Attachment 1
26-ECD-0003

TOC-ENV-NOC-5362, REVISION 0, “CRITERIA AND TOXICS AIR EMISSIONS NOTICE OF CONSTRUCTION FOR REMEDIATION AND OPERATIONS OF HANFORD 241-SY TANK FARM”

(52 pages including cover sheet)

DOCUMENT RELEASE AND CHANGE FORM

Prepared For the U.S. Department of Energy, Assistant Secretary for Environmental Management
By Hanford Tank Waste Operations & Closure LLC, (H2C)
Contractor For U.S. Department of Energy, Hanford Field Office

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Oct 08,2025
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Document Control Approval	Record, Amanda	*Record, Amanda*	10/08/2025
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USQ Evaluator	Johnson, Linda D	*Johnson, Linda D*	10/08/2025

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Estimate toxic air emissions at 241-SY tank farm during increased operations and maintainence. 241-SY-103 remediation activities are included in this estimate.

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Criteria and Toxics Air Emissions Notice of Construction for Remediation and Operations of Hanford 241-SY Tank Farm

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EXECUTIVE SUMMARY

This document serves as a notice of construction application pursuant to the requirements of WAC 173-400, "General regulations for air pollution sources," and WAC 173-460, "Controls for new sources of toxic air pollutants," for the operation of the 241-SY stationary tank ventilation system. Operation of the ventilation system will be for the storage, treatment, retrieval, sampling, transfers, mixing, and disposal of waste in the tanks.

This notice of construction application provides an estimate of the emissions from the 241-SY stationary ventilation exhausters, 296-S-26, and 296-S-27, during day-to-day activities, (e.g. operation, maintenance, and construction) in addition to tank remediation and waste retrieval activities. Waste retrieval operations will utilize sluicing and adjustable height pumps with in-line dilution to mobilize and transfer supernatant liquid and dissolved saltcake from 241-SY-103 to 241-SY-101, and 241-SY-102.

The current tank remediation plan for 241-SY-103 will utilize two stationary ventilation exhausters, 296-S-26, and 296-S-27, to control emissions of air pollutants during tank remediation operations. The intended operation is for one exhauster to be in operation at one time with the second exhauster in standby status to provide backup capabilities. While the exhausters will most likely run at a lower velocity, this notice of construction application is based on maximum capacity and will permit the exhausters to operate at up to a maximum of 2,300 scfm and estimates emissions from a single stationary exhauster operating at this rate (2,300 scfm total).

The combined emissions of criteria pollutants from the stationary exhausters were estimated to be below the regulatory exemption levels, in accordance with WAC 173-400, with the exception of total volatile organic compounds. Estimated emissions of toxic air pollutants from all three 241-SY tanks were analyzed and 52 toxics were found to potentially be emitted. Of the 52 potential toxics identified, 34 were found to be above the WAC 173-460 de minimis screening levels and 29 were found to be above the small-quantity emission rate. Toxic air pollutants did not exceed 91.6 percent of their acceptable source impact level.

An evaluation of best available control technology for toxic emissions was previously performed for the tank farm ventilation system and is included in this notice of construction application. Based on the results of that evaluation, the proposed control technology for the double-shell tank ventilation system is the operation of the standard exhauster configuration (i.e., moisture separator, preheater, prefilter, high-efficiency particulate air filters, fan, and stack with monitoring instrumentation) with periodic confirmatory monitoring to show that the estimated emission parameters are accurate.

Upon issuance of the approval order for this notice of construction application, the previous Notice of Construction Approval Order, DE11NWP-001, Revision 4, Modification A, "Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions," for double-shell tank exhausters will no longer apply to 241-SY Tank Farm activities.

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LIST OF TERMS

Abbreviations and Acronyms

AERMAP	AERMOD Terrain Preprocessor
AERMOD	American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model
ASIL	acceptable source impact level
BACT	Best Available Control Technology
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	State of Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
GRE	Gas Release Event
HEPA	high-efficiency particulate air
LFL	Lower Flammability Limit
NOC	notice of construction
SEPA	State Environmental Policy Act
SQER	small quantity emission rate
SST	single-shell tank
SWIHD	Site Wide Industrial Hygiene Database
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 compound
WAC	Washington Administrative Code

UNITS

%	percent
cfm	cubic feet per minute
g/s	gram(s) per second
gal	gallon(s)
lb/yr	pound(s) per year
m	meter(s)
scfm	standard cubic feet per minute
µg/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	millimeters	millimeters	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

1.0 INTRODUCTION

This notice of construction (NOC) application is being submitted for approval in accordance with 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 two stationary ventilation exhausters, 296-S-26, and 296-S-27, during day-to-day activities, (i.e. operation, maintenance, and construction) in addition to tank remediation and waste retrieval activities at the 241-SY Tank Farm on the Hanford Site. Currently, the 241-SY exhausters are permitted to operate under approval order DE11NWP-001, revision 4, modification A. This application will permit the exhausters to operate at up to a maximum of 2,300 scfm in support of remediation activities related to 241-SY-103. This application compares the estimated combined emissions against the WAC 173-460-150 emissions criteria levels.

Emissions of all criteria air pollutants and toxic air pollutants (TAP) were estimated for the 241-SY Tank Farm based on tank concentration headspace data from the Tank Waste Information Network System (TWINS) database, the Site-Wide Industrial Hygiene Database (SWIHD) and RPP-RPT-65212, *Potential Hazardous Air Pollutants in the SY Farm Exhauster during SY-103 Remediation*. Emissions were estimated based on the highest emission rate of each pollutant for all three tanks in the 241-SY Tank Farm.

The emissions of criteria pollutants were estimated to be below the regulatory exemption levels except for total volatile organic compounds (VOC), as shown in Appendix A. Estimated VOC emissions are ~13,859 lb/yr. This level exceeds the 4,000 lb/yr exemption level in WAC 173-400-110(5)(b). A total of 52 toxics, as defined in WAC 173-460-150, were found to potentially be emitted. Of these, 34 were above the de minimis emission screening level and 29 were above the small-quantity emission rate (SQER). All pollutants were estimated to be below 91.6 percent of acceptable source impact levels (ASIL).

The proposed Best Available Control Technology for Toxics (tBACT) for the double-shell tank (DST) ventilation system is the operation of the standard exhauster configuration (i.e., De-entrainer, heater, prefilter, high-efficiency particulate air [HEPA] filters, fan, and stack with monitoring instrumentation) with periodic confirmatory monitoring to show that the estimated emission parameters are accurate. The control technology assessment described in Section 7.0 eliminated technologies considered in RPP-ENV-46679, *Evaluation of Best Available Control Technology for Toxics (tBACT), Double Shell Tank Farms Primary Ventilation Systems Supporting Waste Transfer Operations*, due to technical infeasibilities or because the costs exceeded the amounts the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) considers to be economically justifiable.

Upon issuance of the approval order for this notice of construction application, the previous Notice of Construction Approval Order, DE11NWP-001, Revision 4, Modification A, "Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions," for double-shell tank exhausters will no longer apply to 241-SY Tank Farm ventilation system.

2.0 FACILITY IDENTIFICATION, RESPONSIBLE MANAGER, AND LOCATION

The Hanford Site tank farms address is:

U.S. Department of Energy, Hanford Field Office
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-SY Tank Farm on the Hanford Site. A map of the Hanford Site is shown in Figure 2-1.

The responsible facility manager is:

Ray Geimer, Site Manager
U.S. Department of Energy, Hanford Field Office
P.O. Box 550
Richland, Washington 99352-0450
(509)376-7395

Table 1. Coordinates of the 200 Area 241-SY Exhausters.

Tank Farm	Latitude	Longitude
241-SY Tank Farm Exhausters	46.5407	-119.62726

2.1 241-SY Tank Farm

The 241-SY Tank Farm consists of three buried DSTs. Each 241-SY DST measures 75 ft in diameter, measures approximately 55 ft from tank bottom to grade-level, and has a waste storage capacity of approximately 1,160,000 gal (HNF-SD-WM-ER-350, *Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 West Area*). The location of the 241-SY Tank Farm relative to other tank farms and facilities is provided as Figure 2-2. The tanks were placed in service during the late 1970s and continue to receive waste mainly from 222-S laboratories (WHC-MR-0132, *A History of the 200 Area Tank Farms*). They are numbered 241-SY-101 through 241-SY-103.

Figure 2-3 provides an aerial photo of 241-S Tank Farm, 241-SY Tank Farm, and the 242-S Evaporator, while Figure 2-4 provides a typical cross-section of a 241-SY Tank Farm underground tank.

Figure 2-1. Hanford Site Map.

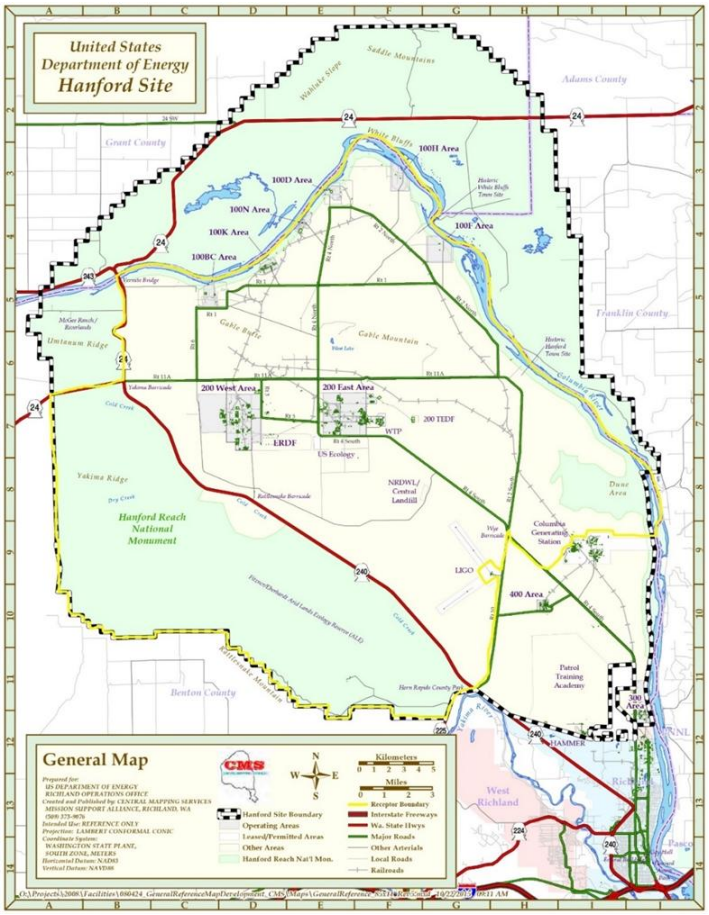
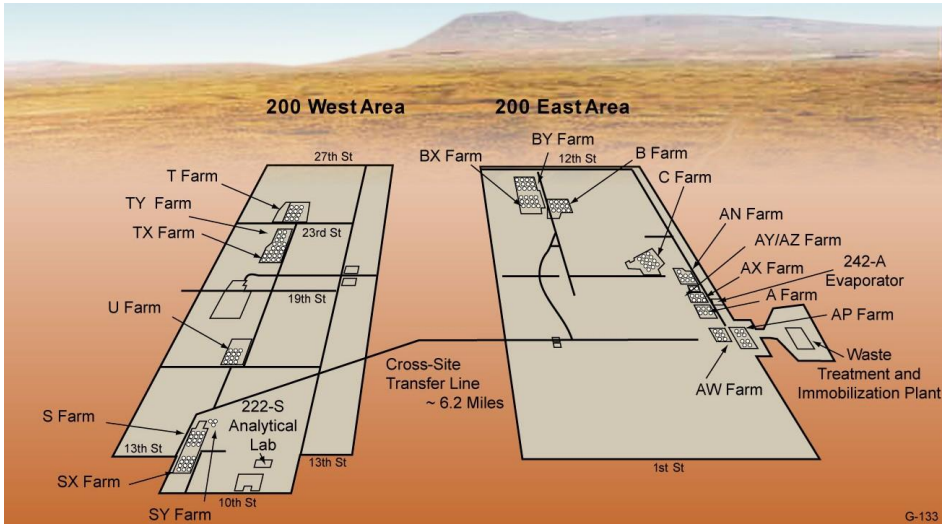


Figure 2-2. Location of Single- and Double-Shell Tank Farms in 200 East and 200 West Areas of the Hanford Site.



