Statement of Basis

Permit to Construct No. P-2008.0162
Project ID 62415

US Ecology Idaho, Inc.
Grand View, Idaho

Facility ID 073-00004

Final

July 24, 2020

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Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GACT	Generally Available Control Technology
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hr/yr	hours per consecutive 12 calendar month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
ISB	Indoor Stabilization Building
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O_2	oxygen
OSF	Outdoor Stabilization Facility
PAH	polyaromatic hydrocarbons
PC	permit condition
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit

PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
USEI	US Ecology Idaho
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

US Ecology Idaho (USEI) operates a solid and hazardous waste treatment, storage, and disposal facility (TSDF) located at 20400 Lemley Road, about 10.25 miles northwest of Grand View in Owyhee County, Idaho since February 2001, although the site has been in operation since 1973. The facility provides treatment and disposal services for wastes subject to the Idaho Hazardous Waste Management Act of 1983 (HWMA), which incorporates the requirements of the federal Resource Conservation and Recovery Act (RCRA), and the Toxic Substances Control Act (TSCA). The Grand View facility is also permitted to manage Naturally Occurring Radioactive Material (NORM, a subset of NARM) and Technologically Enhanced NORM (TENORM) in addition to other wastes exempted from federal regulation by the Nuclear Regulatory Commission (NRC). In addition to requirements imposed by this air quality permit, facility operations are subject to the requirements of Permit Number IDD073114654 issued by DEQ pursuant to its authority under the HWMA.

Waste is trucked to the facility and prepared for disposal in onsite landfill cells. Wastes received for treatment are often in the form of sludges with relatively high moisture content or as solid debris. Wastes are also generated by activities on the site, e.g., leachate from landfill cells and liquids collected from various containment areas/systems. Wastes that already meet Land Disposal Restrictions (LDRs) and do not require further processing or treatment are stored or buried in permitted landfill cells. No air emissions result from this "direct burial."

The term "stabilization" is used by USEI in its generic sense to mean the treatment of a waste material to make it physically and chemically stable. In this sense, it is those processes which make the material pass the applicable LDR treatment standard or other applicable standard.

Water spray bars will be located slightly above and on two sides of each of the treatment pits to control dust from materials determined to contain "fine wastes." Retractable vinyl curtains will also be provided to control emissions from each pit. A hood collector will be located above each treatment pit, ducted to one of two dedicated 25,000 cfm baghouses (SB_BH1 or SB_BH2) with minimum 99.5% capture efficiency for $PM_{10}/PM_{2.5}$.

Just as in the previous Stabilization Building, the stabilization process in the new Indoor Stabilization Building will produce stable products by mixing waste with reagents in either of two mixing tanks, each capable of holding up to 150 tons of untreated waste. Water spray bars will be located slightly above and on two sides of each of the treatment tanks to control dust from materials determined to contain "fine wastes." Retractable vinyl curtains will also be provided to control emissions from each tank. A hood collector will be located above each treatment tank, ducted to one of two dedicated 25,000 acfm baghouses (SB_BH1 or SB_BH2) with minimum 99.5% capture efficiency for $PM_{10}/PM_{2.5}$.

Waste materials, including materials containing "fine wastes" are transferred into the mixing tanks directly from trucks, roll-off bins, or by front-end loader. Stabilization reagents or additives are then added to the tanks. Common reagents used include lime, cement, ferrous sulfate ($FeSO_4$), and clay. Cement or lime is transferred from two nearby existing storage silos using a reagent screw auger system. Each of the storage silos is equipped with a baghouse/filter to capture particulate matter (PM) emissions during silo filling. Other reagents are added in bulk. An excavator or backhoe is used to mix the wastes and reagents and to transfer the processed/stabilized material out of the mixing bin into a transport vehicle for further handling or disposal.

Stabilization operations at the Outdoor Stabilization Facility produce stable products by mixing waste with reagents in mixing bins (typically 52 cubic yard bins), each capable of holding up to 30 tons of untreated waste. A waste processing bin lid covers the bin during reagent addition. In the past, the lid has been presumed to reduce particulate matter (PM) emissions by 25%. No credit was taken for the bin lid in emission calculations for this permitting project. Water may be manually sprayed to control emissions when transferring reagents into the mixing bin(s). Three additive silos, each equipped with a baghouse/filter to capture PM emissions during silo filling, are located adjacent to the outdoor stabilization area. These silos usually contain lime but may also be used to store cement.

Waste treatment methods at USEI's Grand View site include stabilization, size reduction, micro- and macro-encapsulation, chemical oxidation or reduction, deactivation, neutralization, precipitation, adsorption, evaporation, bioremediation, and decanting to reduce solubility and leachability of contaminants in the waste. These processes are briefly described below:

Stabilization, as defined in hazardous waste regulations, means the waste is mixed with a reagent or combination of reagents including Portland cement, lime/pozzolans (e.g., fly ash and cement kiln dust), iron salts (e.g., ferrous sulfate, $FeSO_4$), silicates, and clays.

Size reduction of hazardous debris prior to macro- or micro-encapsulation may be conducted within the Indoor Stabilization Building or at the Outdoor Stabilization Facility, or with prior approval from the DEQ Director in accordance with USEI's RCRA permit, at other locations (e.g., at Container Management Units (CMUs)). Size reduction may include using hand tools such as saws or hammers, or an excavator with attachments such as a jackhammer. Some sizing actions may generate small quantities of dust.

Micro-encapsulation of hazardous debris may be conducted in mixing tanks or bins or in smaller vessels within the Indoor Stabilization Building or at the Outdoor Stabilization Facility, and involves stabilizing the debris to reduce leachability by adding reagents including Portland cement, lime/pozzolans, or other reagents (e.g., iron salts, silicates, carbon, polymers, or clays). Wastes to be micro-encapsulated do not include materials containing "fine wastes." Particulate matter (PM) may be emitted during addition of reagents. Micro-encapsulation in smaller vessels requires first checking the vessels to demonstrate that they are not leaking and have sufficient integrity to contain the material being mixed. The mixing vessels will be filled with reagents and hazardous debris, maintaining a minimum freeboard to avoid spilling. Operators mix the debris and reagents manually or with available tools (e.g., with shovels or other hand tools). In some cases, a concrete vibrator or similar devices/equipment may be used to ensure thorough mixing. Because micro-encapsulation involves treating debris wastes rather than wastes with smaller particle size, emissions of PM and volatile compounds from micro-encapsulation treatment are much lower than for stabilization of finer waste materials.

Micro-encapsulation activities outside the treatment pits will not be conducted when loading, mixing, or unloading is being done either of the treatment pits.

Macro-encapsulation of hazardous debris may be conducted within the Indoor Stabilization Building, the Outdoor Stabilization Facility, or at any of several CMUs. Macro-encapsulation involves wrapping the debris in high density polyethylene liners, placing the debris in polyethylene drums, or with prior approval from the DEQ Director in accordance with USEI's RCRA permit, wrapping or coating the debris with an inert surface coating material. Wastes to be macro-encapsulated do not include materials containing "fine wastes." There are no PM emissions associated with macro-encapsulation. Emissions of volatile compounds from surfaces of contaminated debris during macro-encapsulation treatment are much lower than for stabilization of finer waste materials.

Macro-encapsulation activities will not be conducted when loading, mixing, or unloading is being done either of the treatment pits.

Chemical oxidation or reduction of hazardous wastes involves the addition of an oxidizing or reducing agent to reduce the potential for the wastes to chemically react with other materials in the landfill. These processes may be performed in mixing tanks or containers.

Deactivation is the treatment of those wastes that exhibit the characteristics of ignitability, corrosivity, and/or reactivity. Deactivation may be performed in mixing tanks or containers.

Neutralization is a treatment process designed to adjust the pH of wastes determined to be corrosive (i.e., strongly acidic with a pH less than 2 or strongly basic with a pH greater than 12.5).

Precipitation is the process by which regulated metals and/or inorganics are precipitated out of liquid wastes as insoluble solids.

Adsorption involves the use of an appropriate reagent (e.g., activated carbon or treated clay) to remove chemical compounds from aqueous or compressed gas waste streams. Note that adsorption of compressed gas waste streams is not currently conducted at USEI Grand View. Adsorption at USEI is primarily used to treat site leachate and ordinarily occurs in the carbon vessels located in the site leachate building. Adsorption may also be performed within mixing tanks or containers.

Evaporation of wastes occur primarily within the Evaporation Pond. Non-hazardous liquids and hazardous liquids meeting applicable LDRs are placed in the pond and evaporated to the atmosphere using solar energy.

Bioremediation is the use of biological mechanisms to destroy, transform, or immobilize environmental contaminants. Bio-remediation is normally conducted in-situ, however, there may be scenarios where it would be conducted at an alternate facility such as a TSDF. Bio-remediation would be performed within tanks or containers. Bioremediation is not currently employed at USEI.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

December 30, 2014	P-2008.0162, Revised requirements for the operation of air pollution control equipment in the indoor waste stabilization operations in accordance with the Consent Order signed on September 24, 2014, Permit status (A, but will become S upon issuance of this permit)
January 27, 2009`	P-2008.0162, Revision to the facility-wide permit to improve baghouse monitoring conditions, Permit status (S)
July 26, 2007	Letter for Project No. O-2007.0108 issued to clarify that PTC is not required for two additional steel mixing bin tanks inside of the Containment and Stabilization Building. Operation of these units is already addressed by the existing permit, Permit status (A)
June 9, 2006	Tier II/PTC No. P-040020, facility-wide permit to establish PTC conditions for the Containment operations and for Indoor and Outdoor Stabilization operations, Permit status (S)
July 16, 1997	PTC No. 073-00004 (Project No. P-960103), Initial PTC for the Waste Stabilization Building, Permit status (S)

Application Scope

This PTC is for a minor modification at an existing minor facility.

The applicant has proposed to:

- Construct a new waste Indoor Stabilization Building and construct a new drum storage canopy to replace the Containment and Waste Stabilization Buildings which were badly damaged in a steam explosion in 2018.
- Add two used oil-fired heaters not currently identified in the current PTC.

Application Chronology

March 31, 2020	DEQ received a 15-day pre-permit construction application
April 2, 2020	DEQ received an application fee.
April 29 – May 14, 2020	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
April 17, 2020	DEQ approved pre-permit construction.
April 19, 2020	DEQ received supplemental information from the applicant.
May 1, 2020	DEQ determined that the application was complete.

June 17, 2020	DEQ made available the draft permit and statement of basis for peer and regional office review.
June 29, 2020	DEQ made available the draft permit and statement of basis for applicant review.
July 20, 2020	DEQ received the permit processing fee.
July 24, 2020	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment
ISB	Indoor Stabilization Building (ISB): Treatment Tanks 1 and 2 Tank Capacity, each: 175 T/hr (150 T/hr wastes, 25 T/hr reagents) Waste* Throughput : 300 T/hr, 7,200 T/day, 276,000 T/yr Reagent Throughput: 50 T/hr, 1,200 T/day, 46,000 T/yr "Fugitive" Emissions (Treated as point source emission for PTE) 15' x 15' roll-up door, north wall Two 15' x 28' roll-up doors, south wall Two 14' x 28' roll-up doors, south wall 12' x 15' roll-up door, south wall * "Fine wastes" and wastes containing volatile HAPs/TAPs Two Additive Silos Silo baghouse/filters collect PM emissions during silo filling. Both silos are typically used to store lime but occasionally are used to store cement.	Retractable vinyl curtains and collection hood for each tank. Water spray bars will be installed slightly above and on the east and west sides of each treatment tank. Baghouse (SB_BH1) Rated flow: 25,000 acfm $PM_{10}/PM_{2.5}$ control efficiency: 99.5% Baghouse (SB_BH2) Rated flow: 25,000 acfm $PM_{10}/PM_{2.5}$ control efficiency: 99.5% Negative building pressure is maintained whenever one or both of the baghouses are operating. Two Silo Baghouses (ADD_SILO, LIM_SILO) Manufacturer: Stephens Model: SV380 $PM_{10}/PM_{2.5}$ control efficiency: 99.5%
OSF	Outdoor Stabilization Facility (OSF): Treatment Bins (Portable) (OSF1, OSF2) Manufacturer: N/A Bin Capacity: 52 yd^3 Waste Throughput (All bins combined): 270 T/hr, 6,480 T/day, 337,400 T/yr Reagent Throughput (All bins combined): 50 T/hr, 1,200 T/day, 62,500 T/yr Three Additive/Reagent Silos The silos baghouses collect emissions during silo filling. Additives/reagents are usually lime (58.5% CaO) or occasionally cement.	The Waste processing bin lid covers the processing bin during lime and cement addition, rated at 25% efficient for PM. Water sprays are also used to control dust. Silo Baghouses (O_SILO1, O_SILO2, O_SILO3) Manufacturer: Mikropul "Pulsair" $PM_{10}/PM_{2.5}$ control efficiency: 99.5%
SHOPHTR	Maintenance Shop Space Heater (SHOPHTR) Manufacturer: Firelake Model: 500, B5 single stage burner Manufacture Date: March 2017 Heat input rating: 0.493 MMBtu/hr Max. operation: 3,600 hr/yr Fuel: Used oil, ULSD	None. Combustion emissions are vented directly to the atmosphere.
QHHEATER	Quonset Hut Space Heater (QHHEATER) Manufacturer: Firelake Model: 350, B5 single stage burner Manufacture Date: February 2011 Heat input rating: 0.343 MMBtu/hr Max. operation: 3,600 hr/yr Fuel: Used oil, ULSD	None. Combustion emissions are vented directly to the atmosphere.

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the solid and hazardous waste treatment, storage, and disposal operations at the facility (see

APPENDIX **A**) associated with this proposed project. Emissions estimates of criteria pollutant, and HAPs and TAPs were based on emission factors from AP-42, EPA IWAIR Model, the Toxic Release Inventory (TRI), operation of 8,760 hours per year (3,600 hours per year for the space heaters), and process information specific to the facility for this proposed project.

A detailed emission inventory was developed based on operational records from 2011 through 2015. This inventory included 281 volatile HAPs and 17 HAPs likely to be emitted as particulate matter. Constituent concentrations used to calculate emissions reflect doubling the actual annual average concentration. Calculated emissions of particulate TAPs were adjusted based on presuming each TAP was present at a concentration of 125,000 ppm by weight in all wastes. Emissions of noncarcinogenic volatile TAPs were adjusted based on presuming each TAP was present at a concentration of 10,000 ppm by weight in all wastes. Emissions of carcinogenic volatile TAPs were adjusted based on presuming each TAP was present at a concentration of 1,500 ppm by weight in all wastes. Reagent (Portland cement and cement supplement) HAPs and TAP assumed the maximum concentration listed in the safety data sheets and added nine particulate TAPs to the project.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See

APPENDIX **A** for a detailed presentation of the calculations of these emissions for each emissions unit. Pre-project emissions are set equal to emissions allowed in the 2014 permit based on a detailed emissions inventory conducted in 2016 in response to a data request from the EPA.

Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM_{10}		$PM_{2.5}$		SO_2		NO_X		CO		VOC		Lead	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
ISB Wastes SB Baghouses	0.02	0.075	0.0001	0.0008	0.00	0.00	0.009	0.04	0.00	0.00	8.78	38.46	0.01	0.057
SB Doors	0.18	0.79	0.002	0.008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ISB Reagents SB Baghouses	0.003	0.015	0.0002	0.0007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.1E-11	9.18E-11
SB Doors	0.04	0.16	0.002	0.007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.21E-10	9.66E-10
ISB Reagent Silo Filling	1.12	4.90	0.26	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OSF Wastes[c]	3.46	15.17	0.04	0.19	0.00	0.00	0.00	0.00	0.00	0.00	15.64	68.51	0.005	0.02
OSF Reagents[c]	0.64	2.81	0.009	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55E-08	6.78E-08
OSF Reagent Silo Filling	0.82	3.61	0.19	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landfill[c]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leachate[c]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Containment Debris Handling	0.20	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.18
Pre-Project Totals	**2.38**	**10.42**	**0.45**	**2.00**	**0.00**	**0.00**	**0.009**	**0.04**	**0.00**	**0.00**	**8.78**	**38.46**	**0.05**	**0.24**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) Fugitive emissions are included only to determine if the facility is a major source for HAPs and subject to 40 CFR 63, Subpart DD but are not included in the Pre-Project Totals.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project. Post-project emissions are based on a detailed emissions inventory conducted in 2016 in response to a data request from the EPA. Please refer to the discussion of the emission inventory under the Potential to Emit section.

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See

APPENDIX **A** for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM_{10}		$PM_{2.5}$		SO_2		NO_X		CO		VOC		Lead	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
ISB Wastes SB Baghouses	0.002	0.008	0.00002	0.00008	0.00	0.00	0.009	0.04	0.00	0.00	0.92	4.04	0.01	0.06
SB Doors	0.02	0.08	0.0002	0.0009	0.00	0.00			0.00	0.00				
ISB Reagents SB Baghouses	0.0005	0.002	0.00002	0.00007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.2E-12	9.6E-12
SB Doors	0.12	0.02	0.0002	0.0007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.3E-11	1.0E-10
ISB Reagent Silo Filling	0.12	0.51	0.03	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OSF Wastes[c]	0.49	2.16	0.007	0.03	0.00	0.00	0.00	0.00	0.00	0.00	2.23	9.77	0.005	0.02
OSF Reagents[c]	0.09	0.40	0.001	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.2E-09	9.7E-09
OSF Reagent Silo Filling	0.12	0.51	0.03	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landfill[c]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leachate[c]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Space Heaters	0.29	1.26	0.025	1.11	0.36	1.56	0.05	0.20	0.031	0.055	0.00	0.00	0.00	0.00
Post Project Totals	**0.67**	**2.40**	**0.09**	**1.35**	**0.36**	**1.56**	**0.06**	**0.24**	**0.031**	**0.055**	**0.92**	**4.04**	**0.01**	**0.06**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) Fugitive emissions are included only to determine if the facility is a major source for HAPs and subject to 40 CFR 63, Subpart DD but are not included in the Post-Project Totals.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM_{10}		$PM_{2.5}$		SO_2		NO_X		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	2.38	10.42	0.45	2.00	0.00	0.00	0.009	0.04	0.00	0.00	8.78	38.46	0.05	0.24
Post Project Potential to Emit	0.67	2.40	0.09	1.35	0.36	1.56	0.06	0.24	0.031	0.055	0.92	4.04	0.01	0.06
Changes in Potential to Emit	**-1.71**	**-8.02**	**-0.36**	**-0.65**	**0.36**	**1.56**	**0.05**	**0.20**	**0.03**	**0.06**	**-7.86**	**-34.42**	**-0.04**	**-0.18**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table. Although this facility is applying for a modified PTC, to be conservative, all TAPs emissions from the new Indoor Stabilization Building were presumed to be "new" and therefore pre-project TAPs emissions from the ISB are set to zero.

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 5 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Post Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Change in 24-hour Average Emissions Rates from the ISB (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
1,1,1-Trichloroethane	0.00E-03	3.84E+00	3.84E+00	127	No
1,1-Dichloroethane	0.00E-03	5.12E+00	5.12E+00	27	No
1,2 Butylene Oxide	0.00E-03	3.88E+00	3.88E+00	0.8	Yes
1,2,4-Trichlorobenzene	0.00E-03	6.39E-02	6.39E-02	2.47	No
1,2-diaminoethane	0.00E-03	8.89E-01	8.89E-01	1.67	No
1,2-Dichlorobenzene	0.00E-03	2.50E-01	2.50E-01	20	No
1,2-Dichloroethane	0.00E-03	2.66E+00	2.66E+00	2.667	No
1,2-Dichloroethylene	0.00E-03	3.21E+00	3.21E+00	52.7	No
1,2-Dichloropropane	0.00E-03	1.36E+00	1.36E+00	23.133	No
1,4-Dichlorobenzene	0.00E-03	1.60E-01	1.60E-01	30	No
2,2,4 Trimethylpentane	0.00E-03	1.98E+00	1.98E+00	23.3	No
2,4,5-Trichlorophenol	0.00E-03	4.11E-02	4.11E-02	---	Yes
2,4-D	0.00E-03	1.08E-01	1.08E-01	0.667	No
2-butoxyethanol	0.00E-03	3.03E-01	3.03E-01	8	No
2-Chloropchenol	0.00E-03	2.87E-01	2.87E-01	0.033	Yes
2-Methoxyethanol	0.00E-03	9.12E-01	9.12E-01	1.07	No
4,6-Dinitro-o-cresol	0.00E-03	2.63E-03	2.63E-03	0.013	No
Acetamide	0.00E-03	8.06E-03	8.06E-03	0.002	Yes
Acetic Acid	0.00E-03	1.10E+00	1.10E+00	1.67	No
Acetone	0.00E-03	3.16E+00	3.16E+00	119	No
Acetonitrile	0.00E-03	1.47E+00	1.47E+00	4.47	No
Acrolein	0.00E-03	3.29E-01	3.29E-01	0.017	Yes
Acrylic acid	0.00E-03	3.96E-01	3.96E-01	2	No
Ammonia	0.00E-03	3.56E+00	3.56E+00	1.2	Yes
Biphenyl	0.00E-03	1.94E-02	1.94E-02	0.1	No
bis(2-Chloroethyl)ether	0.00E-03	1.94E-01	1.94E-01	2	No
Bromoform	0.00E-03	3.16E-01	3.16E-01	0.333	No
Bromomethane	0.00E-03	8.71E+00	8.71E+00	1.27	Yes
Butyl Acrylate	0.00E-03	9.16E-01	9.16E-01	3.67	No
Butyl Alcohol	0.00E-03	5.72E-01	5.72E-01	10	No
Butyl Glycidyl Ether	0.00E-03	9.29E-01	9.29E-01	9	No
Butyl Mercaptan	0.00E-03	1.43E+00	1.43E+00	0.12	Yes
Captan	0.00E-03	1.76E-05	1.76E-05	0.333	No
Carbaryl	0.00E-03	2.94E-04	2.94E-04	0.333	No
Carbon disulfide	0.00E-03	4.33E+00	4.33E+00	2	Yes
Catechol	0.00E-03	6.19E-03	6.19E-03	1.33	No
Chlorine	0.00E-03	4.02E+00	4.02E+00	0.2	Yes
Chlorobenzene	0.00E-03	5.95E-01	5.95E-01	23.3	No
Chlorobenzilate	0.00E-03	7.25E-04	7.25E-04	0.047	No

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Post Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Change in 24-hour Average Emissions Rates from the ISB (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Chloroethane	0.00E-03	1.20E+01	1.20E+01	176	No
Chloromethane	0.00E-03	1.31E+01	1.31E+01	6.867	Yes
Chloroprene	0.00E-03	2.53E+00	2.53E+00	2.4	Yes
Cresol	0.00E-03	1.63E-01	1.63E-01	1.47	No
Cumene	0.00E-03	9.47E-01	9.47E-01	16.3	No
Cyanide Compounds	0.00E-03	4.76E+00	4.76E+00	0.333	Yes
Cyclohexane	0.00E-03	2.02E+00	2.02E+00	70	No
Cyclohexanone	0.00E-03	4.03E-01	4.03E-01	6.67	No
Cyclohexene	0.00E-03	1.62E+00	1.62E+00	67.7	No
Cyclopentane	0.00E-03	4.26E+00	4.26E+00	114.667	No
Diazinon	0.00E-03	3.86E-03	3.86E-03	0.007	No
Dibutyl phthalate	0.00E-03	1.08E-03	1.08E-03	0.333	No
Dicyclopentadiene	0.00E-03	9.20E-01	9.20E-01	2	No
Diethanolamine	0.00E-03	3.04E-02	3.04E-02	1	No
Diethylaminoethanol	0.00E-03	1.37E+00	1.37E+00	3.33	No
Diisobutyl Ketone	0.00E-03	4.53E-01	4.53E-01	9.67	No
Dimethyl Aniline	0.00E-03	2.78E-01	2.78E-01	1.67	No
Dimethyl phthalate	0.00E-03	1.65E-02	1.65E-02	0.333	No
Diphenylamine	0.00E-03	9.53E-03	9.53E-03	0.667	No
Ethanol	0.00E-03	1.80E+00	1.80E+00	125	No
Ethanolamine	0.00E-03	1.74E-01	1.74E-01	0.533	No
Ethyl acetate	0.00E-03	1.88E+00	1.88E+00	93.3	No
Ethyl ether	0.00E-03	7.12E+00	7.12E+00	80	No
Ethyl Mercaptan	0.00E-03	1.33E+00	1.33E+00	0.067	Yes
Ethylbenzene	0.00E-03	6.00E-01	6.00E-01	29	No
Ethylene Glycol	0.00E-03	3.36E-02	3.36E-02	0.846	No
Ethylene Glycol Dinitrate	0.00E-03	6.42E-02	6.42E-02	0.021	Yes
Ethylene thiourea	0.00E-03	4.37E-04	4.37E-04	0.047	No
Ethylidene Dichloride	0.00E-03	4.51E+00	4.51E+00	27	No
Ethylidene-2-norbornene, 5-	0.00E-03	6.37E-01	6.37E-01	0.167	Yes
Formic acid	0.00E-03	9.21E-01	9.21E-01	0.627	Yes
Glutaraldehyde	0.00E-03	5.04E-01	5.04E-01	0.0047	Yes
Glycol Ethers	0.00E-03	6.82E-01	6.82E-01	1.27	No
Heptane	0.00E-03	1.36E+00	1.36E+00	109	No
Hexachlorocyclopentadiene	0.00E-03	4.16E-02	4.16E-02	0.007	Yes
Hexane (n-Hexane)	0.00E-03	3.91E+00	3.91E+00	12	No
Hydrogen Chloride	0.00E-03	6.61E+00	6.61E+00	0.05	Yes
Hydrogen Fluoride	0.00E-03	3.36E+00	3.36E+00	0.167	Yes
Hydrogen Sulfide	0.00E-03	1.89E+01	1.89E+01	0.933	Yes
Hydroquinone	0.00E-03	2.11E-01	2.11E-01	0.133	Yes
Isoamyl Acetate	0.00E-03	5.93E-01	5.93E-01	35	No
Isoamyl Alcohol	0.00E-03	1.56E+00	1.56E+00	24	No
Isobutyl alcohol	0.00E-03	4.84E-01	4.84E-01	10	No
Isophorone	0.00E-03	3.22E-01	3.22E-01	1.867	No
Isopropyl alcohol	0.00E-03	1.03E+00	1.03E+00	65.3	No
Malathion	0.00E-03	6.54E-04	6.54E-04	0.667	No

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Post Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Change in 24-hour Average Emissions Rates from the ISB (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Maleic anhydride	0.00E-03	1.64E-01	1.64E-01	0.067	Yes
m-Cresol	0.00E-03	3.15E-02	3.15E-02	1.47	No
Mesityl Oxide	0.00E-03	1.71E-01	1.71E-01	4	No
Methacrylonitrile	0.00E-03	2.37E+00	2.37E+00	0.2	Yes
Methanol	0.00E-03	1.57E+00	1.57E+00	17.3	No
Methoxychlor	0.00E-03	4.28E-04	4.28E-04	0.667	No
Methyl Acrylate	0.00E-03	1.32E+00	1.32E+00	2.33	No
Methyl Amyl Ketone	0.00E-03	4.94E-01	4.94E-01	15.7	No
Methyl Butyl Ketone	0.00E-03	4.21E-01	4.21E-01	13.7	No
Methyl ethyl ketone	0.00E-03	1.81E+00	1.81E+00	39.3	No
Methyl Isoamyl Ketone	0.00E-03	6.36E-01	6.36E-01	16	No
Methyl Methacrylate	0.00E-03	1.25E+00	1.25E+00	27.3	No
Methyl Propyl Ketone	0.00E-03	9.75E-01	9.75E-01	46.7	No
Methylcyclohexane	0.00E-03	1.93E+00	1.93E+00	107	No
m-Xylene	0.00E-03	5.91E-01	5.91E-01	29	No
N,N-Dimethylformamide	0.00E-03	3.38E-01	3.38E-01	2	No
N-Amyl Acetate	0.00E-03	7.04E-01	7.04E-01	35.3	No
Naphthalene	0.00E-03	3.75E-02	3.75E-02	3.33	No
n-butyl acetate	0.00E-03	1.03E+00	1.03E+00	47.3	No
Nitrobenzene	0.00E-03	1.80E-01	1.80E-01	0.333	No
Nonane	0.00E-03	5.71E-01	5.71E-01	70	No
o-Cresol	0.00E-03	1.49E-01	1.49E-01	1.47	No
Octane	0.00E-03	6.48E-01	6.48E-01	93.3	No
o-Xylene	0.00E-03	6.53E-01	6.53E-01	29	No
Parathion	0.00E-03	1.69E-03	1.69E-03	0.007	No
p-Cresol	0.00E-03	4.62E-02	4.62E-02	1.47	No
Pentachloronitrobenzene	0.00E-03	2.84E-03	2.84E-03	0.0333	No
Pentachlorophenol	0.00E-03	4.34E-03	4.34E-03	0.033	No
Pentane	0.00E-03	4.06E+00	4.06E+00	118	No
Phenol	0.00E-03	8.93E-02	8.93E-02	1.27	No
Phenyl Mercaptan	0.00E-03	3.03E-01	3.03E-01	0.133	Yes
Phosgene	0.00E-03	5.35E-01	5.35E-01	0.027	Yes
Phosphine	0.00E-03	5.39E-01	5.39E-01	0.027	Yes
Phthalic anhydride	0.00E-03	4.50E-03	4.50E-03	0.4	No
Picric acid	0.00E-03	1.33E-01	1.33E-01	0.006	Yes
p-Phenylenediamine	0.00E-03	2.39E-03	2.39E-03	0.007	No
Propoxur	0.00E-03	1.11E-03	1.11E-03	0.033	No
Propyl Acetate	0.00E-03	1.57E+00	1.57E+00	56	No
Propyl alcohol	0.00E-03	9.47E-01	9.47E-01	33.3	No
Propylene Oxide	0.00E-03	4.15E+00	4.15E+00	3.2	Yes
p-Xylene	0.00E-03	6.21E-01	6.21E-01	29	No
Pyridine	0.00E-03	8.46E-01	8.46E-01	1	No
Quinone	0.00E-03	4.33E-02	4.33E-02	0.027	Yes
Sec-Amyl Acetate	0.00E-03	7.83E-01	7.83E-01	44.3	No
sec-Butyl alcohol	0.00E-03	1.53E+00	1.53E+00	20.3	No
Styrene	0.00E-03	5.62E-01	5.62E-01	6.67	No
tert-Butyl alcohol	0.00E-03	1.57E+00	1.57E+00	20	No
Toluene	0.00E-03	1.29E+00	1.29E+00	25	No
Toluene-2,6-diisocyanate	0.00E-03	5.39E-02	5.39E-02	0.003	Yes
Toxaphene	0.00E-03	7.87E-04	7.87E-04	0.0333	No
Trichloroethylene	0.00E-03	2.07E+00	2.07E+00	17.93	No
Triethylamine	0.00E-03	1.68E+00	1.68E+00	0.27	Yes
Trifluralin	0.00E-03	4.20E-04	4.20E-04	7.7	No

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Post Project 24-hour Average Emissions Rates from the ISB (lb/hr)	Change in 24-hour Average Emissions Rates from the ISB (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Tri-n-butyl phosphate	0.00E-03	2.37E-02	2.37E-02	0.147	No
Urethane	0.00E-03	1.64E-02	1.64E-02	0.002	Yes
Vinyl Acetate	0.00E-03	2.39E+00	2.39E+00	2.3	Yes
Xylene	0.00E-03	6.29E-01	6.29E-01	29	No
Antimony	0.00E-03	3.01E-02	3.01E-02	0.033	No
Barium	0.00E-03	3.01E-02	3.01E-02	0.033	No
Calcium carbonate (Limestone)	0.00E-03	6.97E-03	6.97E-03	0.667	No
Calcium oxide (CaO)	0.00E-03	4.02E-02	4.02E-02	0.133	No
Calcium sulfate (Gypsum)	0.00E-03	3.72E-03	3.72E-03	0.667	No
Cement, Portland, Chemicals	0.00E-03	4.41E-02	4.41E-02	0.667	No
Chromium III	0.00E-03	7.72E-03	7.72E-03	0.033	No
Cobalt	0.00E-03	3.01E-02	3.01E-02	0.0033	Yes
Manganese (Dust & compounds)	0.00E-03	3.01E-02	3.01E-02	0.333	No
Molybdenum trioxide (soluble)	0.00E-03	3.01E-02	3.01E-02	0.333	No
Phosphorus, total	0.00E-03	3.01E-02	3.01E-02	0.007	Yes
Selenium	0.00E-03	3.01E-02	3.01E-02	0.013	Yes
Silicon Dioxide (amorphous silica)	0.00E-03	6.36E-04	6.36E-04	0.667	No
Silica, Crystalline silica, Quartz	0.00E-03	1.59E-03	1.59E-03	0.0067	No
Silica, Crystalline silica, cristobalite	0.00E-03	3.18E-04	3.18E-04	0.0033	No
Silica, Crystalline silica, tridymite	0.00E-03	3.18E-04	3.18E-04	0.0033	No

Some of the changes in emissions rates for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for those TAPs that exceeded the EL because the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table. Although this facility is applying for a modified PTC, to be conservative, all TAPs emissions from the ISB were presumed to be "new" and therefore all pre-project TAPs emissions from the ISB are set to zero.

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates from the ISB (lb/hr)	Post Project Annual Average Emissions Rates from the ISB (lb/hr)	Change in Annual Average Emissions Rates from the ISB (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
1,1,2,2-Tetrachloroethane	0.00E-03	7.53E-03	7.53E-03	1.10E-05	Yes
1,1,2-Trichloroethane	0.00E-03	1.75E-02	1.75E-02	4.20E-04	Yes
1,1-Dichloroethane	0.00E-03	8.07E-02	8.07E-02	2.50E-04	Yes
1,2-Dibromo-3-chloropropane	0.00E-03	5.65E-04	5.65E-04	1.00E-06	Yes
1,2-Dichloroethane	0.00E-03	4.20E-02	4.20E-02	2.50E-04	Yes
1,3-butadiene	0.00E-03	1.28E-02	1.28E-02	2.40E-05	Yes
1,3-Dichloropropylene	0.00E-03	1.99E-02	1.99E-02	1.70E-03	Yes
2,4,6-Trichlorophenol	0.00E-03	3.28E-04	3.28E-04	1.20E-03	No

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates from the ISB (lb/hr)	Post Project Annual Average Emissions Rates from the ISB (lb/hr)	Change in Annual Average Emissions Rates from the ISB (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	0.00E-03	8.99E-02	8.99E-02	3.00E-03	Yes
Acrylamide	0.00E-03	1.71E-04	1.71E-04	5.10E-06	Yes
Acrylonitrile	0.00E-03	3.19E-02	3.19E-02	9.80E-05	Yes
Aniline	0.00E-03	1.59E-03	1.59E-03	9.00E-04	Yes
Benzene	0.00E-03	3.06E-02	3.06E-02	8.00E-04	Yes
bis(2-Chloroethyl)ether	0.00E-03	3.05E-03	3.05E-03	2.00E-05	Yes
Carbon Tetrachloride	0.00E-03	3.99E-02	3.99E-02	4.40E-04	Yes
Chlordane	0.00E-03	1.42E-05	1.42E-05	1.80E-04	No
Chloroform	0.00E-03	4.25E-02	4.25E-02	2.80E-04	Yes
Chloromethane	0.00E-03	2.07E-01	2.07E-01	1.90E-03	Yes
Di(2-ethylhexyl) phthalate	0.00E-03	2.47E-07	2.47E-07	2.80E-02	No
Dibenzofuran	0.00E-03	7.67E-08	7.67E-08	1.50E-10	Yes
Dichloromethane	0.00E-03	7.64E-02	7.64E-02	1.60E-03	Yes
Dioxane	0.00E-03	2.78E-02	2.78E-02	4.80E-03	Yes
Epichlorohydrin	0.00E-03	1.15E-02	1.15E-02	5.60E-03	Yes
Ethylene Dibromide	0.00E-03	1.06E-02	1.06E-02	3.00E-05	Yes
Ethylene oxide	0.00E-03	3.54E-02	3.54E-02	6.70E-05	Yes
Ethylidene Dichloride	0.00E-03	7.10E-02	7.10E-02	2.50E-04	Yes
Formaldehyde	0.00E-03	2.98E-02	2.98E-02	5.10E-04	Yes
Heptachlor	0.00E-03	9.75E-05	9.75E-05	5.10E-06	Yes
Hexachloro-1,3-butadiene	0.00E-03	1.37E-03	1.37E-03	3.30E-04	Yes
Hexachlorobenzene	0.00E-03	7.24E-06	7.24E-06	1.30E-05	No
Hexachloroethane	0.00E-03	3.06E-04	3.06E-04	1.70E-03	No
Hydrazine	0.00E-03	1.18E-03	1.18E-03	2.30E-06	Yes
Lindane	0.00E-03	3.10E-05	3.10E-05	1.70E-05	Yes
Methyl Hydrazine	0.00E-03	1.14E-02	1.14E-02	2.20E-05	Yes
Methylenebis (2-chloroaniline) (MOCA)	0.00E-03	1.32E-05	1.32E-05	1.40E-04	No
Naphthalene	0.00E-03	5.91E-04	5.91E-04	9.10E-05	Yes
N-Nitrosodiethylamine	0.00E-03	7.98E-05	7.98E-05	1.50E-07	Yes
N-Nitrosodimethylamine	0.00E-03	2.52E-04	2.52E-04	4.80E-07	Yes
N-Nitroso-di-n-butylamine	0.00E-03	9.67E-04	9.67E-04	4.10E-06	Yes
PCBs	0.00E-03	3.08E-05	3.08E-05	6.60E-05	No
Pentachloronitrobenzene	0.00E-03	4.47E-05	4.47E-05	9.10E-05	No
Phenanthrene	0.00E-03	6.18E-05	6.18E-05	9.10E-05	No
POM[(a)]	0.00E-03	9.48E-08	9.48E-08	9.10E-05	No
Tetrachloroethylene	0.00E-03	2.45E-02	2.45E-02	1.30E-02	Yes
Toxaphene	0.00E-03	1.24E-05	1.24E-05	2.00E-05	No
Trichloroethylene	0.00E-03	3.26E-02	3.26E-02	5.10E-04	Yes
Vinyl Chloride	0.00E-03	2.17E-01	2.17E-01	9.40E-04	Yes
Vinylidene chloride	0.00E-03	6.93E-02	6.93E-02	1.30E-04	Yes
Asbestos (friable)	0.00E-03	1.87E-05	1.87E-05	N/A	Yes
Arsenic	0.00E-03	1.04E-03	1.04E-03	1.50E-06	Yes
Beryllium	0.00E-03	2.59E-03	2.59E-03	2.80E-05	Yes
Cadmium	0.00E-03	2.59E-03	2.59E-03	3.70E-06	Yes
Chromium VI, Hexavalent Chromium	0.00E-03	3.53E-04	3.53E-04	5.60E-07	Yes
Nickel	0.00E-03	2.59E-03	2.59E-03	2.70E-05	Yes

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for those TAPs that exceeded the EL because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

For TAPs emitted from processes at the ISB and from the two used oil-fired heaters, the emission rates were summed and compared to the applicable screening emissions level, as shown in Table 7. Modeling is required for those TAPs that exceeded the EL.

Table 7 POST PROJECT PTE FOR TAPS EMITTED FROM THE ISB AND HEATERS

Pollutant	Heater TAPs Emissions (lb/hr) Annual or 24-hr Average	ISB TAPs Emissions (lb/hr) Annual or 24-hr Average	Total TAPs Emissions (lb/hr) Annual or 24-hr Average	TAPs Screening Emission Level (lb/hr)	Exceeds Screening Level?
Octa CDD[c] (Equiv 2,3,7,8,TCDD)	2.33E-14	---	2.33E-14	1.50E-10	No
Benzene	5.36E-07	3.06E-02	3.06E-02	8.00E-04	Yes
Dibutylphthalate	2.07E-07	---	2.07E-07	16.4	No
Ethyl benzene	3.88E-07	6.00E-01	6.00E-01	29	No
Formaldehyde	8.27E-05	2.98E-02	2.99E-02	5.10E-04	Yes
Methyl chloroform (1,1,1-Trichloroethane)	1.44E-06	3.84	3.84	127	No
Toluene	3.78E-05	1.29	1.29	25	No
Xylene	6.65E-07	0.63	0.63	29	No
Acenaphthene	5.29E-08	---	5.29E-08	9.10E-05	No
Acenaphthylene	6.34E-10	---	6.34E-10	9.10E-05	No
Anthracene	2.51E-07	---	2.51E-07	9.10E-05	No
Benzo(a)anthracene	1.01E-08	---	1.01E-08	2.00E-06	No
Benzo(b,k)fluoranthene	3.71E-09	---	3.71E-09	2.00E-06	No
Benzo(g,h,I)perylene	5.67E-09	---	5.67E-09		No
Benzo(b,k)fluoranthene	3.71E-09		3.71E-09	2.00E-06	No
Chrysene	5.97E-09	---	5.97E-09	2.00E-06	No
Dibenzo(a.h)anthracene	4.19E-09	---	4.19E-09	2.00E-06	No
Fluoranthene	1.21E-08		1.21E-08	9.10E-05	No
Fluorene	1.12E-08	---	1.12E-08	9.10E-05	No
Indeno(1,2,3-cd)pyrene	5.36E-09	---	5.36E-09	2.00E-06	No
Naphthalene (noncarcinogen)	6.89E-06	3.75E-02	0.04	3.33	No
Naphthalene	2.83E-06	5.91E-04	5.94E-04	9.10E-05	Yes
Phenanthrene	2.51E-07	6.18E-05	6.20E-05	9.10E-05	No
Phenol	7.02E-08	8.93E-02	8.93E-02	1.27E+00	No
Pyrene[c]	2.08E-08	---	2.08E-08	9.10E-05	No
POM (7-PAH Group)	3.30E-08	---	3.30E-08	2.00E-06	No
Antimony	2.75E-05	3.01E-02	3.02E-02	3.30E-02	No
Arsenic	1.50E-04	3.01E-02	3.03E-02	1.50E-06	Yes

Table 7 POST PROJECT PTE FOR TAPS EMITTED FROM THE ISB AND HEATERS

Pollutant	Heater TAPs Emissions (lb/hr) Annual or 24-hr Average	ISB TAPs Emissions (lb/hr) Annual or 24-hr Average	Total TAPs Emissions (lb/hr) Annual or 24-hr Average	TAPs Screening Emission Level (lb/hr)	Exceeds Screening Level?
Beryllium	4.51E-06	2.59E-03	2.60E-03	2.80E-05	Yes
Cadmium	3.01E-05	2.59E-03	2.62E-03	3.70E-06	Yes
Chromium, II and or III	9.00E-04	7.72E-03	8.62E-03	3.30E-02	No
Chromium, Hexavalent	8.12E-05	3.53E-04	4.34E-04	5.60E-07	Yes
Cobalt	3.17E-05	3.01E-02	3.02E-02	3.30E-03	Yes
Manganese	3.05E-04	3.01E-02	3.05E-02	6.70E-02	No
Nickel	4.01E-04	2.59E-03	2.99E-03	2.70E-05	Yes

Post Project HAP Emissions

The emission inventory in Appendix A reflects worst-case conditions that presume every HAP is present at a specified concentration in all wastes based on a 2016 emission inventory in response to a request from EPA. The concentration of HAP used to calculate emissions reflected doubling the actual annual average concentration received for treatment. Facility wide emissions estimate HAP emissions at 19.13 tons per year. A permit condition limiting facility-wide HAP emissions to less than 10 tons per year for any HAP and less than 25 tons per year for all HAPs combined will ensure that the facility remains a minor source of HAP emissions.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in

APPENDIX **B**, the estimated emission rates of $PM_{2.5}$ and TAP from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in

[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

APPENDIX **A**.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see

APPENDIX **B**).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Owyhee County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 8 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	1.69	**100**	B
PM_{10}	2.40	**100**	B
$PM_{2.5}$	1.35	**100**	B
SO_2	1.56	**100**	B
NO_X	0.20	**100**	B
CO	0.06	**100**	B
VOC	4.04	**100**	B
HAP (single)	< 10	**10**	SM
Total HAPs	< 25	**25**	SM

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401..... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 2.11.

Standards for New Sources (IDAPA 58.01.01.676)

IDAPA 58.01.01.676..... Standards for New Sources

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or more, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Condition 2.15.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301..... Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, and VOC or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is not subject to any NSPS requirements 40 CFR Part 60.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT/GACT Applicability (40 CFR 63)

The facility has proposed to operate as a minor source of hazardous air pollutant (HAP) emissions, and is therefore not subject to the requirements of 40 CFR 63, Subpart DD–National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations.

Permit Conditions Review

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Revised Table 1.1

Table 1.1 was revised to remove the old Containment and Stabilization Building parameters and to include the new Indoor Stabilization Building and two space heaters.

Deleted Existing Permit Condition 2.2

A portion of Permit Condition 2.2 was deleted and the direct burial restrictions were retained. The micro-encapsulation, macro-encapsulation and sizing operations were moved to Section 3 of the permit. In addition, USEI's RCRA permit allows treatment of wastes exceeding 500 ppmw in tanks, surface impoundments, or containers.

Revised Permit Condition 2.3

This permit condition was revised to provide procedures for treating wastes containing HAPs or TAPs not listed in Appendix A of the permit.

Added Permit Conditions 2.17 and 2.18

These permit conditions were added to ensure the facility remains a minor source of HAP emissions by restricting the facility wide emissions under major source thresholds and requires the facility to monitor and record HAP emissions on a monthly and annual basis based on the waste characterization identified by a laboratory.

Deleted Existing Section 3 (Permit Conditions 3.1 – 3.8)

Section 3 of the existing permit was removed as the Containment and Stabilization Building was badly damaged in a steam explosion in 2018 and no longer exist.

Section 4 of the existing permit has been replaced with the requirements for the new Indoor Stabilization Building. The only existing requirements that were not replaced were Permit Conditions 3.12 and 3.17 which were revised for the new baghouses and Permit Condition 3.15 for fine waste determination.

Permit Condition 3.1

This permit condition provides a process description of the new indoor stabilization building operations.

Table 3.1

This table provides a description of the new emission units and control devices in the new indoor stabilization building.

Deleted Previous Permit Condition 4.3

This permit condition was removed because it is not necessary to demonstrate compliance with the NAAQS. Short-term and annual throughputs on the treatment of wastes already inherently limits the PM_{10} emissions from the ISB.

Permit Condition 3.3

This permit condition establishes a waste throughput limit to the indoor stabilization building for "fine wastes" as defined in Appendix B and wastes containing volatile TAPs. Throughputs used in the emission calculations are greater than the throughputs used in the EPA information request based on doubling the highest actual amounts of wasted received. The requested throughputs ensure that facility-wide HAPs emissions remain below major source thresholds. Emissions as shown in Appendix A are based on these throughputs.

Permit Condition 3.4

This permit condition establishes a reagent throughput limit to the indoor stabilization building. Emissions as shown in Appendix A are based on these throughputs. Throughputs used in the emission calculations are greater than the throughputs used in the EPA information request based on doubling the highest actual amounts of wasted

received. The requested throughputs ensure that facility-wide HAPs emissions remain below major source thresholds. Emissions as shown in Appendix A are based on these throughputs.

Permit Condition 3.5

This permit condition establishes noncarcinogenic particulate TAPs treatment limits for “fine wastes”. These noncarcinogenic TAPs are listed in Appendix A of the permit. Calculated emissions of particulate TAPs were adjusted based on presuming each TAP was present at a concentration of 125,000 ppm by weight in all wastes. Emissions and the modeling analysis showed compliance with all ambient air quality standards at these limits.

Permit Condition 3.6

This permit condition establishes carcinogenic particulate TAPs treatment limits for “fine wastes”. These carcinogenic TAPs are listed in Appendix A of the permit and Table 3.3. Calculated emissions of particulate TAPs were adjusted based on presuming each TAP was present at a concentration of 125,000 ppm by weight in all wastes. Emissions and the modeling analysis showed compliance with all ambient air quality standards at these limits.

Permit Condition 3.7

This permit condition establishes noncarcinogenic volatile TAPs treatment limits. These noncarcinogenic TAPs are listed in Appendix A of the permit and Table 3.4. Emissions of noncarcinogenic volatile TAPs were adjusted based on presuming each TAP was present at a concentration of 10,000 ppm by weight in all wastes. Emissions and the modeling analysis showed compliance with all ambient air quality standards at these limits.

Permit Condition 3.8

This permit condition establishes carcinogenic volatile TAPs treatment limits. These carcinogenic TAPs are listed in Appendix A of the permit and Table 3.5. Emissions of carcinogenic volatile TAPs were adjusted based on presuming each TAP was present at a concentration of 1,500 ppm by weight in all wastes. Emissions and the modeling analysis showed compliance with all ambient air quality standards at these limits.

Permit Condition 3.9

This permit condition establishes the maximum TAPs treatment limits shall not be exceeded as listed in Appendix A of the permit.

Permit Condition 3.10

This permit condition establishes that all four baghouses have pressure drop monitoring equipment that ensures they are operating in accordance with manufacturer specifications. In addition, power outage verbiage has been added to the condition that mirror XI.C.2.e in the facility’s latest RCRA permit.

Permit Condition 3.11

This permit condition has been moved from Section 2 of the permit to restrict micro-encapsulation, macro-encapsulation and sizing operations from occurring outside of the treatment pits.

Permit Condition 3.12

This permit condition ensures that all four baghouses are operated during stabilization operations and silo filling operations.

Permit Condition 3.13

This permit condition ensures compliance with the indoor stabilization waste throughput limits permit condition by requiring daily recordkeeping.

Permit Condition 3.14

This permit condition ensures compliance with the indoor stabilization reagent throughput limits permit condition by requiring daily recordkeeping.

Permit Condition 3.16

This permit condition ensures compliance with the TAPs treatment limit permit conditions by requiring monitoring and recordkeeping on a daily and monthly basis.

Permit Condition 3.17

This permit condition establishes daily monitoring and recordkeeping of the pressure drop across each of the four baghouses to ensure compliance with the Pressure Drop Monitoring Device permit condition.

Section 5 of the previous permit is now Section 4 of the current permit.

Table 4.2

Table 4.2 has been revised with current naming conventions for the mixing bins and silos.

Deleted Previous Permit Condition 5.3

This permit condition was removed because it is not necessary to demonstrate compliance with the NAAQS. Short-term and annual throughputs on the treatment of wastes and silos reagent already inherently limits the PM_{10} emissions from the OSF.

Permit Condition 4.3

This permit condition was moved from Section 2 of the permit to prohibit wastes containing an average volatile organic concentration of more than 500 ppmw and matches the wording in the facility's RCRA permit.

Permit Condition 4.4

This permit condition has been revised for the outdoor stabilization building for wastes. Throughputs used in the emission calculations are greater than the throughputs used in the EPA information request based on doubling the highest actual amounts of wasted received. The requested throughputs ensure that facility-wide HAPs emissions remain below major source thresholds. Emissions as shown in Appendix A are based on these throughputs.

Permit Condition 4.5

This permit condition has been revised for the outdoor stabilization building for reagents to the silo. Throughputs used in the emission calculations are greater than the throughputs used in the EPA information request based on doubling the highest actual amounts of wasted received. The requested throughputs ensure that facility-wide HAPs emissions remain below major source thresholds. Emissions as shown in Appendix A are based on these throughputs.

Permit Condition 4.6

This permit condition ensures that the treatment of TAPs in wastes shall not exceed the applicable maximum treatment limits listed in Appendix A of the permit.

Permit Condition 4.9

This permit condition ensures compliance with the outdoor stabilization waste throughput limits permit condition by requiring daily recordkeeping.

Permit Condition 4.10

This permit condition ensures compliance with the outdoor stabilization reagent throughput limits permit condition by requiring daily recordkeeping.

Permit Condition 4.11

This permit condition ensures compliance with the facility-wide HAPs limits and treatment limit in Appendix A of the permit.

Permit Condition 5.1

This permit condition describes the two space heaters used at the facility.

Table 5.1 describes the two space heaters and their associated control devices.

Permit Condition 5.3

This permit condition is a requirement that applies to generators of used oil who burn the used oil on site in space heaters.

Permit Condition 5.4

This permit condition limits the space heaters operations based on the emissions submitted in Appendix A.

Permit Condition 5.5

This permit condition limits the fuel combusted in the space heaters as submitted by the Applicant.

Permit Condition 5.6

This permit condition ensures compliance with the space heaters operations permit condition by monitoring and recordkeeping of monthly operations.

Permit Condition 5.7

This permit condition ensures compliance with the fuel requirements permit condition by requiring supplier verification and used oil specifications meet used oil definitions.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Stabilization Operations

Treatment Tank or Bin Throughputs

2020 PTC APPLICATION

Exterior Throughput, Wastes, ANNUAL, 2020 Application		**337,400**	TPY, for "Fine Wastes" and wastes containing volatile TAPs
		306,089	Mg/yr
Interior Throughput, Wastes, ANNUAL, 2020 Application		**276,000**	TPY, for "Fine Wastes" and wastes containing volatile TAPs
		250,387	Mg/yr
Exterior Throughput, Reagents, ANNUAL, 2020 Application	50 T/hr Reagent for every 270 T/hr Wastes	62,500	TPY, for all reagents, combined
Interior Throughput, Reagents, ANNUAL, 2020 Application	50 T/hr Reagent for every 300 T/hr Wastes	46,000	TPY, for all reagents, combined
Exterior Throughput, Wastes, DAILY, 2020 Application	**270** T/hr x 24 hr/day	**6,480**	T/day, for "Fine Wastes" and wastes containing volatile TAPs
		5,879	Mg/day
Interior Throughput, Wastes, DAILY, 2020 Application	**300** T/hr x 24 hr/day	**7,200**	T/day, , for "Fine Wastes" and wastes containing volatile TAPs
		6,532	Mg/day
Exterior Throughput, Reagents, DAILY, 2020 Application	50 T/hr Reagent for every 270 T/hr Wastes	1,200	T/day, for all reagents, combined
Interior Throughput, Reagents, DAILY, 2020 Application	50 T/hr Reagent for every 300 T/hr Wastes	1,200	T/day, for all reagents, combined

2014 PERMIT

Exterior Throughput, Wastes, ANNUAL, 2014 Permit	270 T/hr x 8760 hr	2,365,200	tpy
		2,145,709	Mg/yr
Interior Throughput, Wastes, ANNUAL, 2014 Permit	300 T/hr x 8760 hr	2,628,000	tpy
		2,384,122	Mg/yr
Exterior Throughput, Reagents, ANNUAL, 2014 Permit	50 T/hr Reagent for every 270 T/hr Wastes	438,000	tpy
Interior Throughput, Reagents, ANNUAL, 2014 Permit	50 T/hr Reagent for every 300 T/hr Wastes	438,000	tpy

BOTH

Allowable Annual Operation time	8,760	hours
Allowable Daily Operation time	24	hours
Avg time to treat a batch	3,600	seconds
Allowable Annual Operation time	8,760	hours
Avg Time to treat a batch	3,600	seconds

Leachate

Volume Produced	4,014,800	gal/yr

Landfill

Throughput

Annual Waste Quantity	7,221,500	Mg/yr

Stabilization Assumptions

	Depth (ft)	Width (ft)	Length (ft)	Diameter (ft)	Surface Area ft^2
Interior Pan 1	11.25	**15**	20	--	300.00
Interior Pan 2	12.5	**15**	20	--	300.00
Interior Pan 3	0	0	0		0.00
Interior Mix Tank 1	0	--	--	0	0.00
Interior Mix Tank 2	0	--	--	0	0.00
Exterior Pan 1	6	10	28	--	280.00
Exterior Pan 2	6	10	28	--	280.00
Exterior Pan 3	0	0	0		0.00
Exterior Mix Tank 1	0	--	--	0	0.00
Exterior Mix Tank 2	0	--	--	0	0.00

Treatment pits in the New SB are 15 x 20 rather than 13 x 20, increasing the available surface area from 260 ft2 to 300 ft2

Treatment Pan Assumptions

	(ft^2)	(m^2)
Interior Total Pan Surface Area	600	56
Exterior Total Pan Surface Area	560	52

	(ft)	(m)
Interior Average depth of waste	2.375	0.72

Exterior Average depth of waste	1.2	0.37

Emissions Control Efficiencies	
Watering Control Efficiency(%) [1]	70
Building Capture Efficiency (%)	5
Hood Capture Efficiency (%)	0
Curtain and Baghouse Flow Capture Efficiency (%)	95
Dust Collector Efficiency (%)	99.5

[1] U.S. EPA AP-42, Chapter 11, 11.19.2 Crushed Stone Processing (1/95)

	Depth (ft)	Width (ft)	Length (ft)	urface Area ft^2
Pile of waste for Macroencapsulation	3	20	10	200

	(ft^2)	(m^2)
Total Pan Surface Area	200	19

	(ft)	(m)
Average depth of waste	3	0.91

Macroencapsulation Assumptions

Emissions Control Efficiencies	
Watering Control Efficiency(%) [1]	70
Building Capture Efficiency (%)	5
Hood Capture Efficiency (%)	0
Curtain and Baghouse Flow Capture Efficiency (%)	95
Dust Collector Efficiency (%)	99.5

[1] U.S. EPA AP-42, Chapter 11, 11.19.2 Crushed Stone Processing (1/95)

Total Porosity (ϵ_t)	0.5	cm^3/cm^3
Air-filled Porosity (ϵ_a)	0.25	cm^3/cm^3
Waste Bulk Density (ρ_b)	1.4	g/cm^3
biodegredation	1.00E-20	--
Assumptions for Calculating volatility of compounds from the Waste — Temperature of System Exterior (T)	10.59	°C
Temperature of System Interior (T)	10.59	°C
Universal Gas Constant (R)	82.1	cm^3-atm/mol-°K
Average Molecular Weight of Waste (MW_{waste})	80	g/mol
Temperature Correction Factor for Gas Diffusivity ($T_{C,\ gas}$) [Exterior]	0.92	--
Temperature Correction Factor for Gas Diffusivity ($T_{C,\ gas}$) [Interior]	0.92	--

Landfill Assumptions

Operating life[1]	t_{life}	20.0	years
Total Area	A_{total}	525,633	m^2
Total Depth[2]	d	18.3	m
Gas Constant		82.1	cm^3-atm/mol-K
Temperature	T	21.5	C
Total Number of Cells[3]	N	3.0	
Average Quantity of W	Q_{annual}	7,221,500	Mg/yr
Dry bulk density[4]	ρ_b	1.2	g/cm^3
Total Porosity of Wast	ε_t	0.5	
Air-filled Porosity of W	ε_a	0.3	
Biodegradation[4]	b	0.0	1/s
Calculation Time	t_{calc}	210,384,000	s
Loading[5]	L	1.2	g/cm^3
Cell Area	Acell	175,211	m^2

[1] Assumes maximum life of a single cell is 20 years
[2] Half of the total unit depth is used for most conservative calculations
[3] Based on total number of subcells in landfill as only one subcell will be open at a time
[4] Default values from EPA IWAIR Model
[5] Loading cannot exceed bulk density based on EPA IWAIR Model

Recommended Permit Limits

Throughput Limits - see items highlighted in blue on the Master Input Sheet

Operational Limit: Micro- and macro-encapsulation, and sizing operations outside of the treatment pits shall not occur if wastes are being loaded, treated, or unloaded from either pit.

Used Oil-Fired Space Heaters: Maximum operation at rated capacity no more than 3,600 hours per year, each.
Used Oil: Maximum 1.0% sulfur

Baghouse Operation: The baghouse serving the treatment pit shall be operated any time "Fine Wastes" are being treated in the pit.

***Facility-Wide HAPs Limit: Less than 10 T/yr of any HAP and less than 25 T/yr for all HAPS, combined.**

Noncarcinogenic PM TAPs Treatment Limits for "Fine Wastes" treated in the new Indoor Stabilization Building

CAS No.	Pollutant	HAP?	Modeled ppmw	Pollutant Treatment Limit* (lb/day)	Pollutant Treatment Limit* (T/day)	Emissions Limit (lb/day)	Emissions Limit (T/yr)	Notes
---	Noncarcinogenic particulate TAPs listed in PM TAPs Summary	---	**125,000**	---	**900**	0.72	< 10	The emissions limits were calculated based on the maximum allowable concentration of the pollutant in treated wastes and the annual throughput limit for "fine wastes" treated in the Stabilization Building. **Use pollutant treatment limits as a surrogate for an emissions limit.** Annual emssions at the daily limit = 264.1

*The Pollutant Treatment Limit in the table above is for the specific pollutant, not the amount of wastes containing the pollutant.
Note: The pollutant modeled ppmw is a screening tool. Wastes with higher concentrations may be treated as long as the limit in T/day or T/yr is not exceeded.

Carcinogenic PM TAPs Treatment Limits for "Fine Wastes" treated in the new Indoor Stabilization Building

CAS No.	Pollutant	HAP?	Modeled ppmw	Pollutant Treatment Limit* (lb/yr)	Pollutant Treatment Limit* (T/yr)	Emissions Limit (lb/day)	Emissions Limit (lb/yr)	Notes
---	Carcinogenic particulate TAPs listed in PM TAPs Summary	---	**125,000**	---	**34,500**	---	22.71	The emissions limits were calculated based on the maximum allowable concentration of the pollutant in treated wastes and the annual throughput limit for "fine wastes" treated in the Stabilization Building. **Use pollutant treatment limits as a surrogate for an emissions limit.**
1332-21-4	Asbestos (friable)	HAP	2,700	---	745.2	---	0.49	
7440-38-2	Arsenic compounds	HAP	50,000	---	13,800	---	9.08	
N090	Total chromium	HAP	50,000	---	13,800	---	9.08	

*The Pollutant Treatment Limit in the table above is for the specific pollutant, not the amount of wastes containing the pollutant.
Note: The pollutant modeled ppmw is a screening tool. Wastes with higher concentrations may be treated as long as the limit in T/day or T/yr is not exceeded.

Noncarcinogenic Volatile TAPs Treatment Limits for Wastes treated in the new Indoor Stabilization Building

CAS No.	Pollutant	HAP?	Modeled ppmw	Pollutant Treatment Limit* (lb/day)	Pollutant Treatment Limit* (T/day)	Notes
---	Noncarcinogenic volatile TAPs listed in 24-hr Volatile TAPs Summary	---	**10,000**	---	**72.0**	Due to differences in the volatility of individual carcinogenic volatile TAPs, at a concentration of 10,000 ppmw, **calculated emission rates** for these TAPs range from 4.23E-04 7.72E-05 **Use pollutant treatment limits as a surrogate for an emissions limit, with monthly monitoring and**
95-95-4	2,4,5-Trichlorophenol	HAP	1,600	23,040	11.52	
60-35-5	Acetamide	HAP	2,800	40,320	20.16	
107-02-8	Acrolein	HAP	1,100	15,840	7.92	
7782-50-5	Chlorine	HAP	1,600	23,040	11.52	
75-08-1	Ethyl Mercaptan	---	3,000	43,200	21.6	
7664-39-3	Hydrogen Fluoride	HAP	7,200	103,680	51.84	
7783-06-4	Hydrogen Sulfide	---	7,000	100,800	50.4	
75-44-5	Phosgene	HAP	410	5,904	2.952	
7803-51-2	Phosphine	HAP	6,100	87,840	43.92	
88-89-1	Picric acid	---	4,700	67,680	33.84	
584-84-9	Toluene-2,6-diisocyanate	HAP	2,100	30,240	15.12	

*The Pollutant Treatment Limit in the table above is for the specific pollutant, not the amount of wastes containing the pollutant.
Note: The pollutant modeled ppmw is a screening tool. Wastes with higher concentrations may be treated as long as the limit in T/day or T/yr is not exceeded.

Carcinogenic Volatile TAPs Treatment Limits for Wastes treated in the new Indoor Stabilization Building

CAS No.	Pollutant	HAP?	Modeled ppmw	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)	Notes
---	Carcinogenic volatile TAPs highlighted in purple in Treatment Pits VOCs Annual	---	**1,500**		**414.0**	Due to differences in the volatility of individual carcinogenic volatile TAPs, at a concentration of 1,500 ppmw, annual **emission rates** for these TAPs range from 6.72E-04 **Use pollutant treatment limits as a surrogate for an emissions limit.**
96-12-8	1,2-Dibromo-3-chloropropane	HAP	360	198,720	99.36	
106-99-0	1,3-butadiene	HAP	100	55,200	27.60	
132-64-9	Dibenzofuran	HAP	29	16,008	8.00	
75-21-8	Ethylene oxide	HAP	530	292,560	146.28	
302-01-2	Hydrazine	HAP	18	9,936	4.97	
60-34-4	Methyl Hydrazine	HAP	1,400	772,800	386.40	
55-18-5	N-Nitrosodiethylamine	---	27	14,904	7.45	
62-75-9	N-Nitrosodimethylamine	HAP	49	27,048	13.52	
75-35-4	Vinylidene chloride	HAP	1,100	607,200	303.60	

*The Pollutant Treatment Limit in the table above is for the specific pollutant, not the amount of wastes containing the pollutant.
Note: The pollutant modeled ppmw is a screening tool. Wastes with higher concentrations may be treated as long as the limit in T/day or T/yr is not exceeded.

