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FEB 2 3 2016

16-ECD-0008

Ms. Jane A. Hedges, Program Manager
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Ms. Hedges:

U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION SUBMITS TOC-ENV-NOC 5252, REV. 00, CRITERIA AND TOXICS AIR EMISSIONS NOTICE OF CONSTRUCTION FOR THE OPERATION OF PORTABLE EXHAUSTERS SUPPORTING SINGLE-SHELL TANK WASTE RETRIEVAL AT THE 241-A AND 241-AX TANK FARMS

Reference: Ecology letter from J.A. Hedges to S. Olinger, ORP, "Approval of Criteria and Toxic Air Emissions Notice of Construction (NOC) Application, Hanford Single-Shell Tank Waste Retrieval," dated July 31, 2007.

The U.S. Department of Energy, Office of River Protection hereby submits to Washington State Department of Ecology the Office of River Protection Notice of Construction (NOC) TOC-ENV-NOC-5252, "Criteria and Toxics Air Emissions Notice of Construction for the Operation of Portable Exhausters Supporting Single-Shell Tank Waste Retrieval at the 241-A and 241-AX Tank Farms," (Attachment 1).

This NOC addresses the concurrent operation of four portable exhausters to support waste retrieval activities in 241-A and 241-AX Tank Farms. Currently, retrieval activities in 241-A and 241-AX Tank Farms are permitted under DE05NWP-002, Rev. 2, "Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions," for Single-Shell Tank Retrieval Exhausters (Reference). However, the project will be utilizing new portable exhausters not covered in DE05NWP-002; therefore, a new approval order is proposed. Upon issuance of the approval order for this NOC application, DE05NWP-002 will no longer apply to 241-A and 241-AX Tank Farm waste retrieval activities.

The NOC application is included in Attachment 2.

If you have any questions, please contact Dennis W. Bowser, Environmental Compliance Division, (509) 373-2566.

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Attachment 1
16-ECD-0008
(47 Pages)

Criteria and Toxics Air Emissions Notice of Construction for the Operation of Portable Exhausters Supporting Single-Shell Tank Waste Retrieval at the 241-A and 241-AX Tank Farms

TOC-ENV-NOC-5252, Revision 00

Dennis W. Bowser

Criteria and Toxics Air Emissions Notice of Construction for the Operation of Portable Exhausters Supporting Single-Shell Tank Waste Retrieval at the 241-A and 241-AX Tank Farms

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Abstract: This document serves as a notice of construction application pursuant to the requirements of Washington Administrative Code 173-400, "General Regulations for Air Pollution Sources," and Washington Administrative Code 173-460, "Controls for New Sources of Toxic Air Pollutants," for the operation of portable exhausters during waste retrieval activities at the 241-A and 241-AX single-shell tank farms.

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Feb 03, 2016
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Approved For Public Release

Criteria and Toxics Air Emissions Notice of Construction for the Operation of Portable Exhausters Supporting Single-Shell Tank Waste Retrieval at the 241-A and 241-AX Tank Farms

Prepared by:
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Date Published
February 2016

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EXECUTIVE SUMMARY

This document serves as a notice of construction application pursuant to the requirements of *Washington Administrative Code* 173-400, "General Regulations for Air Pollution Sources," and *Washington Administrative Code* 173-460, "Controls for New Sources of Toxic Air Pollutants," for the operation of portable exhausters during waste retrieval activities at the 241-A and 241-AX single-shell tank farms.

This notice of construction application includes descriptions of waste retrieval methods, equipment, and controls for retrieving waste from single-shell tanks. Waste retrieval operations will utilize several different methods, such as, but not limited to, modified sluicing, saltcake dissolution, enhanced sluicing, mobile arm retrieval sluicing and vacuum systems, and chemical dissolution.

The current waste retrieval plan for 241-A and 241-AX Tank Farms utilizes four portable exhausters. Two of the portable exhausters are built and ready for use at 241-AX Tank Farm, and two are in the design phase for future use at 241-A Tank Farm. This application analyzes emissions from all four portable exhausters. The combined emissions from the portable exhausters for criteria pollutants were estimated to be below the regulatory exemption levels, in accordance with *Washington Administrative Code* 173-400, with the exception of nitrogen oxides and total volatile organic compounds. Emissions of toxic air pollutants for all portable exhausters were analyzed and 92 toxics were found to potentially be emitted. Of the 92 toxics identified, 44 were found to be above the *Washington Administrative Code* 173-460 de minimis screening levels and 31 were found to be above the small quantity emission rate. Two toxic air pollutants, dimethyl mercury and chromium, exceeded their acceptable source impact levels. As described in Section 8.0, the filter train abatement credit decreased the dispersed concentration of chromium to below the acceptable source impact level. Therefore, only dimethyl mercury was found to be above the acceptable source impact level. It is proposed that RPP-ENV-59016, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," be used to satisfy *Washington Administrative Code* 173-460-090, "Second Tier Review," requirements for dimethyl mercury for this notice of construction application.

A best available control technology for toxics evaluation was previously performed for each new primary tank farm ventilation system in this notice of construction application. Based upon the results of this best available control technology for toxics, the proposed control technology for the single-shell tank ventilation system is the operation of the standard exhauster configuration (moisture eliminator, preheater, HEPA filters, fan, and stack with monitoring instrumentation) with periodic monitoring to confirm that the estimated emission parameters are accurate.

Upon issuance of the approval order for this notice of construction application, DE05NWP-002, Revision 2, "Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions" for Single-Shell Tank Retrieval Exhausters, will no longer apply to 241-A and 241-AX Tank Farm waste retrieval activities.

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Appendix A. Criteria and Toxic Air Pollutant Emission Rates A-1
Appendix B. Dimethyl Mercury Baseline Sampling Results B-1

LIST OF TERMS

AERMOD	American Meteorological Society/U.S. Environmental Protection Agency
ASIL	acceptable source impact level
CAS	Chemical Abstracts Service
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	State of Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
HEPA	high efficiency particulate air
NOC	notice of construction
NOx	nitrogen oxides
RCW	*Revised Code of Washington*
SEPA	State Environmental Policy Act
SQER	small quantity emission rate
SST	single-shell tank
TAP	toxic air pollutant
tBACT	Best Available Control Technology for Toxics
Tri-Party Agreement	Hanford Federal Facility Agreement and Consent Order
TWINS	Tank Waste Information Network System
USC	*United States Code*
VOC	volatile organic compounds
WAC	*Washington Administrative Code*

UNITS

%	percent
cfm	cubic feet per minute
g/s	grams per second
gal	gallons
lb/yr	pound(s) per year
m	meter
scfm	standard cubic feet per minute
$\mu g/m^3$	microgram per cubic meter

METRIC CONVERSION CHART

Into metric units			Out of metric units		
U.S. Customary Units	**Multiply by**	**To get**	**U.S. Customary Units**	**Multiply by**	**To get**
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Energy			**Energy**		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.948	British thermal unit per second	British thermal unit per second	1.055	kilowatt
Force/Pressure			**Force/Pressure**		
pounds per square inch	6.895	kilopascals	kilopascals	0.14504	pounds per square inch

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE, Second Ed., 1990, Professional Publications, Inc., Belmont, California.

1.0 INTRODUCTION

This notice of construction (NOC) application is being submitted for approval in accordance with *Washington Administrative Code* (WAC) 173-400, "General Regulations for Air Pollution Sources," and WAC 173-460, "Controls for New Sources of Toxic Air Pollutants." This NOC application provides an estimate of the emissions from the operation of portable exhausters during waste retrieval activities at the 241-A and 241-AX single-shell Tank Farms on the Hanford Site. The current waste retrieval plan for 241-A and 241-AX Tank Farms utilizes four portable exhausters. Two of the portable exhausters are built and ready for use at 241-AX Tank Farm, and two are in the design phase for future use at 241-A Tank Farm. This application analyzes emissions from all four portable exhausters. The estimated emissions are compared to the WAC 173-460-150 emissions levels.

Emissions of all criteria air pollutants and toxic air pollutants (TAP), except dimethyl mercury, were estimated on a tank farm basis based upon tank concentration headspace data from the Tank Waste Information Network (TWINS) database. Dimethyl mercury tank emission rates were estimated based on baseline sampling data at the AY/AZ Tank Farms exhauster (Appendix B). Due to uncertainties in waste transfers between tanks over the life of these projects, a conservative approach was taken to estimate emissions. Emissions were estimated based upon the highest per tank emission rate of each pollutant for all the tanks in both the 200 West and 200 East Areas. All of the tanks in each tank farm were then assumed to have the highest per tank emission rate for each pollutant. It was assumed that two tanks would be mixed or retrieved at any given time in each tank farm and a tank mixing factor of 10 will be applied to their emissions to simulate the increased emissions from mixing or retrieving. The estimated emissions assume that only two tanks are being mixed or retrieved in each tank farm for the entire year.

The emissions for criteria pollutants were estimated to be below the regulatory exemption levels with the exception of nitrogen oxides (NOx) and total volatile organic compounds (VOC) as shown in Appendix A. Estimated NOx emissions are 7,630 lbs/year and the estimated VOC emissions are 20,132 lbs/year. Both of these levels exceed the 4,000 lb/year exemption level in WAC 173-400-110(5)(b).

A total of 92 toxics, as defined in WAC 173-460-150, were found to potentially be emitted; 44 were above the de minimis emission screening level and 31 were above the small quantity emission rate (SQER). Two toxic air pollutants, dimethyl mercury and chromium, exceeded their acceptable source impact levels (ASIL). As described in Section 8.0, the filter train abatement credit decreased the dispersed concentration of chromium to below the ASIL. Therefore, only dimethyl mercury was found to be above the ASIL. It is proposed that RPP-ENV-59016, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," be used to satisfy WAC 173-460-090, "Second Tier Review," requirements for dimethyl mercury for this notice of construction application.

The technologies considered in RPP-20773, "Evaluation of Best Available Control Technology for Toxics (tBACT), Waste Retrieval System Operations in Single Shell Tank Farms," were eliminated due to technical infeasibilities or because the costs exceeded the amounts the Washington Department of Ecology (Ecology) and the U.S. Environmental Protection Agency

(EPA) considers to be economically justifiable. Based upon the results of this tBACT, the proposed tBACT control technology for the single-shell tank (SST) ventilation system is the operation of the standard exhauster configuration (moisture eliminator, preheater, HEPA filters, fan, and stack with monitoring instrumentation) with periodic monitoring to confirm that the estimated emission parameters are accurate.

Upon issuance of the approval order for this notice of construction application, DE05NWP-002, Revision 2, "Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions" for Single-Shell Tank Retrieval Exhausters, will no longer apply to 241-A and 241-AX Tank Farm waste retrieval activities.

2.0 FACILITY IDENTIFICATION AND LOCATION

The Hanford Site tank farms address is:

U.S. Department of Energy, Office of River Protection
Hanford Site
200 East/200 West Area Tank Farms
Located approximately 25 miles north of
Richland, Washington 99352

Table 1 shows the geodetic locations of the center of the 241-A and 241-AX Tank Farms on the Hanford Site. A map of the Hanford Site is shown in Figure 1. A map of the Hanford Site tank farms is shown in Figure 2.

2.1 Tank Farms

2.1.1 241-A Tank Farm

The 241-A Tank Farm consists of six buried SSTs. Each 241-A SST measures 75 feet in diameter, measures approximately 52 feet from tank bottom to grade-level, and has a waste storage capacity of 1,000,000 gallons. The tank farm is located approximately 400 meters (1,300 feet) northeast of the 202-A Building, which is directly south of the 241-AX Tank Farm. The location of the 241-A Tank Farm is provided as Figure 2. The tanks were placed in service during the mid-1950s and were retired in the early 1970s and 1980s. They are numbered 241-A-101 through 241-A-106.

2.1.2 241-AX Tank Farm

The 241-AX Tank Farm consists of four buried SSTs. Each 241-AX SST measures 75 feet in diameter, measures approximately 53 feet from tank bottom to grade-level, and has a waste storage capacity of 1,000,000 gallons. The tank farm is located approximately 530 meters (1,750 feet) northeast of the 202-A Building, east of the 241-AY Tank Farm, and between the 241-A and 241-AZ Tank Farms. The location of the AX Tank Farm is provided in Figure 2. The tanks were placed in service during the mid-1960s and retired in the early 1980s. They are numbered 241-AX-101 through 241-AX-104.

Table 1. Geodetic Coordinates of the 200 Area Tank Farms.

Tank Farm	Latitude	Longitude
241-A Tank Farm	46° 33' 12" N	119° 31' 2" W
241-AX Tank Farm	46° 33' 15" N	119° 31' 1" W

2.2 Environmental Regulation

The Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) (Ecology et al., 1989) states that SST closure will follow retrieval of as much tank waste as technically possible. Residual waste volumes in 100-series SSTs will not exceed 360 ft^3 or the limit of waste retrieval technology whichever is less (Ecology et al., 1989, Milestone M-045-00).
A consent decree (Ecology 2009) requires waste retrieval from nine 100-series SSTs, assumed to be from the 241-A and 241-AX Tank Farms, be completed by December 31, 2022.
The Tri-Party Agreement milestone for "complete retrieval of waste from all remaining SSTs" is December 31, 2040 (M-045-70).

Figure 1. Hanford Site Map.

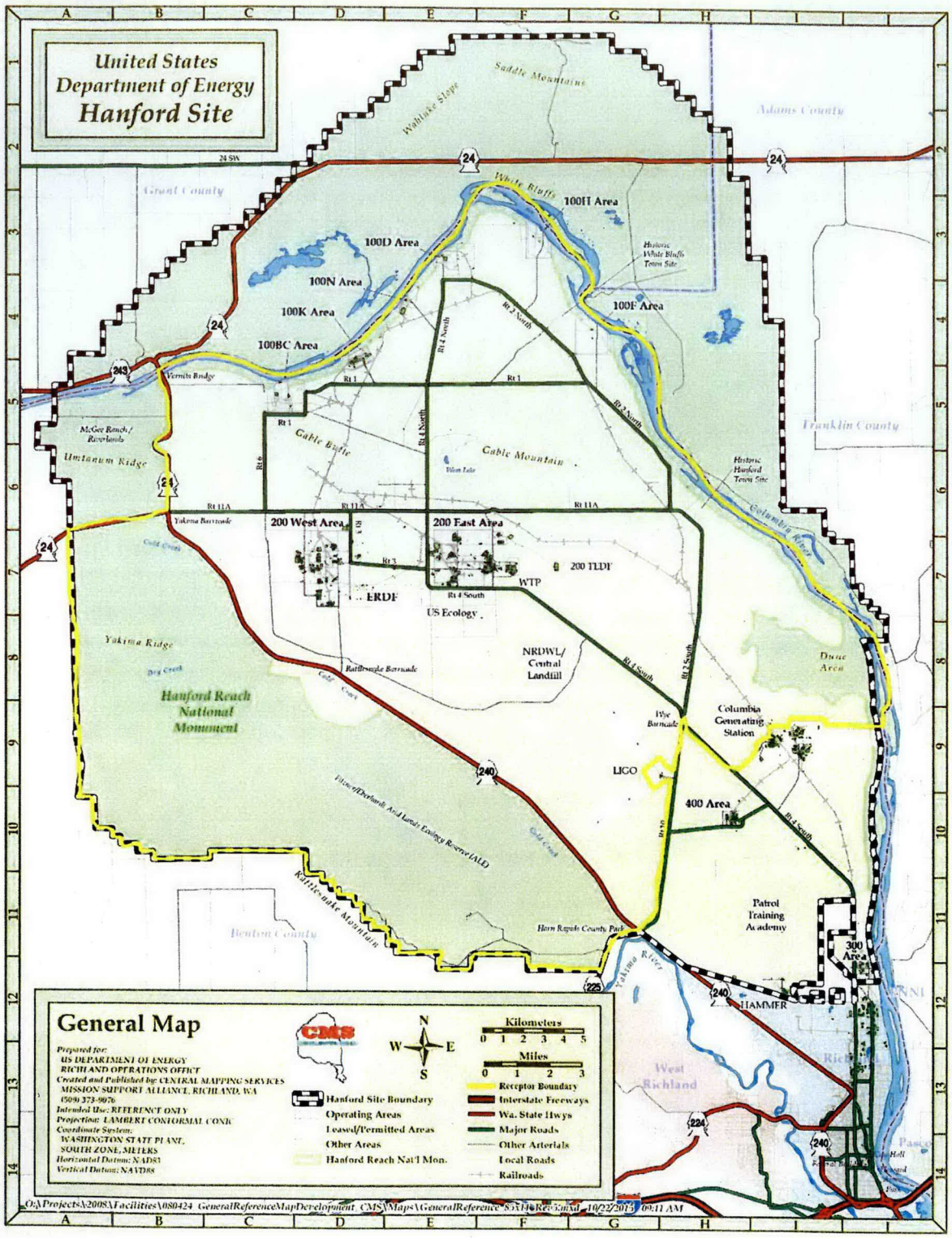
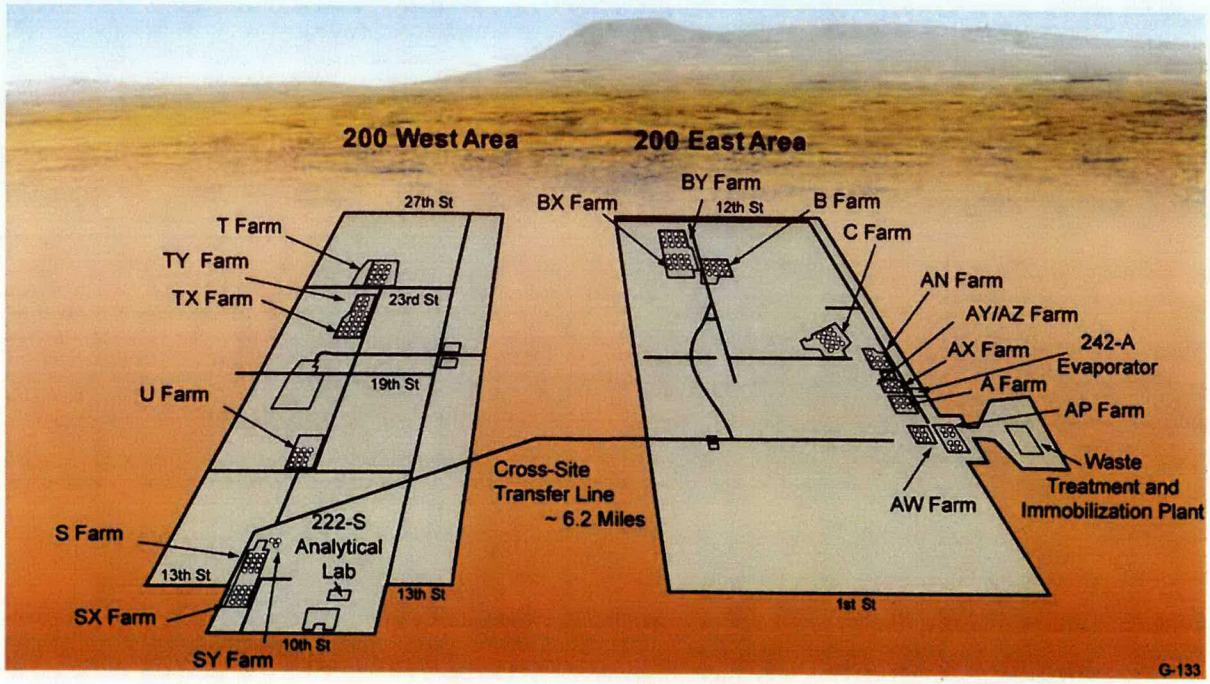


Figure 2. Location of Single- and Double-Shell Tank Farms in 200 East and 200 West Areas of the Hanford Site.