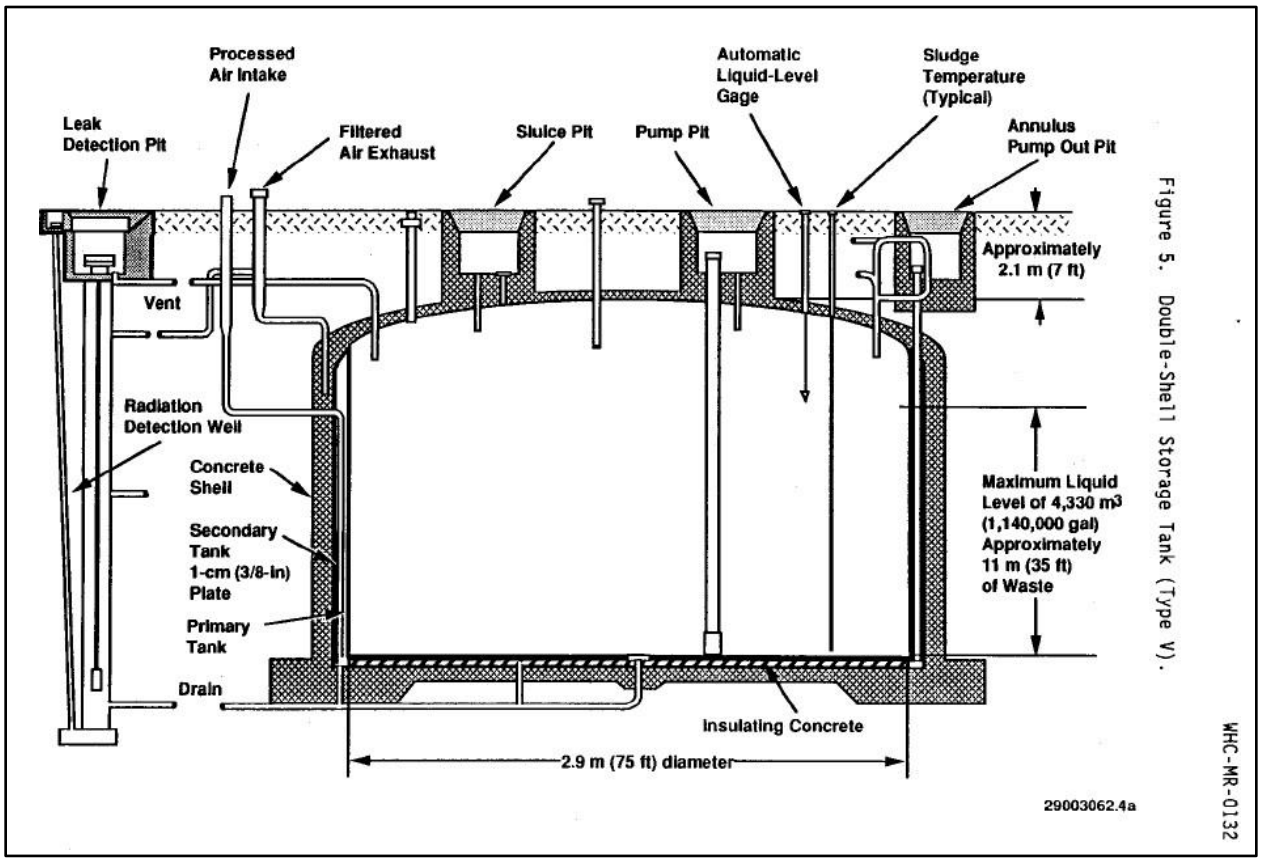
2.1.1 241-SY-103

Tank 241-SY-103 is a Waste Group A tank due to the potential for the tank to have Buoyant Displacement Gas Release Event (BDGRE) issues. RPP-13033, the *Tank Farms Documented Safety Analysis*, prohibits globally waste disturbing activities in Waste Group A tanks. The supernate in the tank has a specific gravity of nearly 1.5. Waste Group A tank remediation and waste retrieval activities are necessary to return the tank status into usable DST space to support future retrievals.

Tank SY-103 is currently planned to be the receipt tank for all 200 West single-shell tank (SST) retrievals. To perform its dedicated function as the receipt tank, Tank SY-103 waste classification status must be amended away from Waste Group A tank. This can be done by decanting the supernate currently in Tank SY-103 to Tank SY-102 to change the Waste Group classification from A to C. The decanting is followed by partial dissolution of the SY-103 saltcake and transfer of dissolved salt to Tanks SY-101, and SY-102 to create more space in Tank SY-103 to support the subsequent SST retrieval operations.

Figure 2-3. Aerial View of 241-S Tank Farm, 241-SY Tank Farm, and the 242-S Evaporator.

Figure 2-4. Typical Cross-Section of SY-Farm Tank.



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 feasible. Residual waste volumes in 100-series SSTs are not to exceed 360 ft^3 or the limit of waste retrieval technology, whichever is less (Ecology et al., 1989, Milestone M-045-00). The Tri-Party Agreement milestone for "complete retrieval of waste from all remaining SSTs" will be revised at a future date in accordance with M-062-45.

To facilitate compliance with the Tri-Party Agreement, SY-103 will be remediated to create DST space to receive waste retrievals from 200 West area SSTs.

3.0 PROPOSED ACTION

This NOC application is a request for operation of the stationary exhausters listed below for ventilation of 241-SY DSTs during remediation and retrieval operations including activities in the preparation for future SST waste retrievals as well as support for day-to-day operational, maintenance, and construction activities. Source parameters are provided in Table 2.

1. 241-SY Tank Farm: Stationary Exhauster (296-S-26)
2. 241-SY Tank Farm: Stationary Exhauster (296-S-27)

Table 2. Stationary Exhauster Parameters.

Unit	Height (m)	Stack Diameter (m)	Max. Flow Rate (scfm)
296-S-26	12.19 (40 ft)	0.25 (10 in.)	2,300
296-S-27	12.19 (40 ft)	0.25 (10 in.)	2,300

This NOC will permit an exhauster to operate at up to a maximum of 2,300 scfm during periods of active remediation as well as periods when remediation operations are not occurring at 241-SY Tank Farm in the 200 West Area of the Hanford Site. Remediation operations include tank preparation activities (e.g., washing and removing internal tank equipment), decanting of tank contents, and maintenance activities. Upon completion of remediation operations, 241-SY-103 will be ready to receive waste from the 200 West area single-shell tanks (SST). Waste retrieval technologies are described in Section 3.2 of this application. The waste in the 241-SY-103 will be transferred to 241-SY-101 and 241-SY-102 for interim storage before additional treatment and eventual disposal.

These exhausters may also support non-retrieval tank farm operations such as vapor control, waste characterization, decommissioning, deactivation, maintenance, construction, operations support activities, and other activities in support of clean up and closure of the Hanford Site. These exhausters may operate intermittently.

The intended operation is for one exhauster to be in operation with the second exhauster in standby. However, during fan switching, both exhausters may be operating as one fan spins up to speed while the other slows down to standby, and the combined exhauster flow rate will not exceed 2,300 scfm. Emission estimate calculations are shown in Appendix A.

3.1 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*. Hanford waste tanks contain mixed waste in the form of liquids and suspended or settled solids. The waste tanks in 241-SY Tank Farm contain mixed waste in the forms of sludge, saltcake, and supernate. Gases are generated by the reaction of radioactive and hazardous chemicals in the tanks and are contained in the headspaces of the tanks. During storage operations, the tank waste is quiescent and not undergoing waste-disturbing activities. When the tank waste leaves a quiescent state, particulate and volatile chemicals are emitted when the contents in the tank are mixed, by various mechanisms, to prevent gas entrapment in the settled solids, to control temperature, to perform chemical treatment and/or for waste retrievals.

3.2 241-SY-103 Remediation Technologies

RPP-RPT-64019, *Flowsheet for Remediation of Waste Group A Tank 241-SY-103,* determines the necessary steps required to remediate SY-103. Removing approximately 50 inches of waste will allow the tank to be reclassified as a waste group C tank. The reduction of waste increases

the headspace such that the tank cannot have Gas Release Events (GRE) that exceed 100% of the LFL per RPP-RPT-64019. This waste is planned to be transferred into SY-102. To conserve tank space, the current process plan is to transfer the supernatant liquid out as-is, up to a density of 1.5 g/ml, without using in-line dilution. See RPP-RPT-64220 *Process Engineering Input for SY-103 Remediation* for process engineering input to the project system design.

To reduce the solids content in SY-103 and prevent it from returning to a Waste Group A after minimal receipt of retrieval waste, additional salt dissolution is necessary. Water batches will be added to SY-103 and recirculated to dissolve the salt. Once the water has dissolved the appropriate amount of salt, the liquid will then be transferred into SY-102. This process will be repeated and the adjustable height pump in SY-103 will be lowered as necessary until the appropriate amount of salt has been dissolved and transferred into SY-102.

In December 2023, RPP-RPT-64319, Rev. 0, *Preliminary 200 West Area Flowsheet,* was released and indicated that solids accumulation in SY farm for outyear work would be an issue. SY-103 is planned to be the retrieval receipt tank. With solids accumulations, the tank would likely encroach upon Waste Group A status only a few years into retrieval activities. To better optimize the solids in SY farm to stage the system for retrievals and pretreatment, the flowsheet team recommended sluicing additional solids from SY-103 into SY-101 after the decant and dissolution into SY-102. This way, SY-101 and SY-102 will be at or near their solids' capacity leaving SY-103 with adequate solids space to accept retrievals for multiple years. Currently SY-101 is nearly full due to receipt of 222-S lab waste from 219-S. Transferring of supernate from SY-101 into SY-103 will be required, to make room for the additional solids from SY-103.

3.2.1 Water Skid (POR394)

Remediation activities require water for flushes of waste transfer lines as well as dilution water additions at the transfer pump. Similar water needs were met by POR394 during the retrieval of AY-102. The project plans to refurbish this skid to support the SY-103 remediation activities.

The discharge manifold of POR394 will also allow for the off-loading of hot water from a tanker truck. Hot water can either be purchased from a supplier or filled at the A285 A/AX hot water supply building. Currently, the project does not plan to install infrastructure to heat water locally outside of SY-Farm for this activity.

3.2.2 SY-103 Adjustable Height Pump with In-Line Dilution

To facilitate the dissolution of salt in SY-103, an adjustable height pump is necessary. As the solids are dissolved and transferred out, the pump will need to be lowered as the solids level drops in the tank.

In-line dilution will be incorporated on the pump to adjust the specific gravity of the transfer stream if needed. It will also provide backflush capability if the pump screen becomes plugged with solids. Water for in-line dilution will be from POR394 and will not be heated.
The pump will be installed and operated while SY-103 is still in a Waste Group A status.

3.2.3 Standard Sluicers

The waste in SY-103 is anticipated to be mobile. Unlike dried out salt and sludge in SST retrievals, the salt in SY-103 should react well to standard sluicing similar to AY-102. For this reason, the less expensive, shorter lead standard sluicers should be adequate to support the recirculation and dissolution of the salt in SY-103.

4.0 STATE ENVIRONMENTAL POLICY ACT

This project fulfills the requirements of WAC 197-11, "SEPA rules," and RCW 43.21C.030(2)(c) per RCW 43.21C.150 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 [sic], 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, Appendix E.1.1.1.2, "Operations and Maintenance".

The lead agency is the U.S. Department of Energy, Hanford Field Office, and the contact person is Douglas Chapin, Environmental Management National Environmental Policy Act Compliance Officer. His phone number is (509) 373-9396.

5.0 EMISSIONS ESTIMATE

Pollutant emission estimates have been prepared for the proposed 241-SY Tank Farm remediation operations with reference to the detailed input, analysis, and results tables of Appendix A.

Emission estimates for this application were based on sample data from TWINS, SWIHD, and RPP-RPT-65212. Sample data were extracted April 09, 2025, for all data applicable to the 241-SY Tank Farm. This sample data download was prepared to acquire and represent characteristic emissions that could be attributed to the 241-SY Tank Farm.

Following download, data were ordered by species (Chemical Abstracts Service [CAS] Registry Number), date of sampling, and then by greatest to least concentration. Where necessary, sample analyte CAS numbers were provided an alias in order to be correlated with recently issued TAP

lists within WAC 173-460. The December 2019 revision of the TAP lists does not identify CAS numbers for 23 groups of materials (e.g., "Fluorides (fluoride containing chemicals), NOS"); as such, an alias is applied in this analysis to capture and reflect appropriate data. The greatest valid and applicable value was selected to represent exhaust concentrations. These concentrations were then multiplied by a factor of 20 to represent potential emissions during waste-disturbing activities.

Assumptions applied in the selection of representative sample data are described in Table 3.