CAS No.	Speciated TAP	Reagents (lb/hr, 24-hr average)	Wastes (lb/hr, 24-hr average)	Total (lb/hr, 24-hr average)	24-hr Modeled Ambient Impact (ug/m3)	AAC (mg/m3)	Complies? Impact < AAC?	Percent of AAC
Noncarcinogenic Particulate TAPs at 125,000 ppmw. Dispersion Coefficient = 0.0314S mg/m3 per lb/hr (USEI S 28H DRS 24HR NP 5yrs 50-34PM SUM)								
7440-48-4	Cobalt	---	3.01E-02	3.01E-02	9.48E-04	0.0025	Yes	38%
7723-14-0	Phosphorus, total	1.84E-09	3.01E-02	3.01E-02	9.48E-04	0.005	Yes	19%
7782-49-2	Selenium	---	3.01E-02	3.01E-02	9.48E-04	0.01	Yes	9%
Noncarcinogenic Volatile TAPs at 10,000 ppmw, except as noted. Dispersion Coefficient = 0.03591 mg/m3 per lb/hr (USEI S 28H DRS 24HR NP 5yrs 50-34VOC SUM)								
106-88-7	1,2 Butylene Oxide		3.88	3.88	1.43E-01	0.6	Yes	24%
95-95-4	2,4,5-Trichlorophenol 0.069 ppmw		0.041	0.041	1.52E-03	0.0016	Yes	94.9%
95-57-8	2-Chlorophenol		0.287	0.287	1.06E-02	0.025	Yes	42%
60-35-5	Acetamide 0.013 ppmw		0.008	0.008	2.98E-04	0.0003	Yes	99.2%
107-02-8	Acrolein 0.548 ppmw		0.329	0.329	1.21E-02	0.0125	Yes	97%
7664-41-7	Ammonia		3.56	3.56	1.31E-01	0.9	Yes	15%
74-83-9	Bromomethane		8.71	8.71	3.21E-01	0.95	Yes	34%
109-79-5	Butyl Mercaptan		1.43	1.43	5.28E-02	0.09	Yes	59%
75-15-0	Carbon disulfide		4.33	4.33	1.60E-01	1.5	Yes	11%
7782-50-5	Chlorine 6.70 ppmw		4.02	4.02	1.48E-01	0.15	Yes	98.9%
74-87-3	Chloromethane		13.13	13.13	4.85E-01	5.15	Yes	9%
126-99-8	Chloroprene		2.53	2.53	9.36E-02	1.8	Yes	5%
592-01-8	Cyanide Compounds		4.76	4.76	1.76E-01	0.25	Yes	70%
75-08-1	Ethyl Mercaptan 2.22 ppmw		1.33	1.33	4.91E-02	0.05	Yes	98.1%
629-86-6	Ethylene Glycol Dinitrate		0.064	0.064	2.37E-03	0.016	Yes	15%
16219-75-3	Ethylidene-2-norbornene		0.637	0.637	2.35E-02	1.25	Yes	2%
64-18-6	Formic acid		0.921	0.921	3.40E-02	0.47	Yes	7%
111-30-8	Glutaraldehyde		0.504	0.504	1.86E-02	0.041	Yes	45%
77-47-4	Hexachlorocyclopentadiene		0.042	0.042	1.53E-03	0.005	Yes	31%
7647-01-0	Hydrogen Chloride		6.61	6.61	2.44E-01	0.375	Yes	65%
7664-39-3	Hydrogen Fluoride 5.60 ppmw		3.36	3.36	1.24E-01	0.125	Yes	99.2%
7783-06-4	Hydrogen Sulfide 31.6 ppmw		18.95	18.95	6.99E-01	0.7	Yes	99.9%
123-31-9	Hydroquinone		0.211	0.211	7.81E-03	0.1	Yes	8%
108-31-6	Maleic anhydride		0.164	0.164	6.04E-03	0.05	Yes	12%
126-98-7	Methacrylonitrile		2.37	2.37	8.76E-02	0.15	Yes	58%
108-98-5	Phenyl Mercaptan		0.303	0.303	1.12E-02	0.1	Yes	11%
75-44-5	Phosgene 0.992 ppmw		0.539	0.539	1.98E-02	0.02	Yes	98.9%
7803-51-2	Phosphine 0.899 ppmw		0.539	0.539	1.99E-02	0.02	Yes	99.5%
88-89-1	Picric acid 0.221 ppmw		0.133	0.133	4.90E-03	0.005	Yes	98.0%
75-56-9	Propylene Oxide		4.15	4.15	1.53E-01	2.4	Yes	6%
106-51-4	Quinone		0.043	0.043	1.60E-03	0.02	Yes	8%
584-84-9	Toluene-2,6-diisocyanate 10 ppmw		0.054	0.054	1.99E-03	0.002	Yes	99.4%
121-44-8	Triethylamine		1.68	1.68	6.21E-02	0.2	Yes	31%
51-79-6	Urethane		0.016	0.016	6.05E-04	0.0015	Yes	40%
108-05-4	Vinyl Acetate		2.39	2.39	8.84E-02	1.75	Yes	5%

CAS No.	Speciated TAP	Reagents (lb/hr, annual average)	Wastes (lb/hr, annual average)	Total (lb/hr, annual average)	Annual Modeled Impact (ug/m3)	T-RACT AACC (ug/m3)	Complies? Impact < T-RACT AACC?	Percent of T-RACT AACC
Carcinogenic Particulate TAPS at 125,000 ppmw, except as noted. Dispersion Coefficient = 2.1 ug/m3 per lb/hr (USEI S 28H DRS ANN NP2 5yrs 50-34PM SUM)								
1332-21-4	Asbestos (friable) 2,700 ppmw	---	1.86649E-05	1.87E-05	3.92E-05	4.00E-05	Yes	98%
7440-38-2	Arsenic 50,000 ppmw	4.54E-11	1.04E-03	1.04E-03	2.18E-03	2.30E-03	Yes	95%
7440-41-7	Beryllium	4.11E-12	2.59E-03	2.59E-03	5.44E-03	4.20E-02	Yes	13%
7440-43-9	Cadmium	5.31E-13	2.59E-03	2.59E-03	5.44E-03	5.60E-03	Yes	97%
18540-29-9	Chromium VI, Hexavalent Chromium, Total Chromium = 50,000 ppmw	1.66E-11	3.53E-04	3.53E-04	7.40E-04	8.30E-04	Yes	89%
7440-02-0	Nickel	1.04E-10	2.59E-03	2.59E-03	5.44E-03	4.20E-02	Yes	13%
Carcinogenic Volatile TAPs at 1,500 ppmw, except as noted. Dispersion Coefficient = 2.8 ug/m3 per lb/hr (USEI S 28H DRS ANN NP2 5yrs 50-34VOC SUM)								
79-34-5	1,1,2,2-Tetrachloroethane		7.53E-03	7.53E-03	2.10E-02	0.17	Yes	12%
79-00-5	1,1,2,-Trichloroethane		1.75E-02	1.75E-02	4.87E-02	0.62	Yes	8%
75-34-3	1,1-Dichloroethane		8.07E-02	8.07E-02	2.25E-01	0.38	Yes	59%
96-12-8	1,2-Dibromo-3-chloropropane 8.97E-03 ppmw		5.65E-04	5.65E-04	1.58E-03	1.60E-03	Yes	98.6%
107-06-2	1,2-Dichloroethane		4.20E-02	4.20E-02	1.17E-01	0.38	Yes	31%
106-99-0	1,3-butadiene 2.03E-01 ppmw		1.28E-02	1.28E-02	3.57E-02	0.036	Yes	99.1%
542-75-6	1,3-Dichloropropylene		1.99E-02	1.99E-02	5.57E-02	2.5	Yes	2%
75-07-0	Acetaldehyde		8.99E-02	8.99E-02	2.51E-01	4.5	Yes	6%
79-06-1	Acrylamide		1.71E-04	1.71E-04	4.78E-04	45	Yes	0.001%
107-13-1	Acrylonitrile		3.19E-02	3.19E-02	8.91E-02	45	Yes	0.20%
62-53-3	Aniline		1.59E-03	1.59E-03	4.43E-03	1.4	Yes	0.32%
71-43-2	Benzene		3.06E-02	3.06E-02	8.54E-02	1.2	Yes	7%
111-44-4	bis2-Chloroethylether		3.05E-03	3.05E-03	8.51E-03	0.03	Yes	28%
56-23-5	Carbon Tetrachloride		3.39E-02	3.39E-02	1.11E-01	0.67	Yes	17%
67-66-3	Chloroform		4.25E-02	4.25E-02	1.18E-01	0.43	Yes	28%
74-87-3	Chloromethane		2.07E-01	2.07E-01	5.77E-01	2.8	Yes	21%
132-64-9	Dibenzofuran 1.23E-06 ppmw		7.67E-08	7.67E-08	2.14E-07	2.20E-07	Yes	97%
75-09-2	Dichloromethane		7.84E-02	7.84E-02	2.13E-01	2.4	Yes	9%
123-91-1	Dioxane		2.78E-02	2.78E-02	7.75E-02	7.1	Yes	1%
106-89-8	Epichlorohydrin		1.15E-02	1.15E-02	3.22E-02	8.3	Yes	0.39%
106-93-4	Ethylene Dibromide		1.06E-02	1.06E-02	2.97E-02	0.045	Yes	66%
75-21-8	Ethylene oxide 5.62E-01 ppmw		3.54E-02	3.54E-02	9.88E-02	0.1	Yes	98.8%
75-34-3	Ethylidene Dichloride		7.10E-02	7.10E-02	1.98E-01	0.38	Yes	52%
50-00-0	Formaldehyde		2.98E-02	2.98E-02	8.33E-02	0.77	Yes	11%
76-44-8	Heptachlor		9.75E-05	9.75E-05	2.72E-04	7.70E-03	Yes	4%
87-68-3	Hexachloro-1,3-butadiene		1.37E-03	1.37E-03	3.83E-03	0.5	Yes	1%
302-01-2	Hydrazine 1.88E-02 ppmw		1.18E-03	1.18E-03	3.36E-03	3.40E-03	Yes	97%
58-89-9	Lindane		3.10E-05	3.10E-05	8.64E-05	2.60E-02	Yes	0.33%
60-34-4	Methyl Hydrazine 1.81E-01 ppmw		1.14E-02	1.14E-02	3.18E-02	3.20E-02	Yes	99.3%
91-20-3	Naphthalene		5.91E-04	5.91E-04	1.65E-03	0.14	Yes	1%
55-18-5	N-Nitrosodiethylamine 1.27E-03 ppmw		7.98E-05	7.98E-05	2.23E-04	2.30E-04	Yes	97%
62-75-9	N-Nitrosodimethylamine 3.96E-03 ppmw		2.52E-04	2.52E-04	7.02E-04	7.10E-04	Yes	98.9%
924-16-3	N-Nitroso-di-n-butylamine		9.67E-04	9.67E-04	2.70E-03	6.30E-03	Yes	43%
127-18-4	Tetrachloroethylene		2.45E-02	2.45E-02	6.84E-02	21	Yes	0.33%
79-01-6	Trichloroethylene		3.26E-02	3.26E-02	9.10E-02	7.7	Yes	1%
75-01-4	Vinyl Chloride		2.17E-01	2.17E-01	6.05E-01	1.4	Yes	43%
75-35-4	Vinylidene chloride 1.10 ppmw		6.93E-02	6.93E-02	1.93E-01	0.2	Yes	97%

Treatment Limits for Carcinogenic Particulate TAPs

CAS No.	Pollutant	HAP?	Modeled Pollutant 1	Pollutant Treatment Limit (T/yr)
1332-21-4	Asbestos	HAP	2700 ---	745.2
7440-38-2	Arsenic	HAP	50000 ---	13800
7440-47-3	Total Chro	HAP	50000 ---	13800

Noncarcinogenic Particulate TAPs

	CAS No.	Speciated TAP	HAP?	Reagents (lb/hr, 24-hr average)[a]	Wastes (lb/hr, 24-hr average)[b]	Total (lb/hr, 24-hr average)	Screening EL (lb/hr, 24-hr average)	Modeling Required?	24-hr Modeled Ambient Impact (mg/m3)[c]	24-hr AAC (mg/m3)	Complies ? Impact < AAC?	Percent of AAC
	7440-36-0	Antimony	HAP	---	3.01E-02	3.01E-02	0.033	No	9.48E-04	0.025	Yes	4%
	7440-39-3	Barium	---	---	3.01E-02	3.01E-02	0.033	No	9.48E-04	0.025	Yes	4%
	1317-65-3	Calcium carbonate (Limestone)	---	6.97E-03	---	6.97E-03	0.667	No	2.19E-04	0.5	Yes	0.04%
	1305-78-8	Calcium oxide (CaO)	---	4.02E-02	---	4.02E-02	0.133	No	1.26E-03	0.1	Yes	1%
	13397-24-5	Calcium sulfate (Gypsum)	---	3.72E-03	---	3.72E-03	0.667	No	1.17E-04	0.5	Yes	0.02%
	65997-15-1	Cement, Portland, Chemicals	---	4.41E-02	---	4.41E-02	0.667	No	1.39E-03	0.5	Yes	0.28%
*	16065-83-1	Chromium III	HAP	3.97E-10	7.72E-03	7.72E-03	0.033	No	2.43E-04	0.025	Yes	1%
	7440-48-4	Cobalt	HAP	---	3.01E-02	3.01E-02	0.0033	YES	9.48E-04	0.0025	Yes	38%
*	7439-96-5	Manganese (Dust & compounds)	HAP	4.69E-09	3.01E-02	3.01E-02	0.333	No	9.48E-04	0.25	Yes	0.38%
	1313-27-5	Molybdenum trioxide (soluble)	HAP	---	3.01E-02	3.01E-02	0.333	No	9.48E-04	0.25	Yes	0.38%
*	7723-14-0	Phosphorus, total	HAP	1.64E-09	3.01E-02	3.01E-02	0.007	YES	9.48E-04	0.005	Yes	19%
	7782-49-2	Selenium	HAP	---	3.01E-02	3.01E-02	0.013	YES	9.48E-04	0.01	Yes	9%
	7631-86-9	Silicon Dioxide (amorphous silica)	---	6.36E-04	---	6.36E-04	0.667	No	2.00E-05	0.5	Yes	0%
	14808-60-7	Silica, Crystalline silica, Quartz	---	1.59E-03	---	1.59E-03	0.0067	No	5.00E-05	0.005	Yes	1%
	14464-46-1	Silica, Crystalline silica, cristobalite	---	3.18E-04	---	3.18E-04	0.0033	No	1.00E-05	0.0025	Yes	0.40%
	15468-32-3	Silica, Crystalline silica, tridymite	---	3.18E-04	---	3.18E-04	0.0033	No	1.00E-05	0.0025	Yes	0.40%

[a] Max ppm or weight percent in 1,200 T/day of any reagent.

[b] TAPs compliance was demonstrated for max 125,000 ppm in 7,200 T/day of wastes (900 T/day).

[c] Ambient impact using 24-hr dispersion coefficient of 0.03145 mg/m3 per lb/hr of emissions (USEI_S_2BH_DRS_24HR_NP_5yrs_50-34PM.SUM)

Carcinogenic Particulate TAPS

	CAS No.	Speciated TAP	HAP?	Reagents (lb/hr, annual average)[a]	Wastes (lb/hr, annual average)[b]	Total (lb/hr, annual average)	Screening EL	Modeling Required?	Annual Modeled Impact (ug/m3)[c]	T-RACT AACC (ug/m3)	Complies ? Impact < T-RACT AACC?	Percent of T-RACT AACC
	1332-21-4	Asbestos (friable)[d]	HAP	---	1.87E-05	1.87E-05	N/A	YES	3.92E-05	4.00E-05	Yes	98%
*	7440-38-2	Arsenic[d]	HAP	4.542E-11	1.04E-03	1.04E-03	1.50E-06	YES	2.18E-03	2.30E-03	Yes	95%
*	7440-41-7	Beryllium	HAP	4.106E-12	2.59E-03	2.59E-03	2.80E-05	YES	5.44E-03	4.20E-02	Yes	13%
*	7440-43-9	Cadmium	HAP	5.314E-13	2.59E-03	2.59E-03	3.70E-06	YES	5.44E-03	5.60E-03	Yes	97%
*	18540-29-9	Chromium VI, Hexavalent Chromium[d]	HAP	1.662E-11	3.53E-04	3.53E-04	5.60E-07	YES	7.40E-04	8.30E-04	Yes	89%
*	7440-02-0	Nickel	HAP	1.036E-10	2.59E-03	2.59E-03	2.70E-05	YES	5.44E-03	4.20E-02	Yes	13%

[a] Max ppm or weight percent in 46,000 T/yr of any reagent.

[b] Max 125,000 ppm in 276,000 T/yr of wastes (34,500 T/yr), except as noted.

[c] Ambient impact using annual dispersion coefficient of 2.1 ug/m3 per lb/hr of emissions (USEI_S_2BH_DRS_ANN_NP2_5yrs_50-34PM.SUM)

[d] See Table below.

Treatment Limits for Carcinogenic Particulate TAPs

CAS No.	Pollutant	HAP?	Modeled ppm	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)
1332-21-4	Asbestos (friable)	HAP	2,700	---	745.2
7440-38-2	Arsenic	HAP	50,000	---	13,800
7440-47-3	Total Chromium (includes Cr II, Cr III and Cr VI)	HAP	50,000	---	13,800

Carcinogenic Volatile TAPs

CAS No.	Speciated TAP	HAP?	Idaho 586 TAP?	Annual Emission Rate (lb/hr, annual average)[a]	Screening Emissions Level (EL), lb/hr, annual average	Annual Modeling Required?	Modeled Ambient Impact (ug/m3)[a]	T-RACT AACC (ug/m3)	Complies? Impact < T-RACT AACC?	Percent of T-RACT AACC
79-34-5	1,1,2,2-Tetrachloroethane	HAP	Yes	7.53E-03	1.10E-05	YES	2.10E-02	0.17	Yes	12%
79-00-5	1,1,2-Trichloroethane	HAP	Yes	1.75E-02	4.20E-04	YES	4.87E-02	0.62	Yes	8%
75-34-3	1,1-Dichloroethane	HAP	Yes	8.07E-02	2.50E-04	YES	2.25E-01	0.38	Yes	59%
96-12-8	1,2-Dibromo-3-chloropropane[c]	HAP	Yes	5.65E-04	1.00E-06	YES	1.58E-03	1.60E-03	Yes	98.6%
107-06-2	1,2-Dichloroethane	HAP	Yes	4.20E-02	2.50E-04	YES	1.17E-01	0.38	Yes	31%
106-99-0	1,3-butadiene[c]	HAP	Yes	1.28E-02	2.40E-05	YES	3.57E-02	0.036	Yes	99.1%
542-75-6	1,3-Dichloropropylene	HAP	Yes	1.99E-02	1.70E-03	YES	5.57E-02	2.5	Yes	2%
88-06-2	2,4,6-Trichlorophenol	HAP	Yes	3.28E-04	1.20E-03	No	9.14E-04	1.8	Yes	0.05%
75-07-0	Acetaldehyde	HAP	Yes	8.99E-02	3.00E-03	YES	2.51E-01	4.5	Yes	6%
79-06-1	Acrylamide	HAP	Yes	1.71E-04	5.10E-06	YES	4.78E-04	45	Yes	0.001%
107-13-1	Acrylonitrile	HAP	Yes	3.19E-02	9.80E-05	YES	8.91E-02	45	Yes	0.20%
62-53-3	Aniline	HAP	Yes	1.59E-03	9.00E-04	YES	4.43E-03	1.4	Yes	0.32%
71-43-2	Benzene	HAP	Yes	3.06E-02	8.00E-04	YES	8.54E-02	1.2	Yes	7%
111-44-4	bis(2-Chloroethyl)ether	HAP	Yes	3.05E-03	2.00E-05	YES	8.51E-03	0.03	Yes	28%
56-23-5	Carbon Tetrachloride	HAP	Yes	3.99E-02	4.40E-04	YES	1.11E-01	0.67	Yes	17%
57-74-9	Chlordane	HAP	Yes	1.42E-05	1.80E-04	No	3.98E-05	0.027	Yes	0.15%
67-66-3	Chloroform	HAP	Yes	4.25E-02	2.80E-04	YES	1.18E-01	0.43	Yes	28%
74-87-3	Chloromethane	HAP	Yes	2.07E-01	1.90E-03	YES	5.77E-01	2.8	Yes	21%
117-81-7	Di(2-ethylhexyl) phthalate	HAP	Yes	2.47E-07	2.80E-02	No	6.89E-07	42	Yes	1.64E-06
132-64-9	Dibenzofuran[c]	HAP	Yes	7.67E-08	1.50E-10	YES	2.14E-07	2.20E-07	Yes	97%
75-09-2	Dichloromethane	HAP	Yes	7.64E-02	1.60E-03	YES	2.13E-01	2.4	Yes	9%
123-91-1	Dioxane	HAP	Yes	2.78E-02	4.80E-03	YES	7.75E-02	7.1	Yes	1%
106-89-8	Epichlorohydrin	HAP	Yes	1.15E-02	5.60E-03	YES	3.22E-02	8.3	Yes	0.39%
106-93-4	Ethylene Dibromide	HAP	Yes	1.06E-02	3.00E-05	YES	2.97E-02	0.045	Yes	66%
75-21-8	Ethylene oxide[c]	HAP	Yes	3.54E-02	6.70E-05	YES	9.88E-02	0.1	Yes	98.8%
75-34-3	Ethylidene Dichloride	HAP	Yes	7.10E-02	2.50E-04	YES	1.98E-01	0.38	Yes	52%
50-00-0	Formaldehyde	HAP	Yes	2.98E-02	5.10E-04	YES	8.33E-02	0.77	Yes	11%
76-44-8	Heptachlor	HAP	Yes	9.75E-05	5.10E-06	YES	2.72E-04	7.70E-03	Yes	4%
87-68-3	Hexachloro-1,3-butadiene	HAP	Yes	1.37E-03	3.30E-04	YES	3.83E-03	0.5	Yes	1%
118-74-1	Hexachlorobenzene	HAP	Yes	7.24E-06	1.30E-05	No	2.02E-05	0.02	Yes	0.10%
67-72-1	Hexachloroethane	HAP	Yes	3.06E-04	1.70E-03	No	8.54E-04	2.5	Yes	0.03%
302-01-2	Hydrazine[c]	HAP	Yes	1.18E-03	2.30E-06	YES	3.30E-03	0.0034	Yes	97%
58-89-9	Lindane	-	Yes	3.10E-05	1.70E-05	YES	8.64E-05	0.026	Yes	0.33%
60-34-4	Methyl Hydrazine[c]	HAP	Yes	1.14E-02	2.20E-05	YES	3.18E-02	0.032	Yes	99.3%
101-14-4	Methylenebis (2-chloroaniline) (MOCA)	HAP	Yes	1.32E-05	1.40E-04	No	3.69E-05	0.21	Yes	0.02%
91-20-3	Naphthalene	HAP	Yes	5.91E-04	9.10E-05	YES	1.65E-03	0.14	Yes	1%
55-18-5	N-Nitrosodiethylamine[c]	-	Yes	7.98E-05	1.50E-07	YES	2.23E-04	2.30E-04	Yes	96.8%
62-75-9	N-Nitrosodimethylamine[c]	HAP	Yes	2.52E-04	4.80E-07	YES	7.02E-04	7.10E-04	Yes	98.9%
924-16-3	N-Nitroso-di-n-butylamine	-	Yes	9.67E-04	4.10E-06	YES	2.70E-03	6.30E-03	Yes	43%
1336-36-3	PCBs	HAP	Yes	3.08E-05	6.60E-05	No	8.60E-05	0.1	Yes	0.09%
82-68-8	Pentachloronitrobenzene	HAP	Yes	4.47E-05	9.10E-05	No	1.25E-04	0.14	Yes	0.09%
85-01-8	Phenanthrene	-	Yes	6.18E-05	9.10E-05	No	1.72E-04	0.14	Yes	0.12%
N590	POLYCYCLIC AROMATIC COMPOUNDS	-	Yes	9.48E-08	9.10E-05	No	2.64E-07	0.14	Yes	1.89E-04
127-18-4	Tetrachloroethylene	HAP	Yes	2.45E-02	1.30E-02	YES	6.84E-02	21	Yes	0.33%
8001-35-2	Toxaphene	HAP	Yes	1.24E-05	2.00E-05	No	3.46E-05	0.03	Yes	0.12%
79-01-6	Trichloroethylene	HAP	Yes	3.26E-02	5.10E-04	YES	9.10E-02	7.7	Yes	1%
75-01-4	Vinyl Chloride	HAP	Yes	2.17E-01	9.40E-04	YES	6.05E-01	1.4	Yes	43%
75-35-4	Vinylidene chloride[c]	HAP	Yes	6.93E-02	1.30E-04	YES	1.93E-01	0.2	Yes	97%

CAS No.	Pollutant	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)	ppmw in wastes
96-12-8	1,2-Dibromo-3-chloropropane	198,720	99.36	360
106-99-0	1,3-butadiene	55,200	27.60	100
132-64-9	Dibenzofuran	16,008	8.00	29
75-21-8	Ethylene oxide	292,560	146.28	530
302-01-2	Hydrazine	9,936	4.97	18
60-34-4	Methyl Hydrazine	772,800	386.40	1,400
55-18-5	N-Nitrosodiethylamine	14,904	7.45	27
62-75-9	N-Nitrosodimethylamine	27,048	13.52	49
75-35-4	Vinylidene chloride	607,200	303.60	1,100

[a] TAPs compliance was demonstrated for max 1,500 ppm of each pollutant in 276,000 T/yr of wastes (414 T/yr), except as noted.

[b] Ambient impact using annual dispersion coefficient of 2.9 ug/m3 per lb/hr of emissions (USEI S 2BH DRS ANN NP2 5yrs 50-34VOC.SUM).

[c] See Table below.

Pollutants highlighted in light purple have modeled impacts greater than 95% of the T-RACT AACC. Modeled impacts for all other pollutants in this list are below 66% of the applicable T-RACT AACC.

Treatment Limits for Carcinogenic Volatile TAPs

CAS No.	Pollutant	HAP?	Modeled ppmw	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)
96-12-8	1,2-Dibromo-3-chloropropane	HAP	360	198,720	99.36
106-99-0	1,3-butadiene	HAP	100	55,200	27.60
132-64-9	Dibenzofuran	HAP	29	16,008	8.00
75-21-8	Ethylene oxide	HAP	530	292,560	146.28
302-01-2	Hydrazine	HAP	18	9,936	4.97
60-34-4	Methyl Hydrazine	HAP	1,400	772,800	386.40
55-18-5	N-Nitrosodiethylamine	---	27	14,904	7.45
62-75-9	N-Nitrosodimethylamine	HAP	49	27,048	13.52
75-35-4	Vinylidene chloride	HAP	1,100	607,200	303.60

75-35-4 Vinylidene chloride 607200 303.6 1100

Noncarcinogenic Volatile TAPs

CAS No.	Speciated TAP	HAP?	Idaho 585 TAP?	Emission Rate, lb/hr, 24-hr average	Screening Emissions Level (EL), lb/hr, 24-hr average	24-hr Modeling Required?	Modeled Ambient Impact (mg/m3)	ACC (mg/m3)	Complies? Impact < AAC?	Percent of AAC
71-55-6	1,1,1-Trichloroethane	HAP	Yes	3.8361	127	No	1.42E-01	95.5	Yes	0.15%
75-34-3	1,1-Dichloroethane	HAP	Yes	5.1211	27	No	1.89E-01	20.25	Yes	1%
106-88-7	1,2 Butylene Oxide	HAP	Yes	3.8790	0.8	YES	1.43E-01	0.6	Yes	24%
120-82-1	1,2,4-Trichlorobenzene	HAP	Yes	0.0639	2.47	No	2.36E-03	1.85	Yes	0.13%
107-15-3	1,2-diaminoethane	-	Yes	0.8893	1.67	No	3.28E-02	1.25	Yes	3%
95-50-1	1,2-Dichlorobenzene	-	Yes	0.2503	20	No	9.24E-03	15	Yes	0.06%
107-06-2	1,2-Dichloroethane	HAP	Yes	2.6646	2.667	No	9.84E-02	2	Yes	5%
540-59-0	1,2-Dichloroethylene	-	Yes	3.2078	52.7	No	1.18E-01	39.5	Yes	0.30%
78-87-5	1,2-Dichloropropane	HAP	Yes	1.3578	23.133	No	5.01E-02	17.35	Yes	0.29%
106-46-7	1,4-Dichlorobenzene	HAP	Yes	0.1597	30	No	5.89E-03	22.5	Yes	0.03%
540-84-1	2,2,4 Trimethylpentane	HAP	Yes	1.9770	23.3	No	7.30E-02	17.5	Yes	0.42%
95-95-4	2,4,5-Trichlorophenol	HAP	Yes	0.0411	---	YES	1.52E-03	0.0016	Yes	94.9%
94-75-7	2,4-D	-	Yes	0.1085	0.667	No	4.00E-03	0.5	Yes	1%
111-76-2	2-butoxyethanol	-	Yes	0.3035	8	No	1.12E-02	6	Yes	0.19%
95-57-8	2-Chloropchenol	-	Yes	0.2868	0.033	YES	1.06E-02	0.025	Yes	42%
109-86-4	2-Methoxyethanol	-	Yes	0.9123	1.07	No	3.37E-02	0.8	Yes	4%
534-52-1	4,6-Dinitro-o-cresol	-	Yes	0.0026	0.013	No	9.70E-05	0.01	Yes	1%
60-35-5	Acetamide	HAP	Yes	0.0081	0.002	YES	2.98E-04	0.0003	Yes	99.2%
64-19-7	Acetic Acid	-	Yes	1.0961	1.67	No	4.05E-02	1.25	Yes	3%
67-64-1	Acetone	-	Yes	3.1599	119	No	1.17E-01	89	Yes	0.13%
75-05-8	Acetonitrile	HAP	Yes	1.4736	4.47	No	5.44E-02	3.35	Yes	2%
107-02-8	Acrolein	HAP	Yes	0.3287	0.017	YES	1.21E-02	0.0125	Yes	97%
79-10-7	Acrylic acid	HAP	Yes	0.3957	2	No	1.46E-02	1.5	Yes	1%
7664-41-7	Ammonia	-	Yes	3.5577	1.2	YES	1.31E-01	0.9	Yes	15%
92-52-4	Biphenyl	HAP	Yes	0.0194	0.1	No	7.15E-04	0.075	Yes	1%
111-44-4	bis(2-Chloroethyl)ether	HAP	Yes	0.1937	2	No	7.15E-03	1.5	Yes	0.48%
75-25-2	Bromoform	HAP	Yes	0.3165	0.333	No	1.17E-02	0.25	Yes	5%
74-83-9	Bromomethane	HAP	Yes	8.7095	1.27	YES	3.21E-01	0.95	Yes	34%
141-32-2	Butyl Acrylate	-	Yes	0.9157	3.67	No	3.38E-02	2.75	Yes	1%
71-36-3	Butyl Alcohol	-	Yes	0.5724	10	No	2.11E-02	7.5	Yes	0.28%
2426-08-6	Butyl Glycidyl Ether	-	Yes	0.9285	9	No	3.43E-02	6.75	Yes	1%
109-79-5	Butyl Mercaptan	-	Yes	1.4312	0.12	YES	5.28E-02	0.09	Yes	59%
133-06-2	Captan	HAP	Yes	0.0000	0.333	No	6.51E-07	0.25	Yes	2.60E-04
63-25-2	Carbaryl	HAP	Yes	0.0003	0.333	No	1.08E-05	0.25	Yes	4.34E-03
75-15-0	Carbon disulfide	HAP	Yes	4.3278	2	YES	1.60E-01	1.5	Yes	11%
120-80-9	Catechol	HAP	Yes	0.0062	1.33	No	2.28E-04	1	Yes	0.023%
7782-50-5	Chlorine	HAP	Yes	4.0185	0.2	YES	1.48E-01	0.15	Yes	98.9%
108-90-7	Chlorobenzene	HAP	Yes	0.5949	23.3	No	2.20E-02	17.5	Yes	0.13%
510-15-6	Chlorobenzilate	HAP	Yes	0.0007	0.047	No	2.68E-05	0.035	Yes	0.08%
75-00-3	Chloroethane	HAP	Yes	11.9792	176	No	4.42E-01	132	Yes	0.33%
74-87-3	Chloromethane	HAP	Yes	13.1347	6.867	YES	4.85E-01	5.15	Yes	9%
126-99-8	Chloroprene	HAP	Yes	2.5348	2.4	YES	9.36E-02	1.8	Yes	5%
1319-77-3	Cresol	HAP	Yes	0.1632	1.47	No	6.02E-03	1.1	Yes	1%
98-82-8	Cumene	HAP	Yes	0.9471	16.3	No	3.50E-02	12.25	Yes	0.29%
592-01-8	**Cyanide Compounds**	-	**Yes**	**4.7582**	**0.333**	**YES**	**1.76E-01**	**0.25**	**Yes**	**70%**
110-82-7	Cyclohexane	-	Yes	2.0178	70	No	7.45E-02	52.5	Yes	0.14%
108-94-1	Cyclohexanone	-	Yes	0.4032	6.67	No	1.49E-02	5	Yes	0.30%
110-83-8	Cyclohexene	-	Yes	1.6185	67.7	No	5.97E-02	50.75	Yes	0.12%
287-92-3	Cyclopentane	-	Yes	4.2562	114.667	No	1.57E-01	86	Yes	0.18%
333-41-5	Diazinon	-	Yes	0.0039	0.007	No	1.43E-04	0.005	Yes	3%
84-74-2	Dibutyl phthalate	HAP	Yes	0.0011	0.333	No	3.97E-05	0.25	Yes	0.02%
77-73-6	Dicyclopentadiene	-	Yes	0.9202	2	No	3.40E-02	1.5	Yes	2%
111-42-2	Diethanolamine	HAP	Yes	0.0304	1	No	1.12E-03	0.75	Yes	0.15%
100-37-8	Diethylaminoethanol	-	Yes	1.3676	3.33	No	5.05E-02	2.5	Yes	2%
108-83-8	Diisobutyl Ketone	-	Yes	0.4527	9.67	No	1.67E-02	7.25	Yes	0.23%
121-69-7	Dimethyl Aniline	HAP	Yes	0.2785	1.67	No	1.03E-02	1.25	Yes	1%
131-11-3	Dimethyl phthalate	HAP	Yes	0.0165	0.333	No	6.10E-04	0.25	Yes	0.24%
122-39-4	Diphenylamine (difficult to distinguish fro	-	Yes	0.0095	0.667	No	3.52E-04	0.5	Yes	0.07%
64-17-5	Ethanol	-	Yes	1.8049	125	No	6.66E-02	94	Yes	0.07%
141-43-5	Ethanolamine	-	Yes	0.1743	0.533	No	6.43E-03	0.4	Yes	2%
141-78-6	Ethyl acetate	-	Yes	1.8769	93.3	No	6.93E-02	70	Yes	0.10%
60-29-7	Ethyl ether	-	Yes	7.1169	80	No	2.63E-01	60	Yes	0.44%
75-08-1	Ethyl Mercaptan	-	Yes	1.3292	0.067	YES	4.91E-02	0.05	Yes	98.1%
100-41-4	Ethylbenzene	HAP	Yes	0.6000	29	No	2.21E-02	21.75	Yes	0.10%
107-21-1	Ethylene Glycol	HAP	Yes	0.0336	0.846	No	1.24E-03	6.35	Yes	0.02%
628-96-6	Ethylene Glycol Dinitrate	-	Yes	0.0642	0.021	YES	2.37E-03	0.016	Yes	15%
96-45-7	Ethylene thiourea	HAP	Yes	0.0004	0.047	No	1.61E-05	0.035	Yes	0.05%
75-34-3	Ethylidene Dichloride	HAP	Yes	4.5086	27	No	1.66E-01	20.25	Yes	1%
16219-75-	Ethylidene-2-norbornene, 5-	-	Yes	0.6369	0.167	YES	2.35E-02	1.25	Yes	2%
64-18-6	Formic acid	-	Yes	0.9211	0.627	YES	3.40E-02	0.47	Yes	7%
111-30-8	Glutaraldehyde	-	Yes	0.5041	0.0047	YES	1.86E-02	0.041	Yes	45%
N230	Glycol Ethers	-	YES	0.6824	1.27	No	2.52E-02	0.95	Yes	3%
142-82-5	Heptane	-	Yes	1.3649	109	No	5.04E-02	82	Yes	0.06%
77-47-4	Hexachlorocyclopentadiene	HAP	Yes	0.0416	0.007	YES	1.53E-03	0.005	Yes	31%
110-54-3	Hexane (n-Hexane)	HAP	Yes	3.9143	12	No	1.44E-01	9	Yes	2%
7647-01-0	Hydrogen Chloride	HAP	Yes	6.6090	0.05	YES	2.44E-01	0.375	Yes	**65%**
7664-39-3	Hydrogen Fluoride	HAP	YES	3.3591	0.167	YES	1.24E-01	0.125	Yes	99.2%
7783-06-4	Hydrogen Sulfide	-	Yes	18.9488	0.933	YES	6.99E-01	0.7	Yes	99.9%
123-31-9	Hydroquinone	HAP	Yes	0.2115	0.133	YES	7.81E-03	0.1	Yes	8%
123-92-2	Isoamyl Acetate	-	Yes	0.5928	35	No	2.19E-02	26.25	Yes	0.08%
123-51-3	Isoamyl Alcohol	-	Yes	1.5632	24	No	5.77E-02	18	Yes	0.32%
78-83-1	Isobutyl alcohol	-	Yes	0.4836	10	No	1.79E-02	6	Yes	0.30%
78-59-1	Isophorone	HAP	Yes	0.3219	1.867	No	1.19E-02	1.4	Yes	1%
67-63-0	Isopropyl alcohol	-	Yes	1.0330	65.3	No	3.81E-02	49	Yes	0.08%
121-75-5	Malathion	-	Yes	0.0007	0.667	No	2.41E-05	0.5	Yes	0.005%
108-31-6	Maleic anhydride	HAP	Yes	0.1637	0.067	YES	6.04E-03	0.05	Yes	12%
108-39-4	m-Cresol	HAP	Yes	0.0315	1.47	No	1.16E-03	1.1	Yes	0.11%
141-79-7	Mesityl Oxide	-	Yes	0.1705	4	No	6.29E-03	3	Yes	0.21%
126-98-7	Methacrylonitrile	-	Yes	2.3730	0.2	YES	8.76E-02	0.15	Yes	58%
67-56-1	Methanol	HAP	Yes	1.5746	17.3	No	5.81E-02	13	Yes	0.4%
72-43-5	Methoxychlor	HAP	Yes	0.0004	0.667	No	1.58E-05	0.5	Yes	0.003%
96-33-3	Methyl Acrylate	-	Yes	1.3216	2.33	No	4.88E-02	1.75	Yes	3%
110-43-0	Methyl Amyl Ketone	-	Yes	0.4942	15.7	No	1.82E-02	11.75	Yes	0.16%
108-10-1	Methyl Butyl Ketone	HAP	Yes	0.4214	13.7	No	1.56E-02	10.25	Yes	0.15%
78-93-3	Methyl ethyl ketone	HAP	Yes	1.8109	39.3	No	6.68E-02	29.5	Yes	0.23%
110-12-3	Methyl Isoamyl Ketone	-	Yes	0.6359	16	No	2.35E-02	12	Yes	0.20%
80-62-6	Methyl Methacrylate	HAP	Yes	1.2474	27.3	No	4.60E-02	20.5	Yes	0.22%
107-87-9	Methyl Propyl Ketone	-	Yes	0.9750	46.7	No	3.60E-02	35	Yes	0.10%
108-87-2	Methylcyclohexane	-	Yes	1.9311	107	No	7.13E-02	80.5	Yes	0.09%
108-38-3	m-Xylene	HAP	YES	0.5908	29	No	2.18E-02	21.75	Yes	0.10%
68-12-2	N,N-Dimethylformamide	HAP	Yes	0.3378	2	No	1.25E-02	1.5	Yes	1%
628-63-7	N-Amyl Acetate	-	Yes	0.7038	35.3	No	2.60E-02	26.5	Yes	0.10%
91-20-3	Naphthalene	HAP	Yes	0.0375	3.33	No	1.38E-03	2.5	Yes	0.06%
123-86-4	n-butyl acetate	-	Yes	1.0337	47.3	No	3.82E-02	35.5	Yes	0.11%
98-95-3	Nitrobenzene	HAP	Yes	0.1797	0.333	No	6.63E-03	0.25	Yes	3%
111-84-2	Nonane	-	Yes	0.5712	70	No	2.11E-02	52.5	Yes	0.04%
95-48-7	o-Cresol	HAP	Yes	0.1488	1.47	No	5.49E-03	1.1	Yes	0.50%
111-65-9	Octane	-	Yes	0.6484	93.3	No	2.39E-02	70	Yes	0.03%
95-47-6	o-Xylene	HAP	YES	0.6525	29	No	2.41E-02	21.75	Yes	0.11%
56-38-2	Parathion	HAP	Yes	0.0017	0.007	No	6.25E-05	0.005	Yes	1%
106-44-5	p-Cresol	HAP	Yes	0.0462	1.47	No	1.71E-03	1.1	Yes	0.16%
82-68-8	Pentachloronitrobenzene	HAP	Yes	0.0028	0.0333	No	1.05E-04	0.025	Yes	0.42%
87-86-5	Pentachlorophenol	HAP	Yes	0.0043	0.033	No	1.60E-04	0.025	Yes	1%
109-66-0	Pentane	-	Yes	4.0567	118	No	1.50E-01	88.5	Yes	0.17%
108-95-2	Phenol	HAP	Yes	0.0893	1.27	No	3.30E-03	0.95	Yes	0.35%
108-98-5	Phenyl Mercaptan	-	Yes	0.3035	0.133	YES	1.12E-02	0.1	Yes	11%
75-44-5	Phosgene	HAP	Yes	0.5355	0.027	YES	1.98E-02	0.02	Yes	98.8%
7803-51-2	Phosphine	HAP	Yes	0.5394	0.027	YES	1.99E-02	0.02	Yes	99.5%
85-44-9	Phthalic anhydride	HAP	Yes	0.0045	0.4	No	1.66E-04	0.3	Yes	0.06%
88-89-1	Picric acid	-	Yes	0.1328	0.006	YES	4.90E-03	0.005	Yes	98.0%
106-50-3	p-Phenylenediamine	HAP	Yes	0.0024	0.007	No	8.83E-05	0.005	Yes	2%
114-26-1	Propoxur	HAP	Yes	0.0011	0.033	No	4.09E-05	0.025	Yes	0.16%
109-60-4	Propyl Acetate	-	Yes	1.5734	56	No	5.81E-02	42	Yes	0.14%
71-23-8	Propyl alcohol	-	Yes	0.9474	33.3	No	3.50E-02	25	Yes	0.14%
75-56-9	Propylene Oxide	HAP	Yes	4.1545	3.2	YES	1.53E-01	2.4	Yes	6%
106-42-3	p-Xylene	HAP	YES	0.6214	29	No	2.29E-02	21.75	Yes	0.11%
110-86-1	Pyridine	-	Yes	0.8455	1	No	3.12E-02	0.75	Yes	4%
106-51-4	Quinone	HAP	Yes	0.0433	0.027	YES	1.60E-03	0.02	Yes	8%
626-38-0	Sec-Amyl Acetate	-	Yes	0.7829	44.3	No	2.89E-02	33.25	Yes	0.09%
78-92-2	sec-Butyl alcohol	-	Yes	1.5307	20.3	No	5.65E-02	15.25	Yes	0.37%
100-42-5	Styrene	HAP	Yes	0.5623	6.67	No	2.08E-02	1	Yes	2%
75-65-0	tert-Butyl alcohol	-	Yes	1.5749	20	No	5.81E-02	15	Yes	0.39%
108-88-3	Toluene	HAP	Yes	1.2912	25	No	4.77E-02	18.75	Yes	0.25%

CAS No.	Pollutant	Pollutant Treatment Limit (lb/day)	Pollutant Treatment Limit (T/day)	ppmw in waste
95-95-4	2,4,5-Trichlorophenol	23,040	11.52	1,600
60-35-5	Acetamide	40,320	20.16	2,800
107-02-8	Acrolein	15,840	7.92	1,100
7782-50-5	Chlorine	23,040	11.52	1,600
75-08-1	Ethyl Mercaptan	43,200	21.60	3,000
7664-39-3	Hydrogen Fluoride	103,680	51.84	7,200
7783-06-4	Hydrogen Sulfide	100,800	50.40	7,000
75-44-5	Phosgene	5,904	2.95	410
7803-51-2	Phosphine	87,840	43.92	6,100
88-89-1	Picric acid	67,680	33.84	4,700

584-84-9	Toluene-2,6-diisocyanate	HAP	Yes	0.0539	0.003	YES	1.99E-03	0.002	Yes	99.4%
8001-35-2	Toxaphene	HAP	Yes	0.0008	0.0333	No	2.91E-05	0.025	Yes	0.12%
79-01-6	Trichloroethylene	HAP	Yes	2.0705	17.93	No	7.64E-02	13.45	Yes	1%
121-44-8	Triethylamine	HAP	Yes	1.6814	0.27	YES	6.21E-02	0.2	Yes	31%
1582-09-8	TRIFLURALIN	HAP	Yes	0.0004	7.7	No	1.55E-05	1.15	Yes	0.001%
126-73-8	Tri-n-butyl phosphate	-	Yes	0.0237	0.147	No	8.75E-04	0.11	Yes	1%
51-79-6	Urethane	HAP	Yes	0.0164	0.002	YES	6.05E-04	0.0015	Yes	40%
108-05-4	Vinyl Acetate	HAP	Yes	2.3940	2.3	YES	8.84E-02	1.75	Yes	5%
1330-20-7	Xylene	HAP	Yes	0.6293	29	No	2.32E-02	21.75	Yes	0.11%

584-84-9 Toluene-2,6-diisocyanate 30,240 15.12 2,100

[a] TAPs compliance was demonstrated for max 10,000 ppm of each pollutant in 7,200 T/day of wastes (72 T/day), except as noted.

[b] Ambient impact using annual dispersion coefficient of 0.03691 mg/m3 per lb/hr of emissions (USEI S 2BH DRS 24HR NP 5yrs 50-34VOC.SUM).

[c] See Table below.

Highlighted pollutants have modeled impacts greater than 95% of the AAC. Modeled impacts for all other pollutants in this list are below 59% of the applicable AAC, except for Cyanide Compounds 70% and Hydrogen Chloride 65%

Treatment Limits for Noncarcinogenic Volatile TAPs

CAS No.	Pollutant	HAP?	Modeled ppm	Pollutant Treatment Limit (lb/day)	Pollutant Treatment Limit (T/day)
95-95-4	2,4,5-Trichlorophenol	HAP	1,600	23,040	11.52
60-35-5	Acetamide	HAP	2,800	40,320	20.16
107-02-8	Acrolein	HAP	1,100	15,840	7.92
7782-50-5	Chlorine	HAP	1,600	23,040	11.52
75-08-1	Ethyl Mercaptan	---	3,000	43,200	21.6
7664-39-3	Hydrogen Fluoride	HAP	7,200	103,680	51.84
7783-06-4	Hydrogen Sulfide	---	7,000	100,800	50.4
75-44-5	Phosgene	HAP	410	5,904	2.952
7803-51-2	Phosphine	HAP	6,100	87,840	43.92
88-89-1	Picric acid	---	4,700	67,680	33.84
584-84-9	Toluene-2,6-diisocyanate	HAP	2,100	30,240	15.12

Emissions Control Efficiencies	
Watering Control Efficiency(%)	70
Building Capture Efficiency (%)	5
Hood Capture Efficiency (%)	0
Curtain and Baghouse Flow Capture Efficiency (%)	95
Dust Collector Efficiency (%)	99.5

2020 Application Potential to Emit											
Source	Throughput (T/yr)	Assumptions	PM HAPs (T/yr)	VOC HAPs (T/yr)	PM (T/yr)	PM_{10} (T/yr)	$PM_{2.5}$ (T/yr)	NOx (T/yr)	SO_2 (T/yr)	VOCs (T/yr)	Lead (T/yr)
NEW INDOOR STABILIZATION BUILDING											
Treatment Pits/Pans											
Wastes	276,000	Factor of ~6 times 2011-2015 actuals									
SB Baghouses			2.55E-01	3.75	7.88E-03	7.88E-03	8.08E-05	0.04		4.04	0.0572
SB Doors				0.20	8.30E-02	8.30E-02	8.50E-04				
Reagents	46,000	50 T/hr (~50 T per 300 T of wastes)									
SB Baghouses			2.17E-10			1.60E-03	7.10E-05				9.64E-12
SB Doors			2.28E-09			1.69E-02	7.48E-04				1.01E-10
Total "New" Emissions			**0.25**	**3.95**	**0.091**	**0.11**	**0.00**	**0.04**		**4.04**	**0.057**
Reagent Silo Filling	46,000		1.74E-14		0.80	0.51	0.120				
Micro-Encapsulation											
Wastes		Micro-encapsulation of debris does not include "fine wastes" Micro-encapsulation typically occurs in the treatment pits. Micro-encapsulation in smaller vessels and treatment in adjacent pit do not occur at the same time. Encapsulation emissions < Stabilization emissions.									
SB Baghouses											
SB Doors											
Reagents											
Macro-Encapsulation	---										
SB Baghouses		Macro-encapsulation of debris does not include "fine wastes." Encapsulation emissions < Stabilization emissions.									
SB Doors											
Reagents		Macro-encpsulation does not include the use of reagents.									
TOTAL, New Indoor Stabilization Building			**2.55E-01**	**3.95**	**0.89**	**0.62**	**0.12**	**3.94E-02**		**4.04**	**5.72E-02**
OUTDOOR STABILIZATION FACILITY (OSF)											
Wastes	337,400	Factor of ~6 times 2011-2015 actuals	1.47E-02	9.56	2.16	2.16	2.19E-02			9.77	0.0195
Reagents	62,500	50 T/hr (~50 T per 270 T of wastes).PM emissions scaled from OSF wastes.	1.00E-07		0.401	0.401	4.05E-03				9.67E-09
Reagent Silo Filling	62,500		3.23E-15		0.80	0.51	0.12				
TOTAL, Outdoor Stabilization Facility			**1.47E-02**	**9.56**	**3.36**	**3.08**	**1.46E-01**			**9.77**	**0.02**
LANDFILL											
	7,960,340	~Factor of 6 times CAA 114 Response = 2,407,200 Mg/yr. (Fugitives, released from landfill surface)	---	#NAME?	---	---	---	---		---	---
LEACHATE											
	4,014,800	~Factor of 6 times CAA 114 Response (Fugitives, released from evaporation ponds) Units are in Gallons	---	4.73E-01	---	---	---	---		---	---
USED OIL-FIRED SPACE HEATERS											
		Operate at max capacity 3,600 hr/yr	**5.58E-03**			**1.26**	**1.11**	**1.98E-01**	**1.56**		
TOTAL (NEW) Regulated Emissions			**2.60E-01**	**3.95**	**8.90E-01**	**1.89**	**1.23**	**2.37E-01**	**1.56**	**4.04**	**0.057**
Significant Emissions Increase					2.5	1.5	1	4	4	4	0.06
Include in Dispersion Modeling?					No	**Include**	**Include**	No	No	Include	No
TOTAL, Facility-wide PTE, 2020 Post-Project, Point Sources			**0.26**	**3.95**	**1.69**	**2.40**	**1.35**	**0.24**	**1.56**	**4.04**	**0.057**
TOTAL, Facility-wide PTE, 2020 Post-Project, Fugitive Emissions			**0.01**	**#NAME?**	**2.57**	**2.57**	**0.03**			**9.77**	**0.020**

2014 Potential to Emit									
2014 Permit Throughput Limits	PM HAPs (T/yr)	VOC HAPs (T/yr)	PM (T/yr)	PM_{10} (T/yr)	$PM_{2.5}$ (T/yr)	NOx (T/yr)	SO_2 (T/yr)	VOCs (T/yr)	Lead (T/yr)
2,628,000									
	2.43E+00	35.74	7.50E-02	7.50E-02	7.69E-04	0.04		38.46	0.057
		1.88	7.90E-01	7.90E-01	8.09E-03				
438,000									
	2.07E-09			1.53E-02	6.76E-04				9.18E-11
	2.17E-08			1.61E-01	7.12E-03				9.66E-10
438,000	1.66E-13		7.61	4.90	1.14				
	2.43	**37.62**	**8.48**	**5.94**	**1.16**	**0.04**	**0.00**	**38.46**	**5.72E-02**
2,365,200	0.10	67.01	15.17	15.17	1.53E-01			68.51	0.02
438,000	7.03E-07		2.81	2.81	2.84E-02				6.78E-08
438,000	2.26E-14		5.60	3.61	8.40E-01				
	0.10	67.01	23.58	21.59	1.02			68.51	0.02
		#NAME?							
		4.73E-01							
Containment Debris Handling	2.1299		0.8694	0.8694					0.1842
	4.56	**37.62**	**14.95**	**10.42**	**1.16**	**0.04**	**0.00**	**38.46**	**0.241**
	0.10	**#NAME?**	**23.58**	**21.59**	**1.02**	**0.00**	**0.00**	**68.51**	**0.020**

Change in Permit Allowable Emissions, 2020- 2014

TOTAL, Facility-wide PTE, Point Sources	**-4.30**	**-33.67**	**-13.26**	**-8.01**	**0.19**	**0.20**	**1.56**	**-34.42**	**-0.18**
TOTAL, Facility-wide PTE, Fugitive Emissions	**-0.09**	**#NAME?**	**-21.02**	**-19.02**	**-1.00**	**0.00**	**0.00**	**-58.74**	**0.00**

Annual NOx emissions from wastes were set equal to 6 times the max nitric acid emissions reported in the Toxic Release Inventory (TRI) from 2012-2017
Annual Lead emissions from wastes were set equal to 1.3 times the max lead and lead compounds emissions reported in the TRI from 2012-2017.

TOTAL HAPS (T/yr)	**#NAME?**	Includes Fugitve Emissions
Maximum of any HAP (T/yr)	5.74E-02	SB Wastes, Asbestos
	2.16E-09	SB Reagents, Manganese
	7.66	**SB & Outdoor Stabilization Wastes, Hydrogen Fluoride**
	#NAME?	Landfill, Acetaldehyde
	0.20	Leachate, Asbestos (Friable)

TOTAL HAPS (T/yr)	**#NAME?**	Includes Fugitve Emissions
Maximum of any HAP (T/yr)	5.47E-01	SB Wastes, Asbestos
	2.05E-08	SB Reagents, Manganese
	53.73	**SB & Outdoor Stabilization Wastes, Hydrogen Fluoride**
	#NAME?	Landfill, Acetaldehyde
	0.20	Leachate, Asbestos (Friable)

Change in Total HAPs Emissions = #NAME? T/yr

Pre- and Post-Project Emissions (05.07.2020)

Table 6-2. USEI Grand View Change in Potential to Emit								
Process	**PM_{10} (T/yr)**	**$PM_{2.5}$ (T/yr)**	**NOx (T/yr)**	**SO_2 (T/yr)**	**VOC (T/yr)**	**Lead (T/yr)**	**Total HAP[a] (T/yr)**	**Max of Any HAP[b] (T/yr)**
Pre-Project Emissions (2014)	10.42	1.16	0.04	0	38.46	0.241	114.75	53.73
Post-Project Emissions (2020)	2.4	1.35	0.24	1.56	4.04	0.057	19.13	7.66
Change	**-8.01**	**0.19**	**0.2**	**1.56**	**-34.42**	**-0.18**	**-95.62**	**---**

Total HAPs emissions include fugitives.

[b] The maximum emissions of any HAP are hydrogen fluoride emissions from the Outdoor Stabilization Facility.

Table xx. USEI Grand View Change in Potential to Emit (lb/hr)											
Process	**PM_{10} (lb/hr)**		**$PM_{2.5}$ (lb/hr)**		**NO_2 (lb/hr)**		**SO_2 (lb/hr)**		**VOC (lb/hr)**		**Lead**
	24-hr Avg	**Annual Avg**	**24-hr Avg**	**Annual Avg**	**1-hr Avg**	**Annual Avg**	**1-hr Avg**	**Annual Avg**	**24-hr Avg**	**Annual Avg**	**(lb/hr)**
Pre-Project Emissions (2014)	4.54	2.38	0.22	0.26	3.29	9.13E-03	0	0	8.78	8.78	2.20E-01
Post-Project Emissions (2020)	5.24	0.55	0.84	0.31	3.40	5.48E-02	0.87	0.36	8.79	0.92	5.21E-02
Change	**0.70**	**-1.83**	**0.62**	**0.04**	**0.11**	**0.05**	**0.87**	**0.36**	**0.01**	**-7.86**	**-0.17**

2014 Permit	**Wastes (T/hr)**	**Reagents (T/hr)**	**Operation (hr/day)**	**Wastes (T/yr)**	**Reagents (T/yr)**	**Operation (hr/yr)**
Inside Stabilization	300	50	24	2,628,000	438,000	8760
Outside Stabilization	270	50	24	2,365,200	438,000	8760
2020 PTC application	**Wastes (T/hr)**	**Reagents (T/hr)**	**Operation (hr/day)**	**Wastes (T/yr)**	**Reagents (T/yr)**	**Operation (hr/yr)**
Inside Stabilization	300	50	24	276,000	46,000	---
Outside Stabilization	270	50	24	337,400	56,233	---

When calculated in the same manner, there is no change in the short-term PTE for PM10, PM2.5, NO2, Lead, or VOCs for waste processing (stabilization, reagents, and silo filling)
Short-term emissions of NO2 from waste processing very conservatively presumes all NO2 is emitted in a one-day campaign.
Short-term emissions of lead from waste processing conservatively presumes all lead is emitted during a 3-month campaign.
Short-term emission increases for PM10, PM2.5, NO2, SO2, and VOCs are limited to emissions from the used oil-fired heaters.

Criteria Air Pollutants and Averaging Period	New Stabilization Building			Used Oil Heaters @3,600 hr/yr		Total Annual Increase	BRC (10% of SER)	Total Hourly Increase	Level I Modeling Threshold
	(lb/hr)	(T/yr)	(lb/mo)	(lb/hr)	(T/yr)	(T/yr)	(T/yr)	(lb/hr)	
PM_{10} 24-hour	2.88E-01	---	---	0.702	1.26	**1.26**	**1.5**	---	0.22 lb/hr
$PM_{2.5}$ 24-hour	**1.37E-02**	---	---	**0.616**	---	---	---	**0.63**	**0.054 lb/hr**
$PM_{2.5}$ annual	1.62E-03	1.58E-03	---	0.253	1.11	**1.11**	**1**	---	**0.35 T/yr**
CO 3-hr, 8-hr	---	---	---	0.03	0.05	0.05	10	---	15 lb/hr
NOx 1-hr	---	---	---	0.11	0.198	---	---	---	0.20 lb/hr
NOx annual	---	0.04	---	---	0.198	0.24	4		1.2 T/yr
SO_2 1hr	---	---	---	0.87	---	---	---	0.87	0.21 lb/hr
SO_2 annual	---	---	---	---	1.56	**1.56**	**4**		---
VOC	---	4.04	---	---	0.01	4.07	4	---	---
Lead rolling 3-month	---	0.057		---	1.46E-05	0.057	0.06		14 lb/mo

PM_{10} and $PM_{2.5}$ 24-hr average emissions are based on a wind speed of 18 mph
PM_{10} and $PM_{2.5}$ annual emisssions are based on a wind speed of 10 mph.