3.0 RESPONSIBLE MANAGER

The current responsible facility manager is:

Kevin Smith, Manager
U.S. Department of Energy
Office of River Protection
P.O. Box 550
Richland, Washington 99352

Phone: (509) 372-2315

4.0 PROPOSED ACTION

This NOC application is submitted for approval for the concurrent operation of four portable exhausters to support waste retrieval activities in 241-A and 241-AX Tank Farms. Source parameters are provided in Table 3.

1. 241-AX Tank Farm: Existing Portable Exhauster 296-P-49 (POR126)
2. 241-AX Tank Farm: Existing Portable Exhauster 296-P-50 (POR127)
3. 241-A Tank Farm: Future Portable Exhauster (Modeled after POR126/POR127)
4. 241-A Tank Farm: Future Portable Exhauster (Modeled after POR126/POR127)

Approval of the operation of the above portable exhausters will support the retrieval and closure operations that will be conducted at 241-A and 241-AX Tank Farms in the 200 East area of the Hanford Site. Operations include pre-retrieval tank preparation activities, such as washing and removing internal tank equipment. Waste retrieval technologies are provided in Section 4.2 of this application. The waste in 241-A and 241-AX will be transferred to double-shell tanks (DST) for interim storage; with a final destination of treatment and disposal.

The 241-A and 241-AX Tank Farms SSTs are normally passively ventilated. The portable exhausters listed above will connect to the tank farms providing active ventilation to support the retrieval operations. The exhausters will be operated during periods of active retrieval and periods when retrieval operations are not occurring. If structural safety or other considerations force shutdown of the exhausters, passive high-efficiency particulate air (HEPA) filtered ventilation will be used.

The activities proposed with this NOC are expected to increase emissions during retrieval. Table A-2 provides the projects estimated emissions and Table A-3 provides the proposed emission limits, as derived at 90% of the WAC 173-460-150 ASIL values.

4.1 Tank Waste

Waste stored in the tanks consists of hazardous chemicals regulated under the *Resource Conservation and Recovery Act of 1976* and radioactive isotopes regulated under the *Atomic Energy Act of 1954*. The tanks contain mixed waste in the form of liquids and suspended or

settled solids. Gases are generated by the reaction of radioactive and hazardous chemicals in the tanks and contained in the headspace of the tank. During storage operations, the tank waste is quiescent and not undergoing waste disturbing activities. The tank waste leaves a quiescent state when the contents in the tank are mixed, by various mechanisms, to control gas entrapment in the settled solids, to control temperature, to perform chemical treatment, or for waste retrieval.

4.2 Waste Retrieval Technologies

RPP-RPT-44139, "Hard Heel Waste Retrieval Technology Review and Roadmap," provides details on current and candidate technologies for retrieving waste from the tanks. The following section provides an overview of technologies considered for 241-A and 241-AX Tank Farms waste retrieval. For more detailed information, including lessons learned and technology limitations, see RPP-RPT-44139. Table 2 summarizes tanks, waste types, tank configuration, and candidate technologies planned for retrieval of waste from the 241-A and 241-AX Tank Farms.

Table 2. Waste Retrieval Technologies for 241-A and 241-AX Tank Farms

Tank	Configuration	Waste	Technologies for Retrieval[1]
241-A-101	Flat bottom, sound	Saltcake Sludge heel	• Saltcake dissolution by modified sluicing • May need enhanced sluicing, chemical dissolution, or other technology to complete retrieval.
241-A-102	Flat bottom, sound	Saltcake	• Saltcake dissolution by modified sluicing • May need enhanced sluicing, chemical dissolution, or other technology to complete retrieval.
241-A-103	Flat bottom, sound	Saltcake Sludge heel	• Saltcake dissolution by modified sluicing • May need enhanced sluicing, chemical dissolution, or other technology to complete retrieval.
241-A-104	Flat bottom, assumed leaker	Sludge heel	• Restricted modified sluicing, possibly MARS – Vacuum
241-A-105	Flat bottom base, bulge and holes in tank bottom liner, confirmed leaker	Sludge heel	• Restricted modified sluicing, possibly MARS – Vacuum
241-A-106	Flat bottom, sound	Saltcake Sludge	• Saltcake dissolution by modified sluicing • May need enhanced sluicing, MARS-S, chemical dissolution, or other technology to complete retrieval.

Table 2. Waste Retrieval Technologies for 241-A and 241-AX Tank Farms

Tank	Configuration	Waste	Technologies for Retrieval[1]
241-AX-101	Highly congested, flat bottom, sound	Saltcake Sludge heel	• Saltcake dissolution by modified sluicing • May need enhanced sluicing, FoldTrack, new risers, chemical dissolution, or other to complete retrieval.
241-AX-102	Highly congested, flat bottom, treat as sound for retrieval	Saltcake Sludge heel	• Saltcake dissolution by modified sluicing • May need enhanced sluicing, FoldTrack, new risers, chemical dissolution, or other to complete retrieval.
241-AX-103	Highly congested, flat bottom, sound	Saltcake Sludge heel	• Saltcake dissolution by Modified sluicing • May need enhanced sluicing, new risers, chemical dissolution, or other to complete retrieval.
241-AX-104	Highly congested, flat bottom, treat as sound for retrieval	Sludge heel	• Modified sluicing • May need enhanced sluicing, new risers, chemical dissolution, or other to complete retrieval.

MARS = mobile arm retrieval system.

ERSS = Extended Reach Sluicer System

1. These are candidate technologies for tanks not yet retrieved or in progress. Specific technologies to be used will be identified in tank waste retrieval work plans.

4.2.1 Modified Sluicing

The sluicing process is called "modified" to differentiate it from the "past practice" sluicing which was used in the 1950s through 1970s at the Hanford Site to retrieve selected sludge tanks. All sluicing processes are based on the principle that fine particles can be suspended in a water/brine solution and then be carried with the fluid so long as there is sufficient turbulence to maintain the solids in suspension. The process is carried out by the use of sluicers which are installed in the tanks through available risers. The sludge waste is pushed by the sluice stream toward a pump which is installed near the center of the tank. The sludge has somewhat high viscosity and will plug the pump if it is deeply submerged in the waste. Therefore, a variable height pump is used. The pump is kept at a relatively shallow submergence of 6 to 12 inches in the waste and pumps the slurry which results from the mixing/suspending action of the sluicers. The pump is lowered as the waste is retrieved. The slurry is pumped to a receiver tank, typically a DST, where the solids are allowed to settle. A pump in the receiver tank transfers clarified supernate back to the sluicers. The supernate is recycled as the sluicing fluid in order to minimize the volume increase in the DST.

4.2.1.1 Saltcake Dissolution

Saltcake dissolution is an application of modified sluicing. Saltcake dissolves in water. Water is distributed across the surface of the waste. The water is allowed to percolate through the saltcake dissolving the salt as it goes. The resulting brine is either circulated back into the tank

using the transfer pump and a recirculation loop or pumped from the bottom of the tank to a receiver tank.

4.2.1.2 Enhanced Sluicing

Enhancements to the modified sluicing system provide for improved mobilization, conditioning, and capture of waste solids in the transfer system. Enhancements could include:

- Articulating and/or telescoping sluicer assemblies to broaden the angle of attack and/or move sluice nozzles closer to the waste providing greater and more flexible mobilization forces.
- Modifications or replacement of the retrieval pump (e.g., use of a backstop, or new slurry pump to condition and transfer slurry with denser/larger particulate).
- Supplemental mobilization technologies (e.g., in-tank vehicles) to condition and move residual waste to the transfer pump.
- Addition of new risers and additional sluicers to provide better coverage and improve the ability to push solids toward the slurry pump. The additional risers/sluicers will provide for more efficient sluicing by reducing the distance and improving the sluice stream angle of attack.

4.2.2 Mobile Arm Retrieval Sluicing System

The Mobile Arm Retrieval Sluicing System (MARS-S) mobilizes and retrieves SST waste using spray nozzles in an end-effector at the end of a telescoping arm and a centrally located centrifugal slurry transfer pump. The waste mobilization is achieved with either recycled supernate or high-pressure water. These spray nozzles direct the resulting waste slurry stream toward the center of the SST where the adjustable height slurry transfer pump is located. The waste is then pumped to the DST using this pump. Initially, the pump is planned to operate using a pump intake configuration similar to that used in past practice sluicing retrieval operations. Later, during final retrieval operations for hard-to-remove waste, a pump backstop assembly will be lowered to a position around and under the slurry pump. In this position, the backstop assembly will support solid particle size reduction and enhance fluid velocities into the pump intake to improve heavy solids entrainment and transport to the DST.

4.2.3 Mobile Arm Retrieval Vacuum System

The eductor driven Mobile Arm Retrieval Vacuum System (MARS-V) has been developed to clean out tanks using limited liquid addition and maintaining a minimum liquid inventory in the tank at all times. With limited liquid additions to the tank, the MARS-V is a suitable technology for sound tanks as well as leaking or suspected leaking tanks. The eductor uses an introduced fluid stream to induce a pressure gradient thereby creating a suction force. In the MARS-V system, the introduced fluid is DST supernate. The supernate stream initially flowing through the dual eductor loop creates suction to collect the waste material and then uses the retrieved material to continue driving the dual eductor loop. A fan nozzle aimed directly at the end effector screened inlet provides liquid to keep the head flooded, which is necessary in an eductor drive system to maintain suction.

4.2.4 Chemical Dissolution

Chemical retrieval methods considered for use in retrieving waste include acid dissolution, caustic dissolution (also referred to as caustic cleaning), and water dissolution. Chemical treatment processes generally involve the batch additions of a chemical solution into the tank. Following the addition of the applicable chemicals, the dissolution occurs. Dissolution progress is monitored by sampling the liquid for certain constituents or chemical properties. When dissolution progress slows, the slurry is removed from the tank using a waste transfer pump. Chemical retrieval methods can be deployed using systems similar to modified sluicing system; however, instead of using supernate pumped in from a DST, the chemical solution is pumped in from mixing tanks. Recirculation using the waste transfer pump and sluice cannon can be used to agitate the tank contents and enhance the dissolution process by distributing the solution throughout the tank.

5.0 STATE ENVIRONMENTAL POLICY ACT

This project fulfills the requirements of WAC 197-11 and *Revised Code of Washington* (RCW) 43.21C.030(2)(C), "Guidelines for state agencies, local governments – Statements –Reports – Advice –Information," per RCW 43.21C.150, "RCW 43.21C.030(2)(c) inapplicable when statement previously prepared pursuant to national environmental policy act." which states, "*The requirements of RCW 43.21C.030(2)(c) pertaining to the preparation of a detailed statement by branches of government shall not apply when an adequate detailed statement has been previously prepared pursuant to the national environmental policy act of 1969, in which event said prepared statement may be utilized in lieu of a separately prepared statement under RCW 43.21C.030(2)(c).*" The document that meets the agencies review needs for the current proposal is:

> DOE/EIS-0391, "Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington," Volume 2, Book 2, Appendix E.1.1.1, Operations and Maintenance.

The lead agency is the Office of River Protection, U.S. Department of Energy and the contact person is Mary Beth Burandt, Document Manager and her phone number is (509) 372-8828.

6.0 EMISSION ESTIMATES

The unabated criteria and toxic air pollutants emissions were estimated on a per tank basis and a maximum tank farm basis using TWINs data. Assumptions made for the evaluation were:

1. When the maximum value in the TWINS database is the measurement detection limit, that value is assumed to be the reported value.
2. Measurements were made over a quiescent waste and passively ventilated for all SSTs and actively ventilated DSTs. A constant emission rate was assumed as long as the tank waste remained quiescent.

3. SSTs were passively ventilated during measurements and each DST ventilation system was assumed to have a flow rate for each tank of 1,000 scfm divided by the number of tanks in the tank farm.
4. It was assumed that the headspace concentrations increased by a factor of 10 during waste disturbing activities.
5. No more than two tanks in a tank farm will have waste disturbing activities occurring simultaneously.
6. The emission rate from the highest tank for each TAP is contained in all tanks in the tank farms.
7. The dimethyl mercury per tank emission rate was assumed at the baseline dimethyl mercury emission rate obtained from sampling at the AY/AX tank farm (Appendix B).

The databases were searched for regulated criteria pollutants by the Chemical Abstracts Service (CAS) number for all tanks, both SST and DST. Because waste transfers will occur between tanks during the lifetimes of the exhausters, the highest emission rate per tank was calculated. The maximum per tank emission rate was used for each farm, assuming that two of the tanks will be simultaneously mixed in each farm. Total emissions were calculated assuming all four exhausters were running concurrently. A factor of 22 was used for each portable in the 241-AX Tank Farm, assuming 2 tanks mixing at a tank mixing factor of 10 and 2 tanks quiescent. A factor of 24 was used for each portable in the 241-A Tank Farm, assuming 2 tanks mixing at a tank mixing factor of 10 and 4 tanks quiescent.

6.1 Estimated Emissions of Criteria Pollutants

The annual emissions of criteria pollutants are shown in Table A-1 in Appendix A. Only NOx and VOCs were above the de minimis annual emission limit of 4,000 lbs/year. Nitrogen oxides had an annual emission rate of 7,630 lbs/year while volatile organic compound emissions were estimated to be 20,100 lbs/year.

6.2 Estimated Emissions of Toxic Air Pollutants

The total estimated emissions of TAPs for this project are shown in Table A-2 in Appendix A. Table A-4 provides TAP emission estimates for a single exhauster in the 241-AX Tank Farm, and Table A-5 provides TAP emission estimates for a single exhauster in the 241-A Tank Farm. Ninety-two TAPs were identified in the tank headspace. Of these, 44 had emissions above the de minimis emission threshold in WAC 173-460-150, and 31 TAPs had emission rates above the SQER emission thresholds. Two toxic air pollutants, dimethyl mercury and chromium, exceeded their ASIL. As described in Section 8.0, the filter train abatement credit decreased the dispersed concentration of chromium to below the ASIL. Therefore, only dimethyl mercury was found to be above the ASIL. As described in Section 8.0, the filter train abatement credit decreased the dispersed concentration of chromium to below the ASIL. Therefore, only dimethyl mercury was found to be above the ASIL. RPP-ENV-59016 is proposed to satisfy second tier review requirements for dimethyl mercury per WAC 173-460-090 (see Section 7.5).

6.3 Air Dispersion Modeling

Ambient air concentrations at the Hanford Site boundary were estimated using the EPA American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model (AERMOD) dispersion model, Version 15181. EPA-454/B-03-001, *User's Guide for the AMS/EPS Regulatory Model – AERMOD*, was used as modeling guidance.

The model inputs included the physical parameters of each stack (Table 3). Each source was simultaneously modeled at the maximum flow rate to produce the worst case air dispersion factors for this project.

Table 3. Portable Exhauster Parameters

Unit	Height (m)	Stack Dia. (m)	Max. Flow Rate (scfm)
296-P-49 (POR 126)	15.24	0.25	3000
296-P-50 (POR 127)	15.24	0.25	3000
Future	15.24	0.25	3000
Future	15.24	0.25	3000

The public access points to the site were used as the site boundaries. The surface meteorological inputs were from the Hanford Meteorological Station and the upper air data was obtained from the Spokane, Washington, National Weather Service for the years 2009 through 2013. Digital elevation model data from the U.S. Geological Survey was used for model terrain input. The regulatory default mode was used. Based upon Ecology's 08-02-025, "Guidance Document: First, Second, and Third Tier Review of Toxic Pollution Source," Table 4 indicates the receptor grid spacing.

Table 4. Ecology Recommended Receptor Grid Spacing

Distance from Source (m)	Grid Spacing (m)
0 – 350	10
350 – 800	25
800 – 4,000	50
4,000 – 8,000	100
>8,000	200

All portable exhausters, existing and future, were assumed to be operating concurrently for the entire year to ensure that the worst case situation was modeled.

A total unitary emission rate for all portable exhausters of 1 gram per second (g/s) was used for the air dispersion modeling scenario. Each portable exhauster was given a fraction of the 1 g/s based on the number of tanks exhausted.

Table 5 shows the most conservative dispersion factors for the years 2009-2013.

Table 5. Air Dispersion Factors

Averaging Period / Year	μg/m³ per g/s
1-hour (2011)	24.50760
24-hour (2011)	1.67468
Annual (2013)	.06058

The air dispersion factors, specific to the TAP averaging period, were multiplied by the total emission rate in g/s per TAP for all portable exhausters to calculate the ambient air or "dispersed" concentrations shown in Table A-2. The total portable exhauster emission rate for each TAP had a mixing factor determined by two tanks mixing and the remaining tanks quiescent.