5.1 Estimated Emissions of Criteria Pollutants

In the manner described above, criteria pollutant emissions were scaled by a factor of 20 to bound potential emissions, assuming waste-disturbing activities were occurring in all 241-SY tanks simultaneously throughout the year. The emission estimates of criteria pollutants are shown in Table A-1 in Appendix A. Total VOCs were estimated to be above the exemption level. Ozone-depleting substances are below the exemption level. No valid lead, carbon monoxide, or sulfur oxides data was present for consideration in emissions estimates. Details for development of the VOC assessment are provided in Table A-2 of Appendix A.

5.2 Estimated Emissions of Ozone-Depleting Substances

Ozone-depleting substances anticipated to be emitted are identified in Table A-3 and incorporated into Table A-1 in Appendix A. Ozone-depleting substances are identified by Appendices A and B of Subpart A of 40 CFR 82, "Protection of Stratospheric Ozone," as Class I and Class II Controlled Substances. Emissions of all contaminants in Table A-4 are assayed against these 40 CFR 82 substance lists.

5.3 Estimated Emissions of Toxic Air Pollutants

The emissions of TAPs for this modification are detailed in Appendix A, Table A-4. Fifty-two TAPs were identified in the tank exhaust. The sample concentrations were converted and scaled by a factor of 20 to represent waste-disturbing activities in all 241-SY tanks.

No filtration or other means of emission reduction was applied in this emission assessment.

The stack flow rate of 2,300 scfm allowed projection of emission rate in terms of grams per second and pounds per respective averaging period for each TAP. Thirty-four TAPs were above the de minimis threshold in WAC 173-460-150, and 29 TAPs had emission rates above the SQER emission thresholds. No projected TAP emission rates exceeded TAPs ASILs. Ammonia (CAS# 7664-41-7) is estimated to be 91.51% of ASIL.

Table 3. Sample Data Assumptions and Selection Criteria.

Assumption	Selection Criteria
1	Working CAS numbers are applicable, and were applied, to sample data not otherwise identifiable as TAPs. Specifically, the December 2019, effective list of TAPs contains 23 groups of materials without identifying CAS numbers (e.g., "Arsenic & inorganic arsenic compounds, NOS"). An alias set of working CAS numbers (M01 through M23 ["M" as the preponderance are metals/metal compounds]) were applied to relevant data within the dataset to capture and appropriately assess TAPs.
2	Samples were not considered valid unless there was a potential to be vented from an exhauster or tank headspace.
3	If multiple valid results are applicable to a pollutant from a specific tank, the most recent value with the highest concentration is selected.
4	SWIHD and TWINS data with the following data qualifiers, flags, and categories were not chosen to be included in the source term: • Invalid (I) data was not selected for use as a source term constituent because analysis declared it to be invalid during the analysis process. • Suspect (S) data was not selected for use as a source term constituent because analysis declared it to be suspect during the analysis process. • The "E" flag is applied to each analyte that exceeded the calibration range of the instrument. This data was not selected. • The "U" flag is applied to analytes that were analyzed for, but were not detected, or were detected below the method detection limit. This data was not selected. • The "J" flag is applied to results that are considered estimates. This data was not selected. • The "Q" flag was applied to analytes for which no value at or above the contractual value was reported. In these cases, the "Q" value displayed is the contracted analytical threshold value. • The data qualifier "M" is applied to each analyte where the target analyte was absent (not detected) from the sample. This data was not selected. • The "N" flag is applied to compounds identified based on MS Library search. These "tentatively identified compounds," or TICs, are not target compounds and these results are only estimates and are not quantitative. This data was not selected. • The "B" flag is applied to analytical results when the preparation blank or method blank for a batch contains an analyte that exceeds the criteria specified in the analytical method. "B" flagged data was not selected. • Aggregation Level: Data was not selected for use if it was listed as "QA Sample." • QA Sample Type: Data was not selected for the source term if it was listed as the following: Ambient System, Ambient Upwind, Field Blank, System Ambient, or Trip Blank. • Result Type: Data was not selected if it was listed as one of the following qualifiers: QC Result, Duplicate, LCS, Matrix Spike DUP Recovery, or Matrix Spike Recovery.
5	Measurements were assumed to be made over a quiescent waste in a HEPA-filtered exhaust stream.

CAS = Chemical Abstracts Service (Registry).
DUP = duplicate.
HEPA = high-efficiency particulate air (filter).
LCS = laboratory control sample.
NOS = not otherwise specified.
QA = quality assurance.
QC = quality control.
SST = single-shell tank.
SWIHD = Site-Wide Industrial Hygiene Database.
TAP = toxic air pollutant.

6.0 AIR DISPERSION MODELING

Ambient air concentrations at the Hanford Site boundary were estimated using the American Meteorological Society/EPA Regulatory Model (AERMOD) dispersion model, Version 23132, and in accordance with HNF-68787, *Hanford Site Toxic Air Modeling Protocol* and HNF-68786, *Hanford Site Criteria and Toxic Air Permitting Protocol*. Appendix B provides the air modeling protocol used for this NOC application.

6.1 Dispersion Model

BREEZE®[1] AERMOD (Trinity Consultants, Inc.) Version 12.0, executable version 23132, was used to process the updated surface and profile files for the years 2016 through 2020. AERMOD Terrain Preprocessor (AERMAP) executable, AERMAP_EPA_18081_64, was used to define the project location and ambient air boundary. Google Earth™[2] Pro version 7.3.6.9796 was used to plot dispersion results.

BREEZE AERMOD is a registered in the Hanford Information Systems Inventory under entry number 2140 and is managed by RPP-PLAN-61339, *Software Management Plan for Grade D Acquired Software AERMOD, BREEZE AERMOD, and BREEZE 3D Analyst (HISI 2140)*.

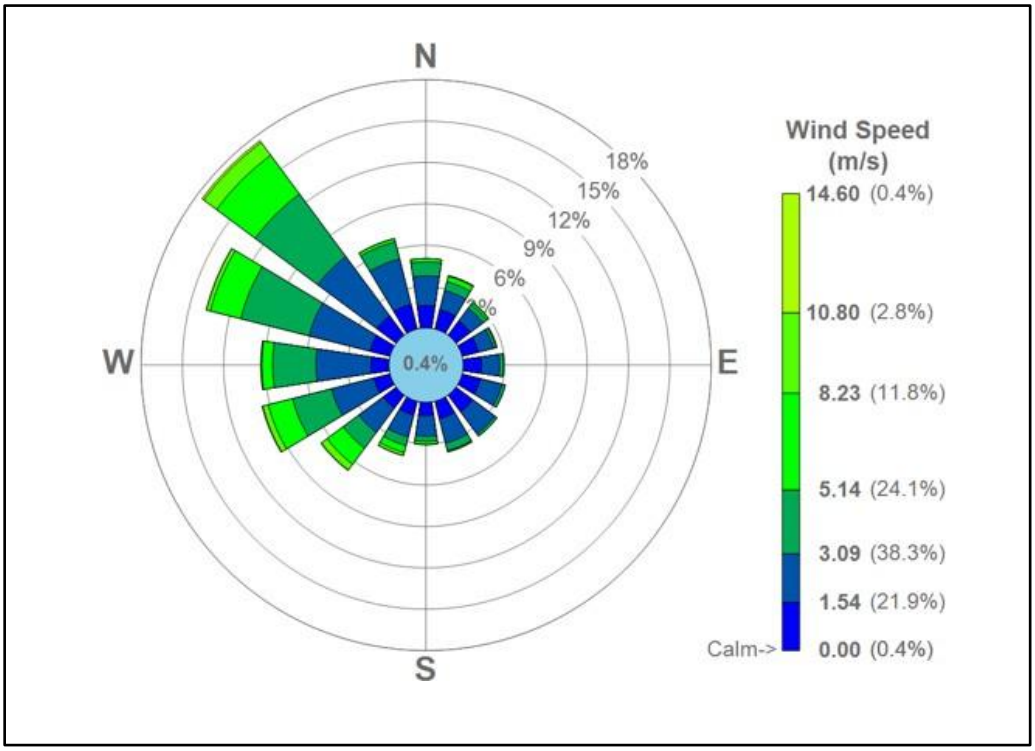
EPA-454/B-23-008, *User's Guide for the AMS/EPA Regulatory Model – AERMOD*, was used as modeling guidance.

6.2 Meteorological Data

The surface meteorological inputs were obtained from the Hanford Meteorological Station and upper air data was obtained from the Spokane, Washington, National Weather Service for the years 2016 through 2020. Digital elevation model data from the U.S. Geological Survey was used for model terrain input. The AERMOD regulatory default mode was used. The wind rose for the model period is shown in Figure 6-1.

[1] BREEZE® is a registered trademark of Trinity Consultants, Inc., Dallas, Texas.
[2] Google Earth™ is a trademark of Google, LLC, Mountain View, California.

Figure 6-1. Wind Rose for Hanford Meteorological Weather Station (2016 through 2020).



6.3 Model Inputs

The model inputs include the physical parameters of stationary exhauster stack. The source was modeled at the maximum flow rate to produce the worst-case air dispersion factors for this project.

The single stack model was used for modeling. Stack parameters are shown in Table 4.

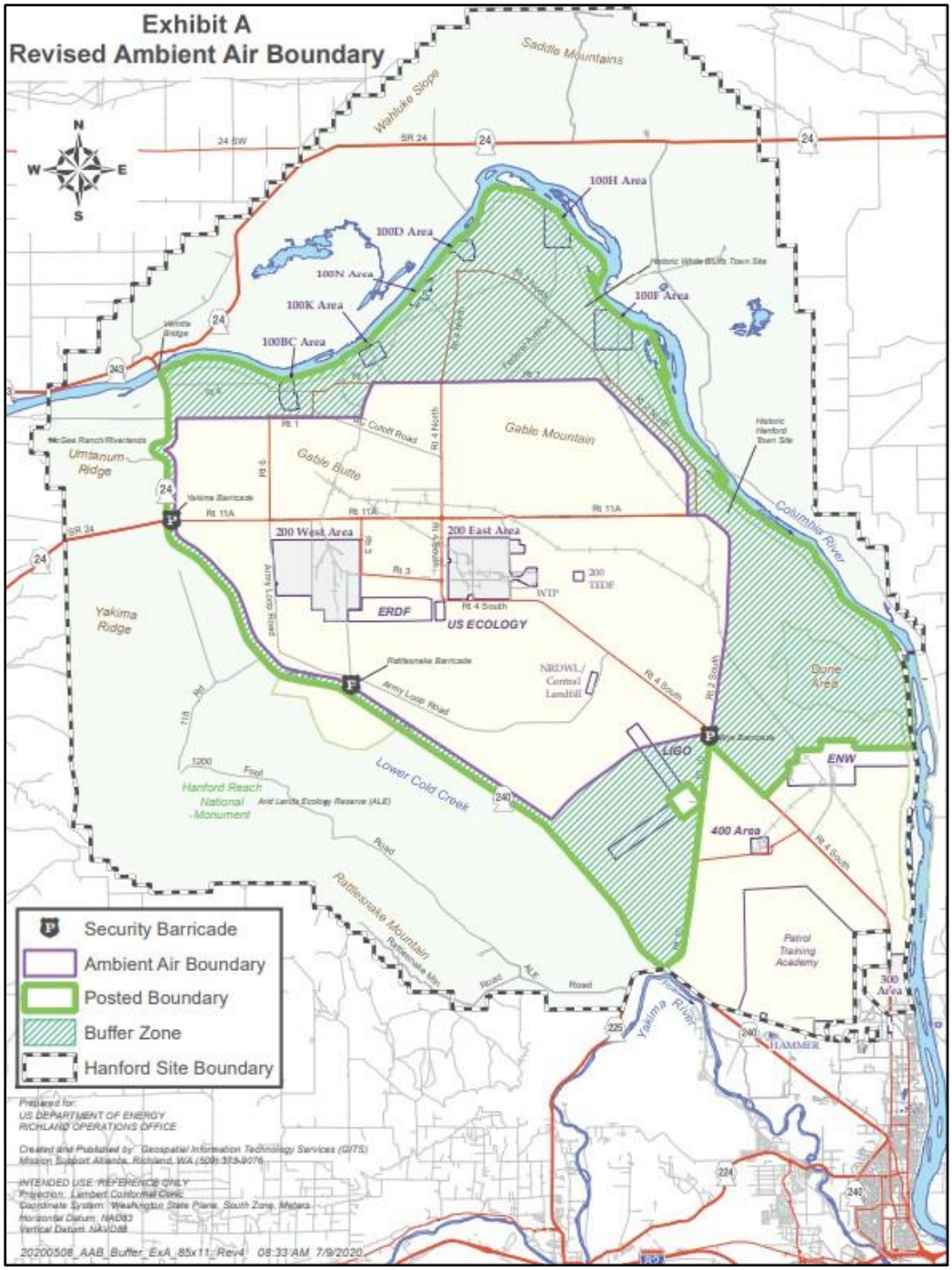
Table 4. 241-SY Stack Parameters

ID	Description	X Coordinate	Y Coordinate	Elevation (m)
241-SY	241-SY 1 stack	298559.5	5157479.67	206.00
Emission Rate (g/s)	**Stack Height (m)**	**Stack Temp (C)**	**Stack Velocity (m/s)**	**Stack Diameter (m)**
1	12.19	20.00	21.422	0.25

Stationary exhausters were assumed to be operating for the entire year to ensure that the worst-case situation was modeled. A total unitary emission rate of 1 g/s was used for the air dispersion modeling scenario.