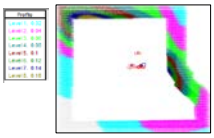
USEI S PM SIG ANN NP Syrs PM 25.SUM

		Source ID	Stack Release Type	FLAT (Non-Default)	Source Description	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter	50-34PM	50-34VOC	ARSENIC	CADMIUM	HEXCHROM	NICKEL	PM 25
						(m)	(m)	(m)	(m)	(K)	(m/s)	(m)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
1	1	BH2	DEFAULT		Stab Bldg Baghouse 2	559608.260	4788303.330	767	60	0	17.9663	3								7.69E-05
2	2	BH3	DEFAULT		Stab Bldg Baghouse 3	559608.260	4788303.330	767	60	0	17.9663	3								7.69E-05
3	3	DRI_S_PT	HORIZONTAL		South Side Doors 1-3 - Equivalent Point Source	559625.480	4788220.880	767	14	0	0.42	575.145								1.48E-03
4	4	DRI_S_PT	HORIZONTAL		South Side Doors 1-3 - Equivalent Point Source	559625.480	4788220.880	767	14	0	0.75	435.48								1.48E-03
5	5	DRI_S_PT	HORIZONTAL		South Side Doors 1-3 - Equivalent Point Source	559625.480	4788220.880	767	14	0	0.75	435.48								1.48E-03
6	6	DRN_SALL	HORIZONTAL		North Side Door - All 5 Side Doors Open - Equiv.Pt Source	559470.920	4788142.740	767	5	0	34.71	203.143								1.48E-03
7	7	DRN_S3	HORIZONTAL		North Side Door w 3 S Side Doors Open - Equiv.Point Source	559816.020	4788240.780	767	5	0	19.04	203.143								1.48E-03
8	14	ADV_SILO	DEFAULT		SE Additive Silo Bh	559601.073	4788239.732	767	60	0	0.001	33.1859							
9	15	UM_SILO	DEFAULT		SE Lime Silo Bh	559601.019	4788239.160	767	60	0	0.001	33.1859							
10	16	O_SILO6	DEFAULT		Outdoor Additive Silo 1 Bh	559888.190	4788387.760	764.68	40	0	0.001	33.1859							
11	17	O_SILO2	DEFAULT		Outdoor Additive Silo 2 Bh	559888.600	4788383.300	764.555	40	0	0.001	33.1859							
12	18	O_SILO3	DEFAULT		Outdoor Additive Silo 3 Bh	559890.900	4788384.570	764.555	25	0	0.001	33.1859							
13	28	OHHEATER	BANCAP		Charmet Hot Liquid Oil Fired Heater	559817.434	4788209.984	766.46	22	344.26	3.75467	8							7.54E-01
14	30	SHOPHTR	BANCAP		Maintenance Shop Liquid Oil Fired Heater	559629.418	4788256.360	766.46	30	383.15	5.2388	8							5.49E-01

SIL Percent

Model	File	Pollutant	Averaging	Group	Rank	Conc/Dep	8.3	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	ALL	1ST	0.19505		559933	4788758	775.88	775.88	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRDRS_NP	1ST	0.17607	58.69%	559363	4788758	776.88	776.88	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRDRS_SP	1ST	0.17608	58.69%	559363	4788758	776.88	776.88	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRN_SALL	1ST	0.17619	58.73%	559363	4788758	776.88	776.88	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRDRN_S3	1ST	0.17618	58.73%	559363	4788758	776.88	776.88	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	BH2_BH2	1ST	0.00E-05	0.027%	559437	4788759	774.72	774.72	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	BH3	1ST	0.00E-05	0.027%	559437	4788759	774.72	774.72	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	BH2	1ST	4.69E-05	0.161%	559437	4788759	774.72	774.72	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRI_S_PT	1ST	2.43E-03	8.36%	559254	4788473	781.57	781.57	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRI_S_PT	1ST	2.41E-03	8.26%	559254	4788473	781.57	781.57	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRI_S_PT	1ST	2.61E-03	8.97%	559254	4788473	781.57	781.57	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRN_SALL	1ST	3.23E-03	11.1%	559254	4788458	781.67	781.67	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	DRN_S3	1ST	3.33E-03	11.1%	559254	4788458	781.67	781.67	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	OHHEATER	1ST	7.83E-02	26%	559363	4788758	776.88	776.88	0	5 YEARS	ktoa2014 25	9	16	5415
AERMOD 19191	USEI S PM S	PM 25	ANNUAL	SHOPHTR	1ST	5.67E-02	19%	559363	4788758	776.88	776.88	0	5 YEARS	ktoa2014 25	9	16	5415

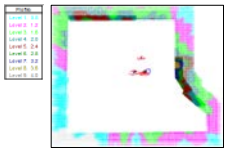
	Annual Dispersion Coefficient (sqlm3 per hr)
OHHEATER	7.54E-01
SHOPHTR	5.47E-01

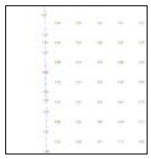


	Percent
High 1st High	0.1762	100%
Adjacent Receptors	0.1761	99.9%
	0.1757	100.0%
	0.1752	99.4%

USEI S_PM SIG 24HR NP 5yrs PM_25.SUM

	Source ID	Stack Release Type	FLAT (Non-Default)	Source Description	Easting (X)	Northing (Y)	Base Elevatio	Stack Height	Tempera ture	Exit Velocity	Stack Diameter	50-34PM	50-34VOC	ARSENIC	CADMIUM	HEXCHROM	NICKEL	PM_25
					(m)	(m)	(m)	(ft)	(K)	(m/s)	(m)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
1	BH2	DEFAULT		Slab Bldg Baghouse 2	559922.7	4768253	787	50	0	17.9668	34.00							5.94E-04
2	BH1	DEFAULT		Slab Bldg Baghouse 1	559928.95	4768253	787	50	0	17.9668	34.00							5.94E-04
3	DRI1_S_PT	HORIZONTAL		South Side Doors 1-5 - Equivalent Point Source	559925.52	4768224	787	14	0	0.86	575.16							1.25E-02
4	DRI3_S_PT	HORIZONTAL		South Side Doors 1-3 - Equivalent Point Source	559920.499	4768224	787	14	0	1.57	426.48							1.25E-02
5	DRI3_S_PT	HORIZONTAL		South Side Doors 3-5 - Equivalent Point Source	559930.47	4768224	787	14	0	1.57	426.48							1.25E-02
6	DRN_SALL	HORIZONTAL		North Side Door - All S Side Doors Open - Equiv Pt Source	559915.925	4768243	787	5	0	63.36	203.16							1.25E-02
7	DRN_S3	HORIZONTAL		North Side Door w 3 S Side Doors Open - Equiv Point Source	559916.009	4768243	787	5	0	34.35	203.16							1.25E-02
14	A_SILO1V	DEFAULT		SB Additive Silo Vent	559901.573	4768239	787	60	0	0.001	33.17							
15	L_SILO1V	DEFAULT		SB Lime Silo Vent	559901.918	4768243	787	60	0	0.001	33.17							
16	O_SILO1V	DEFAULT		Outdoor Additive Silo 1 Vent	559888.1	4768388	784.86	40	0	0.001	33.17							
17	O_SILO2V	DEFAULT		Outdoor Additive Silo 2 Vent	559888.8	4768383	784.865	40	0	0.001	33.17							
18	O_SILO3V	DEFAULT		Outdoor Additive Silo 3 Vent	559890.8	4768396	784.865	25	0	0.001	33.17							
29	QHHEATER	RAINCAP		Quonset Hut Used Oil Fired Heater	559817.434	4768230	789.46	22	344.26	3.75467	8.00							2.53E-01
30	SHOPHTR	RAINCAP		Maintenance Shop Used Oil Fired Heater	559822.418	4768256	789.46	39	383.15	5.2386	8.00							3.64E-01





Model	File	Pollutant	Average	Group	Rank	Conc/Dep	SIL (ug/m3) 1.2	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 19191	SIG_24HR_NP	PM_25	24-HR	GRDRI_SP	1ST	3.24031	270%	560232	4768282	781.22	781.22	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	GRDRI_S3	1ST	4.12062	343%	560232	4768287	781.13	781.13	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	BH2	1ST	0.00219	0.18%	560306	4768003	782.9	782.9	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	BH1	1ST	0.0023	0.19%	560308	4768007	782.75	782.75	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	DRI_S_PT	1ST	0.32349	27%	560235	4768270	781.41	781.41	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	DRI_S_PT	1ST	0.32355	27%	560235	4768270	781.41	781.41	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	DRI3_S_PT	1ST	0.33351	28%	560235	4768270	781.41	781.41	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	DRN_SALL	1ST	0.42701	36%	560234	4768173	781.58	781.58	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	DRN_S3	1ST	0.42723	36%	560234	4768173	781.58	781.58	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	QHHEATER	1ST	1.99227	166%	560232	4768277	781.33	781.33	0	1.5E+07	2014_2018	9	15	5415
AERMOD 19191	SIG_24HR_NP_5	PM_25	24-HR	SHOPHTR	1ST	1.86491	155%	560232	4768302	780.9	780.9	0	1.5E+07	2014_2018	9	15	5415

	24-hr Dispersion Coefficient (mg/m3 per lb/hr
QHHEATER	7.89E-03
SHOPHTR	5.13E-03

	Percent	
High 1st High	4.12	100%
Adjacent Receptors	4.04	98%
	3.99	97%
	4.08	99%
	4.09	99%

POINT SOURCES

Source ID	Stack Release Type	FLAT (Non-Default)	Source Description	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter	24-HR PM2.5
				(m)	(m)	(m)	(ft)	(K)	(m/s)	(in)	(lb/hr)
BH2	DEFAULT		Sab Bldg Baghouse 2	559922.700	4769253.320	787.000	55	0	17.9958247	34	5.94E-04
BH1	DEFAULT		Sab Bldg Baghouse 1	559925.950	4769253.320	787.000	55	0	17.9958247	34	5.94E-04
DRS_S_PT	HORIZONTAL		South Side Doors 1-5 - Equivalent Point Source	559925.500	4769223.890	787.000	14	0	0.66	575.16	1.35E-02
DRS_S_PT	HORIZONTAL		South Side Doors 1-3 - Equivalent Point Source	559920.500	4769223.890	787.000	14	0	1.57	436.46	1.35E-02
DRS_S_PT	HORIZONTAL		South Side Doors 3-5 - Equivalent Point Source	559930.470	4769223.890	787.000	14	0	1.57	436.46	1.35E-02
DRN_SALL	HORIZONTAL		North Side Door - All 6 Side Doors Open - Equiv Pt Source	559915.500	4769242.740	787.000	6	0	41.32	203.16	1.35E-02
DRN_S3	HORIZONTAL		North Side Door w/ 3 S Side Doors Open - Equiv Point Source	559916.003	4769242.740	787.000	6	0	34.35	203.16	1.35E-02
ADD_SILO	DEFAULT		SB Additive Silo Bh1	559960.473	4769258.710	787.000	60	0	0.001	39.17	1.37E-02
LIM_SILO	DEFAULT		SB Lime Silo Bh1	559961.919	4769233.160	787.000	65	0	0.001	39.17	1.37E-02
O_SILO1	DEFAULT		Outdoor Additive Silo 1 BH	559898.100	4769367.700	784.860	40	0	0.001	39.17	8.13E-03
O_SILO2	DEFAULT		Outdoor Additive Silo 2 BH	559898.600	4769363.300	784.550	40	0	0.001	39.17	8.13E-03
O_SILO3	DEFAULT		Outdoor Additive Silo 3 BH	559900.900	4769364.570	784.550	25	0	0.001	39.17	8.13E-03
CBHEATER	RAINCAP		Charmet Hot Liquid Oil Fired Heater	559917.484	4769226.550	789.480	24	344.46	3.75497	8	2.53E-05
SHOPHTR	RAINCAP		Maintenance Shop Used Oil Fired Heater	559922.418	4769256.240	789.480	30	383.15	5.73955	8	3.66E-05

POINT SOURCES

Source ID	Exit Velocity	ANNUAL PM2.5
	(m/s)	(lb/hr)
BH2	17.9958247	1.32E-03
BH1	17.9958247	1.32E-03
DRS_S_PT	0.66	1.50E-02
DRS_S_PT	1.57	1.50E-02
DRS_S_PT	1.57	1.50E-02
DRN_SALL	41.32	1.50E-02
DRN_S3	34.35	1.50E-02
ADD_SILO	0.001	1.37E-02
LIM_SILO	0.001	1.37E-02
O_SILO1	0.001	1.80E-03
O_SILO2	0.001	1.80E-03
O_SILO3	0.001	1.80E-03
CBHEATER	3.75497	1.40E-05
SHOPHTR	5.73955	1.40E-05

Wind Speed = 18 mph
Both BH operating

Wind Speed = 10 mph
Both BH operating

OUTDOOR STABILIZATION FACILITY

Emission Factors[1]

Variable	PM_{30}	PM_{15}
24-hr U (mph)	18	18
Annual U (mph)	10	10
s	0.4	0.4
b	1.3	1.3
c	0.02	0.3
k	0.37	0.18

$$E = k * (0.0032) * (U^5 / M^2) + c$$

Where:

E = Emission rate in lb/ton of material
k = particle size multiplier
U = Wind speed at dozer height (mi/hr)
M = Moisture content (% by weight)
a,b,c = dimensionless constants

[1] Western Areas Air Quality Joint Venture Fugitive PM Emissions Factors, Table 3-2

<25% PM is < 75 µm — M annual 25 %
Moisture Content >20% — M 24-hr 10 %

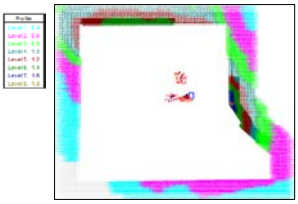
	PM_{30} Emission Factor (lb/ton)	Wastes (Tlhr)	Reagents (Tlhr)	Wastes (T/yr)	Reagents (T/yr)	Uncontrolled PM2.5 Wastes (lb/hr)	Uncontrolled PM2.5 Reagents (lb/hr)	Waste Fraction < 75 µm	Water Spray Control (%)	Controlled PM2.5 Wastes (lb/hr)	Controlled PM2.5 Reagents (lb/hr)
	4.65E-05			237,400	62,500	1.79E-03	9.28E-04	25%	70.00	1.34E-04	6.96E-05
Annual 24-Hr	1.94E-04	270	50	-	-	5.23E-03	9.88E-03	25%	70.00	3.92E-03	2.96E-03

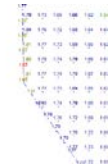
VOLUME SOURCES

Source ID	FLAT (Non-Default)	Source Description	Easting (X)	Northing (Y)	Base Elevation	Release Height	Init. Horizontal Dimension	Initial Vert. Dimension	24-HR PM2.5	ANNUAL PM2.5
			(m)	(m)	(m)	(ft)	(m)	(m)	(lb/hr)	(lb/hr)
OSF1_1		Outdoor Stabilization Facility - Mixing Bin 1	559875.470	4769414.710	784.86	7	0.5671	0.233	1.14E-03	1.50E-02
OSF1_2		Outdoor Stabilization Facility - Mixing Bin 1	559875.160	4769414.500	784.86	7	0.5671	0.233	1.14E-03	1.50E-02
OSF1_3		Outdoor Stabilization Facility - Mixing Bin 1	559874.780	4769414.500	784.86	7	0.5671	0.233	1.14E-03	1.50E-02
OSF2_1		Outdoor Stabilization Facility - Mixing Bin 2	559887.360	4769364.560	784.86	7	0.5671	0.233	1.14E-03	1.50E-02
OSF2_2		Outdoor Stabilization Facility - Mixing Bin 2	559887.040	4769367.350	784.86	7	0.5671	0.233	1.14E-03	1.50E-02
OSF2_3		Outdoor Stabilization Facility - Mixing Bin 2	559886.395	4769369.830	784.86	7	0.5671	0.233	1.14E-03	1.50E-02

USEI_S_PM_CUM_24HR 90 Secs PM2.5.SUM

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 19191	USEI_S	PM2.5	24HR	CUM	1ST	1.79847	559233.6	4769188	781.67	781.67	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	SBDRS_SP	1ST	1.79847	559233.6	4769188	781.67	781.67	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	SBDRS_SP	1ST	1.79847	559233.6	4769188	781.67	781.67	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	SBDRS_SP	1ST	1.79847	559233.6	4769188	781.67	781.67	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	DRN_SALL	1ST	1.81698	559233.6	4769188	781.67	781.67	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	SBDRS_S3	1ST	1.81698	559233.6	4769188	781.67	781.67	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	BH2	1ST	0.00026	559920	4769760	772.34	772.34	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	BH1	1ST	0.00026	559925.4	4769759.4	781.4	781.4	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	DRS_S_PT	1ST	0.11878	559254.9	4769130.4	781.4	781.4	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	DRS_S_PT	1ST	0.11878	559254.9	4769130.4	781.4	781.4	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	DRS_S_PT	1ST	0.11878	559254.9	4769130.4	781.4	781.4	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	DRN_SALL	1ST	0.17543	559233.6	4769173.3	781.45	781.45	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	DRN_S3	1ST	0.17543	559233.6	4769173.3	781.45	781.45	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	ADD_SILO	1ST	0.04169	560035	4768170	781.5	781.5	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	LIM_SILO	1ST	0.04169	560033.9	4768163	781.7	781.7	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	O_SILO1	1ST	0.03847	560035	4768300	780.87	780.87	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	O_SILO2	1ST	0.03870	560035	4768300	780.87	780.87	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	O_SILO3	1ST	0.04864	559723.7	4768760.8	776.47	776.47	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	CBHEATER	1ST	0.73440	560223.2	4769207.8	781.88	781.88	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	SHOPHTR	1ST	0.84798	560036.5	4769159	781.98	781.98	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	OSF1_1	1ST	0.00731	559800.4	4768761.6	778.5	778.5	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	OSF1_2	1ST	0.00738	559758.9	4768760.8	776.34	776.34	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	OSF1_3	1ST	0.0075	559718.8	4768760.8	776.34	776.34	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	OSF2_1	1ST	0.00872	559821.4	4768761.6	778.5	778.5	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	OSF2_2	1ST	0.00879	559821.4	4768761.6	778.5	778.5	0	5 YEARS	sbep2014_2002	20	26	5415
AERMOD 19191	USEI_S	PM2.5	24HR	OSF2_3	1ST	0.00886	559821.4	4768761.6	778.5	778.5	0	5 YEARS	sbep2014_2002	20	26	5415





	Percent	
High 1st High	1.83	100%
Adjacent Receptors	1.83	100%
	1.82	99%
	1.81	99%
	1.77	97%

PTE from T2-040020_06.09.2006 SOB

Table 6-2. USEI Grand View Pre-Project Potential to Emit for Criteria Pollutants and HAPs								
Process	**PM_{10} (T/yr)**	**$PM_{2.5}$ (T/yr)**	**Metals (T/yr)**	**NOx (T/yr)**	**SO_2 (T/yr)**	**VOC (T/yr)**	**Lead (T/yr)**	**HAPs (T/yr)**
Containment Debris Handling	0.8694	---	2.1299	---	---	---	0.1842	0.0005
Indoor Stabilization	0.7271	---	1.4861	---	---	---	0.1295	0.0001
Silo Filling - All Silos	4.3942	---	0	---	---	---	0	8.6466
Outdoor Stabilization Facility	1.9376	---	2.4199	---	---	---	0.2093	0.0005
TOTAL	**7.9283**	**---**	**6.0359**				**0.523**	**8.6477**

TOXIC RELEASE INVENTORY RELEASE DATA

	Maximum Release to Air (Lbs) 2012-2017, Point Source Emissions (OLD STABILIZATION/CONTAINMENT BLDG BHs)						
Cas No.	**Pollutant**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
7664417	AMMONIA	3	**8**	4	2	1	5
N106	CYANIDE COMPOUNDS	2	2	2	2	1	**15**
107211	ETHYLENE GLYCOL	22	9	20	6	12	**26**
7439921	LEAD	72	87	11	2	1	2
N420	LEAD COMPOUNDS	1	1	1	1	1	1
7697372	NITRIC ACID	8	9	18	9	1	11
N590	POLYCYCLIC AROMATIC COMPOUNDS	1	1	1	1	1	1

	Maximum Release to Air (Lbs) 2012-2017, Fugitive Emissions (OUTSIDE STABILIZATION FACILITY)						
Cas No.	**Pollutant**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
7439921	LEAD	13	29	4	1	1	1
N420	LEAD COMPOUNDS	1	1	1	1	1	1
	MAXIMUM (Point Source and Fugitives)	**87**	**118**	**17**	**5**	**4**	**5**

		Lb/hr, if total annual emissions were emitted in one day	Lb/hr, if total annual emissions were emitted in two days	Lb/hr, if total annual emissions were emitted in three days	Lb/hr, if total annual emissions were emitted in three days
Check- 7.4.,be *not emission rate of ammonia at 500 rem =* 3.358 lb/hr	Max TRI emissions of ammonia =	0.333	**0.167**		
Check- 7.4.,be *not emission rate of cyanides at 500 rem =* 4.758 lb/hr	Max TRI emission of cyanides =	0.825	0.3125	**0.208**	
Check- 7.4.,be *not emission rate of ethylene ethyel at 500 rem =* 3.36E-02 lb/hr	Max TRI emissions of ethylene glycol =	1.50			**1.50E-03**

Conclusion: TAP correllance demonstrated at 500 rem ammonia reasonable cantarn the maximum daile ammonia emissions
Conclusion: TAP correllance demonstrated at 500 rem cyanides reasonable cantarn the maximum daile cyanide emissions

LEAD & LEAD COMPOUNDS

"Actuals"	**118**	lb/yr					
New SB	88	lb/yr	Outdoor Stabilization Facility	30	lb/yr		
x 1.3	114.4	lb/yr	x	1.3	39	lb/yr	
	0.0572	T/yr			0.0200	T/yr	Total = **0.0767** **T/yr**

	If lead is emitted evenly thru the year		If all lead is emitted during a single quarter	
	Annual (lb/hr)	Monthly @ Annual lb/hr (lb/mo)	**Quarterly (lb/hr)**	Monthly @ Qrtly lb/hr (lb/mo)
New SB Total	1.31E-02	9.53	0.0522	38.13
BH2	1.14E-02		4.54E-02	
"Fugitives"	1.19E-02		4.77E-02	
QSF	4.45E-03		0.0178	
Total	1.75E-02		7.00E-02	

IDEO Modeline threshold = 14 lb/month

Pb emissions from one bin (3 volume sources) = 5.94E-03 lb/hr from each volume source

Fraction thru BH and Doors

BH1	0.087
"Fugitives"	0.913
QSF	1.000

NO_x EMISSIONS

Nitric Acid "Actuals"	**18**	lb/yr
x 6	108	lb/yr
	78.85	lb NO_x/yr
	3.94E-02	T/yr NO_x

On exposure to light and air, nitric acid degrades to: $4HNO_3 \rightarrow 2H_2O + 4NO_2 + O_2$

Mass of NO_2 produced: 4 lb-mol NO_2/4 lb-mol HNO_3 x 46.0055 lb NO_2/lb-mol NO_2 x lb-mol HNO_3/63.01 lb HNO_3

	SB Processing Rate (tpy)
Solid Waste	276,000
Reagents	46,000

Variable	Emission Factors[1] PM$_{10}$	PM$_{2.5}$
24-hr U (mph)	18	18
Annual U (mph)	10	10
a	0.4	0.4
b	1.3	1.3
c	0.040	0.0
k	1.92	0.38

[1] Emission Factors from U.S. EPA AP-42, Section 11.12, Table 11.12-4, June 2006.

$E = k * (0.0032) * [U^a / M^b] + c$

Where:
- E = Emission rate in lb/ton of material
- k = particle size multiplier
- U = Wind speed at drop height (mi/hr)
- M = Minimum moisture content (% by weight)
- a,b,c = dimmensionless constants

Emissions Control Efficiencies		Basis	Asbestos Controls	
Watering Control Efficiency(%) [1]	70	A water spray system will be installed over each treatment pit in the new SB	90	Wetting is very effective at controlling fine, light asbestos fibers
Building Capture Efficiency (%)	5	Presumes coiling/rollup doors are all open.	5	Presumes rollup doors are open.
Hood Capture Efficiency (%)	0			
Curtain and Baghouse Flow Capture Efficiency (%)	95	Presumes lower 2 retractable sections of vinyl curtains are fully extended downward on one side of the treatment pit and BH is operating.	95	
Baghouse BH1 or BH2 Efficiency (%)	99.5		99.5	

Baghouse Emissions = Uncontrolled x (1- WS%) x (1- Bldg%) x (1-Hood%) x (Curtain-BH Flow%) x (1-BH%)
"Fugitives" = Uncontrolled x (1-WS%) x (1-Bldg%) x (1-Hood%) x (1- Curtain-BH Flow%)

MODELED EMISSION RATES:	If Total TAP PM Emitted = 1.0 lb/hr		
Noncarcinogenic TAP (24-hr standard)	PMBH24 = 0.087 lb/hr	PMFUG24 =	0.913 lb/hr
Carcinogenic TAP (Annual standard)	PMBHANN = 0.087 lb/hr	PMFUGANN =	0.913 lb/hr

Bldg Fug. lb/hr/ (Bldg Fug + BH Emissions) = 0.913

MODELED EMISSION RATES: 0.0434 lb/hr, BH1 and BH2, each 0.913 lb/hr divided among open doors

Speciated HAP/TAP

#	CAS	Material	HAP?	Composition (PPM)	SB Processing Rate (tpy)	SB Processing Rate (T/hr)	Moisture (%)	PM$_{2.5}$ (lb/ton)	PM$_{10}$ (lb/ton)
		Waste Material (Annual)		-	276,000	300	4.5	4.32E-04	4.22E-02
		Waste Material (24-hr)				300	1.5	2.28E-03	5.15E-02
		Waste Material (Annual) Emissions at 125,000 ppmw		125000	34,500.00	37.50	4.5	4.32E-04	4.22E-02
		Waste Material (24-hr) Emissions at 125,000 ppmw		125000		37.50	1.5	2.28E-03	5.15E-02
1	1332-21-4	Asbestos (friable)	HAP	2019.05	557.26	6.06E-01	4.5	4.32E-04	4.22E-02
2	7440-36-0	Antimony Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02
3	7440-38-2	Arsenic Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02
4	7440-41-7	Beryllium Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02
5	7440-43-9	Cadmium Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02
	N090	Chromium Compounds	---	3146.52	868.44	9.44E-01			
	7440-47-3	Chromium Metal, Cr (II)	HAP						
6	16065-83-1	Chromium Metal, Cr (III) (Default Profile, NEI)	HAP	2013.77	555.80	6.04E-01	1.5	2.28E-03	5.15E-02
7	18540-29-9	Chromium VI (Default Chromium Profile, NEI)	HAP	1069.82	295.27	3.21E-01	4.5	4.32E-04	4.22E-02
8	7440-48-4	Cobalt Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02
9	7439-92-1	Lead Compounds	HAP	0.00	0.00	0.00E+00	4.5	5.47E-04	4.28E-02
10	7439-96-5	Manganese Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02
11	7439-97-6	Mercury Compounds	HAP	0.00	0.00	0.00E+00	4.5	5.47E-04	4.28E-02
12	7440-02-0	Nickel Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02
13	7782-49-2	Selenium Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02
14	7440-39-3	Barium Compounds	---	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02
15	1344-28-1	Aluminum oxide (fibrous forms)	HAP	1.00	0.28	3.00E-04	4.5	5.47E-04	4.28E-02
16	1313-27-5	Molybdenum trioxide	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02
17	7723-14-0	Phosphorus	HAP	60.20	16.62	1.81E-02	1.5	2.28E-03	5.15E-02

Material	Uncontrolled Interior PM2.5 (lb/hr)	PM10 (lb/hr)	PM$_{2.5}$ (tpy)	PM$_{10}$ (tpy)	Controlled Interior – Building Fugitives Emissions PM$_{2.5}$ (lb/hr)	PM$_{10}$ (lb/hr)	PM$_{2.5}$ (tpy)	PM$_{10}$ (tpy)	Total Baghouse Emissions PM$_{2.5}$ (lb/hr)	PM$_{10}$ (lb/hr)	PM$_{2.5}$ (tpy)	PM$_{10}$ (tpy)
Waste Material (Annual)	0.1297	12.6552	5.97E-02	5.82	1.94E-04	0.0189	8.50E-04	8.30E-02	1.84E-05	1.80E-03	8.08E-05	7.88E-03
Waste Material (24-hr)	0.6843	15.4575			9.75E-03	0.220			9.26E-04	2.09E-02		
Waste Material (Annual) Emissions at 125,000 ppmw	0.0162	1.5819	7.46E-03	0.73			1.06E-04	1.04E-02			1.01E-05	9.85E-04
Waste Material (24-hr) Emissions at 125,000 ppmw	0.0855	1.9322			1.22E-03	0.028			1.16E-04	2.62E-03		
Asbestos (friable)	2.75E-05	2.68E-03	1.20E-04	1.18E-02	1.31E-07	1.27E-05	5.72E-07	5.58E-05	1.24E-08	1.21E-06	5.44E-08	5.30E-06
Antimony Compounds	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09
Arsenic Compounds	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09
Beryllium Compounds	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09
Cadmium Compounds	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09
Chromium Compounds												
Chromium Metal, Cr (II)												
Chromium Metal, Cr (III) (Default Profile, NEI)	1.38E-03	3.11E-02	6.34E-04	1.43E-02	1.96E-05	4.44E-04	9.03E-06	2.04E-04	1.87E-06	4.21E-05	8.58E-07	1.94E-05
Chromium VI (Default Chromium Profile, NEI)	1.46E-05	1.42E-03	6.38E-05	6.23E-03	2.08E-07	2.03E-05	9.09E-07	8.87E-05	1.97E-08	1.92E-06	8.64E-08	8.43E-06
Cobalt Compounds	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09
Lead Compounds	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-02
Manganese Compounds	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09
Mercury Compounds	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel Compounds	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09
Selenium Compounds	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09
Barium Compounds	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09
Aluminum oxide (fibrous forms)	1.64E-07	1.28E-05	7.55E-08	5.90E-06	2.34E-09	1.83E-07	1.08E-09	8.41E-08	2.22E-10	1.74E-08	1.02E-10	7.99E-09
Molybdenum trioxide	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09
Phosphorus	4.12E-05	9.31E-04	1.89E-05	4.28E-04	5.87E-07	1.33E-05	2.70E-07	6.10E-06	5.58E-08	1.26E-06	2.57E-08	5.79E-07
							Total PM HAP	3.50E-04			Total PM HAP	5.72E-02
							Max any HAP	2.04E-04 (Asbestos)			Max any HAP	5.72E-02 (Asbestos)

Material	Wastes Total TAPs (lb/hr, 24-hr or annual average)	Screening EL (lb/hr)	Modeling Required?	24-hr AAC (mg/m3)	50-34PM Modeled Impact (mg/m3) 0.0315	Complies? Impact < AAC? (Yes/No)	Annual T-RACT AACC (ug/m3)	50-34PM Modeled Impact (ug/m3) 2.100	Complies? Impact < AAC? (Yes/No)
Asbestos (friable)	1.40E-05	N/A	YES	---			4.0E-05	2.93E-05	Yes
Antimony Compounds	2.41E-07	0.033	No	0.025			---		
Arsenic Compounds	2.07E-08	1.50E-06	No	---			2.3E-03		
Beryllium Compounds	2.07E-08	2.80E-05	No	---			4.2E-02		
Cadmium Compounds	2.07E-08	3.70E-06	No	---			5.6E-03		
Chromium Compounds				---			---		
Chromium Metal, Cr (II)							---		
Chromium Metal, Cr (III) (Default Profile, NEI)	4.86E-04	0.033	See Below	0.025	See Below		---		
Chromium VI (Default Chromium Profile, NEI)	2.22E-05	5.60E-07	See Below	---			8.3E-04	See Below	
Cobalt Compounds	2.41E-07	0.0033	No	0.0025			---		
Lead Compounds		Criteria Pollutant and HAP, Not a TAP		---			---		
Manganese Compounds	2.41E-07	0.333	No	0.25			---		
Mercury Compounds		See IDAPA 58.01.01.215		---			---		
Nickel Compounds	2.07E-08	2.70E-05	No	---			4.2E-02		
Selenium Compounds	2.41E-07	0.013	No	0.01			---		
Barium Compounds	2.41E-07	0.033	No	0.025			---		
Aluminum oxide (fibrous forms)	2.00E-07	0.667	No	0.5			---		
Molybdenum trioxide	2.41E-07	0.333	No	0.25			---		
Phosphorus	1.45E-05	0.007	No	0.005					

	Factor to Increase [ ] to "Z" ppm	24-hr Emission Rate @ "Z" ppm (lb/hr)	50-34PM Modeled Ambient Impact (mg/m3)	50-34PM Complies? Impact < AAC?		Percent of AAC	Annual Emission Rate @ "Z" ppm (lb/hr)	50-34PM Modeled Ambient Impact (ug/m3)	50-34PM Complies? Impact < T-RACT AACC?	Percent of T-RACT AACC	Max ppm	Max Pollutant Processed per Year (T/yr)	Max Emissions per Pollutant (T/yr)	# Pollutants	HAP Emissions (T/yr)
	125,000		0.0315					2.100			125,000	34,500	1.14E-02	13	1.48E-01
Asbestos	1.34E+00				2,700		1.87E-05	3.9E-05	Yes	98%	2700	745.2	8.18E-05	1	8.18E-05
	125,000	3.01E-02	9.48E-04	Yes		4%									
Arsenic	50,000				50,000		1.04E-03	See below			50,000	13,800	4.54E-03	1	4.54E-03
	125,000						2.59E-03	See below							
	125,000						2.59E-03	See below							
TOTAL Chromium	15.89				50,000						50,000	13,800	3.54E-02	1	3.54E-02
Chromium Metal, Cr (III) (Default Profile, NEI)	15.891	7.72E-03	See below										Lead	1	0.0572
Chromium VI (Default Chromium Profile, NEI)	15.891						3.53E-04	See below							
	125,000	3.01E-02	9.48E-04	Yes		38%							Mercury	1	0.01
Manganese Compounds	125,000	3.01E-02	See below											TOTAL	2.55E-01
Nickel	125,000						2.59E-03	See below							
	125,000	3.01E-02	9.48E-04	Yes		9%									
	125,000	3.01E-02	9.48E-04	Yes		4%									
	125,000	2.50E-02	7.87E-04	Yes											
	125,000	3.01E-02	9.48E-04	Yes		0.4%									
	2076.38	3.01E-02	See below												

Mercury Emission Standard, Section 215, limits mercury emissions to < 25 lb/yr
Max mercury emissions are 20 lb/yr
Note: No mercury was reported as a received waste from 2011-2015.

Reagents

#	CAS	Material/HAP&TAP Constituents	HAP?	Composition Weight Percent	SB Processing Rate (tpy)	SB Processing Rate (T/hr)	Moisture (%)	PM$_{2.5}$ (lb/ton)	PM$_{10}$ (lb/ton)	Uncontrolled Interior PM2.5 (lb/hr)	PM10 (lb/hr)	PM$_{2.5}$ (tpy)	PM$_{10}$ (tpy)
		Annual			46,000	50	1.5	0.0018	0.0491	0.0902	2.46	4.15E-02	1.13
		24-hr				50	1.0	3.86E-03	0.0595	1.93E-01	2.98E+00		
		Clay			46,000								
1	1302-78-9	Bentonite (Sodium aluminum silicate)	---	100	46,000	50	12	1.53E-04	0.0408	7.64E-03	2.04	3.51E-03	0.94
2	7631-86-9	Silicon Dioxide (amorphous silica)	---	2	920	1	12	1.53E-04	0.0408	1.53E-04	4.08E-02	7.03E-05	0.019
3	14808-60-7	Crystalline silica, Quartz	---	5	2,300	2.5	12	1.53E-04	0.0408	3.82E-04	1.02E-01	1.76E-04	0.047
4	14464-46-1	Crystalline silica, cristobalite	---	1	460	0.5	12	1.53E-04	0.0408	7.64E-05	2.04E-02	3.51E-05	0.009
5	15468-32-3	Crystalline silica, tridymite	---	1	460	0.5	12	1.53E-04	0.0408	7.64E-05	2.04E-02	3.51E-05	0.009
		Lime			46,000	0							
6	1305-78-8	Calcium Oxide (CaO)	---	100	46,000	50	1.5	2.28E-03	0.0515	1.14E-01	2.58	0.052	1.19
	14808-60-7	Crystalline Silica	---	0.1	46	0.05	1.5	2.28E-03	0.0515	1.14E-04	2.58E-03	5.25E-05	0.00119
	1309-48-4	Magnesium oxide (only the fume is a TAP)	---	4	1,840	2	1.5	2.28E-03	0.0515	4.56E-03	1.03E-01	2.10E-03	0.047
	7720-78-7	Ferrous sulfate (FeSO4)											
		Portland cement			46,000								
7	65997-15-1	Cement, Portland, Chemicals	---	95	43,700	47.5	1.0	3.86E-03	0.0595	1.84E-01	2.83	0.084	1.30
8	13397-24-5	Gypsum (Calcium sulfate)	---	8	3,680	4	1.0	3.86E-03	0.0595	1.55E-02	2.38E-01	7.11E-03	0.110
9	1317-65-3	Limestone (Calcium carbonate)	---	15	6,900	7.5	1.0	3.86E-03	0.0595	2.90E-02	4.46E-01	1.33E-02	0.21
	14808-60-7	Quartz	---	0.1	46	0.05	1.0	3.86E-03	0.0595	1.93E-04	2.98E-03	8.89E-05	1.37E-03
	1306-78-8	Calcium Oxide (CaO) - Free lime	---	5	2,300	2.5	1.0	3.86E-03	0.0595	9.66E-03	1.49E-01	4.44E-03	6.85E-02
	1309-48-4	Magnesium oxide (only the fume is a TAP)	---	5	2,300	2.5	1.0	3.86E-03	0.0595	9.66E-03	1.49E-01	4.44E-03	6.85E-02
	7440-38-2	Arsenic	HAP	8.40E-08	3.86E-05	4.20E-08	1.0	3.86E-03	0.0595	1.70E-11	2.63E-10	7.47E-11	1.15E-09
	7440-41-7	Beryllium	HAP	8.95E-10	4.12E-07	4.48E-10	1.0	3.86E-03	0.0595	1.82E-13	2.80E-12	7.95E-13	1.23E-11
*	7440-43-9	Cadmium	HAP	1.17E-08	5.38E-06	5.85E-09	1.0	3.05E-03	0.0554	1.88E-12	3.41E-11	8.22E-12	1.49E-10
	7440-47-3	Total Chromium (includes 16065-83-1, Cr III)	HAP	1.26E-08									
	16065-83-1	Cr III (per Idaho DEQ, 80%)		1.008E-08	4.64E-06	5.04E-09	1.0	3.86E-03	0.0595	1.95E-11	3.00E-10	8.96E-12	1.38E-10
	18540-29-9	Hexavalent Chromium (per Idaho DEQ, 20%)	HAP	2.52E-09	1.16E-06	1.26E-09	1.0	3.05E-03	0.0554	4.04E-13	7.34E-12	1.77E-12	3.21E-11
	7439-92-1	Lead	HAP	3.68E-08	1.69E-05	1.84E-08	1.0	3.86E-03	0.0595	7.11E-11	1.10E-09	3.27E-11	5.04E-10
*	7439-96-5	Manganese (Dust & compounds)	HAP	1.01E-05	4.65E-03	5.05E-06	1.0	3.86E-03	0.0595	1.95E-08	3.01E-07	8.98E-09	1.38E-07
	7440-02-0	Nickel	HAP	8.80E-07	4.05E-04	4.40E-07	1.0	3.86E-03	0.0595	1.79E-10	2.75E-09	7.82E-10	1.20E-08
	7723-14-0	Total Phosphorus	HAP	5.90E-07	2.71E-04	2.95E-07	1.0	3.86E-03	0.0595	1.14E-09	1.76E-08	5.24E-10	8.08E-09
	7782-49-2	Selenium	HAP	ND									
		Cement Supplement (e.g., pozzolans, fly ash)			46,000								
*	7440-38-2	Arsenic	HAP	1.00E-06	4.60E-04	5.00E-07	1.0	3.05E-03	0.0554	1.60E-10	2.91E-09	7.03E-10	1.27E-08
*	7440-41-7	Beryllium	HAP	9.04E-08	4.16E-05	4.52E-08	1.0	3.05E-03	0.0554	1.45E-11	2.63E-10	6.35E-11	1.15E-09
	7440-43-9	Cadmium	HAP	1.98E-10	9.11E-08	9.90E-11	1.0	3.05E-03	0.0554	3.18E-14	5.76E-13	1.39E-13	2.52E-12
	7440-47-3	Total Chromium (includes Cr II, Cr III and Cr VI)	HAP	1.22E-06									
*	16065-83-1	Cr III (per Idaho DEQ, 70%)		8.54E-07	3.93E-04	4.27E-07	1.0	3.86E-03	0.0595	1.65E-09	2.54E-08	7.59E-10	1.17E-08
*	18540-29-9	Hexavalent Chromium (per Idaho DEQ, 30%)	HAP	3.66E-07	1.68E-04	1.83E-07	1.0	3.05E-03	0.0554	5.87E-11	1.07E-09	2.57E-10	4.67E-09
*	7439-92-1	Lead	HAP	5.20E-07	2.39E-04	2.60E-07	1.0	3.86E-03	0.0595	1.00E-09	1.55E-08	4.62E-10	7.12E-09
	7439-96-5	Manganese (Dust & compounds)	HAP	2.56E-07	1.18E-04	1.28E-07	1.0	3.86E-03	0.0595	4.95E-10	7.62E-09	2.28E-10	3.50E-09
*	7440-02-0	Nickel	HAP	2.28E-06	1.05E-03	1.14E-06	1.0	3.05E-03	0.0554	3.66E-10	6.64E-09	1.60E-09	2.91E-08
*	7723-14-0	Total Phosphorus	HAP	3.54E-06	1.63E-03	1.77E-06	1.0	3.86E-03	0.0595	6.84E-09	1.05E-07	3.15E-09	4.85E-08
*	7782-49-2	Selenium	HAP	ND									

Material/HAP&TAP Constituents	Building Fugitives Emissions PM$_{2.5}$ (lb/hr)	PM$_{10}$ (lb/hr)	PM$_{2.5}$ (tpy)	PM$_{10}$ (tpy)	Total Baghouse Emissions PM$_{2.5}$ (lb/hr)	PM$_{10}$ (lb/hr)	PM$_{2.5}$ (tpy)	PM$_{10}$ (tpy)
Annual	1.28E-03	3.50E-02	5.91E-04	1.61E-02	1.22E-04	3.32E-03	5.61E-05	1.53E-03
24-hr	2.75E-03	4.24E-02			2.62E-04	4.03E-03		
Bentonite (Sodium aluminum silicate)	1.09E-04	2.91E-02	5.01E-05	1.34E-02	1.03E-05	2.76E-03	4.76E-06	1.27E-03
Silicon Dioxide (amorphous silica)	2.18E-06	5.81E-04	1.00E-06	2.67E-04	2.07E-07	5.52E-05	9.51E-08	2.54E-05
Crystalline silica, Quartz	5.44E-06	1.45E-03	2.50E-06	6.68E-04	5.17E-07	1.38E-04	2.38E-07	6.35E-05
Crystalline silica, cristobalite	1.09E-06	2.91E-04	5.01E-07	1.34E-04	1.03E-07	2.76E-05	4.76E-08	1.27E-05
Crystalline silica, tridymite	1.09E-06	2.91E-04	5.01E-07	1.34E-04	1.03E-07	2.76E-05	4.76E-08	1.27E-05
Lime	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcium Oxide (CaO)	1.63E-03	3.67E-02	7.48E-04	1.69E-02	1.54E-04	3.49E-03	7.10E-05	1.60E-03
Crystalline Silica	1.63E-06	3.67E-05	7.48E-07	1.69E-05	1.54E-07	3.49E-06	7.10E-08	1.60E-06
Magnesium oxide (only the fume is a TAP)	6.50E-05	1.47E-03	2.99E-05	6.75E-04	6.18E-06	1.40E-04	2.84E-06	6.42E-05
Cement, Portland, Chemicals	2.62E-03	4.03E-02	1.20E-03	1.85E-02	2.48E-04	3.83E-03	1.14E-04	1.76E-03
Gypsum (Calcium sulfate)	2.20E-04	3.39E-03	1.01E-04	1.56E-03	2.09E-05	3.22E-04	9.62E-06	1.48E-04
Limestone (Calcium carbonate)	4.13E-04	6.36E-03	1.90E-04	2.93E-03	3.92E-05	6.04E-04	1.80E-05	2.78E-04
Quartz	2.75E-06	4.24E-05	1.27E-06	1.95E-05	2.62E-07	4.03E-06	1.20E-07	1.85E-06
Calcium Oxide (CaO) - Free lime	1.38E-04	2.12E-03	6.33E-05	9.75E-04	1.31E-05	2.01E-04	6.02E-06	9.27E-05
Magnesium oxide (only the fume is a TAP)	1.38E-04	2.12E-03	6.33E-05	9.75E-04	1.31E-05	2.01E-04	6.02E-06	9.27E-05
Arsenic	2.43E-13	3.74E-12	1.06E-12	1.64E-11	2.31E-14	3.55E-13	1.01E-13	1.56E-12
Beryllium	2.59E-15	3.99E-14	1.13E-14	1.75E-13	2.46E-16	3.79E-15	1.08E-15	1.66E-14
Cadmium	2.67E-14	4.85E-13	1.17E-13	2.13E-12	2.54E-15	4.61E-14	1.11E-14	2.02E-13
Cr III (per Idaho DEQ, 80%)	2.78E-13	4.27E-12	1.28E-13	1.97E-12	2.64E-14	4.06E-13	1.21E-14	1.87E-13
Hexavalent Chromium (per Idaho DEQ, 20%)	5.76E-15	1.05E-13	2.52E-14	4.58E-13	5.47E-16	9.93E-15	2.40E-15	4.35E-14
Lead	1.01E-12	1.56E-11	4.66E-13	7.18E-12	9.62E-14	1.48E-12	4.43E-14	6.82E-13
Manganese (Dust & compounds)	2.78E-10	4.28E-09	1.28E-10	1.97E-09	2.64E-11	4.07E-10	1.22E-11	1.87E-10
Nickel	2.54E-12	3.92E-11	1.11E-11	1.72E-10	2.42E-13	3.72E-12	1.06E-12	1.63E-11
Total Phosphorus	1.62E-11	2.50E-10	7.47E-12	1.15E-10	1.54E-12	2.38E-11	7.10E-13	1.09E-11
Arsenic (Cement Supplement)	2.29E-12	4.15E-11	1.00E-11	1.82E-10	2.17E-13	3.94E-12	9.51E-13	1.73E-11
Beryllium (Cement Supplement)	2.07E-13	3.75E-12	9.05E-13	1.64E-11	1.96E-14	3.56E-13	8.60E-14	1.56E-12
Cadmium (Cement Supplement)	4.53E-16	8.21E-15	1.98E-15	3.60E-14	4.30E-17	7.80E-16	1.88E-16	3.42E-15
Cr III (per Idaho DEQ, 70%)	2.35E-11	3.62E-10	1.08E-11	1.67E-10	2.23E-12	3.44E-11	1.03E-12	1.58E-11
Hexavalent Chromium (per Idaho DEQ, 30%)	8.37E-13	1.52E-11	3.66E-12	6.65E-11	7.95E-14	1.44E-12	3.48E-13	6.32E-12
Lead (Cement Supplement)	1.43E-11	2.21E-10	6.59E-12	1.01E-10	1.36E-12	2.10E-11	6.26E-13	9.64E-12
Manganese (Dust & compounds) (Cement Supplement)	7.05E-12	1.09E-10	3.24E-12	4.99E-11	6.70E-13	1.03E-11	3.08E-13	4.74E-12
Nickel (Cement Supplement)	5.21E-12	9.46E-11	2.28E-11	4.14E-10	4.95E-13	8.98E-12	2.17E-12	3.94E-11
Total Phosphorus (Cement Supplement)	9.75E-11	1.50E-09	4.48E-11	6.91E-10	9.26E-12	1.43E-10	4.26E-12	6.56E-11
Selenium (Cement Supplement)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
			Total PM HAP	2.28E-09			Total PM HAP	2.17E-10

Material/HAP&TAP Constituents	Reagents Total TAPs (lb/hr, 24-hr or annual average)	Wastes Total TAPs (lb/hr, 24-hr or annual average)	TOTAL TAPs (lb/hr, 24-hr or annual average)	Screening EL (lb/hr)	Modeling Required?	24-hr AAC (mg/m3)	50-34PM Modeled Impact (mg/m3) 0.0315	Complies? Impact < AAC? (Yes/No)	Annual TRACT AACC (ug/m3)	50-34PM Modeled Impact (ug/m3) 2.100	Complies? Impact < AACC? (Yes/No)
Bentonite (Sodium aluminum silicate)		---				---	---	---	---	---	---
Silicon Dioxide (amorphous silica)	6.36E-04	---	6.36E-04	0.667	No	0.5	2.00E-05	Yes	---	---	---
Crystalline silica, Quartz	1.59E-03	---	1.59E-03	0.0067	No	0.005	5.00E-05	Yes	---	---	---
Crystalline silica, cristobalite	3.18E-04	---	3.18E-04	0.0033	No	0.0025	1.00E-05	Yes	---	---	---
Crystalline silica, tridymite	3.18E-04	---	3.18E-04	0.0033	No	0.0025	1.00E-05	Yes	---	---	---
Lime		---									
Calcium Oxide (CaO)	4.02E-02	---	4.02E-02	0.133	No	0.1	1.26E-03	Yes	---	---	---
Crystalline Silica		---				---	---	---	---	---	---
Magnesium oxide (only the fume is a TAP)		---		N/A, not Mg fume							
Ferrous sulfate (FeSO4)		---									
Cement, Portland, Chemicals	4.41E-02	---	4.41E-02	0.667	No	0.5	1.39E-03	Yes	---	---	---
Gypsum (Calcium sulfate)	3.72E-03	---	3.72E-03	0.667	No	0.5	1.17E-04	Yes	---	---	---
Limestone (Calcium carbonate)	6.97E-03	---	6.97E-03	0.667	No	0.5	2.19E-04	Yes	---	---	---
Quartz						0.005	---	---	---	---	---
Calcium Oxide (CaO) - Free lime						---	---	---	---	---	---
Magnesium oxide (only the fume is a TAP)		---	0.00E+00	N/A, not Mg fume							
Arsenic	4.10E-12	---	4.10E-12	1.50E-06	No				2.3E-03	8.60E-12	Yes
Beryllium	4.37E-14	---	4.37E-14	2.80E-05	No				4.2E-02	9.17E-14	Yes
Cadmium	5.31E-13	2.59E-03	2.59E-03	3.70E-06	YES				5.6E-03	5.44E-03	Yes
Cr III (per Idaho DEQ, 80%)	4.68E-12	---	4.68E-12	0.033		0.025					
Hexavalent Chromium (per Idaho DEQ, 20%)	1.14E-13	---	1.14E-13	5.60E-07	No				8.3E-04	2.40E-13	Yes
Lead		---									
Manganese (Dust & compounds)	4.69E-09	3.01E-02	3.01E-02	0.333	No	0.25	9.48E-04	Yes	---	---	---
Nickel	4.29E-11	---	4.29E-11	2.70E-05	No				4.2E-02	9.01E-11	Yes
Total Phosphorus	2.74E-10	---	2.74E-10	0.007	No	0.005	8.62E-12	Yes	---	---	---
Selenium				0.013		0.01	0.00E+00	Yes	---	---	---
Arsenic (Cement Supplement)	4.54E-11	1.04E-03	1.04E-03	1.50E-06	YES				2.3E-03	2.18E-03	Yes
Beryllium (Cement Supplement)	4.11E-12	2.59E-03	2.59E-03	2.80E-05	YES				4.2E-02	5.44E-03	Yes
Cadmium (Cement Supplement)	8.99E-15	---	8.99E-15	3.70E-06	No				5.6E-03	1.89E-14	Yes
Total Chromium (includes Cr II, Cr III and Cr VI)									---	---	---
Cr III (per Idaho DEQ, 70%)	3.97E-10	7.72E-03	7.72E-03	0.033	No	0.025	2.43E-04	Yes			
Hexavalent Chromium (per Idaho DEQ, 30%)	1.66E-11	3.53E-04	3.53E-04	5.60E-07	YES				8.3E-04	7.40E-04	Yes
Lead (Cement Supplement)											
Manganese (Dust & compounds) (Cement Supplement)	1.19E-10	---	1.19E-10	0.333	No	1.2	3.74E-12	Yes	---	---	---
Nickel (Cement Supplement)	1.04E-10	2.59E-03	2.59E-03	2.70E-05	YES				4.2E-02	5.44E-03	Yes
Total Phosphorus (Cement Supplement)	1.64E-09	3.01E-02	3.01E-02	0.007	YES	0.005	9.48E-04	Yes	---	---	---
Selenium (Cement Supplement)				0.013		0.01	0.00E+00	Yes	---	---	---

2.59E-03
125,000 ppmw

Reagent Silo Filling, PM HAP Fraction	
0.00E+00	Clay
0.00E+00	Lime
3.49E-12	Portland Cement
5.44E-14	Cement Supplement

Max any HAP 1.97E-09 (Manganese) | Max any HAP 1.87E-10 (Manganese)

Total Max Any HAP 2.50E-09 (Manganese)

Uncontrolled PM HAPs 2.46E-07

Max PM$_{2.5}$ and PM$_{10}$ (TPY)	7.48E-04	1.69E-02
Max Lead (TPY)		1.01E-10
Max PM$_{2.5}$ and PM$_{10}$ (TPY)	7.10E-05	1.60E-03
Max Lead (TPY)		9.64E-12

Reagent TAPs: If a TAP occurs in more than one reagent, the maximum concentration in any reagent is used in the analysis.

Metal TAPs: For Portland cement, concentrations of Arsenic thru Selenium taken from AP-42, Table 11.12-8, Concrete Batch Plant Metal Emission Factors (06/06). Values in the Ap-42 table are in lb pollutant/ton material.
Metal TAPs: For cement supplements (e.g, pozzolans, flyash), concentrations of Arsenic thru Selenium taken from AP-42, Table 11.12-8, Concrete Batch Plant Metal Emission Factors (06/06). Values in the Ap-42 table are in lb pollutant/ton material.
Cement supplement fabric filter presumed 95% efficient.
Metal TAPs: No HAPs emission factors are listed in AP-42, 11.17, Lime Processing, or 11.25, Clay Processing.
Metal TAPs: Bentonite (sodium aluminum silicate) is an aluminum salt but is not soluble (Soluble aluminum salt is an Idaho TAP). see https://pubchem.ncbi.nlm.nih.gov/compound/Sodium-aluminosilicate

Hex Chrome: Treated Wastes. 2014 NEI, Version 1, Technical Support Document (TSD), December 2016. The link to the chromium augmentation factors is on page 2-5. https://www.epa.gov/sites/production/files/2016-12/documents/nei2014v1_tsd.pdf
The default augmentation profile is 34% hexavalent chromium and 66% trivalent chromium.
Hex Chrome: Cement (20%) and cement supplement (30%), Idaho DEQ, gcbp-spreadsheet.xls, https://www.deq.idaho.gov/permitting/air-quality-permitting/permit-to-construct/concrete-batch-plants/

Lead: Lead Compounds = 1.3 x Max Reported Air Emissions in the TRI, 2011-2017. Lead is a criteria pollutant and a HAP, not a TAP.

Moisture: ~15% Bentonite, Industrial Minerals Association North America, https://www.ima-na.org/page/what_is_bentonite
Moisture: ~ 1% AP-42 Section 11.6 Emission Factor Documentation. May 18, 1994. https://www3.epa.gov/ttn/chief/ap42/ch11/bgdocs/b11s06.pdf
Moisture: 1.5%-4% (slaked lime), https://www.tovatech.com/blog/22057/moisture-analyzers-2/determining-hydrated-lime-moisture-content
Moisture: 1.5 - 3% Maximum levels in hydrated/slaked lime. https://www.moisttech.com/moisture-content-hydrated-lime/

All of the equations used to determine VOC emissions from waste piles were taken from the US EPA's Industrial Waste Air Model (IWAIR) Technical Background Document (EPA 530-R-02-010, February 2002), Section 2.0 (Source Emission Estimates Using CHEMDAT8). These equations begin to be used in Column L.

https://www.epa.gov/sites/production/files/2016-03/documents/iwair_technical_background.pdf

Equation 2-16

$$T_{corr} = 10^{\left(VP_b \times \left(\frac{-1}{VP_c + T - 273.15} + \frac{1}{VP_c + 25}\right)\right)}$$

Where:

VP_b = Antoine's vapor pressure constant B for the constituent

VP_c = Antoine's vapor pressure constant C for the constituent

T = Temperature of the system (K)

Note: If the Antoine's vapor pressure constants were unavailable for a constituent, then a conservative value of 1 was used

Equation 2-15

$$K_{eq} = \frac{T_{corr} \times P_{vap} \times MW_{waste} \times \varepsilon_a}{R \times T \times L}$$

Where:

K_{eq} = vapor/liquid equilibrium coefficient

T_{corr} = temperature correction factor for vapor pressure for constituent

P_{vap} = pure component vapor pressure for constituent at 25 C (atm)

MW_{waste} = average molecular weight of the waste (g/mol)

ε_a = air-filled porosity (cm^3/cm^3)

R = Universal gas constant

T = Temperature of the system (K)

L = waste loading rate (g/cm^3)

Equation 2-18

$$D_{eff} = D_a \frac{\varepsilon_a^{3.33} \times T_{C,gas}}{\varepsilon_t^2}$$

Where:

D_{eff} = effective diffusivity (cm^2/s)

D_a = diffusivity of the constituent in air (cm^2/s)

$T_{C,gas}$ = temperature correction factor for gas diffusivity $(T/298.15)^{1.75}$

T = temperature of the system (K)

d_{wmu} = characteristic depth (cm)

ε_a = air-filled porosity (cm^3/cm^3)

ε_t = total porosity (cm^3/cm^3)

Equation 2-19

$$K_v = \frac{K_{eq} \times D_{eff}}{d_{wmu}^2}$$

Where:

K_v = volatilization rate of the compound (1/s)

K_{eq} = vapor/liquid equilibrium coefficient

D_{eff} = effective diffusivity (cm^2/s)

d_{wmu} = characteristic depth (cm)

Equation 2-21

$$f_{emitted} = 2\left(\frac{K_v \times t}{\pi}\right)^{0.5}\left[1 - \frac{t \times b_{soil}}{3}\right]$$

Where:

$F_{emitted}$ = Fraction of the VOCs emitted during the time period

K_v = volatilization rate of the compound (1/s)

b_{soil} = biological destruction rate in the soil (1/s)

t = residence time (s) = 3,600

Equation 2-37

$$E = \frac{M_{annual} \times C_{waste} \times f_{emitted}}{A \times 365.25 \times 24 \times 3600}$$

Where:

E = Mass Flux Rate ($g/m^2 s$)

M_{annual} = Total initial mass that is in the pile during the year (Mg)

C_{waste} = Mixing Ratio of the pollutant in the waste (g/Mg or ppm)

$f_{emitted}$ = Fraction of the VOCs emitted during the time period

A = Cross-sectional area of the pile/pan (m^2)

TPY = Mass Flux Rate (g/m2-s) x Pan Area (m2) x 8760 hr/yr x 3600 s/hr x (lb/453.6 g) x (ton/2000 lb)

Exterior Pans =	337,400	TPY
Interior Pans =	276,000	TPY

MODELED EMISSION RATES;

If Total TAP VOC Emitted = 1.0 lb/hr Curtain Capture Efficiency = 95 %, with baghouse operating

VOCBHANN = 0.950 lb/hr VOCFUGANN = 0.050 lb/hr

Emission rate for Dibenzofuran includes Toxicity Equivalence Factor (TEF) = 0.1

#	CAS	Compound	HAP?	Density (g/cm³)
1	630-20-6	1.1.1.2-Tetrachloroethane	-	1.5532
2	460-73-1	1.1.1.3.3- Pentafluoropropane	-	1.404
3	71-55-6	1.1.1-Trichloroethane	HAP	1.33
4	79-34-5	1.1.2.2-Tetrachloroethane	HAP	1.59
5	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	-	1.58
6	79-00-5	1.1.2-Trichloroethane	HAP	1.3
7	75-34-3	1.1-Dichloroethane	HAP	1.17
8	106-88-7	1.2 Butylene Oxide	HAP	0.8297
9	120-82-1	1.2.4-Trichlorobenzene	HAP	1.41
10	95-63-6	1.2.4-Trimethylbenzene	-	0.876
11	107-15-3	1.2-diaminoethane	-	0.9
12	96-12-8	1.2-Dibromo-3-chloropropane	HAP	1.41
13	95-50-1	1.2-Dichlorobenzene	-	1.31
14	107-06-2	1.2-Dichloroethane	HAP	1.26
15	540-59-0	1.2-Dichloroethylene	-	1.28
16	78-87-5	1.2-Dichloropropane	HAP	1.156
17	108-67-8	1.3.5 Trimethylbenzene	-	0
18	106-99-0	1.3-butadiene	HAP	0.76
19	542-75-6	1.3-Dichloropropylene	HAP	1.217
20	106-46-7	1.4-Dichlorobenzene	HAP	1.29
21	90-12-0	1-Methylnaphthalene	-	0
22	540-84-1	2.2.4 Trimethylpentane	HAP	0
23	95-95-4	2.4.5-Trichlorophenol	HAP	1.18
24	88-06-2	2.4.6-Trichlorophenol	HAP	1
25	94-75-7	2.4-D	-	0.9723
26	95-80-7	2.4-Diaminotoluene	HAP	1.11
27	120-83-2	2.4-Dichlorophenol	-	1.41
28	105-67-9	2.4-Dimethylphenol	-	1.04
29	51-28-5	2.4-Dinitrophenol	HAP	1.68
30	121-14-2	2.4-Dinitrotoluene	HAP	1.31
31	87-65-0	2.6-Dichlorophenol	-	1.41
32	576-26-1	2.6-Dimethylphenol	-	0
33	53-96-3	2-Acetylaminofluorene	HAP	1.02
34	111-76-2	2-butoxyethanol	-	0
35	110-75-8	2-Chloroethyl vinyl ether	-	1.41
36	95-57-8	2-Chlorophenol	-	1.26
37	109-86-4	2-Methoxyethanol	-	0.965
38	88-85-7	2-sec-Butyl-4.6-	-	1.18
39	107-05-1	3-Chloropropylene	HAP	0.94
40	101-77-9	4.4'-Methylenedianiline	HAP	1.0765
41	534-52-1	4.6-Dinitro-o-cresol	-	1.15
42	99-55-8	5-Nitro-o-toluidine	HAP	1.15
43	30560-19-1	Acephate	-	1.35
44	75-07-0	Acetaldehyde	HAP	0.788
45	60-35-5	Acetamide	HAP	1.16
46	64-19-7	Acetic Acid	-	1.05
47	67-64-1	Acetone	-	0.79
48	75-86-5	Acetone Cyanohydrin	-	0.932
49	75-05-8	Acetonitrile	HAP	0.78
50	98-86-2	Acetophenone	HAP	1.0266
51	107-02-8	Acrolein	HAP	0.84
52	79-06-1	Acrylamide	HAP	1.12
53	79-10-7	Acrylic acid	HAP	0.97
54	107-13-1	Acrylonitrile	HAP	0.81
55	111-69-3	Adiponitrile	-	0.97
56	7664-41-7	Ammonia	-	0.6818
57	62-53-3	Aniline	HAP	1.02
58	120-12-7	Anthracene	-	1.25
59	98-87-3	Benzal chloride	-	1.26
60	71-43-2	Benzene	HAP	0.874
61	191-24-2	Benzo(g.h.i)perylene	-	1.02
62	62-23-7	BENZOIC ACID. 4-NITRO	-	1.58
63	100-44-7	Benzyl Chloride	HAP	1.1
64	92-52-4	Biphenyl	HAP	1.18
65	92-54-4	1-Phenylpiperazine	-	1.18
66	111-91-1	bis(2-Chloroethoxy)methane	-	1.41
67	111-44-4	bis(2-Chloroethyl)ether	HAP	1.22
68	39638-32-9	bis(2-Chloroisopropyl)ether	-	1.41
69	75-27-4	Bromodichloromethane	-	1.97
70	75-25-2	Bromoform	HAP	2.89
71	74-83-9	Bromomethane	HAP	1.41
72	141-32-2	Butyl Acrylate	-	0.8986
73	71-36-3	Butyl Alcohol	-	0.81
74	2426-08-6	Butyl Glycidyl Ether	-	0.945
75	109-79-5	Butyl Mercaptan	-	1.26
76	123-72-8	Butyraldehyde	-	0.802
77	107-92-6	Butyric Acid	-	0.958
78	109-74-0	Butyronitrile	-	0.791
79	133-06-2	Captan	HAP	1.74
80	63-25-2	Carbaryl	HAP	1.232
81	75-15-0	Carbon disulfide	HAP	1.26
82	56-23-5	Carbon Tetrachloride	HAP	1.59
83	55285-14-8	Carbosulfan	-	1
84	120-80-9	Catechol	HAP	1.34
85	57-74-9	Chlordane	HAP	1.11
86	7782-50-5	Chlorine	HAP	1
87	79-11-8	Chloroacetic Acid	HAP	1.58
88	108-90-7	Chlorobenzene	HAP	1.11
89	510-15-6	Chlorobenzilate	HAP	1.41
90	124-48-1	Chlorodibromomethane	-	2.451
91	75-00-3	Chloroethane	HAP	1.41
92	67-66-3	Chloroform	HAP	1.49
93	74-87-3	Chloromethane	HAP	0.95
94	126-99-8	Chloroprene	HAP	0.958
95	156-59-2	cis-1.2-Dichloroethylene	-	1.28
96	10061-01-5	cis-1.3-Dichloropropylene	-	1.2
97	1319-77-3	Cresol	HAP	1.03
98	98-82-8	Cumene	HAP	0.86
99	**592-01-8**	Cyanide Compounds	HAP	1.15
100	110-82-7	Cyclohexane	-	0.78
101	108-94-1	Cyclohexanone	-	0.95
102	110-83-8	Cyclohexene	-	0.811
103	287-92-3	Cyclopentane	-	1
104	5989-27-5	d- Limonene	-	0.841
105	117-81-7	Di(2-ethylhexyl) phthalate	HAP	0.981
106	333-41-5	Diazinon	-	1.1088
107	132-64-9	Dibenzofuran	HAP	--
108	74-95-3	Dibromomethane	-	1.41
109	84-74-2	Dibutyl phthalate	HAP	1.043
110	75-09-2	Dichloromethane	HAP	1.34
111	34077-87-7	Dichlorotrifluoroethane	-	1
112	77-73-6	Dicyclopentadiene	-	0.93
113	111-42-2	Diethanolamine	HAP	1.0881
114	64-67-5	Diethyl sulfate	HAP	1.172
115	100-37-8	Diethylaminoethanol	-	1
116	108-83-8	Diisobutyl Ketone	-	1
117	27215-10-7	Di-iso-octyl acid phosphate	-	0.983
118	121-69-7	Dimethyl Aniline	HAP	0.956
119	131-11-3	Dimethyl phthalate	HAP	1.19
120	89396-94-1	Dinitrobutyl phenol	-	1.265
121	25321-14-6	Dinitrotoluene (mixed isomers)	-	1.32
122	621-64-7	Di-n-propylnitrosamine	-	1.15
123	123-91-1	Dioxane	HAP	1.03
124	138-86-3	Dipentene	-	0.834
125	122-39-4	Diphenylamine (difficult to distinguish from diphenylnitrosamine)	-	1.16
126	142-84-7	Dipropylamine	-	0.738
127	106-89-8	Epichlorohydrin	HAP	1.1812
128	64-17-5	Ethanol	-	0.79
129	141-43-5	Ethanolamine	-	1.02
130	141-78-6	Ethyl acetate	-	0.9
131	140-88-5	Ethyl Acrylate	HAP	0.92
132	60-29-7	Ethyl ether	-	0.7134
133	75-08-1	Ethyl Mercaptan	-	1
134	97-63-2	Ethyl methacrylate	-	0.9135
135	352-93-2	Ethyl Sulfide	-	0.837
136	100-41-4	Ethylbenzene	HAP	0.87
137	74-85-1	Ethylene	-	0.76
138	106-93-4	Ethylene Dibromide	HAP	1.41
139	107-21-1	Ethylene Glycol	HAP	1.1153
140	628-96-6	Ethylene Glycol Dinitrate	-	1
141	75-21-8	Ethylene oxide	HAP	0.87
142	96-45-7	Ethylene thiourea	HAP	1.15
143	75-34-3	Ethylidene Dichloride	HAP	1.168

#	Vapor Pressure (mm Hg)	Molecular Weight, MW (g/gmol)	Diffusivity in air, Da (cm²/s)	Antoine's Coefficients a	Column6 b	Column7 c	Average Annual Concentration (Cw) (ppm)	Exterior T_{corr} (Eq. 2-16) --	Exterior K_{eq} (Eq. 2-15) (g/cm³ / g/cm³)	Exterior D_{eff} (Eq. 2-18) (cm²/s)	Exterior K_v (Eq. 2-19) (s⁻¹)	Exterior $f_{emitted}$ (Eq. 2-21) --	Exterior Emission Flux (Eq. 2-37) (g/m²-s)	Exterior Pan Emission Rate (Emissions Calculation) (tpy)
1	12	167.85	0.071	6.89	1350	192	-	3.61E-01	7.33E-06	2.58E-03	1.41E-11	2.54E-04	0.00E+00	0.00E+00
2	17.8	134.05	0.18	0	0	0	-	1.00E+00	2.41E-05	6.53E-03	1.17E-10	7.34E-04	0.00E+00	0.00E+00
3	123	133.4	0.078	0	0	0	1.61	1.00E+00	1.65E-04	2.83E-03	3.50E-10	1.27E-03	3.81E-07	6.89E-04
4	4.62	168	0.071	6.89	1350	192	1.00	3.61E-01	2.83E-06	2.58E-03	5.44E-12	1.58E-04	2.94E-08	5.32E-05
5	300	187.38	0.078	8.78	1890	273	-	4.76E-01	2.70E-04	2.83E-03	5.71E-10	1.62E-03	0.00E+00	0.00E+00
6	23	133.4	0.078	7.19	1480	229	1.00	4.46E-01	1.38E-05	2.83E-03	2.92E-11	3.66E-04	6.82E-08	1.23E-04
7	591	98.96	0.0742	6.9853	1171.42	228.13	1.00	5.26E-01	3.10E-04	2.69E-03	6.23E-10	1.69E-03	3.15E-07	5.70E-04
8	170	72.1	0.106764433	0	0	0	0.64	1.00E+00	1.24E-04	3.87E-03	3.58E-10	1.28E-03	1.52E-07	2.75E-04
9	0.18	181.5	0.03	7.71	2240	253	1.00	3.63E-01	1.20E-07	1.09E-03	9.72E-14	2.11E-05	3.93E-09	7.12E-06
10	2.1	120.2	0.0606	7.04383	1573.267	208.564	-	3.61E-01	9.18E-07	2.20E-03	1.51E-12	8.31E-05	0.00E+00	0.00E+00

#	Interior T_{corr} (Eq. 2-16) --	Interior K_{eq} (Eq. 2-15) (g/cm³ / g/cm³)	Interior D_{eff} (Eq. 2-18) (cm²/s)	Interior K_v (Eq. 2-19) (s⁻¹)	Interior $f_{emitted}$ (Eq. 2-21) --	Interior Emission Flux (Eq. 2-37) (g/m²-s)	Interior Pan Emission Rate (Emissions Calculation) (tpy)	Interior Pan Emission Rate, Annual Avg (Emissions Calculation) (lb/hr)	Total Emissions (tpy)	Idaho 586 TAP? (Yes/No)	Screening Emissions Level (EL), lb/hr, Annual Avg (lb/hr)	Annual Modeling Required? (Yes/No)	T-RACT AACC (ug/m3)	Modeled Ambient Impact (ug/m3) [50-34VOC] 2.79	Complies? Impact < T-RACT AACC? [50-34VOC] (Yes/No)
1	3.61E-01	7.33E-06	2.58E-03	3.60E-12	1.28E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
2	1.00E+00	2.41E-05	6.53E-03	3.00E-11	3.71E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
3	1.00E+00	1.65E-04	2.83E-03	8.93E-11	6.40E-04	1.47E-07	2.85E-04	6.50E-05	9.74E-04	No	---				
4	3.61E-01	2.83E-06	2.58E-03	1.39E-12	7.98E-05	1.13E-08	2.20E-05	5.02E-06	7.52E-05	Yes	1.1E-05	No	0.17	1.401E-05	Yes
5	4.76E-01	2.70E-04	2.83E-03	1.46E-10	8.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
6	4.46E-01	1.38E-05	2.83E-03	7.45E-12	1.85E-04	2.63E-08	5.10E-05	1.16E-05	1.74E-04	Yes	4.2E-04	No	0.62	3.247E-05	Yes
7	5.26E-01	3.10E-04	2.69E-03	1.59E-10	8.54E-04	1.22E-07	2.36E-04	5.38E-05	8.06E-04	Yes	2.5E-04	No	0.38	0.0001501	Yes
8	1.00E+00	1.24E-04	3.87E-03	9.13E-11	6.47E-04	5.86E-08	1.14E-04	2.59E-05	3.88E-04	No	---				
9	3.63E-01	1.20E-07	1.09E-03	2.48E-14	1.07E-05	1.52E-09	2.94E-06	6.71E-07	1.01E-05	No	---				
10	3.61E-01	9.18E-07	2.20E-03	3.85E-13	4.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				

COMPLY at "Z" ppm Concentration when processing 276,000 T/yr of wastes in the SB?