6.4 Estimated Ambient Concentrations Compared to WAC 173-460-150

The results of the emissions and modeling are shown in Table A-2 in Appendix A. Two toxic air pollutants, dimethyl mercury and chromium, exceeded their ASIL. As described in Section 8.0, the filter train abatement credit decreased the dispersed concentration of chromium to below the ASIL. Therefore, only dimethyl mercury was found to be above the WAC 173-460-150 ASIL. The dispersed dimethyl mercury concentration was modeled to be 1.64E-05 microgram per cubic meter ($\mu g/m^3$). The WAC 173-460-150 ASIL value for dimethyl mercury is 1E-99 $\mu g/m^3$. Therefore, the dimethyl mercury dispersed concentration exceeds the ASIL value. Section 6.5 proposes using RPP-ENV-59016 to satisfy second tier review requirements for dimethyl mercury.

6.5 Second Tier Review – Dimethyl Mercury

It is proposed that RPP-ENV-59016, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," which was previously reviewed and approved by Ecology on January 21, 2016, be used to satisfy WAC 173-460-090, "Second Tier Review," requirements for dimethyl mercury for this notice of construction application. RPP-ENV-59016 is a bounding dimethyl mercury health impact assessment that covers the emissions from the activities proposed in this application. The total estimated dimethyl mercury emissions, 9.81E-06 g/s, is 0.10% of the total modeled dimethyl mercury in RPP-ENV-59016, 1.02E-02 g/s.

7.0 TANK VENTILATION PROCESS AND EMISSION CONTROL SYSTEMS

7.1 Applicable Supporting Documents

RPP-15129, "System Design Description for Standard Single-Shell Tank Farms Ventilation Systems," describes SST primary tank ventilation systems on the Hanford Site.

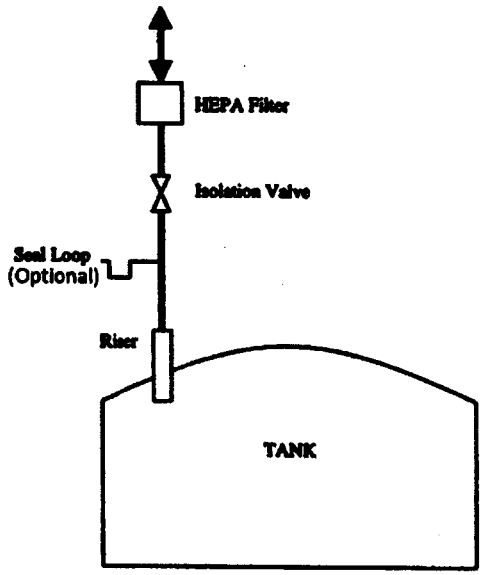
7.2 System Descriptions

7.2.1 Passive Ventilation

The SSTs are equipped with HEPA filters which have manufacturers rated particulate removal efficiencies of 99.97%. During most of the waste retrieval activities, the SSTs will be actively ventilated. However, due to integrity and safety concerns, some of the activities will be accomplished under passive conditions and each of these passive HEPA systems will act as the ventilation control. Each SST HEPA filter is attached at a riser and maintained by current tank farm operations and maintenance activities. Figure 3 shows a typical SST passive ventilation system.

The existing passive ventilation systems produce a variable flow rate through the tank, which is primarily dependent upon atmospheric pressure fluctuations and temperature differences between the tank headspace and atmosphere. A 9 cubic feet per minute (cfm) flow rate was cited as a representative maximum passive ventilation rate for SSTs in HNF-SD-WM-TI-797, "Results of Vapor Space Monitoring of Flammable Gas Watch List Tanks."

Figure 3. Typical SST Passive Ventilation System Flow Diagram.



7.2.2 Active Ventilation

The portable exhausters that will be installed to support 241-A and 241-AX waste retrieval are active ventilation systems. See Figure 4 for the general exhauster layout. The abatement technology for a skid mounted HEPA filter system includes the following:

- Glycol (or similar) heaters and associated components
- One pre-filter and housing
- Demister (optional)

- Two HEPA filters and test sections
- One exhaust fan
- Stack.

During portable exhauster operations, air from the tank will pass through a demister, if needed, and be heated before passing through a pre-filter, two HEPA filters in series, a fan, and discharged through a stack. The stack will contain a section that allows airflow measurements, radiological sample extraction, and potential vapor sampling activities. The pre-filter will increase the life of the HEPA filters by trapping the larger airborne particles to allow for a more economical operating system.

8.0 BEST AVAILABLE CONTROL TECHNOLOGY

Pursuant to WAC 173-400-113(2), an analysis of Best Available Control Technology (BACT) for emissions of criteria pollutants was performed as well as a tBACT analysis pursuant to WAC 173-460-060(2) for toxics. Best Available Control Technology for Toxics (tBACT) for use during retrieval of waste from SSTs was examined in RPP-20773, "Evaluation of Best Available Control Technology for Toxics (tBACT), Waste Retrieval System Operations in Single Shell Tank Farms."

The tBACT analysis was performed using the "top-down" approach established for BACT. This approach is defined in detail in "New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting" (EPA 1990). The approach consists of the following steps:

1. Identify all control technologies.
2. Eliminate technically infeasible options.
3. Rank remaining control technologies by control effectiveness.
4. Evaluate most effective controls and document results.
5. Select BACT.

The following emission control technologies have been identified for destruction or removal of ammonia:

- Absorption (scrubbing)
- Condensation
- Adsorption
- Thermal oxidation
- Biofiltration.

The following emission control technologies have been identified for destruction or removal of non-ammonia TAPs:

- Thermal oxidation
- Catalytic Oxidation
- Adsorption
- Absorption (scrubbing)
- Biofiltration
- Condensation.

Some of the technology options were eliminated from further consideration because of technical infeasibility. A detailed evaluation of the emission control technologies was performed. After an effectiveness analysis, a cost per ton of pollutant removed was calculated. Most of the costs per ton exceeded the cost ceiling estimates guidelines previously approved by Ecology and EPA as economically justifiable. Due to the low emission rates, the cost per ton to remove the pollutants becomes prohibitively expensive. Even though the options evaluated would remove a high portion of the emissions, typically 98-99%, the cost of the equipment would be prohibitively high according to the available Ecology guidelines.

Based upon the results of this tBACT, the proposed tBACT control technology for the SST ventilation system is the operation of the standard exhauster configuration (moisture eliminator, preheater, HEPA filters, fan, and stack with monitoring instrumentation) with periodic monitoring to confirm that the estimated emission parameters are accurate.

8.1 Chromium Abatement

The unabated dispersed concentration of chromium (CAS# 7440-47-3) is calculated at 8.11E-06 $\mu g/m^3$. The WAC 173-460-150 ASIL level for this compound is 0.00000667 $\mu g/m^3$. Therefore, the emission rate is projected to produce a dispersed concentration greater than the ASIL at the receptor. As described in Section 8.0, Best Available Control Technology, and RPP-20773, emission control technology options for particulate metal compounds was evaluated. A control technology consisting of prefilters, mist eliminators, and dual HEPA filters provides a 99.97% mass based removal of metal aerosols. In order to decrease the expected dispersed concentration and provide a more accurate concentration, a 99.97% removal efficiency based on filter train control technology was applied. The abated dispersed concentration of chromium (CAS# 7440-47-3) is calculated at 4.06E-09 $\mu g/m^3$. The abated dispersed concentration is below the ASIL, and therefore does not need further evaluation as required by WAC 173-460-150.

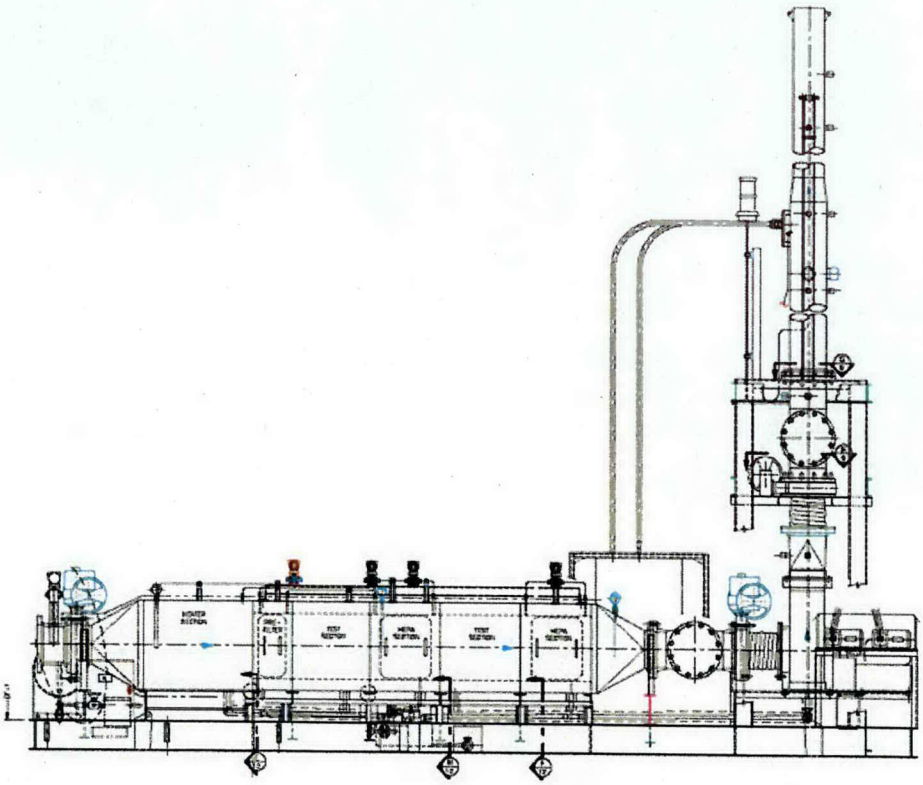
9.0 APPLICABLE CONTROL TECHNOLOGY DRAWINGS

Figure 4 shows a general tank farm exhauster design. The major components of the exhauster ventilation systems are as follows:

- Moisture de-entrainment
- Heater
- Prefilter
- HEPA filters (2 stages)
- Fans
- Exhaust stack
- Monitoring and control instruments and equipment.

The exhauster ventilation systems will remove particulates and moisture, collect condensate, and reduce relative humidity in the exhaust stream.

Figure 4. General Exhauster Layout



10.0 EMISSION LIMITS AND MONITORING

10.1 Emission Limits

Appendix A contains the TAP emission estimates and proposed permit limits for 241-A and 241-AX tank waste retrieval. Table A-2 provides the estimated emissions based on historical tank farm sampling data. Table A-3 provides the proposed emission limits, as derived from the air dispersion factors (Table 5) at 90% of the WAC 173-460-150 ASIL limits.

10.2 Emission Monitoring

Annual sampling is proposed for:

1. NOx and VOCs emissions that are estimated to be above the SQERs.
2. The three TAPs with the highest potential ambient concentration relative to their respective ASIL values.
    a. Estimated emissions of TAPs in Table A-2 and the most current tank content data will be used to determine the three TAPs.

Baseline sampling is proposed for:

1. Dimethyl mercury: based on its exceedance of the ASIL.
2. Ammonia: will be used as a high release indicator (Section 10.3) during active tank waste retrieval.

The baseline sampling will be used to determine permit compliance and to set the project-specific dimethyl mercury and ammonia limits. The initial permit limits established for dimethyl mercury and ammonia will be derived from Appendix A, Table A-2. If the baseline sampling results reveal different dimethyl mercury and ammonia emission rates than what was derived from Table A-2, a new ammonia permit limit will be proposed.

10.3 Ammonia Monitoring

Ammonia is proposed to be used as a real-time indicator of potential high TAP release rates from tank operations during active tank waste retrieval. Active tank waste retrieval includes solids mixing, disturbing bulk tank solids, and removal of enough supernatant to potentially create a gas release event.

Sampling is proposed at the start of active tank waste retrieval for:

1. Dimethyl mercury
2. Ammonia.

This sampling event will verify the ammonia permit limits set from the baseline sampling proposed in Section 10.2. New ammonia permit limits will be proposed if the sampling results obtained at the start of tank waste retrieval warrant lower emission limits for a conservative detection of a high TAP release rate in the tank.

Sampling is proposed during active tank waste retrieval for:

1. Ammonia monitoring.

11.0 REFERENCES

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Consent Decree for Washington vs. DOE, Case No. 08-5085-FVS, United States District Court Eastern District of Washington, October 25, 2010

DE05NWP-002, Revision 2, "Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions" for Single-Shell Tank Retrieval Exhausters, Washington State Department of Ecology, Richland, Washington, as amended.

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42 USC 2011, *Atomic Energy Act of 1954*, et seq.

42 USC 4321, *National Environmental Policy Act of 1969*, et seq.

42 USC 6901, *Resource Conservation and Recovery Act of 1976*, et seq.

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RPP-15129, 2013, "System Design Description for Standard Single-Shell Tank Farms Ventilation Systems," Rev. 2, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-20773, 2004, "Evaluation of Best Available Control Technology for Toxics (tBACT), Waste Retrieval System Operations in Single Shell Tank Farms," Washington River Protection Solutions, LLC, Richland, Washington.

RPP-ENV-59016, 2015, "Second Tier Review Petition for Hanford Tank Farm and Waste Treatment Plant Dimethyl Mercury Emissions," Rev. 01, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-44139, 2014, "Hard Heel Waste Retrieval Technology Review and Roadmap," Washington River Protection Solutions, LLC, Richland, Washington.

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

WAC 197-11, "SEPA Rules," *Washington Administration Code*, as amended.

Appendix A

Criteria and Toxic Air Pollutant Emission Rates

Table A-1. Criteria Pollutants Emission Rates and Comparison to De Minimis Levels

Compound	CAS #	Averaging Period	Emission Rate (g/s)	Emission Rate (lbs/year)	De Minimis (lbs/year)	Above De Minimis?
Nitrogen oxides	10102-44-0	Year	1.59E-03	7,630	4,000	Yes
VOCs	Various	Year	4.20E-03	20,132	4,000	Yes
SOx (Sulfur oxides)	7446-09-05	Year	3.52E-06	17	4,000	No
Lead	7439-92-1	Year	9.50E-07	5	10	No
Carbon monoxide	630-08-0	Year	5.40E-04	2,592	10,000	No

Table A-2. Toxic Air Pollutant Estimated Emission Rates and Comparison to the WAC 173-460-150 de minimis, SQER, and ASIL Levels