The site boundaries were used as the public access points to the site. The Hanford Site Ambient Air Boundary is shown in Figure 6-2.

Figure 6-2. Hanford Site Ambient Air Boundary.



6.4 Receptor Grid

Based on Ecology's Guidance Document 08-02-025, *First, Second, and Third Tier Review of Toxic Pollution Source*, Table 5 indicates Ecology's recommended minimum receptor grid spacing. The regulatory default mode was used with receptors established at 1.5 m flagpole height above grade. Modeling for this NOC application was completed with receptors at 1.5 m flagpole height and at 200 m grid spacing for conservatism. The receptor spacing guidance shown in Table 5 is more conservative than that provided in HNF-68787 Table 3.

Table 5. 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

6.5 Coordinate System

The location of the emission sources for this modeling analysis is represented in the Universal Transverse Mercator coordinate system using the WGS_84 projection. The 241-SY Tank Farm is located in the Universal Transverse Mercator Zone 11 as shown in Table 6.

Table 6. Approximate Location of the 241-SY Tank Farm Exhauster Stack.

Unit	Easting	Northing
241-SY Exhauster	298559.5	5157479.67

6.6 Results

Table 7 shows the most conservative dispersion factors for the years 2016 through 2020.

Table 7. Air Dispersion Factors.

Period (year)	*(µg/m³) / (g/sec)*
1-hr (2017)	56.3577
24-hr (2020)	4.0970
Annual (2019)	0.1963

The air dispersion factors, specific to the TAP averaging period, were multiplied by the total emission rate in grams per second per TAPs, to calculate the ambient air or "dispersed" concentrations shown in Appendix A, Table A-4. Appendix C contains the per-year modeling results in Table C-1, and maps with the location of the maximum dispersion factor relative to the Hanford Site.

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

The results of the emissions and modeling are shown in Appendix A, Table A-4. No projected TAPs emission rates exceed their ASILs as shown in Table 8.

Table 8. Toxic Air Pollutants Greater than Small-Quantity Emission Rates and Comparison to Acceptable Source Impact Levels. (2 pages)

CAS #	Compound/Chemical Name	Dispersed Total Offsite (ug/m^3)	% of ASIL	Above ASIL Yes or No
7664-41-7	Ammonia	4.58E+02	91.51%	No
62-75-9	N-Nitrosodimethylamine	1.15E-04	88.43%	No
55-18-5	N-Nitrosodiethylamine	3.62E-06	6.03%	No
107-02-8	Acrolein	1.24E-02	3.55%	No
107-13-1	Acrylonitrile	8.32E-05	2.45%	No
10595-95-6	N-Nitroso-N-methylethylamine	3.88E-06	2.42%	No
106-99-0	1,3-Butadiene	4.15E-04	1.26%	No
924-16-3	N-Nitrosodi-N-butylamine	3.62E-06	1.13%	No
100-75-4	N-Nitrosopiperidine	3.62E-06	0.98%	No
7439-97-6	Mercury, elemental	2.67E-04	0.89%	No
79-34-5	1,1,2,2-Tetrachloroethane	1.46E-04	0.86%	No
621-64-7	N-Nitrosodi-N-propylamine	3.62E-06	0.72%	No
59-89-2	N-Nitrosomorpholine	3.62E-06	0.68%	No
50-00-0	Formaldehyde	7.32E-04	0.43%	No
98-95-3	Nitrobenzene	8.58E-05	0.34%	No
91-20-3	Naphthalene	8.93E-05	0.31%	No
67-66-3	Chloroform	1.25E-04	0.29%	No
75-05-8	Acetonitrile	1.68E-01	0.28%	No
107-06-2	Ethylene dichloride (EDC, 1,2-dichloroethane)	8.62E-05	0.23%	No
930-55-2	N-Nitrosopyrrolidine	3.62E-06	0.21%	No
79-00-5	1,1,2-Trichloroethane (vinyl trichloride)	1.16E-04	0.18%	No
75-07-0	Acetaldehyde	5.99E-04	0.16%	No
106-46-7	1,4-Dichlorobenzene	1.28E-04	0.14%	No
127-18-4	Perchloroethylene	1.44E-04	0.09%	No
56-23-5	Carbon tetrachloride	1.34E-04	0.08%	No
71-43-2	Benzene	8.17E-05	0.06%	No
123-91-1	1,4-Dioxane	1.20E-04	0.06%	No

Table 8. Toxic Air Pollutants Greater than Small-Quantity Emission Rates and Comparison to Acceptable Source Impact Levels. (2 pages)

CAS #	Compound/Chemical Name	Dispersed Total Offsite (ug/m^3)	% of ASIL	Above ASIL Yes or No
79-01-6	Trichloroethylene (TCE)	1.14E-04	0.05%	No
107-05-1	Allyl chloride	8.00E-05	0.05%	No

ASIL = Acceptable Source Impact Levels.
CAS = Chemical Abstracts Service (Registry).

7.0 CONTROL TECHNOLOGY ASSESSMENT

Pursuant to WAC 173-400-113(2), an analysis of Best Available Control Technology (BACT) for emissions of criteria pollutants as well as a tBACT analysis pursuant to WAC 173-460-060(2) for toxics was performed. These analyses, as presented in RPP-ENV-46679, serve as the tBACT analysis for this NOC application and remain applicable as no significant cost reductions or newly applicable treatment techniques have arisen since its publication. The tBACT was based on emissions from the 241-AP Tank Farm within TOC-ENV-NOC-5297, *Criteria and Toxics Air Emissions Notice of Construction for the Operation of the 241-AP Primary Ventilation Systems in the Support of Direct Feed Low Activity Waste Vitrification*, and remains applicable herein as no facility capacity or design changes are proposed.

The tBACT analysis was performed using the "top-down" approach established for BACT analysis. 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 tBACT.

Toxics with similar chemical and physical properties were grouped together with the assumption that similar control technologies would be effective. The four groups identified were:

- Ammonia
- Toxic organic compounds
- Mercury and mercury-related compounds
- Particulate metal compounds.

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 estimate guidelines previously approved by Ecology and EPA as

economically justifiable (RPP-ENV-46679). The cost per ton to remove the pollutants becomes prohibitively expensive.

Based on the results of this tBACT, the proposed tBACT for the DST ventilation systems are the operation of the standard exhauster configuration (i.e. moisture separator pad, heater, prefilter, two HEPA filters in series, fan, and stack with monitoring instrumentation) with periodic confirmatory monitoring to show that the estimated emission parameters are accurate.

7.1 System Descriptions

7.1.1 Active Ventilation

Two stationary exhausters are already installed to support 241-SY Tank Farm activities as active ventilation systems (RPP-SPEC-42594, Rev. 4, *Procurement Specification SY/AP Primary Exhauster Skid for Waste Tank Ventilation*).

Figure 7-1 shows one example of a general exhauster layout. The equipment for a stationary HEPA filter system includes the following:

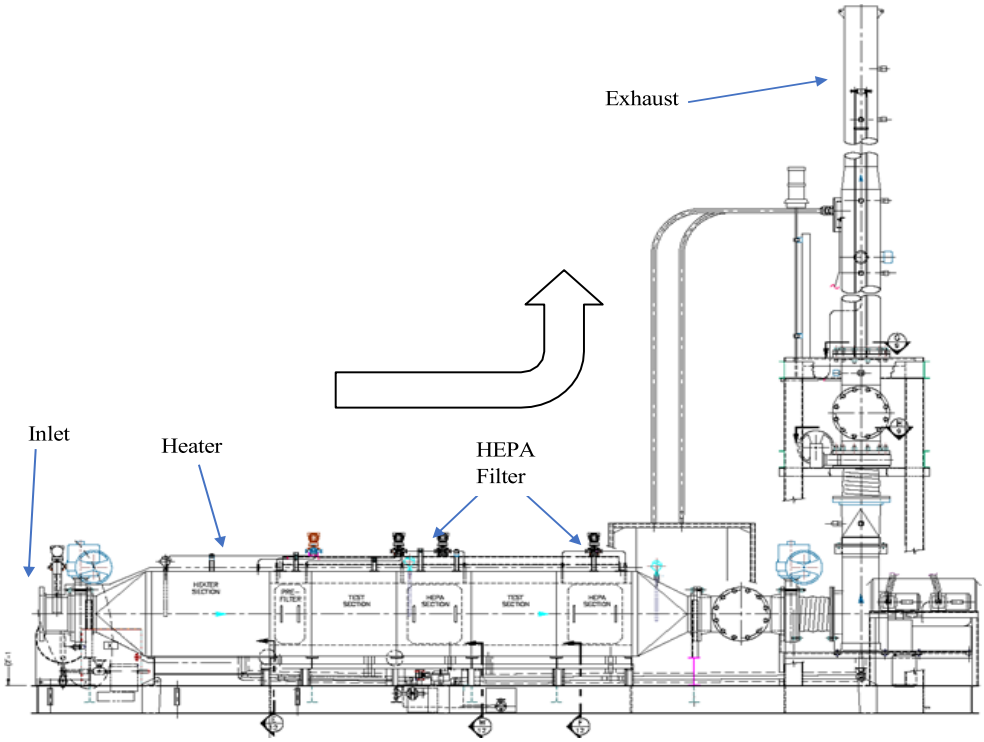
- De-entrainer
- Glycol (or similar) heaters and associated components that are operational when exhauster is in use
- One pre-filter and housing
- Two HEPA filters in series and test sections, abatement technology
- One exhaust fan and stack.

The stationary exhausters are connected to the tank farms via vent duct work/piping and valves that allow ventilation of any number of the three tanks by any combination of exhausters. During stationary exhauster operations, vapors from the tanks will pass through a De-entrainer, and be heated by the heater, before passing through a pre-filter, two HEPA filters in series, a fan, and then discharged through a stack. The moisture separator pad and heater condition the vapor stream as it enters the exhaust systems and before passing through the pre-filter and HEPA filters. The pre-filter increases the life of the HEPA filters by trapping the larger airborne particles to allow for a more economical operating system. The stack contains a section that allows airflow measurements, radiological sample extraction, and potential vapor sampling activities.

7.2 Applicable Control Technology Drawings

Figure 7-1 provides a generalized schematic for the typical DST active ventilation system.

Figure 7-1. General Exhauster Layout.



HEPA = high-efficiency particulate air

8.0 EMISSION LIMITS AND MONITORING

8.1 Emission Limits

Appendix A contains the TAP emission estimates for the 241-SY tank operations and remediation activities. Appendix A, Table A-4 provides the estimated emissions based on historical tank farm sampling data.

8.2 Emission Monitoring

Monthly sampling is proposed for:

- Total VOC emissions.

Annual sampling is proposed for:

- Elemental Mercury
- Ammonia
- N-Nitrosodimethylamine (NDMA, CAS# 62-75-9)

Baseline sampling is proposed for:

1. Elemental mercury: highest metal concentration.

2. Ammonia: will be used as a high release indicator during active tank waste retrieval.

3. NDMA: Organic TAP with the highest estimated emission relative to ASIL.

Baseline sampling will be used to determine compliance with the initial mercury, ammonia, and NDMA permit limits, which are expected to be derived from the estimated values in Appendix A, Table A-4. If the baseline sampling results reveal different mercury, ammonia, or NDMA emission rates than what was derived from Table A-4 revised permit limits will be proposed to Ecology.

9.0 REFERENCES

40 CFR 82, "Protection of Stratospheric Ozone," *Code of Federal Regulations*, as amended.

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

DE11NWP-001, "Criteria and Toxics Air Emissions Notice of Construction for the Operation of Ventilation Systems in the 241-AP, 241-SY, and 241-AY/AZ Tank Farms," Rev. 4 Modification A, Washington State Department of Ecology, Richland, Washington, as amended.