#		Factor to Increase [ ] to "Z" ppm 1500	Annual Emission Rate @ "Z" ppm (lb/hr)	Modeled Ambient Impact (ug/m3) [50-34VOC] 2.79	586 TAP?	Complies? Impact < AACC? [50-34VOC] (Yes/No)	CAS No.	Pollutant	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)
1		5.00E+02	#NAME?	#NAME?	Not 586 TAP	---				
2		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
3		9.30E+02	6.04E-02	1.69E-01	Not 586 TAP	---				
4		1.50E+03	7.53E-03	2.10E-02	Yes	Yes				
5		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
6		1.50E+03	1.75E-02	4.87E-02	Yes	Yes				
7		1.50E+03	8.07E-02	2.25E-01	Yes	Yes				
8		2.36E+03	6.11E-02	1.70E-01	Not 586 TAP	---				
9		1.50E+03	1.01E-03	2.81E-03	Not 586 TAP	---				
10		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
11		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
12	**360**	3.60E+02	5.65E-04	1.58E-03	Yes	Yes	96-12-8	1.2-Dibromo-3-chloropropane	198,720	99.36
13		1.11E+05	3.94E-03	1.10E-02	Not 586 TAP	---				
14		2.45E+06	4.20E-02	1.17E-01	Yes	Yes				
15		4.85E+01	5.05E-02	1.41E-01	Not 586 TAP	---				
16		1.50E+03	2.14E-02	5.97E-02	Not 586 TAP	---				
17		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
18	**100**	1.00E+02	1.28E-02	3.57E-02	Yes	**Yes**	106-99-0	1.3-butadiene	55,200	27.60
19		1.50E+03	1.99E-02	5.57E-02	Yes	Yes				
20		1.07E+05	2.52E-03	7.02E-03	Not 586 TAP	---				
21		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
22		1.50E+03	3.11E-02	8.69E-02	Not 586 TAP	---				
23		5.01E+03	4.05E-03	1.13E-02	Not 586 TAP	---				
24		1.06E+05	3.28E-04	9.14E-04	Yes	Yes				
25		5.26E+03	1.71E-03	4.77E-03	Not 586 TAP	---				
26		1.50E+03	9.84E-06	2.75E-05	Not 586 TAP	---				
27		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
28		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
29		1.50E+03	4.80E-05	1.34E-04	Not 586 TAP	---				
30–93		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
94		1.50E+03	3.99E-02	1.11E-01	Not 586 TAP	---				
95		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
96		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
97		9.54E+03	2.57E-03	7.17E-03	Not 586 TAP	---				
98		1.19E+03	1.49E-02	4.16E-02	Not 586 TAP	---				
99		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
100		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
101		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
102		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
103		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
104		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
105		1.35E+02	2.47E-07	6.89E-07	Yes	Yes				
106		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
107	**29**	1.13E+00	7.67E-08	2.14E-07	Yes	**Yes**	132-64-9	Dibenzofuran	16,008	8.00
108		1.08E+10	3.08E-02	8.59E-02	Not 586 TAP	---				
109		8.56E+02	1.69E-05	4.73E-05	Not 586 TAP	---				
110		3.36E+01	7.64E-02	2.13E-01	Yes	Yes				
111		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
112		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
113		1.02E+00	4.79E-04	1.34E-03	Not 586 TAP	---				
114		1.50E+03	2.44E-03	6.81E-03	Not 586 TAP	---				
115		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
116		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
117		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
118		1.50E+03	4.39E-03	1.22E-02	Not 586 TAP	---				
119		8.68E+01	2.60E-04	7.27E-04	Not 586 TAP	---				
120		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
121		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
122		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
123		1.09E+03	2.78E-02	7.75E-02	Yes	Yes				
124		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
125		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
126		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
127		5.59E+01	1.15E-02	3.22E-02	Yes	Yes				
128		5.18E+00	2.84E-02	7.93E-02	Not 586 TAP	---				
129		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
130		6.62E+02	2.96E-02	8.25E-02	Not 586 TAP	---				
131		9.01E+02	2.04E-02	5.71E-02	Not 586 TAP	---				
132		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
133		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
134		5.11E+03	2.09E-02	5.84E-02	Not 586 TAP	---				
135		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
136		4.97E+01	9.45E-03	2.64E-02	Not 586 TAP	---				
137		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
138		1.50E+03	1.06E-02	2.97E-02	Yes	Yes				
139		2.18E-01	5.29E-04	1.48E-03	Not 586 TAP	---				
140		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---				
141	**530**	2.57E+01	3.54E-02	9.88E-02	Yes	Yes	75-21-8	Ethylene oxide	292,560	146.28
142		2.50E+02	6.89E-06	1.92E-05	Not 586 TAP	---				
143		1.50E+03	7.10E-02	1.98E-01	Yes	Yes				

	CAS	Compound	HAP?	Density (g/cm³)	Vapor Pressure (mm Hg)
144	16219-75-3	Ethylidene-2-norbornene	-	1	4.6
145	206-44-0	Fluoranthene	-	1.02	9.2E-06
146	50-00-0	Formaldehyde	HAP	0.97	93.6
147	64-18-6	Formic acid	-	1.22	42
148	111-0-9	Furan	-	0.935	521.2601
149	111-30-8	Glutaraldehyde	-	1	2.85971
150	N230	Glycol Ethers	-	0.965	6
151	107-16-4	Glycolonitrile	-	1	0.75
152	50-01-1	GUANIDINIUM CHLORIDE	-	1.354	0
153	76-44-8	Heptachlor	HAP	1.57	0.0004
154	142-82-5	Heptane	-	0.68	37.49
155	87-68-3	Hexachloro-1,3-butadiene	HAP	1.67	0.15
156	118-74-1	Hexachlorobenzene	HAP	2.04	1.09E-05
157	77-47-4	Hexachlorocyclopentadiene	HAP	1.702	0.06
158	67-72-1	Hexachloroethane	HAP	2.09	0.4
159	110-54-3	Hexane (n-Hexane)	HAP	0.66	150
160	302-01-2	Hydrazine	HAP	1	549.348
161	7647-01-0	Hydrogen Chloride	HAP	0.909	680
162	7664-39-3	**Hydrogen Fluoride**	HAP	0.97	400
163	2148878	Hydrogen Sulfide	-	1.41	15200
164	123-31-9	Hydroquinone	HAP	1	4
165	74-88-4	Iodomethane	HAP	1	400
166	123-92-2	Isoamyl Acetate	-	1	4
167	123-51-3	Isoamyl Alcohol	-	1	28
168	78-83-1	Isobutyl alcohol	-	0.79	10
169	78-82-0	Isobutyronitrile	-	1	100
170	107-83-5	Isohexane	-	0.653	310.2
171	78-59-1	Isophorone	HAP	0.9255	0.3
172	78-79-5	isoprene	-	0.674	548.955
173	67-63-0	Isopropyl alcohol	-	0.79	40
174	120-58-1	Isosafrole	-	1.12	0.084
175	58-89-9	Lindane	-	1.87	0.000042
176	121-75-5	Malathion	-	1.2076	0.00004
177	108-31-6	Maleic anhydride	HAP	1.314	0.25
178	108-39-4	m-Cresol	HAP	1.0336	0.04
179	541-73-1	m-Dichlorobenzene	-	1.29	2.28
180	141-79-7	Mesityl Oxide	-	0.858	0.858
181	126-98-7	Methacrylonitrile	-	1.15	65
182	67-56-1	Methanol	HAP	0.79	100
183	72-43-5	Methoxychlor	HAP	0.97	2.5E-06
184	66-27-3	Methyl methanesulfonate	-	1.3	0.31
185	96-33-3	Methyl Acrylate	-	0.97	40
186	110-43-0	Methyl Amyl Ketone	-	0.815	3
187	108-10-1	Methyl Butyl Ketone	HAP	1	2
188	624-92-0	Methyl Disulfide	-	1.046	28.6
189	78-93-3	Methyl ethyl ketone	-	0.82	100
190	60-34-4	Methyl Hydrazine	HAP	0.874	37.0531
191	110-12-3	Methyl Isoamyl Ketone	-	0.8	5
192	80-62-6	Methyl Methacrylate	HAP	0.95	40
193	107-87-9	Methyl Propyl Ketone	-	0.8095	12
194	75-18-3	Methyl Sulfide	-	1.26	502
195	1634-04-4	Methyl tert-butyl ether	HAP	0.735	217.983
196	108-87-2	Methylcyclohexane	-	0.76	83.29
197	101-14-4	Methylenebis (2-chloroaniline)	HAP	1.15	0.00001
198	108-38-3	m-Xylene	HAP	0.86	10
199	68-12-2	N,N-Dimethylformamide	HAP	0.9445	4
200	628-63-7	N-Amyl Acetate	-	0.88	5.17
201	91-20-3	Naphthalene	HAP	1.14	0.05
202	123-86-4	n-butyl acetate	-	0	10
203	98-95-3	Nitrobenzene	HAP	1.2	1
204	25322-01-4	Nitropropane	-	0.9876	101.517
205	1321-12-6	Nitrotoluene	-	1	0.13133
206	872-50-4	N-Methyl-2-pyrrolidone	-	1.033	0.5
207	55-18-5	N-Nitrosodiethylamine	-	1	0.89
208	62-75-9	N-Nitrosodimethylamine	HAP	1.005	2.7
209	924-16-3	N-Nitroso-di-n-butylamine	-	1	0.0469
210	10595-95-6	N-Nitrosomethylethylamine	-	1	108.522
211	59-89-2	N-Nitrosomorpholine	HAP	1.15	0.099076
212	100-75-4	N-Nitrosopiperidine	-	1.06	0.092
213	111-84-2	Nonane	-	1	10
214	106-94-5	n-Propyl Bromide	-	1.35	146.262
215	90-04-0	o-Anisidine	HAP	1.096	0.055185
216	95-48-7	o-Cresol	HAP	1.05	1
217	111-65-9	Octane	-	0.7	10
218	88-75-5	o-Nitrophenol	-	1	0.113
219	19044-88-3	Oryzalin	-	1	9.75E-09
220	95-53-4	o-Toluidine	HAP	0.989	0.3
221	95-47-6	o-Xylene	HAP	0.88	10
222	72-55-9	p,p?-DDE	HAP	1.41	6.5E-06
223	56-38-2	Parathion	HAP	1.26	3.75E-05
224	1336-36-3	PCBs	HAP	1.19	4.05E-05
225	106-44-5	p-Cresol	HAP	1.03	0.11
226	1114-71-2	Pebulate	-	1	0.0885
227	40487-42-1	Pendimethalin	-	1.19	9.4E-06
228	76-01-7	Pentachloroethane	-	1.67	4.4
229	82-68-8	Pentachloronitrobenzene	HAP	1.41	9.91E-05
230	87-86-5	Pentachlorophenol	HAP	1.98	0.00011
231	109-66-0	Pentane	-	0.6262	426
232	79-21-0	PERACETIC ACID	-	1.226	11.79906
233	85-01-8	Phenanthrene	-	1.18	0.0002
234	108-95-2	Phenol	HAP	1.07	0.35
235	108-98-5	Phenyl Mercaptan	-	1.073	1
236	75-44-5	Phosgene	HAP	--	1390
237	7803-51-2	Phosphine	HAP	0.00138	2000
238	7723-14-0	PHOSPHORUS	HAP	1.823	0
239	85-44-9	Phthalic anhydride	HAP	1.53	0.000517
240	57-64-7	Physostigmine salicylate	-	1	12
241	88-89-1	Picric acid	-	1.783	1
242	100-02-7	p-Nitrophenol	HAP	1.4	0.000073
243	**N590**	POLYCYCLIC AROMATIC COMPOUNDS	-	1.351	5.9E-09
244	106-50-3	p-Phenylenediamine	HAP	--	0.0046
245	107-12-0	Propionitrile	-	1.15	40
246	114-26-1	Propoxur	HAP	1.15	1.92E-05
247	109-60-4	Propyl Acetate	-	0.89	67.21
248	71-23-8	Propyl alcohol	-	0.8037	44.98
249	111-43-3	Propyl ether	-	0.97	62.5
250	107-03-9	Propyl Mercaptan	-	1	155
251	57-55-6	Propylene Glycol	-	1.04	0.129
252	75-56-9	Propylene Oxide	HAP	0.83	445
253	106-42-3	p-Xylene	HAP	0.86	10
254	110-86-1	Pyridine	-	0.98	20
255	91-22-5	Quinoline	HAP	1.02	1
256	106-51-4	Quinone	HAP	1.318	0.1
257	94-59-7	Safrole	-	1	0.0618
258	626-38-0	Sec-Amyl Acetate	-	1	6.975574
259	78-92-2	sec-Butyl alcohol	-	0.805	14.38513
260	100-42-5	Styrene	HAP	0.9	9.5
261	75-65-0	tert-Butyl alcohol	-	0.7887	33.22366
262	127-18-4	Tetrachloroethylene	HAP	1.613	15.85929
263	7550-45-0	Titanium tetrachloride	HAP	1	10
264	108-88-3	Toluene	HAP	0.87	40
265	584-84-9	Toluene-2,6-diisocyanate	HAP	1.219	1
266	8001-35-2	Toxaphene	HAP	1.65	0.000006
267	156-60-5	trans-1,2-Dichloroethylene	-	1.41	331
268	10061-02-6	trans-1,3-Dichloropropylene	-	1.2	43
269	79-01-6	Trichloroethylene	HAP	1.4	77
270	121-44-8	Triethylamine	HAP	0.7326	57.07
271	54272-29-6	TRIETHYLAMMONIUM SULFATE	-	--	0
272	1582-09-8	TRIFLURALIN	HAP	--	4.58E-05
273	126-73-8	Tri-n-butyl phosphate	-	0.973	0.004
274	126-72-7	tris-(2,3-Dibromopropyl) phosphate	-	1.41	693
275	51-79-6	Urethane	HAP	1.1	0.262
276	109-52-4	Valeric Acid	-	0.939	1
277	1929-77-7	Vernolate	-	1	0.5196
278	108-05-4	Vinyl Acetate	HAP	0.93	140
279	75-01-4	Vinyl Chloride	HAP	0.91	3877.5
280	75-35-4	Vinylidene chloride	HAP	1.213	630
281	1330-20-7	Xylene	HAP	1.02	10

Chemical Properties (continued) and Exterior Pans

	Molecular Weight, MW (g/gmol)	Diffusivity in air, Da (cm²/s)	Antoine's Coefficients a	Column6 b	Column7 c	Average Annual Concentration (Cw) (ppm)	Equation 2-16 Exterior T_{corr}	Equation 2-15 Exterior K_{eq} (g/cm³ / g/cm³)	Equation 2-18 Exterior D_{eff} (cm²/s)	Equation 2-19 Exterior K_v (s⁻¹)	Equation 2-21 Exterior $f_{emitted}$	Equation 2-37 Exterior Emission Flux (g/m²-s)	Emissions Calculation Exterior Pan Emission Rate (tpy)
144	120.2	0.0638	--	--	--	-	1.00E+00	5.58E-06	2.31E-03	9.64E-12	2.10E-04	0.00E+00	0.00E+00
145	202	0.0251	6.373	1756	118	-	4.21E-02	7.88E-13	9.10E-04	5.36E-19	4.96E-08	0.00E+00	0.00E+00
146	30	0.178	7.2	971	244	173.25	6.25E-01	1.77E-05	6.46E-03	8.53E-11	6.25E-04	2.02E-05	3.65E-02
147	46.03	0.079	7.581	1699.2	260.7	-	4.83E-01	9.42E-06	2.87E-03	2.02E-11	3.04E-04	0.00E+00	0.00E+00
148	68.08	0.1048	0	0	0	-	1.00E+00	3.58E-04	3.80E-03	1.02E-09	2.16E-03	0.00E+00	0.00E+00
149	100.1	0.0772	0	0	0	-	1.00E+00	2.89E-06	2.80E-03	6.04E-12	1.66E-04	0.00E+00	0.00E+00
150	76.09	0.0887	0	0	0	1,406.64	1.00E+00	4.60E-06	3.22E-03	1.11E-11	2.25E-04	5.90E-05	1.07E-01
151	57.1	0.11865	--	--	--	-	1.00E+00	4.32E-07	4.30E-03	1.39E-12	7.98E-05	0.00E+00	0.00E+00
152	0	0.001	--	--	--	0.02	1.00E+00	0.00E+00	3.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
153	373.35	0.0223	--	--	--	0.02	1.00E+00	1.51E-09	8.09E-04	9.10E-16	2.04E-06	8.16E-12	1.48E-08
154	100.21	0.0926	6.89385	1264.37	216.636	-	4.66E-01	1.76E-05	3.36E-03	4.43E-11	4.51E-04	0.00E+00	0.00E+00

Interior Pans and Totals

	Equation 2-16 Interior T_{corr}	Equation 2-15 Interior K_{eq} (g/cm³ / g/cm³)	Equation 2-18 Interior D_{eff} (cm²/s)	Equation 2-19 Interior K_v (s⁻¹)	Equation 2-21 Interior $f_{emitted}$	Equation 2-37 Interior Emission Flux (g/m²-s)	Emissions Calculation Interior Pan Emission Rate (tpy)	Emissions Calculation Interior Pan Emission Rate, Annual Avg (lb/hr)	Total Emissions (tpy)	Idaho 586 TAP? (Yes/No)	Screening Emissions Level (EL), lb/hr, Annual Avg (lb/hr)	Annual Modeling Required? (Yes/No)	T-RACT AACC (ug/m3)	50-34VOC Modeled Ambient Impact (ug/m3) 2.79	50-34VOC Complies? Impact < T-RACT AACC? (Yes/No)
144	1.00E+00	5.58E-06	2.31E-03	2.46E-12	1.06E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
145	4.21E-02	7.88E-13	9.10E-04	1.37E-19	2.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No					
146	6.25E-01	1.77E-05	6.46E-03	2.18E-11	3.16E-04	7.79E-06	1.51E-02	3.45E-03	5.16E-02	Yes	5.1E-04	Yes	0.77	0.0096188	Yes
147	4.83E-01	9.42E-06	2.87E-03	5.15E-12	1.54E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
148	1.00E+00	3.58E-04	3.80E-03	2.60E-10	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
149	1.00E+00	2.89E-06	2.80E-03	1.54E-12	8.41E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
150	1.00E+00	4.60E-06	3.22E-03	2.83E-12	1.14E-04	2.28E-05	4.42E-02	1.01E-02	1.51E-01	No	---				
151	1.00E+00	4.32E-07	4.30E-03	3.55E-13	4.03E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
152	1.00E+00	0.00E+00	3.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				
153	1.00E+00	1.51E-09	8.09E-04	2.32E-16	1.03E-06	3.15E-12	6.10E-09	1.39E-09	2.09E-08	Yes	5.1E-06	No	0.0077	3.887E-09	Yes
154	4.66E-01	1.76E-05	3.36E-03	1.13E-11	2.28E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---				

	Total VOC (tpy)	13.81
	Total HAP (tpy)	13.51

	Factor to Increase [ ] to "Z" ppm (1500)	Annual Emission Rate @ "Z" ppm (lb/hr)	50-34VOC Modeled Ambient Impact (ug/m3) 2.79	586 TAP?	50-34VOC Complies? Impact < AACC? (Yes/No)
144		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
145		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
146		8.66E+00	2.98E-02	8.33E-02	Yes	Yes
147		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
148		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
149		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
150		1.07E+00	1.07E-02	3.00E-02	Not 586 TAP	---
151		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
152		6.07E+04	0.00E+00	0.00E+00	Not 586 TAP	---
153		7.00E+04	9.75E-05	2.72E-04	Yes	Yes
154		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
155		1.06E+05	1.37E-03	3.83E-03	Yes	Yes
156		2.16E+06	7.24E-06	2.02E-05	Yes	Yes
157		1.11E+05	6.55E-04	1.83E-03	Not 586 TAP	---
158		1.50E+03	3.06E-04	8.54E-04	Yes	Yes
159		2.95E+01	6.17E-02	1.72E-01	Not 586 TAP	---
160	18	1.32E+03	1.18E-03	3.30E-03	Yes	Yes
161		2.84E-01	1.04E-01	2.90E-01	Not 586 TAP	---
162		1.44E-01	7.35E-02	2.05E-01	Not 586 TAP	---
163		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
164		6.11E+00	3.33E-03	9.29E-03	Not 586 TAP	---
165		1.50E+03	6.87E-02	1.92E-01	Not 586 TAP	---
166		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
167		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
168		8.63E+01	7.62E-03	2.13E-02	Not 586 TAP	---
169		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
170		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
171		8.63E+01	5.07E-03	1.41E-02	Not 586 TAP	---
172		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
173		4.86E+02	1.63E-02	4.54E-02	Not 586 TAP	---
174		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
175		5.26E+03	3.10E-05	8.64E-05	Yes	Yes
176		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
177		3.36E+03	2.58E-03	7.19E-03	Not 586 TAP	---
178		4.06E+04	4.96E-04	1.38E-03	Not 586 TAP	---
179		1.11E+05	5.02E-03	1.40E-02	Not 586 TAP	---
180		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
181		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
182		2.99E+01	2.48E-02	6.92E-02	Not 586 TAP	---
183		5.26E+03	6.74E-06	1.88E-05	Not 586 TAP	---
184		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
185		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
186		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
187		6.76E+03	6.64E-03	1.85E-02	Not 586 TAP	---
188		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
189		3.11E+01	2.85E-02	7.96E-02	Not 586 TAP	---
190	1400	1.40E+03	1.14E-02	3.18E-02	Yes	Yes
191		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
192		4.29E+04	1.97E-02	5.48E-02	Not 586 TAP	---
193		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
194		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
195		9.58E+07	6.41E-02	1.79E-01	Not 586 TAP	---
196		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
197		1.50E+03	1.32E-05	3.69E-05	Yes	Yes
198		6.52E+04	9.31E-03	2.60E-02	Not 586 TAP	---
199		4.74E+03	5.32E-03	1.48E-02	Not 586 TAP	---
200		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
201		3.81E+02	5.91E-04	1.65E-03	Yes	Yes
202		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
203		2.16E+06	2.83E-03	7.90E-03	Not 586 TAP	---
204		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
205		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
206		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
207	27	2.70E+01	7.98E-05	2.23E-04	Yes	Yes
208	49	6.23E+03	2.52E-04	7.02E-04	Yes	Yes
209		1.50E+03	9.67E-04	2.70E-03	Yes	Yes
210		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
211		1.50E+03	1.39E-03	3.88E-03	Not 586 TAP	---
212		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
213		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
214		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
215		1.50E+03	1.12E-03	3.14E-03	Not 586 TAP	---
216		2.21E+04	2.34E-03	6.54E-03	Not 586 TAP	---
217		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
218		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
219		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
220		1.50E+03	1.35E-03	3.76E-03	Not 586 TAP	---
272		5.26E+03	6.62E-06	1.85E-05	Not 586 TAP	---
273		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
274		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
275		1.60E+02	2.58E-04	7.20E-04	Not 586 TAP	---
276		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
277		5.00E+02	0.00E+00	0.00E+00	Not 586 TAP	---
278		2.61E+01	3.77E-02	1.05E-01	Not 586 TAP	---
279		1.59E+05	2.17E-01	6.05E-01	Yes	Yes
280	1100	1.10E+03	6.93E-02	1.93E-01	Yes	Yes
281		1.29E+01	9.91E-03	2.77E-02	Not 586 TAP	---

CAS No.	Pollutant	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)
302-01-2	Hydrazine	9,936	4.97
60-34-4	Methyl Hydrazine	772,800	386.40
55-18-5	N-Nitrosodiethylamine	14,904	7.45
62-75-9	N-Nitrosodimethylamine	27,048	13.52
75-35-4	Vinylidene chloride	607,200	303.60

Total HAP VOCs @1500 ppm 14.83311887

Reduced Throughput, Outdoor Treatment Pits Total VOC (tpy)	9.77		
Reduced Throughput, Outdoor Treatment Pits Total HAP (tpy)	9.56		
Max, any HAP (tpy)	5.42	Hydrogen Fluoride	

New SB Treatment Pits Total VOC (tpy)	4.04		
New SB Treatment Pits Total HAP (tpy)	3.95		
Max, any HAP (tpy)	2.24	Hydrogen Fluoride	7.66
Former SB Treatment Pits Total VOC (tpy)	38.43		
Former SB Treatment Pits Total HAP (tpy)	37.62		

Maximum Volatile TAP emissions at 1,500 ppmw= 0.22 lb/hr
1898.281 lb/yr

Minimum Volatile TAP emissions at 1,500 ppmw= 7.67E-08 lb/hr
6.72E-04 lb/yr

All of the equations used to determine VOC emissions from waste piles were taken from the US EPA's Industrial Waste Air Model (IWAIR) Technical Background Document (EPA 530-R-02-010, February 2002), Section 2.0 (Source Emission Estimates Using CHEMDAT8). These equations begin to be used in Column L.

https://www.epa.gov/sites/production/files/2016-03/documents/iwair_technical_background.pdf

Equation 2-16

$$T_{corr} = 10^{\left(VP_b \times \left(\frac{-1}{VP_c + T - 273.15} + \frac{1}{VP_c + 25}\right)\right)}$$

Where:
VP_b = Antoine's vapor pressure constant B for the constituent
VP_c = Antoine's vapor pressure constant C for the constituent
T = Temperature of the system (K)

Note: If the Antoine's vapor pressure constants were unavailable for a constiuent, then a conservative value of 1 was used

Equation 2-15

$$K_{eq} = \frac{T_{corr} \times P_{vap} \times MW_{waste} \times \varepsilon_a}{R \times T \times L}$$

Where:
K_{eq} = vapor/liquid equilibrium coefficient
T_{corr} = temperature correction factor for vapor pressure for constiuent
P_{vap} = pure component vapor pressure for constituent at 25 C (atm)
MW_{waste} = average molecular weight of the waste (g/mol)
ε_a = air-filled porosity (cm³/cm³)
R = Universal gas constant
T = Temperature of the system (K)

L = waste loading rate (g/cm³)

Equation 2-18

$$D_{eff} = D_a \frac{\varepsilon_a^{3.33} \times T_{C,gas}}{\varepsilon_t^2}$$

Where:
D_{eff} = effective diffusivity (cm²/s)
D_a = diffusivity of the constiuent in air (cm²/s)
$T_{C,gas}$ = temperature correction factor for gas diffusivity (T
T = temperature of the system (K)
d_{wmu} = characteristic depth (cm)
ε_a = air-filled porosity (cm³/cm³)
ε_t = total porosity (cm³/cm³)

Equation 2-19

$$K_v = \frac{K_{eq} \times D_{eff}}{d_{wmu}^2}$$

Where:
K_v = volatilization rate of the compound (1/s)
K_{eq} = vapor/liquid equilibrium coefficient
D_{eff} = effective diffusivity (cm²/s)
d_{wmu} = characteristic depth (cm)

Equation 2-21

$$f_{emitted} = 2\left(\frac{K_v \times t}{\pi}\right)^{0.5}\left[1 - \frac{t \times b_{soil}}{3}\right]$$

Where:
$F_{emitted}$ = Fraction of the VOCs emitted during the time period
K_v = volatilization rate of the compound (1/s)
b_{soil} = biological destruction rate in the soil (1/s)
t = residence time (s) = 3,600

Equation 2-37

$$E = \frac{M_{annual} \times C_{waste} \times f_{emitted}}{A \times 365.25 \times 24 \times 3600}$$

Where:
E = Mass Flux Rate (g/m² s)
M_{annual} = Total initial mass that is in the pile during the year (Mg)
C_{waste} = Mixing Ratio of the pollutant in the waste (g/Mg or ppmm)
$f_{emitted}$ = Fraction of the VOCs emitted during the time period
A = Cross-sectional area of the pile/pan (m²)

TPY = Mass Flux Rate (g/m2-s) x Pan Area (m2) x 8760 hr/yr x 3600 s/hr x (lb/453.6 g) x (ton/2000 lb)

Using annualized lb/hr emission rates is appropriate for 24-hr compliance because:

Daily treatment mass at annual throughput = 756.16 T/day x 2 / 20% = 7,562 T/day

Each tank is roughly 12 ft deep. Avg depth of wastes = 2.375 ft 1.98E-01 Emission calculation treats all wastes as being in the top one-fifth of the tank where volatiles can be more easily released compared to wastes located deeper in the tanks. Actual emissions are likely about 20% of the calculated rate.

Modeling for volatile TAPs presumed 1 lb/hr from baghouses and 1 lb/hr from doors (2 lbs/hr). The dispersion coefficient was used as if it were based on only 1 lb/hr emissions.

Use this table ONLY for 2020 24-hr VOC emissions from the new SB

Exterior Pans =		TPY
Interior Pans =		TPY

MODELED EMISSION RATES:
If Total TAP VOC Emitted = 1.0 lb/hr Curtain Capture Efficiency = 95 %, with baghouse operating
VOCBH24 = 0.950 lb/hr VOCFUG24 = 0.050 lb/hr

COMPLY at "Z" ppm Concentration?

CAS	Compound	HAP?	Density (g/cm³)	Vapor Pressure (mm Hg)	Molecular Weight, MW (g/gmol)	Diffusivity in air, Da (cm²/s)	Antoine's Coefficients a	Column6 b	Column7 c	Average Annual Concentration (Cw) (ppm)
630-20-6	1.1.1.2-Tetrachloroethane	-	1.5532	12	167.85	0.071	6.89	1350	192	-
460-73-1	1.1.1.3.3- Pentafluoropropane	-	1.404	17.8	134.05	0.18	0	0	0	-
71-55-6	1.1.1-Trichloroethane	HAP	1.33	123	133.4	0.078	0	0	0	1.61
79-34-5	1.1.2.2-Tetrachloroethane	HAP	1.59	4.62	168	0.071	6.89	1350	192	-
76-13-1	1.1.2-Trichloro-1.2.2-trifluoroethane	-	1.58	300	187.38	0.078	8.78	1890	273	-
79-00-5	1.1.2-Trichloroethane	HAP	1.3	23	133.4	0.078	7.19	1480	229	9.29E-08
75-34-3	1.1-Dichloroethane	HAP	1.17	591	98.96	0.0742	6.9853	1171.42	228.13	1.08E-03
106-88-7	1.2 Butylene Oxide	HAP	0.8297	170	72.1	0.106764433	0	0	0	0.64
120-82-1	1.2.4-Trichlorobenzene	HAP	1.41	0.18	181.5	0.03	7.71	2240	253	1.43E-03
95-63-6	1.2.4-Trimethylbenzene	-	0.876	2.1	120.2	0.0606	7.04383	1573.267	208.564	-
107-15-3	1.2-diaminoethane	-	0.9	9.7508	60.1	0.117357875	0	0	0	1.00
96-12-8	1.2-Dibromo-3-chloropropane	HAP	1.41	0.8	236.36	0.0268	8.07	2440	273	-
95-50-1	1.2-Dichlorobenzene	-	1.31	1.5	147	0.069	6.882553	1537.672	205.2496	0.01
107-06-2	1.2-Dichloroethane	HAP	1.26	60	98.96	0.104	0	0	0	6.12E-04
540-59-0	1.2-Dichloroethylene	-	1.28	200	96.95	0.0883	7.0223	1205.4	230.6	30.92
78-87-5	1.2-Dichloropropane	HAP	1.156	40	112.99	0.0782	6.98	1380	223	1.71E-07
108-67-8	1.3.5 Trimethylbenzene	-	0	2.4	120.2	0.0602	0	0	0	-
106-99-0	1.3-butadiene	HAP	0.76	2100	54.09	0.18	7.216854	1144.753	269.0367	-
542-75-6	1.3-Dichloropropylene	HAP	1.217	34.4	110.97	0.0857	7.46133	1528.42	226.179	-
106-46-7	1.4-Dichlorobenzene	HAP	1.29	0.6	147	0.069	7.2	1690	218	0.01
90-12-0	1-Methylnaphthalene	-	0	0.0539	142.19	0.0527	0	0	0	-
540-84-1	2.2.4 Trimethylpentane	HAP	0	40.6	114.22	0.0733	0	0	0	1.00
95-95-4	2.4.5-Trichlorophenol	HAP	1.18	1	197.46	0.0291	--	--	--	0.30
88-06-2	2.4.6-Trichlorophenol	HAP	1	0.0073	197.46	0.0261	--	--	--	0.01
94-75-7	2.4-D	-	0.9723	0.133	121.182	0.063496901	0	0	0	0.29
95-80-7	2.4-Diaminotoluene	HAP	1.11	0.00159	122	0.001	7.4922	2164.173	185.3	-
120-83-2	2.4-Dichlorophenol	-	1.41	0.12	163.01	0.0489	7.497876	1890.059	199.3596	-
105-67-9	2.4-Dimethylphenol	-	1.04	0.102	122.16	0.0643	--	--	--	-
51-28-5	2.4-Dinitrophenol	HAP	1.68	0.000611	184.12	0.0273	8.21	3406	273	-
121-14-2	2.4-Dinitrotoluene	HAP	1.31	0.0002	182.14	0.203	7.98	3070	280	0.04
87-65-0	2.6-Dichlorophenol	-	1.41	0.034	163	0.0489	6.899838	1677.797	197.4596	-
576-26-1	2.6-Dimethylphenol	-	0	0.171	122.8	0.001	--	--	--	-
53-96-3	2-Acetylaminofluorene	HAP	1.02	0.0012	223.27	0.0238	7.25633	2110.188	182.2596	-
111-76-2	2-butoxyethanol	-	0	1.0336	118.15	0.0656	0	0	0	1.00
110-75-8	2-Chloroethyl vinyl ether	-	1.41	24.7	106.55	0.0844	--	--	--	-
95-57-8	2-Chlorophenol	-	1.26	2.53	128.6	0.066	6.88	1470	193	1.00
109-86-4	2-Methoxyethanol	-	0.965	10	76.11	0.0951	0	0	273	1.00
88-85-7	2-sec-Butyl-4.6-dinitrophenol/Dinoseb	-	1.18	0.000075	240.24	0.0245	--	--	--	-
107-05-1	3-Chloropropylene	HAP	0.94	368	76.53	0.1165	7.58	1490	273	-
101-77-9	4.4'-Methylenedianiline	HAP	1.0765	2.03E-07	192.268	0.026998813	0	0	0	3.22
534-52-1	4.6-Dinitro-o-cresol	-	1.15	0.00011	198	0.0276	--	--	--	1.00
99-55-8	5-Nitro-o-toluidine	HAP	1.15	0.076014	152.17	0.0503	--	--	--	-
30560-19-1	Acephate	-	1.35	1.7E-06	183.169	0.027754876	0	0	0	-
75-07-0	Acetaldehyde	HAP	0.788	902	44.06	0.124	8.01	1600	292	1.78
60-35-5	Acetamide	HAP	1.16	0.009751	59.07	0.125268618	0	0	0	1.00
64-19-7	Acetic Acid	-	1.05	15.4	60.05	0.113	0	0	0	1.00
67-64-1	Acetone	-	0.79	232	58.08	0.124	7.12	1210	230	47.15
75-86-5	Acetone Cyanohydrin	-	0.932	0.8	85.1	0.0859	--	--	--	-
75-05-8	Acetonitrile	HAP	0.78	73	41.05	0.128	7.12	1310	230	0.39
98-86-2	Acetophenone	HAP	1.0266	1	120.15	0.06	7.385889	1891.5	217.885	0.19
107-02-8	Acrolein	HAP	0.84	244	56.1	0.105	7.21	1300	247	1.00
79-06-1	Acrylamide	HAP	1.12	0.007	71.08	0.097	11.3	3940	273	3.82
79-10-7	Acrylic acid	HAP	0.97	3.97	72.07	0.098	5.65	649	155	7.03
107-13-1	Acrylonitrile	HAP	0.81	109	53.06	0.122	7.11	1340	238	0.51
111-69-3	Adiponitrile	-	0.97	0.00068	108.14	0.071513317	0	0	0	-
7664-41-7	Ammonia	-	0.6818	400	17.03	0.259	7.55466	1002.711	247.885	1.00
62-53-3	Aniline	HAP	1.02	0.4902	93.1	0.07	6.95	1470	177	56.39
120-12-7	Anthracene	-	1.25	1	178.23	0.0385	8.91	3761	273.16	-
98-87-3	Benzal chloride	-	1.26	0.47	161.03	0.0476	--	--	--	-
71-43-2	Benzene	HAP	0.874	95	78.11	0.0895	6.91	1210	221	65.88
191-24-2	Benzo(g.h.i)perylene	-	1.02	1E-10	276.34	0.022	--	--	--	-
62-23-7	BENZOIC ACID. 4-NITRO	-	1.58	0	167.1189	0.001	--	--	--	0.38
100-44-7	Benzyl Chloride	HAP	1.1	1	126.58	0.0716	7.195	1731.66	221.989	-
92-52-4	Biphenyl	HAP	1.18	0.0205	154.2	0.0404	7.2454	1998.72	202.74	1.00
92-54-4	1-Phenylpiperazine	-	1.18	0.0205	154.2	0.0404	7.2454	1998.72	202.74	-
111-91-1	bis(2-Chloroethoxy)methane	-	1.41	0.25032	173.1	0.043588	--	--	--	-
111-44-4	bis(2-Chloroethyl)ether	HAP	1.22	1.55	143.01	0.0413	7.6924	1990.8	235.347	0.01
39638-32-9	bis(2-Chloroisopropyl)ether	-	1.41	1.10688	171.066	0.0445	--	--	--	-
75-27-4	Bromodichloromethane	-	1.97	59.2	163.8	0.0561	7.97	1850	273	4.38E-08
75-25-2	Bromoform	HAP	2.89	5.4	252.77	0.0149	7.99	2160	273	5.62E-04
74-83-9	Bromomethane	HAP	1.41	1590	94.95	0.0728	7.57	1300	273	0.29
141-32-2	Butyl Acrylate	-	0.8986	10	128.17	0.0569	--	--	--	1.00
71-36-3	Butyl Alcohol	-	0.81	15.51	74.12	0.08	7.4768	1362.39	178.77	93.01
2426-08-6	Butyl Glycidyl Ether	-	0.945	3.2	130.18	0.18	0	0	0	1.00
109-79-5	Butyl Mercaptan	-	1.26	45.5	90.2	0.0932	6.93324	1281.018	218.16	1.00
123-72-8	Butyraldehyde	-	0.802	91.5	72.11	0.0915	7.0212	1233	223.01	-
107-92-6	Butyric Acid	-	0.958	0.43	88.11	0.00001092	--	--	--	-
109-74-0	Butyronitrile	-	0.791	20.68	69.1	0.093375	7.0396	1390.7	217	-
133-06-2	Captan	HAP	1.74	9E-08	300.57	0.001	--	--	--	6.43
63-25-2	Carbaryl	HAP	1.232	1.36E-06	201.22	0.0274	--	--	--	0.10
75-15-0	Carbon disulfide	HAP	1.26	366	76.1	0.104	6.94	1170	242	1.04E-03
56-23-5	Carbon Tetrachloride	HAP	1.59	91	153.82	0.078	6.93	1240	230	0.13
55285-14-8	Carbosulfan	-	1	12	397.544	0.0173	--	--	--	-
120-80-9	Catechol	HAP	1.34	0.03025	110.12	0.001	--	--	--	0.54
57-74-9	Chlordane	HAP	1.11	9.7E-06	409.76	0.0179	--	--	--	0.29
7782-50-5	Chlorine	HAP	1	7600	70.91	0.1018	0	0	0	0.92
79-11-8	Chloroacetic Acid	HAP	1.58	0.165	94.49	0.091586129	7.52923	1710.99	178.731	7.51
108-90-7	Chlorobenzene	HAP	1.11	8.8	112.56	0.073	6.98	1430	218	3.11E-03
510-15-6	Chlorobenzilate	HAP	1.41	6.2E-06	325.19	0.0227	--	--	--	1.00
124-48-1	Chlorodibromomethane	-	2.451	15	208.29	0.0366	8.22	2100	273	-
75-00-3	Chloroethane	HAP	1.41	1200	64.51	0.271	6.94	1012.78	236.68	1.59E-05
67-66-3	Chloroform	HAP	1.49	100	119.39	0.104	6.49	929	196	0.28
74-87-3	Chloromethane	HAP	0.95	3672	50.49	0.126	7.09	949	249	0.01
126-99-8	Chloroprene	HAP	0.958	118	88.54	0.104	6.16	783	180	1.00
156-59-2	cis-1.2-Dichloroethylene	-	1.28	200	96.95	0.18	7.0223	1205.4	230.6	-
10061-01-5	cis-1.3-Dichloropropylene	-	1.2	43	111	0.0626	6.81	1330	230	-
1319-77-3	Cresol	HAP	1.03	0.88	108.14	0.0728	8.85	2790	273	0.16
98-82-8	Cumene	HAP	0.86	25.85	120.19	0.065	6.96	1460	208	1.26
592-01-8	Cyanide Compounds	HAP	1.15	308	41.05	0.15574	--	--	--	1.00
110-82-7	Cyclohexane	-	0.78	100	84.16	0.0839	6.8413	1201.531	222.647	1.00
108-94-1	Cyclohexanone	-	0.95	4.8	98.2	0.0784	6.97851	1495.58	209.559	1.00
110-83-8	Cyclohexene	-	0.811	67	82.2	0.0832	6.8724	1221.9	223.18	1.00
287-92-3	Cyclopentane	-	1	400	70.1	0.10252	6.88676	1124.162	231.361	1.00
5989-27-5	d- Limonene	-	0.841	1.425117	136.24	0.058849395	0	0	0	-
117-81-7	Di(2-ethylhexyl) phthalate	HAP	0.981	1.54E-09	390.563	0.035559818	0	0	0	11.13
333-41-5	Diazinon	-	1.1088	0.000102	304.351	0.041992376	0	0	0	1.00
132-64-9	Dibenzofuran	HAP	--	0.00248	222.3	0.001	--	--	--	25.55
74-95-3	Dibromomethane	-	1.41	44.4	173.85	0.043	--	--	--	1.39E-07
84-74-2	Dibutyl phthalate	HAP	1.043	8.54E-06	278.348	0.0423	0	0	0	1.75
75-09-2	Dichloromethane	HAP	1.34	440	84.93	0.101	6.97	1070	223	44.58
34077-87-7	Dichlorotrifluoroethane	-	1	813	152.93	0.0468	--	--	--	-
77-73-6	Dicyclopentadiene	-	0.93	10	132.22	0.0557	--	--	--	1.00
111-42-2	Diethanolamine	HAP	1.0881	0.01	105.14	0.076449	--	--	--	1,472.10
64-67-5	Diethyl sulfate	HAP	1.172	0.206424	154.187	0.0656	0	0	0	-
100-37-8	Diethylaminoethanol	-	1	21	117.19	0.0661	--	--	--	1.00
108-83-8	Diisobutyl Ketone	-	1	2.4	142.27	0.0522	--	--	--	1.00
27215-10-7	Di-iso-octyl acid phosphate	-	0.983	2.75E-07	322.48	0.040403446	0	0	0	-
121-69-7	Dimethyl Aniline	HAP	0.956	0.52	121.1797	0.153	7.72649	2110.009	424.88	1.00
131-11-3	Dimethyl phthalate	HAP	1.19	0.00308	194.2	0.0568	7.72649	2110.009	424.88	17.27
89396-94-1	Dinitrobutyl phenol	-	1.265	1	240.16	0.006707431	0	0	0	-
25321-14-6	Dinitrotoluene (mixed isomers)	-	1.32	0.00001	181.2	0.001	7.98109	3074.44	280.23	-
621-64-7	Di-n-propylnitrosamine	-	1.15	0.080575	130.19	0.0624	--	--	--	-
123-91-1	Dioxane	HAP	1.03	29	88	0.229	7.35	1520	238	1.38
138-86-3	Dipentene	-	0.834	1.541	136.234	0.18	0	0	0	-
122-39-4	Diphenylamine (difficult to distinguish from diphenylnitrosamine)	-	1.16	0.000806	169.2	0.058	--	--	--	1.00
142-84-7	Dipropylamine	-	0.738	20.1	101.19	0.0667	--	--	--	-
106-89-8	Epichlorohydrin	HAP	1.1812	13	92.52	0.0906	7.07829	1408.87	217.147	26.84
64-17-5	Ethanol	-	0.79	50	46.07	0.123	--	--	--	289.43
141-43-5	Ethanolamine	-	1.02	0.404	61.09	0.107	0	0	0	1.00
141-78-6	Ethyl acetate	-	0.9	100	88.11	0.0732	7.101	1244.95	217.88	2.27
140-88-5	Ethyl Acrylate	HAP	0.92	40	100.1158	0.077	7.964455	1897.011	273.16	1.67
60-29-7	Ethyl ether	-	0.7134	760	74.12	0.0782	--	--	--	1.00
75-08-1	Ethyl Mercaptan	-	1	442	62.1	0.1111	6.95206	1084.531	231.39	1.00
97-63-2	Ethyl methacrylate	-	0.9135	20.6	114.14	0.0653	--	--	--	0.29
352-93-2	Ethyl Sulfide	-	0.837	502	90.188	0.078087	--	--	--	-
100-41-4	Ethylbenzene	HAP	0.87	9.53	106.165	0.075	6.98	1420	213	30.19
74-85-1	Ethylene	-	0.76	45.0037	28.05	0.17414	6.74756	585	255	-
106-93-4	Ethylene Dibromide	HAP	1.41	11	187.861	0.043	7.34	1680	245	-
107-21-1	Ethylene Glycol	HAP	1.1153	0.06	62.0678	0.108	8.09	2090	204	6,865.58
628-96-6	Ethylene Glycol Dinitrate	-	1	0.05	152.063	0.0472	--	--	--	1.00
75-21-8	Ethylene oxide	HAP	0.87	1310	44	0.104	7.13	1050	238	20.61
96-45-7	Ethylene thiourea	HAP	1.15	2.02E-06	102.6	0.0802	--	--	--	6.01
75-34-3	Ethylidene Dichloride	HAP	1.168	193.7641	98.9588	0.0922	0	0	0	1.08E-03
16219-75-3	Ethylidene-2-norbornene	-	1	4.6	120.2	0.0638	--	--	--	1.00

CAS No.	Pollutant	Pollutant Treatment Limit (lb/day)	Pollutant Treatment Limit (T/day)	AAC (mg/m3)
95-95-4	2,4,5-Trichlorophenol	23,040	11.52	0.0016
60-35-5	Acetamide	40,320	20.16	0.0003
107-02-8	Acrolein	15,840	7.92	0.0125
7782-50-5	Chlorine	23,040	11.52	0.1500
75-08-1	Ethyl Mercaptan	43,200	21.60	0.0500

CAS	Compound	HAP?	Density (g/cm³)	Vapor Pressure (mm Hg)	Molecular Weight, MW (g/gmol)	Diffusivity in air, Da (cm²/s)	Antoine's Coefficients a	Column6 b	Column7 c	Average Annual Concentration (Cw) (ppm)	Exterior Pans: Equation 2-16 Exterior T_{corr} (--)	Equation 2-15 Exterior K_{eq} (g/cm³ / g/cm³)	Equation 2-18 Exterior D_{eff} (cm²/s)	Equation 2-19 Exterior K_v (s⁻¹)	Equation 2-21 Exterior $f_{emitted}$ (--)	Equation 2-37 Exterior Emission Flux (g/m²-s)	Emissions Calculation Exterior Pan Emission Rate (tpy)	Interior Pans: Equation 2-16 Interior T_{corr} (--)	Equation 2-15 Interior K_{eq} (g/cm³ / g/cm³)	Equation 2-18 Interior D_{eff} (cm²/s)	Equation 2-19 Interior K_v (s⁻¹)	Equation 2-21 Interior $f_{emitted}$ (--)	Equation 2-37 Interior Emission Flux (g/m²-s)	Emissions Calculation Interior Pan Emission Rate (tpy)	Emissions Calculation Interior Pan Emission Rate @8760 hr/yr (lb/hr)	Total Emissions (tpy)	Idaho 585 TAP? (Yes/No)	Screening Emissions Level (EL), 24-hr Avg (lb/hr)	24-hr Modeling Required? (Yes/No)	ACC (mg/m3)	50-34VOC Modeled Ambient Impact (mg/m3) 3.69E-02	50-34VOC Complies? Impact < AAC? (Yes/No)	Factor to Increase [ ] to "Z" ppm 10,000	24-hr Emission Rate @ "Z" ppm (lb/hr)	50-34VOC Modeled Ambient Impact (mg/m3) 3.69E-02	585 TAP?	50-34VOC Complies? Impact < AAC? (Yes/No)
206-44-0	Fluoranthene	-	1.02	9.2E-06	202	0.0251	6.373	1756	118	-	4.21E-02	7.88E-13	9.10E-04	5.36E-19	4.96E-08	0.00E+00	0.00E+00	4.21E-02	7.88E-13	9.10E-04	1.37E-19	2.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---					5.00E+02	0.00E+00	0.00E+00	Not 585 TAP	---
50-00-0	Formaldehyde	HAP	0.97	93.6	30	0.178	7.2	971	244	173.25	6.25E-01	1.77E-05	6.46E-03	8.53E-11	6.25E-04	1.42E-04	2.56E-01	6.25E-01	1.77E-05	6.46E-03	2.18E-11	3.16E-04	7.42E-05	1.44E-01	3.28E-02	4.00E-01	No	---					5.77E+01	1.89E+00	6.99E-02	Not 585 TAP	---
64-18-6	Formic acid	-	1.22	42	46.03	0.079	7.581	1699.2	260.7	1.00	4.83E-01	9.42E-06	2.87E-03	2.02E-11	3.04E-04	3.97E-07	7.19E-04	4.83E-01	9.42E-06	2.87E-03	5.15E-12	1.54E-04	2.08E-07	4.03E-04	9.21E-05	1.12E-03	Yes	0.627	No	0.47	3.40E-06	Yes	1.00E+04	9.21E-01	3.40E-02	Yes	Yes
111-0-9	Furan	-	0.935	521.2601	68.08	0.1048	0	0	0	-	1.00E+00	3.58E-04	3.80E-03	1.02E-09	2.16E-03	0.00E+00	0.00E+00	1.00E+00	3.58E-04	3.80E-03	2.60E-10	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---					5.00E+02	0.00E+00	0.00E+00	Not 585 TAP	---
111-30-8	Glutaraldehyde	-	1	2.85971	100.1	0.0772	0	0	0	1.00	1.00E+00	2.89E-06	2.80E-03	6.04E-12	1.66E-04	2.17E-07	3.93E-04	1.00E+00	2.89E-06	2.80E-03	1.54E-12	8.41E-05	1.14E-07	2.21E-04	5.04E-05	6.14E-04	Yes	0.0047	No	0.041	1.86E-06	Yes	1.00E+04	5.04E-01	1.86E-02	Yes	Yes
N230	Glycol Ethers	-	0.965	6	76.09	0.0887	0	0	0	1,406.64	1.00E+00	4.60E-06	3.22E-03	1.11E-11	2.25E-04	4.14E-04	7.49E-01	1.00E+00	4.60E-06	3.22E-03	2.83E-12	1.14E-04	2.17E-04	4.20E-01	9.60E-02	1.17E+00	YES	1.27	No	0.95	3.54E-03	Yes	7.11E+00	6.82E-01	2.52E-02	Yes	Yes
107-16-4	Glycolonitrile	-	1	0.75	57.1	0.11865	--	--	--	-	1.00E+00	4.32E-07	4.30E-03	1.39E-12	7.98E-05	0.00E+00	0.00E+00	1.00E+00	4.32E-07	4.30E-03	3.55E-13	4.03E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---					5.00E+02	0.00E+00	0.00E+00	Not 585 TAP	---
50-01-1	GUANIDINIUM CHLORIDE	-	1.354	0	0	0.001	--	--	--	0.02	1.00E+00	0.00E+00	3.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	3.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	---					4.05E+05	0.00E+00	0.00E+00	Not 585 TAP	---
76-44-8	Heptachlor	HAP	1.57	0.0004	373.35	0.0223	--	--	--	0.02	1.00E+00	1.51E-09	8.09E-04	9.10E-16	2.04E-06	5.72E-11	1.03E-07	1.00E+00	1.51E-09	8.09E-04	2.32E-16	1.03E-06	3.00E-11	5.81E-08	1.33E-08	1.62E-07	No	---					4.67E+05	6.19E-03	2.28E-04	Not 585 TAP	---
142-82-5	Heptane	-	0.68	37.49	100.21	0.0926	6.89385	1264.37	216.636	1.00	4.66E-01	1.76E-05	3.36E-03	4.43E-11	4.51E-04	5.89E-07	1.06E-03	4.66E-01	1.76E-05	3.36E-03	1.13E-11	2.28E-04	3.08E-07	5.98E-04	1.36E-04	1.66E-03	Yes	109	No	82	5.04E-06	Yes	1.00E+04	1.36E+00	5.04E-02	Yes	Yes

CAS No.	Pollutant	Pollutant Treatment Limit (lb/day)	Pollutant Treatment Limit (T/day)	AAC (mg/m3)
7664-39-3	Hydrogen Fluoride	103,680	51.84	0.1250
2.15E+06	Hydrogen Sulfide	100,800	50.40	---
75-44-5	Phosgene	5,904	2.95	0.0200
7803-51-2	Phosphine	87,840	43.92	0.0200
88-89-1	Picric acid	67,680	33.84	0.0050
584-84-9	Toluene-2,6-diisocyanate	30,240	15.12	0.0020

Maximum Volatile TAP emissions at 10,000 ppmw= 13.13 **lb/hr**
315 lb/day
57.5 T/yr

Minimum Volatile TAP emissions at 10,000 ppmw= 1.76E-05 **lb/hr**
4.23E-04 lb/day
7.72E-05 **T/yr**

	SB Processing Rate
	(tpy)
Solid Waste	276,000
Reagents	46,000

Emission Factors[1]		
Variable	PM_{10}	$PM_{2.5}$
24-hr U (mph)	18	18
Annual U (mph)	10	10
a	0.4	0.4
b	1.3	1.3
c	0.040	0.0
k	1.92	0.38

[1] Emission Factors from U.S. EPA AP-42, Section 11.12, Table 11.12-4, June 2006

$$E = k * (0.0032) * [U^a / M^b] + c$$

Where:
E = Emission rate in lb/ton of material
k = particle size multiplier
U = Wind speed at drop height (mi/hr)
M = Minimum moisture content (% by weight)
a,b,c = dimmensionless constants

Emissions Control Efficiencies		Basis	Asbestos Controls	
Watering Control Efficiency(%) [1]	70	A water spray system will be installed over each treatment pit in the new SB	90	Wetting is very effective at controlling fine, light asbestos fibers
Building Capture Efficiency (%)	5	Presumes coiling/rollup doors are all open.	5	Presumes rollup doors are open.
Hood Capture Efficiency (%)	0			
Curtain and Baghouse Flow Capture Efficiency (%)	95	Presumes lower 2 retractable sections of vinyl curtains are fully extended downward on one side of the treatment pit and BH is operating.	95	
Baghouse BH1 or BH2 Efficiency (%)	99.5		99.5	

Baghouse Emissions = Uncontrolled x (1- WS%) x (1- Bldg%) x (1-Hood%) x (Curtain-BH Flow%) x (1-BH%)
"Fugitives" = Uncontrolled x (1-WS%) x (1-Bldg%) x (1-Hood%) x (1- Curtain-BH Flow%)

MODELED EMISSION RATES:	If Total TAP PM Emitted = 1.0 lb/hr			
Noncarcinogenic TAP (24-hr standard)	PMBH24 =	0.087 lb/hr	PMFUG24 =	0.913 lb/hr
Carcinogenic TAP (Annual standard)	PMBHANN =	0.087 lb/hr	PMFUGANN =	0.913 lb/hr
			Bldg Fug, lb/hr / (Bldg Fug + BH Emissions) = 0.913	

MODELED EMISSION RATES: 0.0434 lb/hr, BH1 and BH2, each — 0.913 lb/hr divided among open doors

Speciated HAP/TAP

No.	CAS	Material	HAP?	Composition (PPM)	SB Processing Rate (tpy)	SB Processing Rate (T/hr)	Moisture (%)	$PM_{2.5}$ (lb/ton)	PM_{10} (lb/ton)	Uncontrolled Interior PM2.5 (lb/hr)	Uncontrolled Interior PM10 (lb/hr)	Uncontrolled Interior $PM_{2.5}$ (tpy)	Uncontrolled Interior PM_{10} (tpy)	Building Fugitives $PM_{2.5}$ (lb/hr)	Building Fugitives PM_{10} (lb/hr)	Building Fugitives $PM_{2.5}$ (tpy)	Building Fugitives PM_{10} (tpy)	Total Baghouse $PM_{2.5}$ (lb/hr)	Total Baghouse PM_{10} (lb/hr)	Total Baghouse $PM_{2.5}$ (tpy)	Total Baghouse PM_{10} (tpy)	Wastes Total TAPs (lb/hr, 24-hr or annual average)	Screening EL (lb/hr)	Modeling Required?	24-hr AAC (mg/m3)	50-34PM Modeled Impact (mg/m3) 0.0315	Complies? Impact < AAC? (Yes/No)	Annual T-RACT AACC (ug/m3)	50-34PM Modeled Impact (ug/m3) 2.100	Complies? Impact < AAC? (Yes/No)
		Waste Material (Annual)		-	276,000	300	4.5	4.32E-04	4.22E-02	0.1297	12.6552	5.97E-02	5.82	1.94E-04	0.0189	8.50E-04	8.30E-02	1.84E-05	1.80E-03	8.08E-05	7.88E-03									
		Waste Material (24-hr)				300	1.5	2.28E-03	5.15E-02	0.6843	15.4575			9.75E-03	0.220			9.26E-04	2.09E-02											
		Waste Material (Annual) Emissions at 125,000 ppmw		125000	34,500.00	37.50	4.5	4.32E-04	4.22E-02	0.0162	1.5819	7.46E-03	0.73			1.06E-04	1.04E-02			1.01E-05	9.85E-04									
		Waste Material (24-hr) Emissions at 125,000 ppmw		125000		37.50	1.5	2.28E-03	5.15E-02	0.0855	1.9322			1.22E-03	0.028			1.16E-04	2.62E-03											
1	1332-21-4	Asbestos (friable)	HAP	2019.05	557.26	6.06E-01	4.5	4.32E-04	4.22E-02	2.75E-05	2.68E-03	1.20E-04	1.18E-02	1.31E-07	1.27E-05	5.72E-07	5.58E-05	1.24E-08	1.21E-06	5.44E-08	5.30E-06	1.40E-05	N/A	YES	---			4.0E-05	2.93E-05	Yes
2	7440-36-0	Antimony Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09	2.41E-07	0.033	No	0.025			---		
3	7440-38-2	Arsenic Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09	2.07E-08	1.50E-06	No	---			2.3E-03		
4	7440-41-7	Beryllium Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09	2.07E-08	2.80E-05	No	---			4.2E-02		
5	7440-43-9	Cadmium Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09	2.07E-08	3.70E-06	No	---			5.6E-03		
	N090	Chromium Compounds	---	3146.52	868.44	9.44E-01																						---		
	7440-47-3	Chromium Metal, Cr (II)	HAP																									---		
6	16065-83-1	Chromium Metal, Cr (III) (Default Profile, NEI)	HAP	2013.77	555.80	6.04E-01	1.5	2.28E-03	5.15E-02	1.38E-03	3.11E-02	6.34E-04	1.43E-02	1.96E-05	4.44E-04	9.03E-06	2.04E-04	1.87E-06	4.21E-05	8.58E-07	1.94E-05	4.86E-04	0.033	See Below	0.025	See Below		---		
7	18540-29-9	Chromium VI (Default Chromium Profile, NEI)	HAP	1069.82	295.27	3.21E-01	4.5	4.32E-04	4.22E-02	1.46E-05	1.42E-03	6.38E-05	6.23E-03	2.08E-07	2.03E-05	9.09E-07	8.87E-05	1.97E-08	1.92E-06	8.64E-08	8.43E-06	2.22E-05	5.60E-07	See Below	---			8.3E-04	See Below	
8	7440-48-4	Cobalt Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09	2.41E-07	0.0033	No	0.0025			---		
9	7439-92-1	Lead Compounds	HAP	0.00	0.00	0.00E+00	4.5	5.47E-04	4.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-02		Criteria Pollutant and HAP, Not a TAP		---			---		
10	7439-96-5	Manganese Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09	2.41E-07	0.333	No	0.25			---		
11	7439-97-6	Mercury Compounds	HAP	0.00	0.00	0.00E+00	4.5	5.47E-04	4.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		See IDAPA 58.01.01.215		---			---		
12	7440-02-0	Nickel Compounds	HAP	1.00	0.28	3.00E-04	4.5	4.32E-04	4.22E-02	1.36E-08	1.33E-06	5.97E-08	5.82E-06	1.94E-10	1.89E-08	8.50E-10	8.30E-08	1.84E-11	1.80E-09	8.08E-11	7.88E-09	2.07E-08	2.70E-05	No	---			4.2E-02		
13	7782-49-2	Selenium Compounds	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09	2.41E-07	0.013	No	0.01			---		
14	7440-39-3	Barium Compounds	---	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09	2.41E-07	0.033	No	0.025			---		
15	1344-28-1	Aluminum oxide (fibrous forms)	HAP	1.00	0.28	3.00E-04	4.5	5.47E-04	4.28E-02	1.64E-07	1.28E-05	7.55E-08	5.90E-06	2.34E-09	1.83E-07	1.08E-09	8.41E-08	2.22E-10	1.74E-08	1.02E-10	7.99E-09	2.00E-07	0.667	No	0.5			---		
16	1313-27-5	Molybdenum trioxide	HAP	1.00	0.28	3.00E-04	1.5	2.28E-03	5.15E-02	6.84E-07	1.55E-05	3.15E-07	7.11E-06	9.75E-09	2.20E-07	4.49E-09	1.01E-07	9.26E-10	2.09E-08	4.26E-10	9.63E-09	2.41E-07	0.333	No	0.25			---		
17	7723-14-0	Phosphorus	HAP	60.20	16.62	1.81E-02	1.5	2.28E-03	5.15E-02	4.12E-05	9.31E-04	1.89E-05	4.28E-04	5.87E-07	1.33E-05	2.70E-07	6.10E-06	5.58E-08	1.26E-06	2.57E-08	5.79E-07	1.45E-05	0.007	No	0.005					
																Total PM HAP	3.50E-04			Total PM HAP	5.72E-02									
																Max any HAP	2.04E-04 (Asbestos)			Max any HAP	5.72E-02 (Asbestos)									

CAS	Material	HAP?	24-hr Emission Rate @ 125,000 ppmw (lb/hr)	Modeled Ambient Impact (mg/m3) (50-34PM)	AAC (mg/m3)	Percent of AAC at concentration of 125,000 ppmw in Wastes (50-34PM)	Maximum Treatment Limit (Tons of TAP treated per calendar day)	Maximum Treatment Limit (Tons of TAP treated per calendar day)
7440-36-0	Antimony Compounds	HAP	3.01E-02	9.48E-04	0.025	3.79%	23,729	7,200
16065-83-1	Profile, NEI)	HAP	7.72E-03	2.43E-04	0.025	0.97%	92,692	7,200
7440-48-4	Cobalt Compounds	HAP	3.01E-02	9.48E-04	0.0025	37.93%	2,373	2,373
7439-96-5	Manganese Compounds	HAP	3.01E-02	9.48E-04	0.25	0.38%	237,292	7,200
7782-49-2	Selenium Compounds	HAP	3.01E-02	9.48E-04	0.01	9.48%	9,492	7,200
7440-39-3	Barium Compounds	---	3.01E-02	9.48E-04	0.025	3.79%	23,729	7,200
1344-28-1	Aluminum oxide (fibrous forms)	HAP	2.50E-02	7.87E-04	0.5	0.157%	571,825	7,200
1313-27-5	Molybdenum trioxide	HAP	3.01E-02	9.48E-04	0.25	0.379%	237,292	7,200
7723-14-0	Phosphorus	HAP	3.01E-02	9.48E-04	0.005	18.96%	4,746	4,746

CAS	Material	HAP?	Annual Emission Rate @ 125,000 ppmw (lb/hr)	Modeled Ambient Impact (ug/m3) (50-34PM; 2.10)	T-RACT AACC (ug/m3) (50-34PM; ug/m3 per lb emissions)	Percent of T-RACT AACC at 125,000 ppmw in Wastes	Maximum Treatment Limit (Tons of TAP treated consecutive 12-month period)	Maximum Treatment Limit (Tons of TAP treated per consecutive 12-month period)
1332-21-4	Asbestos (friable)	HAP			4.0E-05			
7440-38-2	Arsenic Compounds	HAP			2.3E-03			
7440-41-7	Beryllium Compounds	HAP	2.59E-03	5.44E-03	4.2E-02	13%	266,168	266,168
7440-43-9	Cadmium Compounds	HAP	2.59E-03	5.44E-03	5.6E-03	97%	35,489	35,489
N090	Chromium Compounds	---			---			
7440-47-3	Chromium Metal, Cr (II)	HAP			---			
16065-83-1	Chromium Metal, Cr (III)	HAP			---			
18540-29-9	Chromium VI (Default	HAP			8.3E-04			
7440-02-0	Nickel Compounds	HAP	2.59E-03	5.44E-03	4.2E-02	13%	266,168	266,168

Max ppm	Max Pollutant Processed per Year (T/yr)	Max Emissions per Pollutant (T/yr)	# Pollutants	HAP Emissions (T/yr)
125,000	34,500	1.14E-02	13	1.48E-01
2700	745.2	8.18E-05	1	8.18E-05
50,000	13,800	4.54E-03	1	4.54E-03
50,000	13,800	3.54E-02	1	3.54E-02
Lead			1	0.0572
Mercury			1	0.01
TOTAL				2.55E-01

Mercury Emission Standard, Section 215, limits mercury emissions to < 25 lb/yr
Max mercury emissions are 20 lb/yr
Note: No mercury was reported as a received waste from 2011-2015.