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	Above ASIL?	Above SQER?	Above De Minimis?
71-55-6	1,1,1-Trichloroethane	24-hr	1000	131	6.57	9.77E-07	2.15E-05	2.15E-05	2.34E-05	2.34E-05	8.99E-05	7.13E-04	1.71E-02	6.25E+00	1.71E-02	1.51E-04	No	No	No
79-34-5	1,1,2,2-Tetrachloroethane	Year	0.0172	3.3	0.165	1.08E-05	2.37E-04	2.37E-04	2.59E-04	2.59E-04	9.93E-04	7.88E-03	1.89E-01	6.90E+01	6.90E+01	6.01E-05	No	Yes	Yes
79-00-5	1,1,2-Trichloroethane	Year	0.0625	12	0.6	8.57E-06	1.89E-04	1.89E-04	2.06E-04	2.06E-04	7.89E-04	6.26E-03	1.50E-01	5.48E+01	5.48E+01	4.78E-05	No	Yes	Yes
75-34-3	1,1-Dichloroethane	Year	0.625	120	6	3.94E-07	8.68E-06	8.68E-06	9.47E-06	9.47E-06	3.63E-05	2.88E-04	6.91E-03	2.52E+00	2.52E+00	2.20E-06	No	No	No
75-35-4	1,1-Dichloroethylene	24-hr	200	26.3	1.31	4.53E-05	9.97E-04	9.97E-04	1.09E-03	1.09E-03	4.17E-03	3.31E-02	7.94E-01	2.90E+02	7.94E-01	6.98E-03	No	No	No
57-14-7	1,1-Dimethylhydrazine	24-hr	0.5	0.0657	0.00329	2.52E-08	5.55E-07	5.55E-07	6.06E-07	6.06E-07	2.32E-06	1.84E-05	4.42E-04	1.62E-01	4.42E-04	3.89E-06	No	No	No
106-93-4	1,2-Dibromoethane	Year	0.0141	2.71	0.135	1.15E-06	2.54E-05	2.54E-05	2.77E-05	2.77E-05	1.06E-04	8.43E-04	2.02E-02	7.39E+00	7.39E+00	6.44E-06	No	Yes	Yes
107-06-2	1,2-Dichloroethane	Year	0.0385	7.39	0.369	2.36E-05	5.19E-04	5.19E-04	5.66E-04	5.66E-04	2.17E-03	1.72E-02	4.14E-01	1.51E+02	1.51E+02	1.32E-04	No	Yes	Yes
78-87-5	1,2-Dichloropropane	Year	0.1	19.2	0.959	6.93E-07	1.52E-05	1.52E-05	1.66E-05	1.66E-05	6.37E-05	5.06E-04	1.21E-02	4.43E+00	4.43E+00	3.86E-06	No	No	Yes
106-88-7	1,2-Epoxybutane	24-hr	20	2.63	0.131	5.85E-07	1.29E-05	1.29E-05	1.40E-05	1.40E-05	5.38E-05	4.27E-04	1.03E-02	3.74E+00	1.03E-02	9.02E-05	No	No	No
106-99-0	1,3-Butadiene	Year	0.00588	1.13	0.0564	2.89E-06	6.35E-05	6.35E-05	6.93E-05	6.93E-05	2.66E-04	2.11E-03	5.06E-02	1.85E+01	1.85E+01	1.61E-05	No	Yes	Yes
106-46-7	1,4-Dichlorobenzene	Year	0.0909	17.4	0.872	9.00E-07	1.98E-05	1.98E-05	2.16E-05	2.16E-05	8.28E-05	6.57E-04	1.58E-02	5.76E+00	5.76E+00	5.02E-06	No	No	Yes
123-91-1	1,4-Dioxane	Year	0.13	24.9	1.25	1.02E-05	2.24E-04	2.24E-04	2.44E-04	2.44E-04	9.37E-04	7.43E-03	1.78E-01	6.51E+01	6.51E+01	5.67E-05	No	Yes	Yes
75-68-3	1-Chloro-1,1-difluoroethane	24-hr	5.00E+04	6570	329	1.57E-05	3.45E-04	3.45E-04	3.77E-04	3.77E-04	1.44E-03	1.15E-02	2.75E-01	1.00E+02	2.75E-01	2.42E-03	No	No	No
95-48-7	2-Methylphenol	24-hr	600	78.9	3.94	4.12E-07	9.07E-06	9.07E-06	9.90E-06	9.90E-06	3.79E-05	3.01E-04	7.23E-03	2.64E+00	7.23E-03	6.35E-05	No	No	No
79-46-9	2-Nitropropane	24-hr	20	2.63	0.131	2.77E-06	6.10E-05	6.10E-05	6.66E-05	6.66E-05	2.55E-04	2.03E-03	4.86E-02	1.77E+01	4.86E-02	4.28E-04	No	No	No
108-39-4	3-Methylphenol	24-hr	600	78.9	3.94	6.87E-08	1.51E-06	1.51E-06	1.65E-06	1.65E-06	6.32E-06	5.02E-05	1.20E-03	4.39E-01	1.20E-03	1.06E-05	No	No	No
75-07-0	Acetaldehyde	Year	0.37	71	3.55	5.95E-05	1.31E-03	1.31E-03	1.43E-03	1.43E-03	5.47E-03	4.34E-02	1.04E+00	3.80E+02	3.80E+02	3.31E-04	No	Yes	Yes
60-35-5	Acetamide	Year	0.05	9.59	0.48	8.77E-08	1.93E-06	1.93E-06	2.11E-06	2.11E-06	8.07E-06	6.41E-05	1.54E-03	5.61E-01	5.61E-01	4.89E-07	No	No	Yes
75-05-8	Acetonitrile	Year	60	1.15E+04	576	5.55E-05	1.22E-03	1.22E-03	1.33E-03	1.33E-03	5.10E-03	4.05E-02	9.72E-01	3.55E+02	3.55E+02	3.09E-04	No	No	No
107-02-8	Acrolein	24-hr	0.06	0.00789	0.000394	4.32E-08	9.50E-07	9.50E-07	1.04E-06	1.04E-06	3.97E-06	3.15E-05	7.57E-04	2.76E-01	7.57E-04	6.65E-06	No	No	Yes
79-10-7	Acrylic Acid	24-hr	1	0.131	0.00657	9.44E-06	2.08E-04	2.08E-04	2.27E-04	2.27E-04	8.68E-04	6.89E-03	1.65E-01	6.04E+01	1.65E-01	1.45E-03	No	Yes	Yes
107-13-1	Acrylonitrile	Year	0.00345	0.662	0.0331	1.78E-07	3.93E-06	3.93E-06	4.28E-06	4.28E-06	1.64E-05	1.30E-04	3.13E-03	1.14E+00	1.14E+00	9.95E-07	No	Yes	Yes
107-05-1	Allyl Chloride	Year	0.167	32	1.6	1.48E-07	3.25E-06	3.25E-06	3.55E-06	3.55E-06	1.36E-05	1.08E-04	2.59E-03	9.45E-01	9.45E-01	8.23E-07	No	No	No
7664-41-7	Ammonia	24-hr	70.8	9.31	0.465	1.45E-02	3.19E-01	3.19E-01	3.48E-01	3.48E-01	1.33E+00	1.06E+01	2.54E+02	9.27E+04	2.54E+02	2.23E+00	No	Yes	Yes
7440-38-2	Arsenic & Inorganic Arsenic Compounds	Year	0.000303	0.0581	0.00291	4.75E-10	1.04E-08	1.04E-08	1.14E-08	1.14E-08	4.37E-08	3.47E-07	8.32E-06	3.04E-03	3.04E-03	2.65E-09	No	No	Yes
71-43-2	Benzene	Year	0.0345	6.62	0.331	2.36E-05	5.19E-04	5.19E-04	5.66E-04	5.66E-04	2.17E-03	1.72E-02	4.14E-01	1.51E+02	1.51E+02	1.32E-04	No	Yes	Yes
100-44-7	Benzyl Chloride	Year	0.0204	3.91	0.196	1.94E-07	4.27E-06	4.27E-06	4.66E-06	4.66E-06	1.79E-05	1.42E-04	3.40E-03	1.24E+00	1.24E+00	1.08E-06	No	No	Yes
7440-41-7	Beryllium & Compounds (NOS)	Year	0.000417	0.08	0.004	4.76E-08	1.05E-06	1.05E-06	1.14E-06	1.14E-06	4.38E-06	3.48E-05	8.34E-04	3.05E-01	3.05E-01	2.65E-07	No	Yes	Yes
75-25-2	Bromoform	Year	0.909	174	8.72	1.27E-07	2.79E-06	2.79E-06	3.05E-06	3.05E-06	1.17E-05	9.27E-05	2.22E-03	8.12E-01	8.12E-01	7.08E-07	No	No	No
25013-16-5	Butylated hydroxyanisole	Year	17.5	3360	168	2.06E-08	4.54E-07	4.54E-07	4.95E-07	4.95E-07	1.90E-06	1.51E-05	3.61E-04	1.32E-01	1.32E-01	1.15E-07	No	No	No

Table A-2. Toxic Air Pollutant Estimated Emission Rates and Comparison to the WAC 173-460-150 de minimis, SQER, and ASIL Levels

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	Above ASIL?	Above SQER?	Above De Minimis?
7440-43-9	Cadmium & Compounds	Year	0.000238	0.0457	0.00228	2.38E-10	5.24E-09	5.24E-09	5.71E-09	5.71E-09	2.19E-08	1.74E-07	4.17E-06	1.52E-03	1.52E-03	1.33E-09	No	No	No
75-15-0	Carbon disulfide	24-hr	800	105	5.26	5.80E-06	1.28E-04	1.28E-04	1.39E-04	1.39E-04	5.34E-04	4.24E-03	1.02E-01	3.71E+01	1.02E-01	8.94E-04	No	No	No
630-08-0	Carbon monoxide	1-hr	23000	50.4	1.14	5.40E-04	1.19E-02	1.19E-02	1.30E-02	1.30E-02	4.97E-02	3.95E-01	9.47E+00	3.46E+03	3.95E-01	1.22E+00	No	No	No
56-23-5	Carbon Tetrachloride	Year	0.0238	4.57	0.228	2.38E-05	5.23E-04	5.23E-04	5.70E-04	5.70E-04	2.19E-03	1.73E-02	4.16E-01	1.52E+02	1.52E+02	1.32E-04	No	Yes	Yes
108-90-7	Chlorobenzene	24-hr	1000	131	6.57	7.24E-06	1.59E-04	1.59E-04	1.74E-04	1.74E-04	6.66E-04	5.28E-03	1.27E-01	4.63E+01	1.27E-01	1.11E-03	No	No	No
75-45-6	Chlorodifluoromethane	24-hr	5.00E+04	6570	328	1.45E-05	3.18E-04	3.18E-04	3.47E-04	3.47E-04	1.33E-03	1.06E-02	2.53E-01	9.25E+01	2.53E-01	2.23E-03	No	No	No
67-66-3	Chloroform	Year	0.0435	8.35	0.417	2.38E-05	5.23E-04	5.23E-04	5.70E-04	5.70E-04	2.19E-03	1.73E-02	4.16E-01	1.52E+02	1.52E+02	1.32E-04	No	Yes	Yes
7440-47-3	Chromium Hexavalent: Soluble, except Chromic Trioxide	Year	6.67E-06	0.00128	6.40E-05	7.28E-10	1.60E-08	1.60E-08	1.75E-08	1.75E-08	6.70E-08	5.32E-07	1.28E-05	4.66E-03	4.66E-03	4.06E-09	No	Yes	Yes
7440-48-4	Cobalt	24-hr	0.1	0.013	0.000657	9.50E-07	2.09E-05	2.09E-05	2.28E-05	2.28E-05	8.74E-05	6.94E-04	1.66E-02	6.08E+00	1.66E-02	1.46E-04	No	Yes	Yes
7440-50-8	Copper & Compounds	1-hr	100	0.219	0.011	4.76E-07	1.05E-05	1.05E-05	1.14E-05	1.14E-05	4.38E-05	3.48E-04	8.34E-03	3.05E+00	3.48E-04	1.07E-03	No	No	No
98-82-8	Cumene	24-hr	400	52.6	2.63	1.02E-06	2.24E-05	2.24E-05	2.45E-05	2.45E-05	9.38E-05	7.44E-04	1.79E-02	6.52E+00	1.79E-02	1.57E-04	No	No	No
110-82-7	Cyclohexane	24-hr	6000	789	39.4	2.29E-05	5.04E-04	5.04E-04	5.50E-04	5.50E-04	2.11E-03	1.67E-02	4.02E-01	1.47E+02	4.02E-01	3.53E-03	No	No	No
117-81-7	Di(2-ethylhexyl)phthalate	Year	0.0417	8	0.4	1.08E-08	2.38E-07	2.38E-07	2.59E-07	2.59E-07	9.94E-07	7.89E-06	1.89E-04	6.91E-02	6.91E-02	6.02E-08	No	No	No
75-09-2	Dichloromethane	Year	1	192	9.59	1.61E-04	3.55E-03	3.55E-03	3.87E-03	3.87E-03	1.48E-02	1.18E-01	2.83E+00	1.03E+03	1.03E+03	8.99E-04	No	Yes	Yes
593-74-8	Dimethyl Mercury	24-hr	1.00E-99	1.00E-99	1.00E-99	1.07E-07	2.35E-06	2.35E-06	2.56E-06	2.56E-06	9.81E-06	7.78E-05	1.87E-03	6.82E-01	1.87E-03	1.64E-05	Yes	Yes	Yes
75-00-3	Ethyl Chloride	24-hr	3.00E+04	3940	197	4.15E-06	9.14E-05	9.14E-05	9.97E-05	9.97E-05	3.82E-04	3.03E-03	7.28E-02	2.66E+01	7.28E-02	6.40E-04	No	No	No
100-41-4	Ethylbenzene	Year	0.4	76.8	3.84	2.05E-05	4.50E-04	4.50E-04	4.91E-04	4.91E-04	1.88E-03	1.49E-02	3.58E-01	1.31E+02	1.31E+02	1.14E-04	No	Yes	Yes
111-15-9	Ethylene glycol monoethyl ether acetate	24-hr	300	39.4	1.97	2.20E-06	4.83E-05	4.83E-05	5.27E-05	5.27E-05	2.02E-04	1.60E-03	3.85E-02	1.41E+01	3.85E-02	3.39E-04	No	No	No
75-21-8	Ethylene oxide	Year	0.0114	2.19	0.109	1.12E-07	2.47E-06	2.47E-06	2.69E-06	2.69E-06	1.03E-05	8.18E-05	1.96E-03	7.17E-01	7.17E-01	6.25E-07	No	No	Yes
50-00-0	Formaldehyde	Year	0.167	32	1.6	3.41E-07	7.50E-06	7.50E-06	8.18E-06	8.18E-06	3.14E-05	2.49E-04	5.98E-03	2.18E+00	2.18E+00	1.90E-06	No	No	Yes
87-68-3	Hexachlorobutadiene	Year	0.0455	8.73	0.437	1.68E-05	3.70E-04	3.70E-04	4.04E-04	4.04E-04	1.55E-03	1.23E-02	2.95E-01	1.08E+02	1.08E+02	9.38E-05	No	Yes	Yes
67-72-1	Hexachloroethane	Year	0.0909	17.4	0.872	2.44E-05	5.36E-04	5.36E-04	5.85E-04	5.85E-04	2.24E-03	1.78E-02	4.27E-01	1.56E+02	1.56E+02	1.36E-04	No	Yes	Yes
74-90-8	Hydrogen Cyanide	24-hr	9	1.18	0.0591	8.25E-08	1.81E-06	1.81E-06	1.98E-06	1.98E-06	7.59E-06	6.02E-05	1.45E-03	5.28E-01	1.45E-03	1.27E-05	No	No	No
67-63-0	Isopropyl Alcohol	1-hr	3200	7.01	0.35	4.89E-05	1.08E-03	1.08E-03	1.17E-03	1.17E-03	4.50E-03	3.57E-02	8.57E-01	3.13E+02	3.57E-02	1.10E-01	No	No	No
7439-92-1	Lead and compounds (NOS)	Year	0.0833	16	10	4.75E-10	1.04E-08	1.04E-08	1.14E-08	1.14E-08	4.37E-08	3.47E-07	8.32E-06	3.04E-03	3.04E-03	2.65E-09	No	No	No
7439-96-5	Manganese & Compounds	24-hr	0.04	0.00526	0.000263	4.75E-10	1.04E-08	1.04E-08	1.14E-08	1.14E-08	4.37E-08	3.47E-07	8.32E-06	3.04E-03	8.32E-06	7.32E-08	No	No	No
7439-97-6	Mercury, Elemental	24-hr	0.09	0.0118	0.000591	2.88E-07	6.33E-06	6.33E-06	6.91E-06	6.91E-06	2.65E-05	2.10E-04	5.04E-03	1.84E+00	5.04E-03	4.44E-05	No	No	Yes
67-56-1	Methyl Alcohol	24-hr	4000	526	26.3	1.03E-03	2.27E-02	2.27E-02	2.47E-02	2.47E-02	9.48E-02	7.52E-01	1.81E+01	6.59E+03	1.81E+01	1.59E-01	No	No	No
74-83-9	Methyl Bromide	24-hr	5	0.657	0.0629	9.30E-07	2.05E-05	2.05E-05	2.23E-05	2.23E-05	8.56E-05	6.79E-04	1.63E-02	5.95E+00	1.63E-02	1.43E-04	No	No	No
74-87-3	Methyl Chloride	24-hr	90	11.8	0.591	3.24E-06	7.13E-05	7.13E-05	7.78E-05	7.78E-05	2.98E-04	2.37E-03	5.68E-02	2.07E+01	5.68E-02	4.99E-04	No	No	No