DOE/EIS-0391, 2012, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*, Volume 2, Appendix E.1.1.1.2., "Operations and Maintenance," U.S. Department of Energy, Office of River Protection, Richland, Washington.

Ecology Guidance Document 08-02-025, 2015, *First, Second, and Third Tier Review of Toxic Pollution Source*, Washington State Department of Ecology, Olympia, Washington.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

EPA-454/B-23-008, 2023, *User's Guide for the AMS/EPA Regulatory Model (AERMOD)*, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Research Division, Research Triangle Park, North Carolina.

HNF-68786, 2023, *Hanford Site Criteria and Toxic Air Permitting Protocol*, Rev. 0, Mission Support Alliance, LLC, Richland, Washington.

HNF-68787, 2023, *Hanford Site Toxic Air Modeling Protocol*, Rev. 0, Mission Support Alliance, LLC, Richland, Washington.

HNF-SD-WM-ER-350, 1995, *Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 West Area*, Rev. 0, Fluor Daniel Northwest Inc., Richland, Washington.

RCW 43.21C, "State Environmental Policy Act," *Revised Code of Washington*, as amended.

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

RPP-13033, 2023, *Tank Farms Documented Safety Analysis*, Rev. 08T, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-ENV-46679, 2010, *Evaluation of Best Available Control Technology for Toxics (tBACT), Double Shell Tank Farms Primary Ventilation Systems Supporting Waste Transfer Operations*, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-PLAN-61339, 2024, *Software Management Plan for Grade D Acquired Software AERMOD, BREEZE AERMOD, and BREEZE 3D Analyst (HISI 2140)*, Rev. 5, Washington River Protection Solutions LLC, Richland, Washington.

RPP-RPT-64019, 2025, *Flowsheet for Remediation of Waste Group A Tank 241-SY-103*, Rev. 1, Hanford Tank Waste Operations & Closure, LLC, Richland, Washington.

RPP-RPT-64220, 2025, *Process Engineering Input for SY-103 Remediation*, Rev. 3, Hanford Tank Waste Operations & Closure, LLC, Richland, Washington.

RPP-RPT-64319, 2023, *Preliminary 200 West Area Flowsheet*, Rev. 0, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-65212, 2025, *Potential Hazardous Air Pollutants in the SY Farm Exhauster during SY-103 Remediation*, Rev. 0, Hanford Tank Waste Operations & Closure, LLC, Richland, Washington.

RPP-SPEC-42594, 2011, *Procurement Specification SY/AP Primary Exhauster Skid for Waste Tank Ventilation*, Rev. 4, Washington River Protection Solutions, LLC, Richland, Washington.

TOC-ENV-NOC-5297, 2020, *Criteria and Toxics Air Emissions Notice of Construction for the Operation of the 241-AP Primary Ventilation Systems in the Support of Direct Feed Low Activity Waste Vitrification*, Rev. 1, 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.

WHC-MR-0132, 1990, *A History of the 200 Area Tank Farms*, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX A

CRITERIA AND TOXIC AIR POLLUTANT EMISSION RATES

Table A-1. Criteria Pollutants Emission Rates and Exemption Levels.

Compound	CAS #	Emission Rate (g/s)	Emission Rate (lbs/year)	Exemption Level (lbs/year)	Above Exemption?
Nitrogen oxides	10102-44-0	0.00E+00	0.00E+00	4000	No
VOCs	Various	1.99E-01	1.39E+04	4000	Yes
SO_x (Sulfur oxides)	7446-09-05	0.00E+00	0.00E+00	4000	No
Lead	7439-92-1	0.00E+00	0.00E+00	10	No
Carbon monoxide	630-08-0	0.00E+00	0.00E+00	10000	No
PM-10	NA	6.51E-05	4.53E+00	1500	No
PM-2.5	NA	6.51E-05	4.53E+00	1000	No
Total suspended particulates	NA	6.51E-05	4.53E+00	2500	No
Ozone Depleting Substances, total	NA	3.22E-03	2.24E+02	2000	No

CAS = Chemical Abstracts Service (Registry).
VOC = volatile organic compounds.

Table A-2. Stack Volatile Organic Compound Emission Rates. (3 pages)

CAS #	Compound/Chemical Name	Stack Concentration (mg/m^3)	Total Emission (g/s) at 2300 CFM
Total VOC emissions			**1.99E-01**
100-41-4	Ethyl Benzene	3.91E-02	8.48E-04
100-42-5	Styrene	2.13E-02	4.62E-04
100-47-0	Benzonitrile	0.00E+00	0.00E+00
100-52-7	Benzaldehyde	0.00E+00	0.00E+00
100-75-4	n-Nitrosopiperidine	8.50E-04	1.84E-05
104-76-7	1-Hexanol, 2-ethyl-	0.00E+00	0.00E+00
10595-95-6	n-Nitrosomethylethylamine	9.10E-04	1.97E-05
106-35-4	3-Heptanone	4.43E-02	9.61E-04
106-46-7	1,4-Dichlorobenzene	3.01E-02	6.52E-04
106-97-8	Butane	0.00E+00	0.00E+00
106-99-0	1,3-Butadiene	9.73E-02	2.11E-03
107-02-8	Acrolein	1.40E-01	3.03E-03
107-05-1	Allyl Chloride	1.88E-02	4.07E-04

CAS #	Compound/Chemical Name	Stack Concentration (mg/m^3)	Total Emission (g/s) at 2300 CFM
107-06-2	1,2-Dichloroethane	2.02E-02	4.39E-04
107-12-0	Propanenitrile	0.00E+00	0.00E+00
107-13-1	2-Propenenitrile	1.95E-02	4.24E-04
107-18-6	allyl alcohol	0.00E+00	0.00E+00
108-10-1	Methyl Isobutyl Ketone	9.42E-02	2.04E-03
108-38-3	m-Xylene	0.00E+00	0.00E+00
108-38-3M	Xylene (mixture), including m-xylene, o-xylene, p-xylene	2.95E-02	6.40E-04
108-39-4	3-Methylphenol, cresol; m-cresol	1.77E-02	3.84E-04
108-88-3	Toluene	2.98E-01	6.47E-03
108-90-7	Chlorobenzene	2.30E-02	4.99E-04
109-66-0	Pentane	0.00E+00	0.00E+00
109-74-0	Butanenitrile	0.00E+00	0.00E+00
109-99-9	Furan, tetrahydro-	7.37E-02	1.60E-03
110-43-0	2-Heptanone	0.00E+00	0.00E+00
110-54-3	n-Hexane	2.12E-02	4.59E-04
110-59-8	Pentanenitrile	0.00E+00	0.00E+00
110-62-3	valeraldehyde	0.00E+00	0.00E+00
110-82-7	Cyclohexane	2.07E-02	4.48E-04
110-86-1	pyridine	0.00E+00	0.00E+00
112-40-3	Dodecane	0.00E+00	0.00E+00
115-07-1	1-Propene	0.00E+00	0.00E+00
123-05-7	Hexanal, 2-ethyl-	0.00E+00	0.00E+00
123-19-3	4-Heptanone	0.00E+00	0.00E+00
123-38-6	propionaldehyde	1.40E-01	3.04E-03
123-72-8	Butanal	6.48E-02	1.41E-03
123-86-4	n-butyl acetate	0.00E+00	0.00E+00
123-91-1	1,4-Dioxane	2.81E-02	6.10E-04
124-40-3	dimethylamine	3.69E-02	8.00E-04
126-73-8	tributyl phosphate	0.00E+00	0.00E+00
126-98-7	methylacrylonitrile	0.00E+00	0.00E+00
141-78-6	ethyl acetate	1.80E-02	3.91E-04
142-82-5	Heptane	1.06E-01	2.30E-03
17312-55-9	Decane, 3,8-dimethyl-	0.00E+00	0.00E+00
31081-18-2	Nonane, 3-methyl-5-propyl-	0.00E+00	0.00E+00
4170-30-3	2-butenal	0.00E+00	0.00E+00
50-00-0	Formaldehyde	1.72E-01	3.73E-03
541-35-5	Butanamide	0.00E+00	0.00E+00
542-75-6	1,3-Dichloropropene	2.27E-02	4.92E-04
55-18-5	n-Nitrosodiethylamine	8.50E-04	1.84E-05
56-23-5	Carbon Tetrachloride	3.15E-02	6.83E-04
57-55-6	1,2-Propanediol	0.00E+00	0.00E+00

CAS #	Compound/Chemical Name	Stack Concentration (mg/m^3)	Total Emission (g/s) at 2300 CFM
589-81-1	Heptane, 3-methyl-	0.00E+00	0.00E+00
589-82-2	3-Heptanol	0.00E+00	0.00E+00
591-78-6	2-Hexanone	2.46E-02	5.33E-04
593-74-8	Dimethyl Mercury	1.00E-05	2.17E-07
59-89-2	n-Nitrosomorpholine	8.50E-04	1.84E-05
62108-31-0	Heptane, 4-ethyl-2,2,6,6-tetramethyl-	0.00E+00	0.00E+00
621-64-7	n-Nitrosodi-n-propylamine	8.50E-04	1.84E-05
627-05-4	Butane, 1-nitro-	0.00E+00	0.00E+00
62-75-9	n-Nitrosodimethylamine	2.70E-02	5.86E-04
628-73-9	Hexanenitrile	0.00E+00	0.00E+00
629-50-5	Tridecane	0.00E+00	0.00E+00
64-17-5	Ethanol	1.49E+00	3.23E-02
66-25-1	Hexanal	0.00E+00	0.00E+00
67-56-1	Methanol	1.35E+00	2.93E-02
67-63-0	Isopropyl Alcohol	7.61E-02	1.65E-03
67-66-3	Chloroform	2.93E-02	6.36E-04
71-23-8	1-Propanol	8.35E-02	1.81E-03
71-36-3	1-Butanol	2.06E+00	4.47E-02
71-43-2	Benzene	1.92E-02	4.16E-04
7154-80-5	Heptane, 3,3,5-trimethyl-	0.00E+00	0.00E+00
74-89-5	methylamine	4.32E-02	9.37E-04
74-98-6	Propane	0.00E+00	0.00E+00
75-00-3	Ethyl Chloride	1.85E-02	4.01E-04
75-04-7	ethylamine	7.01E-02	1.52E-03
75-05-8	Acetonitrile	1.89E+00	4.09E-02
75-07-0	Acetaldehyde	1.41E-01	3.05E-03
75-34-3	1,1-Dichloroethane; ethylidene chloride	2.02E-02	4.39E-04
75-35-4	1,1-Dichloroethylene	2.38E-02	5.16E-04
75-43-4	Methane, dichlorofluoro-	0.00E+00	0.00E+00
78-93-3	2-Butanone	2.06E-02	4.48E-04
79-00-5	1,1,2-Trichloroethane	2.73E-02	5.92E-04
79-01-6	Trichloroethylene, TCE; trichloroethylen	2.69E-02	5.83E-04
79-34-5	1,1,2,2-Tetrachloroethane, tetrachloroet	3.43E-02	7.45E-04
84-66-2	diethyl phthalate	0.00E+00	0.00E+00
91-20-3	Naphthalene	2.10E-02	4.55E-04
924-16-3	n-Nitroso-di-n-butylamine	8.50E-04	1.84E-05
92-52-4	biphenyl	0.00E+00	0.00E+00
928-45-0	Nitric acid, butyl ester	0.00E+00	0.00E+00
930-55-2	n-Nitrosopyrrolidine	8.50E-04	1.84E-05
95-48-7	2-Methylphenol	1.77E-02	3.84E-04
98-86-2	acetophenone	1.97E-02	4.27E-04
98-95-3	nitrobenzene	2.01E-02	4.37E-04

Table A-3. Ozone-Depleting Substances.

CAS #	Compound/Chemical Name	TWINS or SWIHDs Highest Value (mg/m^3)	Total Emission per tank (g/s) at 2300 CFM
Total Emission of Ozone Depleting Substances (g/s)			**3.22E-03**
75-69-4	CFCl3-Trichlorofluoromethane (CFC-11)	8.98E-02	1.95E-03
79-00-5	C2 H3 Cl3-1,1,2-Trichloroethane	2.73E-02	5.92E-04
56-23-5	CCl4-Carbon Tetrachloride	3.15E-02	6.83E-04

CAS = Chemical Abstracts Service (Registry).
TWINS = Tank Waste Information Network System.
SWIHD = Site-Wide Industrial Hygiene Database.