2.59E-03
125,000 ppmw

Reagents

No.	CAS	Material/HAP&TAP Constituents	HAP?	Composition Weight Percent	SB Processing Rate (tpy)	SB Processing Rate (T/hr)	Moisture (%)	$PM_{2.5}$ (lb/ton)	PM_{10} (lb/ton)	Uncontrolled Interior PM2.5 (lb/hr)	Uncontrolled Interior PM10 (lb/hr)	Uncontrolled Interior $PM_{2.5}$ (tpy)	Uncontrolled Interior PM_{10} (tpy)	Building Fugitives $PM_{2.5}$ (lb/hr)	Building Fugitives PM_{10} (lb/hr)	Building Fugitives $PM_{2.5}$ (tpy)	Building Fugitives PM_{10} (tpy)	Total Baghouse $PM_{2.5}$ (lb/hr)	Total Baghouse PM_{10} (lb/hr)	Total Baghouse $PM_{2.5}$ (tpy)	Total Baghouse PM_{10} (tpy)	Reagents Total TAPs (lb/hr, 24-hr or annual average)	Wastes Total TAPs (lb/hr, 24-hr or annual average)	TOTAL TAPs (lb/hr, 24-hr or annual average)	Screening EL (lb/hr)	Modeling Required?	24-hr AAC (mg/m3)	50-34PM Modeled Impact (mg/m3) 0.0315	Complies? Impact < AAC? (Yes/No)	Annual TRACT AACC (ug/m3)
		Annual			46,000	50	1.5	0.0018	0.0491	0.0902	2.46	4.15E-02	1.13	1.28E-03	3.50E-02	5.91E-04	1.61E-02	1.22E-04	3.32E-03	5.61E-05	1.53E-03									
		24-hr				50	1.0	3.86E-03	0.0595	1.93E-01	2.98E+00			2.75E-03	4.24E-02			2.62E-04	4.03E-03											
		Clay			46,000																									
1	1302-78-9	Bentonite (Sodium aluminum silicate)	---	100	46,000	50	12	1.53E-04	0.0408	7.64E-03	2.04	3.51E-03	0.94	1.09E-04	2.91E-02	5.01E-05	1.34E-02	1.03E-05	2.76E-03	4.76E-06	1.27E-03		---				---	---	---	---
2	7631-86-9	Silicon Dioxide (amorphous silica)	---	2	920	1	12	1.53E-04	0.0408	1.53E-04	4.08E-02	7.03E-05	0.019	2.18E-06	5.81E-04	1.00E-06	2.67E-04	2.07E-07	5.52E-05	9.51E-08	2.54E-05	6.36E-04	---	6.36E-04	0.667	No	0.5	2.00E-05	Yes	---
3	14808-60-7	Crystalline silica, Quartz	---	5	2,300	2.5	12	1.53E-04	0.0408	3.82E-04	1.02E-01	1.76E-04	0.047	5.44E-06	1.45E-03	2.50E-06	6.68E-04	5.17E-07	1.38E-04	2.38E-07	6.35E-05	1.59E-03	---	1.59E-03	0.0067	No	0.005	5.00E-05	Yes	---
4	14464-46-1	Crystalline silica, cristobalite	---	1	460	0.5	12	1.53E-04	0.0408	7.64E-05	2.04E-02	3.51E-05	0.009	1.09E-06	2.91E-04	5.01E-07	1.34E-04	1.03E-07	2.76E-05	4.76E-08	1.27E-05	3.18E-04	---	3.18E-04	0.0033	No	0.0025	1.00E-05	Yes	---
5	15468-32-3	Crystalline silica, tridymite	---	1	460	0.5	12	1.53E-04	0.0408	7.64E-05	2.04E-02	3.51E-05	0.009	1.09E-06	2.91E-04	5.01E-07	1.34E-04	1.03E-07	2.76E-05	4.76E-08	1.27E-05	3.18E-04	---	3.18E-04	0.0033	No	0.0025	1.00E-05	Yes	---
		Lime			46,000	0								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		---							
6	1305-78-8	Calcium Oxide (CaO)	---	100	46,000	50	1.5	2.28E-03	0.0515	1.14E-01	2.58	0.052	1.19	1.63E-03	3.67E-02	7.48E-04	1.69E-02	1.54E-04	3.49E-03	7.10E-05	1.60E-03	4.02E-02	---	4.02E-02	0.133	No	0.1	1.26E-03	Yes	---
	14808-60-7	Crystalline Silica	---	0.1	46	0.05	1.5	2.28E-03	0.0515	1.14E-04	2.58E-03	5.25E-05	0.00119	1.63E-06	3.67E-05	7.48E-07	1.69E-05	1.54E-07	3.49E-06	7.10E-08	1.60E-06		---				---	---	---	---
	1309-48-4	Magnesium oxide (only the fume is a TAP)	---	4	1,840	2	1.5	2.28E-03	0.0515	4.56E-03	1.03E-01	2.10E-03	0.047	6.50E-05	1.47E-03	2.99E-05	6.75E-04	6.18E-06	1.40E-04	2.84E-06	6.42E-05		---		N/A, not Mg fume					
	7720-78-7	**Ferrous sulfate (FeSO4)**																					---							
		Portland cement			46,000																									
7	65997-15-1	Cement, Portland, Chemicals	---	95	43,700	47.5	1.0	3.86E-03	0.0595	1.84E-01	2.83	0.084	1.30	2.62E-03	4.03E-02	1.20E-03	1.85E-02	2.48E-04	3.83E-03	1.14E-04	1.76E-03	4.41E-02	---	4.41E-02	0.667	No	0.5	1.39E-03	Yes	---
8	13397-24-5	Gypsum (Calcium sulfate)	---	8	3,680	4	1.0	3.86E-03	0.0595	1.55E-02	2.38E-01	7.11E-03	0.110	2.20E-04	3.39E-03	1.01E-04	1.56E-03	2.09E-05	3.22E-04	9.62E-06	1.48E-04	3.72E-03	---	3.72E-03	0.667	No	0.5	1.17E-04	Yes	---
9	1317-65-3	Limestone (Calcium carbonate)	---	15	6,900	7.5	1.0	3.86E-03	0.0595	2.90E-02	4.46E-01	1.33E-02	0.21	4.13E-04	6.36E-03	1.90E-04	2.93E-03	3.92E-05	6.04E-04	1.80E-05	2.78E-04	6.97E-03	---	6.97E-03	0.667	No	0.5	2.19E-04	Yes	---
	14808-60-7	Quartz	---	0.1	46	0.05	1.0	3.86E-03	0.0595	1.93E-04	2.98E-03	8.89E-05	1.37E-03	2.75E-06	4.24E-05	1.27E-06	1.95E-05	2.62E-07	4.03E-06	1.20E-07	1.85E-06						0.005	---	---	---
	1306-78-8	Calcium Oxide (CaO) - Free lime	---	5	2,300	2.5	1.0	3.86E-03	0.0595	9.66E-03	1.49E-01	4.44E-03	6.85E-02	1.38E-04	2.12E-03	6.33E-05	9.75E-04	1.31E-05	2.01E-04	6.02E-06	9.27E-05						---	---	---	---
	1309-48-4	Magnesium oxide (only the fume is a TAP)	---	5	2,300	2.5	1.0	3.86E-03	0.0595	9.66E-03	1.49E-01	4.44E-03	6.85E-02	1.38E-04	2.12E-03	6.33E-05	9.75E-04	1.31E-05	2.01E-04	6.02E-06	9.27E-05		---	0.00E+00	N/A, not Mg fume					
	7440-38-2	Arsenic	HAP	8.40E-08	3.86E-05	4.20E-08	1.0	3.86E-03	0.0595	1.70E-11	2.63E-10	7.47E-11	1.15E-09	2.43E-13	3.74E-12	1.06E-12	1.64E-11	2.31E-14	3.55E-13	1.01E-13	1.56E-12	4.10E-12	---	4.10E-12	1.50E-06	No				2.3E-03
	7440-41-7	Beryllium	HAP	8.95E-10	4.12E-07	4.48E-10	1.0	3.86E-03	0.0595	1.82E-13	2.80E-12	7.95E-13	1.23E-11	2.59E-15	3.99E-14	1.13E-14	1.75E-13	2.46E-16	3.79E-15	1.08E-15	1.66E-14	4.37E-14	---	4.37E-14	2.80E-05	No				4.2E-02
*	7440-43-9	Cadmium	HAP	1.17E-08	5.38E-06	5.85E-09	1.0	3.05E-03	0.0554	1.88E-12	3.41E-11	8.22E-12	1.49E-10	2.67E-14	4.85E-13	1.17E-13	2.13E-12	2.54E-15	4.61E-14	1.11E-14	2.02E-13	5.31E-13	2.59E-03	2.59E-03	3.70E-06	YES				5.6E-03
	7440-47-3	Total Chromium (includes 16065-83-1, Cr III)	HAP	1.26E-08																										
	16065-83-1	Cr III (per Idaho DEQ, 80%)		1.008E-08	4.64E-06	5.04E-09	1.0	3.86E-03	0.0595	1.95E-11	3.00E-10	8.96E-12	1.38E-10	2.78E-13	4.27E-12	1.28E-13	1.97E-12	2.64E-14	4.06E-13	1.21E-14	1.87E-13	4.68E-12	---	4.68E-12	0.033		0.025			
	18540-29-9	Hexavalent Chromium (per Idaho DEQ, 20%)	HAP	2.52E-09	1.16E-06	1.26E-09	1.0	3.05E-03	0.0554	4.04E-13	7.34E-12	1.77E-12	3.21E-11	5.76E-15	1.05E-13	2.52E-14	4.58E-13	5.47E-16	9.93E-15	2.40E-15	4.35E-14	1.14E-13	---	1.14E-13	5.60E-07	No				8.3E-04
	7439-92-1	Lead	HAP	3.68E-08	1.69E-05	1.84E-08	1.0	3.86E-03	0.0595	7.11E-11	1.10E-09	3.27E-11	5.04E-10	1.01E-12	1.56E-11	4.66E-13	7.18E-12	9.62E-14	1.48E-12	4.43E-14	6.82E-13		---							
*	7439-96-5	Manganese (Dust & compounds)	HAP	1.01E-05	4.65E-03	5.05E-06	1.0	3.86E-03	0.0595	1.95E-08	3.01E-07	8.98E-09	1.38E-07	2.78E-10	4.28E-09	1.28E-10	1.97E-09	2.64E-11	4.07E-10	1.22E-11	1.87E-10	4.69E-09	3.01E-02	3.01E-02	0.333	No	0.25	9.48E-04	Yes	---
	7440-02-0	Nickel	HAP	8.80E-07	4.05E-04	4.40E-07	1.0	3.86E-03	0.0595	1.79E-10	2.75E-09	7.82E-10	1.20E-08	2.54E-12	3.92E-11	1.11E-11	1.72E-10	2.42E-13	3.72E-12	1.06E-12	1.63E-11	4.29E-11	---	4.29E-11	2.70E-05	No				4.2E-02
	7723-14-0	Total Phosphorus	HAP	5.90E-07	2.71E-04	2.95E-07	1.0	3.86E-03	0.0595	1.14E-09	1.76E-08	5.24E-10	8.08E-09	1.62E-11	2.50E-10	7.47E-12	1.15E-10	1.54E-12	2.38E-11	7.10E-13	1.09E-11	2.74E-10	---	2.74E-10	0.007	No	0.005	8.62E-12	Yes	---
	7782-49-2	Selenium	HAP	ND																					0.013		0.01	0.00E+00	Yes	---
		Cement Supplement (e.g., pozzolans, fly ash)			46,000																									
*	7440-38-2	Arsenic	HAP	1.00E-06	4.60E-04	5.00E-07	1.0	3.05E-03	0.0554	1.60E-10	2.91E-09	7.03E-10	1.27E-08	2.29E-12	4.15E-11	1.00E-11	1.82E-10	2.17E-13	3.94E-12	9.51E-13	1.73E-11	4.54E-11	0.00E+00	4.54E-11	1.50E-06	No				2.3E-03
*	7440-41-7	Beryllium	HAP	9.04E-08	4.16E-05	4.52E-08	1.0	3.05E-03	0.0554	1.45E-11	2.63E-10	6.35E-11	1.15E-09	2.07E-13	3.75E-12	9.05E-13	1.64E-11	1.96E-14	3.56E-13	8.60E-14	1.56E-12	4.11E-12	2.59E-03	2.59E-03	2.80E-05	YES				4.2E-02
	7440-43-9	Cadmium	HAP	1.98E-10	9.11E-08	9.90E-11	1.0	3.05E-03	0.0554	3.18E-14	5.76E-13	1.39E-13	2.52E-12	4.53E-16	8.21E-15	1.98E-15	3.60E-14	4.30E-17	7.80E-16	1.88E-16	3.42E-15	8.99E-15	---	8.99E-15	3.70E-06	No				5.6E-03
	7440-47-3	Total Chromium (includes Cr II, Cr III and Cr VI)	HAP	1.22E-06																										---
*	16065-83-1	Cr III (per Idaho DEQ, 70%)		8.54E-07	3.93E-04	4.27E-07	1.0	3.86E-03	0.0595	1.65E-09	2.54E-08	7.59E-10	1.17E-08	2.35E-11	3.62E-10	1.08E-11	1.67E-10	2.23E-12	3.44E-11	1.03E-12	1.58E-11	3.97E-10	7.72E-03	7.72E-03	0.033	No	0.025	2.43E-04	Yes	
*	18540-29-9	Hexavalent Chromium (per Idaho DEQ, 30%)	HAP	3.66E-07	1.68E-04	1.83E-07	1.0	3.05E-03	0.0554	5.87E-11	1.07E-09	2.57E-10	4.67E-09	8.37E-13	1.52E-11	3.66E-12	6.65E-11	7.95E-14	1.44E-12	3.48E-13	6.32E-12	1.66E-11	0.00E+00	1.66E-11	5.60E-07	No				8.3E-04
*	7439-92-1	Lead	HAP	5.20E-07	2.39E-04	2.60E-07	1.0	3.86E-03	0.0595	1.00E-09	1.55E-08	4.62E-10	7.12E-09	1.43E-11	2.21E-10	6.59E-12	1.01E-10	1.36E-12	2.10E-11	6.26E-13	9.64E-12									
	7439-96-5	Manganese (Dust & compounds)	HAP	2.56E-07	1.18E-04	1.28E-07	1.0	3.86E-03	0.0595	4.95E-10	7.62E-09	2.28E-10	3.50E-09	7.05E-12	1.09E-10	3.24E-12	4.99E-11	6.70E-13	1.03E-11	3.08E-13	4.74E-12	1.19E-10	---	1.19E-10	0.333	No	1.2	3.74E-12	Yes	---
*	7440-02-0	Nickel	HAP	2.28E-06	1.05E-03	1.14E-06	1.0	3.05E-03	0.0554	3.66E-10	6.64E-09	1.60E-09	2.91E-08	5.21E-12	9.46E-11	2.28E-11	4.14E-10	4.95E-13	8.98E-12	2.17E-12	3.94E-11	1.04E-10	2.59E-03	2.59E-03	2.70E-05	YES				4.2E-02
*	7723-14-0	Total Phosphorus	HAP	3.54E-06	1.63E-03	1.77E-06	1.0	3.86E-03	0.0595	6.84E-09	1.05E-07	3.15E-09	4.85E-08	9.75E-11	1.50E-09	4.48E-11	6.91E-10	9.26E-12	1.43E-10	4.26E-12	6.56E-11	1.64E-09	3.01E-02	3.01E-02	0.007	YES	0.005	9.48E-04	Yes	---
*	7782-49-2	Selenium	HAP	ND										0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.013		0.01	0.00E+00	Yes	---

Reagent Silo Filling, PM HAP Fraction		
	0.00E+00	Clay
	0.00E+00	Lime
	3.49E-12	Portland Cement
	5.44E-14	Cement Supplement
Uncontrolled PM HAPs	2.46E-07	

Building Fugitives: Total PM HAP 2.28E-09; Max any HAP 1.97E-09 (Manganese)
Total Baghouse: Total PM HAP 2.17E-10; Max any HAP 1.87E-10 (Manganese)
Total Max Any HAP 2.50E-09 (Manganese)

50-34PM Modeled Impact (ug/m3) 2.100	Complies? Impact < AACC? (Yes/No)
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---	---
8.60E-12	Yes
9.17E-14	Yes
5.44E-03	Yes
2.40E-13	Yes
---	---
9.01E-11	Yes
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---	---
9.54E-11	Yes
5.44E-03	Yes
1.89E-14	Yes
---	---
3.49E-11	Yes
---	---
5.44E-03	Yes
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Max $PM_{2.5}$ and PM_{10} (TPY)	7.48E-04	1.69E-02	Max $PM_{2.5}$ and PM_{10} (TPY)	7.10E-05 / 1.60E-03
Max Lead (TPY)		1.01E-10	Max Lead (TPY)	9.64E-12

Reagent TAPs: If a TAP occurs in more than one reagent, the maximum concentration in any reagent is used in the analysis.

Metal TAPs: For Portland cement, concentrations of Arsenic thru Selenium taken from AP-42, Table 11.12-8, Concrete Batch Plant Metal Emission Factors (06/06). Values in the Ap-42 table are in lb pollutant/ton material.
Metal TAPs: For cement supplements (e.g. pozzolans, flyash), concentrations of Arsenic thru Selenium taken from AP-42, Table 11.12-8, Concrete Batch Plant Metal Emission Factors (06/06). Values in the Ap-42 table are in lb pollutant/ton material.
Cement supplement fabric filter presumed 95% efficient.
Metal TAPs: No HAPs emission factors are listed in AP-42, 11.17, Lime Processing, or 11.25, Clay Processing.
Metal TAPs: Bentonite (sodium aluminum silicate) is an aluminum salt but is not soluble (Soluble aluminum salt is an Idaho TAP), see https://pubchem.ncbi.nlm.nih.gov/compound/Sodium-aluminosilicate

Hex Chrome: Treated Wastes. 2014 NEI, Version 1, Technical Support Document (TSD), December 2016. The link to the chromium augmentation factors is on page 2-5. https://www.epa.gov/sites/production/files/2016-12/documents/nei2014v1_tsd.pdf
The default augmentation profile is 34% hexavalent chromium and 66% trivalent chromium.
Hex Chrome: Cement (20%) and cement supplement (30%), Idaho DEQ, gcbp-spreadsheet.xls, https://www.deq.idaho.gov/permitting/air-quality-permitting/permit-to-construct/concrete-batch-plants/

Lead: Lead Compounds = 1.3 x Max Reported Air Emissions in the TRI, 2011-2017. Lead is a criteria pollutant and a HAP, not a TAP.

Moisture: ~15% Bentonite. Industrial Minerals Association North America. https://www.ima-na.org/page/what_is_bentonite
Moisture: ~ 1% AP-42 Section 11.6 Emission Factor Documentation. May 18, 1994. https://www3.epa.gov/ttn/chief/ap42/ch11/bgdocs/b11s06.pdf
Moisture: 1.5%-4% (slaked lime). https://www.tovatech.com/blog/22057/moisture-analyzers-2/determining-hydrated-lime-moisture-content
Moisture: 1.5 - 3% Maximum levels in hydrated/slaked lime. https://www.moisttech.com/moisture-content-hydrated-lime/

Outdoor Stabilization Facilty Treatment Limits from Appendix A of P-2008.0162, Project 61436, issued January 9, 2015

Compound i	Compound weight fraction w_i	Process	Process rate, Q_P	Maximum compound process rate, Q_i		Maximum compound process rate, Q_i	
			(T/hr)	(lb/hr)	(T/hr)	(lb/day)	(T/day)
		Outdoor Stabilization					
			270				
Aluminum	0.270			145,800	72.90		1,749.6
Antimony	0.130			70,200	35.10		842.4
Arsenic	0.0097			5,238	2.62		62.9
Asbestos	1.00E-08			0.0054	2.70E-06	0.1296	
Barium	0.130			70,200	35.10		842.4
Beryllium	8.00E-05			43	0.02	1,032	
Cadmium	0.023			12,420	6.21		149.0
Chromium	0.130			70,200	35.10		842.4
Copper	0.270			145,800	72.90		1,749.6
Cyanides	0.270			145,800	72.90		1,749.6
Lead	0.195			105,300	52.65		1,263.6
Manganese	0.270			145,800	72.90		1,749.6
Mercury	0.004			2,160	1.08		25.9
Nickel	0.175			94,500	47.25		1,134.0
Selenium	0.050			27,000	13.50		324.0
Silver	0.004			2,160	1.08		25.9
Thallium	0.028			15,120	7.56		181.4
Vanadium	0.012			6,480	3.24		77.8
Zinc	0.284			153,360	76.68		1,840.3

All of the equations used to determine VOC emissions from waste piles were taken from the US EPA's Industrial Waste Air Model (IWAIR) Technical Background Document (EPA 530-R-02-010, February 2002), Section 2.0 (Source Emission Estimates Using CHEMDAT8). These equations begin to be used in Column L.

https://www.epa.gov/sites/production/files/2016-03/documents/iwair_technical_background.pdf

Equation 2-16

$$T_{corr} = 10^{\left(VP_b \times \left(\frac{-1}{VP_c + T - 27315} + \frac{1}{VP_c + 25}\right)\right)}$$

Where:

VP_b = Antoine's vapor pressure constant B for the constituent

VP_c = Antoine's vapor pressure constant C for the constituent

T = Temperature of the system (K)

Note: If the Antoine's vapor pressure constants were unavailable for a constiuent, then a conservative value of 1 was used

Equation 2-18

$$D_{eff} = D_a \frac{\varepsilon_a^{3.33} \times T_{C,gas}}{\varepsilon_t^{2}}$$

Where:

D_{eff} = effective diffusivity (cm^2/s)

D_a = diffusivitity of the constiuent in air (cm^2/s)

$T_{C,gas}$ = temperature correction factor for gas diffusivity $(T/298.15)^{1.75}$

T = temperature of the system (K)

d_{wmu} = characteristic depth (cm)

ε_a = air-filled porosity (cm^3/cm^3)

ε_t = total porosity (cm^3/cm^3)

Equation 2-19

$$K_v = \frac{K_{eq} \times D_{eff}}{d_{wmu}^{2}}$$

Where:

K_v = volatilization rate of the compound (1/s)

K_{eq} = vapor/liquid equilibrium coefficient

D_{eff} = effective diffusivity (cm^2/s)

d_{wmu} = characteristic depth (cm)

Equation 2-21

$$f_{emitted} = 2\left(\frac{K_v \times t}{\pi}\right)^{0.5}\left[1 - \frac{t \times b_{soil}}{3}\right]$$

Where:

$F_{emitted}$ = Fraction of the VOCs emitted during the time period

K_v = volatilization rate of the compound (1/s)

b_{soil} = biological destruction rate in the soil (1/s)

t = residence time (s) = 3,600

Equation 2-37

$$E = \frac{M_{annual} \times C_{waste} \times f_{emitted}}{A \times 365.25 \times 24 \times 3600}$$

Where:

E = Mass Flux Rate ($g/m^2 s$)

M_{annual} = Total initial mass that is in the pile during the year (Mg)

C_{waste} = Mixing Ratio of the pollutant in the waste (g/Mg or ppmm)

$f_{emitted}$ = Fraction of the VOCs emitted during the time period

A = Cross-sectional area of the pile/pan (m^2)

TPY = Mass Flux Rate (g/m2-s) x Pan Area (m2) x 8760 hr/yr x 3600 s/hr x (lb/453.6 g) x (ton/2000 lb)

Use this table ONLY for 2020 24-hr VOC emissions from the new SB

Exterior Pans =		TPY
Interior Pans =		TPY

7,200 T/day

MODELED EMISSION RATES:
If Total TAP VOC Emitted = 1.0 lb/hr Curtain Capture Efficiency = 95 %, with baghouse operating
VOCBH24 = 0.950 lb/hr VOCFUG24 = 0.050 lb/hr

Modeling presumed 1 lb/hr from baghouses and 1 lb/hr from rollup doors
Dispersion coefficient should be 36.91 ug/m3 / 1000 / 2 lb per hour

COMPLY at "Z" ppm Concentration when processing 7200 T/day of wastes in the SB?

CAS	Compound	HAP?	24-hr Emission Rate @ 10,000 ppmw	50-34VOC Modeled Ambient Impact (mg/m3)	ACC (mg/m3)	50-34VOC Percent of AAC at concentration of 10,000 ppmw in all Wastes	Maximum Treatment Limit (Tons of TAP treated per calendar day)	Reduce T/day limit to Max total T/day of wastes treated	CAS No.	Pollutant	Pollutant Treatment Limit (lb/day)	Pollutant Treatment Limit (T/day)	AAC (mg/m3)	
				3.69E-02										
71-55-6	1.1.1-Trichloroethane	HAP	3.84E+00	1.42E-01	95.5	0.15%	48,563	7,200						
75-34-3	1.1-Dichloroethane	HAP	5.12E+00	1.89E-01	20.25	0.93%	7,713	7,200						
106-88-7	1.2 Butylene Oxide	HAP	3.88E+00	1.43E-01	0.6	23.86%	302	302						
120-82-1	1.2.4-Trichlorobenzene	HAP	6.39E-02	2.36E-03	1.85	0.13%	56,449	7,200						
107-15-3	1.2-diaminoethane	-	8.89E-01	3.28E-02	1.25	2.63%	2,742	2,742						
95-50-1	1.2-Dichlorobenzene	-	2.50E-01	9.24E-03	15	0.06%	116,887	7,200						
107-06-2	1.2-Dichloroethane	HAP	2.66E+00	9.84E-02	2	4.92%	1,464	1,464						
540-59-0	1.2-Dichloroethylene	-	3.21E+00	1.18E-01	39.5	0.30%	24,020	7,200						
78-87-5	1.2-Dichloropropane	HAP	1.36E+00	5.01E-02	17.35	0.29%	24,926	7,200						
106-46-7	1.4-Dichlorobenzene	HAP	1.60E-01	5.89E-03	22.5	0.03%	274,858	7,200						
540-84-1	2.2.4 Trimethylpentane	HAP	1.98E+00	7.30E-02	17.5	0.42%	17,267	7,200						
95-95-4	2.4.5-Trichlorophenol	HAP		1.52E-03	0.0016	94.87%			95-95-4	2,4,5-Trichlorophenol	23,040	11.52	0.0016	1600.00
94-75-7	2.4-D	-	1.08E-01	4.00E-03	0.5	0.80%	8,991	7,200						
111-76-2	2-butoxyethanol	-	3.03E-01	1.12E-02	6	0.19%	38,564	7,200						
95-57-8	2-Chlorophenol	-	2.87E-01	1.06E-02	0.025	42.35%	170	170						
109-86-4	2-Methoxyethanol	-	9.12E-01	3.37E-02	0.8	4.21%	1,711	1,711						
534-52-1	4.6-Dinitro-o-cresol	-	2.63E-03	9.70E-05	0.01	0.97%	7,420	7,200						
60-35-5	Acetamide	HAP		2.98E-04	0.0003	99.22%			60-35-5	Acetamide	40,320	20.16	0.0003	2800.0000
64-19-7	Acetic Acid	-	1.10E+00	4.05E-02	1.25	3.24%	2,224	2,224						
67-64-1	Acetone	-	3.16E+00	1.17E-01	89	0.13%	54,941	7,200						
75-05-8	Acetonitrile	HAP	1.47E+00	5.44E-02	3.35	1.62%	4,434	4,434						
107-02-8	Acrolein	HAP		1.21E-02	0.0125	97.06%			107-02-8	Acrolein	15,840	7.92	0.0125	1100.00
79-10-7	Acrylic acid	HAP	3.96E-01	1.46E-02	1.5	0.97%	7,395	7,200						
7664-41-7	Ammonia	-	3.56E+00	1.31E-01	0.9	14.59%	493	493						
92-52-4	Biphenyl	HAP	1.94E-02	7.15E-04	0.075	0.95%	7,555	7,200						
111-44-4	bis(2-Chloroethyl)ether	HAP	1.94E-01	7.15E-03	1.5	0.48%	15,106	7,200						
75-25-2	Bromoform	HAP	3.16E-01	1.17E-02	0.25	4.67%	1,541	1,541						
74-83-9	Bromomethane	HAP	8.71E+00	3.21E-01	0.95	33.84%	213	213						
141-32-2	Butyl Acrylate	-	9.16E-01	3.38E-02	2.75	1.23%	5,858	5,858						
71-36-3	Butyl Alcohol	-	5.72E-01	2.11E-02	7.5	0.28%	25,557	7,200						
2426-08-6	Butyl Glycidyl Ether	-	9.29E-01	3.43E-02	6.75	0.51%	14,181	7,200						
109-79-5	Butyl Mercaptan	-	1.43E+00	5.28E-02	0.09	58.69%	123	123						
133-06-2	Captan	HAP	1.76E-05	6.51E-07	0.25	0.00%	27,651,678	7,200						
63-25-2	Carbaryl	HAP	2.94E-04	1.08E-05	0.25	0.00%	1,660,869	7,200						
75-15-0	Carbon disulfide	HAP	4.33E+00	1.60E-01	1.5	10.65%	676	676						
120-80-9	Catechol	HAP	6.19E-03	2.28E-04	1	0.02%	315,195	7,200						
7782-50-5	Chlorine	HAP		1.48E-01	0.15	98.88%			7782-50-5	Chlorine	23,040	11.52	0.1500	1600.00
108-90-7	Chlorobenzene	HAP	5.95E-01	2.20E-02	17.5	0.13%	57,386	7,200						
510-15-6	Chlorobenzilate	HAP	7.25E-04	2.68E-05	0.035	0.08%	94,117	7,200						
75-00-3	Chloroethane	HAP	1.20E+01	4.42E-01	132	0.33%	21,495	7,200						
74-87-3	Chloromethane	HAP	1.31E+01	4.85E-01	5.15	9.41%	765	765						
126-99-8	Chloroprene	HAP	2.53E+00	9.36E-02	1.8	5.20%	1,385	1,385						
1319-77-3	Cresol	HAP	1.63E-01	6.02E-03	1.1	0.55%	13,147	7,200						
98-82-8	Cumene	HAP	9.47E-01	3.50E-02	12.25	0.29%	25,231	7,200						
592-01-8	Cyanide Compounds	HAP	4.76E+00	1.76E-01	0.25	70.25%	102	102						
110-82-7	Cyclohexane	-	2.02E+00	7.45E-02	52.5	0.14%	50,755	7,200						
108-94-1	Cyclohexanone	-	4.03E-01	1.49E-02	5	0.30%	24,193	7,200						
110-83-8	Cyclohexene	-	1.62E+00	5.97E-02	50.75	0.12%	61,168	7,200						
287-92-3	Cyclopentane	-	4.26E+00	1.57E-01	86	0.18%	39,415	7,200						
333-41-5	Diazinon	-	3.86E-03	1.43E-04	0.005	2.85%	2,524	2,524						
84-74-2	Dibutyl phthalate	HAP	1.08E-03	3.97E-05	0.25	0.02%	453,525	7,200						
77-73-6	Dicyclopentadiene	-	9.20E-01	3.40E-02	1.5	2.26%	3,180	3,180						
111-42-2	Diethanolamine	HAP	3.04E-02	1.12E-03	0.75	0.15%	48,125	7,200						
100-37-8	Diethylaminoethanol	-	1.37E+00	5.05E-02	2.5	2.02%	3,566	3,566						
108-83-8	Diisobutyl Ketone	-	4.53E-01	1.67E-02	7.25	0.23%	31,240	7,200						
121-69-7	Dimethyl Aniline	HAP	2.78E-01	1.03E-02	1.25	0.82%	8,756	7,200						
131-11-3	Dimethyl phthalate	HAP	1.65E-02	6.10E-04	0.25	0.24%	29,501	7,200						
122-39-4	Diphenylamine (difficult to distinguish from diphenylnitrosamine)	-	9.53E-03	3.52E-04	0.5	0.07%	102,299	7,200						
64-17-5	Ethanol	-	1.80E+00	6.66E-02	94	0.07%	101,591	7,200						
141-43-5	Ethanolamine	-	1.74E-01	6.43E-03	0.4	1.61%	4,478	4,478						
141-78-6	Ethyl acetate	-	1.88E+00	6.93E-02	70	0.10%	72,753	7,200						
60-29-7	Ethyl ether	-	7.12E+00	2.63E-01	60	0.44%	16,446	7,200						
75-08-1	Ethyl Mercaptan	-		4.91E-02	0.05	98.12%			75-08-1	Ethyl Mercaptan	43,200	21.60	0.0500	3000.00
100-41-4	Ethylbenzene	HAP	6.00E-01	2.21E-02	21.75	0.10%	70,718	7,200						
107-21-1	Ethylene Glycol	HAP	3.36E-02	1.24E-03	6.35	0.02%	368,860	7,200						
628-96-6	Ethylene Glycol Dinitrate	-	6.42E-02	2.37E-03	0.016	14.82%	486	486						
96-45-7	Ethylene thiourea	HAP	4.37E-04	1.61E-05	0.035	0.05%	156,173	7,200						
75-34-3	Ethylidene Dichloride	HAP	4.51E+00	1.66E-01	20.25	0.82%	8,761	7,200						
16219-75-3	Ethylidene-2-norbornene	-	6.37E-01	2.35E-02	1.25	1.88%	3,829	3,829						
64-18-6	Formic acid	-	9.21E-01	3.40E-02	0.47	7.23%	995	995						
111-30-8	Glutaraldehyde	-	5.04E-01	1.86E-02	0.041	45.38%	159	159						
N230	Glycol Ethers	-	6.82E-01	2.52E-02	0.95	2.65%	2,716	2,716						
142-82-5	Heptane	-	1.36E+00	5.04E-02	82	0.06%	117,189	7,200						
77-47-4	Hexachlorocyclopentadiene	HAP	4.16E-02	1.53E-03	0.005	30.70%	235	235						
110-54-3	Hexane (n-Hexane)	HAP	3.91E+00	1.44E-01	9	1.61%	4,485	4,485						
7647-01-0	Hydrogen Chloride	HAP	6.61E+00	2.44E-01	0.375	65.05%	111	111						
7664-39-3	Hydrogen Fluoride	HAP		1.24E-01	0.125	99.19%			7664-39-3	Hydrogen Fluoride	103,680	51.84	0.1250	7200.00
2148878	Hydrogen Sulfide	-		6.99E-01	0.7	99.91%			7783-06-4	Hydrogen Sulfide	100,800	50.40	0.7000	7000.00
123-31-9	Hydroquinone	HAP	2.11E-01	7.81E-03	0.1	7.81%	922	922						
123-92-2	Isoamyl Acetate	-	5.93E-01	2.19E-02	26.25	0.08%	86,374	7,200						
123-51-3	Isoamyl Alcohol	-	1.56E+00	5.77E-02	18	0.32%	22,462	7,200						
78-83-1	Isobutyl alcohol	-	4.84E-01	1.79E-02	6	0.30%	24,201	7,200						
78-59-1	Isophorone	HAP	3.22E-01	1.19E-02	1.4	0.85%	8,484	7,200						
67-63-0	Isopropyl alcohol	-	1.03E+00	3.81E-02	49	0.08%	92,529	7,200						
121-75-5	Malathion	-	6.54E-04	2.41E-05	0.5	0.00%	1,492,025	7,200						
108-31-6	Maleic anhydride	HAP	1.64E-01	6.04E-03	0.05	12.08%	596	596						
108-39-4	m-Cresol	HAP	3.15E-02	1.16E-03	1.1	0.11%	68,130	7,200						
141-79-7	Mesityl Oxide	-	1.71E-01	6.29E-03	3	0.21%	34,314	7,200						
126-98-7	Methacrylonitrile	-	2.37E+00	8.76E-02	0.15	58.39%	123	123						
67-56-1	Methanol	HAP	1.57E+00	5.81E-02	13	0.45%	16,105	7,200						
72-43-5	Methoxychlor	HAP	4.28E-04	1.58E-05	0.5	0.00%	2,281,121	7,200						
96-33-3	Methyl Acrylate	-	1.32E+00	4.88E-02	1.75	2.79%	2,583	2,583						
110-43-0	Methyl Amyl Ketone	-	4.94E-01	1.82E-02	11.75	0.16%	46,381	7,200						
108-10-1	Methyl Butyl Ketone	HAP	4.21E-01	1.56E-02	10.25	0.15%	47,447	7,200						
78-93-3	Methyl ethyl ketone	-	1.81E+00	6.68E-02	29.5	0.23%	31,778	7,200						
110-12-3	Methyl Isoamyl Ketone	-	6.36E-01	2.35E-02	12	0.20%	36,809	7,200						
80-62-6	Methyl Methacrylate	HAP	1.25E+00	4.60E-02	20.5	0.22%	32,058	7,200						
107-87-9	Methyl Propyl Ketone	-	9.75E-01	3.60E-02	35	0.10%	70,021	7,200						
108-87-2	Methylcyclohexane	-	1.93E+00	7.13E-02	80.5	0.09%	81,315	7,200						
108-38-3	m-Xylene	HAP	5.91E-01	2.18E-02	21.75	0.10%	71,810	7,200						
68-12-2	N.N-Dimethylformamide	HAP	3.38E-01	1.25E-02	1.5	0.83%	8,662	7,200						
628-63-7	N-Amyl Acetate	-	7.04E-01	2.60E-02	26.5	0.10%	73,451	7,200						
91-20-3	Naphthalene	HAP	3.75E-02	1.38E-03	2.5	0.06%	130,025	7,200						
123-86-4	n-butyl acetate	-	1.03E+00	3.82E-02	35.5	0.11%	66,993	7,200						
98-95-3	Nitrobenzene	HAP	1.80E-01	6.63E-03	0.25	2.65%	2,714	2,714						
111-84-2	Nonane	-	5.71E-01	2.11E-02	52.5	0.04%	179,296	7,200						
95-48-7	o-Cresol	HAP	1.49E-01	5.49E-03	1.1	0.50%	14,425	7,200						
111-65-9	Octane	-	6.48E-01	2.39E-02	70	0.03%	210,597	7,200						
95-47-6	o-Xylene	HAP	6.53E-01	2.41E-02	21.75	0.11%	65,021	7,200						
56-38-2	Parathion	HAP	1.69E-03	6.25E-05	0.005	1.25%	5,764	5,764						
106-44-5	p-Cresol	HAP	4.62E-02	1.71E-03	1.1	0.16%	46,433	7,200						
82-68-8	Pentachloronitrobenzene	HAP	2.84E-03	1.05E-04	0.025	0.42%	17,199	7,200						
87-86-5	Pentachlorophenol	HAP	4.34E-03	1.60E-04	0.025	0.64%	11,228	7,200						
109-66-0	Pentane	-	4.06E+00	1.50E-01	88.5	0.17%	42,555	7,200						
108-95-2	Phenol	HAP	8.93E-02	3.30E-03	0.95	0.35%	20,744	7,200						
108-98-5	Phenyl Mercaptan	-	3.03E-01	1.12E-02	0.1	11.20%	643	643						
75-44-5	Phosgene	HAP		1.98E-02	0.02	98.82%			75-44-5	Phosgene	5,904	2.95	0.0200	410.00
7803-51-2	Phosphine	HAP		1.99E-02	0.02	99.54%			7803-51-2	Phosphine	87,840	43.92	0.0200	6100.00
85-44-9	Phthalic anhydride	HAP	4.50E-03	1.66E-04	0.3	0.06%	129,907	7,200						
88-89-1	Picric acid	-		4.90E-03	0.005	98.03%			88-89-1	Picric acid	67,680	33.84	0.0050	4700.00
106-50-3	p-Phenylenediamine	HAP	2.39E-03	8.83E-05	0.005	1.77%	4,078	4,078						
114-26-1	Propoxur	HAP	1.11E-03	4.09E-05	0.025	0.16%	44,052	7,200						
109-60-4	Propyl Acetate	-	1.57E+00	5.81E-02	42	0.14%	52,072	7,200						
71-23-8	Propyl alcohol	-	9.47E-01	3.50E-02	25	0.14%	51,476	7,200						
75-56-9	Propylene Oxide	HAP	4.15E+00	1.53E-01	2.4	6.39%	1,127	1,127						
106-42-3	p-Xylene	HAP	6.21E-01	2.29E-02	21.75	0.11%	68,278	7,200						
110-86-1	Pyridine	-	8.46E-01	3.12E-02	0.75	4.16%	1,730	1,730						
106-51-4	Quinone	HAP	4.33E-02	1.60E-03	0.02	8.00%	900	900						
626-38-0	Sec-Amyl Acetate	-	7.83E-01	2.89E-02	33.25	0.09%	82,849	7,200						
78-92-2	sec-Butyl alcohol	-	1.53E+00	5.65E-02	15.25	0.37%	19,435	7,200						
100-42-5	Styrene	HAP	5.62E-01	2.08E-02	1	2.08%	3,469	3,469						
75-65-0	tert-Butyl alcohol	-	1.57E+00	5.81E-02	15	0.39%	18,579	7,200						
108-88-3	Toluene	HAP	1.29E+00	4.77E-02	18.75	0.25%	28,327	7,200						
584-84-9	Toluene-2.6-diisocyanate	HAP		1.99E-03	0.002	99.42%			584-84-9	Toluene-2,6-diisocyanate	30,240	15.12	0.0020	2100.00
8001-35-2	Toxaphene	HAP	7.87E-04	2.91E-05	0.025	0.12%	61,946	7,200						
79-01-6	Trichloroethylene	HAP	2.07E+00	7.64E-02	13.45	0.57%	12,671	7,200						
121-44-8	Triethylamine	HAP	1.68E+00	6.21E-02	0.2	31.03%	232	232						
1582-09-8	TRIFLURALIN	HAP	4.20E-04	1.55E-05	1.15	0.00%	5,338,636	7,200						
126-73-8	Tri-n-butyl phosphate	-	2.37E-02	8.75E-04	0.11	0.80%	9,050	7,200						
51-79-6	Urethane	HAP	1.64E-02	6.05E-04	0.0015	40.31%	179	179						
108-05-4	Vinyl Acetate	HAP	2.39E+00	8.84E-02	1.75	5.05%	1,426	1,426						
1330-20-7	Xylene	HAP	6.29E-01	2.32E-02	21.75	0.11%	67,420	7,200						

CAS	Compound	HAP?	24-hr Emission Rate @ 10,000 ppmw	50-34VOC Modeled Ambient Impact (mg/m3)	ACC (mg/m3)	50-34VOC Percent of AAC at concentration of 10,000 ppmw in all Wastes	Maximum Treatment Limit (Tons of TAP treated per calendar day)	Reduce T/day limit to Max total T/day of wastes treated	CAS No.	Pollutant	Pollutant Treatment Limit (lb/day)	Pollutant Treatment Limit (T/day)	AAC (mg/m3)
				3.69E-02									

Maximum Volatile TAP emissions at 10,000 ppmw= 13.13 **lb/hr**

315 **lb/day**
57.5 **T/yr**

Minimum Volatile TAP emissions at 10,000 ppmw= 1.76E-05 **lb/hr**
4.23E-04 **lb/day**
7.72E-05 **T/yr**

All of the equations used to determine VOC emissions from waste piles were taken from the US EPA's Industrial Waste Air Model (IWAIR) Technical Background Document (EPA 530-R-02-010, February 2002), Section 2.0 (Source Emission Estimates Using CHEMDAT8). These equations begin to be used in Column L.
https://www.epa.gov/sites/production/files/2016-03/documents/iwair_technical_background.pdf

Eauation 2-16

$$T_{corr} = 10^{\left(VP_b\left(\frac{-1}{VP_c+T-273.15}-\frac{1}{VP_c+25}\right)\right)}$$

Where:

VP_b = Antoine's vapor pressure constant B for the constituent

VP_c = Antoine's vapor pressure constant C for the constituent

T = Temperature of the system (K)

Note: If the Antoine's vapor pressure constants were unavailable for a constituent, then a conservative value of 1 was used

Eauation 2-15

$$K_{eq} = \frac{T_{corr} \times P_{vap} \times MW_{waste} \times \varepsilon_a}{R \times T \times L}$$

Where:

K_{eq} = vapor/liquid equilibrium coefficient

T_{corr} = temperature correction factor for vapor pressure for constituent

P_{vap} = pure component vapor pressure for constituent at 25 C (atm)

MW_{waste} = average molecular weight of the waste (g/mol)

ε_a = air-filled porosity (cm^3/cm^3)

R = Universal gas constant

T = Temperature of the system (K)

L = waste loading rate (g/cm^3)

Eauation 2-18

$$D_{eff} = D_a \frac{\varepsilon_a^{3.33} \times T_{C,gas}}{\varepsilon_t^{2}}$$

Where:

D_{eff} = effective diffusivity (cm^2/s)

D_a = diffusivity of the constituent in air (cm^2/s)

$T_{C,gas}$ = temperature correction factor for gas diffusivity $(T/298.15)^{1.75}$

T = temperature of the system (K)

d_{wmu} = characteristic depth (cm)

ε_a = air-filled porosity (cm^3/cm^3)

ε_t = total porosity (cm^3/cm^3)

Eauation 2-19

$$K_v = \frac{K_{eq} \times D_{eff}}{d_{wmu}^{2}}$$

Where:

K_v = volatilization rate of the compound (1/s)

K_{eq} = vapor/liquid equilibrium coefficient

D_{eff} = effective diffusivity (cm^2/s)

d_{wmu} = characteristic depth (cm)

Eauation 2-21

$$f_{emitted} = 2\left(\frac{K_v \times t}{\pi}\right)^{0.5}\left[1-\frac{t \times b_{soil}}{3}\right]$$

Where:

$F_{emitted}$ = Fraction of the VOCs emitted during the time period

K_v = volatilization rate of the compound (1/s)

b_{soil} = biological destruction rate in the soil (1/s)

t = residence time (s) = 3,600

Eauation 2-37

$$E = \frac{M_{annual} \times C_{waste} \times f_{emitted}}{A \times 365.25 \times 24 \times 3600}$$

Where:

E = Mass Flux Rate (g/m^2 s)

M_{annual} = Total initial mass that is in the pile during the year (Mg)

C_{waste} = Mixing Ratio of the pollutant in the waste (g/Mg or ppm)

$f_{emitted}$ = Fraction of the VOCs emitted during the time period

A = Cross-sectional area of the pile/pan (m^2)

TPY = Mass Flux Rate (g/m2-s) x Pan Area (m2) x 8760 hr/yr x 3600 s/hr x (lb/453.6 g) x (ton/2000 lb)

Exterior Pans =	337,400	TPY
Interior Pans =	276,000	TPY

MODELED EMISSION RATES;

If Total TAP VOC Emitted = 1.0 lb/hr Curtain Capture Efficiency = 95 %, with baghouse operating

VOCBHANN = 0.950 lb/hr VOCFUGANN = 0.050 lb/hr

Emission rate for Dibenzofuran includes Toxicity Equivalence Factor (TEF) = 0.1

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COMPLY at "Z" ppm Concentration when processing 276,000 T/yr of wastes in the SB?

Chemical Properties

	CAS	Compound	HAP?	Density	Vapor Pressure	Molecular Weight, MW	Diffusivity in air, Da	Antoine's Coefficients	Column6	Column7	Average Annual Concentration (Cw)
4	79-34-5	1,1,2,2-Tetrachloroethane	HAP	1.59	4.62	168	0.071	6.89	1350	192	1.00
6	79-00-5	1,1,2-Trichloroethane	HAP	1.3	23	133.4	0.078	7.19	1480	229	1.00
7	75-34-3	1,1-Dichloroethane	HAP	1.17	591	98.96	0.0742	6.9853	1171.42	228.13	1.00
12	96-12-8	1,2-Dibromo-3-chloropropane	HAP	1.41	0.8	236.36	0.0268	8.07	2440	273	1.00
14	107-06-2	1,2-Dichloroethane	HAP	1.26	60	98.96	0.104	0	0	0	0.00
18	106-99-0	1,3-butadiene	HAP	0.76	2100	54.09	0.18	7.216854	1144.753	269.0367	1.00
19	542-75-6	1,3-Dichloropropylene	HAP	1.217	34.4	110.97	0.0857	7.46133	1528.42	226.179	1.00
24	88-06-2	2,4,6-Trichlorophenol	HAP	1	0.0073	197.46	0.0261	--	--	--	0.01
44	75-07-0	Acetaldehyde	HAP	0.788	902	44.06	0.124	8.01	1600	292	1.78
52	79-06-1	Acrylamide	HAP	1.12	0.007	71.08	0.097	11.3	3940	273	3.82
54	107-13-1	Acrylonitrile	HAP	0.81	109	53.06	0.122	7.11	1340	238	0.51
57	62-53-3	Aniline	HAP	1.02	0.4902	93.1	0.07	6.95	1470	177	56.39
60	71-43-2	Benzene	HAP	0.874	95	78.11	0.0895	6.91	1210	221	65.88
61	191-24-2	Benzo(g,h,i)perylene	HAP	1.02	1E-10	276.34	0.022	--	--	--	1.00
67	111-44-4	bis(2-Chloroethyl)ether	HAP	1.22	1.55	143.01	0.0413	7.6924	1990.8	235.347	0.01
82	56-23-5	Carbon Tetrachloride	HAP	1.59	91	153.82	0.078	6.93	1240	230	0.13
85	57-74-9	Chlordane	HAP	1.11	9.7E-06	409.76	0.0179	--	--	--	0.29
92	67-66-3	Chloroform	HAP	1.49	100	119.39	0.104	6.49	929	196	0.28
93	74-87-3	Chloromethane	HAP	0.95	3672	50.49	0.126	7.09	949	249	0.01
105	117-81-7	Di(2-ethylhexyl) phthalate	HAP	0.981	1.54E-09	390.563	0.035559818	0	0	0	11.13
107	132-64-9	Dibenzofuran	HAP	--	0.00248	222.3	0.001	--	--	--	25.55
110	75-09-2	Dichloromethane	HAP	1.34	440	84.93	0.101	6.97	1070	223	44.58
123	123-91-1	Dioxane	HAP	1.03	29	88	0.229	7.35	1520	238	1.38
127	106-89-8	Epichlorohydrin	HAP	1.1812	13	92.52	0.0906	7.07829	1408.87	217.147	26.84
138	106-93-4	Ethylene Dibromide	HAP	1.41	11	187.861	0.043	7.34	1680	245	1.00
141	75-21-8	Ethylene oxide	HAP	0.87	1310	44	0.104	7.13	1050	238	20.61
143	75-34-3	Ethylidene Dichloride	HAP	1.168	193.7641	98.9588	0.0922	0	0	0	1.00
146	50-00-0	Formaldehyde	HAP	0.97	93.6	30	0.178	7.2	971	244	173.25
153	76-44-8	Heptachlor	HAP	1.57	0.0004	373.35	0.0223	--	--	--	0.02
155	87-68-3	Hexachloro-1,3-butadiene	HAP	1.67	0.15	260.8	0.0561	7.49	1960	215	0.01
156	118-74-1	Hexachlorobenzene	HAP	2.04	1.09E-05	284.76	0.0542	9.55	3250	203	6.94E-04
158	67-72-1	Hexachloroethane	HAP	2.09	0.4	236.74	0.0025	7.23	1350	133	1.00
160	302-01-2	Hydrazine	HAP	1	549.348	44.06	0.14037	--	--	--	0.01
175	58-89-9	Lindane	-	1.87	0.000042	290.85	0.027528	--	--	--	0.29
190	60-34-4	Methyl Hydrazine	HAP	0.874	37.0531	46.07	0.071	6.54045	993.538	180.059	1.00
197	101-14-4	Methylenebis (2-chloroaniline)	HAP	1.15	0.00001	267.1533	0.0229	--	--	--	1.00
201	91-20-3	Naphthalene	HAP	1.14	0.05	128.17	0.059	7.37	1970	223	3.94
207	55-18-5	N-Nitrosodiethylamine	-	1	0.89	101.15	0.076547	0	0	273	1.00
208	62-75-9	N-Nitrosodimethylamine	HAP	1.005	2.7	74.08	0.104	--	--	--	0.01
209	924-16-3	N-Nitroso-di-n-butylamine	-	1	0.0469	158.24	0.0442	0	0	273	1.00
224	1336-36-3	PCBs	HAP	1.19	4.05E-05	360.86	0.0228	0	0	0	20.17
229	82-68-8	Pentachloronitrobenzene	HAP	1.41	9.91E-05	295.36	0.0239	--	--	--	91.83
233	85-01-8	Phenanthrene	-	1.18	0.0002	178.22	0.0375	--	--	--	1.00
243	**N590**	POLYCYCLIC AROMATIC COMPOUNDS	HAP	1.351	5.9E-09	252.3092	0.002114554	--	--	--	28.39
262	127-18-4	Tetrachloroethylene	HAP	1.613	15.85929	165.832	0.08	0	0	0	2.92
266	8001-35-2	Toxaphene	HAP	1.65	0.000006	414	0.0217	--	--	--	0.29
269	79-01-6	Trichloroethylene	HAP	1.4	77	131.4	0.079	6.52	1020	193	27.27
279	75-01-4	Vinyl Chloride	HAP	0.91	3877.5	62.5	0.106	6.99	969	251	0.01
280	75-35-4	Vinylidene chloride	HAP	1.213	630	96.97	0.09	6.97	1100	237	1.00

Exterior Pans / Interior Pans / Total Emissions

	CAS	Exterior Pans: Equation 2-16 Exterior T_{corr}	Equation 2-15 Exterior K_{eq}	Equation 2-18 Exterior D_{eff}	Equation 2-19 Exterior K_v	Equation 2-21 Exterior $f_{emitted}$	Equation 2-37 Exterior Emission Flux	Emissions Calculation Exterior Pan Emission Rate	Interior Pans: Equation 2-16 Interior T_{corr}	Equation 2-15 Interior K_{eq}	Equation 2-18 Interior D_{eff}	Equation 2-19 Interior K_v	Equation 2-21 Interior $f_{emitted}$	Equation 2-37 Interior Emission Flux	Emissions Calculation Interior Pan Emission Rate	Emissions Calculation Interior Pan Emission Rate, Annual Avg	Total Emissions
4	79-34-5	3.61E-01	2.83E-06	2.58E-03	5.44E-12	1.58E-04	2.94E-08	5.32E-05	3.61E-01	2.83E-06	2.58E-03	1.39E-12	7.98E-05	1.13E-08	2.20E-05	5.02E-06	7.52E-05
6	79-00-5	4.46E-01	1.38E-05	2.83E-03	2.92E-11	3.66E-04	6.82E-08	1.23E-04	4.46E-01	1.38E-05	2.83E-03	7.45E-12	1.85E-04	2.63E-08	5.10E-05	1.16E-05	1.74E-04
7	75-34-3	5.26E-01	3.10E-04	2.69E-03	6.23E-10	1.69E-03	3.15E-07	5.70E-04	5.26E-01	3.10E-04	2.69E-03	1.59E-10	8.54E-04	1.22E-07	2.36E-04	5.38E-05	8.06E-04
12	96-12-8	3.84E-01	7.32E-07	9.72E-04	5.31E-13	4.94E-05	9.20E-09	1.66E-05	3.84E-01	7.32E-07	9.72E-04	1.36E-13	2.49E-05	3.55E-09	6.88E-06	1.57E-06	2.35E-05
14	107-06-2	1.00E+00	5.99E-05	3.77E-03	1.69E-10	8.80E-04	1.00E-10	1.81E-07	1.00E+00	5.99E-05	3.77E-03	4.31E-11	4.44E-04	3.87E-11	7.50E-08	1.71E-08	2.56E-07
18	106-99-0	6.30E-01	7.22E-04	6.53E-03	3.52E-09	4.02E-03	7.49E-07	1.35E-03	6.30E-01	7.22E-04	6.53E-03	8.99E-10	2.03E-03	2.89E-07	5.60E-04	1.28E-04	1.91E-03
19	542-75-6	4.26E-01	1.64E-05	3.11E-03	3.81E-11	4.18E-04	7.79E-08	1.41E-04	4.26E-01	1.64E-05	3.11E-03	9.73E-12	2.11E-04	3.00E-08	5.82E-05	1.33E-05	1.99E-04
24	88-06-2	1.00E+00	1.45E-08	9.47E-04	1.03E-14	6.87E-06	1.81E-11	3.28E-08	1.00E+00	1.45E-08	9.47E-04	2.63E-15	3.47E-06	7.00E-12	1.36E-08	3.10E-09	4.64E-08
44	75-07-0	5.75E-01	2.30E-04	4.50E-03	7.74E-10	1.88E-03	6.26E-07	1.13E-03	5.75E-01	2.30E-04	4.50E-03	1.98E-10	9.52E-04	2.41E-07	4.68E-04	1.07E-04	1.60E-03
52	79-06-1	2.13E-01	1.07E-09	3.52E-03	2.81E-15	3.59E-06	2.56E-09	4.62E-06	2.13E-01	1.07E-09	3.52E-03	7.17E-16	1.81E-06	9.86E-10	1.91E-06	4.36E-07	6.54E-06
54	107-13-1	5.07E-01	2.96E-05	4.42E-03	9.77E-11	6.69E-04	6.41E-08	1.16E-04	5.07E-01	2.96E-05	4.42E-03	2.49E-11	3.38E-04	2.47E-08	4.79E-05	1.09E-05	1.64E-04
57	62-53-3	2.76E-01	1.27E-07	2.54E-03	2.41E-13	3.32E-05	3.49E-07	6.32E-04	2.76E-01	1.27E-07	2.54E-03	6.15E-14	1.68E-05	1.35E-07	2.61E-04	5.96E-05	8.93E-04
60	71-43-2	4.94E-01	3.70E-05	3.25E-03	8.97E-11	6.41E-04	7.87E-06	1.42E-02	4.94E-01	3.70E-05	3.25E-03	2.29E-11	3.24E-04	3.04E-06	5.89E-03	1.34E-03	2.01E-02
61	191-24-2	1.00E+00	2.79E-16	7.98E-04	1.66E-22	8.73E-10	1.63E-13	2.94E-10	1.00E+00	2.79E-16	7.98E-04	4.24E-23	4.41E-10	6.27E-14	1.22E-10	2.78E-11	4.16E-10
67	111-44-4	3.56E-01	7.97E-07	1.50E-03	8.92E-13	6.39E-05	1.61E-10	2.91E-07	3.56E-01	7.97E-07	1.50E-03	2.28E-13	3.23E-05	6.20E-11	1.20E-07	2.74E-08	4.11E-07
82	56-23-5	5.11E-01	7.22E-05	2.83E-03	1.53E-10	8.36E-04	2.08E-08	3.76E-05	5.11E-01	7.22E-05	2.83E-03	3.90E-11	4.23E-04	8.02E-09	1.55E-05	3.55E-06	5.32E-05
85	57-74-9	1.00E+00	4.01E-11	6.49E-04	1.94E-17	2.99E-07	1.59E-11	2.87E-08	1.00E+00	4.01E-11	6.49E-04	4.96E-18	1.51E-07	6.12E-12	1.19E-08	2.71E-09	4.06E-08
92	67-66-3	5.09E-01	6.13E-05	3.77E-03	1.73E-10	8.90E-04	4.67E-08	8.46E-05	5.09E-01	6.13E-05	3.77E-03	4.41E-11	4.50E-04	1.80E-08	3.50E-05	7.98E-06	1.20E-04
93	74-87-3	6.42E-01	1.20E-03	4.57E-03	4.10E-09	4.34E-03	5.84E-09	1.06E-05	6.42E-01	1.20E-03	4.57E-03	1.05E-09	2.19E-03	2.25E-09	4.37E-06	9.97E-07	1.49E-05
105	117-81-7	1.00E+00	6.06E-15	1.29E-03	5.84E-21	5.17E-09	1.07E-11	1.94E-08	1.00E+00	6.06E-15	1.29E-03	1.49E-21	2.61E-09	4.14E-12	8.02E-09	1.83E-09	2.74E-08
107	132-64-9	1.00E+00	5.56E-09	3.63E-05	1.51E-16	8.31E-07	3.96E-09	7.16E-06	1.00E+00	5.56E-09	3.63E-05	3.85E-17	4.20E-07	1.53E-09	2.96E-06	6.76E-08	1.01E-05
110	75-09-2	5.42E-01	2.04E-04	3.66E-03	5.59E-10	1.60E-03	1.33E-05	2.41E-02	5.42E-01	2.04E-04	3.66E-03	1.43E-10	8.09E-04	5.13E-06	9.94E-03	2.27E-03	3.40E-02
123	123-91-1	4.62E-01	1.19E-05	8.31E-03	7.39E-11	5.82E-04	1.50E-07	2.71E-04	4.62E-01	1.19E-05	8.31E-03	1.89E-11	2.94E-04	5.78E-08	1.12E-04	2.56E-05	3.83E-04
127	106-89-8	4.28E-01	5.20E-06	3.29E-03	1.28E-11	2.42E-04	1.21E-06	2.19E-03	4.28E-01	5.20E-06	3.29E-03	3.26E-12	1.22E-04	4.67E-07	9.05E-04	2.07E-04	3.09E-03
138	106-93-4	4.46E-01	9.29E-06	1.56E-03	1.08E-11	2.23E-04	4.15E-08	7.51E-05	4.46E-01	9.29E-06	1.56E-03	2.76E-12	1.13E-04	1.60E-08	3.10E-05	7.09E-06	1.06E-04
141	75-21-8	5.87E-01	3.41E-04	3.77E-03	9.62E-10	2.10E-03	8.06E-06	1.46E-02	5.87E-01	3.41E-04	3.77E-03	2.45E-10	1.06E-03	3.11E-06	6.03E-03	1.38E-03	2.06E-02
143	75-34-3	1.00E+00	1.93E-04	3.34E-03	4.83E-10	1.49E-03	2.77E-07	5.02E-04	1.00E+00	1.93E-04	3.34E-03	1.23E-10	7.52E-04	1.07E-07	2.07E-04	4.74E-05	7.09E-04
146	50-00-0	6.25E-01	1.77E-05	6.46E-03	8.53E-11	6.25E-04	2.02E-05	3.65E-02	6.25E-01	1.77E-05	6.46E-03	2.18E-11	3.16E-04	7.79E-06	1.51E-02	3.45E-03	5.16E-02
153	76-44-8	1.00E+00	1.51E-09	8.09E-04	9.10E-16	2.04E-06	8.16E-12	1.48E-08	1.00E+00	1.51E-09	8.09E-04	2.32E-16	1.03E-06	3.15E-12	6.10E-09	1.39E-09	2.09E-08
155	87-68-3	3.01E-01	1.19E-07	2.03E-03	1.80E-13	2.88E-05	7.60E-11	1.37E-07	3.01E-01	1.19E-07	2.03E-03	4.61E-14	1.45E-05	2.93E-11	5.68E-08	1.30E-08	1.94E-07
156	118-74-1	1.09E-01	3.42E-12	1.97E-03	5.02E-18	1.52E-07	1.96E-14	3.55E-11	1.09E-01	3.42E-12	1.97E-03	1.28E-18	7.67E-08	7.57E-15	1.47E-11	3.35E-12	5.02E-11
158	67-72-1	1.39E-01	1.33E-07	9.07E-05	8.98E-15	6.42E-06	1.20E-09	2.16E-06	1.39E-01	1.33E-07	9.07E-05	2.29E-15	3.24E-06	4.61E-10	8.94E-07	2.04E-07	3.06E-06
160	302-01-2	1.00E+00	2.44E-04	5.09E-03	9.29E-10	2.06E-03	5.23E-09	9.47E-06	1.00E+00	2.44E-04	5.09E-03	2.37E-10	1.04E-03	2.02E-09	3.91E-06	8.94E-07	1.34E-05
175	58-89-9	1.00E+00	1.23E-10	9.98E-04	9.19E-17	6.49E-07	3.45E-11	6.24E-08	1.00E+00	1.23E-10	9.98E-04	2.35E-17	3.28E-07	1.33E-11	2.58E-08	5.89E-09	8.82E-08
190	60-34-4	4.30E-01	7.41E-06	2.58E-03	1.43E-11	2.56E-04	4.76E-08	8.62E-05	4.30E-01	7.41E-06	2.58E-03	3.64E-12	1.29E-04	1.84E-08	3.56E-05	8.13E-06	1.22E-04
197	101-14-4	1.00E+00	2.69E-11	8.31E-04	1.67E-17	2.77E-07	5.16E-11	9.33E-08	1.00E+00	2.69E-11	8.31E-04	4.27E-18	1.40E-07	1.99E-11	3.86E-08	8.81E-09	1.32E-07
201	91-20-3	3.24E-01	2.09E-08	2.14E-03	3.34E-14	1.24E-05	9.08E-09	1.64E-05	3.24E-01	2.09E-08	2.14E-03	8.54E-15	6.26E-06	3.50E-09	6.79E-06	1.55E-06	2.32E-05
207	55-18-5	1.00E+00	9.08E-07	2.78E-03	1.88E-12	9.29E-05	1.73E-08	3.13E-05	1.00E+00	9.08E-07	2.78E-03	4.81E-13	4.69E-05	6.68E-09	1.29E-05	2.96E-06	4.43E-05
208	62-75-9	1.00E+00	2.02E-06	3.77E-03	5.69E-12	1.61E-04	2.37E-10	4.28E-07	1.00E+00	2.02E-06	3.77E-03	1.45E-12	8.16E-05	9.13E-11	1.77E-07	4.04E-08	6.06E-07
209	924-16-3	1.00E+00	7.49E-08	1.60E-03	8.97E-14	2.03E-05	3.78E-09	6.84E-06	1.00E+00	7.49E-08	1.60E-03	2.29E-14	1.02E-05	1.46E-09	2.83E-06	6.45E-07	9.66E-06
224	1336-36-3	1.00E+00	1.47E-10	8.27E-04	9.11E-17	6.46E-07	2.43E-09	4.39E-06	1.00E+00	1.47E-10	8.27E-04	2.33E-17	3.26E-07	9.37E-10	1.82E-06	4.15E-07	6.21E-06
229	82-68-8	1.00E+00	2.95E-10	8.67E-04	1.91E-16	9.36E-07	1.60E-08	2.90E-05	1.00E+00	2.95E-10	8.67E-04	4.88E-17	4.73E-07	6.18E-09	1.20E-05	2.73E-06	4.10E-05
233	85-01-8	1.00E+00	3.60E-10	1.36E-03	3.65E-16	1.29E-06	2.41E-10	4.36E-07	1.00E+00	3.60E-10	1.36E-03	9.33E-17	6.54E-07	9.30E-11	1.80E-07	4.12E-08	6.17E-07
243	N590	1.00E+00	1.50E-14	7.67E-05	8.60E-22	1.99E-09	1.05E-11	1.90E-08	1.00E+00	1.50E-14	7.67E-05	2.20E-22	1.00E-09	4.05E-12	7.86E-09	1.79E-09	2.69E-08
262	127-18-4	1.00E+00	2.65E-05	2.90E-03	5.75E-11	5.13E-04	2.79E-07	5.05E-04	1.00E+00	2.65E-05	2.90E-03	1.47E-11	2.59E-04	1.08E-07	2.09E-04	4.77E-05	7.14E-04
266	8001-35-2	1.00E+00	2.51E-11	7.87E-04	1.47E-17	2.60E-07	1.38E-11	2.50E-08	1.00E+00	2.51E-11	7.87E-04	3.76E-18	1.31E-07	5.33E-12	1.03E-08	2.36E-09	3.53E-08
269	79-01-6	4.66E-01	4.76E-05	2.87E-03	1.02E-10	6.83E-04	3.47E-06	6.29E-03	4.66E-01	4.76E-05	2.87E-03	2.60E-11	3.45E-04	1.34E-06	2.60E-03	5.93E-04	8.88E-03
279	75-01-4	6.41E-01	1.57E-03	3.84E-03	4.50E-09	4.54E-03	7.96E-09	1.44E-05	6.41E-01	1.57E-03	3.84E-03	1.15E-09	2.29E-03	3.07E-09	5.95E-06	1.36E-06	2.04E-05
280	75-35-4	5.70E-01	3.51E-04	3.26E-03	8.56E-10	1.98E-03	3.69E-07	6.68E-04	5.70E-01	3.51E-04	3.26E-03	2.19E-10	1.00E-03	1.42E-07	2.76E-04	6.30E-05	9.44E-04
																Total VOC (tpy)	0.15
																Total HAP (tpy)	0.15