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Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	Above ASIL?	Above SQER?	Above De Minimis?
78-93-3	Methyl Ethyl Ketone	24-hr	5000	657	32.9	1.39E-04	3.06E-03	3.06E-03	3.34E-03	3.34E-03	1.28E-02	1.01E-01	2.44E+00	8.89E+02	2.44E+00	2.14E-02	No	No	No
108-10-1	Methyl Isobutyl Ketone	24-hr	3000	394	19.7	4.01E-05	8.83E-04	8.83E-04	9.63E-04	9.63E-04	3.69E-03	2.93E-02	7.03E-01	2.57E+02	7.03E-01	6.18E-03	No	No	No
624-83-9	Methyl Isocyanate	24-hr	1	0.131	0.00657	2.56E-08	5.64E-07	5.64E-07	6.15E-07	6.15E-07	2.36E-06	1.87E-05	4.49E-04	1.64E-01	4.49E-04	3.95E-06	No	No	No
108-38-3	m-Xylene	24-hr	221	29	1.45	1.37E-05	3.00E-04	3.00E-04	3.28E-04	3.28E-04	1.26E-03	9.97E-03	2.39E-01	8.73E+01	2.39E-01	2.10E-03	No	No	No
91-20-3	Naphthalene	Year	0.0294	5.64	0.282	1.88E-07	4.14E-06	4.14E-06	4.52E-06	4.52E-06	1.73E-05	1.37E-04	3.30E-03	1.20E+00	1.20E+00	1.05E-06	No	No	Yes
110-54-3	n-Hexane	24-hr	700	92	4.6	7.48E-05	1.65E-03	1.65E-03	1.80E-03	1.80E-03	6.88E-03	5.46E-02	1.31E+00	4.78E+02	1.31E+00	1.15E-02	No	No	No
10102-44-0	Nitrogen dioxide	1-hr	470	1.03	0.457	7.99E-04	1.76E-02	1.76E-02	1.92E-02	1.92E-02	7.35E-02	5.84E-01	1.40E+01	5.11E+03	5.84E-01	1.80E+00	No	No	Yes
55-18-5	n-Nitrosodiethylamine	Year	1.00E-04	0.0192	0.000959	2.81E-08	6.18E-07	6.18E-07	6.74E-07	6.74E-07	2.58E-06	2.05E-05	4.92E-04	1.80E-01	1.80E-01	1.57E-07	No	Yes	Yes
62-75-9	n-Nitrosodimethylamine	Year	0.000217	0.0416	0.00208	3.83457E-05	8.44E-04	8.44E-04	9.20E-04	9.20E-04	3.53E-03	2.80E-02	6.72E-01	2.45E+02	2.45E+02	2.14E-04	No	Yes	Yes
924-16-3	n-Nitroso-di-n-butylamine	Year	0.000323	0.062	0.0031	2.81E-08	6.18E-07	6.18E-07	6.74E-07	6.74E-07	2.58E-06	2.05E-05	4.92E-04	1.80E-01	1.80E-01	1.57E-07	No	Yes	Yes
621-64-7	n-Nitrosodi-n-propylamine	Year	0.0005	0.0959	0.0048	2.81E-08	6.18E-07	6.18E-07	6.74E-07	6.74E-07	2.58E-06	2.05E-05	4.92E-04	1.80E-01	1.80E-01	1.57E-07	No	Yes	Yes
59-89-2	n-Nitrosomorpholine	Year	0.000526	0.101	0.00505	1.30E-07	2.86E-06	2.86E-06	3.11E-06	3.11E-06	1.19E-05	9.48E-05	2.27E-03	8.30E-01	8.30E-01	7.23E-07	No	Yes	Yes
10595-95-6	n-Nitroso-n-methylethylamine	Year	0.000159	0.0305	0.00153	2.81E-08	6.18E-07	6.18E-07	6.74E-07	6.74E-07	2.58E-06	2.05E-05	4.92E-04	1.80E-01	1.80E-01	1.57E-07	No	Yes	Yes
100-75-4	n-Nitrosopiperidine	Year	0.00037	0.071	0.00355	4.12E-07	9.06E-06	9.06E-06	9.89E-06	9.89E-06	3.79E-05	3.01E-04	7.22E-03	2.64E+00	2.64E+00	2.30E-06	No	Yes	Yes
930-55-2	n-Nitrosopyrrolidine	Year	0.00167	0.32	0.016	2.81E-08	6.18E-07	6.18E-07	6.74E-07	6.74E-07	2.58E-06	2.05E-05	4.92E-04	1.80E-01	1.80E-01	1.57E-07	No	No	Yes
95-47-6	o-Xylene	24-hr	221	29	1.45	2.33E-05	5.12E-04	5.12E-04	5.59E-04	5.59E-04	2.14E-03	1.70E-02	4.08E-01	1.49E+02	4.08E-01	3.59E-03	No	No	No
127-18-4	Perchloroethylene	Year	0.169	32.4	1.62	2.34E-05	5.16E-04	5.16E-04	5.63E-04	5.63E-04	2.16E-03	1.71E-02	4.11E-01	1.50E+02	1.50E+02	1.31E-04	No	Yes	Yes
108-95-2	Phenol	24-hr	200	26.3	1.31	1.18E-04	2.60E-03	2.60E-03	2.83E-03	2.83E-03	1.09E-02	8.62E-02	2.07E+00	7.55E+02	2.07E+00	1.82E-02	No	No	Yes
1336-36-3	Polychlorinated Biphenyls (PCBs)	Year	0.00175	0.336	0.0168	2.95E-07	6.49E-06	6.49E-06	7.08E-06	7.08E-06	2.71E-05	2.15E-04	5.17E-03	1.89E+00	1.89E+00	1.64E-06	No	Yes	Yes
57-55-6	Propylene Glycol	24-hr	28.5	3.75	0.187	3.26E-06	7.18E-05	7.18E-05	7.83E-05	7.83E-05	3.00E-04	2.38E-03	5.72E-02	2.09E+01	5.72E-02	5.03E-04	No	No	No
115-07-1	Propylene	24-hr	3000	394	19.7	5.69E-05	1.25E-03	1.25E-03	1.37E-03	1.37E-03	5.24E-03	4.16E-02	9.97E-01	3.64E+02	9.97E-01	8.77E-03	No	No	No
106-42-3	p-Xylene	24-hr	221	29	1.45	2.36E-05	5.19E-04	5.19E-04	5.66E-04	5.66E-04	2.17E-03	1.72E-02	4.14E-01	1.51E+02	4.14E-01	3.64E-03	No	No	No
7782-49-2	Selenium & Selenium Compounds (other than Hydrogen Selenide)	24-hr	20	2.63	0.131	8.26E-08	1.82E-06	1.82E-06	1.98E-06	1.98E-06	7.60E-06	6.03E-05	1.45E-03	5.28E-01	1.45E-03	1.27E-05	No	No	No
100-42-5	Styrene	24-hr	900	118	5.91	6.70E-06	1.47E-04	1.47E-04	1.61E-04	1.61E-04	6.17E-04	4.89E-03	1.17E-01	4.29E+01	1.17E-01	1.03E-03	No	No	No
7446-09-5	Sulfur dioxide	1-hr	660	1.45	0.457	3.52E-06	7.74E-05	7.74E-05	8.44E-05	8.44E-05	3.24E-04	2.57E-03	6.17E-02	2.25E+01	2.57E-03	7.93E-03	No	No	No
108-88-3	Toluene	24-hr	5000	657	32.9	5.92E-04	1.30E-02	1.30E-02	1.42E-02	1.42E-02	5.45E-02	4.32E-01	1.04E+01	3.79E+03	1.04E+01	9.13E-02	No	No	No
156-60-5	Trans-1,2-dichloroethene	24-hr	807	106	5.3	1.73E-09	3.81E-08	3.81E-08	4.15E-08	4.15E-08	1.59E-07	1.26E-06	3.03E-05	1.11E-02	3.03E-05	2.66E-07	No	No	No
79-01-6	Trichloroethylene	Year	0.5	95.9	4.8	2.36E-05	5.19E-04	5.19E-04	5.66E-04	5.66E-04	2.17E-03	1.72E-02	4.14E-01	1.51E+02	1.51E+02	1.32E-04	No	Yes	Yes
1314-62-1	Vanadium Pentoxide	1-hr	30	0.0657	0.00329	1.70E-06	3.74E-05	3.74E-05	4.08E-05	4.08E-05	1.56E-04	1.24E-03	2.98E-02	1.09E+01	1.24E-03	3.83E-03	No	No	No

Table A-2. Toxic Air Pollutant Estimated Emission Rates and Comparison to the WAC 173-460-150 de minimis, SQER, and ASIL Levels

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	Above ASIL?	Above SQER?	Above De Minimis?
108-05-4	Vinyl acetate	24-hr	200	26.3	1.31	6.49E-09	1.43E-07	1.43E-07	1.56E-07	1.56E-07	5.97E-07	4.74E-06	1.14E-04	4.15E-02	1.14E-04	1.00E-06	No	No	No
75-01-4	Vinyl Chloride	Year	0.0128	2.46	0.123	2.38E-05	5.23E-04	5.23E-04	5.70E-04	5.70E-04	2.19E-03	1.73E-02	4.16E-01	1.52E+02	1.52E+02	1.32E-04	No	Yes	Yes

Table A-3. Proposed Toxic Air Pollutant Permit Limits

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Permit Limit Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	90% of ASIL (ug/m³)
71-55-6	1,1,1-Trichloroethane	24-hr	1000	131	6.57	9.77E-07	1.29E+02	1.29E+02	1.40E+02	1.40E+02	5.37E+02	4.27E+03	1.02E+05	3.74E+07	1.02E+05	9.00E+02	900
79-34-5	1,1,2,2-Tetrachloroethane	Year	0.0172	3.3	0.165	1.08E-05	6.11E-02	6.11E-02	6.67E-02	6.67E-02	2.56E-01	2.03E+00	4.87E+01	1.78E+04	1.78E+04	1.55E-02	0.01548
79-00-5	1,1,2-Trichloroethane	Year	0.0625	12	0.6	8.57E-06	2.22E-01	2.22E-01	2.42E-01	2.42E-01	9.29E-01	7.37E+00	1.77E+02	6.46E+04	6.46E+04	5.63E-02	0.05625
75-34-3	1,1-Dichloroethane	Year	0.625	120	6	3.94E-07	2.22E+00	2.22E+00	2.42E+00	2.42E+00	9.29E+00	7.37E+01	1.77E+03	6.46E+05	6.46E+05	5.63E-01	0.5625
75-35-4	1,1-Dichloroethylene	24-hr	200	26.3	1.31	4.53E-05	2.57E+01	2.57E+01	2.80E+01	2.80E+01	1.07E+02	8.53E+02	2.05E+04	7.47E+06	2.05E+04	1.80E+02	180
57-14-7	1,1-Dimethylhydrazine	24-hr	0.5	0.0657	0.00329	2.52E-08	6.43E-02	6.43E-02	7.01E-02	7.01E-02	2.69E-01	2.13E+00	5.12E+01	1.87E+04	5.12E+01	4.50E-01	0.45
106-93-4	1,2-Dibromoethane	Year	0.0141	2.71	0.135	1.15E-06	5.01E-02	5.01E-02	5.46E-02	5.46E-02	2.09E-01	1.66E+00	3.99E+01	1.46E+04	1.46E+04	1.27E-02	0.01269
107-06-2	1,2-Dichloroethane	Year	0.0385	7.39	0.369	2.36E-05	1.37E-01	1.37E-01	1.49E-01	1.49E-01	5.72E-01	4.54E+00	1.09E+02	3.98E+04	3.98E+04	3.47E-02	0.03465
78-87-5	1,2-Dichloropropane	Year	0.1	19.2	0.959	6.93E-07	3.55E-01	3.55E-01	3.88E-01	3.88E-01	1.49E+00	1.18E+01	2.83E+02	1.03E+05	1.03E+05	9.00E-02	0.09
106-88-7	1,2-Epoxybutane	24-hr	20	2.63	0.131	5.85E-07	2.57E+00	2.57E+00	2.80E+00	2.80E+00	1.07E+01	8.53E+01	2.05E+03	7.47E+05	2.05E+03	1.80E+01	18
106-99-0	1,3-Butadiene	Year	0.00588	1.13	0.0564	2.89E-06	2.09E-02	2.09E-02	2.28E-02	2.28E-02	8.74E-02	6.93E-01	1.66E+01	6.07E+03	6.07E+03	5.29E-03	0.005292
106-46-7	1,4-Dichlorobenzene	Year	0.0909	17.4	0.872	9.00E-07	3.23E-01	3.23E-01	3.52E-01	3.52E-01	1.35E+00	1.07E+01	2.57E+02	9.39E+04	9.39E+04	8.18E-02	0.08181
123-91-1	1,4-Dioxane	Year	0.13	24.9	1.25	1.02E-05	4.62E-01	4.62E-01	5.04E-01	5.04E-01	1.93E+00	1.53E+01	3.68E+02	1.34E+05	1.34E+05	1.17E-01	0.117
75-68-3	1-Chloro-1,1-difluoroethane	24-hr	5.00E+04	6570	329	1.57E-05	6.43E+03	6.43E+03	7.01E+03	7.01E+03	2.69E+04	2.13E+05	5.12E+06	1.87E+09	5.12E+06	4.50E+04	45000
95-48-7	2-Methylphenol	24-hr	600	78.9	3.94	4.12E-07	7.71E+01	7.71E+01	8.41E+01	8.41E+01	3.22E+02	2.56E+03	6.14E+04	2.24E+07	6.14E+04	5.40E+02	540
79-46-9	2-Nitropropane	24-hr	20	2.63	0.131	2.77E-06	2.57E+00	2.57E+00	2.80E+00	2.80E+00	1.07E+01	8.53E+01	2.05E+03	7.47E+05	2.05E+03	1.80E+01	18
108-39-4	3-Methylphenol	24-hr	600	78.9	3.94	6.87E-08	7.71E+01	7.71E+01	8.41E+01	8.41E+01	3.22E+02	2.56E+03	6.14E+04	2.24E+07	6.14E+04	5.40E+02	540
75-07-0	Acetaldehyde	Year	0.37	71	3.55	5.95E-05	1.31E+00	1.31E+00	1.43E+00	1.43E+00	5.50E+00	4.36E+01	1.05E+03	3.82E+05	3.82E+05	3.33E-01	0.333
60-35-5	Acetamide	Year	0.05	9.59	0.48	8.77E-08	1.78E-01	1.78E-01	1.94E-01	1.94E-01	7.43E-01	5.90E+00	1.41E+02	5.16E+04	5.16E+04	4.50E-02	0.045
75-05-8	Acetonitrile	Year	60	1.15E+04	576	5.55E-05	2.13E+02	2.13E+02	2.33E+02	2.33E+02	8.91E+02	7.07E+03	1.70E+05	6.20E+07	6.20E+07	5.40E+01	54
107-02-8	Acrolein	24-hr	0.06	0.00789	0.000394	4.32E-08	7.71E-03	7.71E-03	8.41E-03	8.41E-03	3.22E-02	2.56E-01	6.14E+00	2.24E+03	6.14E+00	5.40E-02	0.054
79-10-7	Acrylic Acid	24-hr	1	0.131	0.00657	9.44E-06	1.29E-01	1.29E-01	1.40E-01	1.40E-01	5.37E-01	4.27E+00	1.02E+02	3.74E+04	1.02E+02	9.00E-01	0.9
107-13-1	Acrylonitrile	Year	0.00345	0.662	0.0331	1.78E-07	1.23E-02	1.23E-02	1.34E-02	1.34E-02	5.13E-02	4.07E-01	9.76E+00	3.56E+03	3.56E+03	3.11E-03	0.003105
107-05-1	Allyl Chloride	Year	0.167	32	1.6	1.48E-07	5.93E-01	5.93E-01	6.47E-01	6.47E-01	2.48E+00	1.97E+01	4.73E+02	1.72E+05	1.72E+05	1.50E-01	0.1503
7664-41-7	Ammonia	24-hr	70.8	9.31	0.465	1.45E-02	9.10E+00	9.10E+00	9.93E+00	9.93E+00	3.80E+01	3.02E+02	7.25E+03	2.65E+06	7.25E+03	6.37E+01	63.72
7440-38-2	Arsenic & Inorganic Arsenic Compounds	Year	0.000303	0.0581	0.00291	4.75E-10	1.08E-03	1.08E-03	1.17E-03	1.17E-03	4.50E-03	3.57E-02	8.57E-01	3.13E+02	3.13E+02	2.73E-04	0.000273
71-43-2	Benzene	Year	0.0345	6.62	0.331	2.36E-05	1.23E-01	1.23E-01	1.34E-01	1.34E-01	5.13E-01	4.07E+00	9.76E+01	3.56E+04	3.56E+04	3.11E-02	0.03105
100-44-7	Benzyl Chloride	Year	0.0204	3.91	0.196	1.94E-07	7.25E-02	7.25E-02	7.91E-02	7.91E-02	3.03E-01	2.41E+00	5.77E+01	2.11E+04	2.11E+04	1.84E-02	0.01836
7440-41-7	Beryllium & Compounds (NOS)	Year	0.000417	0.08	0.004	4.76E-08	1.48E-03	1.48E-03	1.62E-03	1.62E-03	6.20E-03	4.92E-02	1.18E+00	4.31E+02	4.31E+02	3.75E-04	0.000375
75-25-2	Bromoform	Year	0.909	174	8.72	1.27E-07	3.23E+00	3.23E+00	3.52E+00	3.52E+00	1.35E+01	1.07E+02	2.57E+03	9.39E+05	9.39E+05	8.18E-01	0.8181
25013-16-5	Butylated hydroxyanisole	Year	17.5	3360	168	2.06E-08	6.22E+01	6.22E+01	6.78E+01	6.78E+01	2.60E+02	2.06E+03	4.95E+04	1.81E+07	1.81E+07	1.58E+01	15.75
7440-43-9	Cadmium & Compounds	Year	0.000238	0.0457	0.00228	2.38E-10	8.46E-04	8.46E-04	9.22E-04	9.22E-04	3.54E-03	2.81E-02	6.74E-01	2.46E+02	2.46E+02	2.14E-04	0.000214
75-15-0	Carbon disulfide	24-hr	800	105	5.26	5.80E-06	1.03E+02	1.03E+02	1.12E+02	1.12E+02	4.30E+02	3.41E+03	8.19E+04	2.99E+07	8.19E+04	7.20E+02	720