Table A-4. Toxic Air Pollutant Emission Rates from 241-SY Tank Farm. (3 pages)

CAS #	Compound/Chemical Name	SWIHD and TWINS Highest Value (mg/m3)	Tank Emissions g/s	Dispersed Total Offsite (ug/m^3)	% of ASIL	Above ASIL Yes or No	Total Unit of Measure Based on Averaging Period (lbs per period)	Averaging Period	Above SQER?
7664-41-7	Ammonia	5147.5204	1.12E+02	4.58E+02	91.51%	No	2.12E+04	24-hr	Yes
62-75-9	N-Nitrosodimethylamine	0.0270	5.86E-04	1.15E-04	88.43%	No	4.06E+01	year	Yes
55-18-5	N-Nitrosodiethylamine	0.0009	1.84E-05	3.62E-06	6.03%	No	1.28E+00	year	Yes
107-02-8	Acrolein	0.1399	3.03E-03	1.24E-02	3.55%	No	5.77E-01	24-hr	Yes
107-13-1	Acrylonitrile	0.0195	4.24E-04	8.32E-05	2.45%	No	2.94E+01	year	Yes
10595-95-6	N-Nitroso-N-methylethylamine	0.0009	1.97E-05	3.88E-06	2.42%	No	1.37E+00	year	Yes
106-99-0	1,3-Butadiene	0.0973	2.11E-03	4.15E-04	1.26%	No	1.47E+02	year	Yes
924-16-3	N-Nitrosodi-N-butylamine	0.0009	1.84E-05	3.62E-06	1.13%	No	1.28E+00	year	Yes
100-75-4	N-Nitrosopiperidine	0.0009	1.84E-05	3.62E-06	0.98%	No	1.28E+00	year	Yes
7439-97-6	Mercury, elemental	0.0030	6.51E-05	2.67E-04	0.89%	No	1.24E-02	24-hr	Yes
79-34-5	1,1,2,2-Tetrachloroethane	0.0343	7.45E-04	1.46E-04	0.86%	No	5.17E+01	year	Yes
621-64-7	N-Nitrosodi-N-propylamine	0.0009	1.84E-05	3.62E-06	0.72%	No	1.28E+00	year	Yes
59-89-2	N-Nitrosomorpholine	0.0009	1.84E-05	3.62E-06	0.68%	No	1.28E+00	year	Yes
50-00-0	Formaldehyde	0.1719	3.73E-03	7.32E-04	0.43%	No	2.59E+02	year	Yes
98-95-3	Nitrobenzene	0.0201	4.37E-04	8.58E-05	0.34%	No	3.03E+01	year	Yes
91-20-3	Naphthalene	0.0210	4.55E-04	8.93E-05	0.31%	No	3.16E+01	year	Yes
67-66-3	Chloroform	0.0293	6.36E-04	1.25E-04	0.29%	No	4.41E+01	year	Yes
75-05-8	Acetonitrile	1.8873	4.09E-02	1.68E-01	0.28%	No	7.78E+00	24-hr	Yes

Table A-4. Toxic Air Pollutant Emission Rates from 241-SY Tank Farm. (3 pages)

CAS #	Compound/Chemical Name	SWIHD and TWINS Highest Value (mg/m3)	Tank Emissions g/s	Dispersed Total Offsite (ug/m^3)	% of ASIL	Above ASIL Yes or No	Total Unit of Measure Based on Averaging Period (lbs per period)	Averaging Period	Above SQER?
107-06-2	Ethylene dichloride (EDC, 1,2-dichloroethane)	0.0202	4.39E-04	8.62E-05	0.23%	No	3.05E+01	year	Yes
930-55-2	N-Nitrosopyrrolidine	0.0009	1.84E-05	3.62E-06	0.21%	No	1.28E+00	year	Yes
79-00-5	1,1,2-Trichloroethane (vinyl trichloride)	0.0273	5.92E-04	1.16E-04	0.18%	No	4.11E+01	year	Yes
75-07-0	Acetaldehyde	0.1405	3.05E-03	5.99E-04	0.16%	No	2.12E+02	year	Yes
123-38-6	Propionaldehyde	0.1402	3.04E-03	1.25E-02	0.16%	No	5.78E-01	24-hr	No
106-46-7	1,4-Dichlorobenzene	0.0301	6.52E-04	1.28E-04	0.14%	No	4.52E+01	year	Yes
127-18-4	Perchloroethylene	0.0339	7.36E-04	1.44E-04	0.09%	No	5.10E+01	year	Yes
56-23-5	Carbon tetrachloride	0.0315	6.83E-04	1.34E-04	0.08%	No	4.74E+01	year	Yes
71-43-2	Benzene	0.0192	4.16E-04	8.17E-05	0.06%	No	2.89E+01	year	Yes
75-69-4	Fluorides (fluoride containing chemicals), NOS	0.0898	1.95E-03	7.98E-03	0.06%	No	3.70E-01	24-hr	No
123-91-1	1,4-Dioxane	0.0281	6.10E-04	1.20E-04	0.06%	No	4.23E+01	year	Yes
79-01-6	Trichloroethylene (TCE)	0.0269	5.83E-04	1.14E-04	0.05%	No	4.04E+01	year	Yes
107-05-1	Allyl chloride	0.0188	4.07E-04	8.00E-05	0.05%	No	2.83E+01	year	Yes
100-41-4	Ethyl benzene	0.0391	8.48E-04	1.66E-04	0.04%	No	5.88E+01	year	No
542-75-6	1,3-Dichloropropene	0.0227	4.92E-04	9.66E-05	0.04%	No	3.42E+01	year	No
75-34-3	1,1-Dichloroethane (ethylidene dichloride)	0.0202	4.39E-04	8.62E-05	0.01%	No	3.05E+01	year	No
591-78-6	2-Hexanone	0.0246	5.33E-04	2.18E-03	0.01%	No	1.01E-01	24-hr	No

Table A-4. Toxic Air Pollutant Emission Rates from 241-SY Tank Farm. (3 pages)

CAS #	Compound/Chemical Name	SWIHD and TWINS Highest Value (mg/m3)	Tank Emissions g/s	Dispersed Total Offsite (ug/m^3)	% of ASIL	Above ASIL Yes or No	Total Unit of Measure Based on Averaging Period (lbs per period)	Averaging Period	Above SQER?
67-63-0	Isopropyl alcohol	0.0761	1.65E-03	9.31E-02	0.00%	No	1.31E-02	1-hr	No
108-38-3M	Xylene (mixture), including m-xylene, o-xylene, p-xylene	0.0295	6.40E-04	2.62E-03	0.00%	No	1.22E-01	24-hr	No
75-35-4	1,1-Dichloroethylene (1,1-DCE)	0.0238	5.16E-04	2.11E-03	0.00%	No	9.81E-02	24-hr	No
67-56-1	Methyl alchohol (methanol)	1.3524	2.93E-02	1.20E-01	0.00%	No	5.58E+00	24-hr	No
108-88-3	Toluene	0.2980	6.47E-03	2.65E-02	0.00%	No	1.23E+00	24-hr	No
109-99-9	Tetrahydrofuran	0.0737	1.60E-03	6.55E-03	0.00%	No	3.04E-01	24-hr	No
108-10-1	Methyl isobutyl ketone (MIBK, hexone)	0.0942	2.04E-03	8.38E-03	0.00%	No	3.89E-01	24-hr	No
110-54-3	n-Hexane	0.0212	4.59E-04	1.88E-03	0.00%	No	8.72E-02	24-hr	No
108-39-4	m-cresol (3-methylphenol)	0.0177	3.84E-04	1.57E-03	0.00%	No	7.30E-02	24-hr	No
95-48-7	o-cresol (2-methylphenol)	0.0177	3.84E-04	1.57E-03	0.00%	No	7.30E-02	24-hr	No
100-42-5	Styrene	0.0213	4.62E-04	1.89E-03	0.00%	No	8.78E-02	24-hr	No
108-90-7	Chlorobenzene	0.0230	4.99E-04	2.05E-03	0.00%	No	9.49E-02	24-hr	No
75-09-2	Dichloromethane	0.0208	4.52E-04	8.88E-05	0.00%	No	3.14E+01	year	No
78-93-3	Methyl ethyl ketone	0.0206	4.48E-04	1.83E-03	0.00%	No	8.51E-02	24-hr	No
110-82-7	Cyclohexane	0.0207	4.48E-04	1.84E-03	0.00%	No	8.52E-02	24-hr	No
75-00-3	Chloroethane (ethyl chloride)	0.0185	4.01E-04	1.64E-03	0.00%	No	7.62E-02	24-hr	No

APPENDIX B

AIR MODELING PROTOCOL

Introduction

This criteria and toxic air modeling protocol was written to provide guidance to Hanford contractors on the process to follow when performing modeling for criteria and toxic air permits. This protocol also documents some of the information and files needed to run AERMOD and the process that was followed to develop and check the quality of the supporting AERMOD modeling files.

This document can be used as part of the Pre-Application Meeting with Ecology and included in the permit application package sent to Ecology.

Toxic Air Modeling Process

1. Make Modeling Determination.
    a. Are you complying with WAC 173-460-070 with WAC 173-460-080(2)(a) or (b)?
    b. Based on WAC 173-400-110(5) evaluation, do you need to model for compliance with WAC 173-400-113(3)? [i.e. do you exceed the WAC 173-400-110 (5) exemption level for any of the pollutants listed in WAC 173-400-113(4)(a)?]
        i. Note: if you do not exceed the Table 4(a) emission concentration levels at the stack, you do not need to model [even if you exceed the WAC 173-400-110(5) exemption levels]. Compliance with WAC 173-400-113(3) using calculated stack concentrations should be discussed at the pre-application meeting.
    c. Propose modeling plan, with proposed emissions to be modeled (increased rate versus total rate).
        i. One project model with option for source groupings for each emission unit.
        ii. Individual emission unit models.
    d. If applicable, determine modeling parameters for each unit.
2. Prepare Modeling Protocol
    a. Perform modeling as agreed to in the Modeling Protocol and pre-application meeting.
3. Transmit modeling files to Ecology for their review.

AERMOD and Supporting Files Documentation

The following is the process that was followed to develop the meteorology files for AERMOD. Section 6.0 and Appendix A documents the detailed process that was followed to process the

Hanford surface meteorological data with the upper air data from the National Weather Service to develop the meteorological files for AERMOD and the quality assurance checks that were performed.

1. AERMOD Executable
    a. Previous release – 23132 (if project has been kicked off with Ecology via a pre-application meeting)
    b. Latest release – 23132 (required for all new projects)
2. MET Data Processing by AERMET (version 23132 and AERSURFACE 20060), following the EPA guidance (EPA Air Quality Analysis Checklist revised December 20, 2016, available online at https://www.epa.gov/sites/default/files/2020-09/documents/air_quality_analysis_checklist-revised_20161220.pdf) summary provided below, full details in Appendix A and Quality Assurance checks performed in developing the data.
    a. Continuous 5-years of most recent available data *(provided by HMIS to contractors)*
        i. 2016-2020
    b. Meteorological data from the Hanford Meteorological Station (number 12321) (location 46.563N, 119.599W). Concurrent upper air data from the National Weather Service office in Spokane, Washington (number 4106).
    c. The Hanford Meteorological Station has a base elevation of 222 m and is 121.9 m high. The sampling height and data collected from and used are shown below.

Height(m)	Temperature	Wind Speed and Direction
0.9	Yes	No
9.1	Yes	Yes
15.2	Yes	Yes
30.5	Yes	No
61.0	Yes	Yes
76.2	Yes	No
91.4	Yes	No
121.9	Yes	Yes

    d. For AERSURFACE input the area is considered arid and the following seasonal parameters were used:

Seasonal Category	Season Description	Month
1	Midsummer with lush vegetation	Jun, Jul, Aug
2	Autumn with unharvested cropland	Sep, Oct, Nov
3	Late autumn after frost and harvest, or winter with no snow	Dec, Jan, Feb
5	Transitional spring with partial green coverage or short annuals	Mar, Apr, May

g. NWS surface data substitution was not used since the onsite data met the 90 percent per quarter completeness criteria.

3. The Ambient Air Boundary (AAB) for the Hanford Site was agreed upon between the Department of Energy and the Department of Ecology in "Memorandum of Agreement Between the U.S. Department of Energy Richland Operations Office and Office of River Protection and the Washington State Department of Ecology Regarding the Hanford Ambient Air Boundary," Richland, Washington, July 23, 2020. The map of the agreed upon Hanford AAB is shown below.