Reduced Throughput, Outdoor Treatment Pits Total VOC (tpy)	0.10	
Reduced Throughput, Outdoor Treatment Pits Total HAP (tpy)	0.10	
Max, any HAP (tpy)	0.04	Hydrogen Fluoride

New SB Treatment Pits Total VOC (tpy)	0.04		
New SB Treatment Pits Total HAP (tpy)	0.04		
Max, any HAP (tpy)	0.02	Hydrogen Fluoride	0.05
Former SB Treatment Pits Total VOC (tpy)	38.43		
Former SB Treatment Pits Total HAP (tpy)	37.62		

Screening

	CAS	Idaho 586 TAP?	Screening	Annual	T-RACT AACC	50-34VOC Modeled Ambient Impact (ug/m3)	50-34VOC Complies? Impact < T-RACT AACC?
4	79-34-5	Yes	1.1E-05	No	0.17	1.401E-05	Yes
6	79-00-5	Yes	4.2E-04	No	0.62	3.247E-05	Yes
7	75-34-3	Yes	2.5E-04	No	0.38	0.0001501	Yes
12	96-12-8	Yes	1.0E-06	Yes	0.0016	4.381E-06	Yes
14	107-06-2	Yes	2.5E-04	No	0.38	4.778E-08	Yes
18	106-99-0	Yes	2.4E-05	Yes	0.036	0.0003566	Yes
19	542-75-6	Yes	1.7E-03	No	2.5	3.71E-05	Yes
24	88-06-2	Yes	1.2E-03	No	1.8	8.641E-09	Yes
44	75-07-0	Yes	3.0E-03	No	4.5	0.0002982	Yes
52	79-06-1	Yes	5.1E-06	No	45	1.218E-06	Yes
54	107-13-1	Yes	9.8E-05	No	45	3.053E-06	Yes
57	62-53-3	Yes	9.0E-04	No	1.4	0.0001664	Yes
60	71-43-2	Yes	8.0E-04	**Yes**	1.2	0.0037501	**Yes**
61	191-24-2	Yes	**see POM**				
67	111-44-4	Yes	2.0E-05	No	0.03	7.654E-08	Yes
82	56-23-5	Yes	4.4E-04	No	0.67	9.903E-06	Yes
85	57-74-9	Yes	1.8E-04	No	0.027	7.555E-09	Yes
92	67-66-3	Yes	2.8E-04	No	0.43	2.226E-05	Yes
93	74-87-3	Yes	1.9E-03	No	2.8	2.781E-06	Yes
105	117-81-7	Yes	2.8E-02	No	42	5.11E-09	Yes
107	132-64-9	YES	1.5E-10	Yes	2.20E-07	1.885E-07	Yes
110	75-09-2	Yes	1.6E-03	**Yes**	2.4	0.0063336	**Yes**
123	123-91-1	Yes	4.8E-03	No	7.1	7.138E-05	Yes
127	106-89-8	Yes	5.6E-03	No	8.3	0.0005763	Yes
138	106-93-4	Yes	3.0E-05	No	0.045	1.978E-05	Yes
141	75-21-8	Yes	6.7E-05	**Yes**	0.1	0.0038417	**Yes**
143	75-34-3	Yes	2.5E-04	No	0.38	0.0001321	Yes
146	50-00-0	Yes	5.1E-04	**Yes**	0.77	0.0096188	**Yes**
153	76-44-8	Yes	5.1E-06	No	0.0077	3.887E-09	Yes
155	87-68-3	Yes	3.3E-04	No	0.5	3.62E-08	Yes
156	118-74-1	Yes	1.3E-05	No	0.02	9.343E-12	Yes
158	67-72-1	Yes	1.7E-03	No	2.5	5.696E-07	Yes
160	302-01-2	Yes	2.3E-06	No	0.0034	2.493E-06	Yes
175	58-89-9	Yes	1.7E-05	No	0.026	1.643E-08	Yes
190	60-34-4	Yes	2.2E-05	No	0.032	2.269E-05	Yes
197	101-14-4	Yes	1.4E-04	No	0.21	2.458E-08	Yes
201	91-20-3	Yes	9.1E-05	No	1.40E-01		
207	55-18-5	Yes	1.5E-07	Yes	0.00023	8.248E-06	Yes
208	62-75-9	Yes	4.8E-07	No	0.00071	1.128E-07	Yes
209	924-16-3	Yes	4.1E-06	No	0.0063	1.8E-06	Yes
224	1336-36-3	YES	6.6E-05	No	1.00E-01	1.157E-06	Yes
229	82-68-8	Yes	9.1E-05	No	0.14	7.63E-06	Yes
233	85-01-8	Yes	9.1E-05	No	0.14		
243	N590	YES	9.1E-05	No	1.40E-01	5.004E-09	Yes
262	127-18-4	Yes	1.3E-02	No	21	1.33E-04	Yes
266	8001-35-2	Yes	2.0E-05	No	0.03	6.576E-09	Yes
269	79-01-6	Yes	5.1E-04	Yes	7.7	0.0016547	Yes
279	75-01-4	Yes	9.4E-04	No	1.4	3.791E-06	Yes
280	75-35-4	Yes	1.3E-04	No	0.2	0.0001758	Yes

CAS	Compound	HAP?	Annual Emission Rate @ 1,500 ppmw (lb/hr)	50-34VOC Modeled Ambient Impact (ug/m3)	T-RACT AACC (ug/m3)	50-34VOC Percent of T-RACT AACC at concentration of 1,500 ppmw in Wastes	Maximum Treatment Limit (Tons of TAP treated per consecutive 12-month period)	Reduce T/yr limit to Max total T/yr of wastes treated	CAS No.	Pollutant	Pollutant Treatment Limit (lb/yr)	Pollutant Treatment Limit (T/yr)	ppmw in wastes
79-34-5	1,1,2,2-Tetrachloroethane	HAP	7.53E-03	2.10E-02	0.17	12.37%	3,348	3,348					
79-00-5	1,1,2-Trichloroethane	HAP	1.75E-02	4.87E-02	0.62	7.86%	5,270	5,270					
75-34-3	1,1-Dichloroethane	HAP	8.07E-02	2.25E-01	0.38	59.23%	699	699					
96-12-8	1,2-Dibromo-3-chloropropane	HAP	5.65E-04	1.58E-03	0.0016	98.57%			96-12-8	1,2-Dibromo-3-chloropropane	198,720	99.36	**360**
107-06-2	1,2-Dichloroethane	HAP	4.20E-02	1.17E-01	0.38	30.82%	1,343	1,343					
106-99-0	1,3-butadiene	HAP	1.28E-02	3.57E-02	0.036	99.06%			106-99-0	1,3-butadiene	55,200	27.60	**100**
542-75-6	1,3-Dichloropropylene	HAP	1.99E-02	5.57E-02	2.5	2.23%	18,597	18,597					
88-06-2	2,4,6-Trichlorophenol	HAP	3.28E-04	9.14E-04	1.8	0.051%	815,191	276,000					
75-07-0	Acetaldehyde	HAP	8.99E-02	2.51E-01	4.5	5.57%	7,426	7,426					
79-06-1	Acrylamide	HAP	1.71E-04	4.78E-04	45	0.001%	38,996,196	276,000					
107-13-1	Acrylonitrile	HAP	3.19E-02	8.91E-02	45	0.198%	209,082	209,082					
62-53-3	Aniline	HAP	1.59E-03	4.43E-03	1.4	0.32%	130,958	130,958					
71-43-2	**Benzene**	**HAP**	3.06E-02	8.54E-02	1.2	7.12%	5,818	5,818					
191-24-2	Benzo(g,h,i)perylene	-	4.17E-08	1.16E-07	3.00E-03	0.0039%	10,687,996	276,000					
111-44-4	bis(2-Chloroethyl)ether	HAP	3.05E-03	8.51E-03	0.03	28.38%	1,459	1,459					
56-23-5	Carbon Tetrachloride	HAP	3.99E-02	1.11E-01	0.67	16.62%	2,491	2,491					
57-74-9	Chlordane	HAP	1.42E-05	3.98E-05	0.027	0.15%	281,187	276,000					
67-66-3	Chloroform	HAP	4.25E-02	1.18E-01	0.43	27.56%	1,502	1,502					
74-87-3	Chloromethane	HAP	2.07E-01	5.77E-01	2.80	20.62%	2,008	2,008					
117-81-7	Di(2-ethylhexyl) phthalate	HAP	2.47E-07	6.89E-07	42.0	0.000002%	2.52E+10	276,000					
132-64-9	Dibenzofuran	HAP	7.67E-08	2.14E-07	2.20E-07	97.25%			132-64-9	Dibenzofuran	16,008	8.00	**29**
75-09-2	**Dichloromethane**	**HAP**	7.64E-02	2.13E-01	2.40	8.88%	4,662	4,662					
123-91-1	Dioxane	HAP	2.78E-02	7.75E-02	7.10	1.09%	37,942	37,942					
106-89-8	Epichlorohydrin	HAP	1.15E-02	3.22E-02	8.30	0.39%	106,710	106,710					
106-93-4	Ethylene Dibromide	HAP	1.06E-02	2.97E-02	0.045	65.92%	628	628					
75-21-8	**Ethylene oxide**	**HAP**	3.54E-02	9.88E-02	0.100	98.77%			75-21-8	Ethylene oxide	292,560	146.28	**530**
75-34-3	Ethylidene Dichloride	HAP	7.10E-02	1.98E-01	0.380	52.15%	794	794					
50-00-0	**Formaldehyde**	**HAP**	2.98E-02	8.33E-02	0.770	10.82%	3,828	3,828					
76-44-8	Heptachlor	HAP	9.75E-05	2.72E-04	0.0077	3.53%	11,721	11,721					
87-68-3	Hexachloro-1,3-butadiene	HAP	1.37E-03	3.83E-03	0.500	0.766%	54,054	54,054					
118-74-1	Hexachlorobenzene	HAP	7.24E-06	2.02E-05	0.020	0.101%	409,852	276,000					
67-72-1	Hexachloroethane	HAP	3.06E-04	8.54E-04	2.50	0.034%	1,211,281	276,000					
302-01-2	Hydrazine	HAP	1.18E-03	3.30E-03	0.0034	96.96%			302-01-2	Hydrazine	9,936	4.97	**18**
58-89-9	Lindane	-	3.10E-05	8.64E-05	0.026	0.33%	124,548	124,548					
60-34-4	Methyl Hydrazine	HAP	1.14E-02	3.18E-02	0.032	99.27%			60-34-4	Methyl Hydrazine	772,800	386.40	**1400**
101-14-4	Methylenebis (2-chloroaniline) (MC	HAP	1.32E-05	3.69E-05	0.21	0.018%	2,358,466	276,000					
91-20-3	Naphthalene	HAP	5.91E-04	1.65E-03	1.40E-01	1.18%	35,160	35,160					
55-18-5	N-Nitrosodiethylamine	-	7.98E-05	2.23E-04	0.00023	96.82%			55-18-5	N-Nitrosodiethylamine	14,904	7.45	**27**
62-75-9	N-Nitrosodimethylamine	HAP	2.52E-04	7.02E-04	0.00071	98.90%			62-75-9	N-Nitrosodimethylamine	27,048	13.52	**49**
924-16-3	N-Nitroso-di-n-butylamine	-	9.67E-04	2.70E-03	0.0063	42.85%	966	966					
1336-36-3	PCBs	HAP	3.08E-05	8.60E-05	1.00E-01	0.086%	481,220	276,000					
82-68-8	Pentachloronitrobenzene	HAP	4.47E-05	1.25E-04	0.14	0.089%	465,087	276,000					
85-01-8	Phenanthrene	-	6.18E-05	1.72E-04	0.14	0.123%	336,378	276,000					
N590	POLYCYCLIC AROMATIC COMPOUN	-	9.48E-08	2.64E-07	1.40E-01	0.0002%	219,196,847	276,000					
127-18-4	Tetrachloroethylene	HAP	2.45E-02	6.84E-02	21	0.33%	127,176	127,176					
8001-35-2	Toxaphene	HAP	1.24E-05	3.46E-05	0.03	0.12%	358,942	276,000					
79-01-6	Trichloroethylene	HAP	3.26E-02	9.10E-02	7.7	1.18%	35,029	35,029					
75-01-4	Vinyl Chloride	HAP	2.17E-01	6.05E-01	1.4	43.18%	959	959					
75-35-4	Vinylidene chloride	HAP	6.93E-02	1.93E-01	0.2	96.72%	428		75-35-4	Vinylidene chloride	607,200	303.60	**1100**

Reagents	Exterior Processing Rate (tpy)	Interior Processing Rate (tpy)
Solid Waste	337,400	276,000

Emissions Control Efficiencies	
Watering Control Efficiency(%) [1]	70
Building Capture Efficiency (%)	5
Hood Capture Efficiency (%)	0
Curtain Capture Efficiency (%)	95
Dust Collector Efficiency (%)	99.5

[1] U.S. EPA AP-42, Chapter 11, 11.19.2 Crushed Stone Processing (1/95)

	Emission Factors[1]		
	Variable	PM_{10}	$PM_{2.5}$
24-hr	U (mi/hr)	18	18
Annual	U (mi/hr)	10	10
	a	0.4	0.4
	b	1.3	1.3
	c	0.04	0
	k	1.92	0.38

[1] Emission Factors from U.S. EPA AP-42, Section 11.12, Table 11.12-4, June 2006.

$E = k * (0.0032) * [U^a / M^b] + c$

Where:

E = Emission rate in lb/ton of material
k = particle size multiplier
U = Wind speed at drop height (mi/hr)
M = Minimum moisture content (% by weight)
a,b,c = dimmensionless constants

Material is pre-wet with water prior to placement into External stabilization bins.

Speciated HAP

CAS	Material		Composition (PPM)	Exterior Processing Rate (tpy) (T/hr)	Interior Processing Rate (tpy)	Moisture (%)	$PM_{2.5}$ (lb/ton)	PM_{10} (lb/ton)	Uncontrolled Interior $PM_{2.5}$ (tpy)	Uncontrolled Interior PM_{10} (tpy)	Uncontrolled Exterior $PM_{2.5}$ (tpy)	Uncontrolled Exterior PM_{10} (tpy)	Controlled Interior: Building Fugitives Emissions $PM_{2.5}$ (tpy)	Controlled Interior: Building Fugitives Emissions PM_{10} (tpy)	Controlled Interior: Pan Dust Collector Emissions $PM_{2.5}$ (tpy)	Controlled Interior: Pan Dust Collector Emissions PM_{10} (tpy)	Controlled Exterior Emissions $PM_{2.5}$ (tpy)	Controlled Exterior Emissions PM_{10} (tpy)	Total Controlled $PM_{2.5}$ (tpy)	Total Controlled PM_{10} (tpy)	Controlled Exterior Emissions $PM_{2.5}$ (24-hr lb/hr)	Controlled Exterior Emissions PM_{10} (24-hr lb/hr)
-	**Solid Waste Material (annual)**		-	**337,400**	276,000	**4.5**	**0.00043**	**0.0428**	5.97E-02	5.90E+00	**7.29E-02**	**7.21E+00**	2.83E-03	2.80E-01	0.00E+00	0.00E+00	2.19E-02	2.16E+00	2.47E-02	2.44E+00		
	Solid Waste Material (24-hr)			**270**		**1.5**	0.0023	0.0515													1.85E-01	4.17E+00
				50		**4.5**																
1332-21-4	Asbestos (friable)	HAP	2019.05	681.2290909	557.259126	4.5	0.00043	0.0422	1.20E-04	1.18E-02	1.47E-04	1.44E-02	5.72E-06	5.58E-04	0.00E+00	0.00E+00	4.42E-05	4.31E-03	4.99E-05	4.87E-03		
N010	Antimony Compounds	HAP	4.83	1.62933187	1.332826	1.5	0.0023	0.0515	1.52E-06	3.43E-05	1.86E-06	4.20E-05	7.22E-08	1.63E-06	0.00E+00	0.00E+00	5.57E-07	1.26E-05	6.30E-07	1.42E-05		
N020	Arsenic Compounds	HAP	286.65	96.71541175	79.115156	4.5	0.0004	0.0422	1.71E-05	1.67E-03	2.09E-05	2.04E-03	8.12E-07	7.93E-05	0.00E+00	0.00E+00	6.27E-06	6.12E-04	7.08E-06	6.91E-04		
N050	Beryllium Compounds	HAP	0.20	0.066327397	0.054257	4.5	0.0004	0.0422	1.17E-08	1.14E-06	1.43E-08	1.40E-06	5.57E-10	5.44E-08	0.00E+00	0.00E+00	4.30E-09	4.20E-07	4.86E-09	4.74E-07		
N078	Cadmium Compounds	HAP	83.45	28.15594747	23.032132	4.5	0.0004	0.0422	4.98E-06	4.86E-04	6.09E-06	5.94E-04	2.36E-07	2.31E-05	0.00E+00	0.00E+00	1.83E-06	1.78E-04	2.06E-06	2.01E-04		
N090	Chromium Compounds	HAP	3146.52	1061.634664	868.438551	4.5	0.0004	0.0422	1.88E-04	1.83E-02	2.29E-04	2.24E-02	8.92E-06	**8.70E-04**	0.00E+00	**0.00E+00**	6.88E-05	**6.72E-03**	7.78E-05	7.59E-03		
N096	Cobalt Compounds	HAP	184.66	62.30367941	50.965665	1.5	0.0023	0.0515	5.81E-05	1.31E-03	7.11E-05	1.61E-03	2.76E-06	6.24E-05	0.00E+00	0.00E+00	2.13E-05	4.82E-04	2.41E-05	5.44E-04		
N420	Lead Compounds	HAP	0.00	0	0.000000	4.5	0.0004	0.0422	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
N450	Manganese Compounds	HAP	386.63	130.4503003	106.710975	1.5	0.0023	0.0515	1.22E-04	2.75E-03	1.49E-04	3.36E-03	5.78E-06	1.31E-04	0.00E+00	0.00E+00	4.46E-05	1.01E-03	5.04E-05	1.14E-03		
N458	Mercury Compounds	HAP	5.45	1.839165426	1.504474	4.5	0.0004	0.0422	3.25E-07	3.17E-05	3.98E-07	3.88E-05	1.54E-08	1.51E-06	0.00E+00	0.00E+00	1.19E-07	1.16E-05	1.35E-07	1.31E-05		
N495	Nickel Compounds	HAP	640.41	216.0742446	176.753087	4.5	0.0004	0.0422	3.82E-05	3.73E-03	4.67E-05	4.56E-03	1.81E-06	1.77E-04	0.00E+00	0.00E+00	1.40E-05	1.37E-03	1.58E-05	1.54E-03		
N725	Selenium Compounds	HAP	0.00	0	0.000000	1.5	0.0023	0.0515	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
N040	Barium Compounds	---	0.00	0	0.000000	1.5	0.0023	0.0515	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
1344-28-1	Aluminum oxide (fibrous forms)	HAP	0.00	0	0.000000	1.5	0.0023	0.0515	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
1313-27-5	Molybdenum trioxide	---	0.00	0	0.000000	1.5	0.0023	0.0515	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		

Reduced Throughput Total PM HAP **1.47E-02**

Reduced Throughput, Max 6.72E-03 (Chromium compounds)

	ISB Reagents (T/yr)	OSF Uncontrolled Reagent HAPs (T/yr)	Water Sprays (%)	Controlled PM HAPs (T/yr)
Reagent HAPS	2.46E-07	3.35E-07	70	1.00E-07

					0.493	MMBtu/hr	0.343	MMBtu/hr	Months	Days	Hrs/Day	Hr/yr
									5	30	24	3,600

Emission Factors: Used Oil (AP-42, Section 1.11 (10/96) - Atomizing Burner, and Distillate Fuel Oil (#1 or #2, AP-42 Section 1.3 (5/10))

Fuel Type Toggle =	1		Sulfur Content	1.518	weight %
Heat Input Capacity, approx	0.84	MMBtu/hr	Lead Content	0.00109	weight %
Fuel Consumption Rate	6.10E-03	1,000 gal/hr	Ash Content	2.02	weight %
Max Daily Operation	24	hr/day	Fuel Heating Value	137,030	Btu/gal
Max Annual Operation	3,600	hrs/yr	Density =	7.05	lb/gal, AP-42, Table 1.3-12

Pollutant	Emission Factor (lb/1000 gal)	Emissions (lb/hr)	Emissions (T/yr)	Heaters: TAPs Emissions (lb/hr) **Annual** or 24-hr Average	SB Pits: TAPs Emissions (lb/hr) **Annual** or 24-hr Average	Total TAPs Emissions (lb/hr) **Annual** or 24-hr Average	TAPs Screening Emission Level (lb/hr)	Modeling Required?
PM (total)	133.32	8.13E-01	1.46					
PM-10 (total)	115.14	7.02E-01	1.26					
PM-2.5 (total)	101	0.616	1.11					
CO	5	3.05E-02	5.49E-02					
NOx	18	1.10E-01	1.98E-01					
SO_2	142	0.87	1.56E+00					
VOC (TOC EF)	1.00	6.10E-03	1.10E-02					
Lead	5.45E-04	3.32E-06	1.46E-05					
HCl		0.00E+00	0.00E+00	0.00E+00			5.00E-02	No
Dioxins								
Octa CDD[c] (Equiv 2,3,7,8,TCDD)	3.10E-09	5.67E-14	1.02E-13	**2.33E-14**			**1.50E-10**	No
Non-PAH HAPs								
Benzene	2.14E-04	1.31E-06	2.35E-06	**5.36E-07**	**3.06E-02**	**3.06E-02**	**8.00E-04**	YES
Bis(2-ethylhexyl)phthalate (DEHP)		0.00E+00	0.00E+00	**0.00E+00**	---	0.00E+00	**2.80E-02**	No
Butylbenzylphthalate		0.00E+00	0.00E+00		---	0.00E+00		
Dibutylphthalate	3.40E-05	2.07E-07	3.73E-07	2.07E-07	---	2.07E-07	16.4	No
Ethyl benzene	6.36E-05	3.88E-07	6.98E-07	3.88E-07	6.00E-01	6.00E-01	29	No
Formaldehyde	3.30E-02	2.01E-04	3.62E-04	**8.27E-05**	**2.98E-02**	**2.99E-02**	**5.10E-04**	YES
Methyl chloroform (1,1,1-Trichloroethane)	2.36E-04	1.44E-06	2.59E-06	1.44E-06	3.84	3.84	127	No
Toluene	6.20E-03	3.78E-05	6.81E-05	3.78E-05	1.29	1.29	25	No
Xylene	1.09E-04	6.65E-07	1.20E-06	6.65E-07	0.63	0.63	29	No
PAH HAPs								
2-Methylnaphthalene								
3-Methylchloranthrene								
Acenaphthene	2.11E-05	1.29E-07	2.32E-07	**5.29E-08**	**---**	**5.29E-08**	9.10E-05	No
Acenaphthylene	2.53E-07	1.54E-09	2.78E-09	**6.34E-10**	**---**	**6.34E-10**	9.10E-05	No
Anthracene	1.00E-04	6.10E-07	1.10E-06	**2.51E-07**	**---**	**2.51E-07**	9.10E-05	No
Benzo(a)anthracene	4.01E-06	2.45E-08	4.40E-08	**1.01E-08**	**---**	**1.01E-08**	**See POM**	
Benzo(a)pyrene					**---**		**See POM**	
Benzo(b,k)fluoranthene	1.48E-06	9.03E-09	1.63E-08	**3.71E-09**	**---**	**3.71E-09**	**See POM**	
Benzo(e)pyrene					**---**			
Benzo(g,h,i)perylene	2.26E-06	1.38E-08	2.48E-08	**5.67E-09**				
Benzo(b,k)fluoranthene	1.48E-06	9.03E-09	1.63E-08	**3.71E-09**		**3.71E-09**	**See POM**	
Chrysene	2.38E-06	1.45E-08	2.61E-08	**5.97E-09**	**---**	**5.97E-09**	**See POM**	
Dibenzo(a.h)anthracene	1.67E-06	1.02E-08	1.83E-08	**4.19E-09**	**---**	**4.19E-09**	**See POM**	
Dichlorobenzene		0.00E+00	0.00E+00	**0.00E+00**	**---**	**0.00E+00**		
Fluoranthene	4.84E-06	2.95E-08	5.31E-08	**1.21E-08**		**1.21E-08**	9.10E-05	No
Fluorene	4.47E-06	2.73E-08	4.91E-08	**1.12E-08**	**---**	**1.12E-08**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	2.14E-06	1.31E-08	2.35E-08	**5.36E-09**	**---**	**5.36E-09**	**See POM**	
Naphthalene (noncarcinogen)	1.13E-03	6.89E-06	1.24E-05	6.89E-06	3.75E-02	0.04	3.33	No
Naphthalene	1.13E-03	6.89E-06	1.24E-05	**2.83E-06**	**5.91E-04**	**5.94E-04**	**9.10E-05**	YES
Phenanthrene	1.00E-04	6.10E-07	1.10E-06	**2.51E-07**	**6.18E-05**	**6.20E-05**	**9.10E-05**	No
Phenol	2.80E-05	1.71E-07	3.07E-07	7.02E-08	8.93E-02	8.93E-02	1.27E+00	No
Pyrene[c]	8.30E-06	5.06E-08	9.11E-08	**2.08E-08**	**---**	**2.08E-08**	9.10E-05	No
POM (7-PAH Group)		8.03E-08	1.44E-07	**3.30E-08**		**3.30E-08**	**2.00E-06**	No
Metals								
Antimony	4.50E-03	2.75E-05	4.94E-05	2.75E-05	3.01E-02	3.02E-02	3.30E-02	No
Arsenic	6.00E-02	3.66E-04	6.59E-04	**1.50E-04**	**3.01E-02**	**3.03E-02**	**1.50E-06**	YES
Barium								
Beryllium	1.80E-03	1.10E-05	1.98E-05	**4.51E-06**	**2.59E-03**	**2.60E-03**	**2.80E-05**	YES
Cadmium	1.20E-02	7.32E-05	1.32E-04	**3.01E-05**	**2.59E-03**	**2.62E-03**	**3.70E-06**	YES
Chromium, Total	1.80E-01							
Chromium, II and or III	1.48E-01	9.00E-04	1.62E-03	9.00E-04	7.72E-03	8.62E-03	3.30E-02	No
Chromium, Hexavalent	3.24E-02	1.98E-04	3.56E-04	**8.12E-05**	**3.53E-04**	**4.34E-04**	**5.60E-07**	YES
Cobalt	5.20E-03	3.17E-05	5.71E-05	3.17E-05	3.01E-02	3.02E-02	3.30E-03	YES
Manganese	5.00E-02	3.05E-04	5.49E-04	3.05E-04	3.01E-02	3.05E-02	6.70E-02	No

Pollutant	Emission Factor (lb/1000 gal)
CO_2	22,000
Nitrous oxide (N_2O)	0.05
Methane	1.78

	Annual Dispersion Coefficient (ug/m3 per lb/hr)	24-hr Dispersion Coefficient (mg/m3)
QHHEATER	7.54E-01	7.89E-03
SHOPHTR	6.47E-01	5.13E-03

	QHHEATER	SHOPHTR	ISB Impact (ug/m3)	Total Impact (ug/m3)
	4.10E-01	5.90E-01		
Benzene	1.66E-07	2.05E-07	8.54E-02	**8.54E-02**
Formaldehyde	2.56E-05	3.16E-05	**8.33E-02**	**8.33E-02**
Naphthalene	8.75E-07	1.08E-06	**1.65E-03**	**1.65E-03**
Arsenic	4.65E-05	5.74E-05	**2.18E-03**	**2.28E-03**
Beryllium	1.39E-06	1.72E-06	**5.44E-03**	**5.45E-03**
Cadmium	9.29E-06	1.15E-05	**5.44E-03**	**5.46E-03**
Chromium, Hexavalent	2.51E-05	3.10E-05	**7.40E-04**	**7.96E-04**
mg/m3: Cobalt	1.03E-07	9.60E-08	9.48E-04	9.48E-04

$$DSCFM = ACFM \times \frac{459.67^{o}R + 68}{459.67^{o}R + Temp} \times \frac{actual\ P}{14.696\ psi} \times (1 - B_{wo})$$

USEI Elevation = 789 m = 2590 ft

$$Pact = 101325 \times (1 - 2.25577 \times 10\text{-}5 \times (altitude\ in\ m))^{5.25588} = 92.20\ kPa = \boxed{13.372}\ psia$$

	Maintenance Shop Heater	Quonset Hut Heater	
ACFM	360	258	Field measurement
Exhaust Temp (F)	230	160	Field measurement
Volumetric Fraction of Water, B_{wo}	10%	10%	Table 4-2, Combustion Source Evaluation, Student Manual, APTI Course 427, 3rd Edition, (Doyle), http://www.4cleanair.org/APTI/427combined.pdf
DSCFM	226	180	

MAXIMUM GRAIN LOADING

	Maint Shop Heater	Quonset Hut Heater	
Fuel use, gal/hr	3.6	2.5	
PM, lb/hr	0.020	0.014	
PM, gr/min	2.33	1.63	7,000 gr/lb
Exhaust, dscfm	226	180	
Excess Air =	10%	10%	Excess air (typically 5-20% for fuel oil, https://www.engineeringtoolbox.com/boiler-combustion-efficiency-d_271.html)
O_2 %	2	2	See Figure 4-2
Grain loading, gr/dscf @ 3% O_2	**0.0098**	**0.0086**	Conc @ 3%O_2 = Conc x (20.9 - 3.0)/(20.9 - O_2)
Grain loading, gr/dscf @ 3% O_2	0.050	0.050	IDAPA 58.01.01.676 Limit (Oil), Rated heat input ≥ 10 MMBtu/hr
Grain loading, gr/dscf @ 3% O_2	**0.050**	**0.050**	**IDAPA 58.01.01.677 Limit (Oil), Rated heat input < 10 MMBtu/hr**

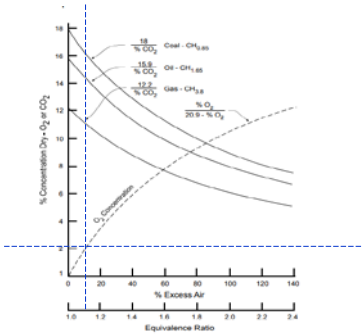

Figure 4-2. Excess Air versus O_2 and CO_2

Figure 4-2, Combustion Source Evaluation, Student Manual, APTI Course 427, 3rd Edition, (Doyle), http://www.4cleanair.org/APTI/427combined.pdf

REAGENT SILO FILLING EMISSIONS

Emission Factors	Uncontrolled		
AP-42, Table 11.12-2 (06/06)	PM	PM_{10}	$PM_{2.5}$
lb of pollutant per ton of material	lb/ton	lb/ton	lb/ton
Cement (or lime) unloading to elevated storage silo	0.73	0.47	0.10095

Metal HAPs (worst case from either Portland cement or cement supplement)

1.70E-05 ppm, total = **3.40E-08 lb HAPs/ton**

Fraction of PM that is $PM_{2.5}$ = 15.00%

Silo Baghouse/Filter Control = 99.5%

*Idaho DEQ Concrete Batch Plant Spreadsheet, https://www.deq.idaho.gov/permitting/air-quality-permitting/permit-to-construct/concrete-batch-plants/

Controlled by Silo Baghouse/Filter

Source	Description	Throughput Limit (T/yr)	PM	PM_{10}	$PM_{2.5}$	HAPs
2014 Permit			T/yr	T/yr	T/yr	T/yr
A_SILO	SB Additive Silo, cement	438,000	0.80	0.51	0.12	3.73E-08
L_SILO	SB Lime Silo					
O_SILO1	Outdoor Stabilization Silo 1	438,000	0.80	0.51	0.12	3.73E-08
O_SILO2	Outdoor Stabilization Silo 1					
O_SILO3	Outdoor Stabilization Silo 1					
		TOTAL	**1.60**	**1.03**	**0.24**	**7.46E-08**

Source	Description	Throughput Limit (T/yr)	PM	PM_{10}	$PM_{2.5}$	HAPs
2020 Application			T/yr	T/yr	T/yr	T/yr
ADD_SILO	SB Additive Silo, cement	337,400	0.616	0.396	0.092	2.87E-08
LIM_SILO	SB Lime Silo					
O_SILO1	Outdoor Stabilization Silo 1	62,500	0.114	0.073	0.017	5.32E-09
O_SILO2	Outdoor Stabilization Silo 1					
O_SILO3	Outdoor Stabilization Silo 1					
		TOTAL	**0.73**	**0.47**	**0.11**	**3.40E-08**

Change in Permitted Allowables

PM	PM_{10}	$PM_{2.5}$	HAPs
T/yr	T/yr	T/yr	T/yr
-0.87	-0.56	-0.13	4.05E-08

Throughput Limit (T/hr)	Max Emission Rates, 24-hr average: PM	PM_{10}	$PM_{2.5}$	Max Emission Rates, 24-hr average: PM_{10}	$PM_{2.5}$	Max Emission Rates, annual average: PM	PM_{10}	$PM_{2.5}$	Max Emission Rates, annual average: PM_{10}	$PM_{2.5}$	Max Metal HAPS	
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	(T/yr)	
50	0.183	0.118	0.027	0.059	0.014		9.05E-02	2.11E-02	4.53E-02	1.05E-02	1.74E-14	ISB
				0.059	0.014				4.53E-02	1.05E-02		
50	0.183	0.118	0.027	0.039	0.009		1.68E-02	3.91E-03	5.59E-03	1.30E-03	3.23E-15	OSF
				0.039	0.009				5.59E-03	1.30E-03		
				0.039	0.009				5.59E-03	1.30E-03		
TOTAL	**0.37**	**0.24**	**0.05**	**0.10**	**0.02**							

Landfill Input Parameters			
Operating life[1]	t_{life}	20.0	years
Total Area	A_{total}	525,633	m^2
Total Depth[2]	d	18.3	m
Gas Constant		82.1	cm3-atm/mol-°K
Temperature	T	21.5	C
Total Number of Cells[3]	N	3.0	
Average Quantity of Waste	Q_{annual}	7,221,500	Mg/yr
Dry bulk density[4]	ρ_b	1.2	g/cm^3
Total Porosity of Waste[4]	ε_t	0.5	
Air-filled Porosity of Waste	ε_a	0.3	
Biodegradation[4]	b	0.0	1/s
Calculation Time	t_{calc}	210,384,000	s
Loading[5]	L	1.2	g/cm^3
Cell Area	A_{cell}	175,211	m^2

[1]Assumes maximum life of a single cell is 20 years
[2]Half of the total unit depth is used for most conservative calculations
[3]Based on total number of subcells in landfill as only one subcell will be open at a time
[4]Default values from EPA IWAIR Model. Biodegradation is assumed to be 0 for landfills.
[5]Loading cannot exceed bulk density based on EPA IWAIR Model

All of the equations used to determine VOC emissions from waste piles were taken from the IWAIR Technical Background Document, Section 2.0 (Source Emission Estimates Using CHEMDAT8).

Equation 2-16

$$T_{corr} = 10^{\left(VP_b \times \left(\frac{-1}{VP_c + T - 27315} - \frac{1}{VP_c + 25}\right)\right)}$$

Where:
VP_b = Antoine's vapor pressure constant B for the constituent
VP_c = Antoine's vapor pressure constant C for the constituent
T = Temperature of the system (K)

Equation 2-15

$$K_{eq} = \frac{T_{corr} \times P_{vap} \times MW_{waste} \times \varepsilon_a}{R \times T \times L}$$

Where:
K_{eq} = vapor/liquid equilibrium coefficient
T_{corr} = temperature correction factor for vapor pressure for cc
P_{vap} = pure component vapor pressure for constituent at 25 C
MW_{waste} = average molecular weight of the waste (g/mol)
ε_a = air-filled porosity (cm^3/cm^3)
R = Universal gas constant
T = Temperature of the system (K)
L = waste loading rate (g/cm^3)

Equation 2-18

$$D_{eff} = D_a \frac{\varepsilon_a^{3.33} \times T_{C,gas}}{\varepsilon_t^{2}}$$

Where:
D_{eff} = effective diffusivity (cm^2/s)
D_a = diffusivitity of the constituent in air (cm^2/s)
$T_{C,gas}$ = temperature correction factor for gas diffusivity $(T/298.15)^{1.75}$
T = temperature of the system (K)
d_{wmu} = characteristic depth (cm)
ε_a = air-filled porosity (cm^3/cm^3)
ε_t = total porosity (cm^3/cm^3)

Equation 2-19

$$K_v = \frac{K_{eq} \times D_{eff}}{d_{wmu}^{2}}$$

Where:
K_v = volatilization rate of the compound (1/s)
K_{eq} = vapor/liquid equilibrium coefficient
D_{eff} = effective diffusivity (cm^2/s)
d_{wmu} = characteristic depth (cm)

Equation 2-21

$$f_{emitted} = 2\left(\frac{K_v \times t}{\pi}\right)^{0.5}\left[1 - \frac{t \times b_{soil}}{3}\right]$$

Where:
$F_{emitted}$ = Fraction of the VOCs emitted during the time period
K_v = volatilization rate of the compound (1/s)
b_{soil}= biological destruction rate in the soil (1/s)
t = residence time (s)

Calculation Time (Equation 2-13)

$$t_{calc} = \frac{t_{life} \times 365.25 \times 24 \times 3{,}600}{N_{cells}}$$

Where:
t_{life} (years) = lifetime of unit and
N_{cells} = number of cells utilized at the landfill

Loading (Equation 2-14)

$$L = \frac{t_{life} \times Q_{annual}}{A_{total} \times d}$$

Where:
t_{life} (years) = lifetime of unit,
Q_{annual} (Mg/yr) = annual waste quantity,
A_{total} (m^2) = total area of unit, and

Landfill Emission Flux Rate (Equation 2-25)

$$E = \frac{Q_{annual} \times C_{waste} \times L \times f_{emitted}}{A_{cell} \times \rho_b \times 365.25 \times 24 \times 3{,}600}$$

Q_{annual} (Mg/yr) = annual waste quantity,
C_{waste} (ppmw) = concentration of constituent in waste,
L(g/cm^3) = loading factor,
$f_{emitted}$ = fraction of constituent emitted to the atmosphere,

CAS	Group ID	HAP	Total Volatile Concentration (ppmw)	Equation 2-16 T_{corr} --	Equation 2-15 K_{eq} (g/cm^3 / g/cm^3)	Equation 2-18 D_{eff} (cm^2/s)	Equation 2-19 K_v (s^{-1})	Equation 2-21 $f_{emitted}$ --	Equation 2-25 E g/m^2-s	Annual VOC Emissions (tpy)
630-20-6	1,1,1,2-Tetrachloroethane	-	0.0	7.92E-01	1.81E-05	2.75E-03	1.49E-14	2.00E-03	0.00E+00	#NAME?
460-73-1	1,1,1,3,3- Pentafluoropropane	-	0.0	1.00E+00	2.70E-05	6.98E-03	5.64E-14	3.89E-03	0.00E+00	#NAME?
71-55-6	1,1,1-Trichloroethane	HAP	0.3	1.00E+00	1.86E-04	3.02E-03	1.68E-13	6.71E-03	2.22E-09	#NAME?
79-34-5	1,1,2,2-Tetrachloroethane	HAP	0.0	7.92E-01	6.97E-06	2.75E-03	5.73E-15	1.24E-03	5.19E-13	#NAME?
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	-	0.0	8.42E-01	5.36E-04	3.02E-03	4.85E-13	1.14E-02	0.00E+00	#NAME?
79-00-5	1,1,2-Trichloroethane	HAP	0.0	8.30E-01	2.89E-05	3.02E-03	2.61E-14	2.64E-03	2.33E-14	#NAME?
75-34-3	1,1-Dichloroethane	HAP	0.0	8.62E-01	5.71E-04	2.88E-03	4.91E-13	1.15E-02	1.19E-14	#NAME?
106-88-7	1,2 Butylene Oxide	HAP	0.0	1.00E+00	1.39E-04	4.14E-03	1.72E-13	6.78E-03	2.74E-12	#NAME?
120-82-1	1,2,4-Trichlorobenzene	HAP	0.0	7.91E-01	2.93E-07	1.16E-03	1.02E-16	1.65E-04	9.11E-18	#NAME?
95-63-6	1,2,4-Trimethylbenzene	-	0.0	7.91E-01	2.26E-06	2.35E-03	1.59E-15	6.52E-04	0.00E+00	#NAME?
107-15-3	1,2-diaminoethane	-	0.0	1.00E+00	6.64E-06	4.55E-03	9.03E-15	1.56E-03	0.00E+00	#NAME?
96-12-8	1,2-Dibromo-3-chloropropane	HAP	0.0	8.01E-01	1.72E-06	1.04E-03	5.33E-16	3.78E-04	0.00E+00	#NAME?
95-50-1	1,2-Dichlorobenzene	-	0.0	7.90E-01	1.97E-06	2.67E-03	1.58E-15	6.50E-04	3.72E-15	#NAME?
107-06-2	1,2-Dichloroethane	HAP	0.0	1.00E+00	6.73E-05	4.03E-03	8.11E-14	4.66E-03	3.00E-11	#NAME?
540-59-0	1,2-Dichloroethylene	-	0.0	8.61E-01	1.89E-04	3.42E-03	1.94E-13	7.20E-03	3.06E-10	#NAME?
78-87-5	1,2-Dichloropropane	HAP	0.0	8.34E-01	4.27E-05	3.03E-03	3.87E-14	3.22E-03	0.00E+00	#NAME?
108-67-8	1,3,5 Trimethylbenzene	-	0.0	1.00E+00	3.27E-06	2.33E-03	2.28E-15	7.81E-04	0.00E+00	#NAME?
106-99-0	1,3-butadiene	HAP	0.0	8.98E-01	1.16E-03	6.98E-03	2.41E-12	2.54E-02	0.00E+00	#NAME?
542-75-6	1,3-Dichloropropylene	HAP	0.4	8.22E-01	3.55E-05	3.32E-03	3.53E-14	3.07E-03	1.48E-09	#NAME?
106-46-7	1,4-Dichlorobenzene	HAP	0.1	7.93E-01	7.92E-07	2.67E-03	6.34E-16	4.12E-04	3.85E-11	#NAME?
90-12-0	1-Methylnaphthalene	-	0.0	1.00E+00	8.68E-08	2.04E-03	5.30E-17	1.19E-04	0.00E+00	#NAME?
540-84-1	2,2,4 Trimethylpentane	HAP	0.0	1.00E+00	5.25E-05	2.84E-03	4.46E-14	3.46E-03	7.97E-12	#NAME?
95-95-4	2,4,5-Trichlorophenol	HAP	0.1	1.00E+00	2.24E-06	1.13E-03	7.54E-16	4.50E-04	5.88E-11	#NAME?
88-06-2	2,4,6-Trichlorophenol	HAP	0.0	1.00E+00	1.63E-08	1.01E-03	4.94E-18	3.64E-05	1.17E-14	#NAME?
94-75-7	2,4-D	-	110.2	1.00E+00	1.83E-07	2.46E-03	1.34E-16	1.90E-04	2.73E-08	#NAME?
95-80-7	2,4-Diaminotoluene	HAP	0.0	6.72E-01	1.48E-09	3.88E-05	1.71E-20	2.14E-06	0.00E+00	#NAME?
120-83-2	2,4-Dichlorophenol	-	0.0	7.37E-01	1.63E-07	1.90E-03	9.26E-17	1.57E-04	0.00E+00	#NAME?
105-67-9	2,4-Dimethylphenol	-	0.0	1.00E+00	1.41E-07	2.49E-03	1.05E-16	1.68E-04	0.00E+00	#NAME?
51-28-5	2,4-Dinitrophenol	HAP	0.0	7.33E-01	9.35E-10	1.06E-03	2.96E-19	8.90E-06	0.00E+00	#NAME?
121-14-2	2,4-Dinitrotoluene	HAP	0.0	7.66E-01	3.16E-10	7.87E-03	7.44E-19	1.41E-05	4.54E-15	#NAME?
87-65-0	2,6-Dichlorophenol	-	0.0	7.59E-01	4.77E-08	1.90E-03	2.70E-17	8.51E-05	0.00E+00	#NAME?
576-26-1	2,6-Dimethylphenol	-	0.0	1.00E+00	2.38E-07	3.88E-05	2.76E-18	2.72E-05	0.00E+00	#NAME?
53-96-3	2-Acetylaminofluorene	HAP	0.0	6.71E-01	2.04E-09	9.22E-04	5.62E-19	1.23E-05	0.00E+00	#NAME?
111-76-2	2-butoxyethanol	-	0.0	1.00E+00	1.38E-06	2.54E-03	1.05E-15	5.31E-04	0.00E+00	#NAME?
110-75-8	2-Chloroethyl vinyl ether	-	0.0	1.00E+00	2.98E-05	3.27E-03	2.92E-14	2.79E-03	0.00E+00	#NAME?
95-57-8	2-Chloropchenol	-	0.0	7.78E-01	2.87E-06	2.56E-03	2.19E-15	7.66E-04	0.00E+00	#NAME?
109-86-4	2-Methoxyethanol	-	0.0	1.00E+00	8.62E-06	3.69E-03	9.50E-15	1.60E-03	0.00E+00	#NAME?
88-85-7	2-sec-Butyl-4,6-dinitrophenol/Dinoseb	-	0.0	1.00E+00	2.04E-10	9.49E-04	5.80E-20	3.94E-06	0.00E+00	#NAME?
107-05-1	3-Chloropropylene	HAP	0.0	8.73E-01	2.79E-04	4.51E-03	3.76E-13	1.00E-02	0.00E+00	#NAME?
101-77-9	4,4'-Methylenedianiline	HAP	0.0	1.00E+00	4.42E-13	1.05E-03	1.38E-22	1.93E-07	7.25E-16	#NAME?
534-52-1	4,6-Dinitro-o-cresol	-	0.0	1.00E+00	2.47E-10	1.07E-03	7.89E-20	4.60E-06	0.00E+00	#NAME?
99-55-8	5-Nitro-o-toluidine	HAP	0.0	1.00E+00	1.31E-07	1.95E-03	7.64E-17	1.43E-04	0.00E+00	#NAME?
30560-19-1	Acephate	-	0.0	1.00E+00	3.53E-12	1.08E-03	1.13E-21	5.51E-07	0.00E+00	#NAME?
75-07-0	Acetaldehyde	HAP	17.0	8.79E-01	3.96E-04	4.81E-03	5.69E-13	1.23E-02	2.74E-07	#NAME?
60-35-5	Acetamide	HAP	0.0	1.00E+00	6.53E-09	4.85E-03	9.47E-18	5.04E-05	2.47E-13	#NAME?
64-19-7	Acetic Acid	-	0.0	1.00E+00	1.05E-05	4.38E-03	1.37E-14	1.92E-03	0.00E+00	#NAME?
67-64-1	Acetone	-	15.3	8.60E-01	1.31E-04	4.81E-03	1.89E-13	7.11E-03	1.42E-07	#NAME?
75-86-5	Acetone Cyanohydrin	-	0.0	1.00E+00	7.71E-07	3.33E-03	7.68E-16	4.54E-04	0.00E+00	#NAME?
75-05-8	Acetonitrile	HAP	15.1	8.49E-01	2.88E-05	4.96E-03	4.28E-14	3.39E-03	6.69E-08	#NAME?
98-86-2	Acetophenone	HAP	0.0	7.71E-01	1.05E-06	2.33E-03	7.30E-16	4.42E-04	8.33E-14	#NAME?
107-02-8	Acrolein	HAP	0.0	8.67E-01	1.35E-04	4.07E-03	1.64E-13	6.62E-03	0.00E+00	#NAME?
79-06-1	Acrylamide	HAP	0.1	6.99E-01	3.94E-09	3.76E-03	4.43E-18	3.44E-05	4.35E-12	#NAME?
79-10-7	Acrylic acid	HAP	1.6	8.49E-01	2.75E-06	3.80E-03	3.13E-15	9.15E-04	1.95E-09	#NAME?
107-13-1	Acrylonitrile	HAP	0.0	8.55E-01	5.60E-05	4.73E-03	7.92E-14	4.61E-03	1.85E-11	#NAME?
111-69-3	Adiponitrile	-	0.0	1.00E+00	8.33E-10	2.77E-03	6.90E-19	1.36E-05	0.00E+00	#NAME?
7664-41-7	Ammonia	-	0.0	8.97E-01	6.92E-05	1.00E-02	2.08E-13	7.46E-03	0.00E+00	#NAME?
62-53-3	Aniline	HAP	0.0	7.46E-01	3.86E-07	2.71E-03	3.13E-16	2.90E-04	5.61E-12	#NAME?
120-12-7	Anthracene	-	0.0	7.10E-01	1.43E-06	1.49E-03	6.40E-16	4.14E-04	0.00E+00	#NAME?
98-87-3	Benzal chloride	-	0.0	1.00E+00	8.58E-07	1.84E-03	4.73E-16	3.56E-04	0.00E+00	#NAME?

CAS	Group ID	HAP	Total Volatile Concentration (ppmw)	Equation 2-16 T_{corr} --	Equation 2-15 K_{eq} (g/cm^3 / g/cm^3)	Equation 2-18 D_{eff} (cm^2/s)	Equation 2-19 K_v (s^{-1})	Equation 2-21 $f_{emitted}$ --	Equation 2-25 E g/m^2-s	Annual VOC Emissions (tpy)
71-43-2	Benzene	HAP	9.6	8.50E-01	7.15E-05	3.47E-03	7.41E-14	4.46E-03	5.58E-08	#NAME?
191-24-2	Benzo(g,h,i)perylene	-	0.0	1.00E+00	3.13E-16	8.53E-04	7.98E-26	4.62E-09	0.00E+00	#NAME?
62-23-7	BENZOIC ACID, 4-NITRO	-	0.0	1.00E+00	0.00E+00	3.88E-05	0.00E+00	0.00E+00	0.00E+00	#NAME?
100-44-7	Benzyl Chloride	HAP	0.0	7.95E-01	1.14E-06	2.77E-03	9.45E-16	5.03E-04	0.00E+00	#NAME?
92-52-4	Biphenyl	HAP	0.0	7.31E-01	2.62E-08	1.57E-03	1.23E-17	5.73E-05	2.07E-13	#NAME?
92-54-4	1-Phenylpiperazine	-	0.0	7.31E-01	2.62E-08	1.57E-03	1.23E-17	5.73E-05	0.00E+00	#NAME?
111-91-1	bis(2-Chloroethoxy)methane	-	0.0	1.00E+00	4.91E-07	1.69E-03	2.48E-16	2.58E-04	0.00E+00	#NAME?
111-44-4	bis(2-Chloroethyl)ether	HAP	0.0	7.88E-01	1.98E-06	1.60E-03	9.47E-16	5.04E-04	0.00E+00	#NAME?
39638-32-9	bis(2-Chloroisopropyl)ether	-	0.0	1.00E+00	2.15E-06	1.72E-03	1.11E-15	5.44E-04	0.00E+00	#NAME?
75-27-4	Bromodichloromethane	-	0.0	8.45E-01	9.28E-05	2.17E-03	6.04E-14	4.02E-03	0.00E+00	#NAME?
75-25-2	Bromoform	HAP	0.0	8.21E-01	1.27E-05	5.77E-04	2.19E-15	7.67E-04	1.42E-11	#NAME?
74-83-9	Bromomethane	HAP	0.1	8.88E-01	1.52E-03	2.82E-03	1.28E-12	1.85E-02	2.42E-09	#NAME?
141-32-2	Butyl Acrylate	-	0.0	1.00E+00	1.45E-05	2.21E-03	9.57E-15	1.60E-03	0.00E+00	#NAME?
71-36-3	Butyl Alcohol	-	7.8	7.66E-01	9.98E-06	3.10E-03	9.25E-15	1.57E-03	1.60E-08	#NAME?
2426-08-6	Butyl Glycidyl Ether	-	0.0	1.00E+00	4.72E-06	6.98E-03	9.84E-15	1.62E-03	0.00E+00	#NAME?
109-79-5	Butyl Mercaptan	-	0.0	8.39E-01	3.90E-05	3.61E-03	4.21E-14	3.36E-03	0.00E+00	#NAME?
123-72-8	Butyraldehyde	-	0.0	8.50E-01	6.36E-05	3.55E-03	6.74E-14	4.25E-03	0.00E+00	#NAME?
107-92-6	Butyric Acid	-	0.0	1.00E+00	4.29E-07	4.23E-07	5.43E-20	3.81E-06	0.00E+00	#NAME?
109-74-0	Butyronitrile	-	0.0	8.25E-01	1.34E-05	3.62E-03	1.45E-14	1.97E-03	0.00E+00	#NAME?
133-06-2	Captan	HAP	21.6	1.00E+00	3.07E-13	3.88E-05	3.55E-24	3.08E-08	8.69E-13	#NAME?
63-25-2	Carbaryl	HAP	0.2	1.00E+00	3.10E-12	1.06E-03	9.84E-22	5.14E-07	1.02E-13	#NAME?
75-15-0	Carbon disulfide	HAP	0.0	8.76E-01	2.76E-04	4.03E-03	3.33E-13	9.44E-03	2.32E-11	#NAME?
56-23-5	Carbon Tetrachloride	HAP	0.1	8.57E-01	1.36E-04	3.02E-03	1.23E-13	5.74E-03	1.03E-09	#NAME?
55285-14-8	Carbosulfan	-	0.0	1.00E+00	5.41E-05	6.70E-04	1.08E-14	1.70E-03	0.00E+00	#NAME?
120-80-9	Catechol	HAP	0.0	1.00E+00	3.77E-08	3.88E-05	4.37E-19	1.08E-05	5.13E-13	#NAME?
57-74-9	Chlordane	HAP	0.1	1.00E+00	4.50E-11	6.94E-04	9.34E-21	1.58E-06	2.07E-13	#NAME?
7782-50-5	Chlorine	HAP	0.0	1.00E+00	6.11E-03	3.95E-03	7.20E-12	4.39E-02	6.74E-10	#NAME?
79-11-8	Chloroacetic Acid	HAP	0.0	7.15E-01	1.26E-07	3.55E-03	1.34E-16	1.90E-04	1.76E-12	#NAME?
108-90-7	Chlorobenzene	HAP	0.0	8.22E-01	9.22E-06	2.83E-03	7.80E-15	1.45E-03	4.83E-13	#NAME?
510-15-6	Chlorobenzilate	HAP	0.0	1.00E+00	2.28E-11	8.80E-04	6.01E-21	1.27E-06	0.00E+00	#NAME?
124-48-1	Chlorodibromomethane	-	0.0	8.26E-01	2.92E-05	1.42E-03	1.24E-14	1.82E-03	0.00E+00	#NAME?
75-00-3	Chloroethane	HAP	0.0	8.87E-01	7.78E-04	1.05E-02	2.44E-12	2.56E-02	0.00E+00	#NAME?
67-66-3	Chloroform	HAP	0.1	8.57E-01	1.16E-04	4.03E-03	1.40E-13	6.12E-03	9.27E-10	#NAME?
74-87-3	Chloromethane	HAP	0.0	9.03E-01	1.90E-03	4.88E-03	2.77E-12	2.72E-02	0.00E+00	#NAME?
126-99-8	Chloroprene	HAP	0.0	8.59E-01	1.02E-04	4.03E-03	1.23E-13	5.73E-03	0.00E+00	#NAME?
156-59-2	cis-1,2-Dichloroethylene	-	0.0	8.61E-01	1.89E-04	6.98E-03	3.95E-13	1.03E-02	0.00E+00	#NAME?
10061-01-5	cis-1,3-Dichloropropylene	-	0.0	8.47E-01	4.58E-05	2.43E-03	3.32E-14	2.98E-03	4.08E-19	#NAME?
1319-77-3	Cresol	HAP	0.0	7.76E-01	8.36E-07	2.82E-03	7.06E-16	4.35E-04	8.24E-12	#NAME?
98-82-8	Cumene	HAP	1.0	8.04E-01	2.83E-05	2.52E-03	2.13E-14	2.39E-03	3.13E-09	#NAME?
592-01-8	Cyanide Compounds	HAP	0.0	1.00E+00	1.43E-04	6.04E-03	2.59E-13	8.32E-03	0.00E+00	#NAME?
110-82-7	Cyclohexane	-	0.0	8.53E-01	8.14E-05	3.25E-03	7.91E-14	4.60E-03	0.00E+00	#NAME?
108-94-1	Cyclohexanone	-	0.0	8.02E-01	4.28E-06	3.04E-03	3.89E-15	1.02E-03	0.00E+00	#NAME?
110-83-8	Cyclohexene	-	0.0	8.52E-01	5.31E-05	3.22E-03	5.12E-14	3.70E-03	0.00E+00	#NAME?
287-92-3	Cyclopentane	-	0.0	8.71E-01	2.77E-04	3.97E-03	3.29E-13	9.38E-03	0.00E+00	#NAME?
5989-27-5	d- Limonene	-	0.0	1.00E+00	2.20E-06	2.28E-03	1.50E-15	6.34E-04	0.00E+00	#NAME?
117-81-7	Di(2-ethylhexyl) phthalate	HAP	0.5	1.00E+00	6.81E-15	1.38E-03	2.81E-24	2.74E-08	1.79E-14	#NAME?
333-41-5	Diazinon	-	0.0	1.00E+00	3.50E-10	1.63E-03	1.70E-19	6.76E-06	0.00E+00	#NAME?
132-64-9	Dibenzofuran	HAP	4.4	1.00E+00	6.25E-09	3.88E-05	7.24E-20	4.40E-06	2.55E-11	#NAME?
74-95-3	Dibromomethane	-	0.0	1.00E+00	8.75E-05	1.67E-03	4.36E-14	3.42E-03	0.00E+00	#NAME?
84-74-2	Dibutyl phthalate	HAP	0.1	1.00E+00	2.69E-11	1.64E-03	1.32E-20	1.88E-06	1.83E-13	#NAME?
75-09-2	Dichloromethane	HAP	4.0	8.69E-01	3.68E-04	3.91E-03	4.30E-13	1.07E-02	5.57E-08	#NAME?
34077-87-7	Dichlorotrifluoroethane	-	0.0	1.00E+00	1.41E-03	1.81E-03	7.64E-13	1.43E-02	0.00E+00	#NAME?
77-73-6	Dicyclopentadiene	-	0.0	1.00E+00	1.50E-05	2.16E-03	9.67E-15	1.61E-03	0.00E+00	#NAME?
111-42-2	Diethanolamine	HAP	103.4	1.00E+00	1.19E-08	2.96E-03	1.06E-17	5.32E-05	7.18E-09	#NAME?
64-67-5	Diethyl sulfate	HAP	0.0	1.00E+00	3.61E-07	2.54E-03	2.74E-16	2.71E-04	0.00E+00	#NAME?
100-37-8	Diethylaminoethanol	-	0.0	1.00E+00	2.79E-05	2.56E-03	2.14E-14	2.39E-03	0.00E+00	#NAME?
108-83-8	Diisobutyl Ketone	-	0.0	1.00E+00	3.87E-06	2.02E-03	2.34E-15	7.92E-04	0.00E+00	#NAME?
27215-10-7	Di-iso-octyl acid phosphate	-	0.0	1.00E+00	1.00E-12	1.57E-03	4.70E-22	3.55E-07	0.00E+00	#NAME?
121-69-7	Dimethyl Aniline	HAP	0.0	9.19E-01	6.56E-07	5.93E-03	1.16E-15	5.58E-04	1.95E-12	#NAME?
131-11-3	Dimethyl phthalate	HAP	0.0	9.19E-01	6.23E-09	2.20E-03	4.10E-18	3.31E-05	6.57E-13	#NAME?
89396-94-1	Dinitrobutyl phenol	-	0.0	1.00E+00	2.72E-06	2.60E-04	2.11E-16	2.38E-04	0.00E+00	#NAME?
25321-14-6	Dinitrotoluene (mixed isomers)	1.32	0.0	7.66E-01	1.57E-11	3.88E-05	1.82E-22	2.21E-07	0.00E+00	#NAME?
621-64-7	Di-n-propylnitrosamine	-	0.0	1.00E+00	1.19E-07	2.42E-03	8.59E-17	1.52E-04	0.00E+00	#NAME?
123-91-1	Dioxane	HAP	0.0	8.37E-01	2.42E-05	8.87E-03	6.42E-14	4.15E-03	4.07E-11	#NAME?
138-86-3	Dipentene	-	0.0	1.00E+00	2.38E-06	6.98E-03	4.96E-15	1.15E-03	0.00E+00	#NAME?
122-39-4	Diphenylamine (difficult to distinguish from diphe	-	0.0	1.00E+00	1.54E-09	2.25E-03	1.04E-18	1.67E-05	0.00E+00	#NAME?
142-84-7	Dipropylamine	-	0.0	1.00E+00	2.30E-05	2.58E-03	1.78E-14	2.18E-03	0.00E+00	#NAME?
106-89-8	Epichlorohydrin	HAP	0.1	8.23E-01	1.12E-05	3.51E-03	1.18E-14	1.78E-03	1.88E-10	#NAME?
64-17-5	Ethanol	-	4.3	1.00E+00	2.61E-05	4.77E-03	3.72E-14	3.16E-03	1.77E-08	#NAME?
141-43-5	Ethanolamine	-	0.0	1.00E+00	2.80E-07	4.15E-03	3.47E-16	3.05E-04	0.00E+00	#NAME?
141-78-6	Ethyl acetate	-	0.1	8.43E-01	8.41E-05	2.84E-03	7.14E-14	4.37E-03	4.16E-10	#NAME?
140-88-5	Ethyl Acrylate	HAP	0.4	8.42E-01	3.82E-05	2.98E-03	3.41E-14	3.02E-03	1.74E-09	#NAME?
60-29-7	Ethyl ether	-	0.0	1.00E+00	6.38E-04	3.03E-03	5.78E-13	1.24E-02	0.00E+00	#NAME?
75-08-1	Ethyl Mercaptan	-	0.0	8.75E-01	2.72E-04	4.31E-03	3.50E-13	9.69E-03	0.00E+00	#NAME?
97-63-2	Ethyl methacrylate	-	0.0	1.00E+00	2.66E-05	2.53E-03	2.02E-14	2.32E-03	0.00E+00	#NAME?
352-93-2	Ethyl Sulfide	-	0.0	1.00E+00	5.13E-04	3.03E-03	4.64E-13	1.12E-02	0.00E+00	#NAME?
100-41-4	Ethylbenzene	HAP	1.1	8.16E-01	9.36E-06	2.91E-03	8.13E-15	1.48E-03	2.12E-09	#NAME?
74-85-1	Ethylene	-	0.0	9.41E-01	1.35E-05	6.75E-03	2.72E-14	2.70E-03	0.00E+00	#NAME?
106-93-4	Ethylene Dibromide	HAP	0.0	8.30E-01	1.94E-05	1.67E-03	9.68E-15	1.61E-03	0.00E+00	#NAME?
107-21-1	Ethylene Glycol	HAP	11.7	7.24E-01	3.05E-08	4.19E-03	3.82E-17	1.01E-04	1.55E-09	#NAME?
628-96-6	Ethylene Glycol Dinitrate	-	0.0	1.00E+00	8.61E-08	1.83E-03	4.71E-17	1.12E-04	0.00E+00	#NAME?
75-21-8	Ethylene oxide	HAP	0.0	8.84E-01	5.78E-04	4.03E-03	6.96E-13	1.37E-02	4.13E-10	#NAME?
96-45-7	Ethylene thiourea	HAP	0.0	1.00E+00	2.35E-12	3.11E-03	2.18E-21	7.65E-07	0.00E+00	#NAME?
75-34-3	Ethylidene Dichloride	HAP	0.0	1.00E+00	2.17E-04	3.57E-03	2.32E-13	7.88E-03	8.19E-15	#NAME?
16219-75-3	Ethylidene-2-norbornene	-	0.0	1.00E+00	6.26E-06	2.47E-03	4.63E-15	1.11E-03	0.00E+00	#NAME?
206-44-0	Fluoranthene	-	0.0	4.95E-01	1.04E-11	9.73E-04	3.03E-21	9.01E-07	0.00E+00	#NAME?
50-00-0	Formaldehyde	HAP	2.1	8.97E-01	2.85E-05	6.90E-03	5.89E-14	3.97E-03	1.10E-08	#NAME?
64-18-6	Formic acid	-	0.0	8.45E-01	1.85E-05	3.06E-03	1.69E-14	2.13E-03	0.00E+00	#NAME?