Table A-3. Proposed Toxic Air Pollutant Permit Limits

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Permit Limit Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	90% of ASIL (ug/m³)
630-08-0	Carbon monoxide	1-hr	23000	50.4	1.14	5.40E-04	2.02E+02	2.02E+02	2.20E+02	2.20E+02	8.45E+02	6.70E+03	1.61E+05	5.87E+07	6.70E+03	2.07E+04	20700
56-23-5	Carbon Tetrachloride	Year	0.0238	4.57	0.228	2.38E-05	8.46E-02	8.46E-02	9.22E-02	9.22E-02	3.54E-01	2.81E+00	6.74E+01	2.46E+04	2.46E+04	2.14E-02	0.02142
108-90-7	Chlorobenzene	24-hr	1000	131	6.57	7.24E-06	1.29E+02	1.29E+02	1.40E+02	1.40E+02	5.37E+02	4.27E+03	1.02E+05	3.74E+07	1.02E+05	9.00E+02	900
75-45-6	Chlorodifluoromethane	24-hr	5.00E+04	6570	328	1.45E-05	6.43E+03	6.43E+03	7.01E+03	7.01E+03	2.69E+04	2.13E+05	5.12E+06	1.87E+09	5.12E+06	4.50E+04	45000
67-66-3	Chloroform	Year	0.0435	8.35	0.417	2.38E-05	1.55E-01	1.55E-01	1.69E-01	1.69E-01	6.46E-01	5.13E+00	1.23E+02	4.49E+04	4.49E+04	3.92E-02	0.03915
7440-47-3	Chromium Hexavalent: Soluble, except Chromic Trioxide	Year	6.67E-06	0.00128	6.40E-05	7.28E-10	2.37E-05	2.37E-05	2.59E-05	2.59E-05	9.91E-05	7.86E-04	1.89E-02	6.89E+00	6.89E+00	6.00E-06	6E-06
7440-48-4	Cobalt	24-hr	0.1	0.013	0.000657	9.50E-07	1.29E-02	1.29E-02	1.40E-02	1.40E-02	5.37E-02	4.27E-01	1.02E+01	3.74E+03	1.02E+01	9.00E-02	0.09
7440-50-8	Copper & Compounds	1-hr	100	0.219	0.011	4.76E-07	8.78E-01	8.78E-01	9.58E-01	9.58E-01	3.67E+00	2.91E+01	7.00E+02	2.55E+05	2.91E+01	9.00E+01	90
98-82-8	Cumene	24-hr	400	52.6	2.63	1.02E-06	5.14E+01	5.14E+01	5.61E+01	5.61E+01	2.15E+02	1.71E+03	4.09E+04	1.49E+07	4.09E+04	3.60E+02	360
110-82-7	Cyclohexane	24-hr	6000	789	39.4	2.29E-05	7.71E+02	7.71E+02	8.41E+02	8.41E+02	3.22E+03	2.56E+04	6.14E+05	2.24E+08	6.14E+05	5.40E+03	5400
117-81-7	Di(2-ethylhexyl)phthalate	Year	0.0417	8	0.4	1.08E-08	1.48E-01	1.48E-01	1.62E-01	1.62E-01	6.20E-01	4.92E+00	1.18E+02	4.31E+04	4.31E+04	3.75E-02	0.03753
75-09-2	Dichloromethane	Year	1	192	9.59	1.61E-04	3.55E+00	3.55E+00	3.88E+00	3.88E+00	1.49E+01	1.18E+02	2.83E+03	1.03E+06	1.03E+06	9.00E-01	0.9
593-74-8	Dimethyl Mercury	24-hr	1.00E-99	1.00E-99	1.00E-99	1.07E-07	1.29E-100	1.29E-100	1.40E-100	1.40E-100	5.37E-100	4.27E-99	1.02E-97	3.74E-95	1.02E-97	9.00E-100	9E-100
75-00-3	Ethyl Chloride	24-hr	3.00E+04	3940	197	4.15E-06	3.86E+03	3.86E+03	4.21E+03	4.21E+03	1.61E+04	1.28E+05	3.07E+06	1.12E+09	3.07E+06	2.70E+04	27000
100-41-4	Ethylbenzene	Year	0.4	76.8	3.84	2.05E-05	1.42E+00	1.42E+00	1.55E+00	1.55E+00	5.94E+00	4.72E+01	1.13E+03	4.13E+05	4.13E+05	3.60E-01	0.36
111-15-9	Ethylene glycol monoethyl ether acetate	24-hr	300	39.4	1.97	2.20E-06	3.86E+01	3.86E+01	4.21E+01	4.21E+01	1.61E+02	1.28E+03	3.07E+04	1.12E+07	3.07E+04	2.70E+02	270
75-21-8	Ethylene oxide	Year	0.0114	2.19	0.109	1.12E-07	4.05E-02	4.05E-02	4.42E-02	4.42E-02	1.69E-01	1.34E+00	3.23E+01	1.18E+04	1.18E+04	1.03E-02	0.01026
50-00-0	Formaldehyde	Year	0.167	32	1.6	3.41E-07	5.93E-01	5.93E-01	6.47E-01	6.47E-01	2.48E+00	1.97E+01	4.73E+02	1.72E+05	1.72E+05	1.50E-01	0.1503
87-68-3	Hexachlorobutadiene	Year	0.0455	8.73	0.437	1.68E-05	1.62E-01	1.62E-01	1.76E-01	1.76E-01	6.76E-01	5.36E+00	1.29E+02	4.70E+04	4.70E+04	4.10E-02	0.04095
67-72-1	Hexachloroethane	Year	0.0909	17.4	0.872	2.44E-05	3.23E-01	3.23E-01	3.52E-01	3.52E-01	1.35E+00	1.07E+01	2.57E+02	9.39E+04	9.39E+04	8.18E-02	0.08181
74-90-8	Hydrogen Cyanide	24-hr	9	1.18	0.0591	8.25E-08	1.16E+00	1.16E+00	1.26E+00	1.26E+00	4.84E+00	3.84E+01	9.21E+02	3.36E+05	9.21E+02	8.10E+00	8.1
67-63-0	Isopropyl Alcohol	1-hr	3200	7.01	0.35	4.89E-05	2.81E+01	2.81E+01	3.07E+01	3.07E+01	1.18E+02	9.33E+02	2.24E+04	8.17E+06	9.33E+02	2.88E+03	2880
7439-92-1	Lead and compounds (NOS)	Year	0.0833	16	10	4.75E-10	2.96E-01	2.96E-01	3.23E-01	3.23E-01	1.24E+00	9.82E+00	2.36E+02	8.60E+04	8.60E+04	7.50E-02	0.07497
7439-96-5	Manganese & Compounds	24-hr	0.04	0.00526	0.000263	4.75E-10	5.14E-03	5.14E-03	5.61E-03	5.61E-03	2.15E-02	1.71E-01	4.09E+00	1.49E+03	4.09E+00	3.60E-02	0.036
7439-97-6	Mercury, Elemental	24-hr	0.09	0.0118	0.000591	2.88E-07	1.16E-02	1.16E-02	1.26E-02	1.26E-02	4.84E-02	3.84E-01	9.21E+00	3.36E+03	9.21E+00	8.10E-02	0.081
67-56-1	Methyl Alcohol	24-hr	4000	526	26.3	1.03E-03	5.14E+02	5.14E+02	5.61E+02	5.61E+02	2.15E+03	1.71E+04	4.09E+05	1.49E+08	4.09E+05	3.60E+03	3600
74-83-9	Methyl Bromide	24-hr	5	0.657	0.0629	9.30E-07	6.43E-01	6.43E-01	7.01E-01	7.01E-01	2.69E+00	2.13E+01	5.12E+02	1.87E+05	5.12E+02	4.50E+00	4.5
74-87-3	Methyl Chloride	24-hr	90	11.8	0.591	3.24E-06	1.16E+01	1.16E+01	1.26E+01	1.26E+01	4.84E+01	3.84E+02	9.21E+03	3.36E+06	9.21E+03	8.10E+01	81
78-93-3	Methyl Ethyl Ketone	24-hr	5000	657	32.9	1.39E-04	6.43E+02	6.43E+02	7.01E+02	7.01E+02	2.69E+03	2.13E+04	5.12E+05	1.87E+08	5.12E+05	4.50E+03	4500
108-10-1	Methyl Isobutyl Ketone	24-hr	3000	394	19.7	4.01E-05	3.86E+02	3.86E+02	4.21E+02	4.21E+02	1.61E+03	1.28E+04	3.07E+05	1.12E+08	3.07E+05	2.70E+03	2700
624-83-9	Methyl Isocyanate	24-hr	1	0.131	0.00657	2.56E-08	1.29E-01	1.29E-01	1.40E-01	1.40E-01	5.37E-01	4.27E+00	1.02E+02	3.74E+04	1.02E+02	9.00E-01	0.9
108-38-3	m-Xylene	24-hr	221	29	1.45	1.37E-05	2.84E+01	2.84E+01	3.10E+01	3.10E+01	1.19E+02	9.43E+02	2.26E+04	8.26E+06	2.26E+04	1.99E+02	198.9
91-20-3	Naphthalene	Year	0.0294	5.64	0.282	1.88E-07	1.04E-01	1.04E-01	1.14E-01	1.14E-01	4.37E-01	3.47E+00	8.32E+01	3.04E+04	3.04E+04	2.65E-02	0.02646

Table A-3. Proposed Toxic Air Pollutant Permit Limits

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/avg. period)	De Minimis (lbs/avg. period)	Emission Rate per Tank (g/s)	Portable 1 AX Tank Farm POR 126 (g/s)	Portable 2 AX Tank Farm POR 127 (g/s)	Portable 3 A Tank Farm Future (g/s)	Portable 4 A Tank Farm Future (g/s)	Permit Limit Total (g/s)	Total (lbs/hr)	Total (lbs/24-hr)	Total (lbs/yr)	Emissions Total (lbs/avg. period)	Dispersed Concentration (ug/m³)	90% of ASIL (ug/m³)
110-54-3	n-Hexane	24-hr	700	92	4.6	7.48E-05	9.00E+01	9.00E+01	9.81E+01	9.81E+01	3.76E+02	2.99E+03	7.17E+04	2.62E+07	7.17E+04	6.30E+02	630
10102-44-0	Nitrogen dioxide	1-hr	470	1.03	0.457	7.99E-04	4.13E+00	4.13E+00	4.50E+00	4.50E+00	1.73E+01	1.37E+02	3.29E+03	1.20E+06	1.37E+02	4.23E+02	423
55-18-5	n-Nitrosodiethylamine	Year	1.00E-04	0.0192	0.000959	2.81E-08	3.55E-04	3.55E-04	3.88E-04	3.88E-04	1.49E-03	1.18E-02	2.83E-01	1.03E+02	1.03E+02	9.00E-05	0.00009
62-75-9	n-Nitrosodimethylamine	Year	0.000217	0.0416	0.00208	3.83E-05	7.71E-04	7.71E-04	8.41E-04	8.41E-04	3.22E-03	2.56E-02	6.14E-01	2.24E+02	2.24E+02	1.95E-04	0.000195
924-16-3	n-Nitroso-di-n-butylamine	Year	0.000323	0.062	0.0031	2.81E-08	1.15E-03	1.15E-03	1.25E-03	1.25E-03	4.80E-03	3.81E-02	9.14E-01	3.34E+02	3.34E+02	2.91E-04	0.000291
621-64-7	n-Nitrosodi-n-propylamine	Year	0.0005	0.0959	0.0048	2.81E-08	1.78E-03	1.78E-03	1.94E-03	1.94E-03	7.43E-03	5.90E-02	1.41E+00	5.16E+02	5.16E+02	4.50E-04	0.00045
59-89-2	n-Nitrosomorpholine	Year	0.000526	0.101	0.00505	1.30E-07	1.87E-03	1.87E-03	2.04E-03	2.04E-03	7.81E-03	6.20E-02	1.49E+00	5.43E+02	5.43E+02	4.73E-04	0.000473
10595-95-6	n-Nitroso-n-methylethylamine	Year	0.000159	0.0305	0.00153	2.81E-08	5.65E-04	5.65E-04	6.16E-04	6.16E-04	2.36E-03	1.87E-02	4.50E-01	1.64E+02	1.64E+02	1.43E-04	0.000143
100-75-4	n-Nitrosopiperidine	Year	0.00037	0.071	0.00355	4.12E-07	1.31E-03	1.31E-03	1.43E-03	1.43E-03	5.50E-03	4.36E-02	1.05E+00	3.82E+02	3.82E+02	3.33E-04	0.000333
930-55-2	n-Nitrosopyrrolidine	Year	0.00167	0.32	0.016	2.81E-08	5.93E-03	5.93E-03	6.47E-03	6.47E-03	2.48E-02	1.97E-01	4.73E+00	1.72E+03	1.72E+03	1.50E-03	0.001503
95-47-6	o-Xylene	24-hr	221	29	1.45	2.33E-05	2.84E+01	2.84E+01	3.10E+01	3.10E+01	1.19E+02	9.43E+02	2.26E+04	8.26E+06	2.26E+04	1.99E+02	198.9
127-18-4	Perchloroethylene	Year	0.169	32.4	1.62	2.34E-05	6.00E-01	6.00E-01	6.55E-01	6.55E-01	2.51E+00	1.99E+01	4.78E+02	1.75E+05	1.75E+05	1.52E-01	0.1521
108-95-2	Phenol	24-hr	200	26.3	1.31	1.18E-04	2.57E+01	2.57E+01	2.80E+01	2.80E+01	1.07E+02	8.53E+02	2.05E+04	7.47E+06	2.05E+04	1.80E+02	180
1336-36-3	Polychlorinated Biphenyls (PCBs)	Year	0.00175	0.336	0.0168	2.95E-07	6.22E-03	6.22E-03	6.78E-03	6.78E-03	2.60E-02	2.06E-01	4.95E+00	1.81E+03	1.81E+03	1.58E-03	0.001575
57-55-6	Propylene Glycol	24-hr	28.5	3.75	0.187	3.26E-06	3.66E+00	3.66E+00	4.00E+00	4.00E+00	1.53E+01	1.22E+02	2.92E+03	1.06E+06	2.92E+03	2.57E+01	25.65
115-07-1	Propylene	24-hr	3000	394	19.7	5.69E-05	3.86E+02	3.86E+02	4.21E+02	4.21E+02	1.61E+03	1.28E+04	3.07E+05	1.12E+08	3.07E+05	2.70E+03	2700
106-42-3	p-Xylene	24-hr	221	29	1.45	2.36E-05	2.84E+01	2.84E+01	3.10E+01	3.10E+01	1.19E+02	9.43E+02	2.26E+04	8.26E+06	2.26E+04	1.99E+02	198.9
7782-49-2	Selenium & Selenium Compounds (other than Hydrogen Selenide)	24-hr	20	2.63	0.131	8.26E-08	2.57E+00	2.57E+00	2.80E+00	2.80E+00	1.07E+01	8.53E+01	2.05E+03	7.47E+05	2.05E+03	1.80E+01	18
100-42-5	Styrene	24-hr	900	118	5.91	6.70E-06	1.16E+02	1.16E+02	1.26E+02	1.26E+02	4.84E+02	3.84E+03	9.21E+04	3.36E+07	9.21E+04	8.10E+02	810
7446-09-5	Sulfur dioxide	1-hr	660	1.45	0.457	3.52E-06	5.80E+00	5.80E+00	6.32E+00	6.32E+00	2.42E+01	1.92E+02	4.62E+03	1.69E+06	1.92E+02	5.94E+02	594
108-88-3	Toluene	24-hr	5000	657	32.9	5.92E-04	6.43E+02	6.43E+02	7.01E+02	7.01E+02	2.69E+03	2.13E+04	5.12E+05	1.87E+08	5.12E+05	4.50E+03	4500
156-60-5	Trans-1,2-dichloroethene	24-hr	807	106	5.3	1.73E-09	1.04E+02	1.04E+02	1.13E+02	1.13E+02	4.34E+02	3.44E+03	8.26E+04	3.02E+07	8.26E+04	7.26E+02	726.3
79-01-6	Trichloroethylene	Year	0.5	95.9	4.8	2.36E-05	1.78E+00	1.78E+00	1.94E+00	1.94E+00	7.43E+00	5.90E+01	1.41E+03	5.16E+05	5.16E+05	4.50E-01	0.45
1314-62-1	Vanadium Pentoxide	1-hr	30	0.0657	0.00329	1.70E-06	2.63E-01	2.63E-01	2.87E-01	2.87E-01	1.10E+00	8.74E+00	2.10E+02	7.66E+04	8.74E+00	2.70E+01	27
108-05-4	Vinyl acetate	24-hr	200	26.3	1.31	6.49E-09	2.57E+01	2.57E+01	2.80E+01	2.80E+01	1.07E+02	8.53E+02	2.05E+04	7.47E+06	2.05E+04	1.80E+02	180
75-01-4	Vinyl Chloride	Year	0.0128	2.46	0.123	2.38E-05	4.55E-02	4.55E-02	4.96E-02	4.96E-02	1.90E-01	1.51E+00	3.62E+01	1.32E+04	1.32E+04	1.15E-02	0.01152

Table A-4. 241-AX Tank Farm Estimated Emissions Per Portable Exhauster

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/averaging period)	De Minimis (lbs/averaging period)	Emission Rate per Tank (g/s)	AX Tank Farm (per exhauster) (g/s)	Emissions Total (lbs/averaging period)	Dispersed Concentration (ug/m³)	Above ASIL?
71-55-6	1,1,1-Trichloroethane	24-hr	1000	131	6.57	9.77E-07	2.15E-05	4.09E-03	3.60E-05	No
79-34-5	1,1,2,2-Tetrachloroethane	Year	0.0172	3.3	0.165	1.08E-05	2.37E-04	1.65E+01	1.44E-05	No
79-00-5	1,1,2-Trichloroethane	Year	0.0625	12	0.6	8.57E-06	1.89E-04	1.31E+01	1.14E-05	No
75-34-3	1,1-Dichloroethane	Year	0.625	120	6	3.94E-07	8.68E-06	6.03E-01	5.26E-07	No
75-35-4	1,1-Dichloroethylene	24-hr	200	26.3	1.31	4.53E-05	9.97E-04	1.90E-01	1.67E-03	No
57-14-7	1,1-Dimethylhydrazine	24-hr	0.5	0.0657	0.00329	2.52E-08	5.55E-07	1.06E-04	9.30E-07	No
106-93-4	1,2-Dibromoethane	Year	0.0141	2.71	0.135	1.15E-06	2.54E-05	1.77E+00	1.54E-06	No
107-06-2	1,2-Dichloroethane	Year	0.0385	7.39	0.369	2.36E-05	5.19E-04	3.61E+01	3.14E-05	No
78-87-5	1,2-Dichloropropane	Year	0.1	19.2	0.959	6.93E-07	1.52E-05	1.06E+00	9.24E-07	No
106-88-7	1,2-Epoxybutane	24-hr	20	2.63	0.131	5.85E-07	1.29E-05	2.45E-03	2.16E-05	No
106-99-0	1,3-Butadiene	Year	0.00588	1.13	0.0564	2.89E-06	6.35E-05	4.42E+00	3.85E-06	No
106-46-7	1,4-Dichlorobenzene	Year	0.0909	17.4	0.872	9.00E-07	1.98E-05	1.38E+00	1.20E-06	No
123-91-1	1,4-Dioxane	Year	0.13	24.9	1.25	1.02E-05	2.24E-04	1.56E+01	1.36E-05	No
75-68-3	1-Chloro-1,1-difluoroethane	24-hr	5.00E+04	6570	329	1.57E-05	3.45E-04	6.58E-02	5.78E-04	No
95-48-7	2-Methylphenol	24-hr	600	78.9	3.94	4.12E-07	9.07E-06	1.73E-03	1.52E-05	No
79-46-9	2-Nitropropane	24-hr	20	2.63	0.131	2.77E-06	6.10E-05	1.16E-02	1.02E-04	No
108-39-4	3-Methylphenol	24-hr	600	78.9	3.94	6.87E-08	1.51E-06	2.88E-04	2.53E-06	No
75-07-0	Acetaldehyde	Year	0.37	71	3.55	5.95E-05	1.31E-03	9.10E+01	7.93E-05	No
60-35-5	Acetamide	Year	0.05	9.59	0.48	8.77E-08	1.93E-06	1.34E-01	1.17E-07	No
75-05-8	Acetonitrile	Year	60	1.15E+04	576	5.55E-05	1.22E-03	8.48E+01	7.39E-05	No
107-02-8	Acrolein	24-hr	0.06	0.00789	0.000394	4.32E-08	9.50E-07	1.81E-04	1.59E-06	No
79-10-7	Acrylic Acid	24-hr	1	0.131	0.00657	9.44E-06	2.08E-04	3.96E-02	3.48E-04	No
107-13-1	Acrylonitrile	Year	0.00345	0.662	0.0331	1.78E-07	3.93E-06	2.73E-01	2.38E-07	No
107-05-1	Allyl Chloride	Year	0.167	32	1.6	1.48E-07	3.25E-06	2.26E-01	1.97E-07	No
7664-41-7	Ammonia	24-hr	70.8	9.31	0.465	1.45E-02	3.19E-01	6.08E+01	5.34E-01	No
7440-38-2	Arsenic & Inorganic Arsenic Compounds	Year	0.000303	0.0581	0.00291	4.75E-10	1.04E-08	7.26E-04	6.33E-10	No
71-43-2	Benzene	Year	0.0345	6.62	0.331	2.36E-05	5.19E-04	3.61E+01	3.14E-05	No
100-44-7	Benzyl Chloride	Year	0.0204	3.91	0.196	1.94E-07	4.27E-06	2.97E-01	2.59E-07	No
7440-41-7	Beryllium & Compounds (NOS)	Year	0.000417	0.08	0.004	4.76E-08	1.05E-06	7.28E-02	6.34E-08	No
75-25-2	Bromoform	Year	0.909	174	8.72	1.27E-07	2.79E-06	1.94E-01	1.69E-07	No
25013-16-5	Butylated hydroxyanisole	Year	17.5	3360	168	2.06E-08	4.54E-07	3.15E-02	2.75E-08	No
7440-43-9	Cadmium & Compounds	Year	0.000238	0.0457	0.00228	2.38E-10	5.24E-09	3.64E-04	3.17E-10	No