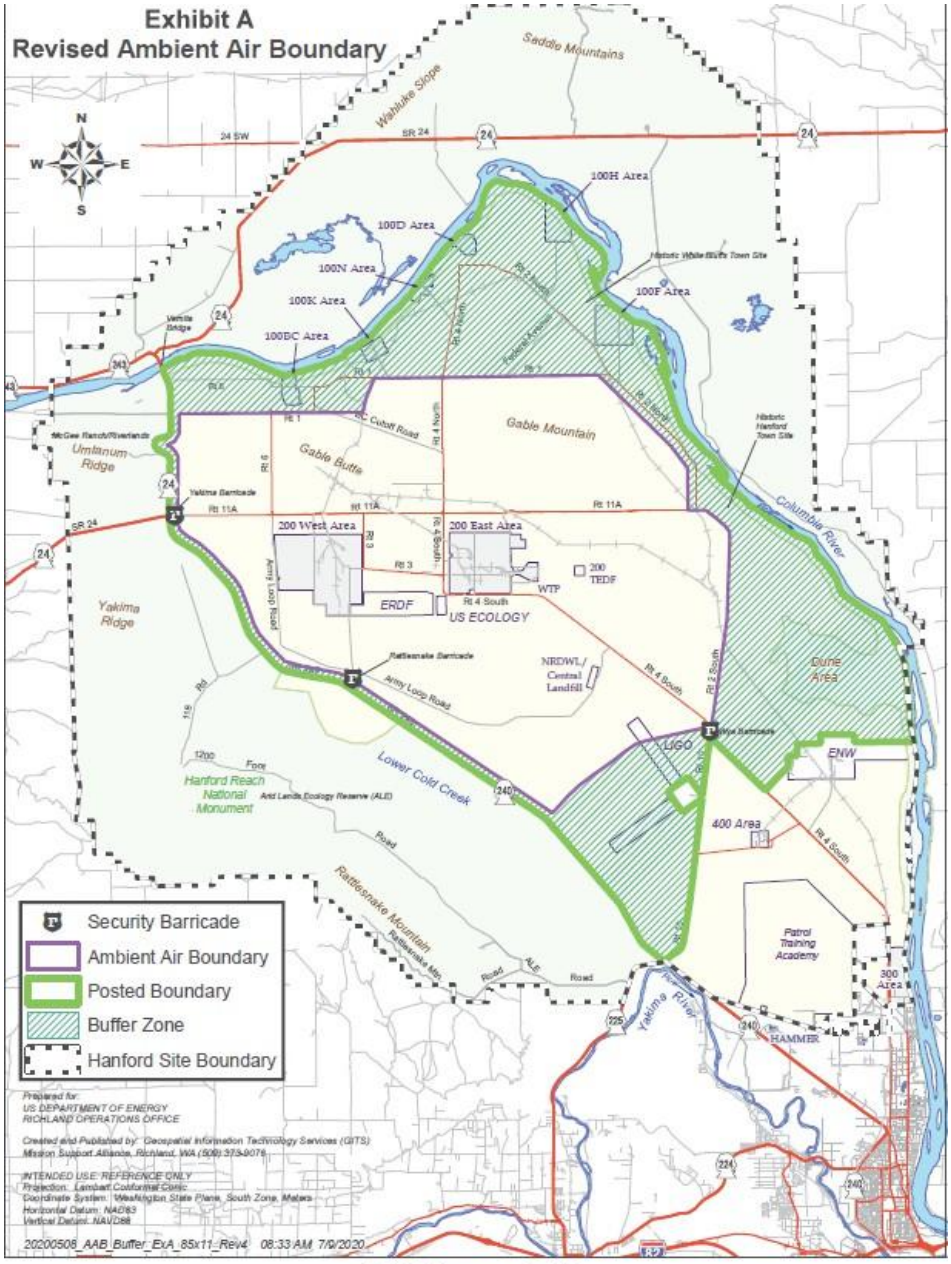

Exhibit A - page 1 of 11

4. Receptors
    a. Receptor spacing guidance from the Ecology in First, Second, and Third Tier Review of Toxic Air Pollution Sources (Chapter 173-460 WAC), Publication 08-02-025.

Distance from Source (m)	Grid Spacing (m)
0 – 150	12.5
150 – 400	25
400 – 900	50
900 – 2,000	100
2,000 – 4,500	300
> 4,500	600

    b. Ambient Air Boundary – Most sources at the Hanford Site are well within the AAB (greater than 3,000 m from the source to the AAB), but there are a few sources that are outside of the AAB. Different receptor grid spacing will be used depending upon the location of the source as described below.
    c. Emission unit(s) located inside the ambient air boundary:
        i. Uniform resolution grid – 200 meters (receptor file provided by HMIS)
            1. Based upon the guidance in Ecology Publication 08-02-025 for a distance over 3,000 m from sources to the AAB should have a grid receptor spacing of 300 m. A 200 m grid spacing was agreed upon with Ecology to be conservative and to ensure capturing the various terrain features around the Hanford Site.
        ii. Grid – centered on the Hanford Site
        iii. Delete grid receptors inside the AAB
    d. Emission unit(s) located outside the ambient air boundary (located in the ambient air) or sources that are inside and in close proximity to the AAB (scoping models, source parameters and emissions estimates, and distance to the AAB are factors to consider when determining final grid resolution):
        i. Variable resolution grid – as shown above from Ecology Publication 08-02-025.
            1. 12.5-m spacing from the property (AAB or facility) boundary (if you don't have a fence or physical boundary, the receptors start from the emission unit) to 150 m from the nearest emission source.
        ii. Delete grid receptors inside the ambient air boundary
    e. Height – Flagpole above ground level = 1.5 meters
    f. Relaxed receptor grid beyond the black and white Hanford property boundary, if desired

g. HIA – coordinate with Ecology

5. Elevation Data
    a. NED *(provided by HMIS)*
    b. AERMAP Executable – AERMAP Version 18081
    c. Calculate source elevations = yes
    d. Calculate building, if applicable, elevations = yes
    a. Calculate receptor elevations = yes
6. Building Downwash
    a. Not applicable inside the AAB – the nearest building is approximately 3,000 m to AAB and outside of the zone where AERMOD calculates building downwash.
    b. Emission unit(s) located outside the AAB or sources that are close enough to the AAB for the BPIP algorithm to impact receptor concentrations (receptors located at a distance less than 5 times the greater of the height or widest width of the closest building).
        i. Yes
7. Deposition
    a. No
    b. HIA – coordinate with Ecology

AERMET Processing Details Report and Quality Assurance

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ENVIRONMENT
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MEMO

Project name **HMIS: Modeling and Regulatory Support**
Project no. **1690026762-002**
To **Brian Rumburg, HMIS**
From **Michael Ring, PhD**

Date July 11, 2022

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1 Introduction

The following summarizes a review and reprocessing of surface meteorological data collected at the Hanford Site and upper-air data collected at the Spokane National Weather Service station through the AERMET meteorological pre-processor. The review and reprocessing were performed by Michael Ring of Ramboll. The reprocessing used AERMET version 22112, which was the most current version of AERMET available at the time of the reprocessing. The land surface analysis used AERSURFACE version 20060, which likewise was the most recent version of AERSURFACE available at the time the reprocessing was performed.

This document provides responses to items in the "Meteorological Input Data" section of the EPA Air Quality Analysis Checklist (revised December 20, 2016, available online at https://www.epa.gov/sites/default/files/2020-09/documents/air_quality_analysis_checklist-revised_20161220.pdf). A summary of supplemental quality assurance analyses is also provided.

2 Responses to EPA QA Checklist

The meteorological input data section of the checklist contains items in the six following sub-sections:

- Screening Meteorology
- Site-Specific Meteorology
- NWS Meteorology
- Prognostic Meteorology
- Representativeness and Surface Characteristics
- General Considerations

The modeling analysis did not use screening meteorology, NWS surface data, or prognostic data. Therefore, those three sections are not applicable. The items from the remaining sections are addressed below.

2.1 Site-Specific Meteorology Responses

Five years (2016-2020) of on-site data from the Hanford Meteorological Tower, at the center of the Hanford Nuclear Reservation (latitude 46.563N and longitude 119.599W), base elevation 222 m, were used to develop meteorological files. Temperature data were collected at 0.9 m, 9.1 m, 15.2 m, 30.5 m, 61.0 m, 76.2

APPENDIX C

AMBIENT AIR MODELING RESULTS

Table C-1. Air Dispersion Coefficients for 2016 through 2020.

241-SY Tank Farm	2016	2017	2018	2019	2020	Maximum Value
Max Annual (ug/m^3)	0.18384	0.1633	0.16924	0.19632	0.15267	**0.1963**
1-hr (ug/m^3)	39.7082	56.35767	41.13613	37.78971	46.50039	**56.3577**
24-hr (ug/m^3)	3.66675	2.96723	2.67329	2.51909	4.09697	**4.0970**

Figure C- 1. Maximum Annual Air Dispersion, 2019.

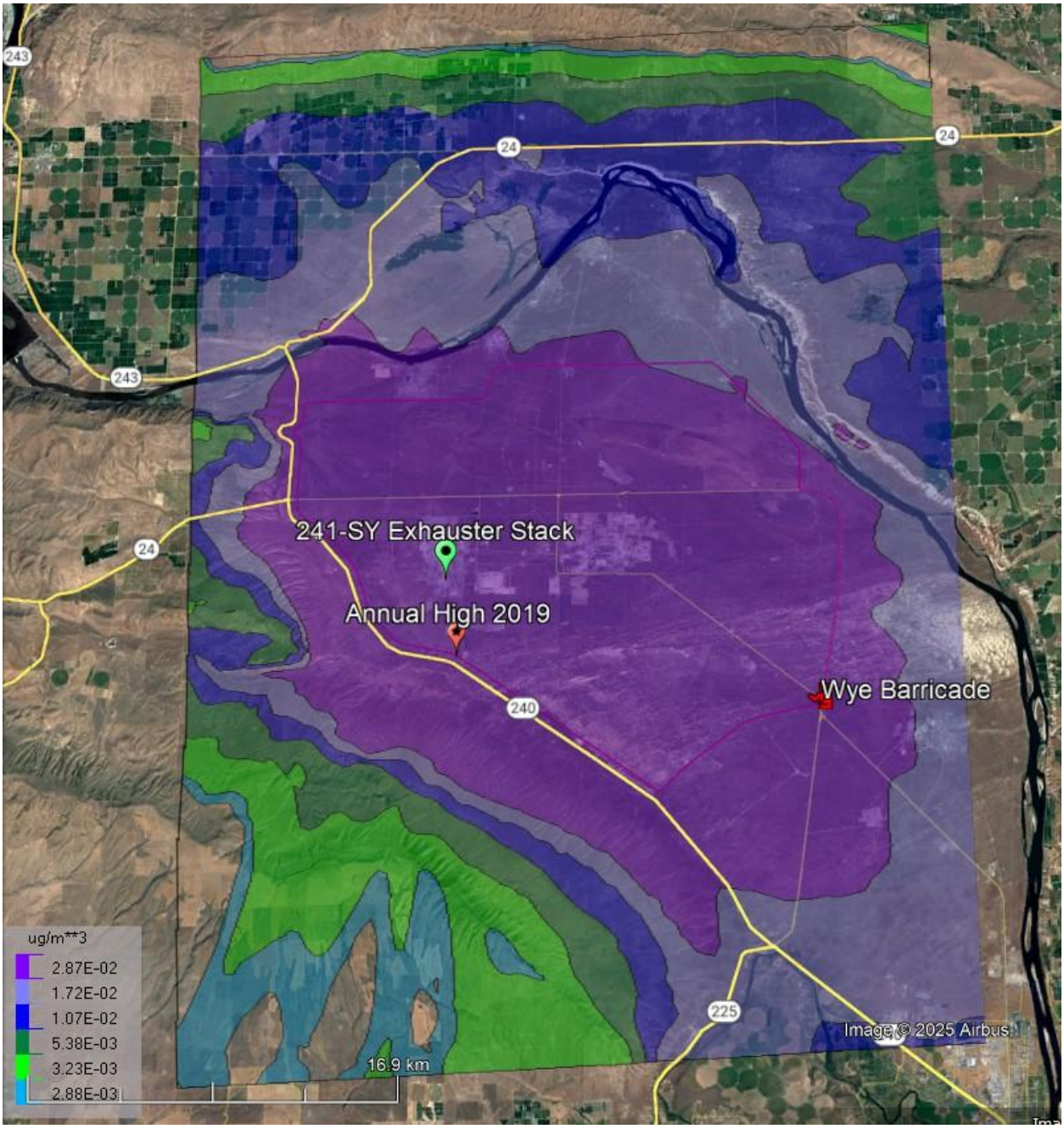


Figure C-2. One-Hour Maximum Dispersion Coefficient Location, 2017.

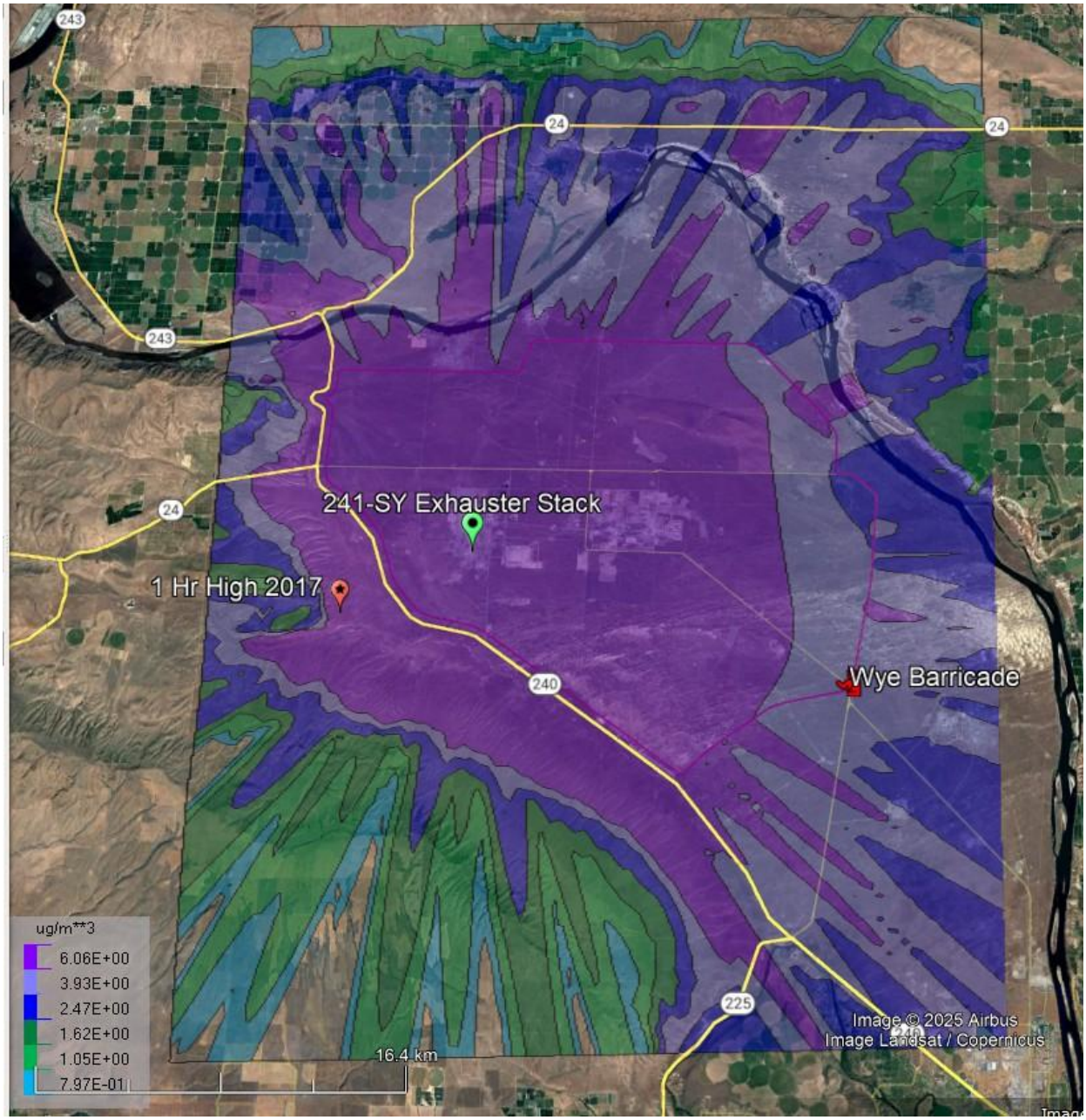
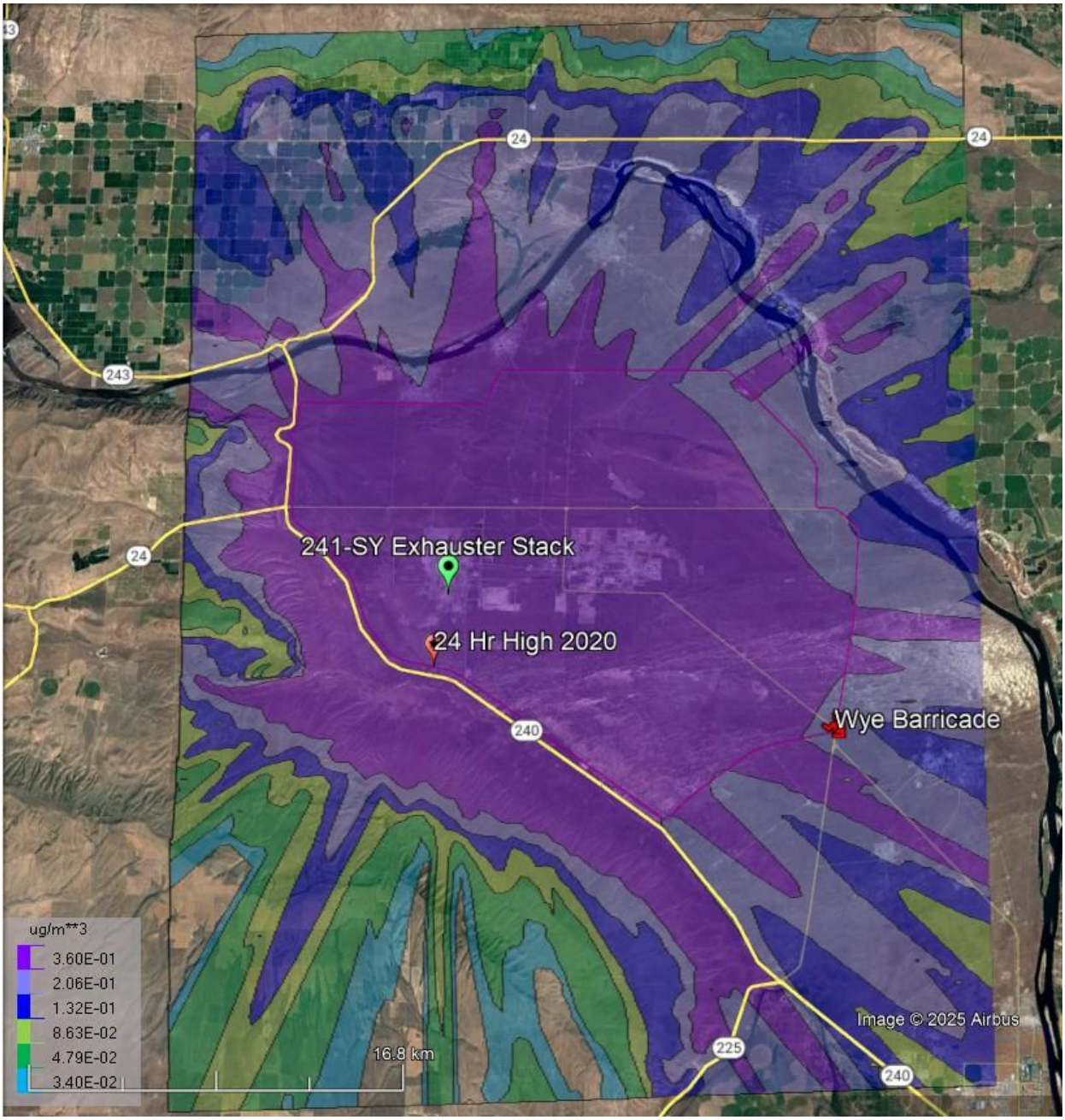


Figure C-3. Twenty-Four-Hour Maximum Dispersion Coefficient Location, 2020.



INFORMATION CLEARANCE REVIEW AND RELEASE APPROVAL

Part I: Background Information

Title: Criteria and Toxics Air Emissions Notice of Construction for Remediation and Operations of Hanford 241-SY Tank Farm	Information Category: ☐ Abstract ☐ Journal Article ☐ Summary ☐ Internet ☐ Visual Aid ☐ Software ☐ Full Paper ☐ Report ☑ Other Air Emission Permit Application
Publish to OSTI? ☐ Yes ☑ No	

Trademark/Copyright "Right to Use" Information or Permission Documentation	Yes ☐ NA ☑
Document Number: TOC-ENV-NOC-5362 Revision 0	Date: October 2025
Author: Vickery, Buzz	

Part II: External/Public Presentation Information

Conference Name:	
Sponsoring Organization(s): DOE	
Date of Conference:	Conference Location:
Will Material be Handed Out? ☐ Yes ☑ No	Will Information be Published? ☐ Yes ☑ No *(If Yes, attach copy of Conference format instructions/guidance.)*

Part III: H2C Document Originator Checklist

Description	*Yes*	*N/A*	*Print/Sign/Date*
Information Product meets requirements in TFC-BSM-AD-C-01?	☐	☑	
Document Release Criteria in TFC-ENG-DESIGN-C-25 completed? (Attach checklist)	☐	☑	
If product contains pictures, safety review completed?	☑	☐	Roberts, Sheryl K IDMS Data File att. 10/20/2025

Part IV: H2C Internal Review

Function	*Organization*	*Date*	*Print Name/Signature/Date*
Subject Matter Expert	H2C	10/22/2025	Vickery, Buzz IDMS Data File att.
Responsible Manager	H2C	10/15/2025	Beam, Tom IDMS Data File att.
Other:			

Part V: IRM Clearance Services Review

Description	*Yes*	*No*	*Print Name/Signature*
Document Contains Classified Information?	☐	☑	If Answer is "Yes," ADC Approval Required Print Name/Signature/Date
Document Contains Information Restricted by DOE Operational Security Guidelines?	☐	☑	Reviewer Signature: Print Name/Signature/Date
Document is Subject to Release Restrictions? *If the answer is "Yes," please mark category at right and describe limitation or responsible organization below:*	☐	☑	Document contains: ☐ Applied Technology ☐ Protected CRADA ☐ Personal/Private ☐ Export Controlled ☐ Proprietary ☐ Procurement – Sensitive ☐ Patentable Info. ☐ OUO ☐ Predecisional Info. ☐ UCNI ☐ Restricted by Operational Security Guidelines ☐ Other (Specify)
Additional Comments from Information Clearance Specialist Review?	☐	☑	Information Clearance Specialist Approval APPROVED By Janis Aardal at 1:26 pm, Oct 27, 2025 Print Name/Signature/Date

When IRM Clearance Review is Complete – Return to H2C Originator for Final Signature Routing (Part VI)

INFORMATION CLEARANCE REVIEW AND RELEASE APPROVAL

Part VI: Final Review and Approvals

Description	*Approved for Release*		*Print Name/Signature*
	Yes	*N/A*	
H2C External Affairs	☑	☐	IDMS Data File att. Kraemer, Kristin M
H2C Office of Chief Counsel	☑	☐	IDMS Data File att. Zhou, Yin
DOE – ORP Public Affairs/Communications	☑	☐	IDMS Data File att. Dawson, Edward M
Other: DOE ECD	☐	☑	Concurred separately by email on 10-15-25
Other:	☐	☐	

Comments Required for H2C-Indicate Purpose of Document:

Application for approval of a Notice of Construction for the increase in ventilation at the 241-SY Tank Farm in support of waste retrievals for purposes of criteria and toxic air emissions regulated under WAC 173-400 and WAC 173-460.

APPROVED
By Janis Aardal at 1:26 pm, Oct 27, 2025

Approved for Public Release;
Further Dissemination Unlimited

Information Release Station

Was/Is Information Product Approved for Release? ☑ Yes ☐ No

If Yes, what is the Level of Releaser? ☑ Public/Unrestricted ☐ Other (Specify) _____

Date Information Product Stamped/Marked for Release: 10/27/2025

Was/Is Information Product Transferred to OSTI? ☐ Yes ☑ No

Forward Copies of Completed Form to H2C Originator

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  performer-id="267960" username="h0090683">
    <comments>ATTNf Due Tuesday, October 21, 2025 - 4f30 PM Please approve external public release of
    the, Criteria and Toxics Air Emissions Notice of Construction for Remediation and Operations of
    Hanford 241-SY Tank Farm, submitted by Buzz Vickery for the Application for approval of an NOC.
    [Released 10/8/25 into SPF/IDMS, and comment incorporation will require a revision.] Thank you,
    Janis Aardal Information Clearance </comments>
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