CAS	Group ID	HAP	Total Volatile Concentration (ppmw)	Equation 2-16 T_{corr} --	Equation 2-15 K_{eq} (g/cm^3 / g/cm^3)	Equation 2-18 D_{eff} (cm^2/s)	Equation 2-19 K_v (s^{-1})	Equation 2-21 $f_{emitted}$ --	Equation 2-25 E g/m^2-s	Annual VOC Emissions (tpy)
111-0-9	Furan	-	0.0	1.00E+00	4.02E-04	4.06E-03	4.88E-13	1.14E-02	0.00E+00	#NAME?
111-30-8	Glutaraldehyde	-	0.0	1.00E+00	3.24E-06	2.99E-03	2.90E-15	8.82E-04	0.00E+00	#NAME?
N230	Glycol Ethers	-	1.7	1.00E+00	5.17E-06	3.44E-03	5.32E-15	1.19E-03	2.61E-09	#NAME?
107-16-4	Glycolonitrile	-	0.0	1.00E+00	4.85E-07	4.60E-03	6.67E-16	4.23E-04	0.00E+00	#NAME?
50-01-1	GUANIDINIUM CHLORIDE	-	0.1	1.00E+00	0.00E+00	3.88E-05	0.00E+00	0.00E+00	0.00E+00	#NAME?
76-44-8	Heptachlor	HAP	0.0	1.00E+00	1.69E-09	8.64E-04	4.37E-19	1.08E-05	0.00E+00	#NAME?
142-82-5	Heptane	-	0.0	8.39E-01	3.57E-05	3.59E-03	3.83E-14	3.20E-03	0.00E+00	#NAME?
87-68-3	Hexachloro-1,3-butadiene	HAP	0.0	7.59E-01	3.36E-07	2.17E-03	2.19E-16	2.42E-04	7.79E-14	#NAME?
118-74-1	Hexachlorobenzene	HAP	0.0	6.02E-01	2.12E-11	2.10E-03	1.33E-20	1.89E-06	6.08E-16	#NAME?
77-47-4	Hexachlorocyclopentadiene	HAP	0.0	7.73E-01	1.43E-07	1.08E-03	4.64E-17	1.11E-04	0.00E+00	#NAME?
67-72-1	Hexachloroethane	HAP	0.0	6.43E-01	6.90E-07	9.69E-05	2.00E-17	7.32E-05	2.36E-14	#NAME?
110-54-3	Hexane (n-Hexane)	HAP	0.0	8.59E-01	1.26E-04	7.75E-03	2.91E-13	8.84E-03	1.03E-10	#NAME?
302-01-2	Hydrazine	HAP	0.1	1.00E+00	2.74E-04	5.44E-03	4.46E-13	1.09E-02	9.46E-10	#NAME?
7647-01-0	Hydrogen Chloride	HAP	3.4	1.00E+00	2.81E-04	5.94E-03	4.99E-13	1.16E-02	5.09E-08	#NAME?
7664-39-3	Hydrogen Fluoride	HAP	1.8	8.92E-01	8.09E-05	1.50E-02	3.64E-13	9.87E-03	2.28E-08	#NAME?
2148878	Hydrogen Sulfide	-	0.0	9.21E-01	5.40E-03	6.82E-03	1.10E-11	5.43E-02	0.00E+00	#NAME?
123-31-9	Hydroquinone	HAP	0.2	6.27E-01	3.13E-06	2.65E-03	2.48E-15	8.15E-04	2.00E-10	#NAME?
74-88-4	Iodomethane	HAP	0.0	8.73E-01	5.62E-04	2.03E-03	3.41E-13	9.56E-03	0.00E+00	#NAME?
123-92-2	Isoamyl Acetate	-	0.0	1.00E+00	5.90E-06	2.27E-03	4.01E-15	1.04E-03	0.00E+00	#NAME?
123-51-3	Isoamyl Alcohol	-	0.0	1.00E+00	2.80E-05	3.34E-03	2.79E-14	2.73E-03	0.00E+00	#NAME?
78-83-1	Isobutyl alcohol	-	0.0	7.72E-01	6.47E-06	3.33E-03	6.45E-15	1.31E-03	1.41E-11	#NAME?
78-82-0	Isobutyronitrile	-	0.0	8.25E-01	6.46E-05	4.02E-03	7.77E-14	4.56E-03	0.00E+00	#NAME?
107-83-5	Isohexane	-	0.0	1.00E+00	3.03E-04	3.08E-03	2.79E-13	8.64E-03	0.00E+00	#NAME?
78-59-1	Isophorone	HAP	0.0	7.90E-01	3.71E-07	2.34E-02	2.60E-15	8.34E-04	3.09E-11	#NAME?
78-79-5	isoprene	-	0.0	1.00E+00	4.24E-04	6.98E-03	8.84E-13	1.54E-02	0.00E+00	#NAME?
67-63-0	Isopropyl alcohol	-	0.0	8.07E-01	2.20E-05	3.80E-03	2.50E-14	2.59E-03	0.00E+00	#NAME?
120-58-1	Isosafrole	-	0.0	1.00E+00	1.54E-07	1.72E-03	7.96E-17	1.46E-04	0.00E+00	#NAME?
58-89-9	Lindane	-	0.1	1.00E+00	1.38E-10	1.07E-03	4.41E-20	3.44E-06	4.50E-13	#NAME?
121-75-5	Malathion	-	0.0	6.23E-01	9.33E-11	8.37E-04	2.34E-20	2.50E-06	0.00E+00	#NAME?
108-31-6	Maleic anhydride	HAP	0.0	1.00E+00	2.78E-07	3.68E-03	3.06E-16	2.86E-04	0.00E+00	#NAME?
108-39-4	m-Cresol	HAP	0.0	7.41E-01	3.63E-08	2.87E-03	3.11E-17	9.13E-05	1.81E-12	#NAME?
541-73-1	m-Dichlorobenzene	-	0.0	8.01E-01	3.04E-06	2.68E-03	2.44E-15	8.08E-04	2.10E-14	#NAME?
141-79-7	Mesityl Oxide	-	0.0	8.14E-01	7.78E-07	2.84E-03	6.61E-16	4.21E-04	0.00E+00	#NAME?
126-98-7	Methacrylonitrile	-	0.0	1.00E+00	4.94E-05	4.35E-03	6.43E-14	4.15E-03	0.00E+00	#NAME?
67-56-1	Methanol	HAP	15.5	8.31E-01	3.02E-05	5.81E-03	5.25E-14	3.75E-03	7.61E-08	#NAME?
72-43-5	Methoxychlor	HAP	0.1	1.00E+00	9.79E-12	7.13E-04	2.09E-21	7.48E-07	9.78E-14	#NAME?
66-27-3	Methyl methanesulfonate	-	0.0	1.00E+00	3.87E-07	2.39E-03	2.76E-16	2.72E-04	0.00E+00	#NAME?
96-33-3	Methyl Acrylate	-	0.0	8.56E-01	3.34E-05	3.36E-03	3.35E-14	3.00E-03	0.00E+00	#NAME?
110-43-0	Methyl Amyl Ketone	-	0.0	1.00E+00	3.88E-06	2.40E-03	2.79E-15	8.64E-04	0.00E+00	#NAME?
108-10-1	Methyl Butyl Ketone	HAP	63.7	1.00E+00	2.27E-06	2.99E-03	2.03E-15	7.37E-04	6.14E-08	#NAME?
624-92-0	Methyl Disulfide	-	0.0	8.37E-01	2.55E-05	3.24E-03	2.47E-14	2.57E-03	0.00E+00	#NAME?
78-93-3	Methyl ethyl ketone	-	0.1	8.48E-01	6.93E-05	3.13E-03	6.49E-14	4.17E-03	7.37E-10	#NAME?
60-34-4	Methyl Hydrazine	HAP	0.0	8.25E-01	1.60E-05	2.75E-03	1.31E-14	1.88E-03	1.75E-11	#NAME?
110-12-3	Methyl Isoamyl Ketone	-	0.0	1.00E+00	6.47E-06	2.39E-03	4.62E-15	1.11E-03	0.00E+00	#NAME?
80-62-6	Methyl Methacrylate	HAP	0.2	8.29E-01	3.76E-05	2.98E-03	3.35E-14	3.00E-03	5.89E-10	#NAME?
107-87-9	Methyl Propyl Ketone	-	0.0	1.00E+00	1.17E-05	3.10E-03	1.09E-14	1.71E-03	0.00E+00	#NAME?
75-18-3	Methyl Sulfide	-	0.0	8.73E-01	3.08E-04	5.43E-03	5.01E-13	1.16E-02	0.00E+00	#NAME?
1634-04-4	Methyl tert-butyl ether	HAP	0.0	1.00E+00	2.18E-04	2.91E-03	1.89E-13	7.12E-03	0.00E+00	#NAME?
108-87-2	Methylcyclohexane	-	0.0	8.44E-01	7.82E-05	3.21E-03	7.51E-14	4.49E-03	0.00E+00	#NAME?
101-14-4	Methylenebis (2-chloroaniline) (MOCA)	HAP	0.0	1.00E+00	3.03E-11	8.87E-04	8.03E-21	1.47E-06	0.00E+00	#NAME?
108-38-3	m-Xylene	HAP	0.1	8.14E-01	9.79E-06	2.71E-03	7.94E-15	1.46E-03	1.24E-10	#NAME?
68-12-2	N,N-Dimethylformamide	HAP	0.0	7.92E-01	2.62E-06	3.64E-03	2.86E-15	8.75E-04	3.11E-11	#NAME?
628-63-7	N-Amyl Acetate	-	0.0	1.00E+00	7.63E-06	2.48E-03	5.66E-15	1.23E-03	0.00E+00	#NAME?
91-20-3	Naphthalene	HAP	2.1	7.71E-01	5.60E-08	2.29E-03	3.83E-17	1.01E-04	2.79E-10	#NAME?
123-86-4	n-butyl acetate	-	0.0	1.00E+00	1.32E-05	3.10E-03	1.22E-14	1.81E-03	0.00E+00	#NAME?
98-95-3	Nitrobenzene	HAP	0.0	7.59E-01	1.06E-06	2.95E-03	9.33E-16	5.00E-04	1.61E-13	#NAME?
25322-01-4	Nitropropane	-	0.0	1.00E+00	1.02E-04	3.58E-03	1.10E-13	5.42E-03	0.00E+00	#NAME?
1321-12-6	Nitrotoluene	-	0.0	1.00E+00	2.04E-07	2.13E-03	1.30E-16	1.86E-04	0.00E+00	#NAME?
872-50-4	N-Methyl-2-pyrrolidone	-	0.0	1.00E+00	5.62E-07	3.06E-03	5.14E-16	3.71E-04	0.00E+00	#NAME?
55-18-5	N-Nitrosodiethylamine	-	0.0	1.00E+00	1.02E-06	2.97E-03	9.05E-16	4.92E-04	0.00E+00	#NAME?
62-75-9	N-Nitrosodimethylamine	HAP	0.0	1.00E+00	2.27E-06	4.03E-03	2.73E-15	8.55E-04	0.00E+00	#NAME?
924-16-3	N-Nitroso-di-n-butylamine	-	0.0	1.00E+00	8.41E-08	1.71E-03	4.31E-17	1.07E-04	0.00E+00	#NAME?
10595-95-6	N-Nitrosomethylethylamine	-	0.0	1.00E+00	1.26E-04	2.94E-03	1.10E-13	5.44E-03	0.00E+00	#NAME?
59-89-2	N-Nitrosomorpholine	HAP	0.0	1.00E+00	1.30E-07	2.29E-03	8.91E-17	1.55E-04	0.00E+00	#NAME?
100-75-4	N-Nitrosopiperidine	-	0.0	1.00E+00	1.19E-07	2.70E-03	9.62E-17	1.61E-04	0.00E+00	#NAME?
111-84-2	Nonane	-	0.0	7.98E-01	1.16E-05	2.29E-03	7.96E-15	1.46E-03	0.00E+00	#NAME?
106-94-5	n-Propyl Bromide	-	0.0	1.00E+00	2.04E-04	2.98E-03	1.81E-13	6.97E-03	0.00E+00	#NAME?
90-04-0	o-Anisidine	HAP	0.0	1.00E+00	7.70E-08	2.53E-03	5.82E-17	1.25E-04	8.76E-14	#NAME?
95-48-7	o-Cresol	HAP	0.0	7.24E-01	8.87E-07	2.87E-03	7.61E-16	4.51E-04	1.45E-13	#NAME?
111-65-9	Octane	-	0.0	8.19E-01	1.06E-05	2.96E-03	9.38E-15	1.58E-03	0.00E+00	#NAME?
88-75-5	o-Nitrophenol	-	0.0	1.00E+00	1.78E-07	2.09E-03	1.11E-16	1.73E-04	0.00E+00	#NAME?
19044-88-3	Oryzalin	-	0.0	1.00E+00	3.82E-14	7.21E-04	8.24E-24	4.70E-08	0.00E+00	#NAME?
95-53-4	o-Toluidine	HAP	0.0	7.46E-01	2.72E-07	2.77E-03	2.25E-16	2.45E-04	0.00E+00	#NAME?
95-47-6	o-Xylene	HAP	0.1	8.11E-01	9.75E-06	3.37E-03	9.83E-15	1.62E-03	1.38E-10	#NAME?
72-55-9	p,p?-DDE	HAP	0.0	1.00E+00	2.34E-11	9.22E-04	6.46E-21	1.32E-06	0.00E+00	#NAME?
56-38-2	Parathion	HAP	0.0	1.00E+00	1.24E-10	8.84E-04	3.27E-20	2.96E-06	1.71E-13	#NAME?
1336-36-3	PCBs	HAP	689.7	1.00E+00	1.66E-10	8.84E-04	4.37E-20	3.42E-06	3.08E-09	#NAME?
106-44-5	p-Cresol	HAP	0.0	7.03E-01	9.48E-08	2.87E-03	8.12E-17	1.48E-04	1.95E-12	#NAME?
1114-71-2	Pebulate	-	0.0	7.97E-01	1.63E-07	9.57E-04	4.65E-17	1.12E-04	0.00E+00	#NAME?
40487-42-1	Pendimethalin	-	0.0	1.00E+00	3.00E-11	1.72E-03	1.54E-20	2.03E-06	0.00E+00	#NAME?
76-01-7	Pentachloroethane	-	0.0	7.97E-01	8.04E-06	2.56E-03	6.15E-15	1.28E-03	0.00E+00	#NAME?
82-68-8	Pentachloronitrobenzene	HAP	0.0	1.00E+00	3.31E-10	9.26E-04	9.18E-20	4.96E-06	7.01E-16	#NAME?
87-86-5	Pentachlorophenol	HAP	0.3	1.00E+00	3.32E-10	2.17E-03	2.15E-19	7.60E-06	2.50E-12	#NAME?
109-66-0	Pentane	-	0.0	8.77E-01	3.06E-04	3.18E-03	2.91E-13	8.82E-03	0.00E+00	#NAME?
79-21-0	PERACETIC ACID	-	0.0	1.00E+00	1.02E-05	3.37E-03	1.03E-14	1.66E-03	0.00E+00	#NAME?
85-01-8	Phenanthrene	-	0.0	1.00E+00	4.04E-10	1.45E-03	1.75E-19	6.86E-06	0.00E+00	#NAME?
108-95-2	Phenol	HAP	1.4	7.34E-01	2.74E-07	3.18E-03	2.60E-16	2.64E-04	4.67E-10	#NAME?
108-98-5	Phenyl Mercaptan	-	0.0	1.00E+00	1.25E-06	2.82E-03	1.05E-15	5.31E-04	0.00E+00	#NAME?

CAS	Group ID	HAP	Total Volatile Concentration (ppmw)	Equation 2-16 T_{corr} --	Equation 2-15 K_{eq} (g/cm^3 / g/cm^3)	Equation 2-18 D_{eff} (cm^2/s)	Equation 2-19 K_v (s^{-1})	Equation 2-21 $f_{emitted}$ --	Equation 2-25 E g/m^2-s	Annual VOC Emissions (tpy)
75-44-5	Phosgene	HAP	0.0	1.00E+00	1.56E-03	4.19E-03	1.95E-12	2.28E-02	0.00E+00	#NAME?
7803-51-2	Phosphine	HAP	0.0	1.00E+00	7.70E-04	3.88E-05	8.93E-15	1.55E-03	0.00E+00	#NAME?
7723-14-0	PHOSPHORUS	HAP	0.7	1.00E+00	0.00E+00	3.88E-05	0.00E+00	0.00E+00	0.00E+00	#NAME?
85-44-9	Phthalic anhydride	HAP	0.0	7.70E-01	6.68E-10	2.75E-03	5.50E-19	1.21E-05	1.05E-13	#NAME?
57-64-7	Physostigmine salicylate	-	0.0	1.00E+00	5.85E-05	6.43E-04	1.13E-14	1.74E-03	0.00E+00	#NAME?
88-89-1	Picric acid	-	0.0	1.00E+00	2.60E-06	1.17E-03	9.11E-16	4.94E-04	0.00E+00	#NAME?
100-02-7	p-Nitrophenol	HAP	0.0	1.00E+00	1.15E-10	2.42E-03	8.33E-20	4.72E-06	0.00E+00	#NAME?
N590	POLYCYCLIC AROMATIC COMPOUNDS	-	0.3	1.00E+00	1.69E-14	8.19E-05	4.13E-25	1.05E-08	4.29E-15	#NAME?
106-50-3	p-Phenylenediamine	HAP	0.0	1.00E+00	5.64E-09	3.88E-05	6.53E-20	4.18E-06	0.00E+00	#NAME?
107-12-0	Propionitrile	-	0.0	8.39E-01	2.09E-05	4.25E-03	2.66E-14	2.67E-03	0.00E+00	#NAME?
114-26-1	Propoxur	HAP	0.0	1.00E+00	4.55E-11	1.03E-03	1.40E-20	1.94E-06	0.00E+00	#NAME?
109-60-4	Propyl Acetate	-	0.0	8.26E-01	6.43E-05	2.79E-03	5.36E-14	3.79E-03	0.00E+00	#NAME?
71-23-8	Propyl alcohol	-	0.0	7.94E-01	2.43E-05	3.06E-03	2.23E-14	2.44E-03	7.23E-12	#NAME?
111-43-3	Propyl ether	-	0.0	1.00E+00	7.24E-05	2.89E-03	6.26E-14	4.10E-03	0.00E+00	#NAME?
107-03-9	Propyl Mercaptan	-	0.0	1.00E+00	1.34E-04	3.74E-03	1.50E-13	6.33E-03	0.00E+00	#NAME?
57-55-6	Propylene Glycol	-	0.0	1.00E+00	1.11E-07	3.60E-03	1.20E-16	1.79E-04	0.00E+00	#NAME?
75-56-9	Propylene Oxide	HAP	0.0	8.74E-01	2.56E-04	4.03E-03	3.09E-13	9.09E-03	8.93E-11	#NAME?
106-42-3	p-Xylene	HAP	0.1	8.15E-01	9.81E-06	2.98E-03	8.74E-15	1.53E-03	1.30E-10	#NAME?
110-86-1	Pyridine	-	0.0	8.25E-01	1.48E-05	3.53E-03	1.56E-14	2.04E-03	6.58E-13	#NAME?
91-22-5	Quinoline	HAP	0.0	1.00E+00	1.46E-06	2.32E-03	1.01E-15	5.21E-04	7.71E-13	#NAME?
106-51-4	Quinone	HAP	0.0	7.14E-01	8.75E-08	2.58E-03	6.75E-17	1.34E-04	0.00E+00	#NAME?
94-59-7	Safrole	-	0.0	7.61E-01	8.64E-08	1.64E-03	4.23E-17	1.07E-04	0.00E+00	#NAME?
626-38-0	Sec-Amyl Acetate	-	0.0	1.00E+00	1.03E-05	2.27E-03	7.00E-15	1.37E-03	0.00E+00	#NAME?
78-92-2	sec-Butyl alcohol	-	0.0	1.00E+00	2.58E-05	3.46E-03	2.68E-14	2.68E-03	0.00E+00	#NAME?
100-42-5	Styrene	HAP	9.6	8.06E-01	9.04E-06	2.75E-03	7.44E-15	1.41E-03	1.78E-08	#NAME?
75-65-0	tert-Butyl alcohol	-	0.0	1.00E+00	2.79E-05	3.39E-03	2.83E-14	2.75E-03	2.96E-11	#NAME?
127-18-4	Tetrachloroethylene	HAP	15.1	1.00E+00	2.98E-05	3.10E-03	2.76E-14	2.72E-03	5.37E-08	#NAME?
7550-45-0	Titanium tetrachloride	HAP	0.0	1.00E+00	2.15E-05	2.99E-03	1.92E-14	2.27E-03	0.00E+00	#NAME?
108-88-3	Toluene	HAP	2.4	8.33E-01	3.48E-05	3.37E-03	3.51E-14	3.07E-03	9.45E-09	#NAME?
584-84-9	Toluene-2,6-diisocyanate	HAP	0.0	1.00E+00	1.97E-06	1.27E-03	7.51E-16	4.49E-04	1.81E-13	#NAME?
8001-35-2	Toxaphene	HAP	0.1	1.00E+00	2.81E-11	8.41E-04	7.08E-21	1.38E-06	1.80E-13	#NAME?
156-60-5	trans-1,2-Dichloroethylene	-	0.0	8.69E-01	3.16E-04	2.72E-03	2.57E-13	8.30E-03	0.00E+00	#NAME?
10061-02-6	trans-1,3-Dichloropropylene	-	0.0	8.47E-01	4.58E-05	2.43E-03	3.32E-14	2.98E-03	0.00E+00	#NAME?
79-01-6	Trichloroethylene	HAP	0.2	8.40E-01	9.63E-05	3.06E-03	8.82E-14	4.86E-03	1.05E-09	#NAME?
121-44-8	Triethylamine	HAP	0.0	8.46E-01	5.54E-05	3.41E-03	5.65E-14	3.89E-03	5.97E-12	#NAME?
54272-29-6	TRIETHYLAMMONIUM SULFATE	-	0.0	1.00E+00	0.00E+00	3.88E-05	0.00E+00	0.00E+00	0.00E+00	#NAME?
1582-09-8	TRIFLURALIN	HAP	0.2	1.00E+00	1.74E-10	3.88E-05	2.02E-21	7.35E-07	1.88E-13	#NAME?
126-73-8	Tri-n-butyl phosphate	-	0.0	1.00E+00	1.21E-08	1.78E-03	6.42E-18	4.15E-05	0.00E+00	#NAME?
126-72-7	tris-(2,3-Dibromopropyl) phosphate	-	0.0	1.00E+00	5.48E-03	5.89E-04	9.65E-13	1.61E-02	0.00E+00	#NAME?
51-79-6	Urethane	HAP	0.0	1.00E+00	2.64E-07	3.88E-05	3.06E-18	2.87E-05	6.70E-13	#NAME?
109-52-4	Valeric Acid	-	0.0	1.00E+00	1.16E-06	2.86E-03	9.89E-16	5.15E-04	0.00E+00	#NAME?
1929-77-7	Vernolate	-	0.0	1.00E+00	1.21E-06	9.53E-04	3.45E-16	3.04E-04	0.00E+00	#NAME?
108-05-4	Vinyl Acetate	HAP	0.2	8.47E-01	1.16E-04	3.29E-03	1.14E-13	5.52E-03	1.21E-09	#NAME?
75-01-4	Vinyl Chloride	HAP	0.0	9.02E-01	2.48E-03	4.11E-03	3.04E-12	2.85E-02	3.68E-12	#NAME?
75-35-4	Vinylidene chloride	HAP	0.0	8.78E-01	6.08E-04	3.49E-03	6.34E-13	1.30E-02	3.36E-12	#NAME?
1330-20-7	Xylene	HAP	2.6	8.27E-01	9.95E-06	2.86E-03	8.49E-15	1.51E-03	5.15E-09	#NAME?
									Total HAP	#NAME?
									Total VOC	#NAME?
									Maximum of Any	#NAME? Acetaldehyde

Volume Produced (gallons)	4,014,800

Conversions	
3.7854	L/gal
453.6	g/lb

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
630-20-6	1,1,1,2-Tetrachloroethane	-	0	0
460-73-1	1,1,1,3,3- Pentafluoropropane	-	0	0
71-55-6	1,1,1-Trichloroethane	HAP	2.28877E-06	3.8342E-08
79-34-5	1,1,2,2-Tetrachloroethane	HAP	0	0
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethar	-	0	0
79-00-5	1,1,2-Trichloroethane	HAP	0	0
75-34-3	1,1-Dichloroethane	HAP	0.0088	0.00014742
106-88-7	1,2 Butylene Oxide	HAP	0	0
120-82-1	1,2,4-Trichlorobenzene	HAP	0.0024	4.0205E-05
95-63-6	1,2,4-Trimethylbenzene	-	0	0
107-15-3	1,2-diaminoethane	-	0	0
96-12-8	1,2-Dibromo-3-chloropropane	HAP	0	0
95-50-1	1,2-Dichlorobenzene	-	0	0
107-06-2	1,2-Dichloroethane	HAP	0	0
540-59-0	1,2-Dichloroethylene	-	0	0
78-87-5	1,2-Dichloropropane	HAP	0	0
108-67-8	1,3,5 Trimethylbenzene	-	0	0
106-99-0	1,3-butadiene	HAP	0	0
542-75-6	1,3-Dichloropropylene	HAP	0	0
106-46-7	1,4-Dichlorobenzene	HAP	0	0
90-12-0	1-Methylnaphthalene	-	0	0
540-84-1	2,2,4 Trimethylpentane	HAP	0	0
95-95-4	2,4,5-Trichlorophenol	HAP	0.076	0.00127317
88-06-2	2,4,6-Trichlorophenol	HAP	0.066	0.00110565
94-75-7	2,4-D	-	0.096	0.00160821
95-80-7	2,4-Diaminotoluene	HAP	0	0
120-83-2	2,4-Dichlorophenol	-	0	0
105-67-9	2,4-Dimethylphenol	-	0	0
51-28-5	2,4-Dinitrophenol	HAP	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
121-14-2	2,4-Dinitrotoluene	HAP	0	0
87-65-0	2,6-Dichlorophenol	-	0	0
576-26-1	2,6-Dimethylphenol	-	0	0
53-96-3	2-Acetylaminofluorene	HAP	0	0
111-76-2	2-butoxyethanol	-	0	0
110-75-8	2-Chloroethyl vinyl ether	-	0	0
95-57-8	2-Chloropchenol	-	0	0
109-86-4	2-Methoxyethanol	-	0	0
88-85-7	2-sec-Butyl-4,6-dinitrophenol/Dinc	-	0	0
107-05-1	3-Chloropropylene	HAP	0	0
101-77-9	4,4'-Methylenedianiline	HAP	0	0
534-52-1	4,6-Dinitro-o-cresol	-	0	0
99-55-8	5-Nitro-o-toluidine	HAP	0	0
30560-19-1	Acephate	-	0	0
75-07-0	Acetaldehyde	HAP	0	0
60-35-5	Acetamide	HAP	0	0
64-19-7	Acetic Acid	-	0	0
67-64-1	Acetone	-	0	0
75-86-5	Acetone Cyanohydrin	-	0	0
75-05-8	Acetonitrile	HAP	0	0
98-86-2	Acetophenone	HAP	0	0
107-02-8	Acrolein	HAP	0	0
79-06-1	Acrylamide	HAP	0	0
79-10-7	Acrylic acid	HAP	0	0
107-13-1	Acrylonitrile	HAP	0	0
111-69-3	Adiponitrile	-	0	0
7664-41-7	Ammonia	-	0	0
62-53-3	Aniline	HAP	0	0
120-12-7	Anthracene	-	0	0
98-87-3	Benzal chloride	-	0	0
71-43-2	Benzene	HAP	0.073496138	0.00123122
191-24-2	Benzo(g,h,i)perylene	-	0	0
62-23-7	BENZOIC ACID, 4-NITRO	-	0	0
100-44-7	Benzyl Chloride	HAP	0	0
92-52-4	Biphenyl	HAP	0	0
92-54-4	1-Phenylpiperazine	-	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
111-91-1	bis(2-Chloroethoxy)methane	-	0	0
111-44-4	bis(2-Chloroethyl)ether	HAP	0	0
39638-32-9	bis(2-Chloroisopropyl)ether	-	0	0
75-27-4	Bromodichloromethane	-	0	0
75-25-2	Bromoform	HAP	0	0
74-83-9	Bromomethane	HAP	0	0
141-32-2	Butyl Acrylate	-	0	0
71-36-3	Butyl Alcohol	-	0	0
2426-08-6	Butyl Glycidyl Ether	-	0	0
109-79-5	Butyl Mercaptan	-	0	0
123-72-8	Butyraldehyde	-	0	0
107-92-6	Butyric Acid	-	0	0
109-74-0	Butyronitrile	-	0	0
133-06-2	Captan	HAP	0	0
63-25-2	Carbaryl	HAP	0	0
75-15-0	Carbon disulfide	HAP	0.0006	1.0051E-05
56-23-5	Carbon Tetrachloride	HAP	0	0
55285-14-8	Carbosulfan	-	0	0
120-80-9	Catechol	HAP	0	0
57-74-9	Chlordane	HAP	0	0
7782-50-5	Chlorine	HAP	0	0
79-11-8	Chloroacetic Acid	HAP	0	0
108-90-7	Chlorobenzene	HAP	0.101521646	0.00170071
510-15-6	Chlorobenzilate	HAP	0	0
124-48-1	Chlorodibromomethane	-	0	0
75-00-3	Chloroethane	HAP	0.0008	1.3402E-05
67-66-3	Chloroform	HAP	0.032	0.00053607
74-87-3	Chloromethane	HAP	0.00174	2.9149E-05
126-99-8	Chloroprene	HAP	0	0
156-59-2	cis-1,2-Dichloroethylene	-	0	0
10061-01-5	cis-1,3-Dichloropropylene	-	0	0
1319-77-3	Cresol	HAP	0.02284237	0.00038266
98-82-8	Cumene	HAP	0	0
592-01-8	Cyanide Compounds	HAP	0	0
110-82-7	Cyclohexane	-	0	0
108-94-1	Cyclohexanone	-	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
110-83-8	Cyclohexene	-	0	0
287-92-3	Cyclopentane	-	0	0
5989-27-5	d- Limonene	-	0	0
117-81-7	Di(2-ethylhexyl) phthalate	HAP	0.078	0.00130667
333-41-5	Diazinon	-	0	0
132-64-9	Dibenzofuran	HAP	0	0
74-95-3	Dibromomethane	-	0	0
84-74-2	Dibutyl phthalate	HAP	0	0
75-09-2	Dichloromethane	HAP	0.009517654	0.00015944
34077-87-7	Dichlorotrifluoroethane	-	0	0
77-73-6	Dicyclopentadiene	-	0	0
111-42-2	Diethanolamine	HAP	0	0
64-67-5	Diethyl sulfate	HAP	0	0
100-37-8	Diethylaminoethanol	-	0	0
108-83-8	Diisobutyl Ketone	-	0	0
27215-10-7	Di-iso-octyl acid phosphate	-	0	0
121-69-7	Dimethyl Aniline	HAP	0	0
131-11-3	Dimethyl phthalate	HAP	0.010605386	0.00017766
89396-94-1	Dinitrobutyl phenol	-	0	0
25321-14-6	Dinitrotoluene (mixed isomers)	1.32	0	0
621-64-7	Di-n-propylnitrosamine	-	0	0
123-91-1	Dioxane	HAP	0.52	0.00871116
138-86-3	Dipentene	-	0	0
122-39-4	Diphenylamine (difficult to disting	-	0	0
142-84-7	Dipropylamine	-	0	0
106-89-8	Epichlorohydrin	HAP	0	0
64-17-5	Ethanol	-	0	0
141-43-5	Ethanolamine	-	0	0
141-78-6	Ethyl acetate	-	0	0
140-88-5	Ethyl Acrylate	HAP	0	0
60-29-7	Ethyl ether	-	0	0
75-08-1	Ethyl Mercaptan	-	0	0
97-63-2	Ethyl methacrylate	-	0	0
352-93-2	Ethyl Sulfide	-	0	0
100-41-4	Ethylbenzene	HAP	0.032586908	0.0005459
74-85-1	Ethylene	-	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
106-93-4	Ethylene Dibromide	HAP	0	0
107-21-1	Ethylene Glycol	HAP	0.021754638	0.00036444
628-96-6	Ethylene Glycol Dinitrate	-	0	0
75-21-8	Ethylene oxide	HAP	0	0
96-45-7	Ethylene thiourea	HAP	0	0
75-34-3	Ethylidene Dichloride	HAP	0.0088	0.00014742
16219-75-3	Ethylidene-2-norbornene	-	0	0
206-44-0	Fluoranthene	-	0	0
50-00-0	Formaldehyde	HAP	0	0
64-18-6	Formic acid	-	0	0
111-0-9	Furan	-	0	0
111-30-8	Glutaraldehyde	-	0	0
N230	Glycol Ethers	-	0.025380412	0.00042518
107-16-4	Glycolonitrile	-	0	0
50-01-1	GUANIDINIUM CHLORIDE	-	0	0
76-44-8	Heptachlor	HAP	0	0
142-82-5	Heptane	-	0	0
87-68-3	Hexachloro-1,3-butadiene	HAP	0	0
118-74-1	Hexachlorobenzene	HAP	0	0
77-47-4	Hexachlorocyclopentadiene	HAP	0	0
67-72-1	Hexachloroethane	HAP	0	0
110-54-3	Hexane (n-Hexane)	HAP	0	0
302-01-2	Hydrazine	HAP	0	0
7647-01-0	Hydrogen Chloride	HAP	0.215447969	0.00360923
7664-39-3	Hydrogen Fluoride	HAP	4.394210366	0.07361283
2148878	Hydrogen Sulfide	-	0	0
123-31-9	Hydroquinone	HAP	0	0
74-88-4	Iodomethane	HAP	0	0
123-92-2	Isoamyl Acetate	-	0	0
123-51-3	Isoamyl Alcohol	-	0	0
78-83-1	Isobutyl alcohol	-	0	0
78-82-0	Isobutyronitrile	-	0	0
107-83-5	Isohexane	-	0	0
78-59-1	Isophorone	HAP	0	0
78-79-5	isoprene	-	0	0
67-63-0	Isopropyl alcohol	-	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
120-58-1	Isosafrole	-	0	0
58-89-9	Lindane	-	0	0
121-75-5	Malathion	-	0	0
108-31-6	Maleic anhydride	HAP	0	0
108-39-4	m-Cresol	HAP	0	0
541-73-1	m-Dichlorobenzene	-	0	0
141-79-7	Mesityl Oxide	-	0	0
126-98-7	Methacrylonitrile	-	0	0
67-56-1	Methanol	HAP	0.110586079	0.00185256
72-43-5	Methoxychlor	HAP	0	0
66-27-3	Methyl methanesulfonate	-	0	0
96-33-3	Methyl Acrylate	-	0	0
110-43-0	Methyl Amyl Ketone	-	0	0
108-10-1	Methyl Butyl Ketone	HAP	0.050763112	0.0008504
624-92-0	Methyl Disulfide	-	0	0
78-93-3	Methyl ethyl ketone	-	0	0
60-34-4	Methyl Hydrazine	HAP	0	0
110-12-3	Methyl Isoamyl Ketone	-	0	0
80-62-6	Methyl Methacrylate	HAP	0	0
107-87-9	Methyl Propyl Ketone	-	0	0
75-18-3	Methyl Sulfide	-	0	0
1634-04-4	Methyl tert-butyl ether	HAP	0.00086	1.4407E-05
108-87-2	Methylcyclohexane	-	0	0
101-14-4	Methylenebis (2-chloroaniline) (M	HAP	0	0
108-38-3	m-Xylene	HAP	0	0
68-12-2	N,N-Dimethylformamide	HAP	0	0
628-63-7	N-Amyl Acetate	-	0	0
91-20-3	Naphthalene	HAP	0.026108036	0.00043737
123-86-4	n-butyl acetate	-	0	0
98-95-3	Nitrobenzene	HAP	5.47945E-05	9.1793E-07
25322-01-4	Nitropropane	-	0	0
1321-12-6	Nitrotoluene	-	0	0
872-50-4	N-Methyl-2-pyrrolidone	-	0	0
55-18-5	N-Nitrosodiethylamine	-	0	0
62-75-9	N-Nitrosodimethylamine	HAP	0	0
924-16-3	N-Nitroso-di-n-butylamine	-	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
10595-95-6	N-Nitrosomethylethylamine	-	0	0
59-89-2	N-Nitrosomorpholine	HAP	0	0
100-75-4	N-Nitrosopiperidine	-	0	0
111-84-2	Nonane	-	0	0
106-94-5	n-Propyl Bromide	-	0	0
90-04-0	o-Anisidine	HAP	0	0
95-48-7	o-Cresol	HAP	0	0
111-65-9	Octane	-	0	0
88-75-5	o-Nitrophenol	-	0	0
19044-88-3	Oryzalin	-	0	0
95-53-4	o-Toluidine	HAP	0	0
95-47-6	o-Xylene	HAP	0	0
72-55-9	p,p?-DDE	HAP	0	0
56-38-2	Parathion	HAP	0	0
1336-36-3	PCBs	HAP	0.956364809	0.01602124
106-44-5	p-Cresol	HAP	0	0
1114-71-2	Pebulate	-	0	0
40487-42-1	Pendimethalin	-	0	0
76-01-7	Pentachloroethane	-	0	0
82-68-8	Pentachloronitrobenzene	HAP	0	0
87-86-5	Pentachlorophenol	HAP	1.88	0.03149419
109-66-0	Pentane	-	0	0
79-21-0	PERACETIC ACID	-	0	0
85-01-8	Phenanthrene	-	0	0
108-95-2	Phenol	HAP	0.026139105	0.00043789
108-98-5	Phenyl Mercaptan	-	0	0
75-44-5	Phosgene	HAP	0	0
7803-51-2	Phosphine	HAP	0	0
7723-14-0	PHOSPHORUS	HAP	0.002085862	3.4943E-05
85-44-9	Phthalic anhydride	HAP	0	0
57-64-7	Physostigmine salicylate	-	0	0
88-89-1	Picric acid	-	0	0
100-02-7	p-Nitrophenol	HAP	0.001208289	2.0242E-05
N590	POLYCYCLIC AROMATIC COM	-	0	0
106-50-3	p-Phenylenediamine	HAP	0	0
107-12-0	Propionitrile	-	0	0

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
114-26-1	Propoxur	HAP	0	0
109-60-4	Propyl Acetate	-	0	0
71-23-8	Propyl alcohol	-	0	0
111-43-3	Propyl ether	-	0	0
107-03-9	Propyl Mercaptan	-	0	0
57-55-6	Propylene Glycol	-	0	0
75-56-9	Propylene Oxide	HAP	0	0
106-42-3	p-Xylene	HAP	0	0
110-86-1	Pyridine	-	0	0
91-22-5	Quinoline	HAP	0	0
106-51-4	Quinone	HAP	0	0
94-59-7	Safrole	-	0	0
626-38-0	Sec-Amyl Acetate	-	0	0
78-92-2	sec-Butyl alcohol	-	0	0
100-42-5	Styrene	HAP	0	0
75-65-0	tert-Butyl alcohol	-	0	0
127-18-4	Tetrachloroethylene	HAP	0.879437176	0.01473253
7550-45-0	Titanium tetrachloride	HAP	0	0
108-88-3	Toluene	HAP	4.513501829	0.07561123
584-84-9	Toluene-2,6-diisocyanate	HAP	0	0
8001-35-2	Toxaphene	HAP	0	0
156-60-5	trans-1,2-Dichloroethylene	-	0	0
10061-02-6	trans-1,3-Dichloropropylene	-	0	0
79-01-6	Trichloroethylene	HAP	0.007663071	0.00012837
121-44-8	Triethylamine	HAP	0	0
54272-29-6	TRIETHYLAMMONIUM SULFA	-	0	0
1582-09-8	TRIFLURALIN	HAP	0	0
126-73-8	Tri-n-butyl phosphate	-	0	0
126-72-7	tris-(2,3-Dibromopropyl) phosphat	-	0	0
51-79-6	Urethane	HAP	0	0
109-52-4	Valeric Acid	-	0	0
1929-77-7	Vernolate	-	0	0
108-05-4	Vinyl Acetate	HAP	0	0
75-01-4	Vinyl Chloride	HAP	0.004	6.7009E-05
75-35-4	Vinylidene chloride	HAP	0	0
1330-20-7	Xylene	HAP	0.118529563	0.00198563

CAS	Compound	HAP?	Total Volatile Concentration (mg/L)	Total Emissions (tpy)
1332-21-4	Asbestos (friable)	HAP	11.81344854	0.19790162
N010	Antimony Compounds	HAP	0	0
N020	Arsenic Compounds	HAP	0	0
N050	Beryllium Compounds	HAP	0	0
N078	Cadmium Compounds	HAP	0	0
N090	Chromium Compounds	HAP	0.340037237	0.00569638
N096	Cobalt Compounds	HAP	0	0
N420	Lead Compounds	HAP	0.793790501	0.01329776
N450	Manganese Compounds	HAP	0.900988748	0.01509357
N458	Mercury Compounds	HAP	0	0
N495	Nickel Compounds	HAP	0.111050631	0.00186035
N725	Selenium Compounds	HAP	0	0
N040	Barium Compounds	HAP	0	0
1344-28-1	Aluminum oxide (fibrous forms)	HAP	0	0
1313-27-5	Molybdenum trioxide	-	0	0
			Total VOC	0.47467653
			Total HAP	0.47264313
			Maximum of Any HAP	0.19790162 Asbestos (friable)

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

M E M O R A N D U M

DATE: June 26, 2020

TO: Kelli Wetzel, Permit Writer, Air Program

FROM: Pao Baylon, Modeling Review Analyst, Air Program

PROJECT: P-2008.0162 PROJ 62415, Permit Modification for an Existing Solid and Hazardous Waste Treatment, Storage, and Disposal Facility located near Grand View, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

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Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ASOS	Automated Surface Observing System
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CAS	Chemical Abstracts Service
cfm	Cubic feet per minute
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
DV	Design Values
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
fpm	Feet per minute
fps	Feet per second
ft	Feet
ft^2	Square feet
GEP	Good Engineering Practice
hr	Hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
km	Kilometer
lb/hr	Pounds per hour
m	Meters
m/sec	Meters per second
mph	Miles per hour
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
O_3	Ozone
Pb	Lead

PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion
ppmw	parts per million by weight
PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
psi	Pounds per square inch
PTC	Permit to Construct
PTE	Potential to Emit
REC	Robinson Environmental Consulting, LLC (permittee's permitting and modeling consultant)
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	Tons per year
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
TSDF	Treatment, Storage, and Disposal Facility
ULSD	Ultra-Low Sulfur Diesel
USEI	U.S. Ecology Idaho (permittee)
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
ºF	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air
µm	Microns

1.0 Summary

U.S. Ecology Idaho (USEI) submitted a Permit to Construct (PTC) application for its existing hazardous waste treatment, storage, and disposal facility (TSDF) near Grand View, Idaho. USEI has been operating this facility since February 2001. In November 2018, the Waste Stabilization Building, Containment Building, and several nearby buildings were badly damaged in a steam explosion. USEI is proposing to build a new, smaller Indoor Stabilization Building and to construct a drum storage canopy in lieu of rebuilding the Containment Building. No emissions to the atmosphere will be associated with the new drum storage canopy. Two existing small used oil-fired space heaters located in the Maintenance Shop and Quonset Hut are also being addressed in this permitting action. Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

Robinson Environmental Consulting, LLC (REC), on behalf of USEI, prepared the PTC application and performed ambient air impact analyses for this project. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions

representative of design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
General Emission Rates. Emission rates used in the air impact analyses, as listed in Table 5 of this memorandum, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses.
Air Impact Analyses for Criteria Pollutant Emissions. Project-specific annual emission increase of $PM_{2.5}$[a] from processes at the new Indoor Stabilization Building and from the two space heaters exceeds BRC thresholds. Therefore, annual and 24-hour $PM_{2.5}$ were subject to NAAQS Compliance Demonstration requirements.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutant increases above BRC thresholds, or for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds (where the BRC exclusion cannot be used).
Air Impact Analyses for TAP Emissions. Emissions of more than 300 particulate and volatile toxic air pollutants (TAPs) from waste and reagent handling in the new Indoor Stabilization Building were evaluated to demonstrate compliance with TAP increments. Ambient impacts were calculated for each TAP using the worst-case dispersion coefficient for different combinations of open roll-up doors and baghouse operations. The maximum ambient impacts were compared to the applicable AAC or Toxic Air Pollutant Reasonably Available Control Technology (T-RACT) AACC increments listed in Idaho Air Rules Sections 585/586. Emissions of TAPs from combustion of used oil or ultra-low sulfur diesel fuel in the two space heaters were added to emissions of the same TAPs emitted from processes at the new Indoor Stabilization Building and compared to applicable screening emission levels (ELs). Modeling was conducted for any TAP with combined emissions greater than the applicable EL. Dispersion coefficients were determined for each of the heaters based on a unit emission rate. Maximum calculated ambient impacts from the Indoor Stabilization Building and the two heaters were summed and compared to the applicable AAC or T-RACT AACC increments listed in Idaho Air Rules Sections 585/586.	A TAP increment compliance demonstration would be required for any TAPs with emissions above ELs.
Approved T-RACT Ambient Impacts. The ambient impacts for all carcinogenic TAPs demonstrate compliance with the T-RACT allowable increments. T-RACT increments allow a 1 in 100,000 cancer risk versus the 1 in 1,000,000 risk level incorporated in Idaho Air Rules Section 586 and use the maximum ambient impact as the design concentration.	A T-RACT analysis was conducted in accordance with Sections 210.12 and 210.13 of the Idaho Air Rules to justify increasing the acceptable ambient concentration for carcinogens (AACC) increments by a factor of ten. Review and approval of control measures proposed as T-RACT was the responsbility of the DEQ permit writer. This memo verifies that modeled impacts are less than T-RACT-adjusted AACCs.

[a.] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Summary of Submittals and Actions

November 18, 2019 Pre-application meeting held at DEQ State Office.

December 11, 2019 Modeling protocol submitted to DEQ by REC.

January 3, 2020 Conditional protocol approval provided by DEQ to REC.

April 3, 2020	Regulatory start date.
April 17, 2020	15-day pre-permit construction approved by DEQ.
May 1, 2020	Application deemed complete by DEQ.

2.0 Background Information

This section provides background information applicable to the project and the site proposed for the facility. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

The project involves constructing a new Indoor Stabilization Building and addressing emissions from two existing space heaters burning used oil or ultra-low sulfur diesel (ULSD).

Wastes are trucked to the USEI facility where they may be directly disposed in onsite landfill cells or treated prior to storage and disposal. Wastes received for treatment are often in the form of sludges with relatively high moisture content or as solid debris. Stabilization and treatment processes may be conducted within the new Indoor Stabilization Building or at the existing Outdoor Stabilization Facility.

In the new Indoor Stabilization Building, wastes will be transferred into one of two mixing tanks or pits directly from trucks, roll-off bins, or by front-end loaders. Stabilization reagents or additives are then added to the tanks. Common reagents include lime, cement, ferrous sulfate, and clay. Lime or cement is transferred from nearby storage silos using a pneumatic or screw auger system. Other reagents are added in bulk. An excavator or backhoe is used to mix the wastes and reagents and to transfer the processed/stabilized material out of the mixing tank into a transport vehicle for further handling or disposal.

Water spray bars will be located slightly above and on two sides of each of the treatment pits to control dust from materials determined to contain fine wastes and to minimize dust produced when loading or mixing dry reagents. Retractable vinyl curtains will also be provided to control emissions from each pit. A hood collector will be located above each treatment pit, ducted to one of two dedicated baghouses. The baghouse serving each treatment pit will be operated any time materials containing fine wastes are being handled in that pit, when sizing operations that might generate dust are conducted near the pit, and when handling other types of wastes.

When one or both baghouses are in operation, volatile pollutants will be entrained in the upward air flow and released to the atmosphere through the baghouse stacks. When neither baghouse is operating, volatile emissions will be released primarily through door openings located on the north and south sides of the new Indoor Stabilization Building.

A vent will be provided on both the east and west sides of the new building. These vents will normally be closed but will open as needed if the air pressure in the building drops 0.25 pounds per square inch (psi) below normal atmospheric pressure. This is a safety feature to prevent inward collapse of the insulated metal panels that will form the walls and roof when one or both of the baghouses are operating and most or all of the roll-up/coiling doors are closed.

Micro- and macro-encapsulation of hazardous debris will occur within the building. Activities within the new building to reduce the size of debris prior to encapsulation will include using saws, hammers, cutting torches, or an excavator with attachments such as a jackhammer.

Emission points for the new Indoor Stabilization Building include the two baghouse stacks and emissions from open roll-up or coiling doors.

The small space heaters in the Maintenance Shop and in the Quonset Hut burn used oil generated onsite to provide heat during colder months. On rare occasions, the heaters burn used oil received from household do-it-yourself used oil generators. When used oil supplies are depleted, the heaters burn ULSD fuel. Combustion emissions from each space heater are emitted from a stack extending through the roofs of the buildings.

The PTC addresses all air pollutant-emitting activities associated with the facility.

2.2 Facility Location and Area Classification

The USEI Grand View facility is located in in the Snake River valley in southwestern Idaho, within Owyhee County (Northing: 4,768.2 kilometers (km); Easting: 559.9 km; UTM Zone 11). This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS**. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.** Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations**. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

Table 2. APPLICABLE REGULATORY LIMITS.

Pollutant	**Averaging Period**	**Significant Impact Levels[a] (μg/m^3)[b]**	**Regulatory Limit[c] (μg/m^3)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 μg/m^3)	75 ppb[p] (196 μg/m^3)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 μg/m^3)	100 ppb[s] (188 μg/m^3)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If modeled maximum pollutant impacts to ambient air from the emission sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates an exceedance of NAAQS, a culpability analysis can determine if this exceedance is due to emissions from the proposed project. The permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the

cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines that Toxic Air Pollutant Reasonably Available Control Technology (T-RACT) is used to control emissions of carcinogenic TAPs, then modeled concentrations of ten times the AACCs are considered acceptable, as per Idaho Air Rules Section 210.12.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the USEI Grand View facility were estimated by REC for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant." [1] The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*. [2] These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds is conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors. The use of Level II modeling thresholds was not approved by DEQ

for this project.

Table 3 provides a comparison between project-specific emission increases for criteria pollutants and BRC thresholds. Project-specific emission increases include emissions from handling wastes and reagents in the new Indoor Stabilization Building and from the two existing space heaters.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY.

Criteria Pollutant	New Stabilization Building (tpy)[a]	Existing Space Heaters (tpy)	Total Annual Increase (tpy)	BRC (tpy)	Air Impact Analyses Required?
PM_{10}[b]	0.11	1.26	1.37	1.5	No
$PM_{2.5}$[c]	1.58E-03	1.11	1.11	1.0	Yes
Carbon Monoxide (CO)	0	0.05	0.05	10.0	No
Sulfur Dioxide (SO_2)	0	1.56	1.56	4.0	No
Nitrogen Oxides (NOx)	0.04	0.24	0.28	4.0	No
Lead (Pb)	0.057	1.46E-05	0.057	0.06	No

a. Tons per year.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

As indicated in Table 3, project-specific emission increases for PM_{10}, CO, SO_2, NOx, and Pb qualify for a BRC permit exemption. Therefore, a NAAQS compliance demonstration of these pollutants and all averaging periods was not required. Modeling was required only for 24-hour and annual $PM_{2.5}$.

Table 4 lists criteria pollutant emission rates used in the SIL Analysis. Source IDs DR1_5_PT, DR1_3_PT, D3_5_PT, DRN_SALL, and DRN_S3 represent five different configurations for modeling the roll-up/coiling doors at the new Indoor Stabilization Building. The purpose for modeling different door scenarios is to determine which configuration of open doors causes the highest modeled impacts. Fugitive emissions from these doors were modeled as equivalent horizontal point sources, which is more conservative than modeling them as volume sources. More details are provided in Section 3.1.3 of this modeling memo.

Table 4. MODELED EMISSION RATES FOR SIL ANALYSIS.

Source ID	Description	$PM_{2.5}$ Emission Rate (lb/hr)[a]	
		24-hr	Annual
BH1	Stabilization Building Baghouse 1	5.94E-04	7.02E-05
BH2	Stabilization Building Baghouse 2	5.94E-04	7.02E-05
DR1_5_PT	South Side Doors 1-5 - Equivalent Point Source	1.25E-02	1.48E-03
DR1_3_PT	South Side Doors 1-3 - Equivalent Point Source	1.25E-02	1.48E-03
DR3_5_PT	South Side Doors 3-5 - Equivalent Point Source	1.25E-02	1.48E-03
DRN_SALL	North Side Door - All South Side Doors Open - Equivalent Point Source	1.25E-02	1.48E-03
DRN_S3	North Side Door w 3 South Side Doors Open - Equivalent Point Source	1.25E-02	1.48E-03
QHHEATER	Quonset Hut Used Oil-Fired Heater	2.53E-01	1.04E-01
SHOPHTR	Maintenance Shop Used Oil-Fired Heater	3.64E-01	1.49E-01

a. Pounds per hour.

Table 5 lists criteria pollutant emission rates used in the Cumulative NAAQS Impact Analysis.

Table 5. MODELED EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSIS.		
Source ID	**Description**	**$PM_{2.5}$ Emission Rate (lb/hr)[a]**
		24-hr
BH1	Stabilization Building Baghouse 1	5.94E-04
BH2	Stabilization Building Baghouse 2	5.94E-04
DR1_5_PT	South Side Doors 1-5 - Equivalent Point Source	1.25E-02
DR1_3_PT	South Side Doors 1-3 - Equivalent Point Source	1.25E-02
DR3_5_PT	South Side Doors 3-5 - Equivalent Point Source	1.25E-02
DRN_SALL	North Side Door - All South Side Doors Open - Equivalent Point Source	1.25E-02
DRN_S3	North Side Door w 3 South Side Doors Open - Equivalent Point Source	1.25E-02
ADD_SILO	SB Additive Silo Baghouse	1.37E-02
LIM_SILO	SB Lime Silo Baghouse	1.37E-02
O_SILO1	Outdoor Additive Silo 1 Baghouse	9.13E-03
O_SILO2	Outdoor Additive Silo 2 Baghouse	9.13E-03
O_SILO3	Outdoor Additive Silo 3 Baghouse	9.13E-03
QHHEATER	Quonset Hut Used Oil-Fired Heater	2.53E-01
SHOPHTR	Maintenance Shop Used Oil-Fired Heater	3.64E-01
OSF1_1	Outdoor Stabilization Facility Mixing Bin 1	1.14E-03
OSF1_2	Outdoor Stabilization Facility Mixing Bin 1	1.14E-03
OSF1_3	Outdoor Stabilization Facility Mixing Bin 1	1.14E-03
OSF2_1	Outdoor Stabilization Facility Mixing Bin 2	1.14E-03
OSF2_2	Outdoor Stabilization Facility Mixing Bin 2	1.14E-03
OSF2_3	Outdoor Stabilization Facility Mixing Bin 2	1.14E-03

a. Pounds per hour.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource-intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 within the context of permitting a new stationary source has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY.*

DEQ determined it was not appropriate or necessary to require a quantitative source-specific O_3 impact analysis because allowable emission estimates of VOCs and NOx are below the 100 tons/year threshold.

3.1.2 TAPs Modeling Applicability

TAP emissions were calculated for the new Indoor Stabilization Building and space heaters.

Particulate TAPs were each presumed to be present at typical representative concentrations in each reagent and at an initial concentration of 125,000 parts per million by weight (ppmw) in all fine wastes processed in the new Indoor Stabilization Building. Emissions of particulate TAPs were controlled by water sprays at each treatment pit, capture within the building, entrainment in the baghouse exhaust flow, and capture in the baghouse dedicated to each treatment pit. Non-carcinogenic volatile TAPs were presumed to be present at an initial concentration of 10,000 ppmw in all wastes processed in the new Indoor Stabilization Building. Carcinogenic volatile TAPs were presumed to be present at an initial concentration of 1,500 ppmw in all wastes processed in the new Indoor Stabilization Building. No control was presumed for volatile TAPs.

Emissions of more than 300 particulate and volatile TAPs from waste and reagent handling in the new Indoor Stabilization Building were evaluated to demonstrate compliance with TAP increments. Emissions of TAPs from combustion of used oil in the two space heaters were added to emissions of the same TAPs emitted from processes at the new Indoor Stabilization Building and compared to applicable screening emission levels (ELs). Modeling was conducted for any TAP with combined emissions greater than the applicable EL. A Toxic Air Pollutant Reasonably Available Control Technology (T-RACT) analysis was conducted in accordance with Sections 210.12 and 210.13 of the Idaho Air Rules to justify increasing the acceptable ambient concentration increment for carcinogens (AACC) increments by a factor of ten. Review and approval of control measures proposed as T-RACT was the responsbility of the DEQ permit writer. This memo verifies that modeled impacts are less than T-RACT-adjusted AACCs.

3.1.3 Special Methods for Modeling Criteria Pollutants and TAP Emissions

An initial modeling run was conducted using the full 10-km receptor grid to demonstrate that the maximum ambient impacts for both the 24-hour and annual averaging periods occur at or near the facility fenceline. The full 10-km receptor grid (illustrated in Figure 3) is composed of 7,812 receptors. Based on results of the initial modeling run, the receptor network was altered using more finely spaced receptors extending approximately 100 meters from the fence line. This ensures that the highest modeled impacts are adequately captured by the receptors. The finely spaced receptor network (illustrated in Figure 5) is composed of 5,415 receptors and was used in the final dispersion modeling runs. See Section 3.3.11 for more discussion on the receptor network.

The new Indoor Stabilization Building has one roll-up/coiling door on the north side and five roll-up/coiling doors on the south side (illustrated in Section 3.1.5, Figure 1). Open doors were grouped into equivalent horizontal point sources as follows:

1. Winds flowing through the north side coiling door to the five south side coiling doors:
    a. DR1_5_PT – south side doors 1 through 5 are all open.
    b. DR1_3_PT – south side doors 1 through 3 are open.
    c. DR3_5_PT – south side doors 3 through 5 are open.
2. Winds flowing through the south side doors to the north side coiling door:
    a. DRN_SALL – south side doors 1 through 5 are all open.
    b. DRN_S3 – three south side doors are open.

Emissions of particulate TAPs subject to a 24-hour standard were calculated using a wind speed of 18 miles per hour (mph). Annual emissions of particulate TAPs were calculated using a wind speed of 10 mph. These wind speeds were selected based on conservative estimates of daily average sustained winds at nearby Mountain Home Air Force Base. Modeling results using a unit emission rate demonstrated that the highest ambient impacts occurred when both baghouses were operating and when fugitive emissions at the new building were released through the roll-up door on the north side of the building presuming three roll-up doors were open on the south side of the building (source group GRDRN_S3, which includes source group DRN_S3 and the rest of the facility).

Similarly, modeling results for unit emissions of volatile TAPs demonstrated that the highest ambient impacts occurred when volatiles were entrained into the upward air flow through both baghouses and fugitive emissions were released through the roll-up door on the north side of the building presuming three roll-up doors were open on the south side of the building.

Modeling for TAP emissions from the Indoor Stabilization Building demonstrated that the ambient impacts resulting from modeling fugitive emissions from the open roll-up/coiling doors as equivalent horizontal point sources were considerably higher than the impacts if emissions from the doors were modeled as volume sources. DEQ acknowledges the high degree of conservatism by modeling the roll-up/coiling doors as equivalent point sources instead of volume sources.

Using a dispersion coefficient (in units of $\mu g/m^3$ per lb/hr) developed from the modeling results, the analysis demonstrated that new TAP emissions from the Indoor Stabilization Building baghouses and open doors would either not exceed screening ELs or not exceed AAC/T-RACT AACC increments. A T-RACT analysis was developed to justify multiplying the AACCs by a factor of ten.

The SIL and Cumulative NAAQS Impact Analyses were run with door emissions modeled as horizontal point sources for the same door scenarios as the TAP Analysis.