Table A-4. 241-AX Tank Farm Estimated Emissions Per Portable Exhauster

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/averaging period)	De Minimis (lbs/averaging period)	Emission Rate per Tank (g/s)	AX Tank Farm (per exhauster) (g/s)	Emissions Total (lbs/averaging period)	Dispersed Concentration (ug/m³)	Above ASIL?
75-15-0	Carbon disulfide	24-hr	800	105	5.26	5.80E-06	1.28E-04	2.43E-02	2.14E-04	No
630-08-0	Carbon monoxide	1-hr	23000	50.4	1.14	5.40E-04	1.19E-02	9.44E-02	2.91E-01	No
56-23-5	Carbon Tetrachloride	Year	0.0238	4.57	0.228	2.38E-05	5.23E-04	3.63E+01	3.17E-05	No
108-90-7	Chlorobenzene	24-hr	1000	131	6.57	7.24E-06	1.59E-04	3.03E-02	2.67E-04	No
75-45-6	Chlorodifluoromethane	24-hr	5.00E+04	6570	328	1.45E-05	3.18E-04	6.06E-02	5.33E-04	No
67-66-3	Chloroform	Year	0.0435	8.35	0.417	2.38E-05	5.23E-04	3.63E+01	3.17E-05	No
7440-47-3	Chromium Hexavalent: Soluble, except Chromic Trioxide	Year	6.67E-06	0.00128	6.40E-05	7.28E-10	1.60E-08	1.11E-03	9.70E-10	No
7440-48-4	Cobalt	24-hr	0.1	0.013	0.000657	9.50E-07	2.09E-05	3.98E-03	3.50E-05	No
7440-50-8	Copper & Compounds	1-hr	100	0.219	0.011	4.76E-07	1.05E-05	8.31E-05	2.57E-04	No
98-82-8	Cumene	24-hr	400	52.6	2.63	1.02E-06	2.24E-05	4.27E-03	3.76E-05	No
110-82-7	Cyclohexane	24-hr	6000	789	39.4	2.29E-05	5.04E-04	9.61E-02	8.45E-04	No
117-81-7	Di(2-ethylhexyl)phthalate	Year	0.0417	8	0.4	1.08E-08	2.38E-07	1.65E-02	1.44E-08	No
75-09-2	Dichloromethane	Year	1	192	9.59	1.61E-04	3.55E-03	2.47E+02	2.15E-04	No
593-74-8	Dimethyl Mercury	24-hr	1.00E-99	1.00E-99	1.00E-99	1.07E-07	2.35E-06	4.47E-04	3.93E-06	Yes
75-00-3	Ethyl Chloride	24-hr	3.00E+04	3940	197	4.15E-06	9.14E-05	1.74E-02	1.53E-04	No
100-41-4	Ethylbenzene	Year	0.4	76.8	3.84	2.05E-05	4.50E-04	3.13E+01	2.73E-05	No
111-15-9	Ethylene glycol monoethyl ether acetate	24-hr	300	39.4	1.97	2.20E-06	4.83E-05	9.21E-03	8.10E-05	No
75-21-8	Ethylene oxide	Year	0.0114	2.19	0.109	1.12E-07	2.47E-06	1.71E-01	1.49E-07	No
50-00-0	Formaldehyde	Year	0.167	32	1.6	3.41E-07	7.50E-06	5.22E-01	4.54E-07	No
87-68-3	Hexachlorobutadiene	Year	0.0455	8.73	0.437	1.68E-05	3.70E-04	2.57E+01	2.24E-05	No
67-72-1	Hexachloroethane	Year	0.0909	17.4	0.872	2.44E-05	5.36E-04	3.73E+01	3.25E-05	No
74-90-8	Hydrogen Cyanide	24-hr	9	1.18	0.0591	8.25E-08	1.81E-06	3.46E-04	3.04E-06	No
67-63-0	Isopropyl Alcohol	1-hr	3200	7.01	0.35	4.89E-05	1.08E-03	8.54E-03	2.64E-02	No
7439-92-1	Lead and compounds (NOS)	Year	0.0833	16	10	4.75E-10	1.04E-08	7.26E-04	6.33E-10	No
7439-96-5	Manganese & Compounds	24-hr	0.04	0.00526	0.000263	4.75E-10	1.04E-08	1.99E-06	1.75E-08	No
7439-97-6	Mercury, Elemental	24-hr	0.09	0.0118	0.000591	2.88E-07	6.33E-06	1.21E-03	1.06E-05	No
67-56-1	Methyl Alcohol	24-hr	4000	526	26.3	1.03E-03	2.27E-02	4.32E+00	3.80E-02	No
74-83-9	Methyl Bromide	24-hr	5	0.657	0.0629	9.30E-07	2.05E-05	3.90E-03	3.43E-05	No
74-87-3	Methyl Chloride	24-hr	90	11.8	0.591	3.24E-06	7.13E-05	1.36E-02	1.19E-04	No
78-93-3	Methyl Ethyl Ketone	24-hr	5000	657	32.9	1.39E-04	3.06E-03	5.82E-01	5.12E-03	No
108-10-1	Methyl Isobutyl Ketone	24-hr	3000	394	19.7	4.01E-05	8.83E-04	1.68E-01	1.48E-03	No
624-83-9	Methyl Isocyanate	24-hr	1	0.131	0.00657	2.56E-08	5.64E-07	1.07E-04	9.44E-07	No
108-38-3	m-Xylene	24-hr	221	29	1.45	1.37E-05	3.00E-04	5.72E-02	5.03E-04	No

Table A-4. 241-AX Tank Farm Estimated Emissions Per Portable Exhauster

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/averaging period)	De Minimis (lbs/averaging period)	Emission Rate per Tank (g/s)	AX Tank Farm (per exhauster) (g/s)	Emissions Total (lbs/averaging period)	Dispersed Concentration (ug/m³)	Above ASIL?
91-20-3	Naphthalene	Year	0.0294	5.64	0.282	1.88E-07	4.14E-06	2.88E-01	2.51E-07	No
110-54-3	n-Hexane	24-hr	700	92	4.6	7.48E-05	1.65E-03	3.13E-01	2.76E-03	No
10102-44-0	Nitrogen dioxide	1-hr	470	1.03	0.457	7.99E-04	1.76E-02	1.40E-01	4.31E-01	No
55-18-5	n-Nitrosodiethylamine	Year	1.00E-04	0.0192	0.000959	2.81E-08	6.18E-07	4.30E-02	3.74E-08	No
62-75-9	n-Nitrosodimethylamine	Year	0.000217	0.0416	0.00208	3.83457E-05	8.44E-04	5.87E+01	5.11E-05	No
924-16-3	n-Nitroso-di-n-butylamine	Year	0.000323	0.062	0.0031	2.81E-08	6.18E-07	4.30E-02	3.74E-08	No
621-64-7	n-Nitrosodi-n-propylamine	Year	0.0005	0.0959	0.0048	2.81E-08	6.18E-07	4.30E-02	3.74E-08	No
59-89-2	n-Nitrosomorpholine	Year	0.000526	0.101	0.00505	1.30E-07	2.86E-06	1.99E-01	1.73E-07	No
10595-95-6	n-Nitroso-n-methylethylamine	Year	0.000159	0.0305	0.00153	2.81E-08	6.18E-07	4.30E-02	3.74E-08	No
100-75-4	n-Nitrosopiperidine	Year	0.00037	0.071	0.00355	4.12E-07	9.06E-06	6.30E-01	5.49E-07	No
930-55-2	n-Nitrosopyrrolidine	Year	0.00167	0.32	0.016	2.81E-08	6.18E-07	4.30E-02	3.74E-08	No
95-47-6	o-Xylene	24-hr	221	29	1.45	2.33E-05	5.12E-04	9.76E-02	8.58E-04	No
127-18-4	Perchloroethylene	Year	0.169	32.4	1.62	2.34E-05	5.16E-04	3.59E+01	3.12E-05	No
108-95-2	Phenol	24-hr	200	26.3	1.31	1.18E-04	2.60E-03	4.94E-01	4.35E-03	No
1336-36-3	Polychlorinated Biphenyls (PCBs)	Year	0.00175	0.336	0.0168	2.95E-07	6.49E-06	4.51E-01	3.93E-07	No
57-55-6	Propylene Glycol	24-hr	28.5	3.75	0.187	3.26E-06	7.18E-05	1.37E-02	1.20E-04	No
115-07-1	Propylene	24-hr	3000	394	19.7	5.69E-05	1.25E-03	2.39E-01	2.10E-03	No
106-42-3	p-Xylene	24-hr	221	29	1.45	2.36E-05	5.19E-04	9.89E-02	8.69E-04	No
7782-49-2	Selenium & Selenium Compounds (other than Hydrogen Selenide)	24-hr	20	2.63	0.131	8.26E-08	1.82E-06	3.46E-04	3.04E-06	No
100-42-5	Styrene	24-hr	900	118	5.91	6.70E-06	1.47E-04	2.81E-02	2.47E-04	No
7446-09-5	Sulfur dioxide	1-hr	660	1.45	0.457	3.52E-06	7.74E-05	6.14E-04	1.90E-03	No
108-88-3	Toluene	24-hr	5000	657	32.9	5.92E-04	1.30E-02	2.48E+00	2.18E-02	No
156-60-5	Trans-1,2-dichloroethene	24-hr	807	106	5.3	1.73E-09	3.81E-08	7.25E-06	6.37E-08	No
79-01-6	Trichloroethylene	Year	0.5	95.9	4.8	2.36E-05	5.19E-04	3.61E+01	3.14E-05	No
1314-62-1	Vanadium Pentoxide	1-hr	30	0.0657	0.00329	1.70E-06	3.74E-05	2.97E-04	9.16E-04	No
108-05-4	Vinyl acetate	24-hr	200	26.3	1.31	6.49E-09	1.43E-07	2.72E-05	2.39E-07	No
75-01-4	Vinyl Chloride	Year	0.0128	2.46	0.123	2.38E-05	5.23E-04	3.63E+01	3.17E-05	No

Table A-5. 241-A Tank Farm Estimated Emissions Per Portable Exhauster

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/averaging period)	De Minimis (lbs/averaging period)	Emission Rate per Tank (g/s)	A Tank Farm (per exhauster) (g/s)	Emissions Total (lbs/averaging period)	Dispersed Concentration (ug/m³)	Above ASIL?
71-55-6	1,1,1-Trichloroethane	24-hr	1000	131	6.57	9.77E-07	2.34E-05	4.47E-03	3.93E-05	No
79-34-5	1,1,2,2-Tetrachloroethane	Year	0.0172	3.3	0.165	1.08E-05	2.59E-04	1.80E+01	1.57E-05	No
79-00-5	1,1,2-Trichloroethane	Year	0.0625	12	0.6	8.57E-06	2.06E-04	1.43E+01	1.25E-05	No
75-34-3	1,1-Dichloroethane	Year	0.625	120	6	3.94E-07	9.47E-06	6.58E-01	5.74E-07	No
75-35-4	1,1-Dichloroethylene	24-hr	200	26.3	1.31	4.53E-05	1.09E-03	2.07E-01	1.82E-03	No
57-14-7	1,1-Dimethylhydrazine	24-hr	0.5	0.0657	0.00329	2.52E-08	6.06E-07	1.15E-04	1.01E-06	No
106-93-4	1,2-Dibromoethane	Year	0.0141	2.71	0.135	1.15E-06	2.77E-05	1.93E+00	1.68E-06	No
107-06-2	1,2-Dichloroethane	Year	0.0385	7.39	0.369	2.36E-05	5.66E-04	3.94E+01	3.43E-05	No
78-87-5	1,2-Dichloropropane	Year	0.1	19.2	0.959	6.93E-07	1.66E-05	1.16E+00	1.01E-06	No
106-88-7	1,2-Epoxybutane	24-hr	20	2.63	0.131	5.85E-07	1.40E-05	2.68E-03	2.35E-05	No
106-99-0	1,3-Butadiene	Year	0.00588	1.13	0.0564	2.89E-06	6.93E-05	4.82E+00	4.20E-06	No
106-46-7	1,4-Dichlorobenzene	Year	0.0909	17.4	0.872	9.00E-07	2.16E-05	1.50E+00	1.31E-06	No
123-91-1	1,4-Dioxane	Year	0.13	24.9	1.25	1.02E-05	2.44E-04	1.70E+01	1.48E-05	No
75-68-3	1-Chloro-1,1-difluoroethane	24-hr	5.00E+04	6570	329	1.57E-05	3.77E-04	7.17E-02	6.31E-04	No
95-48-7	2-Methylphenol	24-hr	600	78.9	3.94	4.12E-07	9.90E-06	1.89E-03	1.66E-05	No
79-46-9	2-Nitropropane	24-hr	20	2.63	0.131	2.77E-06	6.66E-05	1.27E-02	1.12E-04	No
108-39-4	3-Methylphenol	24-hr	600	78.9	3.94	6.87E-08	1.65E-06	3.14E-04	2.76E-06	No
75-07-0	Acetaldehyde	Year	0.37	71	3.55	5.95E-05	1.43E-03	9.92E+01	8.65E-05	No
60-35-5	Acetamide	Year	0.05	9.59	0.48	8.77E-08	2.11E-06	1.46E-01	1.28E-07	No
75-05-8	Acetonitrile	Year	60	1.15E+04	576	5.55E-05	1.33E-03	9.25E+01	8.06E-05	No
107-02-8	Acrolein	24-hr	0.06	0.00789	0.000394	4.32E-08	1.04E-06	1.97E-04	1.74E-06	No
79-10-7	Acrylic Acid	24-hr	1	0.131	0.00657	9.44E-06	2.27E-04	4.32E-02	3.79E-04	No
107-13-1	Acrylonitrile	Year	0.00345	0.662	0.0331	1.78E-07	4.28E-06	2.98E-01	2.59E-07	No
107-05-1	Allyl Chloride	Year	0.167	32	1.6	1.48E-07	3.55E-06	2.46E-01	2.15E-07	No
7664-41-7	Ammonia	24-hr	70.8	9.31	0.465	1.45E-02	3.48E-01	6.63E+01	5.83E-01	No
7440-38-2	Arsenic & Inorganic Arsenic Compounds	Year	0.000303	0.0581	0.00291	4.75E-10	1.14E-08	7.92E-04	6.90E-10	No
71-43-2	Benzene	Year	0.0345	6.62	0.331	2.36E-05	5.66E-04	3.94E+01	3.43E-05	No
100-44-7	Benzyl Chloride	Year	0.0204	3.91	0.196	1.94E-07	4.66E-06	3.24E-01	2.82E-07	No
7440-41-7	Beryllium & Compounds (NOS)	Year	0.000417	0.08	0.004	4.76E-08	1.14E-06	7.94E-02	6.92E-08	No
75-25-2	Bromoform	Year	0.909	174	8.72	1.27E-07	3.05E-06	2.12E-01	1.85E-07	No
25013-16-5	Butylated hydroxyanisole	Year	17.5	3360	168	2.06E-08	4.95E-07	3.44E-02	3.00E-08	No
7440-43-9	Cadmium & Compounds	Year	0.000238	0.0457	0.00228	2.38E-10	5.71E-09	3.97E-04	3.46E-10	No
75-15-0	Carbon disulfide	24-hr	800	105	5.26	5.80E-06	1.39E-04	2.65E-02	2.33E-04	No
630-08-0	Carbon monoxide	1-hr	23000	50.4	1.14	5.40E-04	1.30E-02	1.03E-01	3.18E-01	No

Table A-5. 241-A Tank Farm Estimated Emissions Per Portable Exhauster

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/averaging period)	De Minimis (lbs/averaging period)	Emission Rate per Tank (g/s)	A Tank Farm (per exhauster) (g/s)	Emissions Total (lbs/averaging period)	Dispersed Concentration (ug/m³)	Above ASIL?
56-23-5	Carbon Tetrachloride	Year	0.0238	4.57	0.228	2.38E-05	5.70E-04	3.96E+01	3.45E-05	No
108-90-7	Chlorobenzene	24-hr	1000	131	6.57	7.24E-06	1.74E-04	3.31E-02	2.91E-04	No
75-45-6	Chlorodifluoromethane	24-hr	5.00E+04	6570	328	1.45E-05	3.47E-04	6.61E-02	5.81E-04	No
67-66-3	Chloroform	Year	0.0435	8.35	0.417	2.38E-05	5.70E-04	3.96E+01	3.45E-05	No
7440-47-3	Chromium Hexavalent: Soluble, except Chromic Trioxide	Year	6.67E-06	0.00128	6.40E-05	7.28E-10	1.75E-08	1.21E-03	1.06E-09	No
7440-48-4	Cobalt	24-hr	0.1	0.013	0.000657	9.50E-07	2.28E-05	4.34E-03	3.82E-05	No
7440-50-8	Copper & Compounds	1-hr	100	0.219	0.011	4.76E-07	1.14E-05	9.07E-05	2.80E-04	No
98-82-8	Cumene	24-hr	400	52.6	2.63	1.02E-06	2.45E-05	4.66E-03	4.10E-05	No
110-82-7	Cyclohexane	24-hr	6000	789	39.4	2.29E-05	5.50E-04	1.05E-01	9.21E-04	No
117-81-7	Di(2-ethylhexyl)phthalate	Year	0.0417	8	0.4	1.08E-08	2.59E-07	1.80E-02	1.57E-08	No
75-09-2	Dichloromethane	Year	1	192	9.59	1.61E-04	3.87E-03	2.69E+02	2.34E-04	No
593-74-8	Dimethyl Mercury	24-hr	1.00E-99	1.00E-99	1.00E-99	1.07E-07	2.56E-06	4.87E-04	4.28E-06	Yes
75-00-3	Ethyl Chloride	24-hr	3.00E+04	3940	197	4.15E-06	9.97E-05	1.90E-02	1.67E-04	No
100-41-4	Ethylbenzene	Year	0.4	76.8	3.84	2.05E-05	4.91E-04	3.41E+01	2.97E-05	No
111-15-9	Ethylene glycol monoethyl ether acetate	24-hr	300	39.4	1.97	2.20E-06	5.27E-05	1.00E-02	8.83E-05	No
75-21-8	Ethylene oxide	Year	0.0114	2.19	0.109	1.12E-07	2.69E-06	1.87E-01	1.63E-07	No
50-00-0	Formaldehyde	Year	0.167	32	1.6	3.41E-07	8.18E-06	5.69E-01	4.96E-07	No
87-68-3	Hexachlorobutadiene	Year	0.0455	8.73	0.437	1.68E-05	4.04E-04	2.81E+01	2.45E-05	No
67-72-1	Hexachloroethane	Year	0.0909	17.4	0.872	2.44E-05	5.85E-04	4.07E+01	3.55E-05	No
74-90-8	Hydrogen Cyanide	24-hr	9	1.18	0.0591	8.25E-08	1.98E-06	3.77E-04	3.32E-06	No
67-63-0	Isopropyl Alcohol	1-hr	3200	7.01	0.35	4.89E-05	1.17E-03	9.31E-03	2.88E-02	No
7439-92-1	Lead and compounds (NOS)	Year	0.0833	16	10	4.75E-10	1.14E-08	7.92E-04	6.90E-10	No
7439-96-5	Manganese & Compounds	24-hr	0.04	0.00526	0.000263	4.75E-10	1.14E-08	2.17E-06	1.91E-08	No
7439-97-6	Mercury, Elemental	24-hr	0.09	0.0118	0.000591	2.88E-07	6.91E-06	1.32E-03	1.16E-05	No
67-56-1	Methyl Alcohol	24-hr	4000	526	26.3	1.03E-03	2.47E-02	4.71E+00	4.14E-02	No
74-83-9	Methyl Bromide	24-hr	5	0.657	0.0629	9.30E-07	2.23E-05	4.25E-03	3.74E-05	No
74-87-3	Methyl Chloride	24-hr	90	11.8	0.591	3.24E-06	7.78E-05	1.48E-02	1.30E-04	No
78-93-3	Methyl Ethyl Ketone	24-hr	5000	657	32.9	1.39E-04	3.34E-03	6.35E-01	5.59E-03	No
108-10-1	Methyl Isobutyl Ketone	24-hr	3000	394	19.7	4.01E-05	9.63E-04	1.83E-01	1.61E-03	No
624-83-9	Methyl Isocyanate	24-hr	1	0.131	0.00657	2.56E-08	6.15E-07	1.17E-04	1.03E-06	No
108-38-3	m-Xylene	24-hr	221	29	1.45	1.37E-05	3.28E-04	6.24E-02	5.49E-04	No
91-20-3	Naphthalene	Year	0.0294	5.64	0.282	1.88E-07	4.52E-06	3.14E-01	2.74E-07	No
110-54-3	n-Hexane	24-hr	700	92	4.6	7.48E-05	1.80E-03	3.42E-01	3.01E-03	No

Table A-5. 241-A Tank Farm Estimated Emissions Per Portable Exhauster

Chemical ID	Compound	Averaging Period	ASIL (ug/m³)	SQER (lbs/averaging period)	De Minimis (lbs/averaging period)	Emission Rate per Tank (g/s)	A Tank Farm (per exhauster) (g/s)	Emissions Total (lbs/averaging period)	Dispersed Concentration (ug/m³)	Above ASIL?
10102-44-0	Nitrogen dioxide	1-hr	470	1.03	0.457	7.99E-04	1.92E-02	1.52E-01	4.70E-01	No
55-18-5	n-Nitrosodiethylamine	Year	1.00E-04	0.0192	0.000959	2.81E-08	6.74E-07	4.69E-02	4.08E-08	No
62-75-9	n-Nitrosodimethylamine	Year	0.000217	0.0416	0.00208	3.83457E-05	9.20E-04	6.40E+01	5.58E-05	No
924-16-3	n-Nitroso-di-n-butylamine	Year	0.000323	0.062	0.0031	2.81E-08	6.74E-07	4.69E-02	4.08E-08	No
621-64-7	n-Nitrosodi-n-propylamine	Year	0.0005	0.0959	0.0048	2.81E-08	6.74E-07	4.69E-02	4.08E-08	No
59-89-2	n-Nitrosomorpholine	Year	0.000526	0.101	0.00505	1.30E-07	3.11E-06	2.17E-01	1.89E-07	No
10595-95-6	n-Nitroso-n-methylethylamine	Year	0.000159	0.0305	0.00153	2.81E-08	6.74E-07	4.69E-02	4.08E-08	No
100-75-4	n-Nitrosopiperidine	Year	0.00037	0.071	0.00355	4.12E-07	9.89E-06	6.88E-01	5.99E-07	No
930-55-2	n-Nitrosopyrrolidine	Year	0.00167	0.32	0.016	2.81E-08	6.74E-07	4.69E-02	4.08E-08	No
95-47-6	o-Xylene	24-hr	221	29	1.45	2.33E-05	5.59E-04	1.06E-01	9.36E-04	No
127-18-4	Perchloroethylene	Year	0.169	32.4	1.62	2.34E-05	5.63E-04	3.91E+01	3.41E-05	No
108-95-2	Phenol	24-hr	200	26.3	1.31	1.18E-04	2.83E-03	5.39E-01	4.74E-03	No
1336-36-3	Polychlorinated Biphenyls (PCBs)	Year	0.00175	0.336	0.0168	2.95E-07	7.08E-06	4.92E-01	4.29E-07	No
57-55-6	Propylene Glycol	24-hr	28.5	3.75	0.187	3.26E-06	7.83E-05	1.49E-02	1.31E-04	No
115-07-1	Propylene	24-hr	3000	394	19.7	5.69E-05	1.37E-03	2.60E-01	2.29E-03	No
106-42-3	p-Xylene	24-hr	221	29	1.45	2.36E-05	5.66E-04	1.08E-01	9.48E-04	No
7782-49-2	Selenium & Selenium Compounds (other than Hydrogen Selenide)	24-hr	20	2.63	0.131	8.26E-08	1.98E-06	3.78E-04	3.32E-06	No
100-42-5	Styrene	24-hr	900	118	5.91	6.70E-06	1.61E-04	3.06E-02	2.69E-04	No
7446-09-5	Sulfur dioxide	1-hr	660	1.45	0.457	3.52E-06	8.44E-05	6.70E-04	2.07E-03	No
108-88-3	Toluene	24-hr	5000	657	32.9	5.92E-04	1.42E-02	2.71E+00	2.38E-02	No
156-60-5	Trans-1,2-dichloroethene	24-hr	807	106	5.3	1.73E-09	4.15E-08	7.91E-06	6.95E-08	No
79-01-6	Trichloroethylene	Year	0.5	95.9	4.8	2.36E-05	5.66E-04	3.94E+01	3.43E-05	No
1314-62-1	Vanadium Pentoxide	1-hr	30	0.0657	0.00329	1.70E-06	4.08E-05	3.24E-04	9.99E-04	No
108-05-4	Vinyl acetate	24-hr	200	26.3	1.31	6.49E-09	1.56E-07	2.97E-05	2.61E-07	No
75-01-4	Vinyl Chloride	Year	0.0128	2.46	0.123	2.38E-05	5.70E-04	3.96E+01	3.45E-05	No

Appendix B

Dimethyl Mercury Baseline Sampling Results

Table B-1. Dimethyl Mercury Baseline Sampling Results

Agent	Air Concentration[a] (mg/m^3)	Sample Date	Sample ID	Specific Location	Stack Flow Rate[b] (ft^3/min)	Emissions (lb/24hr)	Average AY/AZ Emissions (lb/24hr)
Dimethyl Mercury	3.0E-04	11/11/2015	15-08730-1-002a	702-AZ: Train 2: 702-AZ Exhauster/Sample Port AE-AZK 1-3	753	2.0E-05	2.1E-05
	3.0E-04	11/10/2015	15-08700-1-001a	702-AZ: Train 1: 702-AZ Exhauster/Sample Port AE-AZK 1-3	753	2.0E-05	
	3.0E-04	11/10/2015	15-08700-1-002a	702-AZ: Train 2: 702-AZ Exhauster/Sample Port AE-AZK 1-3	753	2.0E-05	
	6.0E-06	11/11/2015	15-08746-1-001A	AY FARM: AY102	980	5.3E-07	
	6.0E-06	11/10/2015	15-08701-1-001	AY FARM: AY102	980	5.3E-07	
	5.0E-06	11/11/2015	15-08746-1-002A	AY FARM: AY102	980	4.4E-07	
	5.0E-06	11/10/2015	15-08701-1-002A	AY FARM: AY102	980	4.4E-07	

[a]Site Wide Industrial Hygiene Database (SWIHD) reported generated 12/7/2015.

[b]702AZ: Median flow rate from Surveillance Data Display System (SDDS) for dates 11/10/2015 - 11/11/2015; report generated 12/2/2015.
AY102: Work Package #159051 dated 9/8/15.

Attachment 2
16-ECD-0008
(7 Pages)

Notice of Construction Application

Dennis W. Bowser

WRPS-150XXXX – Enclosure 2

DEPARTMENT OF ECOLOGY State of Washington

Notice of Construction Application

This application applies statewide for facilities under the Department of Ecology's jurisdiction. Submit this form for review of your project to construct a new or modified source of air emissions. Please refer to Ecology Forms ECY 070-410a-g, "Instructions for NOC Application," for general information about completing the application.

Ecology offers up to two hours of free pre-application assistance. We encourage you to schedule a pre-application meeting with the contact person specified for the location of your proposal, below. If you use up your two hours of free pre-application assistance, we will continue to assist you after you submit Part 1 of the application and the application fee. You may schedule a meeting with us at any point in the process.

Upon completion of the application, please enclose a check for the initial fee and mail to:

Department of Ecology
Cashiering Unit
P.O. Box 47611
Olympia, WA 98504-7611

For Fiscal Office Use Only:
001-NSR-216-0299-000404

Check the box for the location of your proposal. For assistance, call the contact listed below:		
	Ecology Permitting Office	**Contact**
☐ **CRO**	**Chelan, Douglas, Kittitas, Klickitat, or Okanogan County** Ecology Central Regional Office – Air Quality Program	Lynnette Haller (509) 457-7126 lynnette.haller@ecy.wa.gov
☐ **ERO**	**Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla or Whitman County** Ecology Eastern Regional Office – Air Quality Program	Greg Flibbert (509) 329-3452 gregory.flibbert@ecy.wa.gov
☐ **NWRO**	**San Juan County** Ecology Northwest Regional Office – Air Quality Program	David Adler (425) 649-7082 david.adler@ecy.wa.gov
☐ **IND**	**For actions taken at Kraft and Sulfite Paper Mills and Aluminum Smelters** Ecology Industrial Section – Waste 2 Resources Program Permit manager: _____	Garin Schrieve (360) 407-6916 garin.schrieve@ecy.wa.gov
☒ **NWP**	**For actions taken on the US Department of Energy Hanford Reservation** Ecology Nuclear Waste Program	Philip Gent (509) 372-7983 philip.gent@ecy.wa.gov

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Check the box below for the fee that applies to your application.

New project or equipment:

☒	**$1,500: Basic project** initial fee covers up to 16 hours of review.
☐	**$10,000: Complex project** initial fee covers up to 106 hours of review.

Change to an existing permit or equipment:

☐	**$200: Administrative or simple change** initial fee covers up to 3 hours of review Ecology may determine your change is complex during completeness review of your application. If your project is complex, you must pay the additional $675 before we will continue working on your application.
☐	**$875: Complex change** initial fee covers up to 10 hours of review
☐	**$350** flat fee: **Replace or alter control technology equipment under WAC 173-400-114** Ecology will contact you if we determine your change belongs in another fee category. You must pay the fee associated with that category before we will continue working on your application.

Read each statement, then check the box next to it to acknowledge that you agree.	
☒	The initial fee you submitted may not cover the cost of processing your application. Ecology will track the number of hours spent on your project. If the number of hours Ecology spends exceeds the hours included in your initial fee, Ecology will bill you $95 per hour for the extra time.
☒	You must include all information requested by this application. Ecology may not process your application if it does not include all the information requested.
☒	Submittal of this application allows Ecology staff to visit and inspect your facility.

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Part 1: General Information

I. Project, Facility, and Company Information

1. Project Name TOC-ENV-NOC-5252, Rev. 0, Notice of Construction Application for A and AX Tank Farm Retrieval
2. Facility Name United States Department of Energy, Office of River Protection
3. Facility Street Address 2440 Stevens Drive, Richland, WA 99352
4. Facility Legal Description Hanford Site, 200 West and 200 East Areas
5. Company Legal Name (if different from Facility Name)
6. Company Mailing Address (street, city, state, zip) P.O. Box 550, MSIN H6-60, Richland, WA 99352

II. Contact Information and Certification

1. Facility Contact Name (who will be onsite) Dennis Bowser	
2. Facility Contact Mailing Address (if different than Company Mailing Address)	
3. Facility Contact Phone Number (509) 373-2566	4. Facility Contact E-mail Dennis_W_Bowser@orp.doe.gov
5. Billing Contact Name (who should receive billing information) Dennis Bowser	
6. Billing Contact Mailing Address (if different than Company Mailing Address)	
7. Billing Contact Phone Number (509) 373-2566	8. Billing Contact E-mail Dennis_W_Bowser@orp.doe.gov
9. Consultant Name (optional – if 3rd party hired to complete application elements)	
10. Consultant Organization/Company	
11. Consultant Mailing Address (street, city, state, zip)	
12. Consultant Phone Number	13.Consultant E-mail
14. Responsible Official Name and Title (who is responsible for project policy or decision-making) Kevin W. Smith, Manager	
16. Responsible Official Phone (509) 372-2315	17. Responsible Official E-mail Kevin_W_Smith@orp.doe.gov
18. Responsible Official Certification and Signature I certify, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate ~~and~~ complete. Signature K.W. Smith Date 2/23/12	

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Part 2: Technical Information

The Technical Information may be sent with this application form to the Cashiering Unit, or may be sent directly to the Ecology regional office with jurisdiction along with a copy of this application form.

For all sections, check the box next to each item as you complete it.

III. Project Description

Please attach the following to your application.

☒ Written narrative describing your proposed project.
☒ Projected construction start and completion dates.
☒ Operating schedule and production rates.
☒ List of all major process equipment with manufacturer and maximum rated capacity.
☒ Process flow diagram with all emission points identified.
☒ Plan view site map.

☐ Manufacturer specification sheets for major process equipment components.
☒ Manufacturer specification sheets for pollution control equipment.
☒ Fuel specifications, including type, consumption (per hour & per year) and percent sulfur.

IV. State Environmental Policy Act (SEPA) Compliance

Check the appropriate box below.

☒ SEPA review is complete:
Include a copy of the final SEPA checklist and SEPA determination (e.g., DNS, MDNS, EIS) with your application.

☐ SEPA review has not been conducted:

☐ If review will be conducted by another agency, list the agency. You must provide a copy of the final SEPA checklist and SEPA determination before Ecology will issue your permit.
Agency Reviewing SEPA:

_____

☐ If the review will be conducted by Ecology, fill out a SEPA checklist and submit it with your application. You can find a SEPA checklist online at www.ecy.wa.gov/programs/sea/sepa/docs/echecklist.doc

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V. Emissions Estimations of Criteria Pollutants

Does your project generate criteria air pollutant emissions? ☒ Yes ☐ No

If yes, please provide the following information regarding your criteria emissions in your application.

☒ The names of the criteria air pollutants emitted (i.e., NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, TSP, VOC, and Pb)

☒ Potential emissions of criteria air pollutants in tons per hour, tons per day, and tons per year (include calculations)

☐ If there will be any fugitive criteria pollutant emissions, clearly identify the pollutant and quantity

VI. Emissions Estimations of Toxic Air Pollutants

Does your project generate toxic air pollutant emissions? ☒ Yes ☐ No

If yes, please provide the following information regarding your toxic air pollutant emissions in your application.

☒ The names of the toxic air pollutants emitted (specified in WAC 173-460-150[1])

☒ Potential emissions of toxic air pollutants in pounds per hour, pounds per day, and pounds per year (include calculations)

☐ If there will be any fugitive toxic air pollutant emissions, clearly identify the pollutant and quantity

VII. Emission Standard Compliance

☐ Provide a list of all applicable new source performance standards, national emission standards for hazardous air pollutants, national emission standards for hazardous air pollutants for source categories, and emission standards adopted under Chapter 70.94 RCW.

Does your project comply with all applicable standards identified? ☒ Yes ☐ No

VIII. Best Available Control Technology

☒ Provide a complete evaluation of Best Available Control Technology (BACT) for your proposal.

IX. Ambient Air Impacts Analyses

Please provide the following:

☒ Ambient air impacts analyses for Criteria Air Pollutants (including fugitive emissions)

☒ Ambient air impacts analyses for Toxic Air Pollutants (including fugitive emissions)

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[1] http://apps.leg.wa.gov/WAC/default.aspx?cite=173-460-150

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☒ Discharge point data for each point included in air impacts analyses (include only if modeling is required)

- ☒ Exhaust height
- ☒ Exhaust inside dimensions (ex. diameter or length and width)
- ☒ Exhaust gas velocity or volumetric flow rate
- ☒ Exhaust gas exit temperature
- ☒ The volumetric flow rate
- ☒ Description of the discharges (i.e., vertically or horizontally) and whether there are any obstructions (ex., raincap)
- ☒ Identification of the emission unit(s) discharging from the point
- ☒ The distance from the stack to the nearest property line
- ☒ Emission unit building height, width, and length
- ☒ Height of tallest building on-site or in the vicinity and the nearest distance of that building to the exhaust
- ☒ Whether the facility is in an urban or rural location

Does your project cause or contribute to a violation of any ambient air quality standard or acceptable source impact level? ☐ Yes ☒ No

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