3.1.4 Emission Release Parameters

Table 6 lists the emission release parameters, including stack height, exhaust temperature, exhaust velocity, and stack diameter for USEI's point sources in metric units (English units are in parentheses). Emission point release parameters were based on information provided in the application. Justification for emission release parameters is summarized in the next section.

Table 6. POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).

Release Point	Description	UTM[a] Coordinates		Stack Height in m (ft)[c]	Stack Exhaust Temp. in K (ºF)[d]	Stack Exhaust Velocity in m/sec (fps)[e]	Stack Diameter in m (ft)	Orient. Of Release[f]
		Easting-X in m[b]	Northing-Y in m					
BH1	Stab. Bldg. Baghouse 1	559,928.95	4,768,253.32	15.2 (50.0)	0[g] (-460)	18.0 (58.9)	0.86 (2.8)	D
BH2	Stab. Bldg. Baghouse 2	559,922.70	4,768,253.32	15.2 (50.0)	0 (-460)	18.0 (58.9)	0.86 (2.8)	D
DR1_5_PT	South Side Doors 1-5	559,925.52	4,768,223.89	4.3 (14.0)	0 (-460)	0.9[h] (2.8)	14.61[h] (47.93)	H
DR1_3_PT	South Side Doors 1-3	559,920.50	4,768,223.89	4.3 (14.0)	0 (-460)	1.6[h] (5.2)	10.83[h] (35.54)	H
DR3_5_PT	South Side	559,930.47	4,768,223.89	4.3	0	1.6[h]	10.83[h]	H

	Doors 3-5			(14.0)	(-460)	(5.2)	(35.54)	
DRN_SALL	North Side Door - All S Side Doors Open	559,915.93	4,768,242.74	1.5 (5.0)	0 (-460)	63.4[h] (208.0)	5.16[h] (16.93)	H
DRN_S3	North Side Door w 3 S Side Doors Open	559,916.00	4,768,242.74	1.5 (5.0)	0 (-460)	34.4[h] (112.9)	5.16[h] (16.93)	H
ADD_SILO	SB Additive Silo BH	559,901.57	4,768,238.71	18.3 (60.0)	0 (-460)	0.001 (0.003)	0.84 (2.8)	D
LIM_SILO	SB Lime Silo BH	559,901.92	4,768,233.16	18.3 (60.0)	0 (-460)	0.001 (0.003)	0.84 (2.8)	D
O_SILO1	Outdoor Additive Silo 1 BH	559,888.10	4,768,387.70	12.2 (40.0)	0 (-460)	0.001 (0.003)	0.84 (2.8)	D
O_SILO2	Outdoor Additive Silo 2 BH	559,888.60	4,768,383.30	12.2 (40.0)	0 (-460)	0.001 (0.003)	0.84 (2.8)	D
O_SILO3	Outdoor Additive Silo 3 BH	559,890.80	4,768,394.57	7.6 (25.0)	0 (-460)	0.001 (0.003)	0.84 (2.8)	D
QHHEATER	Quonset Hut Used Oil-Fired Heater	559,817.43	4,768,229.55	6.7 (22.0)	344 (160)	3.8 (12.3)	0.20 (0.7)	R
SHOPHTR	Maintenance Shop Used Oil-Fired Heater	559,822.42	4,768,256.24	11.9 (39.0)	383 (230)	5.2 (17.2)	0.20 (0.7)	R

a. Universal Transverse Mercator.
b. m: meters.
c. ft: feet.
d. K: Kelvin; ºF: degrees Fahrenheit.
e. m/sec: meters per second; fps: feet per second.
f. D: default (vertical, uninterrupted release); R: raincap; H: horizontal.
g. Setting the exhaust temperature to 0 K (-460 ºF) triggers AERMOD to use the actual ambient air temperatures from the meteorological data input files.
h. Exhaust velocities and exit diameters of the equivalent point sources for the roll-up/coiling doors were calculated assuming both baghouses were operating at 50,000 cubic feet per minute (cfm). This is the worst-case modeling scenario. See Sections 3.1.3 and 3.1.5 for more details.

Table 7 lists the emission release parameters for USEI's volume sources in metric units (English units are in parentheses). Emission point release parameters were based on information provided in the application. Justification for volume source parameters is summarized in the next section.

Table 7. VOLUME SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).

Release Point	Description	UTM[a] Coordinates		Release Height in m (ft)[c]	Init. Horiz. Dim. in m (ft)	Init. Vert. Dim. in m (ft)
		Easting-X in m[b]	Northing-Y in m			
OSF1_1	Outdoor Stabilization Facility - Mixing Bin 1	559,875.47	4,768,414.71	2.13 (7.0)	0.57 (1.86)	0.23 (0.76)
OSF1_2	Outdoor Stabilization Facility - Mixing Bin 1	559,875.10	4,768,416.92	2.13 (7.0)	0.57 (1.86)	0.23 (0.76)
OSF1_3	Outdoor Stabilization Facility - Mixing Bin 1	559,874.73	4,768,419.62	2.13 (7.0)	0.57 (1.86)	0.23 (0.76)
OSF2_1	Outdoor Stabilization	559,887.36	4,768,354.55	2.13	0.57	0.23

	Facility - Mixing Bin 2			(7.0)	(1.86)	(0.76)
OSF2_2	Outdoor Stabilization Facility - Mixing Bin 2	559,887.24	4,768,357.25	2.13 (7.0)	0.57 (1.86)	0.23 (0.76)
OSF2_3	Outdoor Stabilization Facility - Mixing Bin 2	559,887.00	4,768,359.83	2.13 (7.0)	0.57 (1.86)	0.23 (0.76)

a. Universal Transverse Mercator.
b. m: meters.
c. ft: feet.

3.1.5 Emission Release Parameter Justification

<u>New Indoor Stabilization Building Baghouses</u>

Model ID: BH1, BH2

Emission release parameters for the Indoor Stabilization Building baghouses were determined based on project drawings and design specifications.

BH1 and BH2 were modeled with a stack height of 50.0 feet (15.2 meters) based on the proposed layout. This value must be verified upon final construction.

Modeled temperature was set to 0 K. This triggers AERMOD to use the actual ambient air temperatures from the meteorological data input files.

BH1 and BH2 were modeled with an exit diameter of 2.8 feet (0.86 meters). Given a minimum rated flow rate of 25,000 actual cubic feet per minute (acfm), the corresponding exit velocity is 20.6 meter/second (67.6 feet/second).

$$BH1, BH2\ exit\ velocity = 25{,}000\frac{feet^3}{minute} \times \frac{4}{\pi(2.8\ feet)^2} \times \frac{1\ minute}{60\ seconds} \times \frac{1\ meter}{3.28\ feet} = 20.6\frac{meter}{second}$$

However, BH1 and BH2 were conservatively modeled with an exit velocity of 18.0 meter/second (58.9 feet/second).

Both baghouses were modeled with vertical, uninterrupted release.

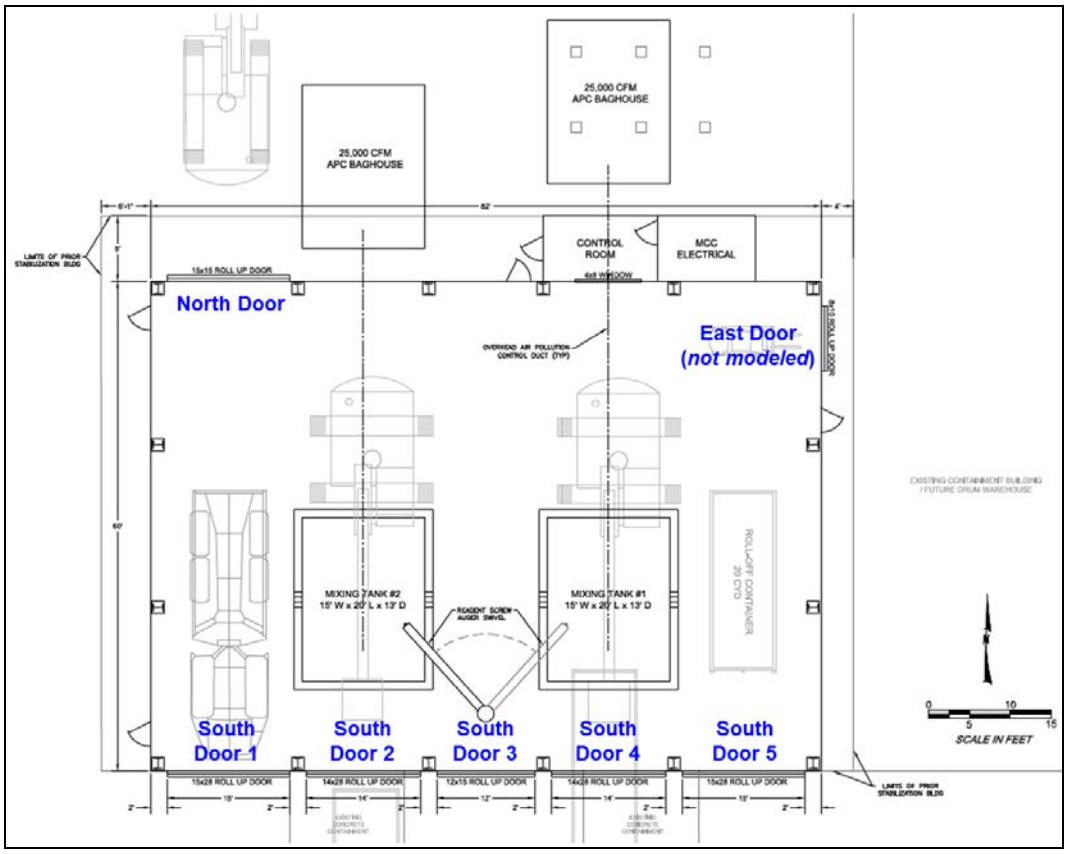
Indoor Stabilization Building baghouse release parameters were appropriately documented and justified.

<u>New Indoor Stabilization Building Roll-up/Coiling Doors</u>

Model ID: DR1_5_PT, DR1_3_PT, DR3_5_PT, DRN_SALL, DRN_S3

Emission release parameters for the roll-up/coiling doors were determined based on project drawings for the door locations and sizes. Figure 1 shows a plot plan of the new Indoor Stabilization Building. Because of the prevailing bi-directional wind directions (northwest to southeast and southeast to northwest), modeling focused on the large doors in the north and south sides of the building. The roll-up door on the east side of the building opens directly into the adjacent drum storage area, which has open sides but includes a solid roof at a height of 15 feet. Because emissions from this door are extremely unlikely to result in higher ambient impacts at or near the fenceline compared to the north and south doors in the building, this door opening was not modeled for this project.

Figure 1. PLOT PLAN OF THE NEW INDOOR STABILIZATION BUILDING (TOP VIEW).



For each modeled door or group of open doors, an equivalent diameter was determined based on the open area of the doors so that the doors could be modeled as horizontal point sources. The exit velocity from each door or group of doors was determined based on an assumed outside wind speed (18 mph for 24-hour averaging periods and 10 mph for annual averaging periods). Table 8 illustrates how exit velocities were calculated for a 24-hour averaging period, where an external wind speed of 18 mph or 1,584 feet per minute (fpm) is assumed.

Table 8. SAMPLE EXIT VELOCITY CALCULATION FOR THE FIVE ROLL-UP/COILING DOOR CONFIGURATIONS.

Roll-up/Coiling Door Configuration	Inflow (cfm)[a]	Outflow (cfm)	Face Velocity (fpm)[b]	Exit Velocity (m/sec)[c]
	fpm × Area[d]	Inflow – BH[e]	Outflow / Area[f]	
Wind Flowing from North Side Door to South Side Doors				
DR1_5_PT	356,400	306,400	169.84	0.9
DR1_3_PT and DR3_5_PT	356,400	306,400	308.87	1.6
Wind Flowing from South Side Doors to North Side Door				
DRN_SALL	2,857,536	2,807,536	12,478	63.4
DRN_S3	1,571,328	1,521,328	6,761	34.4

a. cfm: cubic feet per minute.
b. fpm: feet per minute.
c. m/sec: meters per second.
d. fpm = 1,584 feet per minute (18 miles per hour for 24-hour averaging period); Area = 225

square feet for DR1_5_PT, DR1_3_PT, and DR3_5_PT; Area = 1,804 square feet for DRN_SALL; Area = 992 square feet for DRN_S3.

e. BH flow = 50,000 cfm.

f. Area = 1,804 square feet for DR1_5_PT; Area = 992 square feet for DR1_3_PT and DR3_5_PT; Area = 225 square feet for DRN_SALL and DRN_S3.

DR1_5_PT, DR1_3_PT, and DR3_5_PT were conservatively modeled with a stack height of 4.3 meters (14.0 feet) based on the proposed height for the south doors (8.5 meters or 28.0 feet). DRN_SALL and DRN_S3 were conservatively modeled with a stack height of 1.5 meters (5.0 feet) based on the proposed height for the north door (4.6 meters or 15.0 feet). Equivalent diameters were calculated based on the face area of the roll-up/coiling doors.

Modeled temperature was set to 0 K. This triggers AERMOD to use the actual temperatures from the meteorological data input files.

Modeling for TAP emissions from the Indoor Stabilization Building demonstrated that the ambient impacts resulting from modeling fugitive emissions from the open roll-up/coiling doors as equivalent horizontal point sources were considerably higher than the impacts if emissions from the doors were modeled as volume sources. DEQ acknowledges the high level of conservatism from modeling fugitive emissions as equivalent point sources instead of volume sources.

Silo Baghouses

Model ID: ADD_SILO, LIM_SILO, O_SILO1, O_SILO2, O_SILO3

The listed manufacturer for the Indoor Stabilization silo baghouses (ADD_SILO, LIM_SILO) is Stephens, Model No. SV380. The listed manufacturer for the Outdoor Stabilization Facility silo baghouses (O_SILO1, O_SILO2, O_SILO3) is Mikropul “Pulsair”. Because the silo baghouses exhaust horizontally and actual exhaust flows for silo baghouses were not known (the baghouses are not equipped with fans), silo-filling emissions were modeled as point sources using the actual stack opening size and an exit velocity of 0.001 m/sec. Modeled temperature was set to 0 K. This triggers AERMOD to use the actual temperatures from the meteorological data input files. Silo diameters were estimated using Google Earth imagery. Silo heights were based on information from the field.

Silo baghouse release parameters were adequately documented and justified.

Space Heaters

Model ID: QHHEATER, SHOPHTR

The used oil-fired space heaters at the Quonset Hut (QHHEATER) and Maintenance Shop (SHOPHTR) are existing units. They were installed in February 2011 and March 2017, respectively. The listed manufacturer for QHHEATER is Firelake, Model 350, B5 Single stage burner. The listed manufacturer for SHOPHTR is Firelake, Model 500, B5 Single stage burner. Exhaust parameters were provided by USEI operations staff. Exhaust flows and temperatures were measured in the field, as were stack heights and stack diameters.

Space heater release parameters were adequately documented and justified.

Outdoor Stabilization Facility Mixing Bins

Model ID: OSF1_1, OSF1_2, OSF1_3, OSF2_1, OSF2_2, OSF2_3

Two representative mixing bins were modeled, each adjacent to an elevated deck for positioning an excavator. The approximate size of each bin is 25 feet × 8 feet × 7 feet. Each mixing bin (52 cubic yards in volume) was modeled using three adjacent volume sources.

Release height was set to 7.0 feet (2.13 meters). Initial horizontal dimension was calculated based on length of the side (8 feet/4.3 = 1.86 feet or 0.57 meters). Initial vertical dimension was calculated based on the vertical dimension of the mixing bin (3.28 feet/4.3 = 0.76 feet or 0.23 meters).

Volume parameters of the Outdoor Stabilization Facility mixing bins were adequately supported.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Background design values (DV) for 24-hour PM_{10} and 24-hour and annual $PM_{2.5}$ were obtained from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST; https://arcg.is/1jXmHH) using the project site coordinates. These background air pollutant levels are based on regional-scale air pollution modeling of pollutants in Washington, Oregon, and Idaho, with modeling results adjusted according to available monitoring data. REC selected the grid point that was closest to the USEI Grand View facility. The background values obtained from NW AIRQUEST are listed in Table 9.

Table 9. AMBIENT BACKGROUND CONCENTRATIONS AT THE USEI GRAND VIEW FACILITY.

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a,b]
PM_{10}[c]	24-hr	92.5
$PM_{2.5}$[d]	24-hr	20.8
	Annual	4.7

a. Micrograms per cubic meter.
b. NW AIRQUEST ambient background lookup tool, mid 2014-mid 2017.
c. Particulate matter with an aerodynamic diameter of 10 microns or less.
d. Particulate matter with an aerodynamic diameter of 2.5 microns or less.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

REC performed the project-specific air pollutant emission inventory and air impact analyses that were submitted with the application. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 10 provides a brief description of parameters used in the modeling analyses.

Table 10. MODELING PARAMETERS.		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Grand View, Owyhee County, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Boise surface data; Boise upper air data	See Section 3.3.5 of this memorandum for additional details of the meteorological data.
Terrain	Considered	1/3 arc second National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.6 for more details.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD. See Section 3.3.7.
Receptor Grid	**SIL Analysis** The selection of receptors for use in the SIL analysis is as follows (see Section 3.3.11):	
	Grid 1	15-meter spacing along the ambient air boundary and from the property boundary out to 100 meters from the property boundary.
	Grid 2	25-meter spacing from 100 meters beyond the property boundary out to 200 meters from the property boundary.
	Grid 3	50-meter spacing from 200 meters beyond the property boundary out to 500 meters from the property boundary.
	Grid 4	250-meter spacing from 500 meters beyond the property boundary out to 1,000 meters from the property boundary.
	Grid 5	500-meter spacing from 1,000 meters beyond the property boundary out to 5,000 meters from the property boundary.
	Grid 6	1,000-meter spacing from 5,000 meters beyond the property boundary out to 10,000 meters from the property boundary.
	Cumulative NAAQS Impact Analysis The same receptors were used in the Cumulative NAAQS Impact Analysis as in the SIL Analysis. Final dispersion modeling cases were run using a grid with more finely spaced receptors (5-meter spacing along the ambient air boundary and from the property boundary out to 25 meters from the property boundary) extending approximately 100 meters from the fence line. See Section 3.3.11.	
	TAPs Analysis The same receptors were used in the TAPs Analysis as in the Cumulative NAAQS Impact Analysis.	

3.3.2 Modeling Protocol

A modeling protocol was submitted to DEQ by REC on December 11, 2019. DEQ sent a conditional protocol approval to REC on January 3, 2020.

3.3.3 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*.[2]

3.3.4 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. The refined, steady-state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

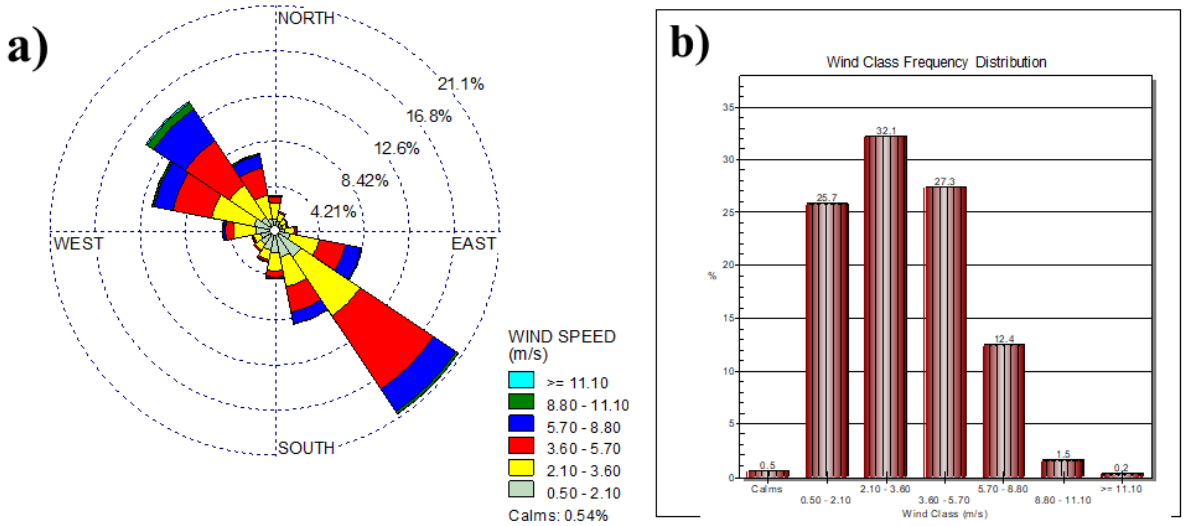
AERMOD version 19191 was used by REC for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.5 Meteorological Data

DEQ processed a meteorological dataset from Boise, Idaho (KBOI; station ID 726810-24131) covering the years 2014-2018. The upper air soundings required by AERMET were obtained from the Boise airport station (site ID 24131). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Boise airport precipitation data. Conditions were determined to be "wet" for 2014 and 2017, and "average" for 2015, 2016, and 2018. Average moisture content is defined as within a 30 percentile of the 30-year mean of 11.3 inches.

Figure 2 shows a wind rose and wind speed histogram at Boise Airport. On average, winds are dominated by southeasterlies with magnitudes of between 2.10 and 3.60 meters/second. Calms were relatively low at 0.54%, and less than one percent of the data were missing from the five-year record.

Figure 2. (a) WIND ROSE AND (b) WIND SPEED HISTOGRAM AT BOISE AIRPORT IN IDAHO (2014-2018).



AERMINUTE version 15271 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 19191 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The "adjust u star" (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. The modeling analyses used the met data set processed with the U* option.

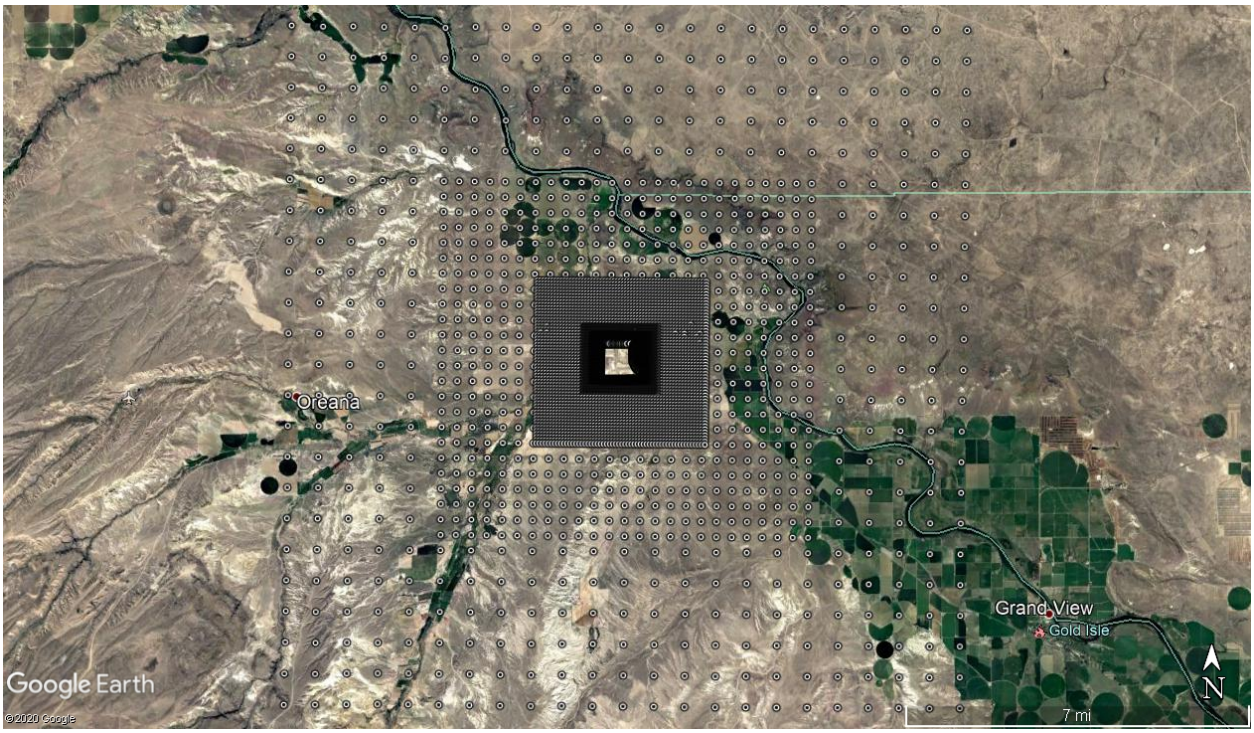
3.3.6 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

The terrain preprocessor AERMAP version 18081 was used by REC to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD.

AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emission plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 3 depicts the full 10-km receptor grid used in the analyses, overlaid on a terrain image from Google Earth.

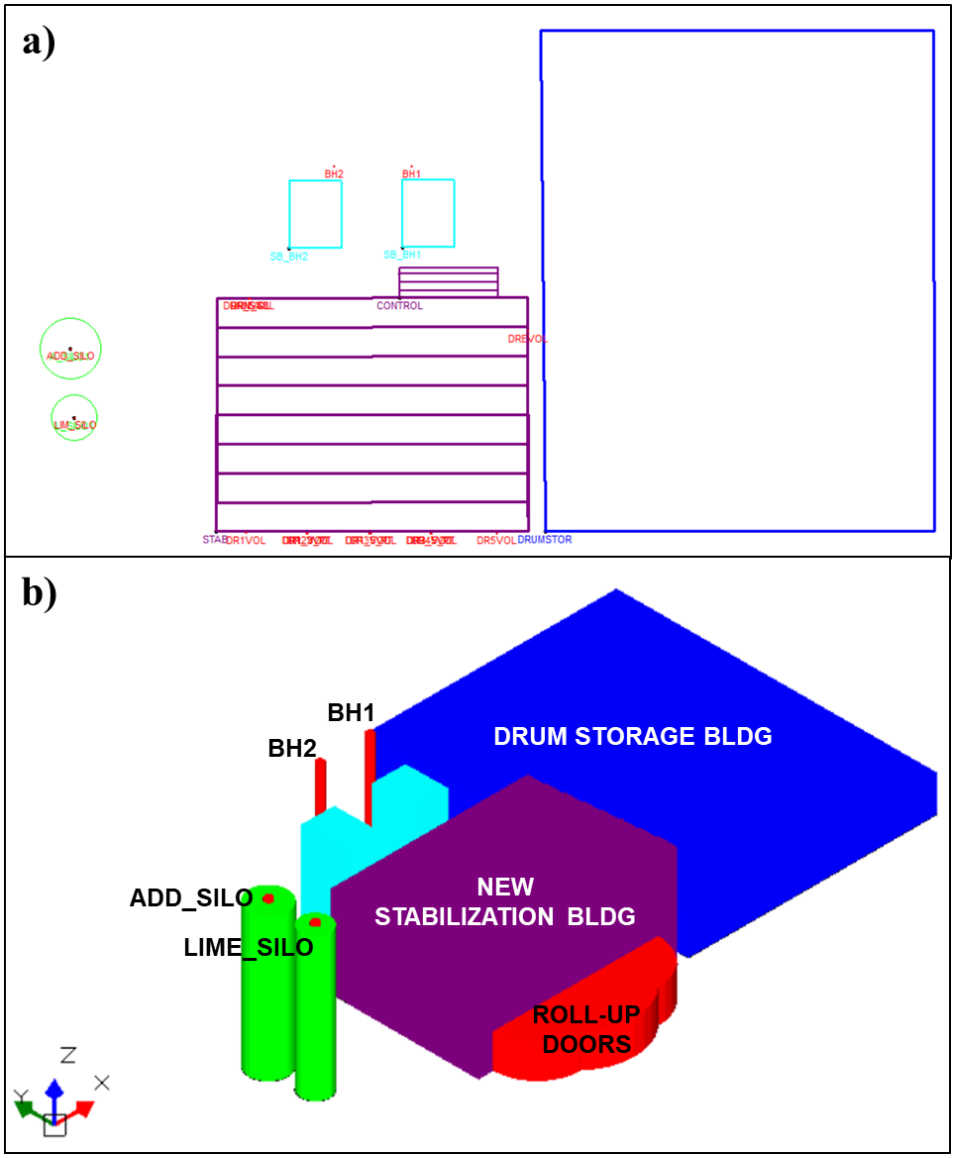
Figure 3. THE FULL RECEPTOR GRID CENTERED AT THE USEI GRAND VIEW FACILITY.



3.3.7 Facility Layout and Downwash

Figure 4 shows the USEI facility's structures and emission sources near the vicinity of the new Indoor Stabilization Building. Red dots in Figure 4a represent point sources. Figure 4b depicts a three-dimensional view of Figure 4a, as viewed from the southwest.

Figure 4. (a) USEI'S MODEL SETUP SHOWING STRUCTURES AND EMISSION SOURCES NEAR THE VICINITY OF THE NEW STABILIZATION BUILDING, AND (b) THREE-DIMENSIONAL VIEW OF (a) AS VIEWED FROM THE SOUTHWEST.



DEQ verified proper identification of the site location, equipment locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to plot plans submitted in the application. Aerial photographs on Google Earth (available at https://www.google.com/earth) were also used to assure that horizontal coordinates were accurate as described in the application.

Potential downwash effects on emission plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

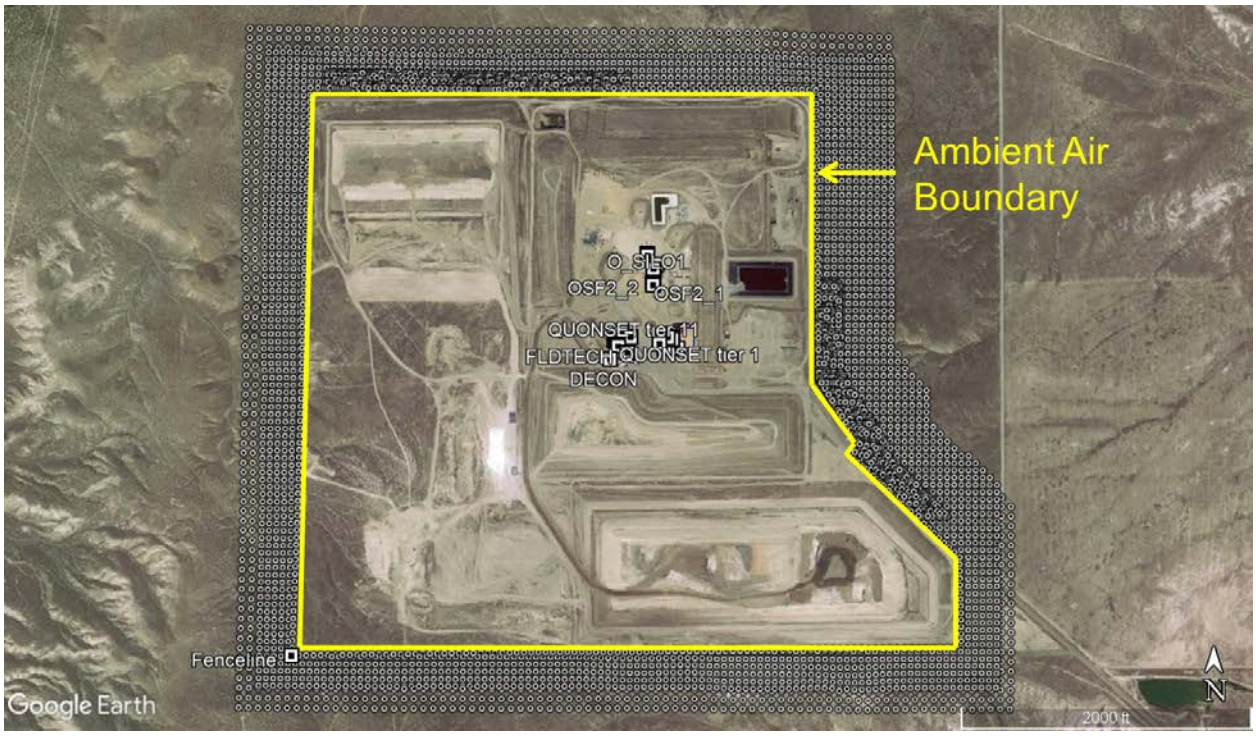
3.3.8 NOx Chemistry

Project-specific emission increase for NOx qualifies for a BRC permit exemption. Therefore, NO_2 NAAQS compliance demonstrations were not required for permit issuance.

3.3.9 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." The ambient air boundary for the USEI facility is based on the facility fenceline, as shown below in Figure 5. The USEI facility is surrounded by a chain link fence that is a minimum of six feet high and topped with three strands of barbed wire. Existing entrances to the facility are controlled access points and are occupied or secured during the site's operational hours. The fenced perimeter was used as the ambient air boundary. DEQ determined that the facility is adequately able to preclude public access to areas excluded from the air impact assessment.

Figure 5. USEI GRAND VIEW'S AMBIENT AIR BOUNDARY.



3.3.10 Nearby Co-Contributing Sources

If impacts of neighboring emission sources on receptors showing a significant impact from the sources subject to the permitting action are not adequately accounted for by the background concentration used, then emissions from those sources must be modeled. There are no nearby sources that had to be modeled as a co-contributing source in USEI's cumulative NAAQS impact analysis.

3.3.11 Receptor Network

A preliminary modeling analysis was run using a full 10-km receptor grid with receptor spacing as listed in Table 10. Modeling results from this initial simulation demonstrated that maximum modeled impacts occurred at or very near the ambient air boundary. Final dispersion modeling cases were run using a grid with more finely spaced receptors (5-meter spacing along the ambient air boundary and from the property boundary out to 25 meters from the property boundary) extending approximately 100 meters from the fence line (see Figure 5). The finer receptor network is able to adequately capture maximum modeled impacts. The full 10-km receptor grid is composed of 7,812 receptors. The finer receptor network is composed of 5,415 receptors.

For each final modeling run, the modeled concentrations at receptors in the immediate vicinity of the maximum modeled impact were evaluated to determine whether the maximum impact had been adequately resolved. Maximum impacts in all cases occurred where spacing between fence line receptors and the adjacent receptor grid was set to 5 meters. Modeled impacts at receptors adjacent to the maximum impact were within 1 to 3% of the reported maximum, demonstrating that maximum impacts were well resolved.

The receptor grid used in the submitted modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2], and DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.12 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

$H = S + 1.5L$, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

Sources from the USEI facility are below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 NAAQS and TAPs Impact Modeling Results

4.1 Results for NAAQS Analyses

4.1.1 Significant Impact Level Analysis

Table 11 provides results for the significant impact level (SIL) analysis. The SIL analysis shows that the

maximum predicted impacts from the facility are above the SIL for 24-hour $PM_{2.5}$. Therefore, a cumulative NAAQS impact analysis was performed for this pollutant and averaging period. Source group analysis suggests that $PM_{2.5}$ emissions from the used oil-fired space heaters are the largest contributors (maximum modeled impacts of 1.99 µg/m^3 and 1.87 µg/m^3 for QHHEATER and SHOPHTR, respectively).

Table 11. RESULTS FOR SIGNIFICANT IMPACT LEVEL ANALYSIS.

Pollutant	Averaging Period and Sources	Maximum Modeled Concentration (µg/m^3)[a]	Significant Impact Level (µg/m^3)	Impact Percentage of Significant Impact Level	Cumulative NAAQS Analysis Required?
$PM_{2.5}$[b]	**24-hour**	**4.12**	**1.2**	**343.3%**	**Yes**
	BH1_BH2[c]	0.00449		0.4%	
	DRN_S3	0.427		35.6%	
	QHHEATER	1.99		165.8%	
	SHOPHTR	1.87		155.8%	
	Annual	**0.176**	**0.2**	**88.0%**	**No**
	BH1_BH2	8.00E-05		0.0%	
	DR1_5_PT	2.43E-03		1.2%	
	DR1_3_PT	2.51E-03		1.3%	
	DR3_5_PT	2.62E-03		1.3%	
	DRN_SALL	3.33E-03		1.7%	
	DRN_S3	3.33E-03		1.7%	
	QHHEATER	7.82E-02		39.1%	
	SHOPHTR	9.67E-02		48.4%	

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
c. BH1_BH2 is a source group for New Indoor Stabilization Building baghouses BH1 and BH2.

4.1.2 Cumulative NAAQS Impact Analysis

Table 12 provides results for the cumulative NAAQS impact analysis. For each modeled pollutant, the total impact was calculated by adding the design value (DV) of the impact to the ambient background value. The sum was then compared to the NAAQS. Ambient impacts for the facility, when combined with approved ambient backgrounds, were below the NAAQS at all receptors for 24-hour $PM_{2.5}$.

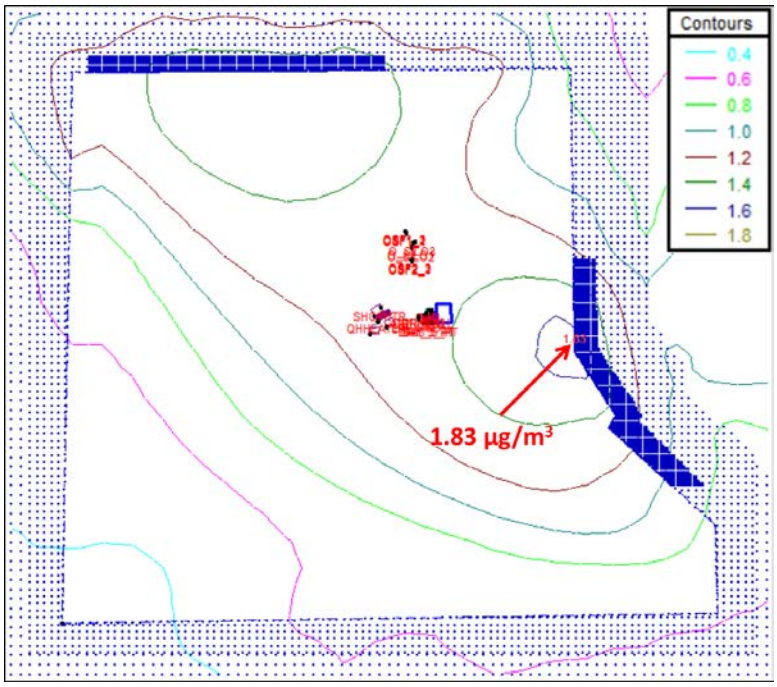
Table 12. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSIS.

Pollutant	Averaging Period	Modeled Design Value Concentration (µg/m^3)[a]	Background Concentration (µg/m^3)	Total Ambient Impact (µg/m^3)	NAAQS (µg/m^3)	Percent of NAAQS
$PM_{2.5}$[b]	24-hour	1.83[c]	20.8	22.63	35	64.7%

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Worst-case scenario occurred for source group GRDRN_S3 which includes facility-wide emission sources and DRN_S3, where emissions from the New Stabilization Building are represented as an equivalent point source emitting from the North Side Door assuming three south side doors are open.

Figure 6 shows the modeled design values for 24-hour $PM_{2.5}$. High concentrations occur at or near the facility fenceline, which is adequately resolved by the finely spaced receptor network.

Figure 6. MODELED DESIGN VALUES FOR 24-HOUR $PM_{2.5}$ CUMULATIVE NAAQS IMPACT ANALYSIS.



4.2 Results for TAPs Impact Analyses

Figure 7 shows plots of the dispersion coefficients (in units of µg/m^3 per lb/hr) for non-carcinogenic and carcinogenic particulate and volatile TAPs. High values occur at or near the facility fenceline, which is adequately resolved by the finely spaced receptor network.

The maximum dispersion coefficient (in µg/m^3 per lb/hr) was multiplied by the total emissions from reagents and wastes at the new Indoor Stabilization Building (in lb/hr), to calculate the maximum modeled impacts (in µg/m^3). Tables 13 and 14 list the non-carcinogenic TAPs and carcinogenic TAPs, respectively, that exceeded the applicable screening emission levels. A T-RACT analysis was developed by the applicant and approved by DEQ to justify multiplying the AACCs by a factor of ten.

TAPs impact analysis demonstrated that new TAP emissions from the USEI Grand View project would either not exceed screening ELs or not exceed AACs or T-RACT AACC increments.

Figure 7. DISPERSION COEFFICIENTS DERIVED FROM TAPS IMPACT ANALYSES.

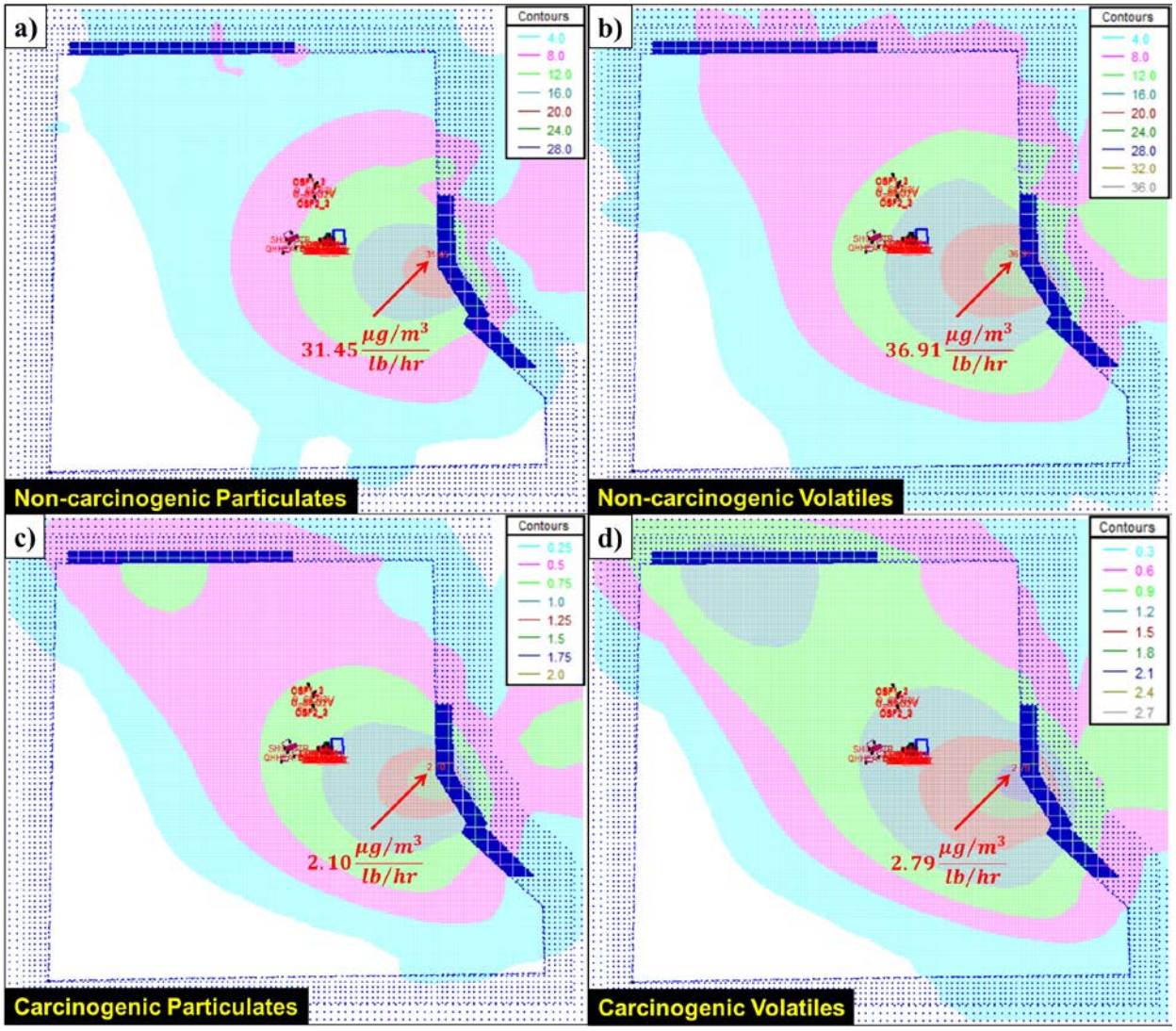


Table 13. MODELING RESULTS FOR NON-CARCINOGENIC TAPS.

CAS[a] No.	Speciated TAP	Emissions (lb/hr[b], 24-hr average)			Modeled Ambient Impact (mg/m^3)[c]	AAC[d] (mg/m^3)	Impact < AAC?	Percent of AAC
		Reagents	Wastes	Total				
Non-carcinogenic Particulate TAPs at 125,000 ppmw[e]. Dispersion Coefficient = 0.03145 mg/m^3 per lb/hr.								
7440-48-4	Cobalt		3.01E-02	3.01E-02	9.47E-04	0.0025	Yes	38%
7723-14-0	Phosphorus, total	1.64E-09	3.01E-02	3.01E-02	9.47E-04	0.005	Yes	19%
7782-49-2	Selenium		3.01E-02	3.01E-02	9.47E-04	0.01	Yes	9%
Non-carcinogenic Volatile TAPs at 10,000 ppmw, except as noted. Dispersion Coefficient = 0.03691 mg/m^3 per lb/hr.								
106-88-7	1,2 Butylene Oxide		3.88	3.88	1.43E-01	0.6	Yes	24%
95-95-4	2,4,5-Trichlorophenol 0.069 ppmw		0.041	0.041	1.51E-03	0.0016	Yes	94.58%
95-57-8	2-Chloropchenol		0.287	0.287	1.06E-02	0.025	Yes	42%
60-35-5	Acetamide		0.008	0.008	2.95E-04	0.0003	Yes	98.43%

	0.013 ppmw							
107-02-8	Acrolein 0.548 ppmw		0.329	0.329	1.21E-02	0.0125	Yes	97.15%
7664-41-7	Ammonia		3.56	3.56	1.31E-01	0.9	Yes	15%
74-83-9	Bromomethane		8.71	8.71	3.21E-01	0.95	Yes	34%
109-79-5	Butyl Mercaptan		1.43	1.43	5.28E-02	0.09	Yes	59%
75-15-0	Carbon disulfide		4.33	4.33	1.60E-01	1.5	Yes	11%
7782-50-5	Chlorine 6.70 ppmw		4.02	4.02	1.48E-01	0.15	Yes	98.92%
74-87-3	Chloromethane		13.13	13.13	4.85E-01	5.15	Yes	9%
126-99-8	Chloroprene		2.53	2.53	9.34E-02	1.8	Yes	5%
592-01-8	Cyanide Compounds		4.76	4.76	1.76E-01	0.25	Yes	70%
75-08-1	Ethyl Mercaptan 2.22 ppmw		1.33	1.33	4.91E-02	0.05	Yes	98.18%
628-96-6	Ethylene Glycol Dinitrate		0.064	0.064	2.36E-03	0.016	Yes	15%
16219-75-3	Ethylidene-2-norbornene		0.637	0.637	2.35E-02	1.25	Yes	2%
64-18-6	Formic acid		0.921	0.921	3.40E-02	0.47	Yes	7%
111-30-8	Glutaraldehyde		0.504	0.504	1.86E-02	0.041	Yes	45%
77-47-4	Hexachlorocyclo-pentadiene		0.042	0.042	1.55E-03	0.005	Yes	31%
7647-01-0	Hydrogen Chloride		6.61	6.61	2.44E-01	0.375	Yes	65%
7664-39-3	Hydrogen Fluoride 5.60 ppmw		3.36	3.36	1.24E-01	0.125	Yes	99.21%
6-4-7783	Hydrogen Sulfide 31.6 ppmw		18.95	18.95	6.99E-01	0.7	Yes	99.92%
123-31-9	Hydroquinone		0.211	0.211	7.79E-03	0.1	Yes	8%
108-31-6	Maleic anhydride		0.164	0.164	6.05E-03	0.05	Yes	12%
126-98-7	Methacrylonitrile		2.37	2.37	8.75E-02	0.15	Yes	58%
108-98-5	Phenyl Mercaptan		0.303	0.303	1.12E-02	0.1	Yes	11%
75-44-5	Phosgene 0.892 ppmw		0.535	0.535	1.97E-02	0.02	Yes	98.73%
7803-51-2	Phosphine 0.899 ppmw		0.539	0.539	1.99E-02	0.02	Yes	99.47%
88-89-1	Picric acid 0.221 ppmw		0.133	0.133	4.91E-03	0.005	Yes	98.18%
75-56-9	Propylene Oxide		4.15	4.15	1.53E-01	2.4	Yes	6%
106-51-4	Quinone		0.043	0.043	1.59E-03	0.02	Yes	8%
584-84-9	Toluene-2,6-diisocyanate 10 ppmw		0.054	0.054	1.99E-03	0.002	Yes	99.66%
121-44-8	Triethylamine		1.68	1.68	6.20E-02	0.2	Yes	31%
51-79-6	Urethane		0.016	0.016	5.91E-04	0.0015	Yes	39%
108-05-4	Vinyl Acetate		2.39	2.39	8.82E-02	1.75	Yes	5%

a. Chemical Abstracts Service.
b. Pounds per hour.
c. Milligrams per cubic meter.
d. Acceptable Ambient Concentration of a non-carcinogenic TAP.
e. Parts per million by weight.

Table 14. MODELING RESULTS FOR CARCINOGENIC TAPS.

CAS[a] No.	Speciated TAP	Emissions (lb/hr[b], annual average)			Annual Modeled Impact (µg/m^3)[c]	T-RACT AACC[d] (µg/m^3)	Impact < T-RACT AACC?	Percent of T-RACT AACC
		Reagents	Wastes	Total				
Carcinogenic Particulate TAPS at 125,000 ppmw[e], except as noted. Dispersion Coefficient = 2.10 µg/m^3 per lb/hr.								

1332-21-4	Asbestos (friable) 2,700 ppmw		1.87E-05	1.87E-05	3.93E-05	4.00E-05	Yes	98%
7440-38-2	Arsenic 50,000 ppmw	4.54E-11	1.04E-03	1.04E-03	2.18E-03	2.30E-03	Yes	95%
7440-41-7	Beryllium	4.11E-12	2.59E-03	2.59E-03	5.44E-03	4.20E-02	Yes	13%
7440-43-9	Cadmium	5.31E-13	2.59E-03	2.59E-03	5.44E-03	5.60E-03	Yes	97%
18540-29-9	Chromium VI, Total Chromium 50,000 ppmw	1.66E-11	3.53E-04	3.53E-04	7.41E-04	8.30E-04	Yes	89%
7440-02-0	Nickel	1.04E-10	2.59E-03	2.59E-03	5.44E-03	4.20E-02	Yes	13%
Carcinogenic Volatile TAPs at 1,500 ppmw, except as noted. Dispersion Coefficient = 2.79 µg/m^3 per lb/hr.								
79-34-5	1,1,2,2-Tetrachloroethane		7.53E-03	7.53E-03	2.10E-02	0.17	Yes	12%
79-00-5	1,1,2-Trichloroethane		1.75E-02	1.75E-02	4.89E-02	0.62	Yes	8%
75-34-3	1,1-Dichloroethane		8.07E-02	8.07E-02	2.25E-01	0.38	Yes	59%
96-12-8	1,2-Dibromo-3-chloropropane 8.97E-03 ppmw		5.65E-04	5.65E-04	1.58E-03	1.60E-03	Yes	98.60%
107-06-2	1,2-Dichloroethane		4.20E-02	4.20E-02	1.17E-01	0.38	Yes	31%
106-99-0	1,3-butadiene 2.03E-01 ppmw		1.28E-02	1.28E-02	3.57E-02	0.036	Yes	99.25%
542-75-6	1,3-Dichloropropylene		1.99E-02	1.99E-02	5.56E-02	2.5	Yes	2%
75-07-0	Acetaldehyde		8.99E-02	8.99E-02	2.51E-01	4.5	Yes	6%
79-06-1	Acrylamide		1.71E-04	1.71E-04	4.77E-04	45	Yes	0.001%
107-13-1	Acrylonitrile		3.19E-02	3.19E-02	8.90E-02	45	Yes	0.20%
62-53-3	Aniline		1.59E-03	1.59E-03	4.44E-03	1.4	Yes	0.32%
71-43-2	Benzene		3.06E-02	3.06E-02	8.54E-02	1.2	Yes	7%
111-44-4	bis(2-Chloroethyl)ether		3.05E-03	3.05E-03	8.51E-03	0.03	Yes	28%
56-23-5	Carbon Tetrachloride		3.99E-02	3.99E-02	1.11E-01	0.67	Yes	17%
67-66-3	Chloroform		4.25E-02	4.25E-02	1.19E-01	0.43	Yes	28%
74-87-3	Chloromethane		2.07E-01	2.07E-01	5.78E-01	2.8	Yes	21%
132-64-9	Dibenzofuran 1.22E-06 ppmw		7.67E-08	7.67E-08	2.14E-07	2.20E-07	Yes	97.32%
75-09-2	Dichloromethane		7.64E-02	7.64E-02	2.13E-01	2.4	Yes	9%
123-91-1	Dioxane		2.78E-02	2.78E-02	7.76E-02	7.1	Yes	1%
106-89-8	Epichlorohydrin		1.15E-02	1.15E-02	3.21E-02	8.3	Yes	0.39%
106-93-4	Ethylene Dibromide		1.06E-02	1.06E-02	2.96E-02	0.045	Yes	66%
75-21-8	Ethylene oxide 5.62E-01 ppmw		3.54E-02	3.54E-02	9.88E-02	0.1	Yes	98.82%
75-34-3	Ethylidene Dichloride		7.10E-02	7.10E-02	1.98E-01	0.38	Yes	52%
50-00-0	Formaldehyde		2.98E-02	2.98E-02	8.32E-02	0.77	Yes	11%
76-44-8	Heptachlor		9.75E-05	9.75E-05	2.72E-04	7.70E-03	Yes	4%
87-68-3	Hexachloro-1,3-butadiene		1.37E-03	1.37E-03	3.82E-03	0.5	Yes	1%
302-01-2	Hydrazine 1.88E-02 ppmw		1.18E-03	1.18E-03	3.29E-03	3.40E-03	Yes	97.00%
58-89-9	Lindane		3.10E-05	3.10E-05	8.65E-05	2.60E-02	Yes	0.33%
60-34-4	Methyl Hydrazine 1.81E-01 ppmw		1.14E-02	1.14E-02	3.18E-02	3.20E-02	Yes	99.30%
91-20-3	Naphthalene		5.91E-04	5.91E-04	1.65E-03	0.14	Yes	1%
55-18-5	N-Nitrosodiethylamine 1.27E-03 ppmw		7.98E-05	7.98E-05	2.23E-04	2.30E-04	Yes	96.85%
62-75-9	N-Nitrosodimethylamine 3.99E-03 ppmw		2.52E-04	2.52E-04	7.03E-04	7.10E-04	Yes	99.08%
924-16-3	N-Nitroso-di-n-butylamine		9.67E-04	9.67E-04	2.70E-03	6.30E-03	Yes	43%
127-18-4	Tetrachloroethylene		2.45E-02	2.45E-02	6.84E-02	21	Yes	0.33%

79-01-6	Trichloroethylene		3.26E-02	3.26E-02	9.10E-02	7.7	Yes	1%
75-01-4	Vinyl Chloride		2.17E-01	2.17E-01	6.06E-01	1.4	Yes	43%
75-35-4	Vinylidene chloride 1.10 ppmw		6.93E-02	6.93E-02	1.93E-01	0.2	Yes	96.50%

a. Chemical Abstracts Service.
b. Pounds per hour.
c. Micrograms per cubic meter.
d. T-RACT: Toxic Air Pollutant Reasonably Available Control Technology; AACC: Acceptable Ambient Concentration of a Carcinogenic TAP.
e. Parts per million by weight.

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ's air impact analyses, demonstrated to DEQ's satisfaction that emissions from the U.S. Ecology Idaho Grand View facility in Owyhee County, ID, coupled with its Toxic Air Pollutant Reasonably Available Control Technology, will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

References

1. *Policy on NAAQS Compliance Demonstration Requirements*. Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses*. Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on July 14, 2020:

Facility Comment: Permit Condition 2.2, USEI's hazardous waste permit issued under the Resource Conservation and Recovery Act (RCRA, Permit No. IDD073114654) allows treatment and disposal of hazardous wastes exceeding an average volatile organic (VO) concentration at the point of waste generation in excess of 500 parts per million by weight (ppmw) in tanks, surface impoundments, or containers, as long as the emission control requirements of IDAPA 58.01.05.008 (40 CFR 264, Subpart CC) are met and prior approval has been received from the DEQ Director (see condition II.T.2 on p. 39 of the USEI RCRA Permit last modified on November 1, 2019). The RCRA permit does not limit concentrations of volatiles in non-hazardous wastes that are treated, stored, or land-disposed at the USEI Grand View site.

For air quality permitting, compliance with Idaho TAPs rules for processing wastes at the Indoor Stabilization Building was demonstrated for volatile concentrations of 10,000 ppmw (noncarcinogens) and 1,500 ppmw (carcinogens), with a few exceptions as shown in Tables 3.4 and 3.5 of this draft permit.

Recommend changing the PC to say the following wastes are not subject to the treatment throughput limits in this permit: Wastes that do not contain particulate or volatile HAP/TAPs, as determined through routine waste characterization practices and wastes that do not require processing or treatment to meet Land Disposal Restrictions (LDRs) and can be disposed in the as-received condition. This practice is referred to as "direct burial."

DEQ Response: The requested change has been made. The requirement for wastes in excess of 500 ppmw of volatile organic concentration has been moved to the OSF section of the permit. The ISB has explicit limits already listed.

Facility Comment: Permit Condition 2.3, move to Indoor Stabilization Building section.

DEQ Response: The requested change has been made. Micro-encapsulation, macro-encapsulation and sizing operations can only occur in the ISB and therefor the condition has been moved.

Facility Comment: Permit Condition 2.4, recommend changing to the following language: Wastes not excluded from treatment throughput limits in Permit Condition 2.2 and which have been determined through routine waste characterization practices to contain one or more TAPs not listed in Appendix A of this permit may be treated/stabilized if:

It has been demonstrated that emissions of the TAP in any calendar day will not exceed the applicable screening emissions level (EL) listed in Section 585 of the Rules and/or projected annual emissions of the TAP will not exceed ten times the applicable EL listed in Section 586 of the Rules. For TAPs listed in both sections, emission rates must be less than or equal to both ELs.

Or

It has been demonstrated that emissions of the TAP will not cause an ambient impact greater than the applicable acceptable ambient concentration (AAC) increment or ten (10) times the acceptable ambient concentration for carcinogens (AACC) increment listed in Section 585 and/or 586 of the Rules in one of the following ways:

Calculating the maximum ambient impact from emissions of the TAP using the dispersion coefficients listed in Appendix A to this permit; or

Conducting atmospheric dispersion modeling to determine the maximum ambient impact from emissions of the TAP. The modeling analyses shall use a current version of an EPA-approved model and follow relevant guidance in the most recent version of the "State of Idaho Guideline for Performing Air Quality Impact Analyses," available for download on DEQ's website.

For TAPs listed in both Section 585 and 586 of the Rules, compliance shall be demonstrated with both the AAC and ten times the AACC.

DEQ Response: The requested changes have been made. The suggested language is much more detailed than the original permit condition but if it ultimately helps the facility demonstrate compliance then the proposed language is accepted.

Facility Comment: Permit Condition 2.18, recommend adding the following language: In accordance with 40 CFR 63.2, fugitive emissions shall be included in facility-wide totals for comparison with these major source thresholds.

DEQ Response: The requested change has been made.

Facility Comment: Permit Condition 2.19, recommend changing language to HAP concentrations determined through routine waste characterization practices instead of waste characterization provided by a laboratory.

DEQ Response: The requested change has been made.

Facility Comment: Permit Condition 3.2, move the stabilization emissions and controlling baghouses with the Treatment Tanks 1 and 2.

DEQ Response: The requested change has been made.

Facility Comment: Permit Condition 3.3, this condition is not necessary to ensure compliance with the NAAQS. PM_{10} emissions from activities in the Indoor Stabilization Building were calculated at 0.11 T/yr. Another 0.51 T/yr is emitted from filling the two reagent silos adjacent to the ISB. Short-term and annual throughput limits on the treatment of "fine wastes" already serve to limit PM_{10} and $PM_{2.5}$ emissions.

DEQ Response: The requested change has been made. The PM_{10} limit was in the previous permit and remained in the draft permit. PM emissions are limited by the throughput limits on the treatment of wastes and therefore can be removed from the permit.

Facility Comment: Permit Conditions 3.4 and 3.5, a limit based on each consecutive 24 hour period would require monitoring and recording treatment throughputs on an hourly basis and calculating rolling 24-hr totals. Changing this to "per calendar" day makes the limit consistent with the draft monitoring and recordkeeping provisions in Permit Conditions 3.12 and 3.13.

DEQ Response: The requested change has been made to make recordkeeping easier for the facility.

Facility Comment: Permit Conditions 3.6, 3.7, 3.8, and 3.9, add screening to the title of the PCs. Compliance with TAPs increments was demonstrated at this level for all TAPs listed in Appendix A, except as noted in the tables. Screening treatment limits for the exceptions in the EI were inadvertently based on the modeling lb/hr emissions rate. These values have been corrected to reflect the ppmw present in wastes used in the calculations tab "Treatment Pits VOC 2020 Annual".

DEQ Response: The requested changes have been made to correct the previously listed values in the EI.

Facility Comment: Recommend adding a Max TAPs Treatment Limits PC to say Treatment of TAPs in wastes shall not exceed the applicable Maximum Treatment Limits listed in Tables A-2, A-3, A-4, or A-5 of Appendix A to this permit. For TAPs listed in both Section 585 and 586 of the Rules, compliance must be demonstrated with the applicable calendar day and annual treatment limits.

DEQ Response: The requested change has been made.

Facility Comment: Permit Condition 3.11, add power outage verbiage that is the same as in condition XLC.2.e in the latest RCRA permit.

DEQ Response: The requested change has been made.

Facility Comment: Permit Condition 3.15, recommend adding the following language. The permittee shall monitor and record the weight of waste being processed and the concentration in parts per million by weight (ppmw) of each TAP present in that waste as determined by routine waste characterization practices, for all wastes processed during a calendar day in the Indoor Stabilization Building.

For any case where the concentration of a TAP exceeds the applicable "modeled ppmw" screening level listed in Tables 3.2, 3.3, 3.4, or 3.5, the permittee shall calculate and record the weight of that TAP processed during that calendar day.

DEQ Response: The requested change has been made to make monitoring and recordkeeping easier for the facility.

Facility Comment: Permit Condition 4.3, Suggest deleting this condition and noting in the SOB that point source emissions of PM_{10}, $PM_{2.5}$, and particulate HAPs/TAPs from the silos are constrained using throughput limits. Fugitive emissions of PM_{10}, $PM_{2.5}$, particulate TAPs and volatile TAPs from stabilizing wastes are constrained by throughput limits and general provisions to control fugitive dusts..

DEQ Response: The requested change has been made. The PM_{10} limit was in the previous permit and remained in the draft permit. PM emissions are limited by the throughput limits on the treatment of wastes and therefore can be removed from the permit.

Facility Comment: Recommend adding the language from PC 2.2 in this section to say: The permittee shall not treat hazardous wastes containing an average volatile organic (VO) concentration at the point of waste origin of more than 500 ppmw unless the appropriate emission control requirements specified in IDAPA 58.01.05.008 (40 CFR 264, Subpart CC) are met. This is the same wording as RCRA condition II.T.2. Previous TAPs analysis conducted for fugitive emissions from outdoor stabilization were based on maximum volatile TAPs concentrations of 500 ppmw.

DEQ Response: The requested change has been made to move this language from previous PC 2.2 and to match the wording of the RCRA condition.

Facility Comment: Permit Condition 4.4, remove the "fine wastes and change to calendar day instead of consecutive 24 hour period. RCRA Permit Condition XI.B.2 prohibits treating or stabilizing "fine wastes" at the Outdoor Stabilization Facility. This means that wastes processed at the Outdoor Stabilization Facility will have a minimum moisture content of 10% and less than 25% of the particles will be smaller than 75 microns. With additional control provided as needed using manual water sprays and the distance to the fence line from these fugitive sources, off-site impacts associated with particulate TAPs from outdoor stabilization are negligible.

DEQ Response: The requested change has been made to make recordkeeping easier for the facility.

Facility Comment: Recommend adding language for maximum treatment limits listed in Appendix A.

DEQ Response: The requested change has been made.

Facility Comment: Recommend adding language for TAPs treatment limits monitoring including both particulate and volatile TAPs.

DEQ Response: The requested change has been made.

Facility Comment: Recommend adding that used oil-fired space heaters shall comply with 40 CFR 279.23.

DEQ Response: The requested change has been made.

Facility Comment: Permit Condition 5.4, clarify that used oil can have a maximum sulfur content of 1.0% by weight and ultra-low sulfur diesel shall have a maximum sulfur content of 0.0015% by weight.

DEQ Response: The requested change has been made.

Facility Comment: In the Statement of Basis, clarify that the TAPs analysis was from the Indoor Stabilization Building and were presumed to be "new" so pre-project rates are set to zero.

DEQ Response: The clarification has been noted in the Statement of Basis.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**US Ecology Idaho, Inc.**
Address:	**20400 Lemley Road**
City:	**Grand View**
State:	**ID**
Zip Code:	**83624**
Facility Contact:	**Rebecca Hogaboam**
Title:	**EH&S Manager**
AIRS No.:	**073-00004**

N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Did this permit require engineering analysis? Y/N
N	Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	0.2	0	0.2
SO_2	1.6	0	1.6
CO	0.1	0	0.1
PM10	0.0	8.02	-8.0
VOC	0.0	34.4	-34.4
Total:	0.0	42.42	**-40.6**
Fee Due	**$ 1,000.00**		

Comments: