

History Sheet

| Rev | Reason for revision | Revised by |
|-----|--|----------------|
| 0 | Initial Issue. | D. Blumenkranz |
| 1 | Corrected abated emissions values in Table D-1 for LB-S1 and LB-S2 emission units for the DFLAW operating configuration (previous abated values were inadvertently doubled). This revision does not impact 24590-WTP-RPT-ENV-18-002, Rev. 0, <i>Radioactive Air Emissions Operating License Application for LAW, LAB, and EMF</i> since only unabated values in Table D-1, revision 0, were used and remain unchanged in revision 1. | D. Blumenkranz |

Contents

| | |
|---|-----------|
| History Sheet | ii |
| Acronyms | v |
| 1 Introduction | 1 |
| 2 Process Description | 1 |
| 2.1 DFLAW Configuration..... | 1 |
| 2.2 Baseline WTP Configuration | 2 |
| 3 Laboratory Emission Units..... | 3 |
| 3.1 Emission Unit LB-S1..... | 3 |
| 3.2 Emission Unit LB-S2..... | 4 |
| 3.3 Emission Unit LB-C2 | 4 |
| 4 Scope | 4 |
| 5 Methodology..... | 5 |
| 5.1 Inputs | 5 |
| 5.2 Assumptions..... | 5 |
| 5.3 Emissions Estimate Approach..... | 7 |
| 5.4 Example Calculations | 7 |
| 5.5 Examples | 8 |
| 6 Annual Possession Quantities | 10 |
| 7 Estimated Emissions..... | 11 |
| 8 References | 11 |
| 8.1 Project References..... | 11 |
| 8.2 Codes | 12 |
| 8.3 Other | 12 |

Appendices

| | |
|---|-----|
| Appendix A Lab Waste/Wastewater Sample Inventory and Mass Released..... | A-i |
| Appendix B Process Stream Mass Fractions..... | B-i |
| Appendix C HEPA Decontamination Factors..... | C-i |
| Appendix D Lab Emissions Estimate..... | D-i |
| Appendix E Annual Possession Quantity Estimate | E-i |

Tables

| | | |
|-----------|--|------|
| Table A-1 | DFLAW Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released..... | A-1 |
| Table A-2 | DFLAW Operating Configuration, Waste/Wastewater Sample Inventory Summation and Mass Released | A-2 |
| Table A-3 | DFLAW Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released by Laser Ablation | A-2 |
| Table A-4 | Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released | A-3 |
| Table A-5 | Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory Summation and Mass Released | A-5 |
| Table A-6 | Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released by Laser Ablation | A-6 |
| Table B-1 | DFLAW Operating Configuration, Mass Fractions for Select Process Streams | B-1 |
| Table B-2 | Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility | B-16 |
| Table B-3 | Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities | B-31 |
| Table C-1 | Constituent Specific Analytical Laboratory HEPA Decontamination Factors..... | C-1 |
| Table D-1 | DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate | D-1 |
| Table D-2 | Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate | D-17 |
| Table D-3 | DFLAW Operating Configuration Mass Released by Laser Ablation | D-35 |
| Table D-4 | Baseline WTP Operating Configuration Mass Released by Laser Ablation..... | D-38 |
| Table E-1 | DFLAW Operating Configuration, Analytical Laboratory Annual Possession Quantity Estimate..... | E-1 |
| Table E-2 | Baseline WTP Operating Configuration, Analytical Laboratory Annual Possession Quantity Estimate..... | E-2 |
| Table E-3 | Lab C2V Ventilation Square Footage | E-4 |
| Table E-4 | LB-C2 General Areas APQ and Emissions Summary | E-4 |

Figures

| | | |
|----------|------------------------------|---|
| Figure 1 | Lab Ventilation System | 2 |
|----------|------------------------------|---|

Acronyms

| | |
|---------|--|
| AHL | analytical hotcell laboratory |
| APPS | Aspen Process Performance Simulation |
| APQ | Annual Possession Quantity |
| ARL | analytical radiological laboratory |
| ASX | autosampling system |
| COPC | constituent of potential concern |
| CRV | concentrate receipt vessel |
| BOF | Balance of Facilities |
| DF | decontamination factor |
| DFLAW | Direct Feed Low-Activity Waste |
| DOE | Department of Energy |
| EMF | Effluent Management Facility |
| HEPA | high-efficiency particulate air (filter) |
| HLW | High-Level Waste (Facility) |
| ICP-AES | inductively coupled plasma-atomic emission spectroscopy |
| ICP-MS | inductively coupled plasma-mass spectrometry |
| IHLW | immobilized high-level waste |
| LA-ICP | laser ablation inductively coupled plasma spectroscopy |
| Lab | Analytical Laboratory |
| LAW | Low-Activity Waste (Facility) |
| LAWPS | Low-Activity Waste Pretreatment System - a generic label used to describe the sample(s) associated with tank farms pretreatment of tank waste feed prior to receipt by the LAW CRV. The actual sample designator has yet to be determined. |
| PT | Pretreatment (Facility) |
| RLD | Radioactive Liquid Waste Disposal System |
| WAC | Washington Administrative Code |
| WDOH | Washington State Department of Health |
| WTP | Hanford Tank Waste Treatment and Immobilization Plant |

1 Introduction

This report is intended to support both radioactive and nonradioactive air permitting efforts associated with operation of the Analytical Laboratory in the Direct Feed Low-Activity Waste (DFLAW) configuration. This report also provides a conservative estimate of potential Hanford Tank Waste Treatment and Immobilization Plant (WTP) Analytical Laboratory (Lab) emissions from each emission unit. This report does not supersede *Non-Radioactive Air Emissions Notice of Construction Modification (2+2) Air Emission Calculation Examples* (24590-WTP-HAC-50-00007) and *Calculations for WTP Laboratory Annual Possession Quantity, Emission Rates, and Dose Rate Estimates* (24590-WTP-HAC-50-00008), which serve as the basis for the current WTP Analytical Laboratory air permits.

2 Process Description

WTP is located on the Hanford Site in southeastern Washington State. WTP will receive chemical and radioactive wastes from the Hanford waste tanks and process these wastes into stable forms of high-level waste and low-activity waste through treatment by vitrification. The WTP may be operated in two processing configurations.

2.1 DFLAW Configuration

WTP will initially be operated in a DFLAW operating configuration involving the Low-Activity Waste (LAW) Facility and the Effluent Management Facility (EMF). In the DFLAW configuration, the tank waste is pretreated by the Hanford Tank Farms. The pretreated LAW feed will bypass the Pretreatment (PT) Facility and will be directly fed to the LAW vitrification facility. The LAW Facility is where the low-activity fraction of the waste is vitrified. The LAW Facility will generate liquid effluents, from various offgas control equipment, that are transferred and treated at the EMF. The EMF will treat the bulk of the effluent by evaporation in the DFLAW configuration. The DFLAW operating configuration is also supported by the Balance of Facilities (BOF) and the Lab. WTP will later be operated in a baseline WTP configuration when the PT Facility and High-Level Waste (HLW) Facility become operational.

The Lab has three emission units: LB-C2, LB-S1, and LB-S2. The building ventilation air associated with general laboratory work areas will be vented through emission unit LB-C2. The C2 areas provide space for equipment that is not expected to be contaminated – such as electrical components, utilities systems components, and instruments – and is ventilated to the C2 ventilation system. The analytical radiological laboratory (ARL) fume hoods will be ventilated to the C3 emission unit LB-S1. Liquid effluents from ARL flow to the laboratory area sink drain collection vessel RLD-VSL-00164 which is ventilated to the C5 emission unit LB-S2.

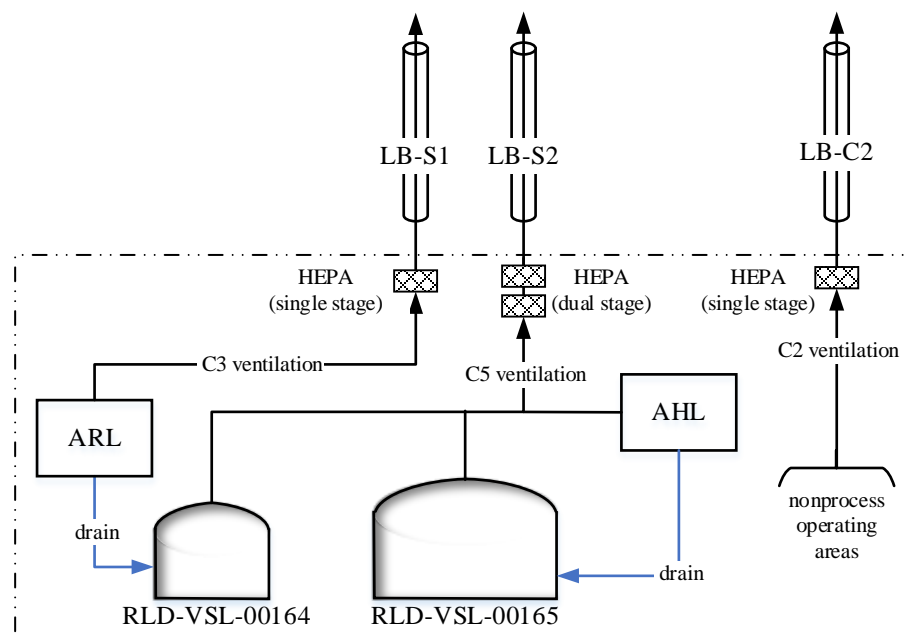
The ARL includes a sample receiving/shipping area designed to manage the inflow of manually transported samples that will be analyzed at the Lab, as well as samples that will be analyzed at off-site laboratories. Samples analyzed off-site are low activity and environmental samples, and do not contribute to the estimated emissions since they are analyzed elsewhere. Fume hoods in the ARL are ventilated to the C3 LB-S1 emission unit. Lab emissions from the ARL are abated by a single stage of high-efficiency particulate air (HEPA) filtration.

Liquid effluents from ARL are discharged to the laboratory area sink drain collection vessel RLD-VSL-00164. Effluents collected in this vessel include rad lab fume hood cupsink drains, C3 maintenance shop sinks, C3 area floor drains, personnel decontamination showers and sinks, and the hotcell access area

airlock floor drains. The laboratory area sink drain collection vessel (RLD-VSL-00164) effluents are transferred to the EMF for processing. RLD-VSL-00164 is ventilated to the LB-S2 emission unit.

Figure 1 provides a simplified illustration of the Lab ventilation system.

Figure 1 Lab Ventilation System



Note that RLD-VSL-00165 and the analytical hotcell laboratory (AHL) are not operational in the DFLAW configuration.

2.2 Baseline WTP Configuration

In the baseline WTP operating configuration¹, the WTP PT Facility will receive waste from the Hanford Waste Tanks as well as waste from the LAW Facility and HLW recycles. Within the PT Facility, water will be removed from the waste by evaporators to concentrate the waste. The waste is filtered to produce a liquid LAW stream and a high solids HLW stream. Soluble, highly radioactive isotopes in the LAW (primarily cesium) are removed by ion exchange units and transferred to the high-level waste fraction. Treated LAW and HLW will be transferred to their respective vitrification facilities for vitrification. The three production process facilities (PT, HLW, and LAW) are also supported by the BOF and Lab.

In the baseline mission configuration, the Lab will receive samples from each of the production facilities for chemical, radionuclide, and physical analyses. The analyses are to monitor the waste compositions during processing to ensure the safety of operations, support secondary waste characterization, predict glass product quality, and provide evidence of glass product constituent concentrations. The Lab is designed to incorporate the features and capability necessary to support efficient WTP operations and to meet process control, limited technology development, authorization basis, and waste form qualification requirements.

¹ The baseline operating configuration is also known as the integrated operating configuration or the full mission configuration.

In the baseline WTP configuration, both high-activity and low-activity laboratories will be operational. High-activity samples are managed in the analytical hotcell laboratory (AHL). The AHL equipment system is designed to provide the capability for remotely handled sample preparation and analysis of high-activity samples. The hotcells are capable of accepting samples taken automatically from each of the production facilities (using pneumatic transport) and samples that are transported manually into the hotcell. The AHL is ventilated through two stages of HEPA filters through emission unit LB-S2.

Liquid effluent flows collected from hotcell cupsinks, hotcell fume hood drains, hotcell pump and piping valve pits, and the C3 maintenance shop decontamination booth flow directly to the hotcell drain collection vessel RLD-VSL-00165. Effluents are transferred to the PT Facility for processing or recycling. The hotcell drain collection vessel (RLD-VSL-00165) and the decontamination booth are ventilated by the LB-S2 emission unit.

Low-activity samples and diluted high-activity samples will continue to be managed and analyzed in the ARL. The ARL also includes a sample receiving/shipping area designed to manage the inflow of manually transported samples that will be analyzed at the Lab, as well as samples that will be analyzed at off-site laboratories. Samples analyzed off-site are low activity and environmental samples, and are not considered to contribute to the estimated emissions since they are analyzed elsewhere. Fume hoods in these laboratories will be handled by the C3 ventilation system and vented through emission unit LB-S1. Lab emissions from the ARL are treated through a single stage of HEPA filters.

Liquid effluents from ARL and maintenance activities flow to the laboratory area sink drain collection vessel RLD-VSL-00164. Effluents collected in this vessel include rad lab fume hood cupsink drains, C3 maintenance shop sinks, C3 area floor drains, personnel decontamination showers and sinks, and the hotcell access area airlock floor drains. The laboratory area sink drain collection vessel (RLD-VSL-00164) effluents are transferred to the PT Facility for processing. RLD-VSL-00164 is ventilated to the LB-S2 emission unit.

3 Laboratory Emission Units

The preparation and analysis of sample material is performed by two systems, which includes the ARL and the AHL. The analytical laboratory ventilation systems include C1V, C2V, C3V, and C5V systems to provide a hierarchy for pressure control and containment similar to other WTP facilities.

3.1 Emission Unit LB-S1

The ARL consists of thirteen laboratories and is designed to support the preparation and analysis of low-to-moderately radioactive samples. The ARL can receive manually and pneumatically transported low-to-moderate activity sample aliquots from the process facilities and other Department of Energy (DOE) facilities. The laboratories also support the analyses of samples diluted, digested, and prepared in the AHL. Each laboratory has specific analytical equipment to perform the intended function. The ARL facilities and equipment required to support these activities are inorganic analysis, quantitation of metals and anions, radionuclide separation and counting, sample receipt and manual transport, preparation of glass samples for elemental analysis, general physical properties analysis, and management of outsourced samples.

Fume hoods in these laboratories will be handled by the C3 ventilation system and vented through emission unit LB-S1. These streams will be processed through a one-stage HEPA filtration system. Within the ARL, non-organic liquid wastes will be disposed in the lab sink drain and drained to the associated collection vessel (RLD-VSL-00164) for eventual transfer to EMF or recycle back into the

WTP process. The vessel is vented through the C5 ventilation system to the LB-S2 emission unit. The ARL will operate in the DFLAW and baseline WTP configuration.

3.2 Emission Unit LB-S2

The AHL provides the capability to perform analyses in support of production facilities on samples with high radiation dose rates, primarily the PT and HLW Facilities. The AHL can receive manually and pneumatically transported moderate-to-high activity sample aliquots from the process facilities and/or Hanford Tank Farms. Functions performed within the hotcells use remotely operated master slave manipulators. The AHL equipment is required to support inorganic analysis, quantitation of metals and anions, radionuclide separation and counting, sample receipt, remote transport, dilution, export, and general physical properties analysis.

Ventilation flow from the hotcell area will be routed to the C5 HEPA filtration system. Air cascading into the C5 areas from the adjacent C2 and/or C3 areas will be exhausted through the emission unit LB-S2 by the C5 exhaust fans after passing through two stages of HEPA filters. Within the AHL, non-organic liquid wastes will be disposed in the hotcell floor drain and drained to the associated collection vessel (RLD-VSL-00165) for eventual recycle back into the WTP process. The vessel is vented through the C5 ventilation system. The AHL will only operate in the baseline (WTP baseline) configuration. Associated hotcell laboratories, tank systems, and ventilation systems, will be isolated in the DFLAW configuration, and will not operate until Pretreatment operations begin.

3.3 Emission Unit LB-C2

Building ventilation air associated with general laboratory work areas are vented through emission unit LB-C2. Laboratory areas classified as C2 ventilation areas include non-process general work areas, personnel protective equipment room, decontamination room, radiological control instrument room, sample and materials receiving areas, waste drum management area, exhaust filter/fan rooms, vacuum pump room, and the C2 maintenance shop.

Actual sample preparation and analyses is completed inside fume hoods located in the ARL. As previously discussed, the fume hoods in the ARL and the waste drum management area are exhausted to the C3 ventilation system.

4 Scope

Information from the *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-ES-PE-17-001) was used as the basis for the emissions in this report. The information presented is for permitting only and is not intended for design.

This report contains estimates of potential Lab emissions during routine operations in the DFLAW and baseline operating configurations (each configuration is considered exclusive of the other). For air permitting purposes, this report is only being utilized for emission estimates in the DFLAW configuration.

This report does not consider non-routine sampling, sampling requirements for waste feed acceptance and qualification, limited technology testing, or BOF effluents that are non-hazardous/non-radioactive. These samples are taken on an as-needed basis and cannot be forecasted or sized. To account for uncertainty, the samples received each year have been increased by a factor of 1.5 for both the DFLAW and the baseline WTP configurations.

5 Methodology

5.1 Inputs

The quantity of samples, sample collection frequency, and sample volumes were obtained from the following three references:

- 24590-WTP-PL-PE-16-0001 Rev 1, *WTP Direct Feed Law Integrated Processing Strategy Description*
- 24590-WTP-RPT-PR-14-001 Rev 0, *WTP Analytical Laboratory Sample Inventory*
- 24590-LAB-PL-OP-12-0001 Rev 1, *Integrated Sampling and Analysis Plan (ISAP)*

In addition to the sample data, sample composition is estimated using mass fraction data derived from the results presented in the *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-ES-PE-17-001). The feed vector modeled for both the DFLAW configuration and the baseline WTP configuration was based on bounding vectors presented in *One System - Feed Vector Development in Support of WTP Environmental Risk Assessment Activities* (24590-WTP-RPT-ENV-16-001).

Appendix A and Appendix B summarize the inputs. Typically, 15 mL sample volumes are collected in increments from autosampling system (ASX) sample points in the PT and HLW Facilities, and 35 mL sample volumes from LAW Facility ASX sample points (24590-LAB-PL-OP-12-0001). EMF sample volumes are 30 mL (estimated quantity). The tables in Appendix A show the waste and wastewater samples chosen for estimating along with the representative Aspen Process Performance Simulation (APPS) stream description, density, and total mass emitted from the associated samples. The tables in Appendix B show the stream composition (mass fractions) from 24590-WTP-ES-PE-17-001 that were used to characterize the samples in Appendix A.

5.2 Assumptions

The references cited above provide the best estimate of sample quantities and frequency at the time of this report. Coupled with input from knowledgeable personnel regarding the DFLAW operating configuration, this report provides an accurate forecast based on projected operating conditions. Since Lab planning efforts are still ongoing, a number of conservative assumptions have been applied to provide an estimate that is much higher than actual anticipated emissions to accommodate these uncertainties.

For the purposes of this report, a sample point is defined as the point in the process at which a sample is taken. A sample event can include collection of several subsamples (e.g., three 35-mL ASX bottles filled to 30 mL [or one 90-mL sample] that are sampled from the LAW concentrate receipt vessel). The sample volume is assumed to represent the amount of material that could be subject to release of constituents of potential concern (COPC) into the Lab ventilation system, without regard to the bottle shape (e.g., narrow or wide-mouthed bottle). Likewise, there is no presumption of the presence of material in the Radioactive Liquid Waste Disposal System (RLD) versus in a bottle, because the release factors applied do not differentiate storage conditions of the effluent. That is, the mass entrainment from 1 kg of liquid in a vessel is the same as the mass that could be entrained from the same mass of liquid in several open sample bottles.

For the purposes of this estimate, all processing of radioactive samples will be performed inside hotcells or laboratory fume hoods. The annual volume of routine samples is considered. There is no accounting for the time a bottle is open or when its contents might be disposed of to the RLD-VSL-00164 or RLD-VSL-00165. A release fraction of 0.001 is applied to the total annual sample volume to estimate emissions, consistent with Washington Administrative Code (WAC) 246-247-030(21)(a), in order to bound the emissions due to the samples and RLD.

A release fraction of 1.0 is applied for the estimated sample material dispersed (0.1 mL)⁽²⁾ in the laser ablation inductively coupled plasma spectroscopy (LA-ICP) analysis. Note that laser ablation is a means of introducing sample material into ICP instrumentation from 0.5-gram glass coupons used to verify projected immobilized waste compositions. As such, volatile constituents, which are destroyed or removed during production of the glass coupon, are not considered in the release of material from such samples³. Release of these constituents is considered in application of the release fraction of 0.001 to the total volume of sample material.

Prior to discharge to the atmosphere, the ARL emissions will pass through a single-stage HEPA filter with a decontamination factor (DF) of 2000 via the LB-S1 stack. The AHL and both RLD-VSL-00164 or RLD-VSL-00165 vessel emissions will pass through two-stage HEPA filtration, with the first bank credited for a DF of 2000, and the second bank credited for a DF of 100, prior to discharge through the LB-S2 emission unit. The chosen DF values are consistent with the Washington State Department of Health (WDOH) approved Best Available Radionuclide Control Technology identified in the Laboratory *Radioactive Air Emissions* approvals (NOC 1044, NOC 1045, and NOC 1046). Only aerosols, particulate matter, and particulate-bound compounds are credited with abatement by HEPA filtration. Volatiles, such as organic compounds and gases, are assumed to pass through the HEPA filters.

Since samples analyzed in the ARL may undergo prior handling in the AHL (e.g., size reduction, dilution, and preparation), the contribution of ARL samples is also included in the Annual Possession Quantity (APQ) for the AHL emissions unit.

Because of the conservatism to the approach to estimating Lab emissions, process water samples (e.g., Balance of Facilities samples) and non-routine samples are not considered part of the total annual volume of sample material brought into the Lab. Outsourced samples are not considered, because they remain sealed and are subject to holding time constraints. Only waste and wastewater samples are considered in the estimate of the annual sample volume. Since the samples will be exposed to the atmosphere, the assumed release fraction of 0.001, applied to an annual inventory, will overestimate the actual emissions. A release fraction of 1.0 is applied for estimated sample material dispersed in laser ablation for both the DFLAW and baseline configurations.

Based on the types of analytical activities occurring and because fossil fuel combustion is not present, criteria pollutant emissions from the Lab emission units are less than WAC 173-400-110(5) exemption levels.

² One conservative estimate of material removed per sample is $0.05 \text{ cm} \times 0.05 \text{ cm} \times 0.05 \text{ cm} = 0.000125 \text{ cm}^3$ or 0.000125 mL. An assumed volume of 0.1 mL provides a conservative estimate of the amount of material dispersed.

³ For this emissions estimate, volatile constituents include organics, inorganics, and radionuclides not retained in glass.

5.3 Emissions Estimate Approach

The approach is similar to what was done in the previous emissions estimate, *Calculations for WTP Laboratory Annual Possession Quantity, Emission Rates, and Dose Rate Estimates* (24590-WTP-HAC-50-00008) that supported the existing radioactive air permit. The total annual volume of sample material for each sample was multiplied by the mass fraction of each constituent from a corresponding or representative bounding process stream to derive a sample concentration. The emissions of each constituent were then estimated by applying a release factor derived in accordance with WAC 246-247-030(21)(a). Although WAC 246-247-030 is specific to radionuclides, the same release fraction was applied to non-radionuclides for consistency and conservatism.

5.4 Example Calculations

The following equation is used to compute the total sample volume associated with a specific sample, collected annually with a factor of 1.5 used for conservatism.

$$V_{sample} = 1.5 \cdot N_{sample} \cdot n_{subsample} \cdot v_{subsample} \quad \text{Equation 1}$$

where:

- V_{sample} = The total volume of sample material collected annually (mL/year)
- N_{sample} = The number of sample events occurring annually (rounded) (events/year)
- $n_{subsample}$ = The number of subsamples in a single sampling event (subsample/event)
- $v_{subsample}$ = The volume of each subsample collected (mL/subsample)

The next equation is used to compute the annual release in grams per second (g/s) or curies per second (Ci/s) from all the samples characterized by stream reported in 24590-WTP-ES-PE-17-001.

$$Q = \Sigma V_{sample} \cdot d \cdot r \cdot CF \quad \text{Equation 2}$$

where:

- Q = Emissions rate, as characterized by a specific process stream and analysis with associated release r (g/s)
- ΣV_{sample} = The total volume (summation) of sample material collected annually, as characterized by a specific process stream and analysis with associated release r (mL/year)
- d = Density of the process stream (kg/m³)
- r = Depending on the associated analysis, a release rate 0.001 or 1 (laser ablation) is applied (unitless)
- CF = Conversion factor $\left(\frac{10^{-6} \text{ m}^3/\text{mL} \cdot 10^3 \text{ g/kg}}{31536000 \text{ s/yr}} \right)$

Adding the values of Q for each associated process stream yields the total emissions characterized by that stream. Using the stream reports in 24590-WTP-ES-PE-17-001, the amount emitted for any particular COPC is simply the product of the total mass emissions rate and the mass fraction of the COPC in the stream.

$$Q_{COPC} = \Sigma(Q \cdot MF_{COPC}) \times a \quad \text{Equation 3}$$

where:

- Q_{COPC} = Emissions rate of a COPC (g/s or Ci/s)
- Q = Emissions rate, as characterized by a specific process stream (g/s or Ci/s)
- MF_{COPC} = Mass fraction of the COPC in the process stream (unitless)

a = Specific activity of the radionuclide (if applicable) (Ci/g)

Summing the contribution of each process stream (ΣQ_{COPC}) then yields the total COPC emitted. For radionuclides, application of the radionuclide specific activity (a) is used to convert radionuclide masses to their activity and vice versa (see 10 CFR 71, Subpart H, Appendix A).

Emitted particulate and aerosol COPCs are then subject to HEPA abatement prior to discharge. As described in Section 2, samples in the ARL fume hoods are exhausted through the LB-S1 emission unit, subject to filtration through a single-stage HEPA filter. Samples in the AHL and emissions from the RLD vessels are exhausted through the LB-S2 emission unit, subject to filtration through two stages of HEPA filters. The predicted unabated emissions are divided by the corresponding emission unit HEPA filter DF to arrive at the abated emissions rate.

5.5 Examples

5.5.1 HLW Melter Feed and Laser Ablation Example

In the baseline WTP operating configuration, sample HLW 2b is collected from two HLW Melter Prep Vessels (HFP-VSL-00001 and HFP-VSL-00005). Eight 15-mL ASX bottles are collected at each sampling event. In the baseline WTP configuration, each vessel is sampled 162 times per year. Using Equation 1, the volume of material collected annually from each vessel is;

$$V_{sample} = 1.5 \cdot 162 \text{ samples/yr} \cdot 8 \text{ subsamples} \cdot 15 \text{ mL} = 29,160 \text{ mL/yr}$$

However, on a less frequent basis (9 times a year), radionuclide composition samples for immobilized high-level waste (IHLW) production are also collected from the same vessels. The quantity collected from each vessel for sample HLW 2c is;

$$V_{sample} = 1.5 \cdot 9 \text{ samples/yr} \cdot 8 \text{ subsamples} \cdot 15 \text{ mL} = 1620 \text{ mL/yr}$$

The samples are collected after glass former additions and are best characterized by process stream HFP03, which has a density of 1251.94 kg/m³. Using Equation 2, the potential emissions from the HLW 2b samples of the two vessels are;

$$Q = \left(29,160 \frac{\text{mL}}{\text{yr}} + 29,160 \frac{\text{mL}}{\text{yr}} \right) \cdot 1251.94 \frac{\text{kg}}{\text{m}^3} \cdot 0.001 \cdot \frac{10^{-6} \text{ m}^3/\text{mL} \cdot 10^3 \text{ g/kg}}{31536000 \text{ s/yr}} = 2.32\text{E-}06 \frac{\text{g}}{\text{s}}$$

The portion potentially released from sample HLW 2c is;

$$Q = \left(1620 \frac{\text{mL}}{\text{yr}} + 1620 \frac{\text{mL}}{\text{yr}} \right) \cdot 1251.94 \frac{\text{kg}}{\text{m}^3} \cdot 0.001 \cdot \frac{10^{-6} \text{ m}^3/\text{mL} \cdot 10^3 \text{ g/kg}}{31536000 \text{ s/yr}} = 1.29\text{E-}07 \frac{\text{g}}{\text{s}}$$

The cumulative portion of mass released that is characterized by process stream HFP03 is 2.32E-06 g/s + 1.29E-07 g/s = 2.45E-06 g/s, without consideration of samples introduced by laser ablation.

The HLW 2b samples are subject to varying analyses, including ICP-MS/ICP-AES with sample preparation by laser ablation. The volume attributed to the release due to the laser ablation process is;

$$V_{sample} = 1.5 \cdot 162 \text{ samples/yr} \cdot 8 \text{ subsamples} \cdot 0.1 \text{ mL} = 194 \text{ mL/yr}$$

The portion emitted from the laser ablation of the IHLW glass coupon samples is computed as well. The density of the IHLW from stream HMP09 is used for glass coupon;

$$Q = \left(194 \frac{\text{mL}}{\text{yr}} + 194 \frac{\text{mL}}{\text{yr}}\right) \cdot 2400.05 \frac{\text{kg}}{\text{m}^3} \cdot 1 \cdot \frac{10^{-6} \text{ m}^3/\text{mL} \cdot 10^3 \text{ g/kg}}{31536000 \text{ s/yr}} = 2.96\text{E-}05 \frac{\text{g}}{\text{s}}$$

The emission of a specific COPC associated with sample HLW 2b and 2c can then be estimated from the mass fractions reported in 24590-WTP-ES-PE-17-001. The mass fraction of strontium-90 (⁹⁰Sr) in stream HFP03 is reported at 2.58E-07. To estimate the mass fraction of ⁹⁰Sr in IHLW that is emitted from laser ablation, the ⁹⁰Sr mass fraction in HFP03 (2.82E-07) is multiplied by the ratio of the stream density to the glass density ($d_{\text{HFP03}} : d_{\text{HMP09}}$), because the glass former additions reduce the constituent mass fraction proportionately. Adding the quantity released from laser ablation to the amount potentially released by the other samples yields the total potential mass of ⁹⁰Sr release, as characterized by HFP03.

$$Q_{\text{Sr-90}} = 2.45\text{E-}06 \frac{\text{g}}{\text{s}} \cdot 2.82\text{E-}07 + 2.96\text{E-}05 \frac{\text{g}}{\text{s}} \cdot \frac{1251.94 \frac{\text{kg}}{\text{m}^3}}{2400.05 \frac{\text{kg}}{\text{m}^3}} \cdot 2.82\text{E-}07 = 5.05\text{E-}12 \frac{\text{g}}{\text{s}}$$

Applying the specific activity of ⁹⁰Sr found in Table A-1 of 10 CFR 71 (140 Ci/g) yields an emissions rate of 7.06E-10 Ci/s.

A portion of HLW 2b samples will be diluted, exported to ARL, and analyzed/counted in the ARL counting room. The remaining portion of HLW 2b samples are analyzed in the AHL; therefore, the associated emissions are filtered by a two-stage HEPA filter before exhausting through emissions unit LB-S2. However, since the amount and dilution of the HLW 2b subaliquot is unknown, it is assumed to be analyzed in the AHL and exhausted through the C5 ventilation system. The DF associated with two-stage HEPA filtration is 200,000. The resulting abated ⁹⁰Sr release associated with HLW 2b is therefore 3.53E-15 Ci/s after HEPA filtration. Application of a factor of 1.5 (a contingency factor, see Section 4) is used, in part, to compensate with uncertainties associated with the portion of HLW 2b samples that is exported to the ARL.

Since equations 1 through 3 have cumulative properties, emissions for each constituent in Appendix D were computed from the mass released for each process stream, times the mass fraction of each constituent in the process stream, summed for all samples attributed the PT, LAW, and HLW facilities and EMF, as appropriate for the operating configuration presented. Appendix D provides additional detail, as does the following example for DFLAW.

5.5.2 Example DFLAW Process Sample

This example for the DFLAW emissions estimate of ⁶³Ni illustrates how the cumulative properties of Equations 1 through 3 are applied to derive gross emissions for the constituent. The DFLAW effluents are represented by process streams LCP01, LFP04, RLD21, DEP13, and DEP20 (refer to Appendix A). Based on inputs in Table A-1, the total mass released associated with each representative stream can be computed (Table A-2). For example, applying Equation 1 for the Low-Activity Waste Pretreatment System (LAWPS) 1A/1B samples⁴ yields 15795 mL/yr, and for LAW 1A/1B yields 36956 mL/yr (see Table A-1). Both samples are represented by process stream LCP01, and their total mass in Table A-2 is 52751 mL/yr. The annual release represented by stream LCP01 (computed using Equation 2) is 2.12E-06 g/s. The same quantity is computed for other representative process streams as shown in Table A-2. The fraction release through laser ablation of the LAW 6 sample is shown in Table A-3. Process stream mass fractions are summarized in Appendix B, and specific activities are available in 10 CFR 71,

⁴ LAWPS 1A/1B is a generic label used to describe the sample(s) associated with tank farms pretreatment of tank waste feed prior to receipt by the LAW concentrate receipt vessel (CRV). The actual sample designator has yet to be determined.

Subpart H, Appendix A. Note that the mass fraction for the ablated sample (2.51E-11 from Table B-1) must be multiplied by the ratio of the stream density to the glass density ($[1556.05 \text{ kg/m}^3]/[2437.05 \text{ kg/m}^3]$) to account for the impact of glass formers. Using Equation 3, the total release for ^{63}Ni can be computed as follows:

$$Q_{63\text{Ni}} = \left(Q_{LCP01} \cdot MF_{LCP01, 63\text{Ni}} + Q_{LFP04} \cdot MF_{LFP04, 63\text{Ni}} + Q_{RLD21} \cdot MF_{RLD21, 63\text{Ni}} + Q_{ablation} \cdot MF_{ablation, 63\text{Ni}} \right) \times a_{63\text{Ni}}$$

$$Q_{63\text{Ni}} = \left(\begin{array}{l} 2.12\text{E-}06 \frac{\text{g}}{\text{s}} \cdot 4.27\text{E-}11 + 6.08\text{E-}07 \frac{\text{g}}{\text{s}} \cdot 2.51\text{E-}11 + \\ 5.42\text{E-}07 \frac{\text{g}}{\text{s}} \cdot 5.39\text{E-}13 + 3.71\text{E-}06 \frac{\text{g}}{\text{s}} \cdot 1.60\text{E-}11 \end{array} \right) \times 57 \frac{\text{Ci}}{\text{g}} = 8.95\text{E-}15 \frac{\text{Ci}}{\text{s}}$$

This is the value shown in Table D-1 for the unabated emissions of ^{63}Ni associated with the LAW Facility samples analyzed by the Lab (unabated release). Samples associated with LAW Facility support of the DFLAW operating configuration are analyzed in the ARL and ventilated through a single-stage HEPA filter. After applying the corresponding DF of 2000, the resulting abated emissions are 4.47E-18 Ci/s. When combined with emissions associated with analysis of EMF samples, the total ^{63}Ni emission rate is 4.51E-18 Ci/s (EMF samples contribute 3.27E-20 Ci/s to abated ^{63}Ni emissions).

6 Annual Possession Quantities

The WAC 246-247, *Radiation Protection – Air Emissions*, requires permittees to estimate an APQ for radioactive air emission units. The APQ is defined in WAC 246-247-030(5) as the sum of the quantity of a radionuclide on hand at the beginning of the calendar year and the quantity of that radionuclide received or produced during the calendar year. In this document, APQ is the annual radionuclide content prior to applying the release fraction of 0.001.

In the DFLAW configuration, the APQ is assumed to be the same for emission units LB-S1 and LB-S2 because waste samples from the ARL can be discharged into RLD-VSL-00164 which then vents to the LB-S2 emission unit. APQs for LB-S1 and LB-S2 are in Table E-1.

In the baseline WTP configuration, APQ is different for the LB-S2 and the LB-S1 emission units as the LB-S2 includes HLW and PT waste samples from the AHL. There is conservatism in the LB-S2 APQ as well, because it sums the waste samples used in the ARL with the AHL. APQ from the ARL is included for the LB-S2 emission unit, because waste samples from the ARL can be discharged into RLD-VSL-00164 which then vents to the LB-S2 emission unit. APQs for LB-S1 and LB-S2 are in Table E-2.

The LB-C2 emission unit APQ is estimated by multiplying the assumed contaminated floor surface area that ventilates to the C2 ventilation system by the C2 surface contamination limits in disintegrations per minute per 100 square centimeters (dpm/100 cm²). The emission rates are then determined by multiplying the C2 APQ by the release fraction of 0.001. C2 Area emission estimate assumptions are provided below:

- The C2 areas within the Lab will have surface contamination limits of 1,000 disintegrations per minute (dpm)/100 cm² for total beta (β) (24590-WTP-3DI-W12W-00004). A 20 dpm/100 cm² was assumed for total alpha (α).
- The assumed C2 floor surface areas were calculated based on the room dimensions. Each room has a reference which confirms the ventilation system contamination classification and square

footage. It is conservatively assumed that approximately 20% of the C2 floor surfaces will have the potential for surface contamination.

- ^{241}Am and ^{90}Sr are used to represent the total α and β emissions.
- $3.7\text{E}+10$ disintegrations per second per curie is used to convert disintegrations to curies.

Refer to Table E-3 for the Lab C2V ventilation square footage and to Table E-4 for emissions summary for the baseline configuration.

7 Estimated Emissions

The estimated emissions are reported in Appendix D. Table D-1 provides the DFLAW emission estimates, and Table D-2 provides the baseline WTP configuration estimates. The results are the culmination of the data in the preceding appendices.

8 References

8.1 Project References

CCN 298036, letter, J Martell (Washington State Department of Health) to K Smith (US Department of Energy), *Approval of Notice of Construction (NOC) 1046 for the Hanford Tank Waste Treatment and Immobilization Plant (WTP)*, AIR 17-416, NOC 1046. 24 April 2017.

CCN 298040, letter, J Martell (Washington State Department of Health) to K Smith (US Department of Energy), *Approval of Notice of Construction (NOC) 1045 for the Hanford Tank Waste Treatment and Immobilization Plant (WTP)*, AIR 17-412, NOC 1045. 24 April 2017.

CCN 298047, letter, K Smith (US Department of Energy) to J Martell (Washington State Department of Health), *Request for Revision of the Hanford Tank Waste Treatment and Immobilization Plant Analytical Laboratory Radioactive Air Emissions Approval*, 17-ECD-0025. 3 May 2017.

24590-LAB-PL-OP-12-0001, Rev 1, *Integrated Sampling and Analysis Plan (ISAP)*.

24590-WTP-3DG-W12W-00002, Rev 1, *Guidance for Non-Accident Related Radiological Engineering Deliverables*.

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant*.

24590-WTP-3DI-W12W-00004, Rev 0, *Classification of Areas for Design*.

24590-WTP-HAC-50-00007, Rev A, *Non-Radioactive Air Emissions Notice of Construction Modification (2+2) Air Emission Calculation Examples*.

24590-WTP-HAC-50-00008, Rev B, *Calculations for WTP Laboratory Annual Possession Quantity, Emission Rates, and Dose Rate Estimates*.

24590-WTP-PL-PE-16-0001, Rev 1, *WTP Direct Feed Low Integrated Processing Strategy Description*.

24590-WTP-PL-PR-04-0001, Rev 3, *Integrated Sampling and Analysis Requirements Document (ISARD)*.

24590-WTP-RPT-PR-14-001, Rev 0, *WTP Analytical Laboratory Sample Inventory*.

24590-WTP-RPT-ENV-01-008, Rev 4, *Radioactive Air Emissions Notice of Construction Permit Application for the Hanford Tank Waste Treatment and Immobilization Plant*.

24590-WTP-RPT-ENV-14-002, Rev 1, *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant*.

24590-WTP-RPT-ENV-16-001, Rev 0, *One System - Feed Vector Development in Support of WTP Environmental Risk Assessment Activities*.

8.2 Codes

10 CFR 71, Subpart H, Appendix A to Part 71—Determination of A₁ and A₂. *Nuclear Regulatory Commission, Packaging and Transportation of Radioactive Material*. Code of Federal Regulations.

WAC 246-247. *Radiation Protection—Air Emissions, Definitions*. Washington Administrative Code. Olympia, WA.

8.3 Other

Shleien, B. (Ed.). 1992. *The Health Physics and Radiological Health Handbook*. Revised Edition, Scinta Inc., ISBN 0-917251-05-9.

Appendix A

Lab Waste/Wastewater Sample Inventory and Mass Released

Appendix A

Lab Waste/Wastewater Sample Inventory and Mass Released

Table A-1 identifies the waste and wastewater samples from *WTP Direct Feed LAW Integrated Processing Strategy Description* (24590-WTP-PL-PE-16-0001). Annual sample quantities are multiplied by a factor of 1.5 for conservatism. Sample volumes (30 mL) are assumed.

Table A-1 DFLAW Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released

| Sample Point | Description | Stream Used for Mass Fractions | Sample Bottles per Event | Sample Events | Samples per Year for WTP Lab* | Sample Volume (mL) per Bottle | Sample Volume (mL) to Lab per Year | Stream Density (kg/m ³) | Release Fraction | Total Mass Released (g/s) |
|--------------|---|--------------------------------|--------------------------|---------------|-------------------------------|-------------------------------|------------------------------------|-------------------------------------|------------------|---------------------------|
| LAWPS 1A/1B | LAWPS lag vessels | LCP01 | 3 | 117 | 527 | 30 | 15795 | 1268.52 | 0.001 | 6.35E-07 |
| LAW 1A/1B | LAW Concentrate Receipt Vessel | LCP01 | 3 | 274 | 1232 | 30 | 36956 | 1268.52 | 0.001 | 1.49E-06 |
| LAW 3 | Plant Wash Vessel | RLD21 | 1 | 12 | 18 | 30 | 540 | 1001.78 | 0.001 | 1.72E-08 |
| LAW 6 | LAW Melter Feed Preparation Vessel | LFP04 | 1 | 274 | 411 | 30 | 12319 | 1556.05 | 0.001 | 6.08E-07 |
| LAW 10A/10B | SBS Condensate Collection Vessel | RLD21 | 1 | 367 | 551 | 30 | 16515 | 1001.78 | 0.001 | 5.25E-07 |
| EMF 1A/1B | Evaporator Concentrate Vessel DEP-VSL-00003 A/B/C | DEP13 | 1 | 91 | 137 | 30 | 4106 | 1057.51 | 0.001 | 1.38E-07 |
| EMF 2 | Overhead Condensate Vessel RLD-VSL-00004 A/B | DEP20 | 1 | 365 | 548 | 20 | 10950 | 999.99 | 0.001 | 3.47E-07 |
| EMF 3 | ETF/LERF lag storage Vessels RLD-VSL-00005 A/B | DEP20 | 1 | 73 | 110 | 20 | 2190 | 999.99 | 0.001 | 6.94E-08 |

* Includes a contingency factor of 1.5.

ILAW glass density is 2437.05 kg/m³ and IHLW glass density is 2400.05 kg/m³.

Refs: 24590-WTP-PL-PE-16-0001, Rev 0, *WTP Direct Feed Law Integrated Processing Strategy Description*

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (stream densities only)

Table A-2 provides a summation of the annual sample quantities in Table A-1, summed according to the process stream used to represent the mass fraction of waste components in the samples.

Table A-2 DFLAW Operating Configuration, Waste/Wastewater Sample Inventory Summation and Mass Released

| Facility | Representative Stream Name | Representative Stream Number (used for summation and density) | Sample Total Volume (ml) to Lab per Year * | Stream Density (kg/m ³) | Sample Total Mass (g) to Lab per Year | Release Fraction | Total Mass Released (g/s) | Sample Location in Lab |
|----------|----------------------------|---|--|-------------------------------------|---------------------------------------|------------------|---------------------------|------------------------|
| LAW | LCP01 LAW Conc | LCP01 | 52751 | 1268.51 | 66916 | 0.001 | 2.12E-06 | ARL |
| LAW | LFP04 Melter Feed | LFP04 | 12319 | 1556.05 | 19169 | 0.001 | 6.08E-07 | ARL |
| LAW | RLD21 Rad Liquid | RLD21 | 17055 | 1001.78 | 17085 | 0.001 | 5.42E-07 | ARL |
| EMF | DEP13 Conc Recycle | DEP13 | 4106 | 1057.51 | 4342 | 0.001 | 1.38E-07 | ARL |
| EMF | DEP20 Rad Cond | DEP20 | 13140 | 999.98 | 13140 | 0.001 | 4.17E-07 | ARL |

* Includes a contingency factor of 1.5.

LAW glass density is 2449.00 kg/m³.

Refs: 24590-WTP-PL-PE-16-0001, Rev 0, *WTP Direct Feed Law Integrated Processing Strategy Description*

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (stream densities only)

Table A-3 identifies those samples for which the laser ablation sample preparation method is used and their corresponding mass release.

Table A-3 DFLAW Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released by Laser Ablation

| Sample Point | Description | Stream Used for Mass Fractions | Glass Samples per Year for WTP Lab * | Ablated Material Volume (ml) per Bottle | Sample Volume (ml) Vaporized per Year | Sample Location in Lab | Stream Density (kg/m ³) | Release Fraction | Total Mass Released (g/s) |
|--------------|------------------------------------|--------------------------------|--------------------------------------|---|---------------------------------------|------------------------|-------------------------------------|------------------|---------------------------|
| LAW 6 | LAW Melter Feed Preparation Vessel | LFP04 | 411 | 0.1 | 41 | ARL | 2437.05 | 1 | 3.17E-06 |

* Includes a contingency factor of 1.5.

Refs: 24590-WTP-RPT-PR-14-001, Rev 0, *WTP Analytical Laboratory Sample Inventory*

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (stream densities only)

Table A-4 identifies waste and wastewater samples from *WTP Analytical Laboratory Sample Inventory* (24590-WTP-RPT-PR-14-001) considered in the Lab emissions estimate.

Table A-4 Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released

| Sample Point | Description | Representative Stream Number | Sample Bottles per Event | Sample Events | Samples per Year for WTP Lab * | Sample Volume (ml) per Bottle | Sample Volume (ml) to Lab per Year | Stream Density (kg/m ³) | Release Fraction | Total Mass Released (g/s) |
|-----------------|---|------------------------------|--------------------------|---------------|--------------------------------|-------------------------------|------------------------------------|-------------------------------------|------------------|---------------------------|
| PT 2 (SF) | Waste Feed Receipt Vessels | FRP01 | 1 | 48 | 72 | 15 | 1080 | 1309.66 | 0.001 | 4.49E-08 |
| PT 2 (WS) | Waste Feed Receipt Vessels | FRP01 | 1 | 48 | 72 | 15 | 1080 | 1309.66 | 0.001 | 4.49E-08 |
| PT 2a | Waste Feed Receipt Vessels | FRP01 | 1 | 48 | 72 | 15 | 1080 | 1309.66 | 0.001 | 4.49E-08 |
| PT 6b (UFP-62A) | UFP Permeate Collection Vessel | UFP33 | 2 | 30 | 90 | 15 | 1350 | 1246.66 | 0.001 | 5.34E-08 |
| PT 6b (UFP-62B) | UFP Permeate Collection Vessel | UFP33 | 2 | 30 | 90 | 15 | 1350 | 1246.66 | 0.001 | 5.34E-08 |
| PT 6b (UFP-62C) | UFP Permeate Collection Vessel | UFP33 | 2 | 30 | 90 | 15 | 1350 | 1246.66 | 0.001 | 5.34E-08 |
| PT 7 | Vessel Vent Caustic Scrubber | PWD01 | 1 | 24 | 36 | 15 | 540 | 1134.88 | 0.001 | 1.94E-08 |
| PT 10 | Cs Evaporator Recovered HNO ₃ Vessel | CNP12 | 1 | 24 | 36 | 15 | 540 | 1324.95 | 0.001 | 2.27E-08 |
| PT 11a | C2 Floor Drain Collection Vessel | PWD01 | 1 | 52 | 78 | 250 | 19500 | 1134.88 | 0.001 | 7.02E-07 |
| PT 12a | Plant Wash Vessel | PWD01 | 1 | 12 | 18 | 15 | 270 | 1134.88 | 0.001 | 9.72E-09 |
| PT 13 | HLW Feed Blending Vessel | HLP09a | 1 | 17 | 26 | 15 | 383 | 1084.41 | 0.001 | 1.32E-08 |
| PT 14a (PWD-15) | Acidic/Alkaline Effluent Vessel | PWD01 | 1 | 12 | 18 | 15 | 270 | 1134.88 | 0.001 | 9.72E-09 |
| PT 14a (PWD-16) | Acidic/Alkaline Effluent Vessel | PWD01 | 1 | 12 | 18 | 15 | 270 | 1134.88 | 0.001 | 9.72E-09 |
| PT 17 | HLW Feed Receipt Vessel | FRP14 | 2 | 12 | 36 | 15 | 540 | 1279.02 | 0.001 | 2.19E-08 |
| PT 17a | HLW Feed Receipt Vessel | FRP14 | 4 | 12 | 72 | 15 | 1080 | 1279.02 | 0.001 | 4.38E-08 |
| PT 17b | HLW Feed Receipt Vessel | FRP14 | 2 | 12 | 36 | 15 | 540 | 1279.02 | 0.001 | 2.19E-08 |
| PT 28 | Treated LAW Collection Vessels | CXP23 | 3 | 548 | 2466 | 15 | 36990 | 1242.99 | 0.001 | 1.46E-06 |
| PT 31a | Spent Resin Collection Vessels | RLD01 | 1 | 1 | 2 | 15 | 23 | 999.27 | 0.001 | 7.13E-10 |
| PT 31b | Spent Resin Collection Vessels | RLD01 | 1 | 1 | 2 | 15 | 23 | 999.27 | 0.001 | 7.13E-10 |

Table A-4 Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released

| Sample Point | Description | Representative Stream Number | Sample Bottles per Event | Sample Events | Samples per Year for WTP Lab * | Sample Volume (ml) per Bottle | Sample Volume (ml) to Lab per Year | Stream Density (kg/m ³) | Release Fraction | Total Mass Released (g/s) |
|------------------|---|------------------------------|--------------------------|---------------|--------------------------------|-------------------------------|------------------------------------|-------------------------------------|------------------|---------------------------|
| PT 35 | Alkaline Effluent Collection Vessels | RDP01 | 1 | 365 | 548 | 15 | 8213 | 997.31 | 0.001 | 2.60E-07 |
| LAW 1a | LAW Concentrate Receipt Vessel | LCP01 | 3 | 274 | 1233 | 35 | 43155 | 1310.39 | 0.001 | 1.79E-06 |
| LAW 1b | LAW Concentrate Receipt Vessel | LCP01 | 3 | 274 | 1233 | 35 | 43155 | 1310.39 | 0.001 | 1.79E-06 |
| LAW 3 | Plant Wash Vessel | RLD21 | 1 | 12 | 18 | 35 | 630 | 999.27 | 0.001 | 2.00E-08 |
| LAW 6 (LFP-1) | LAW Melter Feed Preparation Vessel | LFP04 | 1 | 548 | 822 | 35 | 28770 | 1310.39 | 0.001 | 1.20E-06 |
| LAW 6 (LFP-3) | LAW Melter Feed Preparation Vessel | LFP04 | 1 | 548 | 822 | 35 | 28770 | 1310.39 | 0.001 | 1.20E-06 |
| LAW 10 | SBS Condensate Collection Vessel | RLD21 | 1 | 12 | 18 | 35 | 630 | 999.27 | 0.001 | 2.00E-08 |
| HLW 2a (initial) | HLW Melter Feed Prep Vessels - Before GFC | HCP01 | 4 | 162 | 972 | 15 | 14580 | 1084.41 | 0.001 | 5.01E-07 |
| HLW 2b (final) | HLW Melter Feed Prep Vessels -After GFC | HFP03 | 8 | 162 | 1944 | 15 | 29160 | 1251.94 | 0.001 | 1.16E-06 |
| HLW 2a (initial) | HLW Melter Feed Prep Vessels - Before GFC | HCP01 | 4 | 162 | 972 | 15 | 14580 | 1084.41 | 0.001 | 5.01E-07 |
| HLW 2b (final) | HLW Melter Feed Prep Vessels - After GFC | HFP03 | 8 | 162 | 1944 | 15 | 29160 | 1251.94 | 0.001 | 1.16E-06 |
| HLW 2cA | HLW Melter Feed Prep Vessels - Rad. Invent. | HFP03 | 8 | 9 | 108 | 15 | 1620 | 1251.94 | 0.001 | 6.43E-08 |
| HLW 2cB | HLW Melter Feed Prep Vessels - Rad. Invent. | HFP03 | 8 | 9 | 108 | 15 | 1620 | 1251.94 | 0.001 | 6.43E-08 |
| HLW 3 | HLW Plant Wash & Drains Vessel | RLD62 | 1 | 12 | 18 | 15 | 270 | 1697.19 | 0.001 | 1.45E-08 |
| HLW 4 | HLW Acidic Waste Storage Vessel | RLD62 | 1 | 37 | 56 | 15 | 833 | 1697.19 | 0.001 | 4.48E-08 |

* Includes a contingency factor of 1.5.

Refs: 24590-WTP-RPT-PR-14-001, Rev 0, *WTP Analytical Laboratory Sample Inventory*

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (stream densities only)

Table A-5 provides a summation of the annual sample quantities in Table A-4, summed according to the process stream used to represent the mass fraction of waste components in the samples.

Table A-5 Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory Summation and Mass Released

| Facility | Representative Stream Name | Representative Stream Number (used for summation and density) | Sample Total Volume (ml) to Lab per Year * | Stream Density (kg/m ³) | Sample Total Mass (g) to Lab per Year | Release Fraction | Total Mass Released (g/s) | Sample Location in Lab |
|----------|----------------------------|---|--|-------------------------------------|---------------------------------------|------------------|---------------------------|------------------------|
| PT | FRP01 LAW Waste | FRP01 | 3240 | 1309.66 | 4243 | 0.001 | 1.35E-07 | AHL |
| PT | FRP14 HLW Waste | FRP14 | 2160 | 1279.02 | 2763 | 0.001 | 8.76E-08 | AHL |
| PT | UFP33 UF Permeate | UFP33 | 4050 | 1246.66 | 5049 | 0.001 | 1.60E-07 | AHL |
| PT | CNP12 Cesium Conc | CNP12 | 540 | 1324.95 | 715.5 | 0.001 | 2.27E-08 | AHL |
| PT | CXP23 Treated LAW | CXP23 | 36990 | 1242.99 | 45978 | 0.001 | 1.46E-06 | AHL |
| PT | PWD01 Plant Wash | PWD01 | 20850 | 1134.88 | 23662 | 0.001 | 7.50E-07 | AHL |
| PT | RLD01 Rad Liquid | RDP01 | 8212.5 | 997.31 | 8190 | 0.001 | 2.60E-07 | AHL |
| PT | RDP01 Spent Resin | RLD01 | 45 | 999.27 | 44.97 | 0.001 | 1.43E-09 | AHL |
| LAW | LCP01 LAW Conc | LCP01 | 86310 | 1310.39 | 113100 | 0.001 | 3.59E-06 | ARL |
| LAW | LFP04 Melter Feed | LFP04 | 57540 | 1310.39 | 75400 | 0.001 | 2.39E-06 | ARL |
| LAW | RLD21 Rad Liquid | RLD21 | 1260 | 999.27 | 1259.1 | 0.001 | 3.99E-08 | ARL |
| HLW | HLP09 HLW Blend | HLP09a | 382.5 | 1084.41 | 414.8 | 0.001 | 1.32E-08 | AHL |
| HLW | HCP01 HLW Conc | HCP01 | 29160 | 1084.41 | 31621 | 0.001 | 1.00E-06 | AHL |
| HLW | HFP03 Melter Feed | HFP03 | 61560 | 1251.94 | 77070 | 0.001 | 2.44E-06 | AHL |
| HLW | RLD62 Rad Liquid | RLD62 | 1102.5 | 1697.19 | 1871 | 0.001 | 5.93E-08 | AHL |

* Includes a contingency factor of 1.5.

Refs: 24590-WTP-RPT-PR-14-001, Rev 0, *WTP Analytical Laboratory Sample Inventory*

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (stream densities only)

Table A-6 identifies those samples for which the laser ablation sample preparation method is used and their corresponding mass release.

Table A-6 Baseline WTP Operating Configuration, Waste/Wastewater Sample Inventory and Mass Released by Laser Ablation

| Sample Point | Description | Stream Used for Mass Fractions | Glass Samples per Year for WTP Lab * | Ablated Material Volume (ml) per Bottle | Sample Volume (ml) Vaporized per Year | Sample Location in Lab | Stream Density (kg/m ³) | Release Fraction | Total Mass Released (g/s) |
|----------------|---|--------------------------------|--------------------------------------|---|---------------------------------------|------------------------|-------------------------------------|------------------|---------------------------|
| LAW 6 (LFP-1) | LAW Melter Feed Preparation Vessel A -After GFC | LFP05 | 822 | 0.1 | 82 | ARL | 2437.05 | 1 | 6.35E-06 |
| LAW 6 (LFP-3) | LAW Melter Feed Preparation Vessel B -After GFC | LFP05 | 822 | 0.1 | 82 | ARL | 2437.05 | 1 | 6.35E-06 |
| HLW 2b (final) | HLW Melter Feed Prep Vessels -After GFC | HFP03 | 1944 | 0.1 | 194 | AHL | 2400.05 | 1 | 1.48E-05 |
| HLW 2b (final) | HLW Melter Feed Prep Vessels - After GFC | HFP03 | 1944 | 0.1 | 194 | AHL | 2400.05 | 1 | 1.48E-05 |

* Includes a contingency factor of 1.5.

Refs: 24590-WTP-RPT-PR-14-001, Rev 0, *WTP Analytical Laboratory Sample Inventory*

24590-WTP-ES-PE-17-001, Rev 0, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (stream densities only)

Appendix B

Process Stream Mass Fractions

Appendix B

Process Stream Mass Fractions

Table B-1 summarizes data from Tables A.8-11, A.8-17, and A.8-23 of the *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-ES-PE-17-001). These mass fractions are used to speciate the mass release for Lab samples for the DFLAW operating configuration. A “-” symbol indicates no data are available for approximating the emissions rate (no data were available or the corresponding values were below the model tolerance).

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------------------|------------------|------------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 10028-15-6 | Ozone | Inorganics | - | - | - | - | - |
| 10102-44-0 | Nitrogen dioxide | Inorganics | - | - | - | - | - |
| 124-38-9 | Carbon dioxide | Inorganics | - | - | - | - | - |
| 14265-44-2 | Phosphate | Inorganics | 3.96E-03 | 2.40E-03 | 6.30E-05 | 8.70E-04 | 6.94E-08 |
| 14797-55-8 | Nitrate | Inorganics | 1.25E-01 | 7.37E-02 | 1.69E-07 | 1.27E-02 | 1.36E-05 |
| 14797-65-0 | Nitrite | Inorganics | 5.91E-02 | 3.47E-02 | 7.95E-08 | 5.98E-03 | 1.99E-07 |
| 14808-79-8 | Sulfate | Inorganics | 3.48E-03 | 2.09E-03 | 5.98E-07 | 3.61E-04 | 4.06E-08 |
| 16887-00-6 | Chloride | Inorganics | 4.51E-03 | 2.65E-03 | 2.85E-03 | 2.18E-02 | 3.98E-04 |
| 16984-48-8 | Fluoride | Inorganics | 8.99E-04 | 5.28E-04 | 7.40E-04 | 5.62E-03 | 8.12E-06 |
| 18540-29-9 | Chromium VI | Inorganics | 5.18E-04 | 3.22E-04 | 5.36E-05 | 4.57E-04 | 1.03E-09 |
| 22967-92-6 | Methyl mercury | Inorganics | - | - | - | - | - |
| 24959-67-9 | Bromide | Inorganics | - | - | - | - | - |
| 57-12-5 | Cyanide | Inorganics | 1.59E-06 | 9.36E-07 | - | 1.61E-07 | 1.31E-11 |
| 593-74-8 | Dimethyl Mercury | Inorganics | 5.57E-10 | 5.18E-10 | 9.11E-10 | 4.99E-11 | 9.39E-13 |
| 630-08-0 | Carbon monoxide | Inorganics | - | - | - | - | - |
| 7429-90-5 | Aluminum | Inorganics | 3.85E-03 | 1.30E-02 | 5.69E-05 | 8.16E-04 | 2.51E-08 |
| 7439-89-6 | Iron | Inorganics | 7.90E-05 | 1.53E-02 | 6.53E-05 | 4.96E-04 | 3.01E-10 |
| 7439-92-1 | Lead | Inorganics | 1.31E-04 | 7.72E-05 | 3.26E-06 | 3.65E-05 | 1.01E-07 |
| 7439-93-2 | Lithium | Inorganics | 5.61E-06 | 3.30E-06 | 7.18E-08 | 1.10E-06 | 8.96E-11 |
| 7439-95-4 | Magnesium | Inorganics | 1.93E-06 | 3.60E-03 | 1.24E-06 | 1.96E-05 | 1.61E-09 |
| 7439-96-5 | Manganese | Inorganics | 1.48E-06 | 4.18E-05 | 6.76E-07 | 1.49E-05 | 8.05E-10 |
| 7439-97-6 ¹ | Mercury | Inorganics | - | - | - | - | - |
| 7439-98-7 | Molybdenum | Inorganics | 1.77E-05 | 1.04E-05 | 3.30E-07 | 4.24E-06 | 3.45E-10 |
| 7440-02-0 | Nickel | Inorganics | 1.61E-06 | 3.66E-05 | 6.89E-07 | 5.31E-06 | 1.68E-11 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|-----------|--|------------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 7440-16-6 | Rhodium | Inorganics | 4.35E-12 | 2.56E-12 | 5.52E-14 | 4.41E-11 | 3.58E-15 |
| 7440-22-4 | Silver | Inorganics | 5.56E-07 | 3.27E-07 | 1.04E-08 | 1.37E-07 | 1.11E-11 |
| 7440-23-5 | Sodium | Inorganics | 9.16E-02 | 5.38E-02 | 2.71E-03 | 2.94E-02 | 2.44E-03 |
| 7440-24-6 | Strontium (total) | Inorganics | 5.69E-08 | 3.34E-08 | 5.48E-10 | 9.97E-09 | 3.42E-15 |
| 7440-25-7 | Tantalum | Inorganics | 8.74E-12 | 5.14E-12 | 1.10E-13 | 1.70E-12 | 1.38E-16 |
| 7440-28-0 | Thallium | Inorganics | 5.42E-11 | 3.18E-11 | 1.77E-11 | 5.08E-10 | 4.02E-14 |
| 7440-31-5 | Tin | Inorganics | - | - | - | - | - |
| 7440-33-7 | Tungsten | Inorganics | 3.15E-05 | 1.85E-05 | 3.96E-07 | 6.14E-06 | 4.99E-10 |
| 7440-36-0 | Antimony | Inorganics | 1.29E-05 | 7.59E-06 | 3.18E-06 | 2.50E-05 | 2.03E-09 |
| 7440-38-2 | Arsenic | Inorganics | 1.73E-05 | 1.02E-05 | 4.25E-06 | 3.34E-05 | 2.72E-09 |
| 7440-39-3 | Barium | Inorganics | 7.33E-09 | 4.31E-09 | 6.97E-11 | 1.88E-09 | 1.52E-13 |
| 7440-41-7 | Beryllium | Inorganics | 7.88E-07 | 4.63E-07 | 9.91E-09 | 1.54E-07 | 1.25E-11 |
| 7440-43-9 | Cadmium | Inorganics | 3.37E-06 | 2.60E-06 | 5.07E-08 | 7.20E-07 | 5.11E-11 |
| 7440-47-3 | Chromium III | Inorganics | 5.18E-04 | 3.22E-04 | 5.36E-05 | 4.57E-04 | 1.03E-09 |
| 7440-48-4 | Cobalt | Inorganics | 1.25E-10 | 7.32E-11 | 1.18E-12 | 1.26E-09 | 1.03E-13 |
| 7440-50-8 | Copper | Inorganics | 1.00E-06 | 5.89E-07 | 9.54E-08 | 8.14E-07 | 7.01E-11 |
| 7440-61-1 | Uranium | Inorganics | 1.70E-05 | 9.98E-06 | 2.14E-07 | 3.31E-06 | 2.69E-10 |
| 7440-62-2 | Vanadium | Inorganics | 3.42E-07 | 1.44E-05 | 4.58E-07 | 3.45E-06 | 6.52E-14 |
| 7440-65-5 | Yttrium | Inorganics | 7.22E-08 | 4.24E-08 | 6.87E-10 | 1.25E-08 | 1.01E-12 |
| 7440-66-6 | Zinc | Inorganics | 6.49E-05 | 1.14E-02 | 7.38E-05 | 5.58E-04 | 1.06E-10 |
| 7440-67-7 | Zirconium | Inorganics | 2.94E-06 | 8.10E-03 | 3.95E-06 | 2.98E-05 | 1.52E-13 |
| 7446-09-5 | Sulfur dioxide | Inorganics | - | - | - | - | - |
| 7647-01-0 | Hydrogen chloride | Inorganics | - | - | - | - | - |
| 7664-39-3 | Hydrogen Fluoride | Inorganics | - | - | - | - | - |
| 7664-41-7 | Ammonia/Ammonium | Inorganics | 1.57E-05 | 9.25E-06 | 1.62E-04 | 1.59E-04 | 8.57E-05 |
| 7704-34-9 | Total Sulfur (thermodynamically stable) | Inorganics | 1.16E-03 | 6.98E-04 | 3.37E-07 | 1.27E-04 | 4.65E-08 |
| 7723-14-0 | Phosphorus | Inorganics | 1.29E-03 | 7.84E-04 | 2.06E-05 | 2.84E-04 | 2.26E-08 |
| 7782-41-4 | Fluorine gas F ₂ | Inorganics | - | - | - | - | - |
| 7782-49-2 | Selenium | Inorganics | 2.21E-05 | 1.30E-05 | 7.25E-06 | 5.63E-05 | 4.57E-09 |
| 7782-50-5 | Chlorine | Inorganics | - | - | - | - | - |
| 100-02-7 | p-Nitrophenol | Organics | 4.33E-05 | 2.54E-05 | 6.25E-05 | 3.87E-04 | 7.23E-06 |
| 100-21-0 | Phthalic acid | Organics | 1.11E-05 | 6.50E-06 | 1.49E-05 | 9.24E-05 | 1.70E-06 |
| 100-25-4 | 1,4-Dinitrobenzene | Organics | 5.04E-09 | 2.96E-09 | 6.52E-09 | 1.22E-08 | 3.18E-09 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|---|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 100-40-3 | 4-Ethenylcyclohexene | Organics | 4.68E-07 | 1.34E-08 | 6.50E-12 | 1.15E-11 | 4.01E-17 |
| 100-41-4 | Ethyl benzene | Organics | 2.64E-11 | 5.90E-12 | 1.62E-14 | 3.13E-16 | 5.75E-18 |
| 100-42-5 | Styrene | Organics | 1.49E-11 | 5.96E-12 | 6.86E-08 | 1.52E-13 | 2.57E-10 |
| 100-44-7 | Benzyl chloride | Organics | - | - | - | - | - |
| 100-47-0 | Benzonitrile | Organics | - | - | - | - | - |
| 100-51-6 | Benzyl alcohol | Organics | - | - | - | - | - |
| 100-52-7 | Benzaldehyde | Organics | - | - | - | - | - |
| 10061-01-5 | cis-1,3-Dichloropropene | Organics | 5.51E-11 | 2.20E-11 | 1.75E-13 | 5.55E-16 | 1.18E-15 |
| 10061-02-6 | trans-1,3-Dichloropropene | Organics | 6.13E-11 | 3.16E-11 | 7.79E-13 | 6.22E-16 | 5.95E-14 |
| 101-55-3 | 4-Bromophenylphenyl ether | Organics | 1.92E-06 | 1.11E-06 | 1.90E-07 | 6.19E-10 | 8.64E-08 |
| 101-77-9 | 4,4-Methylenedianiline | Organics | - | - | - | - | - |
| 103-33-3 | Azobenzene | Organics | - | - | - | - | - |
| 103-65-1 | n-Propyl benzene (Isocumene) | Organics | - | - | - | - | - |
| 104-51-8 | n-Butylbenzene | Organics | - | - | - | - | - |
| 104-76-7 | 2-Ethyl-1-hexanol | Organics | 1.51E-06 | 8.86E-07 | 5.31E-07 | 9.83E-09 | 3.17E-07 |
| 105-67-9 | 2,4-Dimethylphenol | Organics | 7.70E-07 | 4.53E-07 | 2.39E-05 | 7.80E-06 | 1.46E-05 |
| 10595-95-6 | n-Nitrosomethylethylamine | Organics | 2.88E-06 | 1.69E-06 | 3.36E-06 | 1.52E-06 | 2.05E-06 |
| 106-43-4 | 4-Chlorotoluene (p-Tolyl chloride) | Organics | - | - | - | - | - |
| 106-44-5 | p-Cresol (4-methyl phenol) | Organics | - | - | - | - | - |
| 106-46-7 | 1,4-Dichlorobenzene | Organics | 9.55E-09 | 3.96E-09 | 2.77E-08 | 1.78E-13 | 1.44E-10 |
| 106-47-8 | p-Chloroaniline | Organics | 1.35E-06 | 7.94E-07 | 2.63E-05 | 1.37E-05 | 1.57E-05 |
| 106-49-0 | p-Toluidine | Organics | - | - | - | - | - |
| 106-51-4 | Quinone | Organics | - | - | - | - | - |
| 106-88-7 | 1,2-Epoxybutane | Organics | 1.67E-06 | 9.51E-07 | 1.09E-07 | 1.33E-10 | 4.12E-08 |
| 106-89-8 | Epichlorohydrin (1-chloro- 2,3 epoxypropane) | Organics | - | - | - | - | - |
| 106-93-4 | Ethylene dibromide | Organics | 1.60E-11 | 8.39E-12 | 2.44E-13 | 1.70E-16 | 2.40E-14 |
| 106-99-0 | 1,3-Butadiene | Organics | 1.46E-10 | 1.86E-12 | 5.45E-16 | 5.04E-15 | 1.49E-21 |
| 107-02-8 | Acrolein | Organics | 8.88E-10 | 5.12E-10 | 8.57E-11 | 1.91E-13 | 3.86E-11 |
| 107-05-1 | 3-Chloropropene | Organics | 4.29E-11 | 7.19E-12 | 1.40E-14 | 5.54E-16 | 2.00E-18 |
| 107-06-2 | 1,2-Dichloroethane | Organics | 1.90E-11 | 9.62E-12 | 1.88E-07 | 4.86E-12 | 7.95E-09 |
| 107-12-0 | Propionitrile | Organics | 5.56E-09 | 3.25E-09 | 1.52E-09 | 1.93E-11 | 8.77E-10 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|----------|---|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 107-13-1 | Acrylonitrile | Organics | 1.07E-09 | 6.19E-10 | 2.05E-06 | 4.73E-09 | 8.79E-07 |
| 107-19-7 | Propargyl alcohol | Organics | - | - | - | - | - |
| 107-21-1 | Ethylene glycol (1,2-ethanediol) | Organics | - | - | - | - | - |
| 107-98-2 | Propylene glycol monomethyl ether | Organics | - | - | - | - | - |
| 108-05-4 | Acetic acid vinyl ester | Organics | 1.97E-06 | 1.07E-06 | 4.42E-08 | 2.47E-11 | 7.15E-09 |
| 108-10-1 | 4-Methyl-2-pentanone | Organics | 2.13E-10 | 1.22E-10 | 1.80E-11 | 3.72E-14 | 7.63E-12 |
| 108-39-4 | m-Cresol | Organics | 4.83E-06 | 2.84E-06 | 5.95E-06 | 4.21E-06 | 3.49E-06 |
| 108-60-1 | bis (2-Chloroisopropyl)ether | Organics | - | - | - | - | - |
| 108-67-8 | 1,3,5-Trimethylbenzene | Organics | - | - | - | - | - |
| 108-86-1 | Bromobenzene (Phenyl bromide) | Organics | - | - | - | - | - |
| 108-87-2 | Methylcyclohexane | Organics | 4.07E-12 | 5.66E-15 | 2.86E-19 | 6.37E-16 | 2.94E-26 |
| 108-88-3 | Toluene | Organics | 6.86E-11 | 1.74E-11 | 2.81E-08 | 6.49E-15 | 6.31E-12 |
| 108-90-7 | Chlorobenzene | Organics | 1.74E-11 | 6.10E-12 | 5.01E-08 | 4.89E-14 | 7.38E-11 |
| 108-94-1 | Cyclohexanone | Organics | 5.96E-08 | 3.49E-08 | 4.11E-08 | 3.03E-09 | 2.57E-08 |
| 108-95-2 | Phenol | Organics | 9.94E-07 | 5.84E-07 | 7.97E-06 | 9.93E-06 | 4.28E-06 |
| 109-74-0 | n-Butanenitrile | Organics | 1.60E-06 | 9.35E-07 | 3.26E-07 | 2.38E-09 | 1.80E-07 |
| 109-75-1 | 3-Butenenitrile | Organics | - | - | - | - | - |
| 109-77-3 | Malononitrile | Organics | - | - | - | - | - |
| 109-86-4 | 2-Methoxyethanol | Organics | - | - | - | - | - |
| 109-99-9 | Tetrahydrofuran | Organics | 6.59E-10 | 3.83E-10 | 1.04E-10 | 5.56E-13 | 5.45E-11 |
| 110-00-9 | Furan | Organics | - | - | - | - | - |
| 110-54-3 | n-Hexane | Organics | 4.67E-11 | 1.71E-13 | 2.04E-18 | 2.92E-14 | 1.04E-27 |
| 110-59-8 | Pentanenitrile | Organics | 1.54E-06 | 8.96E-07 | 2.40E-07 | 1.19E-09 | 1.25E-07 |
| 110-80-5 | 2-Ethoxyethanol | Organics | 1.37E-05 | 8.03E-06 | 1.75E-05 | 2.08E-05 | 9.58E-06 |
| 110-82-7 | Cyclohexane | Organics | 9.12E-12 | 3.55E-14 | 5.09E-18 | 5.54E-16 | 4.80E-24 |
| 110-83-8 | Cyclohexene | Organics | 2.24E-11 | 6.27E-13 | 2.99E-16 | 5.54E-16 | 1.79E-21 |
| 110-86-1 | Pyridine | Organics | 1.44E-08 | 8.43E-09 | 9.95E-09 | 6.81E-10 | 6.23E-09 |
| 111-15-9 | Ethylene glycol monoethyl ether acetate | Organics | - | - | - | - | - |
| 111-44-4 | Bis(2-chloroethyl)ether | Organics | 6.21E-09 | 3.64E-09 | 2.04E-06 | 6.29E-08 | 1.21E-06 |
| 111-65-9 | n-Octane | Organics | 6.10E-12 | 3.97E-14 | 2.69E-19 | 6.83E-15 | - |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|-----------|------------------------------------|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 111-76-2 | 2-Butoxyethanol | Organics | 1.92E-06 | 1.13E-06 | 2.21E-06 | 9.02E-07 | 1.35E-06 |
| 111-84-2 | n-Nonane | Organics | 3.85E-12 | 2.60E-14 | 1.66E-19 | 4.48E-15 | - |
| 111-91-1 | Bis(2-chloroethoxy)methane | Organics | 6.10E-08 | 3.58E-08 | 3.77E-06 | 6.18E-07 | 2.34E-06 |
| 1120-21-4 | Undecane | Organics | - | - | - | - | - |
| 1120-71-4 | 1,3-Propane sultone | Organics | - | - | - | - | - |
| 112-30-1 | 1-Decanol | Organics | - | - | - | - | - |
| 112-31-2 | Decanal | Organics | - | - | - | - | - |
| 112-40-3 | Dodecane | Organics | - | - | - | - | - |
| 117-81-7 | Bis(2-ethylhexyl) phthalate | Organics | 1.87E-05 | 1.10E-05 | 4.50E-05 | 1.74E-04 | 1.41E-05 |
| 117-84-0 | Di-n-octylphthalate | Organics | 6.61E-06 | 3.84E-06 | 1.14E-06 | 1.07E-08 | 6.00E-07 |
| 118-74-1 | Hexachlorobenzene | Organics | 3.29E-11 | 1.59E-11 | 4.48E-08 | 9.32E-13 | 1.07E-09 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | Organics | - | - | - | - | - |
| 120-12-7 | Anthracene | Organics | 1.18E-06 | 6.88E-07 | 7.96E-07 | 5.61E-09 | 4.01E-07 |
| 120-82-1 | 1,2,4-Trichlorobenzene | Organics | 1.16E-09 | 5.51E-10 | 8.41E-12 | 1.13E-14 | 2.64E-13 |
| 120-83-2 | 2,4-Dichlorophenol | Organics | 2.32E-06 | 9.62E-07 | 8.59E-09 | 2.31E-11 | 7.86E-11 |
| 121-14-2 | 2,4-Dinitrotoluene | Organics | 1.56E-05 | 9.17E-06 | 2.52E-05 | 9.89E-05 | 7.81E-06 |
| 122-39-4 | N,N-Diphenylamine | Organics | 1.91E-09 | 1.12E-09 | 2.00E-09 | 7.01E-10 | 1.23E-09 |
| 122-66-7 | 1,2-Diphenylhydrazine | Organics | - | - | - | - | - |
| 123-33-1 | Maleic hydrazide | Organics | - | - | - | - | - |
| 123-38-6 | Propionaldehyde | Organics | 2.02E-09 | 1.17E-09 | 3.08E-10 | 1.55E-12 | 1.59E-10 |
| 123-72-8 | Butanal | Organics | 1.67E-06 | 9.63E-07 | 1.68E-07 | 4.02E-10 | 7.68E-08 |
| 123-91-1 | 1,4-Dioxan | Organics | 6.14E-10 | 3.61E-10 | 5.49E-10 | 7.95E-11 | 3.45E-10 |
| 124-18-5 | Decane | Organics | - | - | - | - | - |
| 124-48-1 | Chlorodibromomethane | Organics | 1.12E-12 | 5.81E-13 | 2.36E-07 | 1.16E-11 | 1.52E-08 |
| 126-73-8 | Tributyl phosphate | Organics | 1.87E-06 | 1.10E-06 | 2.19E-06 | 1.42E-06 | 1.30E-06 |
| 126-98-7 | 2-Methyl-2-propenenitrile | Organics | 6.01E-10 | 3.40E-10 | 2.87E-11 | 2.32E-14 | 9.01E-12 |
| 127-18-4 | 1,1,2,2-Tetrachloroethene | Organics | 1.19E-11 | 1.19E-12 | 1.42E-15 | 1.83E-16 | 5.81E-20 |
| 128-37-0 | 2,6-Bis(tert-butyl)-4-methylphenol | Organics | 2.97E-08 | 1.74E-08 | 2.77E-08 | 6.06E-09 | 1.73E-08 |
| 129-00-0 | Pyrene | Organics | 5.80E-06 | 3.40E-06 | 6.05E-06 | 5.88E-07 | 3.71E-06 |
| 131-11-3 | Dimethyl Phthalate | Organics | 1.76E-06 | 1.03E-06 | 4.67E-06 | 1.78E-05 | 1.49E-06 |
| 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol | Organics | - | - | - | - | - |
| 132-64-9 | Dibenzofuran | Organics | 2.48E-11 | 1.41E-11 | 2.64E-07 | 2.53E-10 | 7.71E-08 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|--|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 1330-20-7 | Xylenes (mixed isomers) | Organics | 4.91E-09 | 1.45E-09 | 3.60E-08 | 6.91E-14 | 1.83E-11 |
| 133-06-2 | Captan | Organics | - | - | - | - | - |
| 1336-36-3 | Polychlorinated biphenyls | Organics | 2.65E-06 | 1.51E-06 | 1.63E-07 | 1.73E-10 | 5.99E-08 |
| 134-32-7 | alpha-Naphthylamine | Organics | 2.62E-06 | 1.54E-06 | 3.48E-06 | 1.30E-05 | 1.14E-06 |
| 135-98-8 | sec-Butylbenzene | Organics | - | - | - | - | - |
| 141-78-6 | Acetic acid ethyl ester | Organics | 6.45E-11 | 3.71E-11 | 5.61E-12 | 1.07E-14 | 2.42E-12 |
| 145-73-3 | Endothall | Organics | - | - | - | - | - |
| 156-59-2 | cis-1,2-Dichloroethene | Organics | - | - | - | - | - |
| 156-60-5 | 1,2-trans-Dichloroethene | Organics | 3.33E-06 | 6.47E-07 | 1.50E-09 | 4.11E-11 | 3.29E-13 |
| 1634-04-4 | Methyl tert-butyl ether | Organics | 1.60E-06 | 8.61E-07 | 3.14E-08 | 1.89E-11 | 4.27E-09 |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD) | Organics | 8.08E-18 | 4.72E-18 | 4.37E-15 | 8.20E-17 | 2.45E-15 |
| 189-55-9 | Dibenzo[a,i]pyrene | Organics | 4.85E-06 | 2.85E-06 | 6.49E-06 | 3.72E-05 | 1.01E-06 |
| 189-64-0 | Dibenzo[a,h]pyrene | Organics | 4.85E-06 | 2.85E-06 | 6.49E-06 | 3.72E-05 | 1.01E-06 |
| 191-24-2 | Benzo(g,h,i)perylene | Organics | 4.61E-06 | 2.71E-06 | 1.42E-05 | 3.48E-05 | 6.15E-06 |
| 191-30-0 | Dibenzo(a,l)pyrene | Organics | 4.85E-06 | 2.85E-06 | 6.49E-06 | 3.72E-05 | 1.01E-06 |
| 192-65-4 | Dibenzo[a,e]pyrene | Organics | 4.85E-06 | 2.85E-06 | 6.49E-06 | 3.72E-05 | 1.01E-06 |
| 192-97-2 | Benzo(e)pyrene | Organics | - | - | - | - | - |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | Organics | 1.89E-06 | 1.11E-06 | 1.04E-05 | 7.29E-06 | 6.00E-06 |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin | Organics | 6.46E-17 | 3.79E-17 | 7.20E-15 | 6.55E-16 | 4.37E-15 |
| 205-82-3 | Benzo[j]fluoranthene | Organics | - | - | - | - | - |
| 205-99-2 | Benzo(b)fluoranthene | Organics | 3.65E-10 | 2.11E-10 | 9.68E-07 | 3.71E-09 | 4.04E-07 |
| 206-44-0 | Fluoranthene | Organics | 5.79E-06 | 3.40E-06 | 5.08E-06 | 3.06E-07 | 3.10E-06 |
| 207-08-9 | Benzo(k)fluoranthene | Organics | 1.55E-06 | 9.12E-07 | 1.30E-05 | 1.57E-05 | 7.01E-06 |
| 208-96-8 | Acenaphthylene | Organics | 1.18E-06 | 6.78E-07 | 4.77E-07 | 1.36E-09 | 2.02E-07 |
| 218-01-9 | Chrysene | Organics | 2.68E-10 | 1.55E-10 | 5.94E-07 | 2.72E-09 | 2.62E-07 |
| 224-42-0 | Dibenz[a,j]acridine | Organics | 6.65E-06 | 3.91E-06 | 8.92E-06 | 5.48E-05 | 1.08E-06 |
| 2245-38-7 | 2,3,5-Trimethylnaphthalene | Organics | - | - | - | - | - |
| 226-36-8 | Dibenz[a,h]acridine | Organics | 6.67E-06 | 3.92E-06 | 8.95E-06 | 5.50E-05 | 1.08E-06 |
| 23950-58-5 | Pronamide | Organics | - | - | - | - | - |
| 27154-33-2 | Trichlorofluoroethane | Organics | 5.07E-06 | 9.04E-07 | 1.89E-09 | 6.43E-11 | 3.21E-13 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|--|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 31508-00-6 | 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) | Organics | 7.53E-18 | 4.23E-18 | 1.33E-13 | 7.70E-17 | 3.07E-14 |
| 319-84-6 | alpha-BHC | Organics | 6.82E-11 | 4.00E-11 | 4.25E-11 | 3.55E-12 | 2.64E-11 |
| 319-85-7 | beta-BHC | Organics | 1.07E-10 | 6.31E-11 | 1.34E-10 | 1.53E-10 | 7.36E-11 |
| 32598-13-3 | 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) | Organics | 4.36E-15 | 2.56E-15 | 4.73E-13 | 4.42E-14 | 2.89E-13 |
| 32598-14-4 | 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) | Organics | 9.48E-20 | 4.91E-20 | 1.60E-14 | 9.90E-19 | 9.39E-16 |
| 3268-87-9 | Octachlorodibenzo(p)dioxin | Organics | 3.08E-15 | 1.81E-15 | 2.00E-13 | 3.12E-14 | 1.22E-13 |
| 32774-16-6 | 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) | Organics | 4.31E-17 | 2.51E-17 | 6.42E-14 | 4.38E-16 | 3.14E-14 |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin | Organics | 2.35E-16 | 1.38E-16 | 3.37E-14 | 2.39E-15 | 2.05E-14 |
| 3697-24-3 | 5-Methylchrysene | Organics | 1.20E-06 | 7.06E-07 | 1.03E-06 | 1.73E-07 | 6.40E-07 |
| 38380-08-4 | 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) | Organics | 7.52E-18 | 4.32E-18 | 4.15E-14 | 7.66E-17 | 1.54E-14 |
| 39001-02-0 | Octachlorodibenzofuran | Organics | 3.10E-15 | 1.82E-15 | 5.46E-14 | 3.14E-14 | 3.21E-14 |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin | Organics | 4.03E-17 | 2.36E-17 | 5.07E-15 | 4.08E-16 | 3.09E-15 |
| 39635-31-9 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) | Organics | 3.33E-17 | 1.94E-17 | 3.11E-14 | 3.38E-16 | 1.63E-14 |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo(p)dioxin | Organics | 4.51E-16 | 2.65E-16 | 1.79E-14 | 4.57E-15 | 1.10E-14 |
| 4170-30-3 | Crotonaldehyde (Propylene aldehyde) | Organics | 8.32E-10 | 4.88E-10 | 5.52E-10 | 3.59E-11 | 3.45E-10 |
| 41851-50-7 | Chlorocyclopentadiene | Organics | - | - | - | - | - |
| 460-19-5 | Cyanogen (oxalonitrile) | Organics | - | - | - | - | - |
| 4786-20-3 | 2-Butenenitrile | Organics | - | - | - | - | - |
| 50-00-0 | Formaldehyde | Organics | 3.44E-06 | 2.02E-06 | 4.47E-06 | 6.56E-06 | 2.34E-06 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|--|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 50-32-8 | Benzo(a)pyrene | Organics | 1.62E-07 | 9.53E-08 | 4.81E-06 | 1.62E-06 | 2.91E-06 |
| 506-68-3 | Cyanogen bromide (bromocyanide) | Organics | - | - | - | - | - |
| 506-77-4 | Cyanogen chloride | Organics | - | - | - | - | - |
| 510-15-6 | Chlorobenzilate | Organics | - | - | - | - | - |
| 51207-31-9 | 2,3,7,8- Tetrachlorodibenzofuran | Organics | 1.55E-16 | 9.08E-17 | 2.91E-14 | 1.57E-15 | 1.75E-14 |
| 51-28-5 | 2,4-Dinitrophenol | Organics | 1.36E-05 | 8.00E-06 | 8.18E-05 | 1.38E-04 | 4.08E-05 |
| 51-79-6 | Ethyl carbamate (urethane) | Organics | - | - | - | - | - |
| 52663-72-6 | 2,3',4,4',5,5'- Hexachlorobiphenyl (PCB 167) | Organics | 4.34E-17 | 2.52E-17 | 6.08E-14 | 4.41E-16 | 2.98E-14 |
| 528-29-0 | 1,2-Dinitrobenzene (o- Dinitrobenzene) | Organics | - | - | - | - | - |
| 532-27-4 | 2-Chloroacetophenone | Organics | - | - | - | - | - |
| 534-52-1 | 4,6-Dinitro-o-cresol | Organics | 2.20E-06 | 1.30E-06 | 3.61E-05 | 2.23E-05 | 2.12E-05 |
| 53-70-3 | Dibenz[a,h]anthracene | Organics | 7.43E-06 | 4.37E-06 | 1.09E-05 | 7.53E-05 | 6.01E-07 |
| 5385-75-1 | Dibenzo(a,e)fluoranthene | Organics | - | - | - | - | - |
| 540-59-0 | 1,2-Dichloroethene (total) (1,2-Dichloroethylene) | Organics | 2.91E-15 | 9.76E-16 | 4.54E-08 | 3.40E-14 | 4.92E-11 |
| 540-73-8 | 1,2-Dimethylhydrazine | Organics | - | - | - | - | - |
| 540-84-1 | 2,2,4-Trimethylpentane | Organics | - | - | - | - | - |
| 541-73-1 | 1,3-Dichlorobenzene | Organics | 7.14E-10 | 2.71E-10 | 1.89E-12 | 7.29E-15 | 8.97E-15 |
| 542-75-6 | 1,3-Dichloropropene | Organics | - | - | - | - | - |
| 542-88-1 | Bis(chloromethyl)ether | Organics | - | - | - | - | - |
| 55673-89-7 | 1,2,3,4,7,8,9- Heptachlorodibenzofuran | Organics | 3.29E-17 | 1.93E-17 | 5.99E-15 | 3.33E-16 | 3.61E-15 |
| 56-23-5 | Carbon tetrachloride | Organics | 1.47E-11 | 7.60E-13 | 6.19E-09 | 3.03E-16 | 5.32E-15 |
| 56-49-5 | 3-Methylcholanthrene | Organics | 1.21E-06 | 7.09E-07 | 1.06E-06 | 1.88E-07 | 6.59E-07 |
| 56-55-3 | Benzo(a)anthracene | Organics | 1.45E-07 | 8.53E-08 | 4.59E-06 | 1.47E-06 | 2.78E-06 |
| 57117-31-4 | 2,3,4,7,8- Pentachlorodibenzofuran | Organics | 5.56E-16 | 3.27E-16 | 2.38E-14 | 5.63E-15 | 1.45E-14 |
| 57117-41-6 | 1,2,3,7,8- Pentachlorodibenzofuran | Organics | 3.69E-16 | 2.17E-16 | 1.61E-14 | 3.74E-15 | 9.82E-15 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|---|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Organics | 1.27E-16 | 7.44E-17 | 1.00E-14 | 1.28E-15 | 6.13E-15 |
| 57-24-9 | Strychnine | Organics | - | - | - | - | - |
| 57465-28-8 | 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) | Organics | 1.66E-15 | 9.73E-16 | 1.77E-13 | 1.68E-14 | 1.08E-13 |
| 57653-85-7 | 1,2,3,6,7,8,-Hexachlorodibenzo(p)dioxin | Organics | 6.83E-17 | 4.01E-17 | 8.86E-15 | 6.92E-16 | 5.39E-15 |
| 57-74-9 | Chlordane | Organics | - | - | - | - | - |
| 581-42-0 | 2,6-Dimethylnaphthalene | Organics | - | - | - | - | - |
| 584-84-9 | 2,4-Toluene diisocyanate | Organics | - | - | - | - | - |
| 58-89-9 | gamma-BHC (Lindane) | Organics | 9.33E-11 | 5.48E-11 | 8.13E-11 | 1.52E-11 | 5.07E-11 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | Organics | 3.66E-06 | 2.15E-06 | 3.35E-06 | 6.81E-07 | 2.09E-06 |
| 589-38-8 | 3-Hexanone | Organics | 1.55E-06 | 8.90E-07 | 1.44E-07 | 3.05E-10 | 6.37E-08 |
| 591-50-4 | Benzene, iodo- | Organics | - | - | - | - | - |
| 591-78-6 | 2-Hexanone | Organics | 2.61E-09 | 1.51E-09 | 3.19E-10 | 1.05E-12 | 1.56E-10 |
| 593-60-2 | Bromoethene (Vinyl bromide) | Organics | - | - | - | - | - |
| 59-50-7 | 4-Chloro-3-methylphenol | Organics | 5.69E-06 | 3.34E-06 | 6.78E-06 | 3.63E-06 | 4.08E-06 |
| 59-89-2 | N-Nitrosomorpholine | Organics | 2.43E-05 | 1.43E-05 | 3.26E-05 | 1.27E-04 | 1.02E-05 |
| 60-11-7 | Dimethyl aminoazobenzene | Organics | 4.70E-28 | 2.76E-28 | - | 4.76E-27 | - |
| 602-87-9 | 5-Nitroacenaphthene | Organics | 1.71E-06 | 1.01E-06 | 2.06E-06 | 1.72E-06 | 1.19E-06 |
| 60-29-7 | Ethyl ether | Organics | 2.18E-09 | 1.06E-09 | 1.87E-11 | 2.13E-14 | 7.64E-13 |
| 60-35-5 | Acetamide | Organics | 6.50E-06 | 3.82E-06 | 8.74E-06 | 3.80E-05 | 2.41E-06 |
| 606-20-2 | 2,6-Dinitrotoluene | Organics | 8.11E-07 | 4.77E-07 | 7.11E-06 | 8.22E-06 | 3.86E-06 |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Organics | 3.67E-17 | 2.16E-17 | 4.78E-15 | 3.72E-16 | 2.91E-15 |
| 608-93-5 | Pentachlorobenzene | Organics | - | - | - | - | - |
| 61626-71-9 | Dichloropentadiene | Organics | - | - | - | - | - |
| 621-64-7 | N-Nitroso-di-n-propylamine | Organics | 5.34E-06 | 3.13E-06 | 5.80E-06 | 1.79E-06 | 3.59E-06 |
| 624-83-9 | Methyl isocyanate | Organics | - | - | - | - | - |
| 62-50-0 | Ethyl methanesulfonate | Organics | - | - | - | - | - |
| 62-53-3 | Aniline | Organics | - | - | - | - | - |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|---|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 62-75-9 | N-Nitroso-N,N-dimethylamine | Organics | 2.86E-08 | 1.68E-08 | 3.23E-08 | 1.29E-08 | 1.98E-08 |
| 628-73-9 | Hexanenitrile | Organics | 1.50E-06 | 8.69E-07 | 1.80E-07 | 5.85E-10 | 8.77E-08 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | Organics | 7.16E-06 | 2.96E-06 | 2.62E-08 | 7.14E-11 | 2.35E-10 |
| 64-18-6 | Formic acid (methanoic acid) | Organics | - | - | - | - | - |
| 65510-44-3 | 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) | Organics | 3.71E-16 | 2.17E-16 | 1.15E-13 | 3.76E-15 | 6.70E-14 |
| 65-85-0 | Benzoic acid | Organics | - | - | - | - | - |
| 67-56-1 | Methyl alcohol | Organics | 3.02E-06 | 1.77E-06 | 2.75E-06 | 4.19E-07 | 1.72E-06 |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Organics | 1.09E-16 | 6.37E-17 | 1.83E-14 | 1.10E-15 | 1.10E-14 |
| 67-63-0 | 2-Propyl alcohol | Organics | 1.70E-09 | 9.99E-10 | 1.23E-09 | 1.01E-10 | 7.73E-10 |
| 67-64-1 | 2-Propanone (Acetone) | Organics | 3.68E-08 | 2.15E-08 | 7.73E-06 | 8.11E-08 | 4.24E-06 |
| 67-66-3 | Chloroform | Organics | 1.80E-11 | 6.34E-12 | 5.01E-08 | 4.89E-14 | 7.38E-11 |
| 67-72-1 | Hexachloroethane | Organics | 2.12E-07 | 7.27E-08 | 4.01E-10 | 2.22E-12 | 1.03E-12 |
| 69782-90-7 | 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) | Organics | 1.16E-16 | 6.73E-17 | 1.03E-13 | 1.17E-15 | 5.38E-14 |
| 70-30-4 | Hexachlorophene | Organics | - | - | - | - | - |
| 70362-50-4 | 3,4,4',5-Tetrachlorobiphenyl (PCB 81) | Organics | 2.56E-16 | 1.50E-16 | 7.50E-14 | 2.59E-15 | 4.38E-14 |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Organics | 4.61E-17 | 2.70E-17 | 1.14E-14 | 4.67E-16 | 6.88E-15 |
| 71-36-3 | n-Butyl alcohol | Organics | 4.92E-08 | 2.89E-08 | 3.43E-08 | 2.48E-09 | 2.15E-08 |
| 71-43-2 | Benzene | Organics | 4.29E-11 | 1.21E-11 | 3.31E-08 | 1.10E-14 | 1.29E-11 |
| 71-55-6 | 1,1,1-Trichloroethane | Organics | 1.24E-11 | 1.32E-12 | 1.67E-15 | 1.86E-16 | 7.85E-20 |
| 72-43-5 | Methoxychlor | Organics | - | - | - | - | - |
| 72-55-9 | 4,4-DDE | Organics | 2.11E-06 | 1.24E-06 | 8.84E-07 | 3.38E-08 | 5.35E-07 |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Organics | 2.32E-17 | 1.36E-17 | 2.88E-15 | 2.35E-16 | 1.75E-15 |
| 74472-37-0 | 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) | Organics | 1.24E-17 | 7.19E-18 | 2.54E-14 | 1.26E-16 | 1.14E-14 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|----------|--------------------------------------|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 74-83-9 | Bromomethane | Organics | 3.32E-11 | 8.74E-12 | 2.97E-08 | 7.45E-15 | 8.08E-12 |
| 74-87-3 | Chloromethane | Organics | 6.13E-11 | 1.25E-11 | 2.10E-08 | 2.66E-15 | 1.73E-12 |
| 74-88-4 | Iodomethane | Organics | 1.16E-15 | 3.41E-16 | 3.38E-08 | 1.41E-14 | 1.64E-11 |
| 74-95-3 | Methylene bromide | Organics | - | - | - | - | - |
| 74-97-5 | Bromochloromethane | Organics | - | - | - | - | - |
| 75-00-3 | Chloroethane | Organics | 3.08E-11 | 6.31E-12 | 1.55E-14 | 3.75E-16 | 4.08E-18 |
| 75-01-4 | 1-Chloroethene | Organics | 2.06E-11 | 1.23E-12 | 9.82E-16 | 3.80E-16 | 1.62E-20 |
| 75-02-5 | Fluoroethene (vinyl fluoride) | Organics | 3.93E-07 | 2.29E-09 | 4.20E-13 | 1.95E-11 | 5.63E-19 |
| 75-05-8 | Acetonitrile | Organics | 1.17E-07 | 6.81E-08 | 8.32E-05 | 1.03E-06 | 4.64E-05 |
| 75-07-0 | Acetaldehyde | Organics | 2.04E-06 | 1.19E-06 | 2.92E-07 | 1.32E-09 | 1.49E-07 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | Organics | 1.12E-08 | 4.79E-09 | 2.19E-06 | 8.26E-12 | 1.44E-08 |
| 75-15-0 | Carbon disulfide | Organics | 1.05E-18 | 5.54E-20 | 6.31E-09 | 2.27E-17 | 5.58E-15 |
| 75-21-8 | Ethylene oxide (Oxirane) | Organics | 3.52E-09 | 2.02E-09 | 2.78E-10 | 4.70E-13 | 1.16E-10 |
| 75-25-2 | Bromoform | Organics | 4.40E-28 | - | 2.88E-11 | 9.51E-27 | 1.33E-26 |
| 75-27-4 | Bromodichloromethane | Organics | 1.44E-05 | 6.65E-06 | 8.91E-08 | 1.40E-10 | 2.11E-09 |
| 75-29-6 | 2-Chloropropane | Organics | - | - | - | - | - |
| 75-34-3 | 1,1-Dichloroethane | Organics | 1.36E-11 | 3.85E-12 | 1.49E-14 | 1.50E-16 | 1.40E-17 |
| 75-35-4 | 1,1-Dichloroethene | Organics | 1.31E-11 | 8.21E-13 | 6.80E-16 | 2.36E-16 | 1.21E-20 |
| 75-44-5 | Phosgene (hydrogen phosphide) | Organics | - | - | - | - | - |
| 75-45-6 | Chlorodifluoromethane | Organics | 2.40E-11 | 8.02E-13 | 4.28E-16 | 5.54E-16 | 3.15E-21 |
| 75-50-3 | Trimethylamine | Organics | 1.83E-06 | 1.06E-06 | 2.02E-07 | 6.00E-10 | 9.57E-08 |
| 75-69-4 | Trichlorofluoromethane | Organics | 1.07E-11 | 8.61E-14 | 1.91E-17 | 4.56E-16 | 3.45E-23 |
| 75-71-8 | Dichlorodifluoromethane | Organics | 3.66E-12 | 5.43E-15 | 3.43E-19 | 4.64E-16 | 6.63E-26 |
| 76-01-7 | Pentachloroethane | Organics | - | - | - | - | - |
| 76-13-1 | 1,2,2-Trichlorotrifluoroethane | Organics | 2.42E-12 | 3.45E-15 | 1.42E-19 | 4.59E-16 | 7.75E-27 |
| 764-41-0 | 1,4-Dichloro-2-butene | Organics | - | - | - | - | - |
| 76-44-8 | Heptachlor | Organics | 8.25E-13 | 2.54E-15 | 3.67E-20 | 4.31E-16 | - |
| 765-34-4 | Glycidylaldehyde | Organics | - | - | - | - | - |
| 77-47-4 | Hexachlorocyclopentadiene | Organics | 5.06E-18 | 3.05E-19 | 2.39E-08 | 1.03E-16 | 3.14E-14 |
| 77-78-1 | Dimethyl sulfate | Organics | - | - | - | - | - |
| 78-83-1 | 2-Methylpropyl alcohol | Organics | 2.86E-05 | 1.68E-05 | 1.89E-05 | 1.27E-06 | 1.18E-05 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|----------|--|----------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 78-87-5 | 1,2-Dichloropropane | Organics | 1.49E-11 | 5.87E-12 | 4.53E-14 | 1.50E-16 | 2.81E-16 |
| 78-93-3 | 2-Butanone | Organics | 8.29E-09 | 4.83E-09 | 2.84E-06 | 1.75E-08 | 1.46E-06 |
| 79-00-5 | 1,1,2-Trichloroethane | Organics | 1.86E-11 | 9.53E-12 | 2.25E-13 | 1.87E-16 | 1.59E-14 |
| 79-01-6 | 1,1,2-Trichloroethylene | Organics | 1.59E-11 | 2.91E-12 | 1.86E-08 | 1.38E-15 | 9.72E-13 |
| 79-10-7 | 2-Propenoic acid | Organics | 5.22E-06 | 3.07E-06 | 6.76E-06 | 9.55E-06 | 3.57E-06 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | Organics | 1.90E-11 | 1.06E-11 | 6.58E-13 | 4.02E-16 | 1.61E-13 |
| 79-46-9 | 2-Nitropropane | Organics | 4.04E-09 | 2.33E-09 | 3.93E-10 | 8.98E-13 | 1.78E-10 |
| 80-62-6 | Methyl methacrylate | Organics | - | - | - | - | - |
| 822-06-0 | Hexamethylene-1,5-diisocyanate | Organics | - | - | - | - | - |
| 823-40-5 | Toluene-2,6-diamine | Organics | - | - | - | - | - |
| 82-68-8 | Pentachloronitrobenzene (PCNB) | Organics | 3.78E-09 | 2.09E-09 | 1.17E-10 | 8.42E-14 | 2.59E-11 |
| 832-69-9 | 1-Methylphenanthrene | Organics | - | - | - | - | - |
| 83-32-9 | Acenaphthene | Organics | 5.78E-06 | 3.31E-06 | 7.00E-07 | 1.20E-09 | 2.66E-07 |
| 84-66-2 | Diethyl phthalate | Organics | 3.49E-06 | 2.05E-06 | 1.07E-05 | 1.79E-05 | 5.36E-06 |
| 84-74-2 | Di-n-butylphthalate | Organics | 3.87E-05 | 2.27E-05 | 7.18E-05 | 3.53E-05 | 4.32E-05 |
| 85-01-8 | Phenanthrene | Organics | 1.19E-06 | 6.96E-07 | 1.93E-06 | 6.29E-08 | 1.13E-06 |
| 85-44-9 | Phthalic anhydride (1,2-benzenedicarboxylic anhydride) | Organics | - | - | - | - | - |
| 85-68-7 | Butylbenzylphthalate | Organics | 1.27E-05 | 7.47E-06 | 2.12E-05 | 1.42E-05 | 1.25E-05 |
| 86-73-7 | Fluorene | Organics | 1.19E-06 | 6.91E-07 | 9.60E-07 | 6.93E-09 | 4.85E-07 |
| 87-61-6 | 1,2,3-Trichlorobenzene | Organics | - | - | - | - | - |
| 87-68-3 | Hexachlorobutadiene | Organics | 7.98E-09 | 1.74E-09 | 4.62E-12 | 9.51E-14 | 1.53E-15 |
| 87-86-5 | Pentachlorophenol | Organics | 3.53E-08 | 2.08E-08 | 4.74E-08 | 2.56E-07 | 8.74E-09 |
| 88-06-2 | 2,4,6-Trichlorophenol | Organics | 5.15E-06 | 3.02E-06 | 3.78E-06 | 2.97E-07 | 2.38E-06 |
| 88-74-4 | o-Nitroaniline (2-nitroaniline) | Organics | 2.38E-06 | 1.40E-06 | 6.42E-06 | 2.41E-05 | 2.07E-06 |
| 88-75-5 | 2-Nitrophenol | Organics | 5.25E-06 | 3.08E-06 | 1.06E-05 | 6.97E-07 | 6.52E-06 |
| 90-04-0 | o-Anisidine | Organics | - | - | - | - | - |
| 90-12-0 | 1-Methylnaphthalene | Organics | - | - | - | - | - |
| 91-20-3 | Naphthalene | Organics | 5.34E-06 | 2.91E-06 | 1.36E-05 | 1.73E-09 | 1.80E-06 |
| 91-22-5 | Quinoline | Organics | - | - | - | - | - |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|------------|---|---------------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 91-57-6 | 2-Methylnaphthalene | Organics | 1.11E-12 | 6.03E-13 | 1.00E-07 | 1.15E-11 | 1.20E-08 |
| 91-58-7 | 2-Chloronaphthalene | Organics | 1.50E-06 | 8.37E-07 | 5.61E-08 | 3.61E-11 | 1.47E-08 |
| 91-94-1 | 3,3'-Dichlorobenzidine | Organics | 2.29E-05 | 1.34E-05 | 3.83E-05 | 2.32E-04 | 4.87E-06 |
| 924-16-3 | N-Nitroso-di-n-Buetylamine | Organics | - | - | - | - | - |
| 92-52-4 | 1,1'-Biphenyl | Organics | 3.79E-09 | 2.12E-09 | 1.45E-10 | 9.43E-14 | 3.86E-11 |
| 94-59-7 | Safrole (5-(2-Propenyl)-1,3-benzodioxole) | Organics | - | - | - | - | - |
| 94-75-7 | 2,4-D | Organics | - | - | - | - | - |
| 95-48-7 | o-Cresol | Organics | 6.52E-06 | 3.83E-06 | 7.77E-06 | 3.96E-06 | 4.69E-06 |
| 95-49-8 | o-Chlorotoluene | Organics | - | - | - | - | - |
| 95-50-1 | 1,2-Dichlorobenzene | Organics | 1.48E-08 | 6.58E-09 | 7.49E-11 | 1.46E-13 | 1.21E-12 |
| 95-53-4 | o-Toluidine | Organics | - | - | - | - | - |
| 95-57-8 | 2-Chlorophenol | Organics | 5.43E-06 | 3.00E-06 | 1.63E-07 | 9.34E-11 | 3.50E-08 |
| 95-63-6 | 1,2,4-Trimethyl benzene | Organics | - | - | - | - | - |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | Organics | - | - | - | - | - |
| 95-95-4 | 2,4,5-Trichlorophenol | Organics | 5.07E-06 | 2.98E-06 | 4.68E-06 | 7.22E-07 | 2.94E-06 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | Organics | - | - | - | - | - |
| 96-18-4 | 1,2,3-Trichloropropane | Organics | - | - | - | - | - |
| 96-45-7 | Ethylene thiourea | Organics | - | - | - | - | - |
| 97-63-2 | Ethyl methacrylate | Organics | - | - | - | - | - |
| 98-01-1 | Furfural | Organics | - | - | - | - | - |
| 98-06-6 | tert-Butyl benzene | Organics | - | - | - | - | - |
| 98-07-7 | Benzotrichloride | Organics | - | - | - | - | - |
| 98-82-8 | Cumene | Organics | 2.72E-08 | 6.75E-11 | 1.23E-15 | 1.13E-11 | 3.17E-24 |
| 98-83-9 | Methyl styrene (mixed isomers) | Organics | - | - | - | - | - |
| 98-86-2 | Acetophenone | Organics | 3.84E-09 | 2.26E-09 | 2.43E-09 | 1.48E-10 | 1.52E-09 |
| 98-95-3 | Nitrobenzene | Organics | 1.67E-08 | 9.75E-09 | 1.63E-06 | 3.31E-08 | 9.51E-07 |
| 99-35-4 | 1,3,5-Trinitrobenzene | Organics | - | - | - | - | - |
| 99-65-0 | 1,3-Dinitrobenzene | Organics | - | - | - | - | - |
| 99-87-6 | p-Cymene | Organics | - | - | - | - | - |
| 10028-17-8 | Tritium | Radionuclides | 1.47E-13 | 8.67E-14 | 1.66E-13 | 1.01E-13 | 9.94E-14 |
| 10045-97-3 | Cesium-137 | Radionuclides | 1.60E-10 | 9.42E-11 | 6.15E-11 | 4.75E-10 | 6.52E-19 |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|-------------------------|------------------|---------------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 10098-91-6 ² | Yttrium-90 | Radionuclides | 6.06E-13 | 3.56E-13 | 7.59E-15 | 1.18E-13 | 4.05E-20 |
| 10098-97-2 | Strontium-90 | Radionuclides | 2.34E-09 | 1.37E-09 | 2.93E-11 | 4.54E-10 | 1.56E-16 |
| 10198-40-0 | Cobalt-60 | Radionuclides | 1.41E-19 | 8.27E-20 | 1.76E-21 | 2.73E-20 | - |
| 13966-29-5 | Uranium-234 | Radionuclides | 1.01E-09 | 5.96E-10 | 1.29E-11 | 1.98E-10 | 1.61E-14 |
| 13967-48-1 | Ruthenium-106 | Radionuclides | 2.51E-19 | 1.47E-19 | 6.23E-21 | 7.19E-20 | 7.53E-27 |
| 13967-70-9 | Cesium-134 | Radionuclides | 1.56E-18 | 9.14E-19 | 5.97E-19 | 4.61E-18 | 6.33E-27 |
| 13968-55-3 | Uranium-233 | Radionuclides | 2.23E-09 | 1.31E-09 | 2.82E-11 | 4.36E-10 | 3.54E-14 |
| 13981-15-2 | Curium-244 | Radionuclides | 8.83E-12 | 5.19E-12 | 1.12E-13 | 1.73E-12 | 1.40E-16 |
| 13981-16-3 | Plutonium-238 | Radionuclides | 5.18E-12 | 3.05E-12 | 6.57E-14 | 1.02E-12 | 2.18E-20 |
| 13981-37-8 | Nickel-63 | Radionuclides | 4.27E-11 | 2.51E-11 | 5.39E-13 | 8.33E-12 | 6.83E-16 |
| 13982-10-0 | Plutonium-242 | Radionuclides | 1.80E-11 | 1.06E-11 | 2.28E-13 | 3.52E-12 | 7.70E-20 |
| 13982-63-3 | Radium-226 | Radionuclides | 4.34E-14 | 2.55E-14 | 1.67E-14 | 1.29E-13 | 1.05E-17 |
| 13982-70-2 | Uranium-236 | Radionuclides | 3.23E-09 | 1.90E-09 | 4.09E-11 | 6.32E-10 | 5.13E-14 |
| 13994-20-2 | Neptunium-237 | Radionuclides | 8.71E-08 | 5.12E-08 | 1.10E-09 | 1.70E-08 | 1.38E-12 |
| 14119-32-5 | Plutonium-241 | Radionuclides | 1.20E-11 | 7.06E-12 | 1.52E-13 | 2.35E-12 | 5.04E-20 |
| 14119-33-6 | Plutonium-240 | Radionuclides | 2.02E-09 | 1.19E-09 | 2.56E-11 | 3.96E-10 | 8.43E-18 |
| 14133-76-7 | Technetium-99 | Radionuclides | 1.41E-05 | 8.26E-06 | 1.18E-05 | 8.94E-05 | 7.26E-09 |
| 14158-29-3 | Uranium-232 | Radionuclides | 1.77E-14 | 1.04E-14 | 2.25E-16 | 3.47E-15 | 2.82E-19 |
| 14234-35-6 | Antimony-125 | Radionuclides | 3.47E-13 | 2.04E-13 | 1.32E-13 | 1.01E-12 | 8.24E-17 |
| 14331-85-2 | Protactinium-231 | Radionuclides | 1.88E-17 | 1.11E-17 | 2.39E-19 | 3.69E-18 | - |
| 14336-70-0 | Nickel-59 | Radionuclides | 4.03E-10 | 2.37E-10 | 5.08E-12 | 7.87E-11 | 6.45E-15 |
| 14391-16-3 | Europium-155 | Radionuclides | 1.48E-18 | 8.72E-19 | 1.88E-20 | 2.91E-19 | - |
| 14596-10-2 | Americium-241 | Radionuclides | 3.29E-09 | 1.93E-09 | 8.18E-11 | 9.44E-10 | 5.45E-17 |
| 14683-23-9 | Europium-152 | Radionuclides | 1.93E-18 | 1.14E-18 | 2.45E-20 | 3.79E-19 | - |
| 14762-75-5 | Carbon-14 | Radionuclides | 4.97E-10 | 2.92E-10 | - | 5.03E-11 | 4.08E-15 |
| 14952-40-0 | Actinium-227 | Radionuclides | 8.87E-14 | 5.21E-14 | 1.12E-15 | 1.74E-14 | 1.41E-18 |
| 14993-75-0 | Americium-243 | Radionuclides | 3.26E-11 | 1.91E-11 | 8.10E-13 | 9.35E-12 | 5.40E-19 |
| 15046-84-1 | Iodine-129 | Radionuclides | 4.87E-07 | 2.86E-07 | - | 3.70E-08 | 1.06E-09 |
| 15117-48-3 | Plutonium-239 | Radionuclides | 3.18E-08 | 1.87E-08 | 4.03E-10 | 6.22E-09 | 1.33E-16 |
| 15117-96-1 | Uranium-235 | Radionuclides | 1.18E-07 | 6.95E-08 | 1.50E-09 | 2.32E-08 | 1.88E-12 |
| 15262-20-1 | Radium-228 | Radionuclides | 9.62E-15 | 5.65E-15 | 3.69E-15 | 2.85E-14 | 2.32E-18 |
| 15510-73-3 | Curium-242 | Radionuclides | 1.76E-13 | 1.03E-13 | 2.23E-15 | 3.44E-14 | 2.80E-18 |
| 15585-10-1 | Europium-154 | Radionuclides | 7.23E-18 | 4.25E-18 | 9.17E-20 | 1.42E-18 | - |
| 15594-54-4 | Thorium-229 | Radionuclides | 2.10E-18 | 1.23E-18 | 2.66E-20 | 4.11E-19 | - |

Table B-1 DFLAW Operating Configuration, Mass Fractions for Select Process Streams

| CASRN | Chemical | Type | LAW Facility Mass Fractions | | | EMF Mass Fractions | |
|--------------------------|--------------|---------------|-----------------------------|----------------------|---------------------|-----------------------|-------------------|
| | | | LCP01 DFLAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | DEP13 Conc Recycle | DEP20 Rad Cond |
| 15715-94-3 | Samarium-151 | Radionuclides | 7.52E-14 | 4.42E-14 | 9.54E-16 | 1.47E-14 | - |
| 15751-77-6 | Zirconium-93 | Radionuclides | 3.16E-12 | 1.86E-12 | 8.92E-16 | 3.26E-13 | - |
| 15757-87-6 | Curium-243 | Radionuclides | 8.20E-13 | 4.82E-13 | 1.04E-14 | 1.61E-13 | 1.30E-17 |
| 15758-45-9 | Selenium-79 | Radionuclides | 4.30E-08 | 2.53E-08 | 1.65E-08 | 1.28E-07 | 1.04E-11 |
| 15832-50-5 | Tin-126 | Radionuclides | 8.25E-08 | 4.85E-08 | 1.05E-09 | 1.61E-08 | 1.31E-12 |
| 378253-40-8 ³ | Barium-137m | Radionuclides | 2.45E-17 | 1.44E-17 | 9.41E-18 | 7.27E-17 | 9.98E-26 |
| 378253-44-2 | Cadmium-113m | Radionuclides | 1.77E-11 | 1.04E-11 | 2.03E-13 | 3.30E-12 | 2.68E-16 |
| 378782-82-2 | Niobium-93m | Radionuclides | 2.99E-17 | 1.76E-17 | 3.79E-19 | 5.86E-18 | - |
| 7440-29-1 | Thorium-232 | Radionuclides | 8.94E-12 | 5.25E-12 | 1.13E-13 | 1.75E-12 | - |
| 7440-61-1R | Uranium-238 | Radionuclides | 1.69E-05 | 9.91E-06 | 2.14E-07 | 3.30E-06 | 2.68E-10 |

Ref.: 24590-WTP-ES-PE-17-001, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant*, Tables A.8-11, A.8-17, and A.8-23.

Notes:

¹ Mercury mass fraction includes elemental and divalent mercury forms.

² Yttrium-90 is not modeled in APPS. Sr-90 is assumed to be in equilibrium with its progeny Y-90, Y-90 is set to an equal Sr-90 activity, and converted to a mass fraction by dividing by the Y-90 specific activity from 10 CFR 71, Table A-1.

³ Barium-137m is not modeled in APPS. Cs-137 is assumed to be in equilibrium with its progeny Ba-137m (Ba-137 meta-stable). Ba-137m is set to 94.6% of the cesium-137 activity (see 24590-WTP-3DG-W12W-00002, Section 5.3), and converted to a mass fraction by dividing by the Ba-137m specific activity from Shleien, B. (Ed.), 1992, *The Health Physics and Radiological Health Handbook*, Scinta Inc., ISBN 0-917251-05-9.

Table B-2 summarizes data from Tables A.8-14, A.8-20, and A.8-26 of the *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-ES-PE-17-001). These mass fractions are used to speciate the mass release for Lab samples for the baseline WTP operating configuration, PT Facility. A “-” symbol indicates no data are available for approximating the emissions rate (no data were available or the corresponding values were below the model tolerance).

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------------------|-------------------|------------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 10028-15-6 | Ozone | Inorganics | - | - | - | - | - | - | - | - |
| 10102-44-0 | Nitrogen dioxide | Inorganics | - | - | - | - | - | - | - | - |
| 124-38-9 | Carbon dioxide | Inorganics | - | - | - | - | - | - | - | - |
| 14265-44-2 | Phosphate | Inorganics | 1.05E-02 | 1.30E-02 | 3.02E-03 | 1.07E-04 | 2.99E-03 | 5.30E-03 | 1.18E-05 | 3.46E-11 |
| 14797-55-8 | Nitrate | Inorganics | 1.52E-01 | 1.19E-01 | 1.42E-01 | 3.26E-01 | 1.40E-01 | 7.00E-02 | 1.43E-04 | 4.36E-04 |
| 14797-65-0 | Nitrite | Inorganics | 4.03E-02 | 3.16E-02 | 3.12E-02 | 1.11E-03 | 3.08E-02 | 1.32E-02 | 6.26E-06 | 1.47E-10 |
| 14808-79-8 | Sulfate | Inorganics | 5.83E-03 | 5.68E-03 | 4.93E-03 | 1.75E-04 | 4.87E-03 | 2.08E-03 | 1.82E-06 | 4.09E-11 |
| 16887-00-6 | Chloride | Inorganics | 2.16E-03 | 1.73E-03 | 1.71E-03 | 6.07E-05 | 1.69E-03 | 7.24E-04 | 2.04E-04 | 3.92E-11 |
| 16984-48-8 | Fluoride | Inorganics | 1.86E-03 | 4.13E-03 | 2.40E-03 | 8.53E-05 | 2.38E-03 | 1.42E-03 | 7.19E-05 | 1.24E-12 |
| 18540-29-9 | Chromium VI | Inorganics | 4.81E-04 | 1.72E-03 | 4.51E-04 | 1.60E-05 | 4.46E-04 | 1.91E-04 | 6.72E-09 | 1.65E-13 |
| 22967-92-6 | Methyl mercury | Inorganics | - | - | - | - | - | - | - | - |
| 24959-67-9 | Bromide | Inorganics | - | - | - | - | - | - | - | - |
| 57-12-5 | Cyanide | Inorganics | 3.18E-07 | 3.54E-06 | 3.09E-07 | 1.10E-08 | 3.06E-07 | 1.32E-07 | 1.50E-10 | 3.54E-15 |
| 593-74-8 | Dimethyl Mercury | Inorganics | 7.40E-13 | 7.40E-13 | 6.73E-11 | - | 6.03E-12 | 8.26E-13 | 1.51E-13 | 8.90E-25 |
| 630-08-0 | Carbon monoxide | Inorganics | - | - | - | - | - | - | - | - |
| 7429-90-5 | Aluminum | Inorganics | 7.19E-03 | 2.23E-02 | 5.59E-03 | 1.98E-04 | 5.53E-03 | 2.37E-03 | 1.83E-06 | 4.30E-11 |
| 7439-89-6 | Iron | Inorganics | 4.20E-05 | 4.17E-03 | 4.62E-05 | 1.64E-06 | 4.57E-05 | 2.19E-05 | 2.25E-08 | 5.28E-13 |
| 7439-92-1 | Lead | Inorganics | 2.37E-05 | 2.74E-04 | 1.76E-05 | 6.23E-07 | 1.74E-05 | 7.70E-06 | 2.88E-07 | 6.81E-12 |
| 7439-93-2 | Lithium | Inorganics | 1.12E-06 | 5.91E-06 | 6.55E-07 | 2.32E-08 | 6.48E-07 | 3.31E-07 | 3.38E-10 | 7.50E-15 |
| 7439-95-4 | Magnesium | Inorganics | 4.08E-06 | 7.46E-05 | 4.08E-06 | 1.45E-07 | 4.03E-06 | 1.78E-06 | 2.71E-09 | 4.71E-14 |
| 7439-96-5 | Manganese | Inorganics | 5.38E-06 | 6.15E-04 | 4.23E-06 | 1.50E-07 | 4.18E-06 | 2.12E-06 | 2.06E-09 | 4.83E-14 |
| 7439-97-6 ¹ | Mercury | Inorganics | - | - | - | - | - | - | - | - |
| 7439-98-7 | Molybdenum | Inorganics | 1.38E-05 | 1.65E-05 | 7.91E-06 | 2.80E-07 | 7.82E-06 | 3.35E-06 | 3.88E-09 | 9.05E-14 |
| 7440-02-0 | Nickel | Inorganics | 3.75E-05 | 3.82E-04 | 2.84E-05 | 1.01E-06 | 2.81E-05 | 1.22E-05 | 1.40E-08 | 3.28E-13 |
| 7440-16-6 | Rhodium | Inorganics | 9.90E-07 | 2.83E-06 | 6.74E-07 | 2.39E-08 | 6.67E-07 | 2.86E-07 | 3.30E-10 | 7.72E-15 |
| 7440-22-4 | Silver | Inorganics | 1.33E-06 | 1.28E-05 | 8.20E-07 | 2.91E-08 | 8.11E-07 | 3.53E-07 | 4.02E-10 | 9.38E-15 |
| 7440-23-5 | Sodium | Inorganics | 1.12E-01 | 8.46E-02 | 9.08E-02 | 5.52E-02 | 8.99E-02 | 3.82E-02 | 1.80E-03 | 5.94E-10 |
| 7440-24-6 | Strontium (total) | Inorganics | 1.95E-05 | 1.64E-04 | 1.37E-05 | 4.85E-07 | 1.35E-05 | 5.86E-06 | 2.83E-11 | 1.10E-15 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|-----------|--|------------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 7440-25-7 | Tantalum | Inorganics | 7.61E-07 | 6.17E-07 | 5.06E-07 | 1.79E-08 | 5.00E-07 | 2.14E-07 | 2.48E-10 | 5.79E-15 |
| 7440-28-0 | Thallium | Inorganics | 5.16E-06 | 2.14E-05 | 3.93E-06 | 1.39E-07 | 3.88E-06 | 1.67E-06 | 2.28E-09 | 4.49E-14 |
| 7440-31-5 | Tin | Inorganics | - | - | - | - | - | - | - | - |
| 7440-33-7 | Tungsten | Inorganics | 1.75E-06 | 1.34E-05 | 1.97E-06 | 6.99E-08 | 1.95E-06 | 8.38E-07 | 9.64E-10 | 2.25E-14 |
| 7440-36-0 | Antimony | Inorganics | 4.06E-06 | 1.08E-05 | 3.00E-06 | 1.07E-07 | 2.97E-06 | 1.27E-06 | 1.64E-09 | 3.44E-14 |
| 7440-38-2 | Arsenic | Inorganics | 4.76E-06 | 1.43E-05 | 2.99E-06 | 1.06E-07 | 2.96E-06 | 1.27E-06 | 1.64E-09 | 3.42E-14 |
| 7440-39-3 | Barium | Inorganics | 1.04E-06 | 3.05E-05 | 6.49E-07 | 2.30E-08 | 6.42E-07 | 2.90E-07 | 3.17E-10 | 7.43E-15 |
| 7440-41-7 | Beryllium | Inorganics | 2.35E-07 | 1.54E-06 | 1.51E-07 | 5.37E-09 | 1.50E-07 | 6.47E-08 | 7.41E-11 | 1.73E-15 |
| 7440-43-9 | Cadmium | Inorganics | 4.93E-06 | 2.80E-05 | 2.82E-06 | 1.00E-07 | 2.79E-06 | 1.21E-06 | 1.38E-09 | 3.23E-14 |
| 7440-47-3 | Chromium III | Inorganics | 4.81E-04 | 1.72E-03 | 4.51E-04 | 1.60E-05 | 4.46E-04 | 1.91E-04 | 6.72E-09 | 1.65E-13 |
| 7440-48-4 | Cobalt | Inorganics | 1.19E-06 | 4.80E-06 | 7.88E-07 | 2.80E-08 | 7.79E-07 | 3.35E-07 | 3.89E-10 | 9.11E-15 |
| 7440-50-8 | Copper | Inorganics | 2.04E-06 | 8.78E-06 | 1.03E-06 | 3.66E-08 | 1.02E-06 | 4.40E-07 | 5.54E-10 | 1.25E-14 |
| 7440-61-1 | Uranium | Inorganics | - | 1.46E-03 | 2.09E-05 | 7.42E-07 | 2.07E-05 | 9.60E-06 | 1.02E-08 | 2.39E-13 |
| 7440-62-2 | Vanadium | Inorganics | 1.45E-06 | 7.86E-06 | 8.70E-07 | 3.09E-08 | 8.60E-07 | 3.71E-07 | 4.27E-10 | 9.95E-15 |
| 7440-65-5 | Yttrium | Inorganics | 4.71E-07 | 1.77E-06 | 3.30E-07 | 1.17E-08 | 3.27E-07 | 1.40E-07 | 1.61E-10 | 3.78E-15 |
| 7440-66-6 | Zinc | Inorganics | 2.10E-06 | 1.90E-05 | 1.18E-06 | 4.19E-08 | 1.17E-06 | 5.73E-07 | 5.75E-10 | 1.35E-14 |
| 7440-67-7 | Zirconium | Inorganics | 3.25E-06 | 1.48E-03 | 1.77E-05 | 6.29E-07 | 1.75E-05 | 8.31E-06 | 8.63E-09 | 2.03E-13 |
| 7446-09-5 | Sulfur dioxide | Inorganics | - | - | - | - | - | - | - | - |
| 7647-01-0 | Hydrogen chloride | Inorganics | - | - | - | - | - | - | - | - |
| 7664-39-3 | Hydrogen Fluoride | Inorganics | - | - | - | - | - | - | - | - |
| 7664-41-7 | Ammonia/Ammonium | Inorganics | - | - | 7.41E-06 | 1.96E-07 | 7.69E-06 | 2.59E-05 | 5.17E-05 | 4.40E-10 |
| 7704-34-9 | Total Sulfur (thermodynamically stable) | Inorganics | 1.95E-03 | 1.89E-03 | 1.71E-03 | 6.06E-05 | 1.69E-03 | 7.21E-04 | 7.43E-07 | 1.44E-11 |
| 7723-14-0 | Phosphorus | Inorganics | 3.43E-03 | 4.25E-03 | 9.86E-04 | 3.50E-05 | 9.75E-04 | 7.05E-03 | 3.84E-06 | 1.13E-11 |
| 7782-41-4 | Fluorine gas F ₂ | Inorganics | - | - | - | - | - | - | - | - |
| 7782-49-2 | Selenium | Inorganics | 1.15E-05 | 1.32E-05 | 1.09E-05 | 3.87E-07 | 1.08E-05 | 4.61E-06 | 6.43E-09 | 1.25E-13 |
| 7782-50-5 | Chlorine | Inorganics | - | - | - | - | - | - | - | - |
| 100-02-7 | p-Nitrophenol | Organics | 7.75E-06 | 9.17E-06 | 1.21E-05 | 4.20E-07 | 1.20E-05 | 7.29E-06 | 4.97E-06 | 3.17E-11 |
| 100-21-0 | Phthalic acid | Organics | 2.96E-06 | 3.50E-06 | 4.90E-06 | 1.72E-07 | 4.86E-06 | 2.92E-06 | 1.95E-06 | 1.25E-11 |
| 100-25-4 | 1,4-Dinitrobenzene | Organics | 5.87E-09 | 6.95E-09 | 9.30E-09 | 3.08E-11 | 9.24E-09 | 7.53E-09 | 8.40E-09 | 2.73E-14 |
| 100-40-3 | 4-Ethenylcyclohexene | Organics | 1.93E-06 | 2.28E-06 | 1.23E-15 | 9.83E-25 | 3.20E-19 | 6.82E-10 | 9.68E-22 | - |
| 100-41-4 | Ethyl benzene | Organics | 5.25E-11 | 6.22E-11 | 5.71E-18 | 1.13E-25 | 3.62E-20 | 1.86E-14 | 2.84E-22 | - |
| 100-42-5 | Styrene | Organics | 2.52E-11 | 2.98E-11 | 1.65E-15 | 1.85E-22 | 2.13E-15 | 1.24E-13 | 4.52E-12 | - |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|---|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 100-44-7 | Benzyl chloride | Organics | - | - | - | - | - | - | - | - |
| 100-47-0 | Benzonitrile | Organics | - | - | - | - | - | - | - | - |
| 100-51-6 | Benzyl alcohol | Organics | - | - | - | - | - | - | - | - |
| 100-52-7 | Benzaldehyde | Organics | - | - | - | - | - | - | - | - |
| 10061-01-5 | cis-1,3-Dichloropropene | Organics | 9.29E-11 | 1.10E-10 | 2.27E-16 | 2.50E-23 | 7.64E-18 | 3.29E-14 | 1.10E-19 | - |
| 10061-02-6 | trans-1,3-Dichloropropene | Organics | 9.70E-11 | 1.15E-10 | 5.87E-15 | 2.95E-21 | 7.94E-16 | 3.44E-14 | 3.26E-17 | - |
| 101-55-3 | 4-Bromophenylphenyl ether | Organics | 2.96E-06 | 3.50E-06 | 2.48E-08 | 1.68E-13 | 1.45E-08 | 3.52E-09 | 3.56E-09 | 2.05E-17 |
| 101-77-9 | 4,4-Methylenedianiline | Organics | - | - | - | - | - | - | - | - |
| 103-33-3 | Azobenzene | Organics | - | - | - | - | - | - | - | - |
| 103-65-1 | n-Propyl benzene (Isocumene) | Organics | - | - | - | - | - | - | - | - |
| 104-51-8 | n-Butylbenzene | Organics | - | - | - | - | - | - | - | - |
| 104-76-7 | 2-Ethyl-1-hexanol | Organics | 2.32E-06 | 2.74E-06 | 2.01E-07 | 5.11E-12 | 1.73E-07 | 7.23E-08 | 9.23E-08 | 4.11E-15 |
| 105-67-9 | 2,4-Dimethylphenol | Organics | - | - | 4.19E-07 | 1.89E-10 | 4.44E-07 | 2.31E-06 | 4.94E-06 | 3.11E-13 |
| 10595-95-6 | n-Nitrosomethylethylamine | Organics | 4.18E-06 | 4.95E-06 | 1.86E-06 | 1.18E-09 | 1.84E-06 | 1.51E-06 | 1.77E-06 | 1.91E-12 |
| 106-43-4 | 4-Chlorotoluene (p-Tolyl chloride) | Organics | - | - | - | - | - | - | - | - |
| 106-44-5 | p-Cresol (4-methyl phenol) | Organics | - | - | - | - | - | - | - | - |
| 106-46-7 | 1,4-Dichlorobenzene | Organics | 1.59E-08 | 1.89E-08 | 5.62E-14 | 7.37E-21 | 3.52E-15 | 5.72E-12 | 2.51E-12 | - |
| 106-47-8 | p-Chloroaniline | Organics | - | - | 6.74E-07 | 5.31E-10 | 6.99E-07 | 2.55E-06 | 5.24E-06 | 8.53E-13 |
| 106-49-0 | p-Toluidine | Organics | - | - | - | - | - | - | - | - |
| 106-51-4 | Quinone | Organics | - | - | - | - | - | - | - | - |
| 106-88-7 | 1,2-Epoxybutane | Organics | 2.57E-06 | 3.04E-06 | 8.56E-09 | 2.57E-14 | 4.06E-09 | 1.44E-09 | 7.40E-10 | 2.37E-18 |
| 106-89-8 | Epichlorohydrin (1-chloro- 2,3 epoxypropane) | Organics | - | - | - | - | - | - | - | - |
| 106-93-4 | Ethylene dibromide | Organics | 2.52E-11 | 2.98E-11 | 2.38E-15 | 1.46E-21 | 3.80E-16 | 8.95E-15 | 1.86E-17 | - |
| 106-99-0 | 1,3-Butadiene | Organics | 8.45E-10 | 1.00E-09 | 1.22E-19 | - | 1.21E-23 | 2.99E-13 | 2.83E-26 | - |
| 107-02-8 | Acrolein | Organics | 1.37E-09 | 1.62E-09 | 1.09E-11 | 5.07E-17 | 6.29E-12 | 1.54E-12 | 1.52E-12 | 8.48E-21 |
| 107-05-1 | 3-Chloropropene | Organics | 9.29E-11 | 1.10E-10 | 3.40E-18 | 3.52E-26 | 1.13E-20 | 3.29E-14 | 7.27E-23 | - |
| 107-06-2 | 1,2-Dichloroethane | Organics | 2.94E-11 | 3.48E-11 | 1.34E-13 | 5.90E-20 | 1.91E-13 | 9.81E-12 | 1.54E-10 | 3.50E-24 |
| 107-12-0 | Propionitrile | Organics | 8.52E-09 | 1.01E-08 | 4.93E-10 | 8.52E-15 | 4.02E-10 | 1.43E-10 | 1.86E-10 | 5.30E-18 |
| 107-13-1 | Acrylonitrile | Organics | 9.29E-10 | 1.10E-09 | 3.34E-10 | 1.87E-15 | 5.30E-10 | 1.92E-08 | 7.08E-08 | 4.88E-19 |
| 107-19-7 | Propargyl alcohol | Organics | - | - | - | - | - | - | - | - |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|----------|---|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 107-21-1 | Ethylene glycol (1,2-ethanediol) | Organics | - | - | - | - | - | - | - | - |
| 107-98-2 | Propylene glycol monomethyl ether | Organics | - | - | - | - | - | - | - | - |
| 108-05-4 | Acetic acid vinyl ester | Organics | 3.06E-06 | 3.63E-06 | 7.88E-10 | 7.46E-16 | 1.78E-10 | 1.10E-09 | 1.28E-11 | 1.20E-20 |
| 108-10-1 | 4-Methyl-2-pentanone | Organics | 3.27E-10 | 3.87E-10 | 1.89E-12 | 7.43E-18 | 1.02E-12 | 2.71E-13 | 2.23E-13 | 9.96E-22 |
| 108-39-4 | m-Cresol | Organics | 6.75E-06 | 8.00E-06 | 3.59E-06 | 3.79E-09 | 3.56E-06 | 2.88E-06 | 3.25E-06 | 5.87E-12 |
| 108-60-1 | bis (2-Chloroisopropyl)ether | Organics | - | - | - | - | - | - | - | - |
| 108-67-8 | 1,3,5-Trimethylbenzene | Organics | - | - | - | - | - | - | - | - |
| 108-86-1 | Bromobenzene (Phenyl bromide) | Organics | - | - | - | - | - | - | - | - |
| 108-87-2 | Methylcyclohexane | Organics | 1.07E-10 | 1.27E-10 | 7.79E-23 | - | 2.34E-28 | 3.79E-14 | - | - |
| 108-88-3 | Toluene | Organics | 1.31E-10 | 1.55E-10 | 4.36E-17 | 1.19E-24 | 2.52E-17 | 4.79E-14 | 1.28E-13 | - |
| 108-90-7 | Chlorobenzene | Organics | 3.03E-11 | 3.59E-11 | 3.83E-16 | 2.67E-23 | 4.67E-16 | 3.61E-14 | 1.35E-12 | - |
| 108-94-1 | Cyclohexanone | Organics | 9.08E-08 | 1.07E-07 | 1.92E-08 | 1.69E-12 | 1.82E-08 | 1.15E-08 | 1.41E-08 | 2.27E-15 |
| 108-95-2 | Phenol | Organics | 2.11E-08 | 2.49E-08 | 3.41E-07 | 7.62E-10 | 3.45E-07 | 7.20E-07 | 1.32E-06 | 1.01E-12 |
| 109-74-0 | n-Butanenitrile | Organics | 2.46E-06 | 2.91E-06 | 8.70E-08 | 1.02E-12 | 6.61E-08 | 1.97E-08 | 2.57E-08 | 4.60E-16 |
| 109-75-1 | 3-Butenenitrile | Organics | - | - | - | - | - | - | - | - |
| 109-77-3 | Malononitrile | Organics | - | - | - | - | - | - | - | - |
| 109-86-4 | 2-Methoxyethanol | Organics | - | - | - | - | - | - | - | - |
| 109-99-9 | Tetrahydrofuran | Organics | 1.01E-09 | 1.20E-09 | 2.06E-11 | 1.65E-16 | 1.43E-11 | 3.70E-12 | 4.77E-12 | 5.19E-20 |
| 110-00-9 | Furan | Organics | - | - | - | - | - | - | - | - |
| 110-54-3 | n-Hexane | Organics | 4.90E-09 | 5.80E-09 | 4.88E-23 | - | - | 1.74E-12 | - | - |
| 110-59-8 | Pentanenitrile | Organics | 2.37E-06 | 2.80E-06 | 5.01E-08 | 4.13E-13 | 3.50E-08 | 9.08E-09 | 1.16E-08 | 1.33E-16 |
| 110-80-5 | 2-Ethoxyethanol | Organics | 1.78E-05 | 2.10E-05 | 1.15E-05 | 2.21E-08 | 1.14E-05 | 8.81E-06 | 9.27E-06 | 3.05E-11 |
| 110-82-7 | Cyclohexane | Organics | 9.29E-11 | 1.10E-10 | 1.59E-21 | - | 3.90E-26 | 3.29E-14 | 6.83E-29 | - |
| 110-83-8 | Cyclohexene | Organics | 9.29E-11 | 1.10E-10 | 5.65E-20 | - | 1.43E-23 | 3.29E-14 | 4.29E-26 | - |
| 110-86-1 | Pyridine | Organics | 2.19E-08 | 2.59E-08 | 4.68E-09 | 4.20E-13 | 4.43E-09 | 2.82E-09 | 3.46E-09 | 5.68E-16 |
| 111-15-9 | Ethylene glycol monoethyl ether acetate | Organics | - | - | - | - | - | - | - | - |
| 111-44-4 | Bis(2-chloroethyl)ether | Organics | - | - | 3.81E-09 | 1.53E-13 | 5.14E-09 | 1.06E-07 | 2.66E-07 | 1.61E-16 |
| 111-65-9 | n-Octane | Organics | 1.12E-09 | 1.33E-09 | 1.97E-24 | - | - | 3.97E-13 | - | - |
| 111-76-2 | 2-Butoxyethanol | Organics | 2.80E-06 | 3.32E-06 | 1.20E-06 | 6.82E-10 | 1.19E-06 | 9.68E-07 | 1.15E-06 | 1.11E-12 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|-----------|------------------------------------|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 111-84-2 | n-Nonane | Organics | 7.51E-10 | 8.89E-10 | 1.11E-24 | - | - | 2.66E-13 | - | - |
| 111-91-1 | Bis(2-chloroethoxy)methane | Organics | - | - | 3.77E-08 | 8.57E-12 | 4.18E-08 | 3.39E-07 | 7.59E-07 | 1.37E-14 |
| 1120-21-4 | Undecane | Organics | - | - | - | - | - | - | - | - |
| 1120-71-4 | 1,3-Propane sultone | Organics | - | - | - | - | - | - | - | - |
| 112-30-1 | 1-Decanol | Organics | - | - | - | - | - | - | - | - |
| 112-31-2 | Decanal | Organics | - | - | - | - | - | - | - | - |
| 112-40-3 | Dodecane | Organics | - | - | - | - | - | - | - | - |
| 117-81-7 | Bis(2-ethylhexyl) phthalate | Organics | 2.32E-06 | 2.74E-06 | 5.37E-06 | 5.27E-08 | 5.34E-06 | 4.21E-06 | 4.45E-06 | 2.55E-11 |
| 117-84-0 | Di-n-octylphthalate | Organics | 1.01E-05 | 1.20E-05 | 2.40E-07 | 3.68E-12 | 1.71E-07 | 4.54E-08 | 5.83E-08 | 7.37E-16 |
| 118-74-1 | Hexachlorobenzene | Organics | 5.27E-11 | 6.24E-11 | 1.39E-14 | 6.04E-21 | 1.82E-14 | 9.68E-13 | 1.91E-11 | 2.40E-25 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | Organics | - | - | - | - | - | - | - | - |
| 120-12-7 | Anthracene | Organics | 1.81E-06 | 2.15E-06 | 4.54E-08 | 5.87E-13 | 3.28E-08 | 1.93E-08 | 4.46E-08 | 1.49E-16 |
| 120-82-1 | 1,2,4-Trichlorobenzene | Organics | 1.86E-09 | 2.21E-09 | 3.00E-14 | 8.25E-21 | 2.38E-15 | 6.61E-13 | 6.00E-17 | - |
| 120-83-2 | 2,4-Dichlorophenol | Organics | 3.87E-06 | 4.58E-06 | 1.34E-11 | 1.76E-18 | 5.35E-13 | 1.37E-09 | 8.42E-15 | 1.52E-24 |
| 121-14-2 | 2,4-Dinitrotoluene | Organics | 8.93E-06 | 1.06E-05 | 1.14E-05 | 1.19E-07 | 1.13E-05 | 7.19E-06 | 5.44E-06 | 5.48E-11 |
| 122-39-4 | N,N-Diphenylamine | Organics | 2.82E-09 | 3.33E-09 | 1.06E-09 | 4.95E-13 | 1.04E-09 | 8.04E-10 | 9.44E-10 | 5.68E-16 |
| 122-66-7 | 1,2-Diphenylhydrazine | Organics | - | - | - | - | - | - | - | - |
| 123-33-1 | Maleic hydrazide | Organics | - | - | - | - | - | - | - | - |
| 123-38-6 | Propionaldehyde | Organics | 3.09E-09 | 3.66E-09 | 6.26E-11 | 5.01E-16 | 4.34E-11 | 1.11E-11 | 1.41E-11 | 1.57E-19 |
| 123-72-8 | Butanal | Organics | 2.57E-06 | 3.04E-06 | 2.23E-08 | 1.09E-13 | 1.31E-08 | 3.18E-09 | 3.27E-09 | 1.93E-17 |
| 123-91-1 | 1,4-Dioxan | Organics | 9.29E-10 | 1.10E-09 | 2.68E-10 | 4.75E-14 | 2.59E-10 | 1.91E-10 | 2.34E-10 | 7.33E-17 |
| 124-18-5 | Decane | Organics | - | - | - | - | - | - | - | - |
| 124-48-1 | Chlorodibromomethane | Organics | - | - | 3.28E-13 | 1.89E-19 | 4.77E-13 | 2.40E-11 | 3.13E-10 | 1.15E-23 |
| 126-73-8 | Tributyl phosphate | Organics | 2.65E-06 | 3.14E-06 | 1.31E-06 | 1.19E-09 | 1.29E-06 | 1.00E-06 | 1.11E-06 | 1.35E-12 |
| 126-98-7 | 2-Methyl-2-propenenitrile | Organics | 9.29E-10 | 1.10E-09 | 1.49E-12 | 3.16E-18 | 5.84E-13 | 3.93E-13 | 8.29E-14 | 1.77E-22 |
| 127-18-4 | 1,1,2,2-Tetrachloroethene | Organics | 3.06E-11 | 3.62E-11 | 2.93E-19 | - | 4.30E-22 | 1.08E-14 | 2.17E-24 | - |
| 128-37-0 | 2,6-Bis(tert-butyl)-4-methylphenol | Organics | 4.45E-08 | 5.26E-08 | 1.41E-08 | 4.16E-12 | 1.37E-08 | 1.02E-08 | 1.22E-08 | 4.63E-15 |
| 129-00-0 | Pyrene | Organics | 8.80E-06 | 1.04E-05 | 1.68E-06 | 2.04E-10 | 1.58E-06 | 1.13E-06 | 1.63E-06 | 1.48E-13 |
| 131-11-3 | Dimethyl Phthalate | Organics | - | - | 2.26E-07 | 2.14E-09 | 2.26E-07 | 2.33E-07 | 3.15E-07 | 1.07E-12 |
| 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol | Organics | - | - | - | - | - | - | - | - |
| 132-64-9 | Dibenzofuran | Organics | - | - | 1.04E-11 | 3.72E-17 | 1.65E-11 | 6.94E-10 | 3.61E-09 | 3.30E-21 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|--|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 1330-20-7 | Xylenes (mixed isomers) | Organics | 8.98E-09 | 1.06E-08 | 3.41E-15 | 1.37E-22 | 1.29E-16 | 3.19E-12 | 3.48E-13 | - |
| 133-06-2 | Captan | Organics | - | - | - | - | - | - | - | - |
| 1336-36-3 | Polychlorinated biphenyls | Organics | 4.08E-06 | 4.83E-06 | 1.21E-08 | 3.41E-14 | 5.55E-09 | 2.01E-09 | 2.99E-10 | 2.91E-18 |
| 134-32-7 | alpha-Naphthylamine | Organics | 2.04E-06 | 2.41E-06 | 2.34E-06 | 2.13E-08 | 2.32E-06 | 1.44E-06 | 1.03E-06 | 1.09E-11 |
| 135-98-8 | sec-Butylbenzene | Organics | - | - | - | - | - | - | - | - |
| 141-78-6 | Acetic acid ethyl ester | Organics | 9.92E-11 | 1.17E-10 | 6.29E-13 | 2.60E-18 | 3.46E-13 | 8.95E-14 | 7.79E-14 | 3.72E-22 |
| 145-73-3 | Endothall | Organics | - | - | - | - | - | - | - | - |
| 156-59-2 | cis-1,2-Dichloroethene | Organics | - | - | - | - | - | - | - | - |
| 156-60-5 | 1,2-trans-Dichloroethene | Organics | 6.90E-06 | 8.17E-06 | 4.50E-13 | 6.61E-21 | 2.12E-15 | 2.45E-09 | 1.52E-17 | - |
| 1634-04-4 | Methyl tert-butyl ether | Organics | 2.51E-06 | 2.97E-06 | 4.43E-10 | 3.56E-16 | 8.83E-11 | 8.97E-10 | 5.50E-12 | 4.42E-21 |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD) | Organics | - | - | 4.39E-18 | 1.42E-22 | 6.23E-18 | 1.57E-16 | 4.27E-16 | 6.41E-26 |
| 189-55-9 | Dibenzo[a,i]pyrene | Organics | 1.79E-06 | 2.12E-06 | 2.35E-06 | 6.05E-08 | 2.33E-06 | 1.35E-06 | 8.27E-07 | 9.23E-12 |
| 189-64-0 | Dibenzo[a,h]pyrene | Organics | 1.79E-06 | 2.12E-06 | 2.35E-06 | 6.05E-08 | 2.33E-06 | 1.35E-06 | 8.27E-07 | 9.23E-12 |
| 191-24-2 | Benzo(g,h,i)perylene | Organics | 1.79E-06 | 2.12E-06 | 2.34E-06 | 1.03E-08 | 2.32E-06 | 1.71E-06 | 1.69E-06 | 6.89E-12 |
| 191-30-0 | Dibenzo(a,l)pyrene | Organics | 1.79E-06 | 2.12E-06 | 2.35E-06 | 6.05E-08 | 2.33E-06 | 1.35E-06 | 8.27E-07 | 9.23E-12 |
| 192-65-4 | Dibenzo[a,e]pyrene | Organics | 1.79E-06 | 2.12E-06 | 2.35E-06 | 6.05E-08 | 2.33E-06 | 1.35E-06 | 8.27E-07 | 9.23E-12 |
| 192-97-2 | Benzo(e)pyrene | Organics | - | - | - | - | - | - | - | - |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | Organics | 1.79E-06 | 2.12E-06 | 1.15E-06 | 1.12E-09 | 1.14E-06 | 1.39E-06 | 2.16E-06 | 1.03E-12 |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin | Organics | - | - | 4.97E-17 | 6.05E-21 | 5.51E-17 | 5.61E-16 | 1.33E-15 | 4.45E-24 |
| 205-82-3 | Benzo[j]fluoranthene | Organics | - | - | - | - | - | - | - | - |
| 205-99-2 | Benzo(b)fluoranthene | Organics | - | - | 2.45E-08 | 2.95E-12 | 2.85E-08 | 3.57E-07 | 8.51E-07 | 2.17E-15 |
| 206-44-0 | Fluoranthene | Organics | 8.83E-06 | 1.04E-05 | 1.26E-06 | 8.08E-11 | 1.15E-06 | 6.91E-07 | 9.82E-07 | 6.16E-14 |
| 207-08-9 | Benzo(k)fluoranthene | Organics | - | - | 5.12E-07 | 9.57E-10 | 5.16E-07 | 9.36E-07 | 1.67E-06 | 8.26E-13 |
| 208-96-8 | Acenaphthylene | Organics | 1.81E-06 | 2.14E-06 | 1.60E-08 | 1.12E-13 | 9.54E-09 | 5.21E-09 | 1.36E-08 | 1.42E-17 |
| 218-01-9 | Chrysene | Organics | - | - | 1.22E-10 | 1.29E-15 | 1.93E-10 | 6.84E-09 | 2.45E-08 | 2.11E-19 |
| 224-42-0 | Dibenz[a,j]acridine | Organics | 1.89E-06 | 2.24E-06 | 2.78E-06 | 9.31E-08 | 2.76E-06 | 1.62E-06 | 1.03E-06 | 7.85E-12 |
| 2245-38-7 | 2,3,5-Trimethylnaphthalene | Organics | - | - | - | - | - | - | - | - |
| 226-36-8 | Dibenz[a,h]acridine | Organics | 1.89E-06 | 2.24E-06 | 2.67E-06 | 8.95E-08 | 2.65E-06 | 1.55E-06 | 9.58E-07 | 7.54E-12 |
| 23950-58-5 | Pronamide | Organics | - | - | - | - | - | - | - | - |
| 27154-33-2 | Trichlorofluoroethane | Organics | 1.08E-05 | 1.28E-05 | 5.33E-13 | 1.15E-20 | 2.12E-15 | 3.82E-09 | 1.45E-17 | - |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|--|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 31508-00-6 | 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) | Organics | - | - | 3.05E-18 | 7.83E-24 | 4.75E-18 | 2.11E-16 | 1.31E-15 | - |
| 319-84-6 | alpha-BHC | Organics | 1.04E-10 | 1.23E-10 | 1.95E-11 | 1.93E-15 | 1.83E-11 | 1.07E-11 | 1.30E-11 | 1.72E-18 |
| 319-85-7 | beta-BHC | Organics | 1.41E-10 | 1.67E-10 | 1.63E-08 | 2.80E-11 | 1.62E-08 | 1.96E-08 | 2.96E-08 | 2.94E-14 |
| 32598-13-3 | 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) | Organics | - | - | 2.53E-15 | 3.01E-19 | 2.96E-15 | 3.63E-14 | 8.56E-14 | 2.87E-22 |
| 32598-14-4 | 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) | Organics | - | - | 2.29E-20 | - | 3.33E-20 | 1.69E-18 | 2.29E-17 | - |
| 3268-87-9 | Octachlorodibenzo(p)dioxin | Organics | - | - | 2.31E-15 | 4.87E-19 | 2.51E-15 | 2.01E-14 | 4.58E-14 | 4.09E-22 |
| 32774-16-6 | 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) | Organics | - | - | 2.02E-17 | 2.49E-22 | 3.18E-17 | 1.05E-15 | 3.36E-15 | 6.98E-26 |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin | Organics | - | - | 1.96E-16 | 1.71E-20 | 2.24E-16 | 2.68E-15 | 6.41E-15 | - |
| 3697-24-3 | 5-Methylchrysene | Organics | 1.82E-06 | 2.15E-06 | 5.03E-07 | 1.08E-10 | 4.85E-07 | 3.41E-07 | 4.10E-07 | 1.15E-13 |
| 38380-08-4 | 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) | Organics | - | - | 4.05E-18 | 2.23E-23 | 6.49E-18 | 2.54E-16 | 1.08E-15 | - |
| 39001-02-0 | Octachlorodibenzofuran | Organics | - | - | 1.76E-15 | 1.43E-18 | 1.80E-15 | 5.33E-15 | 1.07E-14 | 1.37E-21 |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin | Organics | - | - | 6.24E-17 | 6.39E-21 | 6.75E-17 | 5.92E-16 | 1.39E-15 | 5.81E-24 |
| 39635-31-9 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) | Organics | - | - | 1.67E-17 | 2.89E-22 | 2.55E-17 | 7.70E-16 | 2.28E-15 | 1.06E-25 |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo(p)dioxin | Organics | - | - | 4.90E-16 | 1.68E-19 | 5.13E-16 | 2.31E-15 | 4.91E-15 | 2.73E-22 |
| 4170-30-3 | Crotonaldehyde (Propylene aldehyde) | Organics | 1.27E-09 | 1.50E-09 | 7.17E-17 | 9.66E-25 | 3.10E-19 | 4.50E-13 | 7.83E-19 | - |
| 41851-50-7 | Chlorocyclopentadiene | Organics | - | - | - | - | - | - | - | - |
| 460-19-5 | Cyanogen (oxalonitrile) | Organics | - | - | - | - | - | - | - | - |
| 4786-20-3 | 2-Butenenitrile | Organics | - | - | - | - | - | - | - | - |
| 50-00-0 | Formaldehyde | Organics | 4.28E-06 | 5.06E-06 | 3.03E-06 | 7.97E-09 | 3.01E-06 | 2.25E-06 | 2.26E-06 | 1.00E-11 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|--|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 50-32-8 | Benzo(a)pyrene | Organics | 3.68E-09 | 4.35E-09 | 8.08E-08 | 3.82E-11 | 8.46E-08 | 4.11E-07 | 8.87E-07 | 3.51E-14 |
| 506-68-3 | Cyanogen bromide (bromocyanide) | Organics | - | - | - | - | - | - | - | - |
| 506-77-4 | Cyanogen chloride | Organics | - | - | - | - | - | - | - | - |
| 510-15-6 | Chlorobenzilate | Organics | - | - | - | - | - | - | - | - |
| 51207-31-9 | 2,3,7,8- Tetrachlorodibenzofuran | Organics | - | - | 1.19E-16 | 8.69E-21 | 1.41E-16 | 1.98E-15 | 4.83E-15 | 7.09E-24 |
| 51-28-5 | 2,4-Dinitrophenol | Organics | - | - | 3.63E-06 | 1.02E-08 | 3.66E-06 | 5.86E-06 | 9.96E-06 | 9.51E-12 |
| 51-79-6 | Ethyl carbamate (urethane) | Organics | - | - | - | - | - | - | - | - |
| 52663-72-6 | 2,3',4,4',5,5'- Hexachlorobiphenyl (PCB 167) | Organics | - | - | 2.10E-17 | 2.59E-22 | 3.30E-17 | 1.09E-15 | 3.49E-15 | 7.25E-26 |
| 528-29-0 | 1,2-Dinitrobenzene (o- Dinitrobenzene) | Organics | - | - | - | - | - | - | - | - |
| 532-27-4 | 2-Chloroacetophenone | Organics | - | - | - | - | - | - | - | - |
| 534-52-1 | 4,6-Dinitro-o-cresol | Organics | - | - | 1.02E-06 | 9.30E-10 | 1.04E-06 | 3.19E-06 | 6.41E-06 | 1.06E-12 |
| 53-70-3 | Dibenz[a,h]anthracene | Organics | 4.23E-09 | 5.01E-09 | 3.19E-07 | 8.60E-09 | 3.16E-07 | 1.55E-07 | 4.64E-08 | 6.26E-13 |
| 5385-75-1 | Dibenzo(a,e)fluoranthene | Organics | - | - | - | - | - | - | - | - |
| 540-59-0 | 1,2-Dichloroethene (total) (1,2-Dichloroethylene) | Organics | - | - | 2.18E-16 | 1.31E-23 | 2.87E-16 | 1.56E-14 | 9.11E-13 | - |
| 540-73-8 | 1,2-Dimethylhydrazine | Organics | - | - | - | - | - | - | - | - |
| 540-84-1 | 2,2,4-Trimethylpentane | Organics | - | - | - | - | - | - | - | - |
| 541-73-1 | 1,3-Dichlorobenzene | Organics | 1.22E-09 | 1.44E-09 | 2.02E-15 | 1.82E-22 | 5.62E-17 | 4.33E-13 | 7.42E-19 | - |
| 542-75-6 | 1,3-Dichloropropene | Organics | - | - | - | - | - | - | - | - |
| 542-88-1 | Bis(chloromethyl)ether | Organics | - | - | - | - | - | - | - | - |
| 55673-89-7 | 1,2,3,4,7,8,9- Heptachlorodibenzofuran | Organics | - | - | 2.04E-17 | 1.54E-21 | 2.49E-17 | 3.83E-16 | 9.33E-16 | 1.18E-24 |
| 56-23-5 | Carbon tetrachloride | Organics | 4.80E-11 | 5.69E-11 | 1.06E-19 | - | 6.07E-21 | 1.70E-14 | 1.37E-16 | - |
| 56-49-5 | 3-Methylcholanthrene | Organics | 1.82E-06 | 2.15E-06 | 5.17E-07 | 1.17E-10 | 4.99E-07 | 3.54E-07 | 4.26E-07 | 1.26E-13 |
| 56-55-3 | Benzo(a)anthracene | Organics | - | - | 7.47E-08 | 3.33E-11 | 7.84E-08 | 3.89E-07 | 8.41E-07 | 3.07E-14 |
| 57117-31-4 | 2,3,4,7,8- Pentachlorodibenzofuran | Organics | - | - | 2.74E-16 | 2.30E-19 | 2.93E-16 | 1.95E-15 | 4.35E-15 | 7.05E-23 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|---|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Organics | - | - | 2.34E-16 | 6.88E-20 | 2.47E-16 | 1.45E-15 | 3.21E-15 | 5.70E-23 |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Organics | - | - | 7.16E-17 | 1.13E-20 | 8.05E-17 | 7.91E-16 | 1.83E-15 | 1.15E-23 |
| 57-24-9 | Strychnine | Organics | - | - | - | - | - | - | - | - |
| 57465-28-8 | 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) | Organics | - | - | 7.73E-16 | 9.10E-20 | 9.15E-16 | 1.19E-14 | 2.80E-14 | 8.65E-23 |
| 57653-85-7 | 1,2,3,6,7,8,-Hexachlorodibenzo(p)dioxin | Organics | - | - | 3.85E-17 | 2.89E-21 | 4.47E-17 | 5.91E-16 | 1.43E-15 | 2.38E-24 |
| 57-74-9 | Chlordane | Organics | - | - | - | - | - | - | - | - |
| 581-42-0 | 2,6-Dimethylnaphthalene | Organics | - | - | - | - | - | - | - | - |
| 584-84-9 | 2,4-Toluene diisocyanate | Organics | - | - | - | - | - | - | - | - |
| 58-89-9 | gamma-BHC (Lindane) | Organics | 1.41E-10 | 1.66E-10 | 4.05E-11 | 9.41E-15 | 3.92E-11 | 2.88E-11 | 3.56E-11 | 1.01E-17 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | Organics | 5.50E-06 | 6.51E-06 | 1.69E-06 | 4.67E-10 | 1.64E-06 | 1.20E-06 | 1.44E-06 | 5.16E-13 |
| 589-38-8 | 3-Hexanone | Organics | 2.38E-06 | 2.81E-06 | 1.74E-08 | 7.77E-14 | 9.89E-09 | 2.46E-09 | 2.33E-09 | 1.23E-17 |
| 591-50-4 | Benzene, iodo- | Organics | - | - | - | - | - | - | - | - |
| 591-78-6 | 2-Hexanone | Organics | 4.02E-09 | 4.76E-09 | 5.26E-11 | 3.23E-16 | 3.37E-11 | 8.10E-12 | 9.54E-12 | 7.56E-20 |
| 593-60-2 | Bromoethene (Vinyl bromide) | Organics | - | - | - | - | - | - | - | - |
| 59-50-7 | 4-Chloro-3-methylphenol | Organics | 8.16E-06 | 9.66E-06 | 3.03E-06 | 1.10E-09 | 2.97E-06 | 2.39E-06 | 2.90E-06 | 1.80E-12 |
| 59-89-2 | N-Nitrosomorpholine | Organics | 1.80E-05 | 2.13E-05 | 1.85E-05 | 3.40E-07 | 1.84E-05 | 1.24E-05 | 1.04E-05 | 1.39E-10 |
| 60-11-7 | Dimethyl aminoazobenzene | Organics | - | - | - | 1.93E-19 | - | - | - | - |
| 602-87-9 | 5-Nitroacenaphthene | Organics | 2.36E-06 | 2.80E-06 | 1.29E-06 | 1.48E-09 | 1.27E-06 | 9.66E-07 | 1.03E-06 | 1.65E-12 |
| 60-29-7 | Ethyl ether | Organics | 3.49E-09 | 4.13E-09 | 8.07E-14 | 2.63E-20 | 7.46E-15 | 1.24E-12 | 2.14E-16 | 8.17E-26 |
| 60-35-5 | Acetamide | Organics | 4.20E-06 | 4.98E-06 | 3.97E-06 | 1.18E-07 | 3.94E-06 | 2.53E-06 | 1.94E-06 | 3.17E-11 |
| 606-20-2 | 2,6-Dinitrotoluene | Organics | - | - | 2.73E-07 | 4.65E-10 | 2.76E-07 | 5.75E-07 | 1.06E-06 | 4.89E-13 |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Organics | - | - | 2.06E-17 | 2.05E-21 | 2.44E-17 | 3.28E-16 | 7.83E-16 | 1.86E-24 |
| 608-93-5 | Pentachlorobenzene | Organics | - | - | - | - | - | - | - | - |
| 61626-71-9 | Dichloropentadiene | Organics | - | - | - | - | - | - | - | - |
| 621-64-7 | N-Nitroso-di-n-propylamine | Organics | 7.90E-06 | 9.36E-06 | 3.02E-06 | 1.20E-09 | 2.97E-06 | 2.40E-06 | 2.90E-06 | 1.97E-12 |
| 624-83-9 | Methyl isocyanate | Organics | - | - | - | - | - | - | - | - |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|---|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 62-50-0 | Ethyl methanesulfonate | Organics | - | - | - | - | - | - | - | - |
| 62-53-3 | Aniline | Organics | - | - | - | - | - | - | - | - |
| 62-75-9 | N-Nitroso-N,N-dimethylamine | Organics | 4.18E-08 | 4.95E-08 | 1.72E-08 | 8.53E-12 | 1.69E-08 | 1.39E-08 | 1.66E-08 | 1.39E-14 |
| 628-73-9 | Hexanenitrile | Organics | 2.31E-06 | 2.73E-06 | 2.92E-08 | 1.76E-13 | 1.85E-08 | 4.45E-09 | 5.20E-09 | 4.02E-17 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | Organics | 1.20E-05 | 1.41E-05 | 4.05E-11 | 5.25E-18 | 1.60E-12 | 4.24E-09 | 2.50E-14 | 4.48E-24 |
| 64-18-6 | Formic acid (methanoic acid) | Organics | - | - | - | - | - | - | - | - |
| 65510-44-3 | 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) | Organics | - | - | 5.44E-14 | 2.26E-18 | 7.44E-14 | 1.65E-12 | 4.27E-12 | 1.45E-21 |
| 65-85-0 | Benzoic acid | Organics | - | - | - | - | - | - | - | - |
| 67-56-1 | Methyl alcohol | Organics | 4.56E-06 | 5.40E-06 | 1.34E-06 | 2.52E-10 | 1.30E-06 | 9.44E-07 | 1.13E-06 | 3.91E-13 |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Organics | - | - | 6.32E-17 | 4.79E-21 | 7.71E-17 | 1.19E-15 | 2.91E-15 | 5.18E-24 |
| 67-63-0 | 2-Propyl alcohol | Organics | 2.59E-09 | 3.07E-09 | 5.82E-10 | 5.78E-14 | 5.53E-10 | 3.60E-10 | 4.42E-10 | 8.00E-17 |
| 67-64-1 | 2-Propanone (Acetone) | Organics | 4.41E-08 | 5.22E-08 | 7.57E-09 | 1.25E-13 | 9.85E-09 | 2.26E-07 | 6.33E-07 | 7.89E-17 |
| 67-66-3 | Chloroform | Organics | 3.14E-11 | 3.72E-11 | 3.84E-16 | 2.68E-23 | 4.67E-16 | 3.65E-14 | 1.35E-12 | - |
| 67-72-1 | Hexachloroethane | Organics | 3.71E-07 | 4.40E-07 | 3.19E-13 | 2.03E-20 | 6.33E-15 | 1.32E-10 | 7.25E-17 | - |
| 69782-90-7 | 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) | Organics | - | - | 5.01E-17 | 8.62E-22 | 7.66E-17 | 2.31E-15 | 6.87E-15 | 3.17E-25 |
| 70-30-4 | Hexachlorophene | Organics | - | - | - | - | - | - | - | - |
| 70362-50-4 | 3,4,4',5-Tetrachlorobiphenyl (PCB 81) | Organics | - | - | 1.16E-16 | 5.06E-21 | 1.56E-16 | 3.34E-15 | 8.57E-15 | 3.34E-24 |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Organics | - | - | 4.69E-17 | 2.45E-21 | 5.72E-17 | 8.82E-16 | 2.15E-15 | 2.85E-24 |
| 71-36-3 | n-Butyl alcohol | Organics | 7.50E-08 | 8.88E-08 | 1.61E-08 | 1.45E-12 | 1.52E-08 | 9.70E-09 | 1.19E-08 | 1.96E-15 |
| 71-43-2 | Benzene | Organics | 7.95E-11 | 9.41E-11 | 6.88E-17 | 2.47E-24 | 5.87E-17 | 3.14E-14 | 2.53E-13 | - |
| 71-55-6 | 1,1,1-Trichloroethane | Organics | 3.11E-11 | 3.68E-11 | 3.53E-19 | - | 5.77E-22 | 1.10E-14 | 2.98E-24 | - |
| 72-43-5 | Methoxychlor | Organics | - | - | - | - | - | - | - | - |
| 72-55-9 | 4,4-DDE | Organics | 3.23E-06 | 3.83E-06 | 3.58E-07 | 1.68E-11 | 3.17E-07 | 1.47E-07 | 1.84E-07 | 1.11E-14 |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Organics | - | - | 1.20E-17 | 1.20E-21 | 1.43E-17 | 1.97E-16 | 4.70E-16 | 1.08E-24 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|------------|--|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 74472-37-0 | 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) | Organics | - | - | 5.20E-18 | 4.62E-23 | 8.30E-18 | 2.95E-16 | 1.04E-15 | - |
| 74-83-9 | Bromomethane | Organics | 6.28E-11 | 7.43E-11 | 3.97E-17 | 1.20E-24 | 3.37E-17 | 2.41E-14 | 1.62E-13 | - |
| 74-87-3 | Chloromethane | Organics | 1.25E-10 | 1.48E-10 | 1.42E-17 | 2.34E-25 | 5.50E-18 | 4.47E-14 | 3.69E-14 | - |
| 74-88-4 | Iodomethane | Organics | - | - | 5.90E-17 | 2.37E-24 | 7.67E-17 | 4.20E-15 | 3.13E-13 | - |
| 74-95-3 | Methylene bromide | Organics | - | - | - | - | - | - | - | - |
| 74-97-5 | Bromochloromethane | Organics | - | - | - | - | - | - | - | - |
| 75-00-3 | Chloroethane | Organics | 6.28E-11 | 7.43E-11 | 4.98E-18 | 8.20E-26 | 2.62E-20 | 2.23E-14 | 1.94E-22 | - |
| 75-01-4 | 1-Chloroethene | Organics | 6.37E-11 | 7.55E-11 | 1.83E-19 | - | 1.26E-22 | 2.26E-14 | 5.05E-25 | - |
| 75-02-5 | Fluoroethene (vinyl fluoride) | Organics | 3.28E-06 | 3.88E-06 | 1.15E-16 | - | 4.53E-21 | 1.16E-09 | 8.66E-24 | - |
| 75-05-8 | Acetonitrile | Organics | 2.29E-08 | 2.71E-08 | 6.67E-08 | 1.26E-12 | 9.93E-08 | 2.69E-06 | 7.38E-06 | 8.95E-16 |
| 75-07-0 | Acetaldehyde | Organics | 3.14E-06 | 3.71E-06 | 5.58E-08 | 4.12E-13 | 3.78E-08 | 9.47E-09 | 1.18E-08 | 1.18E-16 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | Organics | 1.86E-08 | 2.20E-08 | 1.89E-13 | 2.82E-20 | 1.48E-13 | 1.43E-11 | 2.51E-10 | 1.08E-24 |
| 75-15-0 | Carbon disulfide | Organics | - | - | 2.30E-21 | - | 2.84E-21 | 1.56E-19 | 6.47E-17 | - |
| 75-21-8 | Ethylene oxide (Oxirane) | Organics | 5.41E-09 | 6.41E-09 | 2.78E-11 | 1.03E-16 | 1.46E-11 | 4.06E-12 | 3.06E-12 | 1.28E-20 |
| 75-25-2 | Bromoform | Organics | - | - | - | - | - | - | 3.80E-28 | - |
| 75-27-4 | Bromodichloromethane | Organics | 2.33E-05 | 2.76E-05 | 2.58E-10 | 5.94E-17 | 1.74E-11 | 8.27E-09 | 3.86E-13 | 1.12E-22 |
| 75-29-6 | 2-Chloropropane | Organics | - | - | - | - | - | - | - | - |
| 75-34-3 | 1,1-Dichloroethane | Organics | 2.52E-11 | 2.98E-11 | 7.50E-18 | 2.66E-25 | 8.41E-20 | 8.92E-15 | 7.87E-22 | - |
| 75-35-4 | 1,1-Dichloroethene | Organics | 3.96E-11 | 4.69E-11 | 1.27E-19 | - | 9.42E-23 | 1.40E-14 | 3.86E-25 | - |
| 75-44-5 | Phosgene (hydrogen phosphide) | Organics | - | - | - | - | - | - | - | - |
| 75-45-6 | Chlorodifluoromethane | Organics | 9.29E-11 | 1.10E-10 | 7.93E-20 | - | 2.50E-23 | 3.29E-14 | 7.98E-26 | - |
| 75-50-3 | Trimethylamine | Organics | 2.81E-06 | 3.32E-06 | 2.98E-08 | 1.62E-13 | 1.83E-08 | 4.37E-09 | 4.84E-09 | 3.29E-17 |
| 75-69-4 | Trichlorofluoromethane | Organics | 7.65E-11 | 9.05E-11 | 4.85E-21 | - | 2.81E-25 | 2.71E-14 | 5.77E-28 | - |
| 75-71-8 | Dichlorodifluoromethane | Organics | 7.79E-11 | 9.22E-11 | 1.12E-22 | - | 5.31E-28 | 2.76E-14 | - | - |
| 76-01-7 | Pentachloroethane | Organics | - | - | - | - | - | - | - | - |
| 76-13-1 | 1,2,2-Trichlorotrifluoroethane | Organics | 7.69E-11 | 9.11E-11 | 3.07E-23 | - | - | 2.73E-14 | - | - |
| 764-41-0 | 1,4-Dichloro-2-butene | Organics | - | - | - | - | - | - | - | - |
| 76-44-8 | Heptachlor | Organics | 7.23E-11 | 8.56E-11 | 1.25E-24 | - | - | 2.56E-14 | - | - |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|----------|--|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 765-34-4 | Glycidylaldehyde | Organics | - | - | - | - | - | - | - | - |
| 77-47-4 | Hexachlorocyclopentadiene | Organics | - | - | 3.06E-20 | - | 3.78E-20 | 2.08E-18 | 7.77E-16 | - |
| 77-78-1 | Dimethyl sulfate | Organics | - | - | - | - | - | - | - | - |
| 78-83-1 | 2-Methylpropyl alcohol | Organics | 4.36E-05 | 5.17E-05 | 8.78E-06 | 7.03E-10 | 8.27E-06 | 5.10E-06 | 6.27E-06 | 9.21E-13 |
| 78-87-5 | 1,2-Dichloropropane | Organics | 2.52E-11 | 2.98E-11 | 5.60E-17 | 5.87E-24 | 1.80E-18 | 8.92E-15 | 2.54E-20 | - |
| 78-93-3 | 2-Butanone | Organics | 1.01E-08 | 1.19E-08 | 1.48E-09 | 1.62E-14 | 2.07E-09 | 5.82E-08 | 1.77E-07 | 7.57E-18 |
| 79-00-5 | 1,1,2-Trichloroethane | Organics | 2.95E-11 | 3.49E-11 | 1.58E-15 | 7.53E-22 | 2.04E-16 | 1.05E-14 | 8.01E-18 | - |
| 79-01-6 | 1,1,2-Trichloroethylene | Organics | 3.35E-11 | 3.97E-11 | 4.02E-18 | 2.98E-26 | 2.78E-18 | 1.20E-14 | 2.13E-14 | - |
| 79-10-7 | 2-Propenoic acid | Organics | 6.55E-06 | 7.76E-06 | 4.56E-06 | 1.10E-08 | 4.52E-06 | 3.42E-06 | 3.50E-06 | 1.42E-11 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | Organics | 2.95E-11 | 3.49E-11 | 2.16E-14 | 3.23E-20 | 6.78E-15 | 1.11E-14 | 7.26E-16 | 1.06E-24 |
| 79-46-9 | 2-Nitropropane | Organics | 6.21E-09 | 7.36E-09 | 5.02E-11 | 2.36E-16 | 2.91E-11 | 7.13E-12 | 7.09E-12 | 3.99E-20 |
| 80-62-6 | Methyl methacrylate | Organics | - | - | - | - | - | - | - | - |
| 822-06-0 | Hexamethylene-1,5-diisocyanate | Organics | - | - | - | - | - | - | - | - |
| 823-40-5 | Toluene-2,6-diamine | Organics | - | - | - | - | - | - | - | - |
| 82-68-8 | Pentachloronitrobenzene (PCNB) | Organics | 5.87E-09 | 6.95E-09 | 3.24E-12 | 6.04E-18 | 9.34E-13 | 2.16E-12 | 9.01E-14 | 1.15E-22 |
| 832-69-9 | 1-Methylphenanthrene | Organics | - | - | - | - | - | - | - | - |
| 83-32-9 | Acenaphthene | Organics | 8.90E-06 | 1.05E-05 | 3.87E-08 | 1.87E-13 | 1.96E-08 | 7.16E-09 | 9.60E-09 | 1.46E-17 |
| 84-66-2 | Diethyl phthalate | Organics | 2.64E-06 | 3.12E-06 | 2.45E-06 | 6.77E-09 | 2.43E-06 | 2.02E-06 | 2.31E-06 | 6.34E-12 |
| 84-74-2 | Di-n-butylphthalate | Organics | 5.39E-05 | 6.38E-05 | 2.47E-05 | 1.74E-08 | 2.44E-05 | 2.10E-05 | 2.63E-05 | 2.00E-11 |
| 85-01-8 | Phenanthrene | Organics | 1.81E-06 | 2.15E-06 | 1.86E-07 | 7.84E-12 | 1.64E-07 | 1.37E-07 | 2.58E-07 | 4.89E-15 |
| 85-44-9 | Phthalic anhydride (1,2-benzenedicarboxylic anhydride) | Organics | - | - | - | - | - | - | - | - |
| 85-68-7 | Butylbenzylphthalate | Organics | 1.73E-05 | 2.05E-05 | 9.02E-06 | 8.87E-09 | 8.92E-06 | 7.29E-06 | 8.51E-06 | 1.00E-11 |
| 86-73-7 | Fluorene | Organics | 1.82E-06 | 2.16E-06 | 4.69E-08 | 6.17E-13 | 3.41E-08 | 2.27E-08 | 5.46E-08 | 1.60E-16 |
| 87-61-6 | 1,2,3-Trichlorobenzene | Organics | - | - | - | - | - | - | - | - |
| 87-68-3 | Hexachlorobutadiene | Organics | 1.59E-08 | 1.89E-08 | 1.61E-15 | 3.07E-23 | 9.80E-18 | 5.65E-12 | 7.57E-20 | - |
| 87-86-5 | Pentachlorophenol | Organics | 1.54E-08 | 1.82E-08 | 2.18E-08 | 4.74E-10 | 2.16E-08 | 1.30E-08 | 8.57E-09 | 9.62E-14 |
| 88-06-2 | 2,4,6-Trichlorophenol | Organics | 7.84E-06 | 9.28E-06 | 1.80E-06 | 1.86E-10 | 1.71E-06 | 1.13E-06 | 1.38E-06 | 2.60E-13 |
| 88-74-4 | o-Nitroaniline (2-nitroaniline) | Organics | - | - | 3.11E-07 | 2.88E-09 | 3.10E-07 | 3.23E-07 | 4.38E-07 | 1.46E-12 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | | |
|----------|---|----------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|--|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin | |
| 88-75-5 | 2-Nitrophenol | Organics | 7.93E-06 | 9.39E-06 | 1.66E-06 | 1.38E-10 | 1.57E-06 | 1.45E-06 | 2.35E-06 | 1.82E-13 | |
| 90-04-0 | o-Anisidine | Organics | - | - | - | - | - | - | - | - | |
| 90-12-0 | 1-Methylnaphthalene | Organics | - | - | - | - | - | - | - | - | |
| 91-20-3 | Naphthalene | Organics | 8.32E-06 | 9.85E-06 | 2.59E-09 | 2.62E-15 | 7.11E-10 | 8.36E-09 | 4.75E-08 | 5.10E-20 | |
| 91-22-5 | Quinoline | Organics | - | - | - | - | - | - | - | - | |
| 91-57-6 | 2-Methylnaphthalene | Organics | - | - | 6.94E-11 | 6.51E-17 | 1.04E-10 | 5.02E-09 | 4.71E-08 | 4.43E-21 | |
| 91-58-7 | 2-Chloronaphthalene | Organics | 2.31E-06 | 2.74E-06 | 2.06E-09 | 3.37E-15 | 6.88E-10 | 8.87E-10 | 7.92E-11 | 1.26E-19 | |
| 91-94-1 | 3,3'-Dichlorobenzidine | Organics | - | - | 1.77E-06 | 5.62E-08 | 1.76E-06 | 1.47E-06 | 1.66E-06 | 5.44E-12 | |
| 924-16-3 | N-Nitroso-di-n-Buetylamine | Organics | - | - | - | - | - | - | - | - | |
| 92-52-4 | 1,1'-Biphenyl | Organics | 5.87E-09 | 6.95E-09 | 5.48E-12 | 9.14E-18 | 1.85E-12 | 2.26E-12 | 2.17E-13 | 3.54E-22 | |
| 94-59-7 | Safrole (5-(2-Propenyl)-1,3-benzodioxole) | Organics | - | - | - | - | - | - | - | - | |
| 94-75-7 | 2,4-D | Organics | - | - | - | - | - | - | - | - | |
| 95-48-7 | o-Cresol | Organics | 9.38E-06 | 1.11E-05 | 4.45E-06 | 3.38E-09 | 4.40E-06 | 3.60E-06 | 4.19E-06 | 5.42E-12 | |
| 95-49-8 | o-Chlorotoluene | Organics | - | - | - | - | - | - | - | - | |
| 95-50-1 | 1,2-Dichlorobenzene | Organics | 2.43E-08 | 2.88E-08 | 1.64E-13 | 3.00E-20 | 8.92E-15 | 8.61E-12 | 1.70E-16 | - | |
| 95-53-4 | o-Toluidine | Organics | - | - | - | - | - | - | - | - | |
| 95-57-8 | 2-Chlorophenol | Organics | 8.44E-06 | 9.99E-06 | 4.33E-09 | 5.53E-15 | 1.22E-09 | 3.10E-09 | 1.14E-10 | 1.42E-19 | |
| 95-63-6 | 1,2,4-Trimethyl benzene | Organics | - | - | - | - | - | - | - | - | |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | Organics | - | - | - | - | - | - | - | - | |
| 95-95-4 | 2,4,5-Trichlorophenol | Organics | 7.66E-06 | 9.06E-06 | 2.30E-06 | 4.57E-10 | 2.24E-06 | 1.68E-06 | 2.05E-06 | 7.15E-13 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | Organics | - | - | - | - | - | - | - | - | |
| 96-18-4 | 1,2,3-Trichloropropane | Organics | - | - | - | - | - | - | - | - | |
| 96-45-7 | Ethylene thiourea | Organics | - | - | - | - | - | - | - | - | |
| 97-63-2 | Ethyl methacrylate | Organics | - | - | - | - | - | - | - | - | |
| 98-01-1 | Furfural | Organics | - | - | - | - | - | - | - | - | |
| 98-06-6 | tert-Butyl benzene | Organics | - | - | - | - | - | - | - | - | |
| 98-07-7 | Benzotrichloride | Organics | - | - | - | - | - | - | - | - | |
| 98-82-8 | Cumene | Organics | 1.90E-06 | 2.24E-06 | 6.36E-20 | - | 2.47E-26 | 6.72E-10 | - | - | |
| 98-83-9 | Methyl styrene (mixed isomers) | Organics | - | - | - | - | - | - | - | - | |
| 98-86-2 | Acetophenone | Organics | 5.87E-09 | 6.95E-09 | 1.19E-09 | 8.64E-14 | 1.13E-09 | 1.52E-09 | 2.87E-09 | 1.10E-16 | |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|-------------------------|-----------------------|---------------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 98-95-3 | Nitrobenzene | Organics | 2.05E-08 | 2.43E-08 | 4.13E-09 | 1.18E-13 | 4.76E-09 | 7.21E-08 | 1.86E-07 | 1.04E-16 |
| 99-35-4 | 1,3,5-Trinitrobenzene | Organics | - | - | - | - | - | - | - | - |
| 99-65-0 | 1,3-Dinitrobenzene | Organics | - | - | - | - | - | - | - | - |
| 99-87-6 | p-Cymene | Organics | - | - | - | - | - | - | - | - |
| 10028-17-8 | Tritium | Radionuclides | 4.24E-14 | 7.95E-14 | 4.08E-14 | 3.08E-16 | 4.06E-14 | 2.96E-14 | 2.80E-14 | 7.68E-18 |
| 10045-97-3 | Cesium-137 | Radionuclides | 4.20E-07 | 3.94E-07 | 3.37E-07 | 1.43E-04 | 5.64E-11 | 1.42E-07 | 1.27E-15 | 7.88E-16 |
| 10098-91-6 ² | Yttrium-90 | Radionuclides | 1.29E-12 | 1.16E-10 | 1.22E-12 | 4.32E-14 | 1.20E-12 | 5.76E-13 | 2.52E-18 | 9.83E-23 |
| 10098-97-2 | Strontium-90 | Radionuclides | 4.98E-09 | 4.46E-07 | 4.70E-09 | 1.67E-10 | 4.64E-09 | 2.22E-09 | 9.72E-15 | 3.79E-19 |
| 10198-40-0 | Cobalt-60 | Radionuclides | 1.25E-14 | 1.00E-13 | 1.13E-14 | 4.01E-16 | 1.12E-14 | 4.82E-15 | 5.58E-18 | 1.31E-22 |
| 13966-29-5 | Uranium-234 | Radionuclides | 1.02E-09 | 7.22E-08 | 1.19E-09 | 4.22E-11 | 1.18E-09 | 5.41E-10 | 5.82E-13 | 1.36E-17 |
| 13967-48-1 | Ruthenium-106 | Radionuclides | 8.40E-24 | 4.98E-23 | 3.11E-23 | 1.10E-24 | 3.07E-23 | 1.32E-23 | 2.74E-29 | 1.47E-33 |
| 13967-70-9 | Cesium-134 | Radionuclides | 4.91E-17 | 8.56E-17 | 5.95E-17 | 2.53E-14 | 9.96E-21 | 2.51E-17 | 2.23E-25 | 1.39E-25 |
| 13968-55-3 | Uranium-233 | Radionuclides | 1.96E-09 | 1.63E-07 | 1.69E-09 | 5.99E-11 | 1.67E-09 | 8.01E-10 | 8.27E-13 | 1.93E-17 |
| 13981-15-2 | Curium-244 | Radionuclides | 2.79E-13 | 2.47E-12 | 1.79E-13 | 6.34E-15 | 1.77E-13 | 7.68E-14 | 8.75E-17 | 2.05E-21 |
| 13981-16-3 | Plutonium-238 | Radionuclides | 5.35E-12 | 3.23E-10 | 4.36E-12 | 1.55E-13 | 4.31E-12 | 2.01E-12 | 5.89E-19 | 1.56E-22 |
| 13981-37-8 | Nickel-63 | Radionuclides | 6.15E-10 | 3.34E-09 | 4.31E-10 | 1.53E-11 | 4.27E-10 | 1.84E-10 | 2.13E-13 | 4.98E-18 |
| 13982-10-0 | Plutonium-242 | Radionuclides | 3.35E-11 | 3.60E-10 | 1.85E-11 | 6.57E-13 | 1.83E-11 | 8.01E-12 | 4.02E-15 | 6.73E-22 |
| 13982-63-3 | Radium-226 | Radionuclides | 1.69E-06 | 2.47E-14 | 7.20E-07 | 2.55E-08 | 7.12E-07 | 3.04E-07 | 3.85E-10 | 5.53E-15 |
| 13982-70-2 | Uranium-236 | Radionuclides | 2.63E-09 | 1.94E-07 | 3.55E-09 | 1.26E-10 | 3.51E-09 | 1.60E-09 | 1.74E-12 | 4.06E-17 |
| 13994-20-2 | Neptunium-237 | Radionuclides | 7.15E-08 | 6.05E-07 | 5.92E-08 | 2.10E-09 | 5.86E-08 | 2.53E-08 | 2.90E-11 | 6.78E-16 |
| 14119-32-5 | Plutonium-241 | Radionuclides | 2.12E-12 | 2.12E-10 | 2.75E-12 | 9.77E-14 | 2.72E-12 | 1.28E-12 | 3.72E-19 | 9.84E-23 |
| 14119-33-6 | Plutonium-240 | Radionuclides | 1.24E-09 | 8.18E-08 | 1.01E-09 | 3.58E-11 | 9.97E-10 | 4.69E-10 | 1.36E-16 | 3.60E-20 |
| 14133-76-7 | Technetium-99 | Radionuclides | 4.44E-06 | 4.00E-06 | 3.75E-06 | 1.33E-07 | 3.71E-06 | 1.59E-06 | 3.54E-09 | 4.30E-14 |
| 14158-29-3 | Uranium-232 | Radionuclides | 1.67E-14 | 8.49E-13 | 1.55E-14 | 5.51E-16 | 1.54E-14 | 7.01E-15 | 7.61E-18 | 1.78E-22 |
| 14234-35-6 | Antimony-125 | Radionuclides | 1.34E-15 | 4.39E-15 | 1.50E-15 | 5.33E-17 | 1.48E-15 | 6.35E-16 | 8.87E-19 | 1.72E-23 |
| 14331-85-2 | Protactinium-231 | Radionuclides | 1.62E-10 | 2.98E-10 | 9.92E-11 | 3.52E-12 | 9.81E-11 | 4.20E-11 | 4.86E-14 | 1.14E-18 |
| 14336-70-0 | Nickel-59 | Radionuclides | 7.85E-09 | 3.72E-08 | 5.19E-09 | 1.84E-10 | 5.13E-09 | 2.21E-09 | 2.56E-12 | 5.99E-17 |
| 14391-16-3 | Europium-155 | Radionuclides | 2.80E-14 | 1.29E-12 | 3.23E-14 | 1.15E-15 | 3.19E-14 | 1.43E-14 | 1.58E-17 | 3.70E-22 |
| 14596-10-2 | Americium-241 | Radionuclides | 2.04E-09 | 1.59E-07 | 2.78E-09 | 9.87E-11 | 2.75E-09 | 1.26E-09 | 9.74E-16 | 1.13E-19 |
| 14683-23-9 | Europium-152 | Radionuclides | 5.78E-13 | 5.61E-12 | 4.82E-13 | 1.71E-14 | 4.77E-13 | 2.06E-13 | 2.36E-16 | 5.52E-21 |
| 14762-75-5 | Carbon-14 | Radionuclides | 3.34E-10 | 4.14E-10 | 3.15E-10 | 1.12E-11 | 3.11E-10 | 1.33E-10 | 1.53E-13 | 3.60E-18 |
| 14952-40-0 | Actinium-227 | Radionuclides | 7.97E-14 | 2.03E-13 | 4.71E-14 | 1.67E-15 | 4.66E-14 | 2.00E-14 | 2.31E-17 | 5.39E-22 |
| 14993-75-0 | Americium-243 | Radionuclides | 1.73E-11 | 1.17E-09 | 2.13E-11 | 7.54E-13 | 2.10E-11 | 9.59E-12 | 7.44E-18 | 8.65E-22 |

Table B-2 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the PT Facility

| CASRN | Chemical | Type | PT Facility Stream Mass Fractions | | | | | | | |
|--------------------------|---------------|---------------|-----------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|
| | | | FRP01 LAW Waste | FRP14 HLW Waste | UFP33 UF Permeate | CNP12 Cesium Conc | CXP23 Treated LAW | PWD01 Plant Wash | RLD01 Rad Liquid | RDP01 Spent Resin |
| 15046-84-1 | Iodine-129 | Radionuclides | 4.62E-07 | 4.04E-07 | 3.26E-07 | 1.14E-08 | 3.22E-07 | 1.57E-07 | 4.54E-08 | 1.29E-12 |
| 15117-48-3 | Plutonium-239 | Radionuclides | 2.25E-08 | 1.43E-06 | 1.78E-08 | 6.31E-10 | 1.76E-08 | 8.28E-09 | 2.40E-15 | 6.36E-19 |
| 15117-96-1 | Uranium-235 | Radionuclides | 1.13E-07 | 7.80E-06 | 1.32E-07 | 4.70E-09 | 1.31E-07 | 6.00E-08 | 6.48E-11 | 1.51E-15 |
| 15262-20-1 | Radium-228 | Radionuclides | 1.59E-15 | 7.16E-14 | 1.50E-15 | 5.34E-17 | 1.49E-15 | 6.86E-16 | 9.04E-19 | 1.72E-23 |
| 15510-73-3 | Curium-242 | Radionuclides | 6.40E-15 | 5.46E-14 | 4.57E-15 | 1.62E-16 | 4.51E-15 | 1.96E-15 | 2.23E-18 | 5.22E-23 |
| 15585-10-1 | Europium-154 | Radionuclides | 8.51E-13 | 3.52E-11 | 9.75E-13 | 3.46E-14 | 9.65E-13 | 4.30E-13 | 4.77E-16 | 1.12E-20 |
| 15594-54-4 | Thorium-229 | Radionuclides | 1.29E-12 | 2.24E-11 | 9.95E-13 | 3.53E-14 | 9.84E-13 | 4.32E-13 | 4.87E-16 | 1.14E-20 |
| 15715-94-3 | Samarium-151 | Radionuclides | 2.15E-08 | 1.88E-07 | 1.57E-08 | 5.58E-10 | 1.56E-08 | 6.74E-09 | 3.42E-12 | 1.80E-16 |
| 15751-77-6 | Zirconium-93 | Radionuclides | 1.46E-06 | 2.38E-06 | 9.91E-07 | 3.51E-08 | 9.80E-07 | 4.19E-07 | 4.82E-10 | 1.13E-14 |
| 15757-87-6 | Curium-243 | Radionuclides | 3.74E-14 | 3.07E-13 | 2.33E-14 | 8.26E-16 | 2.30E-14 | 9.99E-15 | 1.14E-17 | 2.67E-22 |
| 15758-45-9 | Selenium-79 | Radionuclides | 2.89E-08 | 2.49E-08 | 2.40E-08 | 8.53E-10 | 2.38E-08 | 1.02E-08 | 1.47E-11 | 2.75E-16 |
| 15832-50-5 | Tin-126 | Radionuclides | 1.01E-07 | 8.64E-08 | 5.73E-08 | 2.03E-09 | 5.66E-08 | 2.42E-08 | 2.80E-11 | 6.55E-16 |
| 378253-40-8 ³ | Barium-137m | Radionuclides | 6.43E-14 | 6.03E-14 | 5.16E-14 | 2.19E-11 | 8.63E-18 | 2.18E-14 | 1.94E-22 | 1.21E-22 |
| 378253-44-2 | Cadmium-113m | Radionuclides | 4.59E-12 | 6.83E-12 | 3.60E-12 | 1.28E-13 | 3.56E-12 | 1.52E-12 | 1.77E-15 | 4.12E-20 |
| 378782-82-2 | Niobium-93m | Radionuclides | 1.62E-11 | 2.68E-11 | 1.11E-11 | 3.94E-13 | 1.10E-11 | 4.70E-12 | 5.43E-15 | 1.27E-19 |
| 7440-29-1 | Thorium-232 | Radionuclides | 3.47E-06 | 1.77E-04 | 3.14E-06 | 1.11E-07 | 3.10E-06 | 1.42E-06 | 1.53E-09 | 3.59E-14 |
| 7440-61-1R | Uranium-238 | Radionuclides | 2.17E-05 | 1.45E-03 | 2.61E-05 | 9.25E-07 | 2.58E-05 | 1.18E-05 | 1.28E-08 | 2.98E-13 |

Ref.: 24590-WTP-ES-PE-17-001, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant*, Tables A.8-14, A.8-20, and A.8-26.

Notes:

¹ Mercury mass fraction includes elemental and divalent mercury forms.

² Yttrium-90 is not modeled. Sr-90 is assumed to be in equilibrium with its progeny Y-90, Y-90 is set to an equal Sr-90 activity, and converted to a mass fraction by dividing by the Y-90 specific activity from 10 CFR 71, Table A-1.

³ Barium-137m is not modeled. Cs-137 is assumed to be in equilibrium with its progeny Ba-137m (Ba-137 meta-stable). Ba-137m is set to 94.6% of the cesium-137 activity (see 24590-WTP-3DG-W12W-00002, Section 5.3), and converted to a mass fraction by dividing by the Ba-137m specific activity from Shleien, B. (Ed.), 1992, *The Health Physics and Radiological Health Handbook*, Scinta Inc., ISBN 0-917251-05-9.

Table B-3 summarizes data from Tables A.8-15, A.8-21, and A.8-27 of the *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-ES-PE-17-001). These mass fractions are used to speciate the mass release for Lab samples for the baseline WTP operating configuration, LAW and HLW Facilities. A “-” symbol indicates no data are available for approximating the emissions rate (no data were available or the corresponding values were below the model tolerance).

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------------------|-------------------|------------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 10028-15-6 | Ozone | Inorganics | - | - | - | - | - | - | - |
| 10102-44-0 | Nitrogen dioxide | Inorganics | - | - | - | - | - | - | - |
| 124-38-9 | Carbon dioxide | Inorganics | - | - | - | - | - | - | - |
| 14265-44-2 | Phosphate | Inorganics | 3.26E-03 | 1.85E-03 | 6.22E-05 | 1.35E-02 | 1.35E-02 | 1.07E-02 | 1.11E-04 |
| 14797-55-8 | Nitrate | Inorganics | 1.70E-01 | 8.14E-02 | 2.38E-07 | 3.05E-02 | 3.05E-02 | 2.42E-02 | 1.30E-02 |
| 14797-65-0 | Nitrite | Inorganics | 3.75E-02 | 1.79E-02 | 5.24E-08 | 6.25E-03 | 6.25E-03 | 4.97E-03 | 4.86E-04 |
| 14808-79-8 | Sulfate | Inorganics | 5.92E-03 | 2.89E-03 | 1.06E-06 | 1.49E-03 | 1.49E-03 | 1.20E-03 | 3.56E-04 |
| 16887-00-6 | Chloride | Inorganics | 3.83E-03 | 1.84E-03 | 2.52E-03 | 3.41E-04 | 3.41E-04 | 2.87E-04 | 5.10E-05 |
| 16984-48-8 | Fluoride | Inorganics | 7.06E-03 | 3.39E-03 | 5.96E-03 | 2.67E-03 | 2.67E-03 | 2.12E-03 | 1.38E-03 |
| 18540-29-9 | Chromium VI | Inorganics | 5.88E-04 | 3.02E-04 | 6.44E-05 | 1.05E-03 | 1.05E-03 | 8.36E-04 | 2.58E-05 |
| 22967-92-6 | Methyl mercury | Inorganics | - | - | - | - | - | - | - |
| 24959-67-9 | Bromide | Inorganics | - | - | - | - | - | - | - |
| 57-12-5 | Cyanide | Inorganics | 3.72E-07 | 1.78E-07 | - | 2.58E-06 | 2.58E-06 | 2.05E-06 | 1.48E-10 |
| 593-74-8 | Dimethyl Mercury | Inorganics | 6.90E-10 | 5.07E-10 | 1.07E-09 | 4.55E-13 | 4.55E-13 | 2.12E-13 | 5.28E-13 |
| 630-08-0 | Carbon monoxide | Inorganics | - | - | - | - | - | - | - |
| 7429-90-5 | Aluminum | Inorganics | 6.78E-03 | 1.59E-02 | 8.90E-05 | 1.45E-02 | 1.45E-02 | 1.50E-02 | 1.13E-04 |
| 7439-89-6 | Iron | Inorganics | 1.28E-04 | 1.88E-02 | 1.02E-04 | 3.55E-03 | 3.55E-03 | 7.24E-03 | 1.25E-04 |
| 7439-92-1 | Lead | Inorganics | 2.09E-05 | 1.02E-05 | 5.49E-07 | 2.12E-04 | 2.12E-04 | 1.69E-04 | 2.62E-06 |
| 7439-93-2 | Lithium | Inorganics | 1.09E-04 | 5.49E-03 | 1.53E-04 | 8.08E-05 | 8.08E-05 | 7.87E-03 | 3.91E-05 |
| 7439-95-4 | Magnesium | Inorganics | 6.28E-06 | 4.43E-03 | 1.96E-06 | 7.96E-05 | 7.96E-05 | 1.02E-04 | 1.79E-06 |
| 7439-96-5 | Manganese | Inorganics | 6.10E-06 | 6.97E-05 | 1.44E-06 | 4.95E-04 | 4.95E-04 | 3.99E-04 | 3.52E-06 |
| 7439-97-6 ¹ | Mercury | Inorganics | - | - | - | - | - | - | - |
| 7439-98-7 | Molybdenum | Inorganics | 9.63E-06 | 4.60E-06 | 1.87E-07 | 1.10E-05 | 1.10E-05 | 8.76E-06 | 1.44E-07 |
| 7440-02-0 | Nickel | Inorganics | 3.51E-05 | 6.04E-05 | 1.45E-06 | 3.01E-04 | 3.01E-04 | 2.39E-04 | 1.00E-05 |
| 7440-16-6 | Rhodium | Inorganics | 8.18E-07 | 3.91E-07 | 1.08E-08 | 1.95E-06 | 1.95E-06 | 1.55E-06 | 1.97E-08 |
| 7440-22-4 | Silver | Inorganics | 9.98E-07 | 4.77E-07 | 1.94E-08 | 9.98E-06 | 9.98E-06 | 7.93E-06 | 6.27E-08 |
| 7440-23-5 | Sodium | Inorganics | 1.13E-01 | 5.41E-02 | 4.87E-03 | 2.92E-02 | 2.92E-02 | 2.83E-02 | 4.45E-03 |
| 7440-24-6 | Strontium (total) | Inorganics | 1.66E-05 | 7.91E-06 | 1.64E-07 | 1.26E-04 | 1.26E-04 | 9.98E-05 | 1.09E-06 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|-----------|--|------------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 7440-25-7 | Tantalum | Inorganics | 6.13E-07 | 2.93E-07 | 8.02E-09 | 2.56E-07 | 2.56E-07 | 2.03E-07 | 2.58E-09 |
| 7440-28-0 | Thallium | Inorganics | 6.20E-06 | 2.97E-06 | 2.11E-06 | 1.98E-05 | 1.98E-05 | 1.57E-05 | 3.95E-06 |
| 7440-31-5 | Tin | Inorganics | - | - | - | - | - | - | - |
| 7440-33-7 | Tungsten | Inorganics | 2.39E-06 | 1.14E-06 | 3.12E-08 | 9.04E-06 | 9.04E-06 | 7.18E-06 | 9.13E-08 |
| 7440-36-0 | Antimony | Inorganics | 4.40E-06 | 2.11E-06 | 1.13E-06 | 6.88E-06 | 6.88E-06 | 5.47E-06 | 2.04E-08 |
| 7440-38-2 | Arsenic | Inorganics | 4.39E-06 | 2.10E-06 | 1.12E-06 | 1.04E-05 | 1.04E-05 | 8.24E-06 | 1.50E-07 |
| 7440-39-3 | Barium | Inorganics | 7.85E-07 | 3.75E-07 | 7.77E-09 | 2.44E-05 | 2.44E-05 | 1.94E-05 | 1.80E-07 |
| 7440-41-7 | Beryllium | Inorganics | 1.84E-07 | 8.78E-08 | 2.40E-09 | 1.18E-06 | 1.18E-06 | 9.41E-07 | 1.20E-08 |
| 7440-43-9 | Cadmium | Inorganics | 3.43E-06 | 2.40E-06 | 5.98E-08 | 2.17E-05 | 2.17E-05 | 1.74E-05 | 1.34E-07 |
| 7440-47-3 | Chromium III | Inorganics | 5.88E-04 | 3.02E-04 | 6.44E-05 | 1.05E-03 | 1.05E-03 | 8.36E-04 | 2.58E-05 |
| 7440-48-4 | Cobalt | Inorganics | 9.53E-07 | 4.56E-07 | 9.43E-09 | 3.52E-06 | 3.52E-06 | 2.79E-06 | 3.55E-08 |
| 7440-50-8 | Copper | Inorganics | 1.33E-06 | 6.36E-07 | 1.32E-07 | 6.96E-06 | 6.96E-06 | 5.53E-06 | 4.36E-08 |
| 7440-61-1 | Uranium | Inorganics | 2.53E-05 | 1.21E-05 | 3.31E-07 | 1.15E-03 | 1.15E-03 | 9.17E-04 | 1.16E-05 |
| 7440-62-2 | Vanadium | Inorganics | 1.57E-06 | 1.81E-05 | 7.35E-07 | 6.19E-06 | 6.19E-06 | 4.92E-06 | 9.57E-08 |
| 7440-65-5 | Yttrium | Inorganics | 4.00E-07 | 1.91E-07 | 3.96E-09 | 1.24E-06 | 1.24E-06 | 9.87E-07 | 1.40E-09 |
| 7440-66-6 | Zinc | Inorganics | 8.29E-05 | 1.39E-02 | 1.15E-04 | 1.11E-04 | 1.11E-04 | 2.56E-03 | 2.37E-05 |
| 7440-67-7 | Zirconium | Inorganics | 2.57E-05 | 9.89E-03 | 6.16E-06 | 1.23E-03 | 1.23E-03 | 2.26E-03 | 1.34E-05 |
| 7446-09-5 | Sulfur dioxide | Inorganics | - | - | - | - | - | - | - |
| 7647-01-0 | Hydrogen chloride | Inorganics | - | - | - | - | - | - | - |
| 7664-39-3 | Hydrogen Fluoride | Inorganics | - | - | - | - | - | - | - |
| 7664-41-7 | Ammonia/Ammonium | Inorganics | 2.45E-05 | 1.17E-05 | 1.88E-04 | 4.86E-05 | 4.86E-05 | 3.86E-05 | 3.77E-05 |
| 7704-34-9 | Total Sulfur (thermodynamically stable) | Inorganics | 2.05E-03 | 1.00E-03 | 4.16E-07 | 5.10E-04 | 5.10E-04 | 4.11E-04 | 2.06E-04 |
| 7723-14-0 | Phosphorus | Inorganics | 1.20E-03 | 6.05E-04 | 2.03E-05 | 4.40E-03 | 4.40E-03 | 3.50E-03 | 3.62E-05 |
| 7782-41-4 | Fluorine gas F ₂ | Inorganics | - | - | - | - | - | - | - |
| 7782-49-2 | Selenium | Inorganics | 1.73E-05 | 8.26E-06 | 5.89E-06 | 3.47E-06 | 3.47E-06 | 2.76E-06 | 1.35E-06 |
| 7782-50-5 | Chlorine | Inorganics | - | - | - | - | - | - | - |
| 100-02-7 | p-Nitrophenol | Organics | 7.95E-05 | 3.80E-05 | 1.15E-04 | 1.10E-05 | 1.10E-05 | 8.75E-06 | 8.44E-06 |
| 100-21-0 | Phthalic acid | Organics | 2.97E-05 | 1.42E-05 | 4.16E-05 | 4.57E-06 | 4.57E-06 | 3.63E-06 | 3.55E-06 |
| 100-25-4 | 1,4-Dinitrobenzene | Organics | 2.66E-08 | 1.27E-08 | 3.49E-08 | 2.00E-08 | 2.00E-08 | 1.58E-08 | 1.45E-08 |
| 100-40-3 | 4-Ethenylcyclohexene | Organics | 2.72E-23 | 3.14E-25 | 1.16E-28 | 1.02E-06 | 1.02E-06 | 8.09E-07 | 5.01E-11 |
| 100-41-4 | Ethyl benzene | Organics | 2.00E-23 | 2.49E-24 | 5.20E-27 | 2.78E-11 | 2.78E-11 | 2.21E-11 | 1.54E-15 |
| 100-42-5 | Styrene | Organics | 4.13E-13 | 1.12E-13 | 4.79E-08 | 1.33E-11 | 1.33E-11 | 1.06E-11 | 1.78E-15 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|---|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 100-44-7 | Benzyl chloride | Organics | - | - | - | - | - | - | - |
| 100-47-0 | Benzonitrile | Organics | - | - | - | - | - | - | - |
| 100-51-6 | Benzyl alcohol | Organics | - | - | - | - | - | - | - |
| 100-52-7 | Benzaldehyde | Organics | - | - | - | - | - | - | - |
| 10061-01-5 | cis-1,3-Dichloropropene | Organics | 9.88E-21 | 2.68E-21 | 1.63E-23 | 4.91E-11 | 4.91E-11 | 3.90E-11 | 6.55E-15 |
| 10061-02-6 | trans-1,3-Dichloropropene | Organics | 3.26E-18 | 1.28E-18 | 2.40E-20 | 5.13E-11 | 5.13E-11 | 4.07E-11 | 5.07E-14 |
| 101-55-3 | 4-Bromophenylphenyl ether | Organics | 4.15E-10 | 1.93E-10 | 2.59E-11 | 1.56E-06 | 1.56E-06 | 1.24E-06 | 3.82E-08 |
| 101-77-9 | 4,4-Methylenedianiline | Organics | - | - | - | - | - | - | - |
| 103-33-3 | Azobenzene | Organics | - | - | - | - | - | - | - |
| 103-65-1 | n-Propyl benzene (Isocumene) | Organics | - | - | - | - | - | - | - |
| 104-51-8 | n-Butylbenzene | Organics | - | - | - | - | - | - | - |
| 104-76-7 | 2-Ethyl-1-hexanol | Organics | 1.27E-08 | 6.03E-09 | 3.10E-09 | 1.26E-06 | 1.26E-06 | 9.87E-07 | 1.57E-07 |
| 105-67-9 | 2,4-Dimethylphenol | Organics | 3.66E-06 | 1.75E-06 | 2.48E-05 | 3.97E-06 | 3.97E-06 | 2.97E-06 | 7.01E-07 |
| 10595-95-6 | n-Nitrosomethylethylamine | Organics | 8.15E-07 | 3.90E-07 | 9.08E-07 | 3.96E-06 | 3.96E-06 | 3.09E-06 | 2.41E-06 |
| 106-43-4 | 4-Chlorotoluene (p-Tolyl chloride) | Organics | - | - | - | - | - | - | - |
| 106-44-5 | p-Cresol (4-methyl phenol) | Organics | - | - | - | - | - | - | - |
| 106-46-7 | 1,4-Dichlorobenzene | Organics | 2.33E-13 | 6.68E-14 | 1.93E-08 | 8.43E-09 | 8.43E-09 | 6.70E-09 | 3.45E-11 |
| 106-47-8 | p-Chloroaniline | Organics | 5.79E-06 | 2.77E-06 | 2.84E-05 | 4.50E-06 | 4.50E-06 | 3.45E-06 | 8.03E-07 |
| 106-49-0 | p-Toluidine | Organics | - | - | - | - | - | - | - |
| 106-51-4 | Quinone | Organics | - | - | - | - | - | - | - |
| 106-88-7 | 1,2-Epoxybutane | Organics | 8.07E-11 | 3.70E-11 | 3.28E-12 | 1.36E-06 | 1.36E-06 | 1.08E-06 | 1.84E-08 |
| 106-89-8 | Epichlorohydrin (1-chloro- 2,3 epoxypropane) | Organics | - | - | - | - | - | - | - |
| 106-93-4 | Ethylene dibromide | Organics | 1.88E-18 | 7.56E-19 | 1.67E-20 | 1.33E-11 | 1.33E-11 | 1.06E-11 | 1.77E-14 |
| 106-99-0 | 1,3-Butadiene | Organics | 5.42E-28 | - | - | 4.47E-10 | 4.47E-10 | 3.55E-10 | 2.20E-14 |
| 107-02-8 | Acrolein | Organics | 1.71E-13 | 7.95E-14 | 1.04E-14 | 7.22E-10 | 7.22E-10 | 5.73E-10 | 1.71E-11 |
| 107-05-1 | 3-Chloropropene | Organics | 4.47E-24 | 3.75E-25 | 5.41E-28 | 4.91E-11 | 4.91E-11 | 3.90E-11 | 2.53E-15 |
| 107-06-2 | 1,2-Dichloroethane | Organics | 1.56E-11 | 5.96E-12 | 1.31E-07 | 1.73E-11 | 1.73E-11 | 1.24E-11 | 1.24E-14 |
| 107-12-0 | Propionitrile | Organics | 2.40E-11 | 1.14E-11 | 4.40E-12 | 4.56E-09 | 4.56E-09 | 3.60E-09 | 4.14E-10 |
| 107-13-1 | Acrylonitrile | Organics | 8.73E-09 | 4.07E-09 | 1.48E-06 | 7.51E-09 | 7.51E-09 | 1.26E-09 | 2.32E-10 |
| 107-19-7 | Propargyl alcohol | Organics | - | - | - | - | - | - | - |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|----------|---|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 107-21-1 | Ethylene glycol (1,2-ethanediol) | Organics | - | - | - | - | - | - | - |
| 107-98-2 | Propylene glycol monomethyl ether | Organics | - | - | - | - | - | - | - |
| 108-05-4 | Acetic acid vinyl ester | Organics | 1.32E-12 | 5.61E-13 | 1.80E-14 | 1.62E-06 | 1.62E-06 | 1.29E-06 | 4.20E-09 |
| 108-10-1 | 4-Methyl-2-pentanone | Organics | 2.47E-14 | 1.14E-14 | 1.30E-15 | 1.73E-10 | 1.73E-10 | 1.37E-10 | 3.32E-12 |
| 108-39-4 | m-Cresol | Organics | 2.16E-06 | 1.03E-06 | 2.62E-06 | 6.99E-06 | 6.99E-06 | 5.49E-06 | 4.65E-06 |
| 108-60-1 | bis (2-Chloroisopropyl)ether | Organics | - | - | - | - | - | - | - |
| 108-67-8 | 1,3,5-Trimethylbenzene | Organics | - | - | - | - | - | - | - |
| 108-86-1 | Bromobenzene (Phenyl bromide) | Organics | - | - | - | - | - | - | - |
| 108-87-2 | Methylcyclohexane | Organics | - | - | - | 5.65E-11 | 5.65E-11 | 4.49E-11 | 2.78E-15 |
| 108-88-3 | Toluene | Organics | 9.70E-15 | 1.43E-15 | 1.96E-08 | 6.94E-11 | 6.94E-11 | 5.51E-11 | 5.58E-14 |
| 108-90-7 | Chlorobenzene | Organics | 1.17E-13 | 2.66E-14 | 3.49E-08 | 1.60E-11 | 1.60E-11 | 1.27E-11 | 2.18E-13 |
| 108-94-1 | Cyclohexanone | Organics | 2.56E-09 | 1.22E-09 | 1.38E-09 | 5.71E-08 | 5.71E-08 | 4.37E-08 | 1.62E-08 |
| 108-95-2 | Phenol | Organics | 2.89E-06 | 1.38E-06 | 9.01E-06 | 1.25E-06 | 1.25E-06 | 9.78E-07 | 2.70E-07 |
| 109-74-0 | n-Butanenitrile | Organics | 3.16E-09 | 1.49E-09 | 4.26E-10 | 1.31E-06 | 1.31E-06 | 1.03E-06 | 8.29E-08 |
| 109-75-1 | 3-Butenenitrile | Organics | - | - | - | - | - | - | - |
| 109-77-3 | Malononitrile | Organics | - | - | - | - | - | - | - |
| 109-86-4 | 2-Methoxyethanol | Organics | - | - | - | - | - | - | - |
| 109-99-9 | Tetrahydrofuran | Organics | 5.64E-13 | 2.65E-13 | 5.75E-14 | 5.36E-10 | 5.36E-10 | 4.25E-10 | 2.44E-11 |
| 110-00-9 | Furan | Organics | - | - | - | - | - | - | - |
| 110-54-3 | n-Hexane | Organics | - | - | - | 2.59E-09 | 2.59E-09 | 2.06E-09 | 1.28E-13 |
| 110-59-8 | Pentanenitrile | Organics | 1.37E-09 | 6.42E-10 | 1.37E-10 | 1.25E-06 | 1.25E-06 | 9.94E-07 | 5.61E-08 |
| 110-80-5 | 2-Ethoxyethanol | Organics | 9.71E-06 | 4.64E-06 | 1.25E-05 | 1.97E-05 | 1.97E-05 | 1.55E-05 | 1.40E-05 |
| 110-82-7 | Cyclohexane | Organics | - | - | - | 4.91E-11 | 4.91E-11 | 3.90E-11 | 2.42E-15 |
| 110-83-8 | Cyclohexene | Organics | 1.19E-27 | - | - | 4.91E-11 | 4.91E-11 | 3.90E-11 | 2.42E-15 |
| 110-86-1 | Pyridine | Organics | 6.32E-10 | 3.01E-10 | 3.43E-10 | 1.38E-08 | 1.38E-08 | 1.06E-08 | 3.97E-09 |
| 111-15-9 | Ethylene glycol monoethyl ether acetate | Organics | - | - | - | - | - | - | - |
| 111-44-4 | Bis(2-chloroethyl)ether | Organics | 5.14E-08 | 2.45E-08 | 1.64E-06 | 1.00E-07 | 1.00E-07 | 4.93E-08 | 4.41E-08 |
| 111-65-9 | n-Octane | Organics | - | - | - | 5.92E-10 | 5.92E-10 | 4.71E-10 | 2.91E-14 |
| 111-76-2 | 2-Butoxyethanol | Organics | 4.94E-07 | 2.36E-07 | 5.38E-07 | 2.61E-06 | 2.61E-06 | 2.03E-06 | 1.55E-06 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|-----------|------------------------------------|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 111-84-2 | n-Nonane | Organics | 2.76E-23 | - | - | 3.97E-10 | 3.97E-10 | 3.15E-10 | 1.95E-14 |
| 111-91-1 | Bis(2-chloroethoxy)methane | Organics | 3.51E-07 | 1.68E-07 | 3.67E-06 | 5.36E-07 | 5.36E-07 | 3.81E-07 | 1.03E-07 |
| 1120-21-4 | Undecane | Organics | - | - | - | - | - | - | - |
| 1120-71-4 | 1,3-Propane sultone | Organics | - | - | - | - | - | - | - |
| 112-30-1 | 1-Decanol | Organics | - | - | - | - | - | - | - |
| 112-31-2 | Decanal | Organics | - | - | - | - | - | - | - |
| 112-40-3 | Dodecane | Organics | - | - | - | - | - | - | - |
| 117-81-7 | Bis(2-ethylhexyl) phthalate | Organics | 3.83E-05 | 1.83E-05 | 6.29E-05 | 6.31E-06 | 6.31E-06 | 5.00E-06 | 3.96E-06 |
| 117-84-0 | Di-n-octylphthalate | Organics | 7.62E-09 | 3.59E-09 | 8.82E-10 | 5.37E-06 | 5.37E-06 | 4.26E-06 | 2.60E-07 |
| 118-74-1 | Hexachlorobenzene | Organics | 1.91E-12 | 6.83E-13 | 3.11E-08 | 2.80E-11 | 2.80E-11 | 2.21E-11 | 1.10E-10 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | Organics | - | - | - | - | - | - | - |
| 120-12-7 | Anthracene | Organics | 6.26E-09 | 2.95E-09 | 4.39E-07 | 9.65E-07 | 9.65E-07 | 7.63E-07 | 5.79E-08 |
| 120-82-1 | 1,2,4-Trichlorobenzene | Organics | 5.80E-18 | 2.03E-18 | 2.38E-20 | 9.85E-10 | 9.85E-10 | 7.82E-10 | 4.02E-13 |
| 120-83-2 | 2,4-Dichlorophenol | Organics | 7.68E-16 | 2.20E-16 | 1.51E-18 | 2.05E-06 | 2.05E-06 | 1.62E-06 | 3.27E-10 |
| 121-14-2 | 2,4-Dinitrotoluene | Organics | 4.62E-05 | 2.21E-05 | 6.58E-05 | 1.24E-05 | 1.24E-05 | 9.86E-06 | 9.30E-06 |
| 122-39-4 | N,N-Diphenylamine | Organics | 4.05E-10 | 1.94E-10 | 3.83E-10 | 2.37E-09 | 2.37E-09 | 1.83E-09 | 1.21E-09 |
| 122-66-7 | 1,2-Diphenylhydrazine | Organics | - | - | - | - | - | - | - |
| 123-33-1 | Maleic hydrazide | Organics | - | - | - | - | - | - | - |
| 123-38-6 | Propionaldehyde | Organics | 1.67E-12 | 7.82E-13 | 1.63E-13 | 1.64E-09 | 1.64E-09 | 1.30E-09 | 7.12E-11 |
| 123-72-8 | Butanal | Organics | 3.69E-10 | 1.71E-10 | 2.35E-11 | 1.36E-06 | 1.36E-06 | 1.08E-06 | 3.39E-08 |
| 123-91-1 | 1,4-Dioxan | Organics | 5.41E-11 | 2.58E-11 | 4.08E-11 | 6.78E-10 | 6.78E-10 | 5.19E-10 | 2.73E-10 |
| 124-18-5 | Decane | Organics | - | - | - | - | - | - | - |
| 124-48-1 | Chlorodibromomethane | Organics | 3.23E-11 | 1.29E-11 | 1.64E-07 | 4.52E-12 | 4.52E-12 | 2.24E-14 | 4.56E-20 |
| 126-73-8 | Tributyl phosphate | Organics | 8.18E-07 | 3.91E-07 | 9.15E-07 | 2.56E-06 | 2.56E-06 | 2.00E-06 | 1.56E-06 |
| 126-98-7 | 2-Methyl-2-propenenitrile | Organics | 8.88E-15 | 4.00E-15 | 2.61E-16 | 4.91E-10 | 4.91E-10 | 3.90E-10 | 4.18E-12 |
| 127-18-4 | 1,1,2,2-Tetrachloroethene | Organics | 1.08E-25 | 5.11E-27 | - | 1.62E-11 | 1.62E-11 | 1.29E-11 | 8.07E-16 |
| 128-37-0 | 2,6-Bis(tert-butyl)-4-methylphenol | Organics | 4.04E-09 | 1.93E-09 | 3.26E-09 | 3.44E-08 | 3.44E-08 | 2.63E-08 | 1.48E-08 |
| 129-00-0 | Pyrene | Organics | 3.99E-07 | 1.90E-07 | 2.22E-06 | 5.57E-06 | 5.57E-06 | 4.24E-06 | 1.40E-06 |
| 131-11-3 | Dimethyl Phthalate | Organics | 3.04E-06 | 1.45E-06 | 5.38E-06 | 3.30E-07 | 3.30E-07 | 2.61E-07 | 1.52E-07 |
| 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol | Organics | - | - | - | - | - | - | - |
| 132-64-9 | Dibenzofuran | Organics | 4.24E-10 | 1.93E-10 | 1.86E-07 | 1.83E-10 | 1.83E-10 | 8.36E-12 | 2.77E-09 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|--|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 1330-20-7 | Xylenes (mixed isomers) | Organics | 2.81E-14 | 5.07E-15 | 2.49E-08 | 4.75E-09 | 4.75E-09 | 3.77E-09 | 4.13E-13 |
| 133-06-2 | Captan | Organics | - | - | - | - | - | - | - |
| 1336-36-3 | Polychlorinated biphenyls | Organics | 3.66E-11 | 1.67E-11 | 1.41E-12 | 2.16E-06 | 2.16E-06 | 1.72E-06 | 2.71E-08 |
| 134-32-7 | alpha-Naphthylamine | Organics | 7.28E-06 | 3.48E-06 | 9.98E-06 | 2.40E-06 | 2.40E-06 | 1.90E-06 | 1.82E-06 |
| 135-98-8 | sec-Butylbenzene | Organics | - | - | - | - | - | - | - |
| 141-78-6 | Acetic acid ethyl ester | Organics | 8.67E-15 | 4.01E-15 | 4.74E-16 | 5.25E-11 | 5.25E-11 | 4.17E-11 | 1.07E-12 |
| 145-73-3 | Endothall | Organics | - | - | - | - | - | - | - |
| 156-59-2 | cis-1,2-Dichloroethene | Organics | - | - | - | - | - | - | - |
| 156-60-5 | 1,2-trans-Dichloroethene | Organics | 1.01E-18 | 1.05E-19 | 1.84E-22 | 3.65E-06 | 3.65E-06 | 2.90E-06 | 1.94E-10 |
| 1634-04-4 | Methyl tert-butyl ether | Organics | 5.63E-13 | 2.35E-13 | 6.53E-15 | 1.33E-06 | 1.33E-06 | 1.05E-06 | 2.69E-09 |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD) | Organics | 7.63E-17 | 3.62E-17 | 3.46E-15 | 1.08E-16 | 1.08E-16 | 3.85E-17 | 1.08E-16 |
| 189-55-9 | Dibenzo[a,i]pyrene | Organics | 1.19E-05 | 5.71E-06 | 1.66E-05 | 2.16E-06 | 2.16E-06 | 1.72E-06 | 1.67E-06 |
| 189-64-0 | Dibenzo[a,h]pyrene | Organics | 1.19E-05 | 5.71E-06 | 1.66E-05 | 2.16E-06 | 2.16E-06 | 1.72E-06 | 1.67E-06 |
| 191-24-2 | Benzo(g,h,i)perylene | Organics | 1.35E-05 | 6.44E-06 | 2.14E-05 | 3.14E-06 | 3.14E-06 | 2.48E-06 | 2.05E-06 |
| 191-30-0 | Dibenzo(a,l)pyrene | Organics | 1.19E-05 | 5.71E-06 | 1.66E-05 | 2.16E-06 | 2.16E-06 | 1.72E-06 | 1.67E-06 |
| 192-65-4 | Dibenzo[a,e]pyrene | Organics | 1.19E-05 | 5.71E-06 | 1.66E-05 | 2.16E-06 | 2.16E-06 | 1.72E-06 | 1.67E-06 |
| 192-97-2 | Benzo(e)pyrene | Organics | - | - | - | - | - | - | - |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | Organics | 3.21E-06 | 1.53E-06 | 1.01E-05 | 2.89E-06 | 2.89E-06 | 2.22E-06 | 1.25E-06 |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin | Organics | 2.98E-16 | 1.42E-16 | 6.37E-15 | 6.84E-17 | 6.84E-17 | 4.00E-17 | 2.11E-15 |
| 205-82-3 | Benzo[j]fluoranthene | Organics | - | - | - | - | - | - | - |
| 205-99-2 | Benzo(b)fluoranthene | Organics | 2.99E-07 | 1.42E-07 | 4.75E-06 | 4.15E-07 | 4.15E-07 | 2.42E-07 | 1.31E-07 |
| 206-44-0 | Fluoranthene | Organics | 1.90E-07 | 9.06E-08 | 1.57E-06 | 5.13E-06 | 5.13E-06 | 3.94E-06 | 9.95E-07 |
| 207-08-9 | Benzo(k)fluoranthene | Organics | 5.70E-06 | 2.72E-06 | 1.44E-05 | 1.52E-06 | 1.52E-06 | 1.18E-06 | 4.05E-07 |
| 208-96-8 | Acenaphthylene | Organics | 1.72E-09 | 8.02E-10 | 2.58E-07 | 9.56E-07 | 9.56E-07 | 7.59E-07 | 2.91E-08 |
| 218-01-9 | Chrysene | Organics | 3.44E-09 | 1.61E-09 | 4.63E-07 | 2.61E-09 | 2.61E-09 | 3.54E-10 | 7.95E-09 |
| 224-42-0 | Dibenz[a,j]acridine | Organics | 1.52E-05 | 7.25E-06 | 2.12E-05 | 2.45E-06 | 2.45E-06 | 1.95E-06 | 1.90E-06 |
| 2245-38-7 | 2,3,5-Trimethylnaphthalene | Organics | - | - | - | - | - | - | - |
| 226-36-8 | Dibenz[a,h]acridine | Organics | 1.41E-05 | 6.73E-06 | 1.96E-05 | 2.30E-06 | 2.30E-06 | 1.83E-06 | 1.79E-06 |
| 23950-58-5 | Pronamide | Organics | - | - | - | - | - | - | - |
| 27154-33-2 | Trichlorofluoroethane | Organics | 9.25E-19 | 8.72E-20 | 1.39E-22 | 5.70E-06 | 5.70E-06 | 4.53E-06 | 2.97E-10 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|--|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 31508-00-6 | 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) | Organics | 1.50E-16 | 6.67E-17 | 1.08E-13 | 5.01E-17 | 5.01E-17 | 1.42E-18 | 7.42E-16 |
| 319-84-6 | alpha-BHC | Organics | 2.62E-12 | 1.25E-12 | 1.24E-12 | 6.27E-11 | 6.27E-11 | 4.82E-11 | 1.56E-11 |
| 319-85-7 | beta-BHC | Organics | 1.81E-07 | 8.67E-08 | 2.50E-07 | 7.34E-08 | 7.34E-08 | 5.82E-08 | 5.61E-08 |
| 32598-13-3 | 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) | Organics | 1.04E-13 | 4.99E-14 | 4.11E-13 | 4.30E-13 | 4.30E-13 | 2.62E-13 | 1.41E-14 |
| 32598-14-4 | 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) | Organics | 2.39E-18 | 9.44E-19 | 1.34E-14 | 3.14E-19 | 3.14E-19 | 2.92E-21 | 5.14E-17 |
| 3268-87-9 | Octachlorodibenzo(p)dioxin | Organics | 2.21E-14 | 1.06E-14 | 2.31E-13 | 2.75E-14 | 2.75E-14 | 1.80E-14 | 1.39E-14 |
| 32774-16-6 | 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) | Organics | 4.85E-16 | 2.28E-16 | 4.72E-14 | 4.76E-16 | 4.76E-16 | 9.24E-17 | 1.23E-16 |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin | Organics | 1.65E-15 | 7.85E-16 | 2.95E-14 | 3.01E-15 | 3.01E-15 | 1.72E-15 | 5.59E-15 |
| 3697-24-3 | 5-Methylchrysene | Organics | 1.12E-07 | 5.33E-08 | 7.94E-08 | 1.28E-06 | 1.28E-06 | 9.76E-07 | 4.79E-07 |
| 38380-08-4 | 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) | Organics | 1.34E-16 | 6.18E-17 | 3.26E-14 | 7.92E-17 | 7.92E-17 | 6.42E-18 | 2.19E-16 |
| 39001-02-0 | Octachlorodibenzofuran | Organics | 1.57E-14 | 7.53E-15 | 6.32E-14 | 8.81E-15 | 8.81E-15 | 6.62E-15 | 3.12E-15 |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin | Organics | 3.16E-16 | 1.51E-16 | 4.49E-15 | 6.92E-16 | 6.92E-16 | 4.09E-16 | 2.48E-15 |
| 39635-31-9 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) | Organics | 3.57E-16 | 1.69E-16 | 2.51E-14 | 4.14E-16 | 4.14E-16 | 1.06E-16 | 1.47E-16 |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo(p)dioxin | Organics | 2.45E-15 | 1.17E-15 | 1.83E-14 | 3.84E-15 | 3.84E-15 | 2.82E-15 | 4.41E-15 |
| 4170-30-3 | Crotonaldehyde (Propylene aldehyde) | Organics | 9.94E-20 | 4.74E-20 | 5.10E-20 | 6.71E-10 | 6.71E-10 | 5.33E-10 | 1.88E-10 |
| 41851-50-7 | Chlorocyclopentadiene | Organics | - | - | - | - | - | - | - |
| 460-19-5 | Cyanogen (oxalonitrile) | Organics | - | - | - | - | - | - | - |
| 4786-20-3 | 2-Butenenitrile | Organics | - | - | - | - | - | - | - |
| 50-00-0 | Formaldehyde | Organics | 2.95E-06 | 1.41E-06 | 3.90E-06 | 4.77E-06 | 4.77E-06 | 3.77E-06 | 3.48E-06 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|--|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 50-32-8 | Benzo(a)pyrene | Organics | 7.80E-07 | 3.73E-07 | 4.79E-06 | 6.52E-07 | 6.52E-07 | 4.69E-07 | 1.35E-07 |
| 506-68-3 | Cyanogen bromide (bromocyanide) | Organics | - | - | - | - | - | - | - |
| 506-77-4 | Cyanogen chloride | Organics | - | - | - | - | - | - | - |
| 510-15-6 | Chlorobenzilate | Organics | - | - | - | - | - | - | - |
| 51207-31-9 | 2,3,7,8- Tetrachlorodibenzofuran | Organics | 1.16E-15 | 5.51E-16 | 2.43E-14 | 2.06E-15 | 2.06E-15 | 1.11E-15 | 3.70E-15 |
| 51-28-5 | 2,4-Dinitrophenol | Organics | 3.91E-05 | 1.87E-05 | 9.23E-05 | 9.48E-06 | 9.48E-06 | 7.43E-06 | 2.60E-06 |
| 51-79-6 | Ethyl carbamate (urethane) | Organics | - | - | - | - | - | - | - |
| 52663-72-6 | 2,3',4,4',5,5'- Hexachlorobiphenyl (PCB 167) | Organics | 1.31E-14 | 6.17E-15 | 4.60E-14 | 1.78E-14 | 1.78E-14 | 3.45E-15 | 1.86E-16 |
| 528-29-0 | 1,2-Dinitrobenzene (o- Dinitrobenzene) | Organics | - | - | - | - | - | - | - |
| 532-27-4 | 2-Chloroacetophenone | Organics | - | - | - | - | - | - | - |
| 534-52-1 | 4,6-Dinitro-o-cresol | Organics | 9.58E-06 | 4.58E-06 | 3.86E-05 | 5.44E-06 | 5.44E-06 | 4.15E-06 | 1.09E-06 |
| 53-70-3 | Dibenz[a,h]anthracene | Organics | 1.01E-05 | 4.81E-06 | 1.39E-05 | 1.12E-07 | 1.12E-07 | 8.92E-08 | 3.68E-07 |
| 5385-75-1 | Dibenzo(a,e)fluoranthene | Organics | - | - | - | - | - | - | - |
| 540-59-0 | 1,2-Dichloroethene (total) (1,2-Dichloroethylene) | Organics | 7.77E-14 | 1.66E-14 | 3.17E-08 | 2.54E-15 | 2.54E-15 | 5.30E-19 | 5.44E-25 |
| 540-73-8 | 1,2-Dimethylhydrazine | Organics | - | - | - | - | - | - | - |
| 540-84-1 | 2,2,4-Trimethylpentane | Organics | - | - | - | - | - | - | - |
| 541-73-1 | 1,3-Dichlorobenzene | Organics | 6.50E-20 | 1.64E-20 | 8.72E-23 | 6.45E-10 | 6.45E-10 | 5.13E-10 | 7.15E-14 |
| 542-75-6 | 1,3-Dichloropropene | Organics | - | - | - | - | - | - | - |
| 542-88-1 | Bis(chloromethyl)ether | Organics | - | - | - | - | - | - | - |
| 55673-89-7 | 1,2,3,4,7,8,9- Heptachlorodibenzofuran | Organics | 2.40E-16 | 1.14E-16 | 5.18E-15 | 4.03E-16 | 4.03E-16 | 2.18E-16 | 3.16E-16 |
| 56-23-5 | Carbon tetrachloride | Organics | 5.36E-18 | 1.19E-19 | 4.31E-09 | 2.54E-11 | 2.54E-11 | 2.02E-11 | 2.09E-15 |
| 56-49-5 | 3-Methylcholanthrene | Organics | 1.20E-07 | 5.71E-08 | 8.88E-08 | 1.29E-06 | 1.29E-06 | 9.92E-07 | 5.00E-07 |
| 56-55-3 | Benzo(a)anthracene | Organics | 7.39E-07 | 3.53E-07 | 4.55E-06 | 6.16E-07 | 6.16E-07 | 4.43E-07 | 1.27E-07 |
| 57117-31-4 | 2,3,4,7,8- Pentachlorodibenzofuran | Organics | 2.75E-15 | 1.31E-15 | 2.27E-14 | 2.88E-15 | 2.88E-15 | 1.98E-15 | 7.59E-16 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|---|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Organics | 1.89E-15 | 9.02E-16 | 1.53E-14 | 2.13E-15 | 2.13E-15 | 1.46E-15 | 1.46E-15 |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Organics | 7.12E-16 | 3.40E-16 | 9.16E-15 | 1.10E-15 | 1.10E-15 | 7.07E-16 | 4.90E-16 |
| 57-24-9 | Strychnine | Organics | - | - | - | - | - | - | - |
| 57465-28-8 | 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) | Organics | 9.67E-15 | 4.61E-15 | 1.54E-13 | 1.55E-14 | 1.55E-14 | 9.41E-15 | 1.02E-15 |
| 57653-85-7 | 1,2,3,6,7,8,-Hexachlorodibenzo(p)dioxin | Organics | 3.36E-16 | 1.60E-16 | 6.76E-15 | 6.21E-16 | 6.21E-16 | 3.37E-16 | 1.40E-15 |
| 57-74-9 | Chlordane | Organics | - | - | - | - | - | - | - |
| 581-42-0 | 2,6-Dimethylnaphthalene | Organics | - | - | - | - | - | - | - |
| 584-84-9 | 2,4-Toluene diisocyanate | Organics | - | - | - | - | - | - | - |
| 58-89-9 | gamma-BHC (Lindane) | Organics | 1.21E-11 | 5.76E-12 | 8.81E-12 | 1.14E-10 | 1.14E-10 | 8.68E-11 | 4.42E-11 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | Organics | 4.45E-07 | 2.13E-07 | 3.50E-07 | 4.09E-06 | 4.09E-06 | 3.14E-06 | 1.72E-06 |
| 589-38-8 | 3-Hexanone | Organics | 2.61E-10 | 1.21E-10 | 1.53E-11 | 1.26E-06 | 1.26E-06 | 9.98E-07 | 2.81E-08 |
| 591-50-4 | Benzene, iodo- | Organics | - | - | - | - | - | - | - |
| 591-78-6 | 2-Hexanone | Organics | 1.10E-12 | 5.12E-13 | 8.55E-14 | 2.12E-09 | 2.12E-09 | 1.69E-09 | 6.92E-11 |
| 593-60-2 | Bromoethene (Vinyl bromide) | Organics | - | - | - | - | - | - | - |
| 59-50-7 | 4-Chloro-3-methylphenol | Organics | 9.47E-07 | 4.53E-07 | 9.23E-07 | 6.98E-06 | 6.98E-06 | 5.40E-06 | 3.68E-06 |
| 59-89-2 | N-Nitrosomorpholine | Organics | 3.23E-05 | 1.55E-05 | 4.50E-05 | 2.25E-05 | 2.25E-05 | 1.78E-05 | 1.73E-05 |
| 60-11-7 | Dimethyl aminoazobenzene | Organics | 1.15E-21 | 5.50E-22 | - | - | - | - | - |
| 602-87-9 | 5-Nitroacenaphthene | Organics | 9.46E-07 | 4.52E-07 | 1.10E-06 | 2.34E-06 | 2.34E-06 | 1.83E-06 | 1.49E-06 |
| 60-29-7 | Ethyl ether | Organics | 2.09E-17 | 7.57E-18 | 1.01E-19 | 1.85E-09 | 1.85E-09 | 1.47E-09 | 9.58E-13 |
| 60-35-5 | Acetamide | Organics | 7.40E-06 | 3.54E-06 | 1.03E-05 | 4.77E-06 | 4.77E-06 | 3.79E-06 | 3.70E-06 |
| 606-20-2 | 2,6-Dinitrotoluene | Organics | 2.72E-06 | 1.30E-06 | 7.87E-06 | 9.75E-07 | 9.75E-07 | 7.57E-07 | 2.22E-07 |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Organics | 2.35E-16 | 1.12E-16 | 4.21E-15 | 3.83E-16 | 3.83E-16 | 2.24E-16 | 1.78E-16 |
| 608-93-5 | Pentachlorobenzene | Organics | - | - | - | - | - | - | - |
| 61626-71-9 | Dichloropentadiene | Organics | - | - | - | - | - | - | - |
| 621-64-7 | N-Nitroso-di-n-propylamine | Organics | 9.99E-07 | 4.77E-07 | 9.98E-07 | 6.89E-06 | 6.89E-06 | 5.33E-06 | 3.73E-06 |
| 624-83-9 | Methyl isocyanate | Organics | - | - | - | - | - | - | - |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|---|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 62-50-0 | Ethyl methanesulfonate | Organics | - | - | - | - | - | - | - |
| 62-53-3 | Aniline | Organics | - | - | - | - | - | - | - |
| 62-75-9 | N-Nitroso-N,N-dimethylamine | Organics | 6.55E-09 | 3.13E-09 | 6.93E-09 | 3.80E-08 | 3.80E-08 | 2.95E-08 | 2.18E-08 |
| 628-73-9 | Hexanenitrile | Organics | 5.96E-10 | 2.79E-10 | 4.57E-11 | 1.22E-06 | 1.22E-06 | 9.68E-07 | 3.89E-08 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | Organics | 2.28E-15 | 6.51E-16 | 4.43E-18 | 6.32E-06 | 6.32E-06 | 5.02E-06 | 9.99E-10 |
| 64-18-6 | Formic acid (methanoic acid) | Organics | - | - | - | - | - | - | - |
| 65510-44-3 | 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) | Organics | 4.50E-13 | 2.14E-13 | 9.02E-14 | 1.37E-12 | 1.37E-12 | 5.96E-13 | 4.46E-16 |
| 65-85-0 | Benzoic acid | Organics | - | - | - | - | - | - | - |
| 67-56-1 | Methyl alcohol | Organics | 2.20E-07 | 1.05E-07 | 1.70E-07 | 3.01E-06 | 3.01E-06 | 2.33E-06 | 1.26E-06 |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Organics | 7.49E-16 | 3.57E-16 | 1.62E-14 | 1.26E-15 | 1.26E-15 | 6.39E-16 | 9.49E-16 |
| 67-63-0 | 2-Propyl alcohol | Organics | 8.13E-11 | 3.88E-11 | 4.66E-11 | 1.66E-09 | 1.66E-09 | 1.27E-09 | 5.03E-10 |
| 67-64-1 | 2-Propanone (Acetone) | Organics | 9.54E-08 | 4.52E-08 | 5.83E-06 | 1.64E-07 | 1.64E-07 | 6.31E-08 | 3.55E-09 |
| 67-66-3 | Chloroform | Organics | 1.17E-13 | 2.66E-14 | 3.49E-08 | 1.66E-11 | 1.66E-11 | 1.32E-11 | 2.18E-13 |
| 67-72-1 | Hexachloroethane | Organics | 6.11E-18 | 1.35E-18 | 5.71E-21 | 1.96E-07 | 1.96E-07 | 1.56E-07 | 1.67E-11 |
| 69782-90-7 | 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) | Organics | 1.08E-15 | 5.08E-16 | 7.58E-14 | 1.25E-15 | 1.25E-15 | 3.19E-16 | 7.66E-16 |
| 70-30-4 | Hexachlorophene | Organics | - | - | - | - | - | - | - |
| 70362-50-4 | 3,4,4',5-Tetrachlorobiphenyl (PCB 81) | Organics | 1.81E-15 | 8.60E-16 | 5.89E-14 | 2.84E-15 | 2.84E-15 | 1.26E-15 | 9.99E-16 |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Organics | 4.13E-16 | 1.97E-16 | 9.84E-15 | 9.24E-16 | 9.24E-16 | 4.98E-16 | 2.25E-15 |
| 71-36-3 | n-Butyl alcohol | Organics | 2.18E-09 | 1.04E-09 | 1.19E-09 | 4.74E-08 | 4.74E-08 | 3.63E-08 | 1.37E-08 |
| 71-43-2 | Benzene | Organics | 2.01E-14 | 3.41E-15 | 2.31E-08 | 4.20E-11 | 4.20E-11 | 3.34E-11 | 1.43E-13 |
| 71-55-6 | 1,1,1-Trichloroethane | Organics | 1.53E-25 | 7.82E-27 | - | 1.64E-11 | 1.64E-11 | 1.31E-11 | 8.23E-16 |
| 72-43-5 | Methoxychlor | Organics | - | - | - | - | - | - | - |
| 72-55-9 | 4,4-DDE | Organics | 2.97E-08 | 1.41E-08 | 8.78E-09 | 1.79E-06 | 1.79E-06 | 1.39E-06 | 2.73E-07 |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Organics | 1.43E-16 | 6.80E-17 | 2.57E-15 | 2.30E-16 | 2.30E-16 | 1.35E-16 | 7.62E-17 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|------------|--|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 74472-37-0 | 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) | Organics | 1.41E-16 | 6.57E-17 | 1.91E-14 | 1.14E-16 | 1.14E-16 | 1.59E-17 | 2.29E-16 |
| 74-83-9 | Bromomethane | Organics | 1.25E-14 | 1.94E-15 | 2.07E-08 | 3.32E-11 | 3.32E-11 | 2.64E-11 | 6.15E-14 |
| 74-87-3 | Chloromethane | Organics | 2.57E-15 | 2.87E-16 | 1.47E-08 | 6.61E-11 | 6.61E-11 | 5.25E-11 | 2.80E-14 |
| 74-88-4 | Iodomethane | Organics | 2.52E-14 | 4.49E-15 | 2.34E-08 | 6.79E-16 | 6.79E-16 | 8.62E-20 | 9.16E-14 |
| 74-95-3 | Methylene bromide | Organics | - | - | - | - | - | - | - |
| 74-97-5 | Bromochloromethane | Organics | - | - | - | - | - | - | - |
| 75-00-3 | Chloroethane | Organics | 1.32E-23 | 1.47E-24 | 2.76E-27 | 3.32E-11 | 3.32E-11 | 2.64E-11 | 1.79E-15 |
| 75-01-4 | 1-Chloroethene | Organics | 2.00E-26 | 5.23E-28 | - | 3.37E-11 | 3.37E-11 | 2.68E-11 | 1.67E-15 |
| 75-02-5 | Fluoroethene (vinyl fluoride) | Organics | 1.11E-25 | 2.27E-28 | - | 1.73E-06 | 1.73E-06 | 1.38E-06 | 8.53E-11 |
| 75-05-8 | Acetonitrile | Organics | 1.15E-06 | 5.45E-07 | 6.34E-05 | 1.81E-06 | 1.81E-06 | 6.29E-07 | 9.44E-09 |
| 75-07-0 | Acetaldehyde | Organics | 1.38E-09 | 6.48E-10 | 1.26E-10 | 1.66E-06 | 1.66E-06 | 1.32E-06 | 6.62E-08 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | Organics | 2.36E-11 | 7.02E-12 | 1.53E-06 | 9.84E-09 | 9.84E-09 | 7.82E-09 | 2.54E-12 |
| 75-15-0 | Carbon disulfide | Organics | 2.70E-18 | 6.05E-20 | 4.34E-09 | 2.46E-20 | 2.46E-20 | 9.76E-26 | 8.34E-16 |
| 75-21-8 | Ethylene oxide (Oxirane) | Organics | 3.39E-13 | 1.56E-13 | 1.68E-14 | 2.86E-09 | 2.86E-09 | 2.27E-09 | 5.11E-11 |
| 75-25-2 | Bromoform | Organics | - | - | 1.98E-11 | - | - | - | - |
| 75-27-4 | Bromodichloromethane | Organics | 3.69E-14 | 1.24E-14 | 1.27E-16 | 1.23E-05 | 1.23E-05 | 9.80E-06 | 3.95E-09 |
| 75-29-6 | 2-Chloropropane | Organics | - | - | - | - | - | - | - |
| 75-34-3 | 1,1-Dichloroethane | Organics | 6.11E-23 | 1.04E-23 | 3.05E-26 | 1.33E-11 | 1.33E-11 | 1.06E-11 | 8.50E-16 |
| 75-35-4 | 1,1-Dichloroethene | Organics | 1.56E-26 | 4.33E-28 | - | 2.09E-11 | 2.09E-11 | 1.66E-11 | 1.03E-15 |
| 75-44-5 | Phosgene (hydrogen phosphide) | Organics | - | - | - | - | - | - | - |
| 75-45-6 | Chlorodifluoromethane | Organics | 2.40E-27 | - | - | 4.91E-11 | 4.91E-11 | 3.90E-11 | 2.42E-15 |
| 75-50-3 | Trimethylamine | Organics | 5.50E-10 | 2.57E-10 | 3.86E-11 | 1.48E-06 | 1.48E-06 | 1.18E-06 | 4.21E-08 |
| 75-69-4 | Trichlorofluoromethane | Organics | - | - | - | 4.04E-11 | 4.04E-11 | 3.21E-11 | 1.99E-15 |
| 75-71-8 | Dichlorodifluoromethane | Organics | - | - | - | 4.12E-11 | 4.12E-11 | 3.27E-11 | 2.03E-15 |
| 76-01-7 | Pentachloroethane | Organics | - | - | - | - | - | - | - |
| 76-13-1 | 1,2,2-Trichlorotrifluoroethane | Organics | - | - | - | 4.07E-11 | 4.07E-11 | 3.23E-11 | 2.00E-15 |
| 764-41-0 | 1,4-Dichloro-2-butene | Organics | - | - | - | - | - | - | - |
| 76-44-8 | Heptachlor | Organics | - | - | - | 3.82E-11 | 3.82E-11 | 3.04E-11 | 1.88E-15 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|----------|--|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 765-34-4 | Glycidylaldehyde | Organics | - | - | - | - | - | - | - |
| 77-47-4 | Hexachlorocyclopentadiene | Organics | 3.23E-17 | 8.46E-19 | 1.65E-08 | 3.29E-19 | 3.29E-19 | 1.59E-24 | 6.08E-13 |
| 77-78-1 | Dimethyl sulfate | Organics | - | - | - | - | - | - | - |
| 78-83-1 | 2-Methylpropyl alcohol | Organics | 1.11E-06 | 5.28E-07 | 5.65E-07 | 2.70E-05 | 2.70E-05 | 2.07E-05 | 7.27E-06 |
| 78-87-5 | 1,2-Dichloropropane | Organics | 2.26E-21 | 6.04E-22 | 3.55E-24 | 1.33E-11 | 1.33E-11 | 1.06E-11 | 1.69E-15 |
| 78-93-3 | 2-Butanone | Organics | 2.44E-08 | 1.15E-08 | 2.10E-06 | 3.49E-08 | 3.49E-08 | 1.12E-08 | 6.31E-10 |
| 79-00-5 | 1,1,2-Trichloroethane | Organics | 8.00E-19 | 3.10E-19 | 5.59E-21 | 1.56E-11 | 1.56E-11 | 1.24E-11 | 1.42E-14 |
| 79-01-6 | 1,1,2-Trichloroethylene | Organics | 1.42E-15 | 1.39E-16 | 1.29E-08 | 1.77E-11 | 1.77E-11 | 1.41E-11 | 1.96E-14 |
| 79-10-7 | 2-Propenoic acid | Organics | 4.32E-06 | 2.06E-06 | 5.67E-06 | 7.41E-06 | 7.41E-06 | 5.85E-06 | 5.37E-06 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | Organics | 7.65E-17 | 3.37E-17 | 1.61E-18 | 1.56E-11 | 1.56E-11 | 1.24E-11 | 8.02E-14 |
| 79-46-9 | 2-Nitropropane | Organics | 7.96E-13 | 3.70E-13 | 4.89E-14 | 3.29E-09 | 3.29E-09 | 2.61E-09 | 7.84E-11 |
| 80-62-6 | Methyl methacrylate | Organics | - | - | - | - | - | - | - |
| 822-06-0 | Hexamethylene-1,5-diisocyanate | Organics | - | - | - | - | - | - | - |
| 823-40-5 | Toluene-2,6-diamine | Organics | - | - | - | - | - | - | - |
| 82-68-8 | Pentachloronitrobenzene (PCNB) | Organics | 9.57E-15 | 4.18E-15 | 1.79E-16 | 3.10E-09 | 3.10E-09 | 2.46E-09 | 1.33E-11 |
| 832-69-9 | 1-Methylphenanthrene | Organics | - | - | - | - | - | - | - |
| 83-32-9 | Acenaphthene | Organics | 1.14E-09 | 5.24E-10 | 1.99E-07 | 4.71E-06 | 4.71E-06 | 3.74E-06 | 7.87E-08 |
| 84-66-2 | Diethyl phthalate | Organics | 6.83E-06 | 3.26E-06 | 1.29E-05 | 3.94E-06 | 3.94E-06 | 3.10E-06 | 2.41E-06 |
| 84-74-2 | Di-n-butylphthalate | Organics | 1.89E-05 | 9.02E-06 | 4.42E-05 | 5.35E-05 | 5.35E-05 | 4.15E-05 | 2.91E-05 |
| 85-01-8 | Phenanthrene | Organics | 4.89E-08 | 2.33E-08 | 1.15E-06 | 1.05E-06 | 1.05E-06 | 8.01E-07 | 1.71E-07 |
| 85-44-9 | Phthalic anhydride (1,2-benzenedicarboxylic anhydride) | Organics | - | - | - | - | - | - | - |
| 85-68-7 | Butylbenzylphthalate | Organics | 7.65E-06 | 3.66E-06 | 1.38E-05 | 1.77E-05 | 1.77E-05 | 1.38E-05 | 1.06E-05 |
| 86-73-7 | Fluorene | Organics | 7.74E-09 | 3.65E-09 | 5.57E-07 | 9.71E-07 | 9.71E-07 | 7.66E-07 | 6.17E-08 |
| 87-61-6 | 1,2,3-Trichlorobenzene | Organics | - | - | - | - | - | - | - |
| 87-68-3 | Hexachlorobutadiene | Organics | 5.29E-21 | 6.44E-22 | 1.31E-24 | 8.43E-09 | 8.43E-09 | 6.70E-09 | 4.63E-13 |
| 87-86-5 | Pentachlorophenol | Organics | 1.06E-07 | 5.08E-08 | 1.48E-07 | 2.02E-08 | 2.02E-08 | 1.61E-08 | 1.56E-08 |
| 88-06-2 | 2,4,6-Trichlorophenol | Organics | 2.64E-07 | 1.26E-07 | 1.54E-07 | 5.09E-06 | 5.09E-06 | 3.89E-06 | 1.58E-06 |
| 88-74-4 | o-Nitroaniline (2-nitroaniline) | Organics | 4.16E-06 | 1.99E-06 | 7.40E-06 | 4.58E-07 | 4.58E-07 | 3.63E-07 | 2.09E-07 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|----------|---|----------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 88-75-5 | 2-Nitrophenol | Organics | 5.18E-07 | 2.47E-07 | 6.23E-06 | 5.55E-06 | 5.55E-06 | 4.16E-06 | 1.53E-06 |
| 90-04-0 | o-Anisidine | Organics | - | - | - | - | - | - | - |
| 90-12-0 | 1-Methylnaphthalene | Organics | - | - | - | - | - | - | - |
| 91-20-3 | Naphthalene | Organics | 5.06E-09 | 2.16E-09 | 9.43E-06 | 4.40E-06 | 4.40E-06 | 3.50E-06 | 5.44E-08 |
| 91-22-5 | Quinoline | Organics | - | - | - | - | - | - | - |
| 91-57-6 | 2-Methylnaphthalene | Organics | 6.97E-09 | 3.29E-09 | 6.37E-07 | 1.02E-09 | 1.02E-09 | 2.56E-10 | 1.52E-08 |
| 91-58-7 | 2-Chloronaphthalene | Organics | 8.38E-12 | 3.72E-12 | 1.92E-13 | 1.22E-06 | 1.22E-06 | 9.73E-07 | 7.15E-09 |
| 91-94-1 | 3,3'-Dichlorobenzidine | Organics | 2.78E-05 | 1.33E-05 | 4.45E-05 | 1.87E-06 | 1.87E-06 | 1.48E-06 | 1.26E-06 |
| 924-16-3 | N-Nitroso-di-n-Buethylamine | Organics | - | - | - | - | - | - | - |
| 92-52-4 | 1,1'-Biphenyl | Organics | 2.29E-14 | 1.02E-14 | 5.36E-16 | 3.10E-09 | 3.10E-09 | 2.46E-09 | 1.87E-11 |
| 94-59-7 | Safrole (5-(2-Propenyl)-1,3-benzodioxole) | Organics | - | - | - | - | - | - | - |
| 94-75-7 | 2,4-D | Organics | - | - | - | - | - | - | - |
| 95-48-7 | o-Cresol | Organics | 2.19E-06 | 1.05E-06 | 2.53E-06 | 9.21E-06 | 9.21E-06 | 7.20E-06 | 5.81E-06 |
| 95-49-8 | o-Chlorotoluene | Organics | - | - | - | - | - | - | - |
| 95-50-1 | 1,2-Dichlorobenzene | Organics | 1.60E-17 | 5.05E-18 | 4.37E-20 | 1.28E-08 | 1.28E-08 | 1.02E-08 | 3.03E-12 |
| 95-53-4 | o-Toluidine | Organics | - | - | - | - | - | - | - |
| 95-57-8 | 2-Chlorophenol | Organics | 1.20E-11 | 5.21E-12 | 2.17E-13 | 4.46E-06 | 4.46E-06 | 3.54E-06 | 1.82E-08 |
| 95-63-6 | 1,2,4-Trimethyl benzene | Organics | - | - | - | - | - | - | - |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | Organics | - | - | - | - | - | - | - |
| 95-95-4 | 2,4,5-Trichlorophenol | Organics | 4.97E-07 | 2.37E-07 | 3.93E-07 | 5.73E-06 | 5.73E-06 | 4.39E-06 | 2.42E-06 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | Organics | - | - | - | - | - | - | - |
| 96-18-4 | 1,2,3-Trichloropropane | Organics | - | - | - | - | - | - | - |
| 96-45-7 | Ethylene thiourea | Organics | - | - | - | - | - | - | - |
| 97-63-2 | Ethyl methacrylate | Organics | - | - | - | - | - | - | - |
| 98-01-1 | Furfural | Organics | - | - | - | - | - | - | - |
| 98-06-6 | tert-Butyl benzene | Organics | - | - | - | - | - | - | - |
| 98-07-7 | Benzotrichloride | Organics | - | - | - | - | - | - | - |
| 98-82-8 | Cumene | Organics | - | - | - | 1.00E-06 | 1.00E-06 | 7.96E-07 | 4.94E-11 |
| 98-83-9 | Methyl styrene (mixed isomers) | Organics | - | - | - | - | - | - | - |
| 98-86-2 | Acetophenone | Organics | 3.57E-10 | 1.70E-10 | 1.72E-10 | 4.61E-09 | 4.61E-09 | 3.35E-09 | 1.11E-09 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|-------------------------|-----------------------|---------------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 98-95-3 | Nitrobenzene | Organics | 3.22E-08 | 1.53E-08 | 1.28E-06 | 6.93E-08 | 6.93E-08 | 3.37E-08 | 3.42E-08 |
| 99-35-4 | 1,3,5-Trinitrobenzene | Organics | - | - | - | - | - | - | - |
| 99-65-0 | 1,3-Dinitrobenzene | Organics | - | - | - | - | - | - | - |
| 99-87-6 | p-Cymene | Organics | - | - | - | - | - | - | - |
| 10028-17-8 | Tritium | Radionuclides | 2.31E-14 | 1.10E-14 | 2.43E-14 | 3.36E-14 | 3.36E-14 | 2.67E-14 | 1.92E-14 |
| 10045-97-3 | Cesium-137 | Radionuclides | 9.55E-11 | 4.56E-11 | 3.81E-11 | 6.36E-07 | 6.36E-07 | 5.05E-07 | 1.06E-08 |
| 10098-91-6 ² | Yttrium-90 | Radionuclides | 1.48E-12 | 7.06E-13 | 1.93E-14 | 9.28E-11 | 9.28E-11 | 7.37E-11 | 8.03E-13 |
| 10098-97-2 | Strontium-90 | Radionuclides | 5.70E-09 | 2.72E-09 | 7.43E-11 | 3.58E-07 | 3.58E-07 | 2.84E-07 | 3.10E-09 |
| 10198-40-0 | Cobalt-60 | Radionuclides | 1.37E-14 | 6.55E-15 | 1.78E-16 | 7.25E-14 | 7.25E-14 | 5.76E-14 | 7.32E-16 |
| 13966-29-5 | Uranium-234 | Radionuclides | 1.44E-09 | 6.90E-10 | 1.90E-11 | 5.75E-08 | 5.75E-08 | 4.56E-08 | 5.80E-10 |
| 13967-48-1 | Ruthenium-106 | Radionuclides | 3.81E-23 | 1.82E-23 | 9.85E-25 | 1.06E-22 | 1.06E-22 | 8.42E-23 | 8.48E-23 |
| 13967-70-9 | Cesium-134 | Radionuclides | 1.69E-20 | 8.06E-21 | 6.73E-21 | 1.07E-16 | 1.07E-16 | 8.47E-17 | 1.76E-18 |
| 13968-55-3 | Uranium-233 | Radionuclides | 2.05E-09 | 9.79E-10 | 2.70E-11 | 1.31E-07 | 1.31E-07 | 1.04E-07 | 1.32E-09 |
| 13981-15-2 | Curium-244 | Radionuclides | 2.17E-13 | 1.04E-13 | 2.86E-15 | 1.93E-12 | 1.93E-12 | 1.53E-12 | 1.94E-14 |
| 13981-16-3 | Plutonium-238 | Radionuclides | 5.29E-12 | 2.53E-12 | 6.98E-14 | 2.59E-10 | 2.59E-10 | 2.06E-10 | 2.61E-12 |
| 13981-37-8 | Nickel-63 | Radionuclides | 5.23E-10 | 2.50E-10 | 6.86E-12 | 2.46E-09 | 2.46E-09 | 1.96E-09 | 1.64E-11 |
| 13982-10-0 | Plutonium-242 | Radionuclides | 2.25E-11 | 1.07E-11 | 2.96E-13 | 2.87E-10 | 2.87E-10 | 2.28E-10 | 2.90E-12 |
| 13982-63-3 | Radium-226 | Radionuclides | 1.20E-06 | 5.75E-07 | 4.81E-07 | 1.41E-07 | 1.41E-07 | 1.12E-07 | 2.81E-08 |
| 13982-70-2 | Uranium-236 | Radionuclides | 4.30E-09 | 2.06E-09 | 5.67E-11 | 1.54E-07 | 1.54E-07 | 1.22E-07 | 1.55E-09 |
| 13994-20-2 | Neptunium-237 | Radionuclides | 7.18E-08 | 3.43E-08 | 9.47E-10 | 4.50E-07 | 4.50E-07 | 3.57E-07 | 4.54E-09 |
| 14119-32-5 | Plutonium-241 | Radionuclides | 3.34E-12 | 1.60E-12 | 4.41E-14 | 1.69E-10 | 1.69E-10 | 1.34E-10 | 1.71E-12 |
| 14119-33-6 | Plutonium-240 | Radionuclides | 1.22E-09 | 5.85E-10 | 1.61E-11 | 6.57E-08 | 6.57E-08 | 5.22E-08 | 6.63E-10 |
| 14133-76-7 | Technetium-99 | Radionuclides | 1.17E-05 | 5.61E-06 | 1.03E-05 | 1.49E-06 | 1.49E-06 | 1.18E-06 | 7.24E-07 |
| 14158-29-3 | Uranium-232 | Radionuclides | 1.88E-14 | 9.01E-15 | 2.48E-16 | 6.77E-13 | 6.77E-13 | 5.37E-13 | 6.83E-15 |
| 14234-35-6 | Antimony-125 | Radionuclides | 2.50E-15 | 1.19E-15 | 9.87E-16 | 2.14E-15 | 2.14E-15 | 1.70E-15 | 6.28E-18 |
| 14331-85-2 | Protactinium-231 | Radionuclides | 1.20E-10 | 5.75E-11 | 1.59E-12 | 2.03E-10 | 2.03E-10 | 1.61E-10 | 2.05E-12 |
| 14336-70-0 | Nickel-59 | Radionuclides | 6.29E-09 | 3.01E-09 | 8.25E-11 | 2.76E-08 | 2.76E-08 | 2.19E-08 | 1.84E-10 |
| 14391-16-3 | Europium-155 | Radionuclides | 3.92E-14 | 1.87E-14 | 5.17E-16 | 1.01E-12 | 1.01E-12 | 8.04E-13 | 1.02E-14 |
| 14596-10-2 | Americium-241 | Radionuclides | 3.40E-09 | 1.63E-09 | 8.81E-11 | 1.27E-07 | 1.27E-07 | 1.01E-07 | 1.97E-09 |
| 14683-23-9 | Europium-152 | Radionuclides | 5.85E-13 | 2.79E-13 | 7.71E-15 | 4.21E-12 | 4.21E-12 | 3.34E-12 | 4.25E-14 |
| 14762-75-5 | Carbon-14 | Radionuclides | 3.78E-10 | 1.81E-10 | - | 7.91E-11 | 7.91E-11 | 6.28E-11 | 1.10E-30 |
| 14952-40-0 | Actinium-227 | Radionuclides | 5.71E-14 | 2.73E-14 | 7.54E-16 | 1.48E-13 | 1.48E-13 | 1.18E-13 | 1.50E-15 |
| 14993-75-0 | Americium-243 | Radionuclides | 2.60E-11 | 1.24E-11 | 6.74E-13 | 9.38E-10 | 9.38E-10 | 7.45E-10 | 1.43E-11 |

Table B-3 Baseline WTP Operating Configuration, Mass Fractions for Select Process Streams for the LAW and HLW Facilities

| CASRN | Chemical | Type | LAW Stream Mass Fractions | | | HLW Stream Mass Fractions | | | |
|--------------------------|---------------|---------------|---------------------------|----------------------|---------------------|---------------------------|-------------------|----------------------|---------------------|
| | | | LCP01 LAW Conc | LFP04 Melter Feed | RLD21 Rad Liquid | HLP09a HLW Blend | HCP01 HLW Conc | HFP03 Melter Feed | RLD62 Rad Liquid |
| 15046-84-1 | Iodine-129 | Radionuclides | 3.01E-07 | 1.44E-07 | - | 1.41E-07 | 1.41E-07 | 1.12E-07 | 4.60E-25 |
| 15117-48-3 | Plutonium-239 | Radionuclides | 2.16E-08 | 1.03E-08 | 2.85E-10 | 1.15E-06 | 1.15E-06 | 9.10E-07 | 1.16E-08 |
| 15117-96-1 | Uranium-235 | Radionuclides | 1.60E-07 | 7.67E-08 | 2.12E-09 | 6.20E-06 | 6.20E-06 | 4.93E-06 | 6.26E-08 |
| 15262-20-1 | Radium-228 | Radionuclides | 2.52E-15 | 1.20E-15 | 1.00E-15 | 7.55E-14 | 7.55E-14 | 6.00E-14 | 1.51E-14 |
| 15510-73-3 | Curium-242 | Radionuclides | 5.53E-15 | 2.65E-15 | 7.30E-17 | 4.18E-14 | 4.18E-14 | 3.32E-14 | 4.22E-16 |
| 15585-10-1 | Europium-154 | Radionuclides | 1.18E-12 | 5.65E-13 | 1.56E-14 | 2.76E-11 | 2.76E-11 | 2.19E-11 | 2.79E-13 |
| 15594-54-4 | Thorium-229 | Radionuclides | 1.21E-12 | 5.77E-13 | 1.59E-14 | 1.76E-11 | 1.76E-11 | 1.39E-11 | 1.77E-13 |
| 15715-94-3 | Samarium-151 | Radionuclides | 1.91E-08 | 9.12E-09 | 2.52E-10 | 1.43E-07 | 1.43E-07 | 1.14E-07 | 1.45E-09 |
| 15751-77-6 | Zirconium-93 | Radionuclides | 1.19E-06 | 5.69E-07 | 3.49E-10 | 1.43E-06 | 1.43E-06 | 1.13E-06 | 6.72E-09 |
| 15757-87-6 | Curium-243 | Radionuclides | 2.82E-14 | 1.35E-14 | 3.72E-16 | 2.40E-13 | 2.40E-13 | 1.91E-13 | 2.42E-15 |
| 15758-45-9 | Selenium-79 | Radionuclides | 4.02E-08 | 1.92E-08 | 1.61E-08 | 6.44E-09 | 6.44E-09 | 5.11E-09 | 2.50E-09 |
| 15832-50-5 | Tin-126 | Radionuclides | 6.94E-08 | 3.32E-08 | 9.16E-10 | 5.34E-08 | 5.34E-08 | 4.24E-08 | 5.38E-10 |
| 378253-40-8 ³ | Barium-137m | Radionuclides | 1.46E-17 | 6.98E-18 | 5.83E-18 | 9.74E-14 | 9.74E-14 | 7.73E-14 | 1.62E-15 |
| 378253-44-2 | Cadmium-113m | Radionuclides | 4.36E-12 | 2.09E-12 | 5.21E-14 | 3.41E-12 | 3.41E-12 | 2.71E-12 | 2.04E-13 |
| 378782-82-2 | Niobium-93m | Radionuclides | 1.35E-11 | 6.43E-12 | 1.78E-13 | 1.60E-11 | 1.60E-11 | 1.27E-11 | 1.61E-13 |
| 7440-29-1 | Thorium-232 | Radionuclides | 3.80E-06 | 1.82E-06 | 5.01E-08 | 1.41E-04 | 1.41E-04 | 1.12E-04 | 1.42E-06 |
| 7440-61-1R | Uranium-238 | Radionuclides | 3.16E-05 | 1.51E-05 | 4.17E-07 | 1.15E-03 | 1.15E-03 | 9.12E-04 | 1.16E-05 |

Ref.: 24590-WTP-ES-PE-17-001, *Emissions Study for the Hanford Tank Waste Treatment and Immobilization Plant*, Tables A.8-15, A.8-21, and A.8-27.

Notes:

¹ Mercury mass fraction includes elemental and divalent mercury forms.

² Yttrium-90 is not modeled in APPS. Sr-90 is assumed to be in equilibrium with its progeny Y-90, Y-90 is set to an equal Sr-90 activity, and converted to a mass fraction by dividing by the Y-90 specific activity from 10 CFR 71, Table A-1.

³ Barium-137m is not modeled in APPS. Cs-137 is assumed to be in equilibrium with its progeny Ba-137m (Ba-137 meta-stable). Ba-137m is set to 94.6% of the cesium-137 activity (see 24590-WTP-3DG-W12W-00002, Section 5.3), and converted to a mass fraction by dividing by the Ba-137m specific activity from Shleien, B. (Ed.), 1992, *The Health Physics and Radiological Health Handbook*, Scinta Inc., ISBN 0-917251-05-9.

Appendix C

HEPA Decontamination Factors

Appendix C

HEPA Decontamination Factors

Table C-1 presents constituent-specific HEPA DFs for the ARL and AHL, respectively. Samples originating from LAW Facility (and EMF in the DFLAW operating configuration) are presumed to be analyzed in the ARL. Samples originating from the PT and HLW Facility are assumed to be analyzed in the AHL.

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|------------|-------------------|------------|-------------------------|---------------|
| 10028-15-6 | Ozone | Inorganics | 1 | 1 |
| 10102-44-0 | Nitrogen dioxide | Inorganics | 1 | 1 |
| 124-38-9 | Carbon dioxide | Inorganics | 1 | 1 |
| 14265-44-2 | Phosphate | Inorganics | 2000 | 200000 |
| 14797-55-8 | Nitrate | Inorganics | 2000 | 200000 |
| 14797-65-0 | Nitrite | Inorganics | 2000 | 200000 |
| 14808-79-8 | Sulfate | Inorganics | 2000 | 200000 |
| 16887-00-6 | Chloride | Inorganics | 2000 | 200000 |
| 16984-48-8 | Fluoride | Inorganics | 2000 | 200000 |
| 18540-29-9 | Chromium VI | Inorganics | 2000 | 200000 |
| 22967-92-6 | Methyl mercury | Inorganics | 1 | 1 |
| 24959-67-9 | Bromide | Inorganics | 2000 | 200000 |
| 57-12-5 | Cyanide | Inorganics | 2000 | 200000 |
| 593-74-8 | Dimethyl Mercury | Inorganics | 1 | 1 |
| 630-08-0 | Carbon monoxide | Inorganics | 1 | 1 |
| 7429-90-5 | Aluminum | Inorganics | 2000 | 200000 |
| 7439-89-6 | Iron | Inorganics | 2000 | 200000 |
| 7439-92-1 | Lead | Inorganics | 2000 | 200000 |
| 7439-93-2 | Lithium | Inorganics | 2000 | 200000 |
| 7439-95-4 | Magnesium | Inorganics | 2000 | 200000 |
| 7439-96-5 | Manganese | Inorganics | 2000 | 200000 |
| 7439-97-6 | Mercury | Inorganics | 2000 | 200000 |
| 7439-98-7 | Molybdenum | Inorganics | 2000 | 200000 |
| 7440-02-0 | Nickel | Inorganics | 2000 | 200000 |
| 7440-16-6 | Rhodium | Inorganics | 2000 | 200000 |
| 7440-22-4 | Silver | Inorganics | 2000 | 200000 |
| 7440-23-5 | Sodium | Inorganics | 2000 | 200000 |
| 7440-24-6 | Strontium (total) | Inorganics | 2000 | 200000 |
| 7440-25-7 | Tantalum | Inorganics | 2000 | 200000 |
| 7440-28-0 | Thallium | Inorganics | 2000 | 200000 |
| 7440-31-5 | Tin | Inorganics | 2000 | 200000 |
| 7440-33-7 | Tungsten | Inorganics | 2000 | 200000 |
| 7440-36-0 | Antimony | Inorganics | 2000 | 200000 |
| 7440-38-2 | Arsenic | Inorganics | 2000 | 200000 |
| 7440-39-3 | Barium | Inorganics | 2000 | 200000 |
| 7440-41-7 | Beryllium | Inorganics | 2000 | 200000 |
| 7440-43-9 | Cadmium | Inorganics | 2000 | 200000 |
| 7440-47-3 | Chromium III | Inorganics | 2000 | 200000 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|------------|---|------------|-------------------------|---------------|
| 7440-48-4 | Cobalt | Inorganics | 2000 | 200000 |
| 7440-50-8 | Copper | Inorganics | 2000 | 200000 |
| 7440-61-1 | Uranium | Inorganics | 2000 | 200000 |
| 7440-62-2 | Vanadium | Inorganics | 2000 | 200000 |
| 7440-65-5 | Yttrium | Inorganics | 2000 | 200000 |
| 7440-66-6 | Zinc | Inorganics | 2000 | 200000 |
| 7440-67-7 | Zirconium | Inorganics | 2000 | 200000 |
| 7446-09-5 | Sulfur dioxide | Inorganics | 1 | 1 |
| 7647-01-0 | Hydrogen chloride | Inorganics | 1 | 1 |
| 7664-39-3 | Hydrogen Fluoride | Inorganics | 1 | 1 |
| 7664-41-7 | Ammonia/Ammonium | Inorganics | 1 | 1 |
| 7704-34-9 | Total Sulfur (thermodynamically stable) | Inorganics | 2000 | 200000 |
| 7723-14-0 | Phosphorus | Inorganics | 2000 | 200000 |
| 7782-41-4 | Fluorine gas F ₂ | Inorganics | 1 | 1 |
| 7782-49-2 | Selenium | Inorganics | 2000 | 200000 |
| 7782-50-5 | Chlorine | Inorganics | 1 | 1 |
| 100-02-7 | p-Nitrophenol | Organics | 1 | 1 |
| 100-21-0 | Phthalic acid | Organics | 1 | 1 |
| 100-25-4 | 1,4-Dinitrobenzene | Organics | 1 | 1 |
| 100-40-3 | 4-Ethenylcyclohexene | Organics | 1 | 1 |
| 100-41-4 | Ethyl benzene | Organics | 1 | 1 |
| 100-42-5 | Styrene | Organics | 1 | 1 |
| 100-44-7 | Benzyl chloride | Organics | 1 | 1 |
| 100-47-0 | Benzonitrile | Organics | 1 | 1 |
| 100-51-6 | Benzyl alcohol | Organics | 1 | 1 |
| 100-52-7 | Benzaldehyde | Organics | 1 | 1 |
| 10061-01-5 | cis-1,3-Dichloropropene | Organics | 1 | 1 |
| 10061-02-6 | trans-1,3-Dichloropropene | Organics | 1 | 1 |
| 101-55-3 | 4-Bromophenylphenyl ether | Organics | 1 | 1 |
| 101-77-9 | 4,4-Methylenedianiline | Organics | 1 | 1 |
| 103-33-3 | Azobenzene | Organics | 1 | 1 |
| 103-65-1 | n-Propyl benzene (Isocumene) | Organics | 1 | 1 |
| 104-51-8 | n-Butylbenzene | Organics | 1 | 1 |
| 104-76-7 | 2-Ethyl-1-hexanol | Organics | 1 | 1 |
| 105-67-9 | 2,4-Dimethylphenol | Organics | 1 | 1 |
| 10595-95-6 | n-Nitrosomethylethylamine | Organics | 1 | 1 |
| 106-43-4 | 4-Chlorotoluene (p-Tolyl chloride) | Organics | 1 | 1 |
| 106-44-5 | p-Cresol (4-methyl phenol) | Organics | 1 | 1 |
| 106-46-7 | 1,4-Dichlorobenzene | Organics | 1 | 1 |
| 106-47-8 | p-Chloroaniline | Organics | 1 | 1 |
| 106-49-0 | p-Toluidine | Organics | 1 | 1 |
| 106-51-4 | Quinone | Organics | 1 | 1 |
| 106-88-7 | 1,2-Epoxybutane | Organics | 1 | 1 |
| 106-89-8 | Epichlorohydrin (1-chloro-2,3 epoxypropane) | Organics | 1 | 1 |
| 106-93-4 | Ethylene dibromide | Organics | 1 | 1 |
| 106-99-0 | 1,3-Butadiene | Organics | 1 | 1 |
| 107-02-8 | Acrolein | Organics | 1 | 1 |
| 107-05-1 | 3-Chloropropene | Organics | 1 | 1 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|-----------|---|----------|-------------------------|---------------|
| 107-06-2 | 1,2-Dichloroethane | Organics | 1 | 1 |
| 107-12-0 | Propionitrile | Organics | 1 | 1 |
| 107-13-1 | Acrylonitrile | Organics | 1 | 1 |
| 107-19-7 | Propargyl alcohol | Organics | 1 | 1 |
| 107-21-1 | Ethylene glycol (1,2-ethanediol) | Organics | 1 | 1 |
| 107-98-2 | Propylene glycol monomethyl ether | Organics | 1 | 1 |
| 108-05-4 | Acetic acid vinyl ester | Organics | 1 | 1 |
| 108-10-1 | 4-Methyl-2-pentanone | Organics | 1 | 1 |
| 108-39-4 | m-Cresol | Organics | 1 | 1 |
| 108-60-1 | bis (2-Chloroisopropyl)ether | Organics | 1 | 1 |
| 108-67-8 | 1,3,5-Trimethylbenzene | Organics | 1 | 1 |
| 108-86-1 | Bromobenzene (Phenyl bromide) | Organics | 1 | 1 |
| 108-87-2 | Methylcyclohexane | Organics | 1 | 1 |
| 108-88-3 | Toluene | Organics | 1 | 1 |
| 108-90-7 | Chlorobenzene | Organics | 1 | 1 |
| 108-94-1 | Cyclohexanone | Organics | 1 | 1 |
| 108-95-2 | Phenol | Organics | 1 | 1 |
| 109-74-0 | n-Butanenitrile | Organics | 1 | 1 |
| 109-75-1 | 3-Butenenitrile | Organics | 1 | 1 |
| 109-77-3 | Malononitrile | Organics | 1 | 1 |
| 109-86-4 | 2-Methoxyethanol | Organics | 1 | 1 |
| 109-99-9 | Tetrahydrofuran | Organics | 1 | 1 |
| 110-00-9 | Furan | Organics | 1 | 1 |
| 110-54-3 | n-Hexane | Organics | 1 | 1 |
| 110-59-8 | Pentanenitrile | Organics | 1 | 1 |
| 110-80-5 | 2-Ethoxyethanol | Organics | 1 | 1 |
| 110-82-7 | Cyclohexane | Organics | 1 | 1 |
| 110-83-8 | Cyclohexene | Organics | 1 | 1 |
| 110-86-1 | Pyridine | Organics | 1 | 1 |
| 111-15-9 | Ethylene glycol monoethyl ether acetate | Organics | 1 | 1 |
| 111-44-4 | Bis(2-chloroethyl)ether | Organics | 1 | 1 |
| 111-65-9 | n-Octane | Organics | 1 | 1 |
| 111-76-2 | 2-Butoxyethanol | Organics | 1 | 1 |
| 111-84-2 | n-Nonane | Organics | 1 | 1 |
| 111-91-1 | Bis(2-chloroethoxy)methane | Organics | 1 | 1 |
| 1120-21-4 | Undecane | Organics | 1 | 1 |
| 1120-71-4 | 1,3-Propane sultone | Organics | 1 | 1 |
| 112-30-1 | 1-Decanol | Organics | 1 | 1 |
| 112-31-2 | Decanal | Organics | 1 | 1 |
| 112-40-3 | Dodecane | Organics | 1 | 1 |
| 117-81-7 | Bis(2-ethylhexyl) phthalate | Organics | 1 | 1 |
| 117-84-0 | Di-n-octylphthalate | Organics | 1 | 1 |
| 118-74-1 | Hexachlorobenzene | Organics | 1 | 1 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | Organics | 1 | 1 |
| 120-12-7 | Anthracene | Organics | 1 | 1 |
| 120-82-1 | 1,2,4-Trichlorobenzene | Organics | 1 | 1 |
| 120-83-2 | 2,4-Dichlorophenol | Organics | 1 | 1 |
| 121-14-2 | 2,4-Dinitrotoluene | Organics | 1 | 1 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|------------|--|----------|-------------------------|---------------|
| 122-39-4 | N,N-Diphenylamine | Organics | 1 | 1 |
| 122-66-7 | 1,2-Diphenylhydrazine | Organics | 1 | 1 |
| 123-33-1 | Maleic hydrazide | Organics | 1 | 1 |
| 123-38-6 | Propionaldehyde | Organics | 1 | 1 |
| 123-72-8 | Butanal | Organics | 1 | 1 |
| 123-91-1 | 1,4-Dioxan | Organics | 1 | 1 |
| 124-18-5 | Decane | Organics | 1 | 1 |
| 124-48-1 | Chlorodibromomethane | Organics | 1 | 1 |
| 126-73-8 | Tributyl phosphate | Organics | 1 | 1 |
| 126-98-7 | 2-Methyl-2-propenenitrile | Organics | 1 | 1 |
| 127-18-4 | 1,1,2,2-Tetrachloroethene | Organics | 1 | 1 |
| 128-37-0 | 2,6-Bis(tert-butyl)-4-methylphenol | Organics | 1 | 1 |
| 129-00-0 | Pyrene | Organics | 1 | 1 |
| 131-11-3 | Dimethyl Phthalate | Organics | 1 | 1 |
| 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol | Organics | 1 | 1 |
| 132-64-9 | Dibenzofuran | Organics | 1 | 1 |
| 1330-20-7 | Xylenes (mixed isomers) | Organics | 1 | 1 |
| 133-06-2 | Captan | Organics | 1 | 1 |
| 1336-36-3 | Polychlorinated biphenyls | Organics | 1 | 1 |
| 134-32-7 | alpha-Naphthylamine | Organics | 1 | 1 |
| 135-98-8 | sec-Butylbenzene | Organics | 1 | 1 |
| 141-78-6 | Acetic acid ethyl ester | Organics | 1 | 1 |
| 145-73-3 | Endothall | Organics | 1 | 1 |
| 156-59-2 | cis-1,2-Dichloroethene | Organics | 1 | 1 |
| 156-60-5 | 1,2-trans-Dichloroethene | Organics | 1 | 1 |
| 1634-04-4 | Methyl tert-butyl ether | Organics | 1 | 1 |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD) | Organics | 1 | 1 |
| 189-55-9 | Dibenzo[a,i]pyrene | Organics | 1 | 1 |
| 189-64-0 | Dibenzo[a,h]pyrene | Organics | 1 | 1 |
| 191-24-2 | Benzo(g,h,i)perylene | Organics | 1 | 1 |
| 191-30-0 | Dibenzo(a,l)pyrene | Organics | 1 | 1 |
| 192-65-4 | Dibenzo[a,e]pyrene | Organics | 1 | 1 |
| 192-97-2 | Benzo(e)pyrene | Organics | 1 | 1 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | Organics | 1 | 1 |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin | Organics | 1 | 1 |
| 205-82-3 | Benzo[j]fluoranthene | Organics | 1 | 1 |
| 205-99-2 | Benzo(b)fluoranthene | Organics | 1 | 1 |
| 206-44-0 | Fluoranthene | Organics | 1 | 1 |
| 207-08-9 | Benzo(k)fluoranthene | Organics | 1 | 1 |
| 208-96-8 | Acenaphthylene | Organics | 1 | 1 |
| 218-01-9 | Chrysene | Organics | 1 | 1 |
| 224-42-0 | Dibenz[a,j]acridine | Organics | 1 | 1 |
| 2245-38-7 | 2,3,5-Trimethylnaphthalene | Organics | 1 | 1 |
| 226-36-8 | Dibenz[a,h]acridine | Organics | 1 | 1 |
| 23950-58-5 | Pronamide | Organics | 1 | 1 |
| 27154-33-2 | Trichlorofluoroethane | Organics | 1 | 1 |
| 31508-00-6 | 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) | Organics | 1 | 1 |
| 319-84-6 | alpha-BHC | Organics | 1 | 1 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|------------|--|----------|-------------------------|---------------|
| 319-85-7 | beta-BHC | Organics | 1 | 1 |
| 32598-13-3 | 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) | Organics | 1 | 1 |
| 32598-14-4 | 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) | Organics | 1 | 1 |
| 3268-87-9 | Octachlorodibenzo(p)dioxin | Organics | 1 | 1 |
| 32774-16-6 | 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) | Organics | 1 | 1 |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin | Organics | 1 | 1 |
| 3697-24-3 | 5-Methylchrysene | Organics | 1 | 1 |
| 38380-08-4 | 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) | Organics | 1 | 1 |
| 39001-02-0 | Octachlorodibenzofuran | Organics | 1 | 1 |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin | Organics | 1 | 1 |
| 39635-31-9 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) | Organics | 1 | 1 |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo(p)dioxin | Organics | 1 | 1 |
| 4170-30-3 | Crotonaldehyde (Propylene aldehyde) | Organics | 1 | 1 |
| 41851-50-7 | Chlorocyclopentadiene | Organics | 1 | 1 |
| 460-19-5 | Cyanogen (oxalonitrile) | Organics | 1 | 1 |
| 4786-20-3 | 2-Butenenitrile | Organics | 1 | 1 |
| 50-00-0 | Formaldehyde | Organics | 1 | 1 |
| 50-32-8 | Benzo(a)pyrene | Organics | 1 | 1 |
| 506-68-3 | Cyanogen bromide (bromocyanide) | Organics | 1 | 1 |
| 506-77-4 | Cyanogen chloride | Organics | 1 | 1 |
| 510-15-6 | Chlorobenzilate | Organics | 1 | 1 |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | Organics | 1 | 1 |
| 51-28-5 | 2,4-Dinitrophenol | Organics | 1 | 1 |
| 51-79-6 | Ethyl carbamate (urethane) | Organics | 1 | 1 |
| 52663-72-6 | 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) | Organics | 1 | 1 |
| 528-29-0 | 1,2-Dinitrobenzene (o-Dinitrobenzene) | Organics | 1 | 1 |
| 532-27-4 | 2-Chloroacetophenone | Organics | 1 | 1 |
| 534-52-1 | 4,6-Dinitro-o-cresol | Organics | 1 | 1 |
| 53-70-3 | Dibenz[a,h]anthracene | Organics | 1 | 1 |
| 5385-75-1 | Dibenzo(a,e)fluoranthene | Organics | 1 | 1 |
| 540-59-0 | 1,2-Dichloroethene (total) (1,2-Dichloroethylene) | Organics | 1 | 1 |
| 540-73-8 | 1,2-Dimethylhydrazine | Organics | 1 | 1 |
| 540-84-1 | 2,2,4-Trimethylpentane | Organics | 1 | 1 |
| 541-73-1 | 1,3-Dichlorobenzene | Organics | 1 | 1 |
| 542-75-6 | 1,3-Dichloropropene | Organics | 1 | 1 |
| 542-88-1 | Bis(chloromethyl)ether | Organics | 1 | 1 |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Organics | 1 | 1 |
| 56-23-5 | Carbon tetrachloride | Organics | 1 | 1 |
| 56-49-5 | 3-Methylcholanthrene | Organics | 1 | 1 |
| 56-55-3 | Benzo(a)anthracene | Organics | 1 | 1 |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | Organics | 1 | 1 |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Organics | 1 | 1 |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Organics | 1 | 1 |
| 57-24-9 | Strychnine | Organics | 1 | 1 |
| 57465-28-8 | 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) | Organics | 1 | 1 |
| 57653-85-7 | 1,2,3,6,7,8,-Hexachlorodibenzo(p)dioxin | Organics | 1 | 1 |
| 57-74-9 | Chlordane | Organics | 1 | 1 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|------------|---|----------|-------------------------|---------------|
| 581-42-0 | 2,6-Dimethylnaphthalene | Organics | 1 | 1 |
| 584-84-9 | 2,4-Toluene diisocyanate | Organics | 1 | 1 |
| 58-89-9 | gamma-BHC (Lindane) | Organics | 1 | 1 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | Organics | 1 | 1 |
| 589-38-8 | 3-Hexanone | Organics | 1 | 1 |
| 591-50-4 | Benzene, iodo- | Organics | 1 | 1 |
| 591-78-6 | 2-Hexanone | Organics | 1 | 1 |
| 593-60-2 | Bromoethene (Vinyl bromide) | Organics | 1 | 1 |
| 59-50-7 | 4-Chloro-3-methylphenol | Organics | 1 | 1 |
| 59-89-2 | N-Nitrosomorpholine | Organics | 1 | 1 |
| 60-11-7 | Dimethyl aminoazobenzene | Organics | 1 | 1 |
| 602-87-9 | 5-Nitroacenaphthene | Organics | 1 | 1 |
| 60-29-7 | Ethyl ether | Organics | 1 | 1 |
| 60-35-5 | Acetamide | Organics | 1 | 1 |
| 606-20-2 | 2,6-Dinitrotoluene | Organics | 1 | 1 |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Organics | 1 | 1 |
| 608-93-5 | Pentachlorobenzene | Organics | 1 | 1 |
| 61626-71-9 | Dichloropentadiene | Organics | 1 | 1 |
| 621-64-7 | N-Nitroso-di-n-propylamine | Organics | 1 | 1 |
| 624-83-9 | Methyl isocyanate | Organics | 1 | 1 |
| 62-50-0 | Ethyl methanesulfonate | Organics | 1 | 1 |
| 62-53-3 | Aniline | Organics | 1 | 1 |
| 62-75-9 | N-Nitroso-N,N-dimethylamine | Organics | 1 | 1 |
| 628-73-9 | Hexanenitrile | Organics | 1 | 1 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | Organics | 1 | 1 |
| 64-18-6 | Formic acid (methanoic acid) | Organics | 1 | 1 |
| 65510-44-3 | 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) | Organics | 1 | 1 |
| 65-85-0 | Benzoic acid | Organics | 1 | 1 |
| 67-56-1 | Methyl alcohol | Organics | 1 | 1 |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Organics | 1 | 1 |
| 67-63-0 | 2-Propyl alcohol | Organics | 1 | 1 |
| 67-64-1 | 2-Propanone (Acetone) | Organics | 1 | 1 |
| 67-66-3 | Chloroform | Organics | 1 | 1 |
| 67-72-1 | Hexachloroethane | Organics | 1 | 1 |
| 69782-90-7 | 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) | Organics | 1 | 1 |
| 70-30-4 | Hexachlorophene | Organics | 1 | 1 |
| 70362-50-4 | 3,4,4',5-Tetrachlorobiphenyl (PCB 81) | Organics | 1 | 1 |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Organics | 1 | 1 |
| 71-36-3 | n-Butyl alcohol | Organics | 1 | 1 |
| 71-43-2 | Benzene | Organics | 1 | 1 |
| 71-55-6 | 1,1,1-Trichloroethane | Organics | 1 | 1 |
| 72-43-5 | Methoxychlor | Organics | 1 | 1 |
| 72-55-9 | 4,4-DDE | Organics | 1 | 1 |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Organics | 1 | 1 |
| 74472-37-0 | 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) | Organics | 1 | 1 |
| 74-83-9 | Bromomethane | Organics | 1 | 1 |
| 74-87-3 | Chloromethane | Organics | 1 | 1 |
| 74-88-4 | Iodomethane | Organics | 1 | 1 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB- S1 HEPA DF | LB-S2 HEPA DF |
|----------|--|----------|-----------------------------------|---------------------|
| 74-95-3 | Methylene bromide | Organics | 1 | 1 |
| 74-97-5 | Bromochloromethane | Organics | 1 | 1 |
| 75-00-3 | Chloroethane | Organics | 1 | 1 |
| 75-01-4 | 1-Chloroethene | Organics | 1 | 1 |
| 75-02-5 | Fluoroethene (vinyl fluoride) | Organics | 1 | 1 |
| 75-05-8 | Acetonitrile | Organics | 1 | 1 |
| 75-07-0 | Acetaldehyde | Organics | 1 | 1 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | Organics | 1 | 1 |
| 75-15-0 | Carbon disulfide | Organics | 1 | 1 |
| 75-21-8 | Ethylene oxide (Oxirane) | Organics | 1 | 1 |
| 75-25-2 | Bromoform | Organics | 1 | 1 |
| 75-27-4 | Bromodichloromethane | Organics | 1 | 1 |
| 75-29-6 | 2-Chloropropane | Organics | 1 | 1 |
| 75-34-3 | 1,1-Dichloroethane | Organics | 1 | 1 |
| 75-35-4 | 1,1-Dichloroethene | Organics | 1 | 1 |
| 75-44-5 | Phosgene (hydrogen phosphide) | Organics | 1 | 1 |
| 75-45-6 | Chlorodifluoromethane | Organics | 1 | 1 |
| 75-50-3 | Trimethylamine | Organics | 1 | 1 |
| 75-69-4 | Trichlorofluoromethane | Organics | 1 | 1 |
| 75-71-8 | Dichlorodifluoromethane | Organics | 1 | 1 |
| 76-01-7 | Pentachloroethane | Organics | 1 | 1 |
| 76-13-1 | 1,2,2-Trichlorotrifluoroethane | Organics | 1 | 1 |
| 764-41-0 | 1,4-Dichloro-2-butene | Organics | 1 | 1 |
| 76-44-8 | Heptachlor | Organics | 1 | 1 |
| 765-34-4 | Glycidylaldehyde | Organics | 1 | 1 |
| 77-47-4 | Hexachlorocyclopentadiene | Organics | 1 | 1 |
| 77-78-1 | Dimethyl sulfate | Organics | 1 | 1 |
| 78-83-1 | 2-Methylpropyl alcohol | Organics | 1 | 1 |
| 78-87-5 | 1,2-Dichloropropane | Organics | 1 | 1 |
| 78-93-3 | 2-Butanone | Organics | 1 | 1 |
| 79-00-5 | 1,1,2-Trichloroethane | Organics | 1 | 1 |
| 79-01-6 | 1,1,2-Trichloroethylene | Organics | 1 | 1 |
| 79-10-7 | 2-Propenoic acid | Organics | 1 | 1 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | Organics | 1 | 1 |
| 79-46-9 | 2-Nitropropane | Organics | 1 | 1 |
| 80-62-6 | Methyl methacrylate | Organics | 1 | 1 |
| 822-06-0 | Hexamethylene-1,5-diisocyanate | Organics | 1 | 1 |
| 823-40-5 | Toluene-2,6-diamine | Organics | 1 | 1 |
| 82-68-8 | Pentachloronitrobenzene (PCNB) | Organics | 1 | 1 |
| 832-69-9 | 1-Methylphenanthrene | Organics | 1 | 1 |
| 83-32-9 | Acenaphthene | Organics | 1 | 1 |
| 84-66-2 | Diethyl phthalate | Organics | 1 | 1 |
| 84-74-2 | Di-n-butylphthalate | Organics | 1 | 1 |
| 85-01-8 | Phenanthrene | Organics | 1 | 1 |
| 85-44-9 | Phthalic anhydride (1,2-benzenedicarboxylic anhydride) | Organics | 1 | 1 |
| 85-68-7 | Butylbenzylphthalate | Organics | 1 | 1 |
| 86-73-7 | Fluorene | Organics | 1 | 1 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB-S1 HEPA DF | LB-S2 HEPA DF |
|------------|---|---------------|-------------------------|---------------|
| 87-61-6 | 1,2,3-Trichlorobenzene | Organics | 1 | 1 |
| 87-68-3 | Hexachlorobutadiene | Organics | 1 | 1 |
| 87-86-5 | Pentachlorophenol | Organics | 1 | 1 |
| 88-06-2 | 2,4,6-Trichlorophenol | Organics | 1 | 1 |
| 88-74-4 | o-Nitroaniline (2-nitroaniline) | Organics | 1 | 1 |
| 88-75-5 | 2-Nitrophenol | Organics | 1 | 1 |
| 90-04-0 | o-Anisidine | Organics | 1 | 1 |
| 90-12-0 | 1-Methylnaphthalene | Organics | 1 | 1 |
| 91-20-3 | Naphthalene | Organics | 1 | 1 |
| 91-22-5 | Quinoline | Organics | 1 | 1 |
| 91-57-6 | 2-Methylnaphthalene | Organics | 1 | 1 |
| 91-58-7 | 2-Chloronaphthalene | Organics | 1 | 1 |
| 91-94-1 | 3,3'-Dichlorobenzidine | Organics | 1 | 1 |
| 924-16-3 | N-Nitroso-di-n-Buetylamine | Organics | 1 | 1 |
| 92-52-4 | 1,1'-Biphenyl | Organics | 1 | 1 |
| 94-59-7 | Safrole (5-(2-Propenyl)-1,3-benzodioxole) | Organics | 1 | 1 |
| 94-75-7 | 2,4-D | Organics | 1 | 1 |
| 95-48-7 | o-Cresol | Organics | 1 | 1 |
| 95-49-8 | o-Chlorotoluene | Organics | 1 | 1 |
| 95-50-1 | 1,2-Dichlorobenzene | Organics | 1 | 1 |
| 95-53-4 | o-Toluidine | Organics | 1 | 1 |
| 95-57-8 | 2-Chlorophenol | Organics | 1 | 1 |
| 95-63-6 | 1,2,4-Trimethyl benzene | Organics | 1 | 1 |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | Organics | 1 | 1 |
| 95-95-4 | 2,4,5-Trichlorophenol | Organics | 1 | 1 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | Organics | 1 | 1 |
| 96-18-4 | 1,2,3-Trichloropropane | Organics | 1 | 1 |
| 96-45-7 | Ethylene thiourea | Organics | 1 | 1 |
| 97-63-2 | Ethyl methacrylate | Organics | 1 | 1 |
| 98-01-1 | Furfural | Organics | 1 | 1 |
| 98-06-6 | tert-Butyl benzene | Organics | 1 | 1 |
| 98-07-7 | Benzotrichloride | Organics | 1 | 1 |
| 98-82-8 | Cumene | Organics | 1 | 1 |
| 98-83-9 | Methyl styrene (mixed isomers) | Organics | 1 | 1 |
| 98-86-2 | Acetophenone | Organics | 1 | 1 |
| 98-95-3 | Nitrobenzene | Organics | 1 | 1 |
| 99-35-4 | 1,3,5-Trinitrobenzene | Organics | 1 | 1 |
| 99-65-0 | 1,3-Dinitrobenzene | Organics | 1 | 1 |
| 99-87-6 | p-Cymene | Organics | 1 | 1 |
| 10028-17-8 | Tritium | Radionuclides | 1 | 1 |
| 10045-97-3 | Cesium-137 | Radionuclides | 2000 | 200000 |
| 10098-91-6 | Yttrium-90 | Radionuclides | 2000 | 200000 |
| 10098-97-2 | Strontium-90 | Radionuclides | 2000 | 200000 |
| 10198-40-0 | Cobalt-60 | Radionuclides | 2000 | 200000 |
| 13966-29-5 | Uranium-234 | Radionuclides | 2000 | 200000 |
| 13967-48-1 | Ruthenium-106 | Radionuclides | 2000 | 200000 |
| 13967-70-9 | Cesium-134 | Radionuclides | 2000 | 200000 |
| 13968-55-3 | Uranium-233 | Radionuclides | 2000 | 200000 |

Table C-1 Constituent Specific Analytical Laboratory HEPA Decontamination Factors

| CASRN | Chemical | Type | LB-C2 and LB- S1 HEPA DF | LB-S2 HEPA DF |
|--------------|------------------|---------------|---|------------------------------|
| 13981-15-2 | Curium-244 | Radionuclides | 2000 | 200000 |
| 13981-16-3 | Plutonium-238 | Radionuclides | 2000 | 200000 |
| 13981-37-8 | Nickel-63 | Radionuclides | 2000 | 200000 |
| 13982-10-0 | Plutonium-242 | Radionuclides | 2000 | 200000 |
| 13982-63-3 | Radium-226 | Radionuclides | 2000 | 200000 |
| 13982-70-2 | Uranium-236 | Radionuclides | 2000 | 200000 |
| 13994-20-2 | Neptunium-237 | Radionuclides | 2000 | 200000 |
| 14119-32-5 | Plutonium-241 | Radionuclides | 2000 | 200000 |
| 14119-33-6 | Plutonium-240 | Radionuclides | 2000 | 200000 |
| 14133-76-7 | Technetium-99 | Radionuclides | 2000 | 200000 |
| 14158-29-3 | Uranium-232 | Radionuclides | 2000 | 200000 |
| 14234-35-6 | Antimony-125 | Radionuclides | 2000 | 200000 |
| 14331-85-2 | Protactinium-231 | Radionuclides | 2000 | 200000 |
| 14336-70-0 | Nickel-59 | Radionuclides | 2000 | 200000 |
| 14391-16-3 | Europium-155 | Radionuclides | 2000 | 200000 |
| 14596-10-2 | Americium-241 | Radionuclides | 2000 | 200000 |
| 14683-23-9 | Europium-152 | Radionuclides | 2000 | 200000 |
| 14762-75-5 | Carbon-14 | Radionuclides | 2000 | 200000 |
| 14952-40-0 | Actinium-227 | Radionuclides | 2000 | 200000 |
| 14993-75-0 | Americium-243 | Radionuclides | 2000 | 200000 |
| 15046-84-1 | Iodine-129 | Radionuclides | 2000 | 200000 |
| 15117-48-3 | Plutonium-239 | Radionuclides | 2000 | 200000 |
| 15117-96-1 | Uranium-235 | Radionuclides | 2000 | 200000 |
| 15262-20-1 | Radium-228 | Radionuclides | 2000 | 200000 |
| 15510-73-3 | Curium-242 | Radionuclides | 2000 | 200000 |
| 15585-10-1 | Europium-154 | Radionuclides | 2000 | 200000 |
| 15594-54-4 | Thorium-229 | Radionuclides | 2000 | 200000 |
| 15715-94-3 | Samarium-151 | Radionuclides | 2000 | 200000 |
| 15751-77-6 | Zirconium-93 | Radionuclides | 2000 | 200000 |
| 15757-87-6 | Curium-243 | Radionuclides | 2000 | 200000 |
| 15758-45-9 | Selenium-79 | Radionuclides | 2000 | 200000 |
| 15832-50-5 | Tin-126 | Radionuclides | 2000 | 200000 |
| 378253-40-8 | Barium-137m | Radionuclides | 2000 | 200000 |
| 378253-44-2 | Cadmium-113m | Radionuclides | 2000 | 200000 |
| 378782-82-2 | Niobium-93m | Radionuclides | 2000 | 200000 |
| 7440-29-1 | Thorium-232 | Radionuclides | 2000 | 200000 |
| 7440-61-1R | Uranium-238 | Radionuclides | 2000 | 200000 |

Appendix D

Lab Emissions Estimate

Appendix D Lab Emissions Estimate

The following tables were assembled by combining data in Appendix A through Appendix C. Since equations 1 through 3 have cumulative properties, emissions for each constituent were computed from the total sample volume and mass released associated with each applicable process stream, times the mass fraction of each constituent, summed for all samples from the PT, LAW, HLW facilities, and EMF. A separate set of results for laser ablation samples was created and added to the Lab emissions.

In the DFLAW operating configuration samples attributed to the LAW Facility and EMF Facility are analyzed at the ARL and vented through the LB-S1 single-stage HEPA filters. After use, these samples are poured down the laboratory area sink drain and drained to vessel RLD-VSL-00164 which is ventilated to the C5 emission unit LB-S2. LB-S1 and LB-S2 unabated emissions in Table D-1 are identical since a sample may be within an ARL hood, or disposed of to the collection vessel.

In the baseline WTP operating configuration samples attributed to the PT Facility and HLW Facility are analyzed in the AHL and vented through the LB-S2 two stages of HEPA filters, and samples attributed to the LAW Facility are analyzed at the ARL and vented through the LB-S1 single-stage HEPA filters.

Table D-1 presents the potential, estimated emissions for the Lab in the DFLAW operating configuration. As previously discussed, the basis for the estimated emissions is the number of samples processed in the ARL hoods. A “-” symbol indicates no data are available for approximating the emissions rate.

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|------------------|------------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 10028-15-6 | Ozone | Inorganics | - | - | - | - | - | - |
| 10102-44-0 | Nitrogen dioxide | Inorganics | - | - | - | - | - | - |
| 124-38-9 | Carbon dioxide | Inorganics | - | - | - | - | - | - |
| 14265-44-2 | Phosphate | Inorganics | 9.89E-09 | 1.20E-10 | 1.00E-08 | 5.00E-12 | 1.00E-08 | 5.00E-14 |
| 14797-55-8 | Nitrate | Inorganics | 3.11E-07 | 1.76E-09 | 3.13E-07 | 1.56E-10 | 3.13E-07 | 1.56E-12 |
| 14797-65-0 | Nitrite | Inorganics | 2.17E-07 | 8.24E-10 | 2.18E-07 | 1.09E-10 | 2.18E-07 | 1.09E-12 |
| 14808-79-8 | Sulfate | Inorganics | 8.65E-09 | 4.97E-11 | 8.70E-09 | 4.35E-12 | 8.70E-09 | 4.35E-14 |
| 16887-00-6 | Chloride | Inorganics | 1.81E-08 | 3.17E-09 | 2.13E-08 | 1.06E-11 | 2.13E-08 | 1.06E-13 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|-------------------|------------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 16984-48-8 | Fluoride | Inorganics | 3.70E-09 | 7.77E-10 | 4.48E-09 | 2.24E-12 | 4.48E-09 | 2.24E-14 |
| 18540-29-9 | Chromium VI | Inorganics | 1.98E-09 | 6.30E-11 | 2.04E-09 | 1.02E-12 | 2.04E-09 | 1.02E-14 |
| 22967-92-6 | Methyl mercury | Inorganics | - | - | - | - | - | - |
| 24959-67-9 | Bromide | Inorganics | - | - | - | - | - | - |
| 57-12-5 | Cyanide | Inorganics | 5.84E-12 | 2.22E-14 | 5.87E-12 | 2.93E-15 | 5.87E-12 | 2.93E-17 |
| 593-74-8 | Dimethyl Mercury | Inorganics | 1.99E-15 | 7.27E-18 | 2.00E-15 | 2.00E-15 | 2.00E-15 | 2.00E-15 |
| 630-08-0 | Carbon monoxide | Inorganics | - | - | - | - | - | - |
| 7429-90-5 | Aluminum | Inorganics | 4.25E-08 | 1.12E-10 | 4.26E-08 | 2.13E-11 | 4.26E-08 | 2.13E-13 |
| 7439-89-6 | Iron | Inorganics | 9.52E-09 | 6.82E-11 | 9.59E-09 | 4.80E-12 | 9.59E-09 | 4.80E-14 |
| 7439-92-1 | Lead | Inorganics | 4.84E-10 | 5.06E-12 | 4.89E-10 | 2.44E-13 | 4.89E-10 | 2.44E-15 |
| 7439-93-2 | Lithium | Inorganics | 2.06E-11 | 1.52E-13 | 2.08E-11 | 1.04E-14 | 2.08E-11 | 1.04E-16 |
| 7439-95-4 | Magnesium | Inorganics | 9.48E-09 | 2.69E-12 | 9.48E-09 | 4.74E-12 | 9.48E-09 | 4.74E-14 |
| 7439-96-5 | Manganese | Inorganics | 1.14E-10 | 2.06E-12 | 1.16E-10 | 5.78E-14 | 1.16E-10 | 5.78E-16 |
| 7439-97-6 | Mercury | Inorganics | - | - | - | - | - | - |
| 7439-98-7 | Molybdenum | Inorganics | 6.50E-11 | 5.84E-13 | 6.56E-11 | 3.28E-14 | 6.56E-11 | 3.28E-16 |
| 7440-02-0 | Nickel | Inorganics | 1.00E-10 | 7.31E-13 | 1.01E-10 | 5.04E-14 | 1.01E-10 | 5.04E-16 |
| 7440-16-6 | Rhodium | Inorganics | 1.60E-17 | 6.07E-18 | 2.21E-17 | 1.10E-20 | 2.21E-17 | 1.10E-22 |
| 7440-22-4 | Silver | Inorganics | 2.05E-12 | 1.89E-14 | 2.07E-12 | 1.03E-15 | 2.07E-12 | 1.03E-17 |
| 7440-23-5 | Sodium | Inorganics | 3.38E-07 | 5.07E-09 | 3.43E-07 | 1.71E-10 | 3.43E-07 | 1.71E-12 |
| 7440-24-6 | Strontium (total) | Inorganics | 2.09E-13 | 1.37E-15 | 2.10E-13 | 1.05E-16 | 2.10E-13 | 1.05E-18 |
| 7440-25-7 | Tantalum | Inorganics | 3.21E-17 | 2.35E-19 | 3.24E-17 | 1.62E-20 | 3.24E-17 | 1.62E-22 |
| 7440-28-0 | Thallium | Inorganics | 2.08E-16 | 7.00E-17 | 2.78E-16 | 1.39E-19 | 2.78E-16 | 1.39E-21 |
| 7440-31-5 | Tin | Inorganics | - | - | - | - | - | - |
| 7440-33-7 | Tungsten | Inorganics | 1.16E-10 | 8.45E-13 | 1.17E-10 | 5.83E-14 | 1.17E-10 | 5.83E-16 |
| 7440-36-0 | Antimony | Inorganics | 4.91E-11 | 3.44E-12 | 5.25E-11 | 2.63E-14 | 5.25E-11 | 2.63E-16 |
| 7440-38-2 | Arsenic | Inorganics | 6.57E-11 | 4.60E-12 | 7.03E-11 | 3.51E-14 | 7.03E-11 | 3.51E-16 |
| 7440-39-3 | Barium | Inorganics | 2.69E-14 | 2.59E-16 | 2.72E-14 | 1.36E-17 | 2.72E-14 | 1.36E-19 |
| 7440-41-7 | Beryllium | Inorganics | 2.90E-12 | 2.12E-14 | 2.92E-12 | 1.46E-15 | 2.92E-12 | 1.46E-17 |
| 7440-43-9 | Cadmium | Inorganics | 1.40E-11 | 9.92E-14 | 1.41E-11 | 7.07E-15 | 1.41E-11 | 7.07E-17 |
| 7440-47-3 | Chromium III | Inorganics | 1.32E-09 | 6.30E-11 | 1.39E-09 | 6.94E-13 | 1.39E-09 | 6.94E-15 |
| 7440-48-4 | Cobalt | Inorganics | 4.58E-16 | 1.73E-16 | 6.31E-16 | 3.15E-19 | 6.31E-16 | 3.15E-21 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|------------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 7440-50-8 | Copper | Inorganics | 3.73E-12 | 1.12E-13 | 3.85E-12 | 1.92E-15 | 3.85E-12 | 1.92E-17 |
| 7440-61-1 | Uranium | Inorganics | 6.24E-11 | 4.56E-13 | 6.29E-11 | 3.15E-14 | 6.29E-11 | 3.15E-16 |
| 7440-62-2 | Vanadium | Inorganics | 3.89E-11 | 4.76E-13 | 3.94E-11 | 1.97E-14 | 3.94E-11 | 1.97E-16 |
| 7440-65-5 | Yttrium | Inorganics | 2.65E-13 | 1.72E-15 | 2.67E-13 | 1.33E-16 | 2.67E-13 | 1.33E-18 |
| 7440-66-6 | Zinc | Inorganics | 3.01E-08 | 7.68E-11 | 3.02E-08 | 1.51E-11 | 3.02E-08 | 1.51E-13 |
| 7440-67-7 | Zirconium | Inorganics | 2.13E-08 | 4.10E-12 | 2.13E-08 | 1.07E-11 | 2.13E-08 | 1.07E-13 |
| 7446-09-5 | Sulfur dioxide | Inorganics | - | - | - | - | - | - |
| 7647-01-0 | Hydrogen chloride | Inorganics | - | - | - | - | - | - |
| 7664-39-3 | Hydrogen Fluoride | Inorganics | - | - | - | - | - | - |
| 7664-41-7 | Ammonia/Ammonium | Inorganics | 1.27E-10 | 5.77E-11 | 1.84E-10 | 1.84E-10 | 1.84E-10 | 1.84E-10 |
| 7704-34-9 | Total Sulfur (thermodynamically stable) | Inorganics | 2.89E-09 | 1.76E-11 | 2.91E-09 | 1.45E-12 | 2.91E-09 | 1.45E-14 |
| 7723-14-0 | Phosphorus | Inorganics | 3.23E-09 | 3.91E-11 | 3.26E-09 | 1.63E-12 | 3.26E-09 | 1.63E-14 |
| 7782-41-4 | Fluorine gas F ₂ | Inorganics | - | - | - | - | - | - |
| 7782-49-2 | Selenium | Inorganics | 8.50E-11 | 7.75E-12 | 9.28E-11 | 4.64E-14 | 9.28E-11 | 4.64E-16 |
| 7782-50-5 | Chlorine | Inorganics | - | - | - | - | - | - |
| 100-02-7 | p-Nitrophenol | Organics | 1.41E-10 | 5.63E-11 | 1.97E-10 | 1.97E-10 | 1.97E-10 | 1.97E-10 |
| 100-21-0 | Phthalic acid | Organics | 3.55E-11 | 1.34E-11 | 4.89E-11 | 4.89E-11 | 4.89E-11 | 4.89E-11 |
| 100-25-4 | 1,4-Dinitrobenzene | Organics | 1.60E-14 | 3.01E-15 | 1.90E-14 | 1.90E-14 | 1.90E-14 | 1.90E-14 |
| 100-40-3 | 4-Ethenylcyclohexene | Organics | 1.00E-12 | 1.58E-18 | 1.00E-12 | 1.00E-12 | 1.00E-12 | 1.00E-12 |
| 100-41-4 | Ethyl benzene | Organics | 5.97E-17 | 4.55E-23 | 5.97E-17 | 5.97E-17 | 5.97E-17 | 5.97E-17 |
| 100-42-5 | Styrene | Organics | 3.72E-14 | 1.07E-16 | 3.73E-14 | 3.73E-14 | 3.73E-14 | 3.73E-14 |
| 100-44-7 | Benzyl chloride | Organics | - | - | - | - | - | - |
| 100-47-0 | Benzonitrile | Organics | - | - | - | - | - | - |
| 100-51-6 | Benzyl alcohol | Organics | - | - | - | - | - | - |
| 100-52-7 | Benzaldehyde | Organics | - | - | - | - | - | - |
| 10061-01-5 | cis-1,3-Dichloropropene | Organics | 1.30E-16 | 5.69E-22 | 1.30E-16 | 1.30E-16 | 1.30E-16 | 1.30E-16 |
| 10061-02-6 | trans-1,3-Dichloropropene | Organics | 1.50E-16 | 2.49E-20 | 1.50E-16 | 1.50E-16 | 1.50E-16 | 1.50E-16 |
| 101-55-3 | 4-Bromophenylphenyl ether | Organics | 4.86E-12 | 3.61E-14 | 4.89E-12 | 4.89E-12 | 4.89E-12 | 4.89E-12 |
| 101-77-9 | 4,4-Methylenedianiline | Organics | - | - | - | - | - | - |
| 103-33-3 | Azobenzene | Organics | - | - | - | - | - | - |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 103-65-1 | n-Propyl benzene (Isocumene) | Organics | - | - | - | - | - | - |
| 104-51-8 | n-Butylbenzene | Organics | - | - | - | - | - | - |
| 104-76-7 | 2-Ethyl-1-hexanol | Organics | 4.04E-12 | 1.34E-13 | 4.17E-12 | 4.17E-12 | 4.17E-12 | 4.17E-12 |
| 105-67-9 | 2,4-Dimethylphenol | Organics | 1.48E-11 | 7.15E-12 | 2.20E-11 | 2.20E-11 | 2.20E-11 | 2.20E-11 |
| 10595-95-6 | n-Nitrosomethylethylamine | Organics | 8.97E-12 | 1.06E-12 | 1.00E-11 | 1.00E-11 | 1.00E-11 | 1.00E-11 |
| 106-43-4 | 4-Chlorotoluene (p-Tolyl chloride) | Organics | - | - | - | - | - | - |
| 106-44-5 | p-Cresol (4-methyl phenol) | Organics | - | - | - | - | - | - |
| 106-46-7 | 1,4-Dichlorobenzene | Organics | 3.77E-14 | 6.00E-17 | 3.77E-14 | 3.77E-14 | 3.77E-14 | 3.77E-14 |
| 106-47-8 | p-Chloroaniline | Organics | 1.76E-11 | 8.41E-12 | 2.60E-11 | 2.60E-11 | 2.60E-11 | 2.60E-11 |
| 106-49-0 | p-Toluidine | Organics | - | - | - | - | - | - |
| 106-51-4 | Quinone | Organics | - | - | - | - | - | - |
| 106-88-7 | 1,2-Epoxybutane | Organics | 4.17E-12 | 1.72E-14 | 4.19E-12 | 4.19E-12 | 4.19E-12 | 4.19E-12 |
| 106-89-8 | Epichlorohydrin (1-chloro-2,3 epoxypropane) | Organics | - | - | - | - | - | - |
| 106-93-4 | Ethylene dibromide | Organics | 3.92E-17 | 1.00E-20 | 3.92E-17 | 3.92E-17 | 3.92E-17 | 3.92E-17 |
| 106-99-0 | 1,3-Butadiene | Organics | 3.11E-16 | 6.94E-22 | 3.11E-16 | 3.11E-16 | 3.11E-16 | 3.11E-16 |
| 107-02-8 | Acrolein | Organics | 2.24E-15 | 1.61E-17 | 2.26E-15 | 2.26E-15 | 2.26E-15 | 2.26E-15 |
| 107-05-1 | 3-Chloropropene | Organics | 9.54E-17 | 7.72E-23 | 9.54E-17 | 9.54E-17 | 9.54E-17 | 9.54E-17 |
| 107-06-2 | 1,2-Dichloroethane | Organics | 1.02E-13 | 3.31E-15 | 1.05E-13 | 1.05E-13 | 1.05E-13 | 1.05E-13 |
| 107-12-0 | Propionitrile | Organics | 1.46E-14 | 3.68E-16 | 1.50E-14 | 1.50E-14 | 1.50E-14 | 1.50E-14 |
| 107-13-1 | Acrylonitrile | Organics | 1.11E-12 | 3.67E-13 | 1.48E-12 | 1.48E-12 | 1.48E-12 | 1.48E-12 |
| 107-19-7 | Propargyl alcohol | Organics | - | - | - | - | - | - |
| 107-21-1 | Ethylene glycol (1,2-ethanediol) | Organics | - | - | - | - | - | - |
| 107-98-2 | Propylene glycol monomethyl ether | Organics | - | - | - | - | - | - |
| 108-05-4 | Acetic acid vinyl ester | Organics | 4.84E-12 | 2.98E-15 | 4.85E-12 | 4.85E-12 | 4.85E-12 | 4.85E-12 |
| 108-10-1 | 4-Methyl-2-pentanone | Organics | 5.36E-16 | 3.19E-18 | 5.39E-16 | 5.39E-16 | 5.39E-16 | 5.39E-16 |
| 108-39-4 | m-Cresol | Organics | 1.52E-11 | 2.04E-12 | 1.72E-11 | 1.72E-11 | 1.72E-11 | 1.72E-11 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|-----------|---|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 108-60-1 | bis (2-Chloroisopropyl)ether | Organics | - | - | - | - | - | - |
| 108-67-8 | 1,3,5-Trimethylbenzene | Organics | - | - | - | - | - | - |
| 108-86-1 | Bromobenzene (Phenyl bromide) | Organics | - | - | - | - | - | - |
| 108-87-2 | Methylcyclohexane | Organics | 8.64E-18 | 8.78E-23 | 8.64E-18 | 8.64E-18 | 8.64E-18 | 8.64E-18 |
| 108-88-3 | Toluene | Organics | 1.54E-14 | 2.63E-18 | 1.54E-14 | 1.54E-14 | 1.54E-14 | 1.54E-14 |
| 108-90-7 | Chlorobenzene | Organics | 2.72E-14 | 3.07E-17 | 2.72E-14 | 2.72E-14 | 2.72E-14 | 2.72E-14 |
| 108-94-1 | Cyclohexanone | Organics | 1.70E-13 | 1.11E-14 | 1.81E-13 | 1.81E-13 | 1.81E-13 | 1.81E-13 |
| 108-95-2 | Phenol | Organics | 6.78E-12 | 3.15E-12 | 9.93E-12 | 9.93E-12 | 9.93E-12 | 9.93E-12 |
| 109-74-0 | n-Butanenitrile | Organics | 4.15E-12 | 7.54E-14 | 4.23E-12 | 4.23E-12 | 4.23E-12 | 4.23E-12 |
| 109-75-1 | 3-Butenenitrile | Organics | - | - | - | - | - | - |
| 109-77-3 | Malononitrile | Organics | - | - | - | - | - | - |
| 109-86-4 | 2-Methoxyethanol | Organics | - | - | - | - | - | - |
| 109-99-9 | Tetrahydrofuran | Organics | 1.69E-15 | 2.28E-17 | 1.71E-15 | 1.71E-15 | 1.71E-15 | 1.71E-15 |
| 110-00-9 | Furan | Organics | - | - | - | - | - | - |
| 110-54-3 | n-Hexane | Organics | 9.91E-17 | 4.03E-21 | 9.91E-17 | 9.91E-17 | 9.91E-17 | 9.91E-17 |
| 110-59-8 | Pentanenitrile | Organics | 3.95E-12 | 5.23E-14 | 4.00E-12 | 4.00E-12 | 4.00E-12 | 4.00E-12 |
| 110-80-5 | 2-Ethoxyethanol | Organics | 4.34E-11 | 6.86E-12 | 5.02E-11 | 5.02E-11 | 5.02E-11 | 5.02E-11 |
| 110-82-7 | Cyclohexane | Organics | 1.94E-17 | 7.63E-23 | 1.94E-17 | 1.94E-17 | 1.94E-17 | 1.94E-17 |
| 110-83-8 | Cyclohexene | Organics | 4.79E-17 | 7.63E-23 | 4.79E-17 | 4.79E-17 | 4.79E-17 | 4.79E-17 |
| 110-86-1 | Pyridine | Organics | 4.10E-14 | 2.69E-15 | 4.37E-14 | 4.37E-14 | 4.37E-14 | 4.37E-14 |
| 111-15-9 | Ethylene glycol monoethyl ether acetate | Organics | - | - | - | - | - | - |
| 111-44-4 | Bis(2-chloroethyl)ether | Organics | 1.12E-12 | 5.14E-13 | 1.63E-12 | 1.63E-12 | 1.63E-12 | 1.63E-12 |
| 111-65-9 | n-Octane | Organics | 1.30E-17 | 9.40E-22 | 1.30E-17 | 1.30E-17 | 1.30E-17 | 1.30E-17 |
| 111-76-2 | 2-Butoxyethanol | Organics | 5.96E-12 | 6.87E-13 | 6.64E-12 | 6.64E-12 | 6.64E-12 | 6.64E-12 |
| 111-84-2 | n-Nonane | Organics | 8.18E-18 | 6.17E-22 | 8.18E-18 | 8.18E-18 | 8.18E-18 | 8.18E-18 |
| 111-91-1 | Bis(2-chloroethoxy)methane | Organics | 2.19E-12 | 1.06E-12 | 3.25E-12 | 3.25E-12 | 3.25E-12 | 3.25E-12 |
| 1120-21-4 | Undecane | Organics | - | - | - | - | - | - |
| 1120-71-4 | 1,3-Propane sultone | Organics | - | - | - | - | - | - |
| 112-30-1 | 1-Decanol | Organics | - | - | - | - | - | - |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|-----------|------------------------------------|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 112-31-2 | Decanal | Organics | - | - | - | - | - | - |
| 112-40-3 | Dodecane | Organics | - | - | - | - | - | - |
| 117-81-7 | Bis(2-ethylhexyl) phthalate | Organics | 7.08E-11 | 2.99E-11 | 1.01E-10 | 1.01E-10 | 1.01E-10 | 1.01E-10 |
| 117-84-0 | Di-n-octylphthalate | Organics | 1.70E-11 | 2.52E-13 | 1.72E-11 | 1.72E-11 | 1.72E-11 | 1.72E-11 |
| 118-74-1 | Hexachlorobenzene | Organics | 2.43E-14 | 4.45E-16 | 2.48E-14 | 2.48E-14 | 2.48E-14 | 2.48E-14 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | Organics | - | - | - | - | - | - |
| 120-12-7 | Anthracene | Organics | 3.36E-12 | 1.68E-13 | 3.53E-12 | 3.53E-12 | 3.53E-12 | 3.53E-12 |
| 120-82-1 | 1,2,4-Trichlorobenzene | Organics | 2.79E-15 | 1.12E-19 | 2.79E-15 | 2.79E-15 | 2.79E-15 | 2.79E-15 |
| 120-83-2 | 2,4-Dichlorophenol | Organics | 5.51E-12 | 3.59E-17 | 5.51E-12 | 5.51E-12 | 5.51E-12 | 5.51E-12 |
| 121-14-2 | 2,4-Dinitrotoluene | Organics | 5.23E-11 | 1.69E-11 | 6.92E-11 | 6.92E-11 | 6.92E-11 | 6.92E-11 |
| 122-39-4 | N,N-Diphenylamine | Organics | 5.81E-15 | 6.08E-16 | 6.42E-15 | 6.42E-15 | 6.42E-15 | 6.42E-15 |
| 122-66-7 | 1,2-Diphenylhydrazine | Organics | - | - | - | - | - | - |
| 123-33-1 | Maleic hydrazide | Organics | - | - | - | - | - | - |
| 123-38-6 | Propionaldehyde | Organics | 5.16E-15 | 6.66E-17 | 5.22E-15 | 5.22E-15 | 5.22E-15 | 5.22E-15 |
| 123-72-8 | Butanal | Organics | 4.22E-12 | 3.20E-14 | 4.25E-12 | 4.25E-12 | 4.25E-12 | 4.25E-12 |
| 123-91-1 | 1,4-Dioxan | Organics | 1.82E-15 | 1.55E-16 | 1.97E-15 | 1.97E-15 | 1.97E-15 | 1.97E-15 |
| 124-18-5 | Decane | Organics | - | - | - | - | - | - |
| 124-48-1 | Chlorodibromomethane | Organics | 1.28E-13 | 6.33E-15 | 1.34E-13 | 1.34E-13 | 1.34E-13 | 1.34E-13 |
| 126-73-8 | Tributyl phosphate | Organics | 5.83E-12 | 7.35E-13 | 6.56E-12 | 6.56E-12 | 6.56E-12 | 6.56E-12 |
| 126-98-7 | 2-Methyl-2-propenenitrile | Organics | 1.50E-15 | 3.76E-18 | 1.50E-15 | 1.50E-15 | 1.50E-15 | 1.50E-15 |
| 127-18-4 | 1,1,2,2-Tetrachloroethene | Organics | 2.60E-17 | 2.52E-23 | 2.60E-17 | 2.60E-17 | 2.60E-17 | 2.60E-17 |
| 128-37-0 | 2,6-Bis(tert-butyl)-4-methylphenol | Organics | 8.85E-14 | 8.03E-15 | 9.66E-14 | 9.66E-14 | 9.66E-14 | 9.66E-14 |
| 129-00-0 | Pyrene | Organics | 1.77E-11 | 1.63E-12 | 1.93E-11 | 1.93E-11 | 1.93E-11 | 1.93E-11 |
| 131-11-3 | Dimethyl Phthalate | Organics | 6.88E-12 | 3.07E-12 | 9.95E-12 | 9.95E-12 | 9.95E-12 | 9.95E-12 |
| 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol | Organics | - | - | - | - | - | - |
| 132-64-9 | Dibenzofuran | Organics | 1.43E-13 | 3.22E-14 | 1.75E-13 | 1.75E-13 | 1.75E-13 | 1.75E-13 |
| 1330-20-7 | Xylenes (mixed isomers) | Organics | 3.08E-14 | 7.63E-18 | 3.08E-14 | 3.08E-14 | 3.08E-14 | 3.08E-14 |
| 133-06-2 | Captan | Organics | - | - | - | - | - | - |
| 1336-36-3 | Polychlorinated biphenyls | Organics | 6.63E-12 | 2.50E-14 | 6.65E-12 | 6.65E-12 | 6.65E-12 | 6.65E-12 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 134-32-7 | alpha-Naphthylamine | Organics | 8.37E-12 | 2.26E-12 | 1.06E-11 | 1.06E-11 | 1.06E-11 | 1.06E-11 |
| 135-98-8 | sec-Butylbenzene | Organics | - | - | - | - | - | - |
| 141-78-6 | Acetic acid ethyl ester | Organics | 1.62E-16 | 1.01E-18 | 1.63E-16 | 1.63E-16 | 1.63E-16 | 1.63E-16 |
| 145-73-3 | Endothall | Organics | - | - | - | - | - | - |
| 156-59-2 | cis-1,2-Dichloroethene | Organics | - | - | - | - | - | - |
| 156-60-5 | 1,2-trans-Dichloroethene | Organics | 7.47E-12 | 5.80E-18 | 7.47E-12 | 7.47E-12 | 7.47E-12 | 7.47E-12 |
| 1634-04-4 | Methyl tert-butyl ether | Organics | 3.94E-12 | 1.78E-15 | 3.94E-12 | 3.94E-12 | 3.94E-12 | 3.94E-12 |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD) | Organics | 2.39E-21 | 1.03E-21 | 3.42E-21 | 3.42E-21 | 3.42E-21 | 3.42E-21 |
| 189-55-9 | Dibenzo[a,i]pyrene | Organics | 1.55E-11 | 5.55E-12 | 2.11E-11 | 2.11E-11 | 2.11E-11 | 2.11E-11 |
| 189-64-0 | Dibenzo[a,h]pyrene | Organics | 1.55E-11 | 5.55E-12 | 2.11E-11 | 2.11E-11 | 2.11E-11 | 2.11E-11 |
| 191-24-2 | Benzo(g,h,i)perylene | Organics | 1.91E-11 | 7.36E-12 | 2.65E-11 | 2.65E-11 | 2.65E-11 | 2.65E-11 |
| 191-30-0 | Dibenzo(a,l)pyrene | Organics | 1.55E-11 | 5.55E-12 | 2.11E-11 | 2.11E-11 | 2.11E-11 | 2.11E-11 |
| 192-65-4 | Dibenzo[a,e]pyrene | Organics | 1.55E-11 | 5.55E-12 | 2.11E-11 | 2.11E-11 | 2.11E-11 | 2.11E-11 |
| 192-97-2 | Benzo(e)pyrene | Organics | - | - | - | - | - | - |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | Organics | 1.03E-11 | 3.50E-12 | 1.38E-11 | 1.38E-11 | 1.38E-11 | 1.38E-11 |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin | Organics | 4.06E-21 | 1.91E-21 | 5.97E-21 | 5.97E-21 | 5.97E-21 | 5.97E-21 |
| 205-82-3 | Benzo[j]fluoranthene | Organics | - | - | - | - | - | - |
| 205-99-2 | Benzo(b)fluoranthene | Organics | 5.25E-13 | 1.69E-13 | 6.94E-13 | 6.94E-13 | 6.94E-13 | 6.94E-13 |
| 206-44-0 | Fluoranthene | Organics | 1.71E-11 | 1.33E-12 | 1.84E-11 | 1.84E-11 | 1.84E-11 | 1.84E-11 |
| 207-08-9 | Benzo(k)fluoranthene | Organics | 1.09E-11 | 5.09E-12 | 1.60E-11 | 1.60E-11 | 1.60E-11 | 1.60E-11 |
| 208-96-8 | Acenaphthylene | Organics | 3.16E-12 | 8.44E-14 | 3.25E-12 | 3.25E-12 | 3.25E-12 | 3.25E-12 |
| 218-01-9 | Chrysene | Organics | 3.22E-13 | 1.10E-13 | 4.32E-13 | 4.32E-13 | 4.32E-13 | 4.32E-13 |
| 224-42-0 | Dibenz[a,j]acridine | Organics | 2.13E-11 | 8.00E-12 | 2.93E-11 | 2.93E-11 | 2.93E-11 | 2.93E-11 |
| 2245-38-7 | 2,3,5-Trimethylnaphthalene | Organics | - | - | - | - | - | - |
| 226-36-8 | Dibenz[a,h]acridine | Organics | 2.14E-11 | 8.02E-12 | 2.94E-11 | 2.94E-11 | 2.94E-11 | 2.94E-11 |
| 23950-58-5 | Pronamide | Organics | - | - | - | - | - | - |
| 27154-33-2 | Trichlorofluoroethane | Organics | 1.13E-11 | 8.99E-18 | 1.13E-11 | 1.13E-11 | 1.13E-11 | 1.13E-11 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 31508-00-6 | 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) | Organics | 7.23E-20 | 1.28E-20 | 8.51E-20 | 8.51E-20 | 8.51E-20 | 8.51E-20 |
| 319-84-6 | alpha-BHC | Organics | 1.92E-16 | 1.15E-17 | 2.03E-16 | 2.03E-16 | 2.03E-16 | 2.03E-16 |
| 319-85-7 | beta-BHC | Organics | 3.39E-16 | 5.17E-17 | 3.90E-16 | 3.90E-16 | 3.90E-16 | 3.90E-16 |
| 32598-13-3 | 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) | Organics | 2.67E-19 | 1.26E-19 | 3.93E-19 | 3.93E-19 | 3.93E-19 | 3.93E-19 |
| 32598-14-4 | 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) | Organics | 8.68E-21 | 3.91E-22 | 9.07E-21 | 9.07E-21 | 9.07E-21 | 9.07E-21 |
| 3268-87-9 | Octachlorodibenzo(p)dioxin | Organics | 1.16E-19 | 5.52E-20 | 1.71E-19 | 1.71E-19 | 1.71E-19 | 1.71E-19 |
| 32774-16-6 | 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) | Organics | 3.49E-20 | 1.31E-20 | 4.80E-20 | 4.80E-20 | 4.80E-20 | 4.80E-20 |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin | Organics | 1.89E-20 | 8.85E-21 | 2.77E-20 | 2.77E-20 | 2.77E-20 | 2.77E-20 |
| 3697-24-3 | 5-Methylchrysene | Organics | 3.54E-12 | 2.90E-13 | 3.83E-12 | 3.83E-12 | 3.83E-12 | 3.83E-12 |
| 38380-08-4 | 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) | Organics | 2.25E-20 | 6.43E-21 | 2.89E-20 | 2.89E-20 | 2.89E-20 | 2.89E-20 |
| 39001-02-0 | Octachlorodibenzofuran | Organics | 3.72E-20 | 1.77E-20 | 5.50E-20 | 5.50E-20 | 5.50E-20 | 5.50E-20 |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin | Organics | 2.85E-21 | 1.34E-21 | 4.19E-21 | 4.19E-21 | 4.19E-21 | 4.19E-21 |
| 39635-31-9 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) | Organics | 1.69E-20 | 6.82E-21 | 2.37E-20 | 2.37E-20 | 2.37E-20 | 2.37E-20 |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo(p)dioxin | Organics | 1.08E-20 | 5.21E-21 | 1.60E-20 | 1.60E-20 | 1.60E-20 | 1.60E-20 |
| 4170-30-3 | Crotonaldehyde (Propylene aldehyde) | Organics | 2.36E-15 | 1.49E-16 | 2.51E-15 | 2.51E-15 | 2.51E-15 | 2.51E-15 |
| 41851-50-7 | Chlorocyclopentadiene | Organics | - | - | - | - | - | - |
| 460-19-5 | Cyanogen (oxalonitrile) | Organics | - | - | - | - | - | - |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 4786-20-3 | 2-Butenenitrile | Organics | - | - | - | - | - | - |
| 50-00-0 | Formaldehyde | Organics | 1.09E-11 | 1.88E-12 | 1.28E-11 | 1.28E-11 | 1.28E-11 | 1.28E-11 |
| 50-32-8 | Benzo(a)pyrene | Organics | 3.01E-12 | 1.44E-12 | 4.45E-12 | 4.45E-12 | 4.45E-12 | 4.45E-12 |
| 506-68-3 | Cyanogen bromide (bromocyanide) | Organics | - | - | - | - | - | - |
| 506-77-4 | Cyanogen chloride | Organics | - | - | - | - | - | - |
| 510-15-6 | Chlorobenzilate | Organics | - | - | - | - | - | - |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | Organics | 1.61E-20 | 7.51E-21 | 2.36E-20 | 2.36E-20 | 2.36E-20 | 2.36E-20 |
| 51-28-5 | 2,4-Dinitrophenol | Organics | 7.81E-11 | 3.60E-11 | 1.14E-10 | 1.14E-10 | 1.14E-10 | 1.14E-10 |
| 51-79-6 | Ethyl carbamate (urethane) | Organics | - | - | - | - | - | - |
| 52663-72-6 | 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) | Organics | 3.31E-20 | 1.25E-20 | 4.55E-20 | 4.55E-20 | 4.55E-20 | 4.55E-20 |
| 528-29-0 | 1,2-Dinitrobenzene (o-Dinitrobenzene) | Organics | - | - | - | - | - | - |
| 532-27-4 | 2-Chloroacetophenone | Organics | - | - | - | - | - | - |
| 534-52-1 | 4,6-Dinitro-o-cresol | Organics | 2.50E-11 | 1.19E-11 | 3.69E-11 | 3.69E-11 | 3.69E-11 | 3.69E-11 |
| 53-70-3 | Dibenz[a,h]anthracene | Organics | 2.43E-11 | 1.06E-11 | 3.50E-11 | 3.50E-11 | 3.50E-11 | 3.50E-11 |
| 5385-75-1 | Dibenzo(a,e)fluoranthene | Organics | - | - | - | - | - | - |
| 540-59-0 | 1,2-Dichloroethene (total) (1,2-Dichloroethylene) | Organics | 2.46E-14 | 2.05E-17 | 2.46E-14 | 2.46E-14 | 2.46E-14 | 2.46E-14 |
| 540-73-8 | 1,2-Dimethylhydrazine | Organics | - | - | - | - | - | - |
| 540-84-1 | 2,2,4-Trimethylpentane | Organics | - | - | - | - | - | - |
| 541-73-1 | 1,3-Dichlorobenzene | Organics | 1.68E-15 | 4.74E-21 | 1.68E-15 | 1.68E-15 | 1.68E-15 | 1.68E-15 |
| 542-75-6 | 1,3-Dichloropropene | Organics | - | - | - | - | - | - |
| 542-88-1 | Bis(chloromethyl)ether | Organics | - | - | - | - | - | - |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Organics | 3.33E-21 | 1.55E-21 | 4.87E-21 | 4.87E-21 | 4.87E-21 | 4.87E-21 |
| 56-23-5 | Carbon tetrachloride | Organics | 3.39E-15 | 2.26E-21 | 3.39E-15 | 3.39E-15 | 3.39E-15 | 3.39E-15 |
| 56-49-5 | 3-Methylcholanthrene | Organics | 3.56E-12 | 3.01E-13 | 3.87E-12 | 3.87E-12 | 3.87E-12 | 3.87E-12 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 56-55-3 | Benzo(a)anthracene | Organics | 2.84E-12 | 1.36E-12 | 4.21E-12 | 4.21E-12 | 4.21E-12 | 4.21E-12 |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | Organics | 1.43E-20 | 6.82E-21 | 2.11E-20 | 2.11E-20 | 2.11E-20 | 2.11E-20 |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Organics | 9.64E-21 | 4.61E-21 | 1.42E-20 | 1.42E-20 | 1.42E-20 | 1.42E-20 |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Organics | 5.73E-21 | 2.73E-21 | 8.46E-21 | 8.46E-21 | 8.46E-21 | 8.46E-21 |
| 57-24-9 | Strychnine | Organics | - | - | - | - | - | - |
| 57465-28-8 | 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) | Organics | 1.00E-19 | 4.74E-20 | 1.48E-19 | 1.48E-19 | 1.48E-19 | 1.48E-19 |
| 57653-85-7 | 1,2,3,6,7,8,-Hexachlorodibenzo(p)dioxin | Organics | 4.97E-21 | 2.34E-21 | 7.31E-21 | 7.31E-21 | 7.31E-21 | 7.31E-21 |
| 57-74-9 | Chlordane | Organics | - | - | - | - | - | - |
| 581-42-0 | 2,6-Dimethylnaphthalene | Organics | - | - | - | - | - | - |
| 584-84-9 | 2,4-Toluene diisocyanate | Organics | - | - | - | - | - | - |
| 58-89-9 | gamma-BHC (Lindane) | Organics | 2.75E-16 | 2.32E-17 | 2.98E-16 | 2.98E-16 | 2.98E-16 | 2.98E-16 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | Organics | 1.09E-11 | 9.64E-13 | 1.19E-11 | 1.19E-11 | 1.19E-11 | 1.19E-11 |
| 589-38-8 | 3-Hexanone | Organics | 3.90E-12 | 2.66E-14 | 3.92E-12 | 3.92E-12 | 3.92E-12 | 3.92E-12 |
| 591-50-4 | Benzene, iodo- | Organics | - | - | - | - | - | - |
| 591-78-6 | 2-Hexanone | Organics | 6.64E-15 | 6.51E-17 | 6.71E-15 | 6.71E-15 | 6.71E-15 | 6.71E-15 |
| 593-60-2 | Bromoethene (Vinyl bromide) | Organics | - | - | - | - | - | - |
| 59-50-7 | 4-Chloro-3-methylphenol | Organics | 1.78E-11 | 2.20E-12 | 2.00E-11 | 2.00E-11 | 2.00E-11 | 2.00E-11 |
| 59-89-2 | N-Nitrosomorpholine | Organics | 7.79E-11 | 2.18E-11 | 9.97E-11 | 9.97E-11 | 9.97E-11 | 9.97E-11 |
| 60-11-7 | Dimethyl aminoazobenzene | Organics | 1.17E-33 | 6.56E-34 | 1.82E-33 | 1.82E-33 | 1.82E-33 | 1.82E-33 |
| 602-87-9 | 5-Nitroacenaphthene | Organics | 5.36E-12 | 7.31E-13 | 6.09E-12 | 6.09E-12 | 6.09E-12 | 6.09E-12 |
| 60-29-7 | Ethyl ether | Organics | 5.28E-15 | 3.21E-19 | 5.28E-15 | 5.28E-15 | 5.28E-15 | 5.28E-15 |
| 60-35-5 | Acetamide | Organics | 2.09E-11 | 6.24E-12 | 2.71E-11 | 2.71E-11 | 2.71E-11 | 2.71E-11 |
| 606-20-2 | 2,6-Dinitrotoluene | Organics | 5.86E-12 | 2.74E-12 | 8.60E-12 | 8.60E-12 | 8.60E-12 | 8.60E-12 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Organics | 2.68E-21 | 1.26E-21 | 3.94E-21 | 3.94E-21 | 3.94E-21 | 3.94E-21 |
| 608-93-5 | Pentachlorobenzene | Organics | - | - | - | - | - | - |
| 61626-71-9 | Dichloropentadiene | Organics | - | - | - | - | - | - |
| 621-64-7 | N-Nitroso-di-n-propylamine | Organics | 1.64E-11 | 1.74E-12 | 1.81E-11 | 1.81E-11 | 1.81E-11 | 1.81E-11 |
| 624-83-9 | Methyl isocyanate | Organics | - | - | - | - | - | - |
| 62-50-0 | Ethyl methanesulfonate | Organics | - | - | - | - | - | - |
| 62-53-3 | Aniline | Organics | - | - | - | - | - | - |
| 62-75-9 | N-Nitroso-N,N-dimethylamine | Organics | 8.83E-14 | 1.00E-14 | 9.84E-14 | 9.84E-14 | 9.84E-14 | 9.84E-14 |
| 628-73-9 | Hexanenitrile | Organics | 3.81E-12 | 3.66E-14 | 3.85E-12 | 3.85E-12 | 3.85E-12 | 3.85E-12 |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | Organics | 1.70E-11 | 1.08E-16 | 1.70E-11 | 1.70E-11 | 1.70E-11 | 1.70E-11 |
| 64-18-6 | Formic acid (methanoic acid) | Organics | - | - | - | - | - | - |
| 65510-44-3 | 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) | Organics | 6.34E-20 | 2.84E-20 | 9.18E-20 | 9.18E-20 | 9.18E-20 | 9.18E-20 |
| 65-85-0 | Benzoic acid | Organics | - | - | - | - | - | - |
| 67-56-1 | Methyl alcohol | Organics | 8.98E-12 | 7.76E-13 | 9.75E-12 | 9.75E-12 | 9.75E-12 | 9.75E-12 |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Organics | 1.02E-20 | 4.74E-21 | 1.49E-20 | 1.49E-20 | 1.49E-20 | 1.49E-20 |
| 67-63-0 | 2-Propyl alcohol | Organics | 4.89E-15 | 3.36E-16 | 5.22E-15 | 5.22E-15 | 5.22E-15 | 5.22E-15 |
| 67-64-1 | 2-Propanone (Acetone) | Organics | 4.28E-12 | 1.78E-12 | 6.05E-12 | 6.05E-12 | 6.05E-12 | 6.05E-12 |
| 67-66-3 | Chloroform | Organics | 2.72E-14 | 3.07E-17 | 2.72E-14 | 2.72E-14 | 2.72E-14 | 2.72E-14 |
| 67-72-1 | Hexachloroethane | Organics | 4.94E-13 | 7.35E-19 | 4.94E-13 | 4.94E-13 | 4.94E-13 | 4.94E-13 |
| 69782-90-7 | 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) | Organics | 5.60E-20 | 2.26E-20 | 7.86E-20 | 7.86E-20 | 7.86E-20 | 7.86E-20 |
| 70-30-4 | Hexachlorophene | Organics | - | - | - | - | - | - |
| 70362-50-4 | 3,4,4',5-Tetrachlorobiphenyl (PCB 81) | Organics | 4.13E-20 | 1.86E-20 | 5.99E-20 | 5.99E-20 | 5.99E-20 | 5.99E-20 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Organics | 6.29E-21 | 2.93E-21 | 9.22E-21 | 9.22E-21 | 9.22E-21 | 9.22E-21 |
| 71-36-3 | n-Butyl alcohol | Organics | 1.41E-13 | 9.29E-15 | 1.50E-13 | 1.50E-13 | 1.50E-13 | 1.50E-13 |
| 71-43-2 | Benzene | Organics | 1.80E-14 | 5.39E-18 | 1.80E-14 | 1.80E-14 | 1.80E-14 | 1.80E-14 |
| 71-55-6 | 1,1,1-Trichloroethane | Organics | 2.71E-17 | 2.56E-23 | 2.71E-17 | 2.71E-17 | 2.71E-17 | 2.71E-17 |
| 72-43-5 | Methoxychlor | Organics | - | - | - | - | - | - |
| 72-55-9 | 4,4-DDE | Organics | 5.72E-12 | 2.28E-13 | 5.94E-12 | 5.94E-12 | 5.94E-12 | 5.94E-12 |
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Organics | 1.62E-21 | 7.62E-22 | 2.38E-21 | 2.38E-21 | 2.38E-21 | 2.38E-21 |
| 74472-37-0 | 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) | Organics | 1.38E-20 | 4.76E-21 | 1.86E-20 | 1.86E-20 | 1.86E-20 | 1.86E-20 |
| 74-83-9 | Bromomethane | Organics | 1.62E-14 | 3.37E-18 | 1.62E-14 | 1.62E-14 | 1.62E-14 | 1.62E-14 |
| 74-87-3 | Chloromethane | Organics | 1.15E-14 | 7.19E-19 | 1.15E-14 | 1.15E-14 | 1.15E-14 | 1.15E-14 |
| 74-88-4 | Iodomethane | Organics | 1.83E-14 | 6.83E-18 | 1.83E-14 | 1.83E-14 | 1.83E-14 | 1.83E-14 |
| 74-95-3 | Methylene bromide | Organics | - | - | - | - | - | - |
| 74-97-5 | Bromochloromethane | Organics | - | - | - | - | - | - |
| 75-00-3 | Chloroethane | Organics | 6.92E-17 | 5.33E-23 | 6.92E-17 | 6.92E-17 | 6.92E-17 | 6.92E-17 |
| 75-01-4 | 1-Chloroethene | Organics | 4.45E-17 | 5.24E-23 | 4.45E-17 | 4.45E-17 | 4.45E-17 | 4.45E-17 |
| 75-02-5 | Fluoroethene (vinyl fluoride) | Organics | 8.36E-13 | 2.69E-18 | 8.36E-13 | 8.36E-13 | 8.36E-13 | 8.36E-13 |
| 75-05-8 | Acetonitrile | Organics | 4.54E-11 | 1.95E-11 | 6.48E-11 | 6.48E-11 | 6.48E-11 | 6.48E-11 |
| 75-07-0 | Acetaldehyde | Organics | 5.21E-12 | 6.22E-14 | 5.27E-12 | 5.27E-12 | 5.27E-12 | 5.27E-12 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | Organics | 1.21E-12 | 6.01E-15 | 1.22E-12 | 1.22E-12 | 1.22E-12 | 1.22E-12 |
| 75-15-0 | Carbon disulfide | Organics | 3.42E-15 | 2.33E-21 | 3.42E-15 | 3.42E-15 | 3.42E-15 | 3.42E-15 |
| 75-21-8 | Ethylene oxide (Oxirane) | Organics | 8.84E-15 | 4.83E-17 | 8.89E-15 | 8.89E-15 | 8.89E-15 | 8.89E-15 |
| 75-25-2 | Bromoform | Organics | 1.56E-17 | 6.85E-33 | 1.56E-17 | 1.56E-17 | 1.56E-17 | 1.56E-17 |
| 75-27-4 | Bromodichloromethane | Organics | 3.46E-11 | 8.97E-16 | 3.46E-11 | 3.46E-11 | 3.46E-11 | 3.46E-11 |
| 75-29-6 | 2-Chloropropane | Organics | - | - | - | - | - | - |
| 75-34-3 | 1,1-Dichloroethane | Organics | 3.12E-17 | 2.65E-23 | 3.12E-17 | 3.12E-17 | 3.12E-17 | 3.12E-17 |
| 75-35-4 | 1,1-Dichloroethene | Organics | 2.82E-17 | 3.25E-23 | 2.82E-17 | 2.82E-17 | 2.82E-17 | 2.82E-17 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|----------|--------------------------------|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 75-44-5 | Phosgene (hydrogen phosphide) | Organics | - | - | - | - | - | - |
| 75-45-6 | Chlorodifluoromethane | Organics | 5.15E-17 | 7.63E-23 | 5.15E-17 | 5.15E-17 | 5.15E-17 | 5.15E-17 |
| 75-50-3 | Trimethylamine | Organics | 4.62E-12 | 3.99E-14 | 4.66E-12 | 4.66E-12 | 4.66E-12 | 4.66E-12 |
| 75-69-4 | Trichlorofluoromethane | Organics | 2.28E-17 | 6.28E-23 | 2.28E-17 | 2.28E-17 | 2.28E-17 | 2.28E-17 |
| 75-71-8 | Dichlorodifluoromethane | Organics | 7.78E-18 | 6.39E-23 | 7.78E-18 | 7.78E-18 | 7.78E-18 | 7.78E-18 |
| 76-01-7 | Pentachloroethane | Organics | - | - | - | - | - | - |
| 76-13-1 | 1,2,2-Trichlorotrifluoroethane | Organics | 5.14E-18 | 6.32E-23 | 5.14E-18 | 5.14E-18 | 5.14E-18 | 5.14E-18 |
| 764-41-0 | 1,4-Dichloro-2-butene | Organics | - | - | - | - | - | - |
| 76-44-8 | Heptachlor | Organics | 1.75E-18 | 5.94E-23 | 1.75E-18 | 1.75E-18 | 1.75E-18 | 1.75E-18 |
| 765-34-4 | Glycidylaldehyde | Organics | - | - | - | - | - | - |
| 77-47-4 | Hexachlorocyclopentadiene | Organics | 1.30E-14 | 1.31E-20 | 1.30E-14 | 1.30E-14 | 1.30E-14 | 1.30E-14 |
| 77-78-1 | Dimethyl sulfate | Organics | - | - | - | - | - | - |
| 78-83-1 | 2-Methylpropyl alcohol | Organics | 8.12E-11 | 5.11E-12 | 8.63E-11 | 8.63E-11 | 8.63E-11 | 8.63E-11 |
| 78-87-5 | 1,2-Dichloropropane | Organics | 3.52E-17 | 1.38E-22 | 3.52E-17 | 3.52E-17 | 3.52E-17 | 3.52E-17 |
| 78-93-3 | 2-Butanone | Organics | 1.56E-12 | 6.10E-13 | 2.17E-12 | 2.17E-12 | 2.17E-12 | 2.17E-12 |
| 79-00-5 | 1,1,2-Trichloroethane | Organics | 4.54E-17 | 6.66E-21 | 4.55E-17 | 4.55E-17 | 4.55E-17 | 4.55E-17 |
| 79-01-6 | 1,1,2-Trichloroethylene | Organics | 1.01E-14 | 4.05E-19 | 1.01E-14 | 1.01E-14 | 1.01E-14 | 1.01E-14 |
| 79-10-7 | 2-Propenoic acid | Organics | 1.66E-11 | 2.80E-12 | 1.94E-11 | 1.94E-11 | 1.94E-11 | 1.94E-11 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | Organics | 4.72E-17 | 6.73E-20 | 4.73E-17 | 4.73E-17 | 4.73E-17 | 4.73E-17 |
| 79-46-9 | 2-Nitropropane | Organics | 1.02E-14 | 7.41E-17 | 1.03E-14 | 1.03E-14 | 1.03E-14 | 1.03E-14 |
| 80-62-6 | Methyl methacrylate | Organics | - | - | - | - | - | - |
| 822-06-0 | Hexamethylene-1,5-diisocyanate | Organics | - | - | - | - | - | - |
| 823-40-5 | Toluene-2,6-diamine | Organics | - | - | - | - | - | - |
| 82-68-8 | Pentachloronitrobenzene (PCNB) | Organics | 9.35E-15 | 1.08E-17 | 9.36E-15 | 9.36E-15 | 9.36E-15 | 9.36E-15 |
| 832-69-9 | 1-Methylphenanthrene | Organics | - | - | - | - | - | - |
| 83-32-9 | Acenaphthene | Organics | 1.47E-11 | 1.11E-13 | 1.48E-11 | 1.48E-11 | 1.48E-11 | 1.48E-11 |
| 84-66-2 | Diethyl phthalate | Organics | 1.45E-11 | 4.70E-12 | 1.92E-11 | 1.92E-11 | 1.92E-11 | 1.92E-11 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|----------|--|----------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 84-74-2 | Di-n-butylphthalate | Organics | 1.35E-10 | 2.28E-11 | 1.58E-10 | 1.58E-10 | 1.58E-10 | 1.58E-10 |
| 85-01-8 | Phenanthrene | Organics | 3.99E-12 | 4.80E-13 | 4.47E-12 | 4.47E-12 | 4.47E-12 | 4.47E-12 |
| 85-44-9 | Phthalic anhydride (1,2-benzenedicarboxylic anhydride) | Organics | - | - | - | - | - | - |
| 85-68-7 | Butylbenzylphthalate | Organics | 4.30E-11 | 7.15E-12 | 5.02E-11 | 5.02E-11 | 5.02E-11 | 5.02E-11 |
| 86-73-7 | Fluorene | Organics | 3.46E-12 | 2.03E-13 | 3.66E-12 | 3.66E-12 | 3.66E-12 | 3.66E-12 |
| 87-61-6 | 1,2,3-Trichlorobenzene | Organics | - | - | - | - | - | - |
| 87-68-3 | Hexachlorobutadiene | Organics | 1.80E-14 | 1.37E-20 | 1.80E-14 | 1.80E-14 | 1.80E-14 | 1.80E-14 |
| 87-86-5 | Pentachlorophenol | Organics | 1.13E-13 | 3.89E-14 | 1.52E-13 | 1.52E-13 | 1.52E-13 | 1.52E-13 |
| 88-06-2 | 2,4,6-Trichlorophenol | Organics | 1.48E-11 | 1.03E-12 | 1.58E-11 | 1.58E-11 | 1.58E-11 | 1.58E-11 |
| 88-74-4 | o-Nitroaniline (2-nitroaniline) | Organics | 9.37E-12 | 4.18E-12 | 1.36E-11 | 1.36E-11 | 1.36E-11 | 1.36E-11 |
| 88-75-5 | 2-Nitrophenol | Organics | 1.87E-11 | 2.81E-12 | 2.15E-11 | 2.15E-11 | 2.15E-11 | 2.15E-11 |
| 90-04-0 | o-Anisidine | Organics | - | - | - | - | - | - |
| 90-12-0 | 1-Methylnaphthalene | Organics | - | - | - | - | - | - |
| 91-20-3 | Naphthalene | Organics | 2.05E-11 | 7.49E-13 | 2.12E-11 | 2.12E-11 | 2.12E-11 | 2.12E-11 |
| 91-22-5 | Quinoline | Organics | - | - | - | - | - | - |
| 91-57-6 | 2-Methylnaphthalene | Organics | 5.43E-14 | 5.01E-15 | 5.93E-14 | 5.93E-14 | 5.93E-14 | 5.93E-14 |
| 91-58-7 | 2-Chloronaphthalene | Organics | 3.71E-12 | 6.13E-15 | 3.72E-12 | 3.72E-12 | 3.72E-12 | 3.72E-12 |
| 91-94-1 | 3,3'-Dichlorobenzidine | Organics | 7.74E-11 | 3.39E-11 | 1.11E-10 | 1.11E-10 | 1.11E-10 | 1.11E-10 |
| 924-16-3 | N-Nitroso-di-n-Buethylamine | Organics | - | - | - | - | - | - |
| 92-52-4 | 1,1'-Biphenyl | Organics | 9.41E-15 | 1.61E-17 | 9.42E-15 | 9.42E-15 | 9.42E-15 | 9.42E-15 |
| 94-59-7 | Safrole (5-(2-Propenyl)-1,3-benzodioxole) | Organics | - | - | - | - | - | - |
| 94-75-7 | 2,4-D | Organics | - | - | - | - | - | - |
| 95-48-7 | o-Cresol | Organics | 2.04E-11 | 2.50E-12 | 2.29E-11 | 2.29E-11 | 2.29E-11 | 2.29E-11 |
| 95-49-8 | o-Chlorotoluene | Organics | - | - | - | - | - | - |
| 95-50-1 | 1,2-Dichlorobenzene | Organics | 3.55E-14 | 5.24E-19 | 3.55E-14 | 3.55E-14 | 3.55E-14 | 3.55E-14 |
| 95-53-4 | o-Toluidine | Organics | - | - | - | - | - | - |
| 95-57-8 | 2-Chlorophenol | Organics | 1.34E-11 | 1.46E-14 | 1.35E-11 | 1.35E-11 | 1.35E-11 | 1.35E-11 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--------------------------------|---------------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 95-63-6 | 1,2,4-Trimethyl benzene | Organics | - | - | - | - | - | - |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | Organics | - | - | - | - | - | - |
| 95-95-4 | 2,4,5-Trichlorophenol | Organics | 1.51E-11 | 1.32E-12 | 1.64E-11 | 1.64E-11 | 1.64E-11 | 1.64E-11 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | Organics | - | - | - | - | - | - |
| 96-18-4 | 1,2,3-Trichloropropane | Organics | - | - | - | - | - | - |
| 96-45-7 | Ethylene thiourea | Organics | - | - | - | - | - | - |
| 97-63-2 | Ethyl methacrylate | Organics | - | - | - | - | - | - |
| 98-01-1 | Furfural | Organics | - | - | - | - | - | - |
| 98-06-6 | tert-Butyl benzene | Organics | - | - | - | - | - | - |
| 98-07-7 | Benzotrichloride | Organics | - | - | - | - | - | - |
| 98-82-8 | Cumene | Organics | 5.77E-14 | 1.56E-18 | 5.77E-14 | 5.77E-14 | 5.77E-14 | 5.77E-14 |
| 98-83-9 | Methyl styrene (mixed isomers) | Organics | - | - | - | - | - | - |
| 98-86-2 | Acetophenone | Organics | 1.08E-14 | 6.52E-16 | 1.15E-14 | 1.15E-14 | 1.15E-14 | 1.15E-14 |
| 98-95-3 | Nitrobenzene | Organics | 9.27E-13 | 4.01E-13 | 1.33E-12 | 1.33E-12 | 1.33E-12 | 1.33E-12 |
| 99-35-4 | 1,3,5-Trinitrobenzene | Organics | - | - | - | - | - | - |
| 99-65-0 | 1,3-Dinitrobenzene | Organics | - | - | - | - | - | - |
| 99-87-6 | p-Cymene | Organics | - | - | - | - | - | - |
| 10028-17-8 | Tritium | Radionuclides | 4.42E-15 | 5.37E-16 | 4.96E-15 | 4.96E-15 | 4.96E-15 | 4.96E-15 |
| 10045-97-3 | Cesium-137 | Radionuclides | 5.41E-14 | 5.69E-15 | 5.98E-14 | 2.99E-17 | 5.98E-14 | 2.99E-19 |
| 10098-91-6 | Yttrium-90 | Radionuclides | 1.20E-12 | 8.76E-15 | 1.21E-12 | 6.06E-16 | 1.21E-12 | 6.06E-18 |
| 10098-97-2 | Strontium-90 | Radionuclides | 1.20E-12 | 8.76E-15 | 1.21E-12 | 6.06E-16 | 1.21E-12 | 6.06E-18 |
| 10198-40-0 | Cobalt-60 | Radionuclides | 5.69E-22 | 4.14E-24 | 5.73E-22 | 2.87E-25 | 5.73E-22 | 2.87E-27 |
| 13966-29-5 | Uranium-234 | Radionuclides | 2.31E-17 | 1.69E-19 | 2.33E-17 | 1.16E-20 | 2.33E-17 | 1.16E-22 |
| 13967-48-1 | Ruthenium-106 | Radionuclides | 3.05E-21 | 3.27E-23 | 3.08E-21 | 1.54E-24 | 3.08E-21 | 1.54E-26 |
| 13967-70-9 | Cesium-134 | Radionuclides | 7.84E-21 | 8.26E-22 | 8.67E-21 | 4.33E-24 | 8.67E-21 | 4.33E-26 |
| 13968-55-3 | Uranium-233 | Radionuclides | 7.94E-17 | 5.82E-19 | 8.00E-17 | 4.00E-20 | 8.00E-17 | 4.00E-22 |
| 13981-15-2 | Curium-244 | Radionuclides | 2.63E-15 | 1.93E-17 | 2.65E-15 | 1.32E-18 | 2.65E-15 | 1.32E-20 |
| 13981-16-3 | Plutonium-238 | Radionuclides | 3.24E-16 | 2.38E-18 | 3.26E-16 | 1.63E-19 | 3.26E-16 | 1.63E-21 |
| 13981-37-8 | Nickel-63 | Radionuclides | 8.95E-15 | 6.54E-17 | 9.01E-15 | 4.51E-18 | 9.01E-15 | 4.51E-20 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|-------------|------------------|---------------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 13982-10-0 | Plutonium-242 | Radionuclides | 2.58E-19 | 1.89E-21 | 2.60E-19 | 1.30E-22 | 2.60E-19 | 1.30E-24 |
| 13982-63-3 | Radium-226 | Radionuclides | 1.68E-19 | 1.77E-20 | 1.86E-19 | 9.29E-23 | 1.86E-19 | 9.29E-25 |
| 13982-70-2 | Uranium-236 | Radionuclides | 7.71E-19 | 5.65E-21 | 7.77E-19 | 3.88E-22 | 7.77E-19 | 3.88E-24 |
| 13994-20-2 | Neptunium-237 | Radionuclides | 2.27E-16 | 1.67E-18 | 2.29E-16 | 1.14E-19 | 2.29E-16 | 1.14E-21 |
| 14119-32-5 | Plutonium-241 | Radionuclides | 4.42E-15 | 3.24E-17 | 4.45E-15 | 2.22E-18 | 4.45E-15 | 2.22E-20 |
| 14119-33-6 | Plutonium-240 | Radionuclides | 1.71E-15 | 1.25E-17 | 1.72E-15 | 8.60E-19 | 1.72E-15 | 8.60E-21 |
| 14133-76-7 | Technetium-99 | Radionuclides | 9.86E-13 | 2.09E-13 | 1.19E-12 | 5.97E-16 | 1.19E-12 | 5.97E-18 |
| 14158-29-3 | Uranium-232 | Radionuclides | 1.44E-18 | 1.05E-20 | 1.45E-18 | 7.23E-22 | 1.45E-18 | 7.23E-24 |
| 14234-35-6 | Antimony-125 | Radionuclides | 1.34E-15 | 1.40E-16 | 1.48E-15 | 7.42E-19 | 1.48E-15 | 7.42E-21 |
| 14331-85-2 | Protactinium-231 | Radionuclides | 3.25E-24 | 2.39E-26 | 3.28E-24 | 1.64E-27 | 3.28E-24 | 1.64E-29 |
| 14336-70-0 | Nickel-59 | Radionuclides | 1.19E-16 | 8.67E-19 | 1.19E-16 | 5.97E-20 | 1.19E-16 | 5.97E-22 |
| 14391-16-3 | Europium-155 | Radionuclides | 2.67E-21 | 1.96E-23 | 2.69E-21 | 1.35E-24 | 2.69E-21 | 1.35E-26 |
| 14596-10-2 | Americium-241 | Radionuclides | 4.12E-14 | 4.42E-16 | 4.16E-14 | 2.08E-17 | 4.16E-14 | 2.08E-19 |
| 14683-23-9 | Europium-152 | Radionuclides | 1.28E-21 | 9.39E-24 | 1.29E-21 | 6.45E-25 | 1.29E-21 | 6.45E-27 |
| 14762-75-5 | Carbon-14 | Radionuclides | 5.55E-15 | 3.12E-17 | 5.58E-15 | 2.79E-18 | 5.58E-15 | 2.79E-20 |
| 14952-40-0 | Actinium-227 | Radionuclides | 2.35E-17 | 1.72E-19 | 2.37E-17 | 1.18E-20 | 2.37E-17 | 1.18E-22 |
| 14993-75-0 | Americium-243 | Radionuclides | 2.40E-17 | 2.57E-19 | 2.42E-17 | 1.21E-20 | 2.42E-17 | 1.21E-22 |
| 15046-84-1 | Iodine-129 | Radionuclides | 2.17E-16 | 9.96E-19 | 2.18E-16 | 1.09E-19 | 2.18E-16 | 1.09E-21 |
| 15117-48-3 | Plutonium-239 | Radionuclides | 7.24E-15 | 5.31E-17 | 7.30E-15 | 3.65E-18 | 7.30E-15 | 3.65E-20 |
| 15117-96-1 | Uranium-235 | Radionuclides | 9.57E-19 | 7.02E-21 | 9.64E-19 | 4.82E-22 | 9.64E-19 | 4.82E-24 |
| 15262-20-1 | Radium-228 | Radionuclides | 1.01E-17 | 1.06E-18 | 1.11E-17 | 5.57E-21 | 1.11E-17 | 5.57E-23 |
| 15510-73-3 | Curium-242 | Radionuclides | 2.14E-15 | 1.57E-17 | 2.15E-15 | 1.08E-18 | 2.15E-15 | 1.08E-20 |
| 15585-10-1 | Europium-154 | Radionuclides | 6.91E-21 | 5.07E-23 | 6.96E-21 | 3.48E-24 | 6.96E-21 | 3.48E-26 |
| 15594-54-4 | Thorium-229 | Radionuclides | 1.62E-24 | 1.19E-26 | 1.63E-24 | 8.16E-28 | 1.63E-24 | 8.16E-30 |
| 15715-94-3 | Samarium-151 | Radionuclides | 7.19E-18 | 5.28E-20 | 7.24E-18 | 3.62E-21 | 7.24E-18 | 3.62E-23 |
| 15751-77-6 | Zirconium-93 | Radionuclides | 2.90E-20 | 1.12E-22 | 2.91E-20 | 1.45E-23 | 2.91E-20 | 1.45E-25 |
| 15757-87-6 | Curium-243 | Radionuclides | 1.57E-16 | 1.15E-18 | 1.58E-16 | 7.90E-20 | 1.58E-16 | 7.90E-22 |
| 15758-45-9 | Selenium-79 | Radionuclides | 1.17E-14 | 1.23E-15 | 1.29E-14 | 6.46E-18 | 1.29E-14 | 6.46E-20 |
| 15832-50-5 | Tin-126 | Radionuclides | 8.49E-15 | 6.22E-17 | 8.55E-15 | 4.28E-18 | 8.55E-15 | 4.28E-20 |
| 378253-40-8 | Barium-137m | Radionuclides | 5.11E-14 | 5.39E-15 | 5.65E-14 | 2.83E-17 | 5.65E-14 | 2.83E-19 |
| 378253-44-2 | Cadmium-113m | Radionuclides | 1.43E-14 | 1.00E-16 | 1.44E-14 | 7.20E-18 | 1.44E-14 | 7.20E-20 |

Table D-1 DFLAW Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | LAW Sample Unabated Release (g/s or Ci/s) | EMF Sample Unabated Release (g/s or Ci/s) | LB-S1 Unabated Release (g/s or Ci/s) | LB-S1 Abated Emissions (g/s or Ci/s) | LB-S2 Unabated Release (g/s or Ci/s) | LB-S2 Abated Emissions (g/s or Ci/s) |
|-------------|-------------|---------------|---|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 378782-82-2 | Niobium-93m | Radionuclides | 2.64E-20 | 1.94E-22 | 2.66E-20 | 1.33E-23 | 2.66E-20 | 1.33E-25 |
| 7440-29-1 | Thorium-232 | Radionuclides | 3.61E-24 | 2.65E-26 | 3.64E-24 | 1.82E-27 | 3.64E-24 | 1.82E-29 |
| 7440-61-1R | Uranium-238 | Radionuclides | 2.11E-17 | 1.55E-19 | 2.12E-17 | 1.06E-20 | 2.12E-17 | 1.06E-22 |

Table D-2 and Table D-4 present the potential, estimated emissions for the Lab in the baseline WTP operating configuration. A “-” symbol indicates no data are available for approximating the emissions rate.

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|------------------|------------|--|---|---|--|--|--|--|
| 10028-15-6 | Ozone | Inorganics | - | - | - | - | - | - | - |
| 10102-44-0 | Nitrogen dioxide | Inorganics | - | - | - | - | - | - | - |
| 124-38-9 | Carbon dioxide | Inorganics | - | - | - | - | - | - | - |
| 14265-44-2 | Phosphate | Inorganics | 1.14E-08 | 1.61E-08 | 4.00E-08 | 1.61E-08 | 8.07E-12 | 5.13E-08 | 2.57E-13 |
| 14797-55-8 | Nitrate | Inorganics | 3.18E-07 | 8.06E-07 | 9.10E-08 | 8.06E-07 | 4.03E-10 | 4.09E-07 | 2.05E-12 |
| 14797-65-0 | Nitrite | Inorganics | 6.80E-08 | 2.99E-07 | 9.52E-08 | 2.99E-07 | 1.50E-10 | 1.63E-07 | 1.20E-12 |
| 14808-79-8 | Sulfate | Inorganics | 1.07E-08 | 2.81E-08 | 4.47E-09 | 2.81E-08 | 1.41E-11 | 1.52E-08 | 7.61E-14 |
| 16887-00-6 | Chloride | Inorganics | 3.78E-09 | 3.08E-08 | 5.48E-09 | 3.08E-08 | 1.54E-11 | 9.26E-09 | 6.85E-14 |
| 16984-48-8 | Fluoride | Inorganics | 5.55E-09 | 5.68E-08 | 4.07E-08 | 5.68E-08 | 2.85E-11 | 4.63E-08 | 3.95E-13 |
| 18540-29-9 | Chromium VI | Inorganics | 1.08E-09 | 4.90E-09 | 1.60E-08 | 4.90E-09 | 2.46E-12 | 1.71E-08 | 1.50E-13 |
| 22967-92-6 | Methyl mercury | Inorganics | - | - | - | - | - | - | - |
| 24959-67-9 | Bromide | Inorganics | - | - | - | - | - | - | - |
| 57-12-5 | Cyanide | Inorganics | 9.48E-13 | 2.97E-12 | 3.93E-11 | 2.97E-12 | 1.49E-15 | 4.02E-11 | 3.59E-16 |
| 593-74-8 | Dimethyl Mercury | Inorganics | 2.04E-17 | 3.73E-15 | 1.01E-18 | 3.73E-15 | 3.73E-15 | 2.14E-17 | 2.14E-17 |
| 630-08-0 | Carbon monoxide | Inorganics | - | - | - | - | - | - | - |
| 7429-90-5 | Aluminum | Inorganics | 1.37E-08 | 1.71E-07 | 2.83E-07 | 1.71E-07 | 8.62E-11 | 2.97E-07 | 2.65E-12 |
| 7439-89-6 | Iron | Inorganics | 4.61E-10 | 4.54E-08 | 2.13E-08 | 4.54E-08 | 2.27E-11 | 2.18E-08 | 1.09E-13 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|-----------|-------------------|------------|--|---|---|--|--|--|--|
| 7439-92-1 | Lead | Inorganics | 6.12E-11 | 1.69E-10 | 3.23E-09 | 1.69E-10 | 8.48E-14 | 3.29E-09 | 2.95E-14 |
| 7439-93-2 | Lithium | Inorganics | 1.97E-12 | 5.10E-08 | 1.41E-07 | 5.10E-08 | 2.57E-11 | 1.41E-07 | 1.31E-12 |
| 7439-95-4 | Magnesium | Inorganics | 1.50E-11 | 4.09E-08 | 1.90E-09 | 4.09E-08 | 2.06E-11 | 1.91E-09 | 1.74E-14 |
| 7439-96-5 | Manganese | Inorganics | 6.30E-11 | 6.65E-10 | 7.64E-09 | 6.65E-10 | 3.35E-13 | 7.70E-09 | 6.93E-14 |
| 7439-97-6 | Mercury | Inorganics | - | - | - | - | - | - | - |
| 7439-98-7 | Molybdenum | Inorganics | 1.85E-11 | 7.70E-11 | 1.68E-10 | 7.70E-11 | 3.86E-14 | 1.86E-10 | 1.61E-15 |
| 7440-02-0 | Nickel | Inorganics | 9.31E-11 | 6.83E-10 | 4.59E-09 | 6.83E-10 | 3.44E-13 | 4.68E-09 | 4.19E-14 |
| 7440-16-6 | Rhodium | Inorganics | 1.68E-12 | 6.54E-12 | 2.97E-11 | 6.54E-12 | 3.28E-15 | 3.14E-11 | 2.76E-16 |
| 7440-22-4 | Silver | Inorganics | 2.88E-12 | 7.98E-12 | 1.52E-10 | 7.98E-12 | 4.01E-15 | 1.55E-10 | 1.39E-15 |
| 7440-23-5 | Sodium | Inorganics | 1.98E-07 | 9.03E-07 | 5.36E-07 | 9.03E-07 | 4.54E-10 | 7.35E-07 | 5.86E-12 |
| 7440-24-6 | Strontium (total) | Inorganics | 4.33E-11 | 1.32E-10 | 1.91E-09 | 1.32E-10 | 6.65E-14 | 1.96E-09 | 1.75E-14 |
| 7440-25-7 | Tantalum | Inorganics | 1.13E-12 | 4.90E-12 | 3.89E-12 | 4.90E-12 | 2.46E-15 | 5.02E-12 | 4.08E-17 |
| 7440-28-0 | Thallium | Inorganics | 1.01E-11 | 4.97E-11 | 3.01E-10 | 4.97E-11 | 2.49E-14 | 3.11E-10 | 2.77E-15 |
| 7440-31-5 | Tin | Inorganics | - | - | - | - | - | - | - |
| 7440-33-7 | Tungsten | Inorganics | 5.20E-12 | 1.91E-11 | 1.38E-10 | 1.91E-11 | 9.59E-15 | 1.43E-10 | 1.27E-15 |
| 7440-36-0 | Antimony | Inorganics | 7.26E-12 | 3.53E-11 | 1.05E-10 | 3.53E-11 | 1.77E-14 | 1.12E-10 | 9.82E-16 |
| 7440-38-2 | Arsenic | Inorganics | 7.64E-12 | 3.51E-11 | 1.58E-10 | 3.51E-11 | 1.76E-14 | 1.66E-10 | 1.46E-15 |
| 7440-39-3 | Barium | Inorganics | 4.07E-12 | 6.28E-12 | 3.71E-10 | 6.28E-12 | 3.15E-15 | 3.75E-10 | 3.37E-15 |
| 7440-41-7 | Beryllium | Inorganics | 4.58E-13 | 1.47E-12 | 1.80E-11 | 1.47E-12 | 7.37E-16 | 1.85E-11 | 1.65E-16 |
| 7440-43-9 | Cadmium | Inorganics | 8.55E-12 | 3.44E-11 | 3.33E-10 | 3.44E-11 | 1.73E-14 | 3.42E-10 | 3.05E-15 |
| 7440-47-3 | Chromium III | Inorganics | 1.08E-09 | 2.83E-09 | 3.12E-09 | 2.83E-09 | 1.42E-12 | 4.20E-09 | 2.10E-14 |
| 7440-48-4 | Cobalt | Inorganics | 2.10E-12 | 7.62E-12 | 5.35E-11 | 7.62E-12 | 3.83E-15 | 5.56E-11 | 4.93E-16 |
| 7440-50-8 | Copper | Inorganics | 3.02E-12 | 1.06E-11 | 1.06E-10 | 1.06E-11 | 5.34E-15 | 1.09E-10 | 9.71E-16 |
| 7440-61-1 | Uranium | Inorganics | 1.69E-10 | 2.03E-10 | 1.76E-08 | 2.03E-10 | 1.02E-13 | 1.77E-08 | 1.59E-13 |
| 7440-62-2 | Vanadium | Inorganics | 2.56E-12 | 1.73E-10 | 9.43E-11 | 1.73E-10 | 8.69E-14 | 9.68E-11 | 8.64E-16 |
| 7440-65-5 | Yttrium | Inorganics | 8.53E-13 | 3.20E-12 | 1.89E-11 | 3.20E-12 | 1.60E-15 | 1.98E-11 | 1.75E-16 |
| 7440-66-6 | Zinc | Inorganics | 4.27E-12 | 1.28E-07 | 4.60E-08 | 1.28E-07 | 6.46E-11 | 4.60E-08 | 4.28E-13 |
| 7440-67-7 | Zirconium | Inorganics | 1.65E-10 | 9.13E-08 | 4.17E-08 | 9.13E-08 | 4.60E-11 | 4.19E-08 | 3.84E-13 |
| 7446-09-5 | Sulfur dioxide | Inorganics | - | - | - | - | - | - | - |
| 7647-01-0 | Hydrogen chloride | Inorganics | - | - | - | - | - | - | - |
| 7664-39-3 | Hydrogen Fluoride | Inorganics | - | - | - | - | - | - | - |
| 7664-41-7 | Ammonia/ Ammonium | Inorganics | 4.52E-11 | 1.23E-10 | 1.46E-10 | 1.23E-10 | 1.23E-10 | 1.91E-10 | 1.91E-10 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|------------|--|---|---|--|--|--|--|
| 7704-34-9 | Total Sulfur (thermodynamically stable) | Inorganics | 3.71E-09 | 9.75E-09 | 1.54E-09 | 9.75E-09 | 4.88E-12 | 5.24E-09 | 2.62E-14 |
| 7723-14-0 | Phosphorus | Inorganics | 7.71E-09 | 5.75E-09 | 1.30E-08 | 5.75E-09 | 2.87E-12 | 2.07E-08 | 1.04E-13 |
| 7782-41-4 | Fluorine gas F ₂ | Inorganics | - | - | - | - | - | - | - |
| 7782-49-2 | Selenium | Inorganics | 2.37E-11 | 1.38E-10 | 5.29E-11 | 1.38E-10 | 6.94E-14 | 7.66E-11 | 5.96E-16 |
| 7782-50-5 | Chlorine | Inorganics | - | - | - | - | - | - | - |
| 100-02-7 | p-Nitrophenol | Organics | 2.80E-11 | 3.80E-10 | 3.31E-11 | 3.80E-10 | 3.80E-10 | 6.11E-11 | 6.11E-11 |
| 100-21-0 | Phthalic acid | Organics | 1.13E-11 | 1.42E-10 | 1.37E-11 | 1.42E-10 | 1.42E-10 | 2.50E-11 | 2.50E-11 |
| 100-25-4 | 1,4-Dinitrobenzene | Organics | 2.42E-14 | 1.27E-13 | 5.97E-14 | 1.27E-13 | 1.27E-13 | 8.39E-14 | 8.39E-14 |
| 100-40-3 | 4-Ethenylcyclohexene | Organics | 4.59E-13 | 9.82E-29 | 3.01E-12 | 9.82E-29 | 9.82E-29 | 3.47E-12 | 3.47E-12 |
| 100-41-4 | Ethyl benzene | Organics | 1.25E-17 | 7.76E-29 | 8.22E-17 | 7.76E-29 | 7.76E-29 | 9.47E-17 | 9.47E-17 |
| 100-42-5 | Styrene | Organics | 7.27E-18 | 1.91E-15 | 3.94E-17 | 1.91E-15 | 1.91E-15 | 4.66E-17 | 4.66E-17 |
| 100-44-7 | Benzyl chloride | Organics | - | - | - | - | - | - | - |
| 100-47-0 | Benzonitrile | Organics | - | - | - | - | - | - | - |
| 100-51-6 | Benzyl alcohol | Organics | - | - | - | - | - | - | - |
| 100-52-7 | Benzaldehyde | Organics | - | - | - | - | - | - | - |
| 10061-01-5 | cis-1,3-Dichloropropene | Organics | 2.22E-17 | 4.18E-26 | 1.45E-16 | 4.18E-26 | 4.18E-26 | 1.67E-16 | 1.67E-16 |
| 10061-02-6 | trans-1,3-Dichloropropene | Organics | 2.31E-17 | 1.48E-23 | 1.52E-16 | 1.48E-23 | 1.48E-23 | 1.75E-16 | 1.75E-16 |
| 101-55-3 | 4-Bromophenylphenyl ether | Organics | 7.33E-13 | 1.95E-15 | 4.62E-12 | 1.95E-15 | 1.95E-15 | 5.36E-12 | 5.36E-12 |
| 101-77-9 | 4,4-Methylenedianiline | Organics | - | - | - | - | - | - | - |
| 103-33-3 | Azobenzene | Organics | - | - | - | - | - | - | - |
| 103-65-1 | n-Propyl benzene (Isocumene) | Organics | - | - | - | - | - | - | - |
| 104-51-8 | n-Butylbenzene | Organics | - | - | - | - | - | - | - |
| 104-76-7 | 2-Ethyl-1-hexanol | Organics | 9.15E-13 | 6.00E-14 | 3.70E-12 | 6.00E-14 | 6.00E-14 | 4.62E-12 | 4.62E-12 |
| 105-67-9 | 2,4-Dimethylphenol | Organics | 3.73E-12 | 1.83E-11 | 1.13E-11 | 1.83E-11 | 1.83E-11 | 1.51E-11 | 1.51E-11 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|--|---|---|--|--|--|--|
| 10595-95-6 | n-Nitrosomethylethylamine | Organics | 5.57E-12 | 3.89E-12 | 1.17E-11 | 3.89E-12 | 3.89E-12 | 1.73E-11 | 1.73E-11 |
| 106-43-4 | 4-Chlorotoluene (p-Tolyl chloride) | Organics | - | - | - | - | - | - | - |
| 106-44-5 | p-Cresol (4-methyl phenol) | Organics | - | - | - | - | - | - | - |
| 106-46-7 | 1,4-Dichlorobenzene | Organics | 3.80E-15 | 7.71E-16 | 2.49E-14 | 7.71E-16 | 7.71E-16 | 2.87E-14 | 2.87E-14 |
| 106-47-8 | p-Chloroaniline | Organics | 4.40E-12 | 2.85E-11 | 1.31E-11 | 2.85E-11 | 2.85E-11 | 1.75E-11 | 1.75E-11 |
| 106-49-0 | p-Toluidine | Organics | - | - | - | - | - | - | - |
| 106-51-4 | Quinone | Organics | - | - | - | - | - | - | - |
| 106-88-7 | 1,2-Epoxybutane | Organics | 6.20E-13 | 3.78E-16 | 4.02E-12 | 3.78E-16 | 3.78E-16 | 4.64E-12 | 4.64E-12 |
| 106-89-8 | Epichlorohydrin (1-chloro-2,3 epoxypropane) | Organics | - | - | - | - | - | - | - |
| 106-93-4 | Ethylene dibromide | Organics | 6.01E-18 | 8.54E-24 | 3.94E-17 | 8.54E-24 | 8.54E-24 | 4.54E-17 | 4.54E-17 |
| 106-99-0 | 1,3-Butadiene | Organics | 2.01E-16 | 1.94E-33 | 1.32E-15 | 1.94E-33 | 1.94E-33 | 1.52E-15 | 1.52E-15 |
| 107-02-8 | Acrolein | Organics | 3.38E-16 | 8.04E-19 | 2.14E-15 | 8.04E-19 | 8.04E-19 | 2.47E-15 | 2.47E-15 |
| 107-05-1 | 3-Chloropropene | Organics | 2.22E-17 | 1.69E-29 | 1.45E-16 | 1.69E-29 | 1.69E-29 | 1.67E-16 | 1.67E-16 |
| 107-06-2 | 1,2-Dichloroethane | Organics | 5.47E-17 | 5.31E-15 | 4.78E-17 | 5.31E-15 | 5.31E-15 | 1.03E-16 | 1.03E-16 |
| 107-12-0 | Propionitrile | Organics | 2.85E-15 | 1.13E-16 | 1.34E-14 | 1.13E-16 | 1.13E-16 | 1.63E-14 | 1.63E-14 |
| 107-13-1 | Acrylonitrile | Organics | 3.38E-14 | 1.00E-13 | 1.07E-14 | 1.00E-13 | 1.00E-13 | 4.45E-14 | 4.45E-14 |
| 107-19-7 | Propargyl alcohol | Organics | - | - | - | - | - | - | - |
| 107-21-1 | Ethylene glycol (1,2-ethanediol) | Organics | - | - | - | - | - | - | - |
| 107-98-2 | Propylene glycol monomethyl ether | Organics | - | - | - | - | - | - | - |
| 108-05-4 | Acetic acid vinyl ester | Organics | 7.31E-13 | 6.08E-18 | 4.79E-12 | 6.08E-18 | 6.08E-18 | 5.52E-12 | 5.52E-12 |
| 108-10-1 | 4-Methyl-2-pentanone | Organics | 8.00E-17 | 1.16E-19 | 5.12E-16 | 1.16E-19 | 1.16E-19 | 5.92E-16 | 5.92E-16 |
| 108-39-4 | m-Cresol | Organics | 1.04E-11 | 1.03E-11 | 2.08E-11 | 1.03E-11 | 1.03E-11 | 3.12E-11 | 3.12E-11 |
| 108-60-1 | bis (2-Chloroisopropyl)ether | Organics | - | - | - | - | - | - | - |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|-----------|---|----------|--|---|---|--|--|--|--|
| 108-67-8 | 1,3,5-Trimethylbenzene | Organics | - | - | - | - | - | - | - |
| 108-86-1 | Bromobenzene (Phenyl bromide) | Organics | - | - | - | - | - | - | - |
| 108-87-2 | Methylcyclohexane | Organics | 2.55E-17 | - | 1.67E-16 | - | - | 1.93E-16 | 1.93E-16 |
| 108-88-3 | Toluene | Organics | 3.13E-17 | 7.82E-16 | 2.05E-16 | 7.82E-16 | 7.82E-16 | 2.36E-16 | 2.36E-16 |
| 108-90-7 | Chlorobenzene | Organics | 7.59E-18 | 1.39E-15 | 4.74E-17 | 1.39E-15 | 1.39E-15 | 5.50E-17 | 5.50E-17 |
| 108-94-1 | Cyclohexanone | Organics | 6.35E-14 | 1.22E-14 | 1.66E-13 | 1.22E-14 | 1.22E-14 | 2.29E-13 | 2.29E-13 |
| 108-95-2 | Phenol | Organics | 1.45E-12 | 1.40E-11 | 3.67E-12 | 1.40E-11 | 1.40E-11 | 5.12E-12 | 5.12E-12 |
| 109-74-0 | n-Butanenitrile | Organics | 7.18E-13 | 1.49E-14 | 3.86E-12 | 1.49E-14 | 1.49E-14 | 4.58E-12 | 4.58E-12 |
| 109-75-1 | 3-Butenenitrile | Organics | - | - | - | - | - | - | - |
| 109-77-3 | Malononitrile | Organics | - | - | - | - | - | - | - |
| 109-86-4 | 2-Methoxyethanol | Organics | - | - | - | - | - | - | - |
| 109-99-9 | Tetrahydrofuran | Organics | 2.69E-16 | 2.66E-18 | 1.58E-15 | 2.66E-18 | 2.66E-18 | 1.85E-15 | 1.85E-15 |
| 110-00-9 | Furan | Organics | - | - | - | - | - | - | - |
| 110-54-3 | n-Hexane | Organics | 1.17E-15 | - | 7.66E-15 | - | - | 8.83E-15 | 8.83E-15 |
| 110-59-8 | Pentanenitrile | Organics | 6.33E-13 | 6.44E-15 | 3.71E-12 | 6.44E-15 | 6.44E-15 | 4.34E-12 | 4.34E-12 |
| 110-80-5 | 2-Ethoxyethanol | Organics | 3.17E-11 | 4.64E-11 | 5.87E-11 | 4.64E-11 | 4.64E-11 | 9.05E-11 | 9.05E-11 |
| 110-82-7 | Cyclohexane | Organics | 2.22E-17 | - | 1.45E-16 | - | - | 1.67E-16 | 1.67E-16 |
| 110-83-8 | Cyclohexene | Organics | 2.22E-17 | 4.27E-33 | 1.45E-16 | 4.27E-33 | 4.27E-33 | 1.67E-16 | 1.67E-16 |
| 110-86-1 | Pyridine | Organics | 1.54E-14 | 3.00E-15 | 4.02E-14 | 3.00E-15 | 3.00E-15 | 5.56E-14 | 5.56E-14 |
| 111-15-9 | Ethylene glycol monoethyl ether acetate | Organics | - | - | - | - | - | - | - |
| 111-44-4 | Bis(2-chloroethyl)ether | Organics | 1.57E-13 | 3.08E-13 | 2.25E-13 | 3.08E-13 | 3.08E-13 | 3.81E-13 | 3.81E-13 |
| 111-65-9 | n-Octane | Organics | 2.67E-16 | - | 1.75E-15 | - | - | 2.02E-15 | 2.02E-15 |
| 111-76-2 | 2-Butoxyethanol | Organics | 3.61E-12 | 2.36E-12 | 7.70E-12 | 2.36E-12 | 2.36E-12 | 1.13E-11 | 1.13E-11 |
| 111-84-2 | n-Nonane | Organics | 1.79E-16 | 9.90E-29 | 1.17E-15 | 9.90E-29 | 9.90E-29 | 1.35E-15 | 1.35E-15 |
| 111-91-1 | Bis(2-chloroethoxy)methane | Organics | 5.18E-13 | 1.81E-12 | 1.48E-12 | 1.81E-12 | 1.81E-12 | 2.00E-12 | 2.00E-12 |
| 1120-21-4 | Undecane | Organics | - | - | - | - | - | - | - |
| 1120-71-4 | 1,3-Propane sultone | Organics | - | - | - | - | - | - | - |
| 112-30-1 | 1-Decanol | Organics | - | - | - | - | - | - | - |
| 112-31-2 | Decanal | Organics | - | - | - | - | - | - | - |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|----------|------------------------------------|----------|--|---|---|--|--|--|--|
| 112-40-3 | Dodecane | Organics | - | - | - | - | - | - | - |
| 117-81-7 | Bis(2-ethylhexyl) phthalate | Organics | 1.35E-11 | 1.83E-10 | 1.89E-11 | 1.83E-10 | 1.83E-10 | 3.24E-11 | 3.24E-11 |
| 117-84-0 | Di-n-octylphthalate | Organics | 2.75E-12 | 3.59E-14 | 1.59E-11 | 3.59E-14 | 3.59E-14 | 1.86E-11 | 1.86E-11 |
| 118-74-1 | Hexachlorobenzene | Organics | 1.83E-17 | 1.25E-15 | 8.91E-17 | 1.25E-15 | 1.25E-15 | 1.07E-16 | 1.07E-16 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | Organics | - | - | - | - | - | - | - |
| 120-12-7 | Anthracene | Organics | 5.13E-13 | 4.70E-14 | 2.85E-12 | 4.70E-14 | 4.70E-14 | 3.36E-12 | 3.36E-12 |
| 120-82-1 | 1,2,4-Trichlorobenzene | Organics | 4.44E-16 | 2.57E-23 | 2.91E-15 | 2.57E-23 | 2.57E-23 | 3.36E-15 | 3.36E-15 |
| 120-83-2 | 2,4-Dichlorophenol | Organics | 9.23E-13 | 3.28E-21 | 6.05E-12 | 3.28E-21 | 3.28E-21 | 6.97E-12 | 6.97E-12 |
| 121-14-2 | 2,4-Dinitrotoluene | Organics | 2.73E-11 | 2.21E-10 | 3.73E-11 | 2.21E-10 | 2.21E-10 | 6.46E-11 | 6.46E-11 |
| 122-39-4 | N,N-Diphenylamine | Organics | 3.21E-15 | 1.93E-15 | 6.94E-15 | 1.93E-15 | 1.93E-15 | 1.02E-14 | 1.02E-14 |
| 122-66-7 | 1,2-Diphenylhydrazine | Organics | - | - | - | - | - | - | - |
| 123-33-1 | Maleic hydrazide | Organics | - | - | - | - | - | - | - |
| 123-38-6 | Propionaldehyde | Organics | 8.23E-16 | 7.85E-18 | 4.85E-15 | 7.85E-18 | 7.85E-18 | 5.67E-15 | 5.67E-15 |
| 123-72-8 | Butanal | Organics | 6.37E-13 | 1.73E-15 | 4.02E-12 | 1.73E-15 | 1.73E-15 | 4.65E-12 | 4.65E-12 |
| 123-91-1 | 1,4-Dioxan | Organics | 8.47E-16 | 2.57E-16 | 1.97E-15 | 2.57E-16 | 2.57E-16 | 2.82E-15 | 2.82E-15 |
| 124-18-5 | Decane | Organics | - | - | - | - | - | - | - |
| 124-48-1 | Chlorodibromomethane | Organics | 1.00E-16 | 6.70E-15 | 4.64E-18 | 6.70E-15 | 6.70E-15 | 1.05E-16 | 1.05E-16 |
| 126-73-8 | Tributyl phosphate | Organics | 3.77E-12 | 3.91E-12 | 7.58E-12 | 3.91E-12 | 3.91E-12 | 1.14E-11 | 1.14E-11 |
| 126-98-7 | 2-Methyl-2-propenenitrile | Organics | 2.23E-16 | 4.14E-20 | 1.45E-15 | 4.14E-20 | 4.14E-20 | 1.68E-15 | 1.68E-15 |
| 127-18-4 | 1,1,2,2-Tetrachloroethene | Organics | 7.30E-18 | 4.00E-31 | 4.79E-17 | 4.00E-31 | 4.00E-31 | 5.52E-17 | 5.52E-17 |
| 128-37-0 | 2,6-Bis(tert-butyl)-4-methylphenol | Organics | 4.36E-14 | 1.92E-14 | 1.00E-13 | 1.92E-14 | 1.92E-14 | 1.44E-13 | 1.44E-13 |
| 129-00-0 | Pyrene | Organics | 5.94E-12 | 1.97E-12 | 1.61E-11 | 1.97E-12 | 1.97E-12 | 2.20E-11 | 2.20E-11 |
| 131-11-3 | Dimethyl Phthalate | Organics | 6.22E-13 | 1.46E-11 | 9.82E-13 | 1.46E-11 | 1.46E-11 | 1.60E-12 | 1.60E-12 |
| 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol | Organics | - | - | - | - | - | - | - |
| 132-64-9 | Dibenzofuran | Organics | 1.48E-15 | 9.41E-15 | 3.71E-16 | 9.41E-15 | 9.41E-15 | 1.85E-15 | 1.85E-15 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--|----------|--|---|---|--|--|--|--|
| 1330-20-7 | Xylenes (mixed isomers) | Organics | 2.14E-15 | 9.95E-16 | 1.40E-14 | 9.95E-16 | 9.95E-16 | 1.62E-14 | 1.62E-14 |
| 133-06-2 | Captan | Organics | - | - | - | - | - | - | - |
| 1336-36-3 | Polychlorinated biphenyls | Organics | 9.84E-13 | 1.71E-16 | 6.39E-12 | 1.71E-16 | 1.71E-16 | 7.37E-12 | 7.37E-12 |
| 134-32-7 | alpha-Naphthylamine | Organics | 5.59E-12 | 3.48E-11 | 7.19E-12 | 3.48E-11 | 3.48E-11 | 1.28E-11 | 1.28E-11 |
| 135-98-8 | sec-Butylbenzene | Organics | - | - | - | - | - | - | - |
| 141-78-6 | Acetic acid ethyl ester | Organics | 2.43E-17 | 4.07E-20 | 1.55E-16 | 4.07E-20 | 4.07E-20 | 1.80E-16 | 1.80E-16 |
| 145-73-3 | Endothall | Organics | - | - | - | - | - | - | - |
| 156-59-2 | cis-1,2-Dichloroethene | Organics | - | - | - | - | - | - | - |
| 156-60-5 | 1,2-trans-Dichloroethene | Organics | 1.65E-12 | 3.86E-24 | 1.08E-11 | 3.86E-24 | 3.86E-24 | 1.24E-11 | 1.24E-11 |
| 1634-04-4 | Methyl tert-butyl ether | Organics | 5.99E-13 | 2.58E-18 | 3.93E-12 | 2.58E-18 | 2.58E-18 | 4.52E-12 | 4.52E-12 |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD) | Organics | 2.39E-22 | 4.98E-22 | 2.10E-22 | 4.98E-22 | 4.98E-22 | 4.49E-22 | 4.49E-22 |
| 189-55-9 | Dibenzo[a,i]pyrene | Organics | 5.43E-12 | 5.72E-11 | 6.50E-12 | 5.72E-11 | 5.72E-11 | 1.19E-11 | 1.19E-11 |
| 189-64-0 | Dibenzo[a,h]pyrene | Organics | 5.43E-12 | 5.72E-11 | 6.50E-12 | 5.72E-11 | 5.72E-11 | 1.19E-11 | 1.19E-11 |
| 191-24-2 | Benzo(g,h,i)perylene | Organics | 5.91E-12 | 6.45E-11 | 9.36E-12 | 6.45E-11 | 6.45E-11 | 1.53E-11 | 1.53E-11 |
| 191-30-0 | Dibenzo(a,l)pyrene | Organics | 5.43E-12 | 5.72E-11 | 6.50E-12 | 5.72E-11 | 5.72E-11 | 1.19E-11 | 1.19E-11 |
| 192-65-4 | Dibenzo[a,e]pyrene | Organics | 5.43E-12 | 5.72E-11 | 6.50E-12 | 5.72E-11 | 5.72E-11 | 1.19E-11 | 1.19E-11 |
| 192-97-2 | Benzo(e)pyrene | Organics | - | - | - | - | - | - | - |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | Organics | 3.88E-12 | 1.56E-11 | 8.44E-12 | 1.56E-11 | 1.56E-11 | 1.23E-11 | 1.23E-11 |
| 19408-74-3 | 1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin | Organics | 8.54E-22 | 1.66E-21 | 2.93E-22 | 1.66E-21 | 1.66E-21 | 1.15E-21 | 1.15E-21 |
| 205-82-3 | Benzo[j]fluoranthene | Organics | - | - | - | - | - | - | - |
| 205-99-2 | Benzo(b)fluoranthene | Organics | 5.35E-13 | 1.60E-12 | 1.02E-12 | 1.60E-12 | 1.60E-12 | 1.56E-12 | 1.56E-12 |
| 206-44-0 | Fluoranthene | Organics | 4.75E-12 | 9.61E-13 | 1.49E-11 | 9.61E-13 | 9.61E-13 | 1.97E-11 | 1.97E-11 |
| 207-08-9 | Benzo(k)fluoranthene | Organics | 1.97E-12 | 2.75E-11 | 4.46E-12 | 2.75E-11 | 2.75E-11 | 6.43E-12 | 6.43E-12 |
| 208-96-8 | Acenaphthylene | Organics | 4.54E-13 | 1.84E-14 | 2.83E-12 | 1.84E-14 | 1.84E-14 | 3.28E-12 | 3.28E-12 |
| 218-01-9 | Chrysene | Organics | 1.18E-14 | 3.47E-14 | 3.99E-15 | 3.47E-14 | 3.47E-14 | 1.58E-14 | 1.58E-14 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|--|---|---|--|--|--|--|
| 224-42-0 | Dibenz[a,j]acridine | Organics | 6.40E-12 | 7.26E-11 | 7.37E-12 | 7.26E-11 | 7.26E-11 | 1.38E-11 | 1.38E-11 |
| 2245-38-7 | 2,3,5-Trimethylnaphthalene | Organics | - | - | - | - | - | - | - |
| 226-36-8 | Dibenz[a,h]acridine | Organics | 6.16E-12 | 6.74E-11 | 6.92E-12 | 6.74E-11 | 6.74E-11 | 1.31E-11 | 1.31E-11 |
| 23950-58-5 | Pronamide | Organics | - | - | - | - | - | - | - |
| 27154-33-2 | Trichlorofluoroethane | Organics | 2.57E-12 | 3.53E-24 | 1.69E-11 | 3.53E-24 | 3.53E-24 | 1.94E-11 | 1.94E-11 |
| 31508-00-6 | 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) | Organics | 5.07E-22 | 4.99E-21 | 9.84E-23 | 4.99E-21 | 4.99E-21 | 6.05E-22 | 6.05E-22 |
| 319-84-6 | alpha-BHC | Organics | 6.59E-17 | 1.24E-17 | 1.82E-16 | 1.24E-17 | 1.24E-17 | 2.48E-16 | 2.48E-16 |
| 319-85-7 | beta-BHC | Organics | 4.87E-14 | 8.68E-13 | 2.20E-13 | 8.68E-13 | 8.68E-13 | 2.69E-13 | 2.69E-13 |
| 32598-13-3 | 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) | Organics | 5.42E-20 | 5.10E-19 | 1.08E-18 | 5.10E-19 | 5.10E-19 | 1.13E-18 | 1.13E-18 |
| 32598-14-4 | 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) | Organics | 7.27E-24 | 5.46E-22 | 3.38E-24 | 5.46E-22 | 5.46E-22 | 1.06E-23 | 1.06E-23 |
| 3268-87-9 | Octachlorodibenzo(p)dioxin | Organics | 3.10E-20 | 1.14E-19 | 7.27E-20 | 1.14E-19 | 1.14E-19 | 1.04E-19 | 1.04E-19 |
| 32774-16-6 | 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) | Organics | 1.71E-21 | 4.17E-21 | 7.16E-22 | 4.17E-21 | 4.17E-21 | 2.43E-21 | 2.43E-21 |
| 35822-46-9 | 1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin | Organics | 4.03E-21 | 8.96E-21 | 7.58E-21 | 8.96E-21 | 8.96E-21 | 1.16E-20 | 1.16E-20 |
| 3697-24-3 | 5-Methylchrysene | Organics | 1.58E-12 | 5.31E-13 | 3.71E-12 | 5.31E-13 | 5.31E-13 | 5.29E-12 | 5.29E-12 |
| 38380-08-4 | 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) | Organics | 4.80E-22 | 1.93E-21 | 1.09E-22 | 1.93E-21 | 1.93E-21 | 5.89E-22 | 5.89E-22 |
| 39001-02-0 | Octachlorodibenzofuran | Organics | 9.69E-21 | 7.70E-20 | 2.53E-20 | 7.70E-20 | 7.70E-20 | 3.50E-20 | 3.50E-20 |
| 39227-28-6 | 1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin | Organics | 9.14E-22 | 1.67E-21 | 1.85E-21 | 1.67E-21 | 1.67E-21 | 2.76E-21 | 2.76E-21 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--|----------|--|---|---|--|--|--|--|
| 39635-31-9 | 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) | Organics | 1.21E-21 | 2.69E-21 | 6.89E-22 | 2.69E-21 | 2.69E-21 | 1.90E-21 | 1.90E-21 |
| 40321-76-4 | 1,2,3,7,8-Pentachlorodibenzo(p)dioxin | Organics | 3.83E-21 | 1.23E-20 | 1.11E-20 | 1.23E-20 | 1.23E-20 | 1.49E-20 | 1.49E-20 |
| 4170-30-3 | Crotonaldehyde (Propylene aldehyde) | Organics | 3.03E-16 | 4.72E-25 | 1.99E-15 | 4.72E-25 | 4.72E-25 | 2.30E-15 | 2.30E-15 |
| 41851-50-7 | Chlorocyclopentadiene | Organics | - | - | - | - | - | - | - |
| 460-19-5 | Cyanogen (oxalonitrile) | Organics | - | - | - | - | - | - | - |
| 4786-20-3 | 2-Butenenitrile | Organics | - | - | - | - | - | - | - |
| 50-00-0 | Formaldehyde | Organics | 8.16E-12 | 1.41E-11 | 1.43E-11 | 1.41E-11 | 1.41E-11 | 2.24E-11 | 2.24E-11 |
| 50-32-8 | Benzo(a)pyrene | Organics | 6.76E-13 | 3.88E-12 | 1.82E-12 | 3.88E-12 | 3.88E-12 | 2.49E-12 | 2.49E-12 |
| 506-68-3 | Cyanogen bromide (bromocyanide) | Organics | - | - | - | - | - | - | - |
| 506-77-4 | Cyanogen chloride | Organics | - | - | - | - | - | - | - |
| 510-15-6 | Chlorobenzilate | Organics | - | - | - | - | - | - | - |
| 51207-31-9 | 2,3,7,8-Tetrachlorodibenzofuran | Organics | 2.97E-21 | 6.43E-21 | 5.03E-21 | 6.43E-21 | 6.43E-21 | 7.99E-21 | 7.99E-21 |
| 51-28-5 | 2,4-Dinitrophenol | Organics | 1.29E-11 | 1.89E-10 | 2.80E-11 | 1.89E-10 | 1.89E-10 | 4.09E-11 | 4.09E-11 |
| 51-79-6 | Ethyl carbamate (urethane) | Organics | - | - | - | - | - | - | - |
| 52663-72-6 | 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) | Organics | 1.77E-21 | 6.37E-20 | 2.65E-20 | 6.37E-20 | 6.37E-20 | 2.83E-20 | 2.83E-20 |
| 528-29-0 | 1,2-Dinitrobenzene (o-Dinitrobenzene) | Organics | - | - | - | - | - | - | - |
| 532-27-4 | 2-Chloroacetophenone | Organics | - | - | - | - | - | - | - |
| 534-52-1 | 4,6-Dinitro-o-cresol | Organics | 5.74E-12 | 4.68E-11 | 1.57E-11 | 4.68E-11 | 4.68E-11 | 2.15E-11 | 2.15E-11 |
| 53-70-3 | Dibenz[a,h]anthracene | Organics | 6.42E-13 | 4.81E-11 | 3.54E-13 | 4.81E-11 | 4.81E-11 | 9.96E-13 | 9.96E-13 |
| 5385-75-1 | Dibenzo(a,e)fluoranthene | Organics | - | - | - | - | - | - | - |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|--|---|---|--|--|--|--|
| 540-59-0 | 1,2-Dichloroethene (total) (1,2-Dichloroethylene) | Organics | 2.49E-19 | 1.26E-15 | 2.58E-21 | 1.26E-15 | 1.26E-15 | 2.51E-19 | 2.51E-19 |
| 540-73-8 | 1,2-Dimethylhydrazine | Organics | - | - | - | - | - | - | - |
| 540-84-1 | 2,2,4-Trimethylpentane | Organics | - | - | - | - | - | - | - |
| 541-73-1 | 1,3-Dichlorobenzene | Organics | 2.91E-16 | 2.72E-25 | 1.91E-15 | 2.72E-25 | 2.72E-25 | 2.20E-15 | 2.20E-15 |
| 542-75-6 | 1,3-Dichloropropene | Organics | - | - | - | - | - | - | - |
| 542-88-1 | Bis(chloromethyl)ether | Organics | - | - | - | - | - | - | - |
| 55673-89-7 | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | Organics | 5.69E-22 | 1.34E-21 | 9.62E-22 | 1.34E-21 | 1.34E-21 | 1.53E-21 | 1.53E-21 |
| 56-23-5 | Carbon tetrachloride | Organics | 1.15E-17 | 1.72E-16 | 7.51E-17 | 1.72E-16 | 1.72E-16 | 8.66E-17 | 8.66E-17 |
| 56-49-5 | 3-Methylcholanthrene | Organics | 1.62E-12 | 5.69E-13 | 3.77E-12 | 5.69E-13 | 5.69E-13 | 5.39E-12 | 5.39E-12 |
| 56-55-3 | Benzo(a)anthracene | Organics | 6.37E-13 | 3.68E-12 | 1.72E-12 | 3.68E-12 | 3.68E-12 | 2.35E-12 | 2.35E-12 |
| 57117-31-4 | 2,3,4,7,8-Pentachlorodibenzofuran | Organics | 3.06E-21 | 1.39E-20 | 7.82E-21 | 1.39E-20 | 1.39E-20 | 1.09E-20 | 1.09E-20 |
| 57117-41-6 | 1,2,3,7,8-Pentachlorodibenzofuran | Organics | 2.32E-21 | 9.54E-21 | 5.81E-21 | 9.54E-21 | 9.54E-21 | 8.12E-21 | 8.12E-21 |
| 57117-44-9 | 1,2,3,6,7,8-Hexachlorodibenzofuran | Organics | 1.20E-21 | 3.73E-21 | 2.87E-21 | 3.73E-21 | 3.73E-21 | 4.07E-21 | 4.07E-21 |
| 57-24-9 | Strychnine | Organics | - | - | - | - | - | - | - |
| 57465-28-8 | 3,3',4,4',5-Pentachlorobiphenyl (PCB 126) | Organics | 1.76E-20 | 5.19E-20 | 3.88E-20 | 5.19E-20 | 5.19E-20 | 5.64E-20 | 5.64E-20 |
| 57653-85-7 | 1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin | Organics | 8.87E-22 | 1.86E-21 | 1.54E-21 | 1.86E-21 | 1.86E-21 | 2.42E-21 | 2.42E-21 |
| 57-74-9 | Chlordane | Organics | - | - | - | - | - | - | - |
| 581-42-0 | 2,6-Dimethylnaphthalene | Organics | - | - | - | - | - | - | - |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|------------------------------------|----------|--|---|---|--|--|--|--|
| 584-84-9 | 2,4-Toluene diisocyanate | Organics | - | - | - | - | - | - | - |
| 58-89-9 | gamma-BHC (Lindane) | Organics | 1.28E-16 | 5.73E-17 | 3.31E-16 | 5.73E-17 | 5.73E-17 | 4.59E-16 | 4.59E-16 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | Organics | 5.25E-12 | 2.12E-12 | 1.19E-11 | 2.12E-12 | 2.12E-12 | 1.72E-11 | 1.72E-11 |
| 589-38-8 | 3-Hexanone | Organics | 5.86E-13 | 1.22E-15 | 3.72E-12 | 1.22E-15 | 1.22E-15 | 4.30E-12 | 4.30E-12 |
| 591-50-4 | Benzene, iodo- | Organics | - | - | - | - | - | - | - |
| 591-78-6 | 2-Hexanone | Organics | 1.02E-15 | 5.16E-18 | 6.29E-15 | 5.16E-18 | 5.16E-18 | 7.31E-15 | 7.31E-15 |
| 593-60-2 | Bromoethene (Vinyl bromide) | Organics | - | - | - | - | - | - | - |
| 59-50-7 | 4-Chloro-3-methylphenol | Organics | 9.31E-12 | 4.52E-12 | 2.05E-11 | 4.52E-12 | 4.52E-12 | 2.98E-11 | 2.98E-11 |
| 59-89-2 | N-Nitrosomorpholine | Organics | 4.60E-11 | 1.55E-10 | 6.74E-11 | 1.55E-10 | 1.55E-10 | 1.13E-10 | 1.13E-10 |
| 60-11-7 | Dimethyl aminoazobenzene | Organics | 4.38E-27 | 5.44E-27 | - | 5.44E-27 | 5.44E-27 | 4.38E-27 | 4.38E-27 |
| 602-87-9 | 5-Nitroacenaphthene | Organics | 3.62E-12 | 4.52E-12 | 6.93E-12 | 4.52E-12 | 4.52E-12 | 1.05E-11 | 1.05E-11 |
| 60-29-7 | Ethyl ether | Organics | 8.32E-16 | 9.31E-23 | 5.46E-15 | 9.31E-23 | 9.31E-23 | 6.29E-15 | 6.29E-15 |
| 60-35-5 | Acetamide | Organics | 9.78E-12 | 3.54E-11 | 1.43E-11 | 3.54E-11 | 3.54E-11 | 2.41E-11 | 2.41E-11 |
| 606-20-2 | 2,6-Dinitrotoluene | Organics | 1.15E-12 | 1.32E-11 | 2.85E-12 | 1.32E-11 | 1.32E-11 | 4.01E-12 | 4.01E-12 |
| 60851-34-5 | 2,3,4,6,7,8-Hexachlorodibenzofuran | Organics | 4.88E-22 | 1.28E-21 | 9.48E-22 | 1.28E-21 | 1.28E-21 | 1.44E-21 | 1.44E-21 |
| 608-93-5 | Pentachlorobenzene | Organics | - | - | - | - | - | - | - |
| 61626-71-9 | Dichloropentadiene | Organics | - | - | - | - | - | - | - |
| 621-64-7 | N-Nitroso-di-n-propylamine | Organics | 9.25E-12 | 4.76E-12 | 2.03E-11 | 4.76E-12 | 4.76E-12 | 2.95E-11 | 2.95E-11 |
| 624-83-9 | Methyl isocyanate | Organics | - | - | - | - | - | - | - |
| 62-50-0 | Ethyl methanesulfonate | Organics | - | - | - | - | - | - | - |
| 62-53-3 | Aniline | Organics | - | - | - | - | - | - | - |
| 62-75-9 | N-Nitroso-N,N-dimethylamine | Organics | 5.21E-14 | 3.12E-14 | 1.12E-13 | 3.12E-14 | 3.12E-14 | 1.64E-13 | 1.64E-13 |
| 628-73-9 | Hexanenitrile | Organics | 5.86E-13 | 2.81E-15 | 3.61E-12 | 2.81E-15 | 2.81E-15 | 4.19E-12 | 4.19E-12 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|---|----------|--|---|---|--|--|--|--|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | Organics | 2.85E-12 | 9.72E-21 | 1.87E-11 | 9.72E-21 | 9.72E-21 | 2.15E-11 | 2.15E-11 |
| 64-18-6 | Formic acid (methanoic acid) | Organics | - | - | - | - | - | - | - |
| 65510-44-3 | 2',3,4,4',5-Pentachlorobiphenyl (PCB 123) | Organics | 2.47E-18 | 2.13E-18 | 2.85E-18 | 2.13E-18 | 2.13E-18 | 5.32E-18 | 5.32E-18 |
| 65-85-0 | Benzoic acid | Organics | - | - | - | - | - | - | - |
| 67-56-1 | Methyl alcohol | Organics | 4.20E-12 | 1.05E-12 | 8.84E-12 | 1.05E-12 | 1.05E-12 | 1.30E-11 | 1.30E-11 |
| 67562-39-4 | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | Organics | 1.77E-21 | 4.19E-21 | 2.90E-21 | 4.19E-21 | 4.19E-21 | 4.67E-21 | 4.67E-21 |
| 67-63-0 | 2-Propyl alcohol | Organics | 1.90E-15 | 3.86E-16 | 4.82E-15 | 3.86E-16 | 3.86E-16 | 6.72E-15 | 6.72E-15 |
| 67-64-1 | 2-Propanone (Acetone) | Organics | 3.60E-13 | 6.83E-13 | 3.21E-13 | 6.83E-13 | 6.83E-13 | 6.81E-13 | 6.81E-13 |
| 67-66-3 | Chloroform | Organics | 7.87E-18 | 1.39E-15 | 4.92E-17 | 1.39E-15 | 1.39E-15 | 5.71E-17 | 5.71E-17 |
| 67-72-1 | Hexachloroethane | Organics | 8.86E-14 | 2.51E-23 | 5.81E-13 | 2.51E-23 | 2.51E-23 | 6.69E-13 | 6.69E-13 |
| 69782-90-7 | 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) | Organics | 3.64E-21 | 8.10E-21 | 2.09E-21 | 8.10E-21 | 8.10E-21 | 5.73E-21 | 5.73E-21 |
| 70-30-4 | Hexachlorophene | Organics | - | - | - | - | - | - | - |
| 70362-50-4 | 3,4,4',5-Tetrachlorobiphenyl (PCB 81) | Organics | 4.98E-21 | 1.09E-20 | 6.02E-21 | 1.09E-20 | 1.09E-20 | 1.10E-20 | 1.10E-20 |
| 70648-26-9 | 1,2,3,4,7,8-Hexachlorodibenzofuran | Organics | 1.31E-21 | 2.34E-21 | 2.29E-21 | 2.34E-21 | 2.34E-21 | 3.60E-21 | 3.60E-21 |
| 71-36-3 | n-Butyl alcohol | Organics | 5.30E-14 | 1.03E-14 | 1.38E-13 | 1.03E-14 | 1.03E-14 | 1.91E-13 | 1.91E-13 |
| 71-43-2 | Benzene | Organics | 1.90E-17 | 9.22E-16 | 1.24E-16 | 9.22E-16 | 9.22E-16 | 1.43E-16 | 1.43E-16 |
| 71-55-6 | 1,1,1-Trichloroethane | Organics | 7.42E-18 | 5.68E-31 | 4.86E-17 | 5.68E-31 | 5.68E-31 | 5.61E-17 | 5.61E-17 |
| 72-43-5 | Methoxychlor | Organics | - | - | - | - | - | - | - |
| 72-55-9 | 4,4-DDE | Organics | 1.45E-12 | 1.41E-13 | 5.24E-12 | 1.41E-13 | 1.41E-13 | 6.69E-12 | 6.69E-12 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--|----------|--|---|---|--|--|--|--|
| 72918-21-9 | 1,2,3,7,8,9-Hexachlorodibenzofuran | Organics | 2.93E-22 | 7.77E-22 | 5.68E-22 | 7.77E-22 | 7.77E-22 | 8.60E-22 | 8.60E-22 |
| 74472-37-0 | 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) | Organics | 5.05E-22 | 1.43E-21 | 1.68E-22 | 1.43E-21 | 1.43E-21 | 6.73E-22 | 6.73E-22 |
| 74-83-9 | Bromomethane | Organics | 1.50E-17 | 8.28E-16 | 9.82E-17 | 8.28E-16 | 8.28E-16 | 1.13E-16 | 1.13E-16 |
| 74-87-3 | Chloromethane | Organics | 2.99E-17 | 5.86E-16 | 1.96E-16 | 5.86E-16 | 5.86E-16 | 2.25E-16 | 2.25E-16 |
| 74-88-4 | Iodomethane | Organics | 8.45E-20 | 9.35E-16 | 6.13E-21 | 9.35E-16 | 9.35E-16 | 9.06E-20 | 9.06E-20 |
| 74-95-3 | Methylene bromide | Organics | - | - | - | - | - | - | - |
| 74-97-5 | Bromochloromethane | Organics | - | - | - | - | - | - | - |
| 75-00-3 | Chloroethane | Organics | 1.50E-17 | 5.07E-29 | 9.82E-17 | 5.07E-29 | 5.07E-29 | 1.13E-16 | 1.13E-16 |
| 75-01-4 | 1-Chloroethene | Organics | 1.52E-17 | 7.29E-32 | 9.97E-17 | 7.29E-32 | 7.29E-32 | 1.15E-16 | 1.15E-16 |
| 75-02-5 | Fluoroethene (vinyl fluoride) | Organics | 7.82E-13 | 3.99E-31 | 5.13E-12 | 3.99E-31 | 3.99E-31 | 5.91E-12 | 5.91E-12 |
| 75-05-8 | Acetonitrile | Organics | 4.10E-12 | 7.96E-12 | 3.37E-12 | 7.96E-12 | 7.96E-12 | 7.47E-12 | 7.47E-12 |
| 75-07-0 | Acetaldehyde | Organics | 8.22E-13 | 6.51E-15 | 4.91E-12 | 6.51E-15 | 6.51E-15 | 5.73E-12 | 5.73E-12 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | Organics | 4.51E-15 | 6.12E-14 | 2.91E-14 | 6.12E-14 | 6.12E-14 | 3.36E-14 | 3.36E-14 |
| 75-15-0 | Carbon disulfide | Organics | 1.69E-23 | 1.73E-16 | 4.95E-23 | 1.73E-16 | 1.73E-16 | 6.64E-23 | 6.64E-23 |
| 75-21-8 | Ethylene oxide (Oxirane) | Organics | 1.32E-15 | 1.59E-18 | 8.47E-15 | 1.59E-18 | 1.59E-18 | 9.79E-15 | 9.79E-15 |
| 75-25-2 | Bromoform | Organics | 9.88E-35 | 7.90E-19 | - | 7.90E-19 | 7.90E-19 | 9.88E-35 | 9.88E-35 |
| 75-27-4 | Bromodichloromethane | Organics | 5.56E-12 | 1.62E-19 | 3.65E-11 | 1.62E-19 | 1.62E-19 | 4.21E-11 | 4.21E-11 |
| 75-29-6 | 2-Chloropropane | Organics | - | - | - | - | - | - | - |
| 75-34-3 | 1,1-Dichloroethane | Organics | 6.01E-18 | 2.44E-28 | 3.94E-17 | 2.44E-28 | 2.44E-28 | 4.54E-17 | 4.54E-17 |
| 75-35-4 | 1,1-Dichloroethene | Organics | 9.44E-18 | 5.71E-32 | 6.19E-17 | 5.71E-32 | 5.71E-32 | 7.13E-17 | 7.13E-17 |
| 75-44-5 | Phosgene (hydrogen phosphide) | Organics | - | - | - | - | - | - | - |
| 75-45-6 | Chlorodifluoromethane | Organics | 2.22E-17 | 8.62E-33 | 1.45E-16 | 8.62E-33 | 8.62E-33 | 1.67E-16 | 1.67E-16 |
| 75-50-3 | Trimethylamine | Organics | 7.04E-13 | 2.59E-15 | 4.39E-12 | 2.59E-15 | 2.59E-15 | 5.09E-12 | 5.09E-12 |
| 75-69-4 | Trichlorofluoromethane | Organics | 1.82E-17 | - | 1.20E-16 | - | - | 1.38E-16 | 1.38E-16 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|----------|--------------------------------|----------|--|---|---|--|--|--|--|
| 75-71-8 | Dichlorodifluoromethane | Organics | 1.86E-17 | - | 1.22E-16 | - | - | 1.40E-16 | 1.40E-16 |
| 76-01-7 | Pentachloroethane | Organics | - | - | - | - | - | - | - |
| 76-13-1 | 1,2,2-Trichlorotrifluoroethane | Organics | 1.84E-17 | - | 1.20E-16 | - | - | 1.39E-16 | 1.39E-16 |
| 764-41-0 | 1,4-Dichloro-2-butene | Organics | - | - | - | - | - | - | - |
| 76-44-8 | Heptachlor | Organics | 1.73E-17 | - | 1.13E-16 | - | - | 1.30E-16 | 1.30E-16 |
| 765-34-4 | Glycidylaldehyde | Organics | - | - | - | - | - | - | - |
| 77-47-4 | Hexachlorocyclopentadiene | Organics | 2.03E-22 | 6.58E-16 | 3.61E-20 | 6.58E-16 | 6.58E-16 | 3.63E-20 | 3.63E-20 |
| 77-78-1 | Dimethyl sulfate | Organics | - | - | - | - | - | - | - |
| 78-83-1 | 2-Methylpropyl alcohol | Organics | 2.93E-11 | 5.26E-12 | 7.84E-11 | 5.26E-12 | 5.26E-12 | 1.08E-10 | 1.08E-10 |
| 78-87-5 | 1,2-Dichloropropane | Organics | 6.01E-18 | 9.57E-27 | 3.94E-17 | 9.57E-27 | 9.57E-27 | 4.54E-17 | 4.54E-17 |
| 78-93-3 | 2-Butanone | Organics | 9.52E-14 | 1.99E-13 | 6.28E-14 | 1.99E-13 | 1.99E-13 | 1.58E-13 | 1.58E-13 |
| 79-00-5 | 1,1,2-Trichloroethane | Organics | 7.04E-18 | 3.61E-24 | 4.61E-17 | 3.61E-24 | 3.61E-24 | 5.32E-17 | 5.32E-17 |
| 79-01-6 | 1,1,2-Trichloroethylene | Organics | 8.00E-18 | 5.16E-16 | 5.24E-17 | 5.16E-16 | 5.16E-16 | 6.04E-17 | 6.04E-17 |
| 79-10-7 | 2-Propenoic acid | Organics | 1.24E-11 | 2.07E-11 | 2.22E-11 | 2.07E-11 | 2.07E-11 | 3.45E-11 | 3.45E-11 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | Organics | 7.05E-18 | 3.55E-22 | 4.62E-17 | 3.55E-22 | 3.55E-22 | 5.32E-17 | 5.32E-17 |
| 79-46-9 | 2-Nitropropane | Organics | 1.54E-15 | 3.74E-18 | 9.72E-15 | 3.74E-18 | 3.74E-18 | 1.13E-14 | 1.13E-14 |
| 80-62-6 | Methyl methacrylate | Organics | - | - | - | - | - | - | - |
| 822-06-0 | Hexamethylene-1,5-diisocyanate | Organics | - | - | - | - | - | - | - |
| 823-40-5 | Toluene-2,6-diamine | Organics | - | - | - | - | - | - | - |
| 82-68-8 | Pentachloronitrobenzene (PCNB) | Organics | 1.40E-15 | 4.43E-20 | 9.18E-15 | 4.43E-20 | 4.43E-20 | 1.06E-14 | 1.06E-14 |
| 832-69-9 | 1-Methylphenanthrene | Organics | - | - | - | - | - | - | - |
| 83-32-9 | Acenaphthene | Organics | 2.16E-12 | 1.33E-14 | 1.39E-11 | 1.33E-14 | 1.33E-14 | 1.61E-11 | 1.61E-11 |
| 84-66-2 | Diethyl phthalate | Organics | 6.69E-12 | 3.28E-11 | 1.17E-11 | 3.28E-11 | 3.28E-11 | 1.84E-11 | 1.84E-11 |
| 84-74-2 | Di-n-butylphthalate | Organics | 7.49E-11 | 9.10E-11 | 1.57E-10 | 9.10E-11 | 9.10E-11 | 2.32E-10 | 2.32E-10 |
| 85-01-8 | Phenanthrene | Organics | 8.70E-13 | 2.77E-13 | 3.03E-12 | 2.77E-13 | 2.77E-13 | 3.90E-12 | 3.90E-12 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|----------|--|----------|--|---|---|--|--|--|--|
| 85-44-9 | Phthalic anhydride (1,2-benzenedicarboxylic anhydride) | Organics | - | - | - | - | - | - | - |
| 85-68-7 | Butylbenzylphthalate | Organics | 2.62E-11 | 3.68E-11 | 5.24E-11 | 3.68E-11 | 3.68E-11 | 7.87E-11 | 7.87E-11 |
| 86-73-7 | Fluorene | Organics | 5.22E-13 | 5.87E-14 | 2.86E-12 | 5.87E-14 | 5.87E-14 | 3.39E-12 | 3.39E-12 |
| 87-61-6 | 1,2,3-Trichlorobenzene | Organics | - | - | - | - | - | - | - |
| 87-68-3 | Hexachlorobutadiene | Organics | 3.80E-15 | 2.05E-26 | 2.49E-14 | 2.05E-26 | 2.05E-26 | 2.87E-14 | 2.87E-14 |
| 87-86-5 | Pentachlorophenol | Organics | 5.07E-14 | 5.08E-13 | 6.08E-14 | 5.08E-13 | 5.08E-13 | 1.11E-13 | 1.11E-13 |
| 88-06-2 | 2,4,6-Trichlorophenol | Organics | 5.86E-12 | 1.25E-12 | 1.48E-11 | 1.25E-12 | 1.25E-12 | 2.06E-11 | 2.06E-11 |
| 88-74-4 | o-Nitroaniline (2-nitroaniline) | Organics | 8.58E-13 | 2.00E-11 | 1.36E-12 | 2.00E-11 | 2.00E-11 | 2.22E-12 | 2.22E-12 |
| 88-75-5 | 2-Nitrophenol | Organics | 6.14E-12 | 2.70E-12 | 1.59E-11 | 2.70E-12 | 2.70E-12 | 2.20E-11 | 2.20E-11 |
| 90-04-0 | o-Anisidine | Organics | - | - | - | - | - | - | - |
| 90-12-0 | 1-Methylnaphthalene | Organics | - | - | - | - | - | - | - |
| 91-20-3 | Naphthalene | Organics | 2.00E-12 | 4.00E-13 | 1.30E-11 | 4.00E-13 | 4.00E-13 | 1.50E-11 | 1.50E-11 |
| 91-22-5 | Quinoline | Organics | - | - | - | - | - | - | - |
| 91-57-6 | 2-Methylnaphthalene | Organics | 1.62E-14 | 5.83E-14 | 2.56E-15 | 5.83E-14 | 5.83E-14 | 1.87E-14 | 1.87E-14 |
| 91-58-7 | 2-Chloronaphthalene | Organics | 5.54E-13 | 3.89E-17 | 3.62E-12 | 3.89E-17 | 3.89E-17 | 4.18E-12 | 4.18E-12 |
| 91-94-1 | 3,3'-Dichlorobenzidine | Organics | 4.39E-12 | 1.33E-10 | 5.59E-12 | 1.33E-10 | 1.33E-10 | 9.98E-12 | 9.98E-12 |
| 924-16-3 | N-Nitroso-di-n-Buetylamine | Organics | - | - | - | - | - | - | - |
| 92-52-4 | 1,1'-Biphenyl | Organics | 1.40E-15 | 1.07E-19 | 9.18E-15 | 1.07E-19 | 1.07E-19 | 1.06E-14 | 1.06E-14 |
| 94-59-7 | Safrole (5-(2-Propenyl)-1,3-benzodioxole) | Organics | - | - | - | - | - | - | - |
| 94-75-7 | 2,4-D | Organics | - | - | - | - | - | - | - |
| 95-48-7 | o-Cresol | Organics | 1.31E-11 | 1.05E-11 | 2.73E-11 | 1.05E-11 | 1.05E-11 | 4.04E-11 | 4.04E-11 |
| 95-49-8 | o-Chlorotoluene | Organics | - | - | - | - | - | - | - |
| 95-50-1 | 1,2-Dichlorobenzene | Organics | 5.79E-15 | 6.94E-23 | 3.80E-14 | 6.94E-23 | 6.94E-23 | 4.38E-14 | 4.38E-14 |
| 95-53-4 | o-Toluidine | Organics | - | - | - | - | - | - | - |
| 95-57-8 | 2-Chlorophenol | Organics | 2.02E-12 | 5.54E-17 | 1.32E-11 | 5.54E-17 | 5.54E-17 | 1.52E-11 | 1.52E-11 |

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| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|------------|--------------------------------|---------------|--|---|---|--|--|--|--|
| 95-63-6 | 1,2,4-Trimethyl benzene | Organics | - | - | - | - | - | - | - |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | Organics | - | - | - | - | - | - | - |
| 95-95-4 | 2,4,5-Trichlorophenol | Organics | 7.24E-12 | 2.37E-12 | 1.67E-11 | 2.37E-12 | 2.37E-12 | 2.39E-11 | 2.39E-11 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | Organics | - | - | - | - | - | - | - |
| 96-18-4 | 1,2,3-Trichloropropane | Organics | - | - | - | - | - | - | - |
| 96-45-7 | Ethylene thiourea | Organics | - | - | - | - | - | - | - |
| 97-63-2 | Ethyl methacrylate | Organics | - | - | - | - | - | - | - |
| 98-01-1 | Furfural | Organics | - | - | - | - | - | - | - |
| 98-06-6 | tert-Butyl benzene | Organics | - | - | - | - | - | - | - |
| 98-07-7 | Benzotrichloride | Organics | - | - | - | - | - | - | - |
| 98-82-8 | Cumene | Organics | 4.52E-13 | - | 2.96E-12 | - | - | 3.42E-12 | 3.42E-12 |
| 98-83-9 | Methyl styrene (mixed isomers) | Organics | - | - | - | - | - | - | - |
| 98-86-2 | Acetophenone | Organics | 5.12E-15 | 1.70E-15 | 1.29E-14 | 1.70E-15 | 1.70E-15 | 1.81E-14 | 1.81E-14 |
| 98-95-3 | Nitrobenzene | Organics | 1.15E-13 | 2.03E-13 | 1.55E-13 | 2.03E-13 | 2.03E-13 | 2.70E-13 | 2.70E-13 |
| 99-35-4 | 1,3,5-Trinitrobenzene | Organics | - | - | - | - | - | - | - |
| 99-65-0 | 1,3-Dinitrobenzene | Organics | - | - | - | - | - | - | - |
| 99-87-6 | p-Cymene | Organics | - | - | - | - | - | - | - |
| 10028-17-8 | Tritium | Radionuclides | 1.05E-15 | 1.07E-15 | 9.75E-16 | 1.07E-15 | 1.07E-15 | 2.02E-15 | 2.02E-15 |
| 10045-97-3 | Cesium-137 | Radionuclides | 3.04E-10 | 3.97E-14 | 8.42E-10 | 3.97E-14 | 2.00E-17 | 1.15E-09 | 9.13E-15 |
| 10098-91-6 | Yttrium-90 | Radionuclides | 6.85E-12 | 3.77E-12 | 7.62E-10 | 3.77E-12 | 1.90E-15 | 7.69E-10 | 6.92E-15 |
| 10098-97-2 | Strontium-90 | Radionuclides | 6.85E-12 | 3.79E-12 | 7.62E-10 | 3.79E-12 | 1.91E-15 | 7.69E-10 | 6.92E-15 |
| 10198-40-0 | Cobalt-60 | Radionuclides | 3.54E-17 | 7.13E-17 | 1.21E-15 | 7.13E-17 | 3.59E-20 | 1.25E-15 | 1.11E-20 |
| 13966-29-5 | Uranium-234 | Radionuclides | 5.44E-17 | 4.75E-15 | 5.42E-15 | 4.75E-15 | 2.38E-18 | 5.47E-15 | 4.92E-20 |
| 13967-48-1 | Ruthenium-106 | Radionuclides | 2.15E-25 | 5.94E-25 | 5.34E-24 | 5.94E-25 | 2.99E-28 | 5.55E-24 | 4.92E-29 |
| 13967-70-9 | Cesium-134 | Radionuclides | 8.00E-19 | 1.04E-22 | 2.11E-18 | 1.04E-22 | 5.24E-26 | 2.91E-18 | 2.31E-23 |
| 13968-55-3 | Uranium-233 | Radionuclides | 1.73E-16 | 6.78E-15 | 1.94E-14 | 6.78E-15 | 3.39E-18 | 1.96E-14 | 1.76E-19 |
| 13981-15-2 | Curium-244 | Radionuclides | 4.85E-17 | 8.38E-17 | 2.38E-15 | 8.38E-17 | 4.22E-20 | 2.42E-15 | 2.17E-20 |
| 13981-16-3 | Plutonium-238 | Radionuclides | 6.37E-16 | 4.43E-16 | 6.69E-14 | 4.43E-16 | 2.23E-19 | 6.76E-14 | 6.08E-19 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|-------------|------------------|---------------|--|---|---|--|--|--|--|
| 13981-37-8 | Nickel-63 | Radionuclides | 6.86E-14 | 1.43E-13 | 2.14E-12 | 1.43E-13 | 7.18E-17 | 2.21E-12 | 1.96E-17 |
| 13982-10-0 | Plutonium-242 | Radionuclides | 2.80E-19 | 7.38E-17 | 1.70E-17 | 7.38E-17 | 3.69E-20 | 1.73E-17 | 1.55E-22 |
| 13982-63-3 | Radium-226 | Radionuclides | 1.61E-12 | 9.64E-12 | 2.15E-12 | 9.64E-12 | 4.84E-15 | 3.76E-12 | 2.74E-17 |
| 13982-70-2 | Uranium-236 | Radionuclides | 1.57E-18 | 1.40E-14 | 1.52E-16 | 1.40E-14 | 7.02E-18 | 1.53E-16 | 1.38E-21 |
| 13994-20-2 | Neptunium-237 | Radionuclides | 1.25E-16 | 2.35E-13 | 4.86E-15 | 2.35E-13 | 1.17E-16 | 4.98E-15 | 4.45E-20 |
| 14119-32-5 | Plutonium-241 | Radionuclides | 2.42E-15 | 1.59E-15 | 2.57E-13 | 1.59E-15 | 8.01E-19 | 2.60E-13 | 2.33E-18 |
| 14119-33-6 | Plutonium-240 | Radionuclides | 2.14E-15 | 5.32E-15 | 2.30E-13 | 5.32E-15 | 2.67E-18 | 2.32E-13 | 2.09E-18 |
| 14133-76-7 | Technetium-99 | Radionuclides | 1.39E-13 | 3.93E-11 | 3.87E-13 | 3.93E-11 | 1.97E-14 | 5.25E-13 | 4.18E-18 |
| 14158-29-3 | Uranium-232 | Radionuclides | 2.35E-18 | 2.02E-18 | 2.27E-16 | 2.02E-18 | 1.02E-21 | 2.29E-16 | 2.06E-21 |
| 14234-35-6 | Antimony-125 | Radionuclides | 3.45E-18 | 1.19E-17 | 3.25E-17 | 1.19E-17 | 5.97E-21 | 3.60E-17 | 3.11E-22 |
| 14331-85-2 | Protactinium-231 | Radionuclides | 1.12E-17 | 4.20E-16 | 1.45E-16 | 4.20E-16 | 2.10E-19 | 1.56E-16 | 1.37E-21 |
| 14336-70-0 | Nickel-59 | Radionuclides | 1.14E-15 | 2.29E-14 | 3.36E-14 | 2.29E-14 | 1.15E-17 | 3.48E-14 | 3.09E-19 |
| 14391-16-3 | Europium-155 | Radionuclides | 8.76E-17 | 9.09E-17 | 7.55E-15 | 9.09E-17 | 4.58E-20 | 7.63E-15 | 6.86E-20 |
| 14596-10-2 | Americium-241 | Radionuclides | 6.67E-14 | 6.59E-14 | 6.58E-12 | 6.59E-14 | 3.31E-17 | 6.65E-12 | 5.98E-17 |
| 14683-23-9 | Europium-152 | Radionuclides | 2.69E-16 | 5.00E-16 | 1.15E-14 | 5.00E-16 | 2.52E-19 | 1.18E-14 | 1.05E-19 |
| 14762-75-5 | Carbon-14 | Radionuclides | 3.08E-15 | 8.04E-15 | 1.05E-15 | 8.04E-15 | 4.02E-18 | 4.13E-15 | 2.07E-20 |
| 14952-40-0 | Actinium-227 | Radionuclides | 8.57E-18 | 1.96E-17 | 1.62E-16 | 1.96E-17 | 9.89E-21 | 1.71E-16 | 1.51E-21 |
| 14993-75-0 | Americium-243 | Radionuclides | 2.93E-17 | 1.10E-16 | 2.85E-15 | 1.10E-16 | 5.49E-20 | 2.88E-15 | 2.59E-20 |
| 15046-84-1 | Iodine-129 | Radionuclides | 1.35E-16 | 2.56E-16 | 7.52E-17 | 2.56E-16 | 1.28E-19 | 2.10E-16 | 1.05E-21 |
| 15117-48-3 | Plutonium-239 | Radionuclides | 1.01E-14 | 7.69E-14 | 1.08E-12 | 7.69E-14 | 3.84E-17 | 1.09E-12 | 9.81E-18 |
| 15117-96-1 | Uranium-235 | Radionuclides | 2.10E-18 | 5.24E-13 | 2.08E-16 | 5.24E-13 | 2.62E-16 | 2.10E-16 | 1.89E-21 |
| 15262-20-1 | Radium-228 | Radionuclides | 2.54E-18 | 3.23E-18 | 3.10E-16 | 3.23E-18 | 1.63E-21 | 3.13E-16 | 2.81E-21 |
| 15510-73-3 | Curium-242 | Radionuclides | 4.76E-17 | 8.64E-17 | 2.10E-15 | 8.64E-17 | 4.35E-20 | 2.15E-15 | 1.92E-20 |
| 15585-10-1 | Europium-154 | Radionuclides | 1.32E-15 | 1.46E-15 | 1.09E-13 | 1.46E-15 | 7.34E-19 | 1.11E-13 | 9.93E-19 |
| 15594-54-4 | Thorium-229 | Radionuclides | 8.52E-19 | 5.14E-18 | 5.61E-17 | 5.14E-18 | 2.57E-21 | 5.70E-17 | 5.11E-22 |
| 15715-94-3 | Samarium-151 | Radionuclides | 1.29E-12 | 2.41E-12 | 5.67E-11 | 2.41E-12 | 1.21E-15 | 5.80E-11 | 5.18E-16 |
| 15751-77-6 | Zirconium-93 | Radionuclides | 5.77E-15 | 3.90E-12 | 5.42E-14 | 3.90E-12 | 1.95E-15 | 6.00E-14 | 5.18E-19 |
| 15757-87-6 | Curium-243 | Radionuclides | 3.99E-18 | 7.04E-18 | 1.90E-16 | 7.04E-18 | 3.54E-21 | 1.94E-16 | 1.73E-21 |
| 15758-45-9 | Selenium-79 | Radionuclides | 3.66E-15 | 1.45E-13 | 6.87E-15 | 1.45E-13 | 7.24E-17 | 1.05E-14 | 8.02E-20 |
| 15832-50-5 | Tin-126 | Radionuclides | 3.67E-15 | 2.36E-13 | 2.27E-14 | 2.36E-13 | 1.18E-16 | 2.64E-14 | 2.24E-19 |
| 378253-40-8 | Barium-137m | Radionuclides | 2.88E-10 | 3.73E-14 | 7.97E-10 | 3.73E-14 | 1.88E-17 | 1.08E-09 | 8.63E-15 |
| 378253-44-2 | Cadmium-113m | Radionuclides | 1.79E-15 | 4.56E-15 | 1.14E-14 | 4.56E-15 | 2.29E-18 | 1.32E-14 | 1.12E-19 |

Table D-2 Baseline WTP Operating Configuration, Analytical Laboratory Emissions Estimate

| CASRN | Chemical | Type | PT Sample Unabated Release (g/s or Ci/s) | LAW Sample Unabated Release (g/s or Ci/s) | HLW Sample Unabated Release (g/s or Ci/s) | Total LB-S1 Unabated Emissions (g/s or Ci/s) | Total LB-S1 Abated Emissions (g/s or Ci/s) | Total LB-S2 Unabated Emissions (g/s or Ci/s) | Total LB-S2 Abated Emissions (g/s or Ci/s) |
|--------------|-----------------|---------------|---|--|--|---|---|---|---|
| 378782-82-2 | Niobium-93m | Radionuclides | 6.20E-15 | 1.53E-14 | 5.86E-14 | 1.53E-14 | 7.71E-18 | 6.48E-14 | 5.60E-19 |
| 7440-29-1 | Thorium-232 | Radionuclides | 2.43E-18 | 1.24E-11 | 2.36E-16 | 1.24E-11 | 6.21E-15 | 2.39E-16 | 2.14E-21 |
| 7440-61-1R | Uranium-238 | Radionuclides | 6.13E-17 | 1.03E-10 | 5.94E-15 | 1.03E-10 | 5.16E-14 | 6.00E-15 | 5.39E-20 |

¹ Includes the contribution of laser ablation samples, see Table D-4.

Table D-3 shows the contribution of laser ablation samples to be emitted through LB-S1 from the ARL in the DFLAW operating configuration. The table lists the COPCs predicted to be present in vitrified waste. The contribution of these samples is included in the unabated Lab emissions and abated emissions shown in Table D-2.

Table D-3 DFLAW Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) |
|------------|-------------------|----------------------|--|--|---|
| 14797-65-0 | Nitrite | 3.47E-02 | 2.22E-02 | 7.04E-08 | 3.52E-11 |
| 16887-00-6 | Chloride | 2.65E-03 | 1.69E-03 | 5.38E-09 | 2.69E-12 |
| 16984-48-8 | Fluoride | 5.28E-04 | 3.37E-04 | 1.07E-09 | 5.35E-13 |
| 18540-29-9 | Chromium VI | 3.22E-04 | 2.05E-04 | 6.51E-10 | 3.26E-13 |
| 57-12-5 | Cyanide | 9.36E-07 | 5.97E-07 | 1.90E-12 | 9.48E-16 |
| 7429-90-5 | Aluminum | 1.30E-02 | 8.32E-03 | 2.64E-08 | 1.32E-11 |
| 7439-92-1 | Lead | 7.72E-05 | 4.93E-05 | 1.56E-10 | 7.82E-14 |
| 7439-93-2 | Lithium | 3.30E-06 | 2.10E-06 | 6.68E-12 | 3.34E-15 |
| 7439-95-4 | Magnesium | 3.60E-03 | 2.30E-03 | 7.29E-09 | 3.64E-12 |
| 7439-96-5 | Manganese | 4.18E-05 | 2.67E-05 | 8.46E-11 | 4.23E-14 |
| 7439-98-7 | Molybdenum | 1.04E-05 | 6.63E-06 | 2.10E-11 | 1.05E-14 |
| 7440-02-0 | Nickel | 3.66E-05 | 2.34E-05 | 7.41E-11 | 3.71E-14 |
| 7440-16-6 | Rhodium | 2.56E-12 | 1.63E-12 | 5.18E-18 | 2.59E-21 |
| 7440-22-4 | Silver | 3.27E-07 | 2.09E-07 | 6.62E-13 | 3.31E-16 |
| 7440-23-5 | Sodium | 5.38E-02 | 3.44E-02 | 1.09E-07 | 5.45E-11 |
| 7440-24-6 | Strontium (total) | 3.34E-08 | 2.13E-08 | 6.77E-14 | 3.39E-17 |
| 7440-25-7 | Tantalum | 5.14E-12 | 3.28E-12 | 1.04E-17 | 5.20E-21 |
| 7440-28-0 | Thallium | 3.18E-11 | 2.03E-11 | 6.45E-17 | 3.22E-20 |
| 7440-33-7 | Tungsten | 1.85E-05 | 1.18E-05 | 3.75E-11 | 1.87E-14 |
| 7440-36-0 | Antimony | 7.59E-06 | 4.84E-06 | 1.54E-11 | 7.69E-15 |
| 7440-38-2 | Arsenic | 1.02E-05 | 6.48E-06 | 2.06E-11 | 1.03E-14 |

Table D-3 DFLAW Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) |
|------------|---------------|----------------------|--|--|---|
| 7440-39-3 | Barium | 4.31E-09 | 2.75E-09 | 8.72E-15 | 4.36E-18 |
| 7440-41-7 | Beryllium | 4.63E-07 | 2.96E-07 | 9.38E-13 | 4.69E-16 |
| 7440-43-9 | Cadmium | 2.60E-06 | 1.66E-06 | 5.27E-12 | 2.63E-15 |
| 7440-48-4 | Cobalt | 7.32E-11 | 4.67E-11 | 1.48E-16 | 7.41E-20 |
| 7440-50-8 | Copper | 5.89E-07 | 3.76E-07 | 1.19E-12 | 5.97E-16 |
| 7440-61-1 | Uranium | 9.98E-06 | 6.37E-06 | 2.02E-11 | 1.01E-14 |
| 7440-62-2 | Vanadium | 1.44E-05 | 9.20E-06 | 2.92E-11 | 1.46E-14 |
| 7440-65-5 | Yttrium | 4.24E-08 | 2.71E-08 | 8.59E-14 | 4.30E-17 |
| 7440-66-6 | Zinc | 1.14E-02 | 7.25E-03 | 2.30E-08 | 1.15E-11 |
| 7440-67-7 | Zirconium | 8.10E-03 | 5.17E-03 | 1.64E-08 | 8.20E-12 |
| 7782-49-2 | Selenium | 1.30E-05 | 8.29E-06 | 2.63E-11 | 1.32E-14 |
| 10045-97-3 | Cesium-137 | 9.42E-11 | 6.01E-11 | 1.66E-14 | 8.30E-18 |
| 10098-91-6 | Yttrium-90 | 3.56E-13 | 2.27E-13 | 3.89E-13 | 1.95E-16 |
| 10098-97-2 | Strontium-90 | 1.37E-09 | 8.76E-10 | 3.89E-13 | 1.95E-16 |
| 10198-40-0 | Cobalt-60 | 8.27E-20 | 5.28E-20 | 1.84E-22 | 9.21E-26 |
| 13966-29-5 | Uranium-234 | 5.96E-10 | 3.80E-10 | 7.49E-18 | 3.74E-21 |
| 13967-48-1 | Ruthenium-106 | 1.47E-19 | 9.40E-20 | 9.85E-22 | 4.92E-25 |
| 13967-70-9 | Cesium-134 | 9.14E-19 | 5.84E-19 | 2.41E-21 | 1.20E-24 |
| 13968-55-3 | Uranium-233 | 1.31E-09 | 8.35E-10 | 2.57E-17 | 1.29E-20 |
| 13981-15-2 | Curium-244 | 5.19E-12 | 3.31E-12 | 8.52E-16 | 4.26E-19 |
| 13981-16-3 | Plutonium-238 | 3.05E-12 | 1.94E-12 | 1.05E-16 | 5.25E-20 |
| 13981-37-8 | Nickel-63 | 2.51E-11 | 1.60E-11 | 2.90E-15 | 1.45E-18 |
| 13982-10-0 | Plutonium-242 | 1.06E-11 | 6.74E-12 | 8.34E-20 | 4.17E-23 |
| 13982-63-3 | Radium-226 | 2.55E-14 | 1.63E-14 | 5.16E-20 | 2.58E-23 |

Table D-3 DFLAW Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) |
|------------|------------------|----------------------|--|--|---|
| 13982-70-2 | Uranium-236 | 1.90E-09 | 1.21E-09 | 2.50E-19 | 1.25E-22 |
| 13994-20-2 | Neptunium-237 | 5.12E-08 | 3.27E-08 | 7.36E-17 | 3.68E-20 |
| 14119-32-5 | Plutonium-241 | 7.06E-12 | 4.51E-12 | 1.43E-15 | 7.15E-19 |
| 14119-33-6 | Plutonium-240 | 1.19E-09 | 7.58E-10 | 5.53E-16 | 2.77E-19 |
| 14133-76-7 | Technetium-99 | 8.26E-06 | 5.27E-06 | 2.84E-13 | 1.42E-16 |
| 14158-29-3 | Uranium-232 | 1.04E-14 | 6.66E-15 | 4.65E-19 | 2.32E-22 |
| 14234-35-6 | Antimony-125 | 2.04E-13 | 1.30E-13 | 4.13E-16 | 2.06E-19 |
| 14331-85-2 | Protactinium-231 | 1.11E-17 | 7.07E-18 | 1.05E-24 | 5.27E-28 |
| 14336-70-0 | Nickel-59 | 2.37E-10 | 1.51E-10 | 3.84E-17 | 1.92E-20 |
| 14391-16-3 | Europium-155 | 8.72E-19 | 5.56E-19 | 8.65E-22 | 4.33E-25 |
| 14596-10-2 | Americium-241 | 1.93E-09 | 1.23E-09 | 1.33E-14 | 6.65E-18 |
| 14683-23-9 | Europium-152 | 1.14E-18 | 7.26E-19 | 4.15E-22 | 2.07E-25 |
| 14952-40-0 | Actinium-227 | 5.21E-14 | 3.33E-14 | 7.61E-18 | 3.80E-21 |
| 14993-75-0 | Americium-243 | 1.91E-11 | 1.22E-11 | 7.75E-18 | 3.88E-21 |
| 15117-48-3 | Plutonium-239 | 1.87E-08 | 1.19E-08 | 2.35E-15 | 1.17E-18 |
| 15117-96-1 | Uranium-235 | 6.95E-08 | 4.44E-08 | 3.10E-19 | 1.55E-22 |
| 15262-20-1 | Radium-228 | 5.65E-15 | 3.61E-15 | 3.09E-18 | 1.55E-21 |
| 15510-73-3 | Curium-242 | 1.03E-13 | 6.60E-14 | 6.92E-16 | 3.46E-19 |
| 15585-10-1 | Europium-154 | 4.25E-18 | 2.71E-18 | 2.24E-21 | 1.12E-24 |
| 15594-54-4 | Thorium-229 | 1.23E-18 | 7.87E-19 | 5.24E-25 | 2.62E-28 |
| 15715-94-3 | Samarium-151 | 4.42E-14 | 2.82E-14 | 2.33E-18 | 1.16E-21 |
| 15751-77-6 | Zirconium-93 | 1.86E-12 | 1.19E-12 | 9.40E-21 | 4.70E-24 |
| 15757-87-6 | Curium-243 | 4.82E-13 | 3.08E-13 | 5.08E-17 | 2.54E-20 |
| 15758-45-9 | Selenium-79 | 2.53E-08 | 1.61E-08 | 3.59E-15 | 1.79E-18 |

Table D-3 DFLAW Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) |
|-------------|--------------|-------------------|--|--|--|
| 15832-50-5 | Tin-126 | 4.85E-08 | 3.09E-08 | 2.75E-15 | 1.37E-18 |
| 378253-40-8 | Barium-137m | 1.44E-17 | 9.20E-18 | 1.57E-14 | 7.85E-18 |
| 378253-44-2 | Cadmium-113m | 1.04E-11 | 6.64E-12 | 4.63E-15 | 2.32E-18 |
| 378782-82-2 | Niobium-93m | 1.76E-17 | 1.12E-17 | 8.54E-21 | 4.27E-24 |
| 7440-29-1 | Thorium-232 | 5.25E-12 | 3.35E-12 | 1.17E-24 | 5.85E-28 |
| 7440-61-1R | Uranium-238 | 9.91E-06 | 6.33E-06 | 6.83E-18 | 3.41E-21 |

Table D-4 shows the contribution of laser ablation samples in the baseline WTP operating configuration. The table lists the COPCs predicted to be present in vitrified waste (e.g., non-zero COPCs in process stream LMP09 and HMP09), their respective mass fractions in process stream LFP04 and HFP03, the adjusted mass fraction in the glass coupon (proportioned by the stream density to the glass density, see Section 5.5), the amount of COPC released, and that amount after abatement by the HEPA filters. The contribution of these samples is included in the unabated Lab emissions and abated emissions shown in Table D-2.

Table D-4 Baseline WTP Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) | HFP03 Melter Feed | IHLW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S2 IHLW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S2 IHLW Glass Coupon Abated Release (g/s or Ci/s) |
|------------|-------------|-------------------|--|--|--|-------------------|--|--|--|
| 14797-65-0 | Nitrite | 1.79E-02 | 9.63E-03 | 1.22E-07 | 6.12E-13 | 4.97E-03 | 2.59E-03 | 7.67E-08 | 3.83E-13 |
| 16887-00-6 | Chloride | 1.84E-03 | 9.87E-04 | 1.25E-08 | 6.27E-14 | 2.87E-04 | 1.50E-04 | 4.43E-09 | 2.21E-14 |
| 16984-48-8 | Fluoride | 3.39E-03 | 1.82E-03 | 2.32E-08 | 1.16E-13 | 2.12E-03 | 1.11E-03 | 3.27E-08 | 1.64E-13 |
| 18540-29-9 | Chromium VI | 3.02E-04 | 1.62E-04 | 2.06E-09 | 1.03E-14 | 8.36E-04 | 4.36E-04 | 1.29E-08 | 6.45E-14 |
| 57-12-5 | Cyanide | 1.78E-07 | 9.55E-08 | 1.21E-12 | 6.07E-18 | 2.05E-06 | 1.07E-06 | 3.16E-11 | 1.58E-16 |
| 7429-90-5 | Aluminum | 1.59E-02 | 8.57E-03 | 1.09E-07 | 5.45E-13 | 1.50E-02 | 7.84E-03 | 2.32E-07 | 1.16E-12 |

Table D-4 Baseline WTP Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) | HFP03 Melter Feed | IHLW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S2 IHLW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S2 IHLW Glass Coupon Abated Release (g/s or Ci/s) |
|-----------|-------------------|-------------------|--|--|--|-------------------|--|--|--|
| 7439-92-1 | Lead | 1.02E-05 | 5.47E-06 | 6.94E-11 | 3.47E-16 | 1.69E-04 | 8.79E-05 | 2.60E-09 | 1.30E-14 |
| 7439-93-2 | Lithium | 5.49E-03 | 2.95E-03 | 3.75E-08 | 1.87E-13 | 7.87E-03 | 4.10E-03 | 1.21E-07 | 6.07E-13 |
| 7439-95-4 | Magnesium | 4.43E-03 | 2.38E-03 | 3.03E-08 | 1.51E-13 | 1.02E-04 | 5.30E-05 | 1.57E-09 | 7.84E-15 |
| 7439-96-5 | Manganese | 6.97E-05 | 3.75E-05 | 4.76E-10 | 2.38E-15 | 3.99E-04 | 2.08E-04 | 6.16E-09 | 3.08E-14 |
| 7439-98-7 | Molybdenum | 4.60E-06 | 2.47E-06 | 3.14E-11 | 1.57E-16 | 8.76E-06 | 4.57E-06 | 1.35E-10 | 6.76E-16 |
| 7440-02-0 | Nickel | 6.04E-05 | 3.25E-05 | 4.13E-10 | 2.06E-15 | 2.39E-04 | 1.25E-04 | 3.70E-09 | 1.85E-14 |
| 7440-16-6 | Rhodium | 3.91E-07 | 2.10E-07 | 2.67E-12 | 1.34E-17 | 1.55E-06 | 8.08E-07 | 2.39E-11 | 1.20E-16 |
| 7440-22-4 | Silver | 4.77E-07 | 2.57E-07 | 3.26E-12 | 1.63E-17 | 7.93E-06 | 4.14E-06 | 1.22E-10 | 6.12E-16 |
| 7440-23-5 | Sodium | 5.41E-02 | 2.91E-02 | 3.70E-07 | 1.85E-12 | 2.83E-02 | 1.48E-02 | 4.37E-07 | 2.18E-12 |
| 7440-24-6 | Strontium (total) | 7.91E-06 | 4.26E-06 | 5.41E-11 | 2.70E-16 | 9.98E-05 | 5.21E-05 | 1.54E-09 | 7.70E-15 |
| 7440-25-7 | Tantalum | 2.93E-07 | 1.58E-07 | 2.00E-12 | 1.00E-17 | 2.03E-07 | 1.06E-07 | 3.14E-12 | 1.57E-17 |
| 7440-28-0 | Thallium | 2.97E-06 | 1.59E-06 | 2.03E-11 | 1.01E-16 | 1.57E-05 | 8.20E-06 | 2.43E-10 | 1.21E-15 |
| 7440-33-7 | Tungsten | 1.14E-06 | 6.14E-07 | 7.80E-12 | 3.90E-17 | 7.18E-06 | 3.75E-06 | 1.11E-10 | 5.54E-16 |
| 7440-36-0 | Antimony | 2.11E-06 | 1.13E-06 | 1.44E-11 | 7.19E-17 | 5.47E-06 | 2.85E-06 | 8.44E-11 | 4.22E-16 |
| 7440-38-2 | Arsenic | 2.10E-06 | 1.13E-06 | 1.43E-11 | 7.16E-17 | 8.24E-06 | 4.30E-06 | 1.27E-10 | 6.36E-16 |
| 7440-39-3 | Barium | 3.75E-07 | 2.02E-07 | 2.56E-12 | 1.28E-17 | 1.94E-05 | 1.01E-05 | 2.99E-10 | 1.49E-15 |
| 7440-41-7 | Beryllium | 8.78E-08 | 4.72E-08 | 6.00E-13 | 3.00E-18 | 9.41E-07 | 4.91E-07 | 1.45E-11 | 7.26E-17 |
| 7440-43-9 | Cadmium | 2.40E-06 | 1.29E-06 | 1.64E-11 | 8.18E-17 | 1.74E-05 | 9.08E-06 | 2.69E-10 | 1.34E-15 |
| 7440-48-4 | Cobalt | 4.56E-07 | 2.45E-07 | 3.11E-12 | 1.56E-17 | 2.79E-06 | 1.46E-06 | 4.31E-11 | 2.16E-16 |
| 7440-50-8 | Copper | 6.36E-07 | 3.42E-07 | 4.34E-12 | 2.17E-17 | 5.53E-06 | 2.88E-06 | 8.53E-11 | 4.26E-16 |
| 7440-61-1 | Uranium | 1.21E-05 | 6.52E-06 | 8.28E-11 | 4.14E-16 | 9.17E-04 | 4.78E-04 | 1.42E-08 | 7.08E-14 |
| 7440-62-2 | Vanadium | 1.81E-05 | 9.73E-06 | 1.24E-10 | 6.18E-16 | 4.92E-06 | 2.57E-06 | 7.59E-11 | 3.80E-16 |
| 7440-65-5 | Yttrium | 1.91E-07 | 1.03E-07 | 1.31E-12 | 6.53E-18 | 9.87E-07 | 5.15E-07 | 1.52E-11 | 7.62E-17 |
| 7440-66-6 | Zinc | 1.39E-02 | 7.46E-03 | 9.47E-08 | 4.74E-13 | 2.56E-03 | 1.34E-03 | 3.96E-08 | 1.98E-13 |
| 7440-67-7 | Zirconium | 9.89E-03 | 5.32E-03 | 6.76E-08 | 3.38E-13 | 2.26E-03 | 1.18E-03 | 3.49E-08 | 1.75E-13 |
| 7782-49-2 | Selenium | 8.26E-06 | 4.44E-06 | 5.64E-11 | 2.82E-16 | 2.76E-06 | 1.44E-06 | 4.26E-11 | 2.13E-16 |

Table D-4 Baseline WTP Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) | HFP03 Melter Feed | IHLW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S2 IHLW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S2 IHLW Glass Coupon Abated Release (g/s or Ci/s) |
|------------|------------------|-------------------------|---|--|---|-------------------------|---|---|--|
| 10045-97-3 | Cesium-137 | 4.56E-11 | 2.45E-11 | 3.12E-16 | 1.36E-19 | 5.05E-07 | 2.64E-07 | 6.79E-10 | 3.39E-15 |
| 10098-91-6 | Yttrium-90 | 7.06E-13 | 3.80E-13 | 4.82E-18 | 1.30E-17 | 7.37E-11 | 3.84E-11 | 6.14E-10 | 3.07E-15 |
| 10098-97-2 | Strontium-90 | 2.72E-09 | 1.46E-09 | 1.86E-14 | 1.30E-17 | 2.84E-07 | 1.48E-07 | 6.14E-10 | 3.07E-15 |
| 10198-40-0 | Cobalt-60 | 6.55E-15 | 3.52E-15 | 4.47E-20 | 2.46E-22 | 5.76E-14 | 3.01E-14 | 9.78E-16 | 4.89E-21 |
| 13966-29-5 | Uranium-234 | 6.90E-10 | 3.71E-10 | 4.71E-15 | 1.46E-22 | 4.56E-08 | 2.38E-08 | 4.37E-15 | 2.18E-20 |
| 13967-48-1 | Ruthenium-106 | 1.82E-23 | 9.78E-24 | 1.24E-28 | 2.05E-30 | 8.42E-23 | 4.39E-23 | 4.29E-24 | 2.14E-29 |
| 13967-70-9 | Cesium-134 | 8.06E-21 | 4.33E-21 | 5.50E-26 | 3.58E-28 | 8.47E-17 | 4.42E-17 | 1.70E-18 | 8.50E-24 |
| 13968-55-3 | Uranium-233 | 9.79E-10 | 5.26E-10 | 6.69E-15 | 3.24E-22 | 1.04E-07 | 5.44E-08 | 1.56E-14 | 7.81E-20 |
| 13981-15-2 | Curium-244 | 1.04E-13 | 5.57E-14 | 7.08E-19 | 2.87E-22 | 1.53E-12 | 7.98E-13 | 1.91E-15 | 9.57E-21 |
| 13981-16-3 | Plutonium-238 | 2.53E-12 | 1.36E-12 | 1.73E-17 | 1.47E-21 | 2.06E-10 | 1.07E-10 | 5.39E-14 | 2.70E-19 |
| 13981-37-8 | Nickel-63 | 2.50E-10 | 1.34E-10 | 1.71E-15 | 4.87E-19 | 1.96E-09 | 1.02E-09 | 1.72E-12 | 8.61E-18 |
| 13982-10-0 | Plutonium-242 | 1.07E-11 | 5.78E-12 | 7.34E-17 | 1.43E-24 | 2.28E-10 | 1.19E-10 | 1.37E-17 | 6.87E-23 |
| 13982-63-3 | Radium-226 | 5.75E-07 | 3.09E-07 | 3.93E-12 | 1.97E-17 | 1.12E-07 | 5.85E-08 | 1.73E-12 | 8.65E-18 |
| 13982-70-2 | Uranium-236 | 2.06E-09 | 1.11E-09 | 1.40E-14 | 4.56E-24 | 1.22E-07 | 6.36E-08 | 1.22E-16 | 6.12E-22 |
| 13994-20-2 | Neptunium-237 | 3.43E-08 | 1.85E-08 | 2.34E-13 | 8.32E-22 | 3.57E-07 | 1.86E-07 | 3.91E-15 | 1.96E-20 |
| 14119-32-5 | Plutonium-241 | 1.60E-12 | 8.59E-13 | 1.09E-17 | 5.46E-21 | 1.34E-10 | 7.00E-11 | 2.07E-13 | 1.04E-18 |
| 14119-33-6 | Plutonium-240 | 5.85E-10 | 3.14E-10 | 3.99E-15 | 4.59E-21 | 5.22E-08 | 2.72E-08 | 1.85E-13 | 9.26E-19 |
| 14133-76-7 | Technetium-99 | 5.61E-06 | 3.02E-06 | 3.83E-11 | 3.26E-18 | 1.18E-06 | 6.18E-07 | 3.11E-13 | 1.55E-18 |
| 14158-29-3 | Uranium-232 | 9.01E-15 | 4.84E-15 | 6.15E-20 | 6.77E-24 | 5.37E-13 | 2.80E-13 | 1.82E-16 | 9.12E-22 |
| 14234-35-6 | Antimony-125 | 1.19E-15 | 6.42E-16 | 8.16E-21 | 4.08E-23 | 1.70E-15 | 8.85E-16 | 2.62E-17 | 1.31E-22 |
| 14331-85-2 | Protactinium-231 | 5.75E-11 | 3.09E-11 | 3.93E-16 | 9.23E-23 | 1.61E-10 | 8.40E-11 | 1.17E-16 | 5.84E-22 |
| 14336-70-0 | Nickel-59 | 3.01E-09 | 1.62E-09 | 2.05E-14 | 8.21E-21 | 2.19E-08 | 1.14E-08 | 2.71E-14 | 1.36E-19 |
| 14391-16-3 | Europium-155 | 1.87E-14 | 1.01E-14 | 1.28E-19 | 3.13E-22 | 8.04E-13 | 4.19E-13 | 6.08E-15 | 3.04E-20 |
| 14596-10-2 | Americium-241 | 1.63E-09 | 8.75E-10 | 1.11E-14 | 1.89E-19 | 1.01E-07 | 5.27E-08 | 5.30E-12 | 2.65E-17 |
| 14683-23-9 | Europium-152 | 2.79E-13 | 1.50E-13 | 1.91E-18 | 1.72E-21 | 3.34E-12 | 1.74E-12 | 9.29E-15 | 4.64E-20 |
| 14952-40-0 | Actinium-227 | 2.73E-14 | 1.47E-14 | 1.87E-19 | 6.72E-23 | 1.18E-13 | 6.14E-14 | 1.31E-16 | 6.54E-22 |

Table D-4 Baseline WTP Operating Configuration Mass Released by Laser Ablation

| CASRN | Chemical | LFP04 Melter Feed | ILAW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S1 ILAW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S1 ILAW Glass Coupon Abated Release (g/s or Ci/s) | HFP03 Melter Feed | IHLW Glass Coupon Mass Fraction (adjusted for glass density) | LB-S2 IHLW Glass Coupon Unabated Release (g/s or Ci/s) | LB-S2 IHLW Glass Coupon Abated Release (g/s or Ci/s) |
|-------------|---------------|-------------------|--|--|--|-------------------|--|--|--|
| 14993-75-0 | Americium-243 | 1.24E-11 | 6.69E-12 | 8.50E-17 | 8.50E-23 | 7.45E-10 | 3.88E-10 | 2.30E-15 | 1.15E-20 |
| 15117-48-3 | Plutonium-239 | 1.03E-08 | 5.55E-09 | 7.05E-14 | 2.19E-20 | 9.10E-07 | 4.75E-07 | 8.71E-13 | 4.36E-18 |
| 15117-96-1 | Uranium-235 | 7.67E-08 | 4.12E-08 | 5.24E-13 | 5.76E-24 | 4.93E-06 | 2.57E-06 | 1.67E-16 | 8.37E-22 |
| 15262-20-1 | Radium-228 | 1.20E-15 | 6.46E-16 | 8.21E-21 | 1.11E-23 | 6.00E-14 | 3.13E-14 | 2.50E-16 | 1.25E-21 |
| 15510-73-3 | Curium-242 | 2.65E-15 | 1.42E-15 | 1.81E-20 | 2.98E-22 | 3.32E-14 | 1.73E-14 | 1.69E-15 | 8.45E-21 |
| 15585-10-1 | Europium-154 | 5.65E-13 | 3.04E-13 | 3.86E-18 | 5.02E-21 | 2.19E-11 | 1.14E-11 | 8.80E-14 | 4.40E-19 |
| 15594-54-4 | Thorium-229 | 5.77E-13 | 3.10E-13 | 3.94E-18 | 4.14E-24 | 1.39E-11 | 7.28E-12 | 4.52E-17 | 2.26E-22 |
| 15715-94-3 | Samarium-151 | 9.12E-09 | 4.90E-09 | 6.23E-14 | 8.10E-18 | 1.14E-07 | 5.94E-08 | 4.57E-11 | 2.28E-16 |
| 15751-77-6 | Zirconium-93 | 5.69E-07 | 3.06E-07 | 3.89E-12 | 4.86E-20 | 1.13E-06 | 5.91E-07 | 4.37E-14 | 2.18E-19 |
| 15757-87-6 | Curium-243 | 1.35E-14 | 7.26E-15 | 9.22E-20 | 2.40E-23 | 1.91E-13 | 9.94E-14 | 1.53E-16 | 7.65E-22 |
| 15758-45-9 | Selenium-79 | 1.92E-08 | 1.03E-08 | 1.31E-13 | 4.60E-20 | 5.11E-09 | 2.67E-09 | 5.52E-15 | 2.76E-20 |
| 15832-50-5 | Tin-126 | 3.32E-08 | 1.78E-08 | 2.27E-13 | 3.17E-20 | 4.24E-08 | 2.21E-08 | 1.83E-14 | 9.16E-20 |
| 378253-40-8 | Barium-137m | 6.98E-18 | 3.75E-18 | 4.77E-23 | 1.28E-19 | 7.73E-14 | 4.03E-14 | 6.42E-10 | 3.21E-15 |
| 378253-44-2 | Cadmium-113m | 2.09E-12 | 1.12E-12 | 1.43E-17 | 1.57E-20 | 2.71E-12 | 1.41E-12 | 9.20E-15 | 4.60E-20 |
| 378782-82-2 | Niobium-93m | 6.43E-12 | 3.46E-12 | 4.40E-17 | 5.27E-20 | 1.27E-11 | 6.65E-12 | 4.72E-14 | 2.36E-19 |
| 7440-29-1 | Thorium-232 | 1.82E-06 | 9.77E-07 | 1.24E-11 | 6.83E-24 | 1.12E-04 | 5.85E-05 | 1.90E-16 | 9.51E-22 |
| 7440-61-1R | Uranium-238 | 1.51E-05 | 8.12E-06 | 1.03E-10 | 1.75E-22 | 9.12E-04 | 4.76E-04 | 4.79E-15 | 2.39E-20 |

Example Incorporating Laser Ablation

As briefly described in Section 7, the previous tables were assembled by combining data in Appendix A through Appendix C. For example, Table A-5 provides a summation by representative process stream of the annual sample quantities in Table A-4. The total quantity annually associated with stream HFP03 is 61.56 L. Equation 2 can be used to compute the mass released shown in Table A-5.

$$Q = 61560 \frac{\text{mL}}{\text{yr}} \cdot 1251.94 \frac{\text{kg}}{\text{m}^3} \cdot 0.001 \cdot \frac{10^{-6} \text{ m}^3/\text{mL} \cdot 10^3 \text{ g/kg}}{31536000 \text{ sec/yr}} = 2.44\text{E-}06 \frac{\text{g}}{\text{s}}$$

The mass release rate for ⁹⁰Sr attributed to the HLW Facility also includes the samples PT 13, HLW 2a (initial), HLW 2b (final), HLW 2c (A & B), HLW 3, HLW 4, as shown in Table A-4. Although sample PT 13 (HLW Feed Blending Vessel) is associated with the PT Facility, it is

included with samples associated with the HLW Facility since stream HLP09 is used to characterize it. These samples are represented by process streams HCP01, HFP03, RLD62, and HLP09, as shown in Table A-4.

Expanding Equation 3 for ^{90}Sr , and subscripting variables for identification, yields the following when total mass release rates, by representative process stream, are used:

$$Q_{\text{Sr-90}} = Q_{\text{HLP09}} \cdot MF_{\text{Sr-90}_{\text{HLP09}}} + Q_{\text{HCP01}} \cdot MF_{\text{Sr-90}_{\text{HCP01}}} + Q_{\text{HFP03}} \cdot MF_{\text{Sr-90}_{\text{HFP03}}} + Q_{\text{RLD62}} \cdot MF_{\text{Sr-90}_{\text{RLD62}}}$$

The above equation represents the majority of ^{90}Sr mass release from samples PT 13 (HLP09), HLW 2a-initial (HCP01), HLW 2b-final, HLW 2cA and -2cB (HFP03), and HLW 3 and HLW 4 (RLD62). Note that although *WTP Analytical Laboratory Sample Inventory* (24590-WTP-RPT-PR-14-001) shows HLW 2a associated with process stream HFP06, the *Integrated Sampling and Analysis Plan* (24590-LAB-PL-OP-12-0001) indicates analysis prior to glass former addition; therefore, it is associated with process stream HCP01 for the purposes of this estimate.

Table A-5 provides total release by representative waste stream, which simplifies computations relative to summing each sample contribution in Equation 3. Substituting mass releases from Table A-5 and mass fractions from Table B-3 yields the following:

$$Q_{\text{Sr-90}} = 1.32\text{E-}08 \frac{\text{g}}{\text{s}} \cdot 3.58\text{E-}07 + 1.00\text{E-}06 \frac{\text{g}}{\text{s}} \cdot 3.58\text{E-}07 + 2.44\text{E-}06 \frac{\text{g}}{\text{s}} \cdot 2.84\text{E-}07 + 5.93\text{E-}08 \frac{\text{g}}{\text{s}} \cdot 3.10\text{E-}09 = 1.06\text{E-}12 \frac{\text{g}}{\text{s}}$$

Applying the ^{90}Sr specific activity of 140 Ci/g results in $1.48\text{E-}10$ Ci/s, however, this does not include emissions from the laser ablation samples for HLW. The portion of HLW 2b subjected to laser ablation releases the following amount of ^{90}Sr which must be added to the amount from other samples to arrive at the total ^{90}Sr released. From Table A-6, the total amount released from laser ablation of the glass coupon is $1.48\text{E-}05$ g/s + $1.48\text{E-}05$ g/s = $2.96\text{E-}05$ g/s. Table D-4 shows that the adjusted mass release fraction for ^{90}Sr from a glass coupon is $2.82\text{E-}07 \times (1251.94 \text{ mg/L} \div 2400.05 \text{ mg/L}) = 1.48\text{E-}07$. Substituting these values into Equation 3 yields:

$$Q_{\text{Sr-90, laser ablation}} = Q_{\text{HFP03, laser ablation}} \cdot MF_{\text{I-129}_{\text{HFP03}}} = 2.96\text{E-}05 \frac{\text{g}}{\text{s}} \cdot 1.48\text{E-}07 = 4.39\text{E-}12 \frac{\text{g}}{\text{s}}$$

Applying the ^{90}Sr specific activity of 140 Ci/g results in $6.14\text{E-}10$ Ci/s, the value shown in Table D-4 for ^{90}Sr in the column titled “Glass Coupon Unabated Release (g/s or Ci/s).” When added to the ^{90}Sr released for the other HLW samples, the total unabated ^{90}Sr emitted from HLW is:

$$1.47\text{E-}10 \frac{\text{Ci}}{\text{s}} + 6.14\text{E-}10 \frac{\text{Ci}}{\text{s}} = 7.62\text{E-}10 \frac{\text{Ci}}{\text{s}}$$

This is the value shown in Table D-2 under the column “HLW Sample Unabated Release (g/s or Ci/s).” This value is added to the contribution of PT and LAW Facility samples (computed in a similar fashion, including applicable laser ablation samples) in adjacent columns to provide the unabated emissions. However, it is important to note that depending upon the associated lab (ARL or AHL), the abated emissions associated with each facility’s samples will vary. Within Table D-2, abated emissions for the LB-S1 emissions unit are shown, based on samples associated with the ARL analysis of LAW Facility related samples (as abated by a single stage of HEPA filters). Abated emissions for the LB-S2 emissions unit are shown for the AHL analysis of PT and HLW Facility related samples (as abated by two stages of HEPA filters). The total lab abated emissions are simply the sum of abated emissions from LB-S1 and LB-S2.

Appendix E

Annual Possession Quantity Estimate

Appendix E

Annual Possession Quantity Estimate

This appendix provides an annual possession quantity (APQ) estimate for the Lab based on the inputs and methodology discussed in Section 6. The APQ is the sum of the quantity of a radionuclide on hand at the beginning of the calendar year and the quantity of that radionuclide received or produced during the calendar year (WAC 246-247-030). Since samples are received, analyzed, and disposed of within the year, the APQ for the Lab is based on the radionuclide inventory for the estimated quantity of sample material for a given year. The total sample quantity, in grams per year, associated with a given process stream (Table A-2 and Table A-5) is multiplied by radionuclide mass fractions (Appendix B) and specific activity (10 CFR 71) to provide isotopic activity for that stream. The activities associated with each stream are summed for each radionuclide's APQ.

Table E-1 DFLAW Operating Configuration, Analytical Laboratory Annual Possession Quantity Estimate

| CASRN | Radionuclide | LB-S1 APQ | LB-S2 APQ |
|------------|------------------|-------------------------------|-------------------------------|
| | | C3V (Ci/yr) ⁽¹⁾ | CV5 (Ci/yr) ⁽²⁾ |
| 10028-17-8 | Tritium | 1.56E-04 | 1.56E-04 |
| 10045-97-3 | Cesium-137 | 1.36E-03 | 1.36E-03 |
| 10098-91-6 | Yttrium-90 | 2.59E-02 | 2.59E-02 |
| 10098-97-2 | Strontium-90 | 2.59E-02 | 2.59E-02 |
| 10198-40-0 | Cobalt-60 | 1.23E-11 | 1.23E-11 |
| 13966-29-5 | Uranium-234 | 4.98E-07 | 4.98E-07 |
| 13967-48-1 | Ruthenium-106 | 6.60E-11 | 6.60E-11 |
| 13967-70-9 | Cesium-134 | 1.97E-10 | 1.97E-10 |
| 13968-55-3 | Uranium-233 | 1.71E-06 | 1.71E-06 |
| 13981-15-2 | Curium-244 | 5.67E-05 | 5.67E-05 |
| 13981-16-3 | Plutonium-238 | 6.98E-06 | 6.98E-06 |
| 13981-37-8 | Nickel-63 | 1.93E-04 | 1.93E-04 |
| 13982-10-0 | Plutonium-242 | 5.55E-09 | 5.55E-09 |
| 13982-63-3 | Radium-226 | 4.23E-09 | 4.23E-09 |
| 13982-70-2 | Uranium-236 | 1.66E-08 | 1.66E-08 |
| 13994-20-2 | Neptunium-237 | 4.90E-06 | 4.90E-06 |
| 14119-32-5 | Plutonium-241 | 9.52E-05 | 9.52E-05 |
| 14119-33-6 | Plutonium-240 | 3.68E-05 | 3.68E-05 |
| 14133-76-7 | Technetium-99 | 2.87E-02 | 2.87E-02 |
| 14158-29-3 | Uranium-232 | 3.09E-08 | 3.09E-08 |
| 14234-35-6 | Antimony-125 | 3.38E-05 | 3.38E-05 |
| 14331-85-2 | Protactinium-231 | 7.02E-14 | 7.02E-14 |
| 14336-70-0 | Nickel-59 | 2.56E-06 | 2.56E-06 |
| 14391-16-3 | Europium-155 | 5.76E-11 | 5.76E-11 |
| 14596-10-2 | Americium-241 | 8.92E-04 | 8.92E-04 |
| 14683-23-9 | Europium-152 | 2.76E-11 | 2.76E-11 |

Table E-1 DFLAW Operating Configuration, Analytical Laboratory Annual Possession Quantity Estimate

| CASRN | Radionuclide | LB-S1 APQ | LB-S2 APQ |
|-------------|---------------|-------------------------------|-------------------------------|
| | | C3V (Ci/yr) ⁽¹⁾ | CV5 (Ci/yr) ⁽²⁾ |
| 14762-75-5 | Carbon-14 | 1.76E-04 | 1.76E-04 |
| 14952-40-0 | Actinium-227 | 5.06E-07 | 5.06E-07 |
| 14993-75-0 | Americium-243 | 5.20E-07 | 5.20E-07 |
| 15046-84-1 | Iodine-129 | 6.89E-06 | 6.89E-06 |
| 15117-48-3 | Plutonium-239 | 1.56E-04 | 1.56E-04 |
| 15117-96-1 | Uranium-235 | 2.06E-08 | 2.06E-08 |
| 15262-20-1 | Radium-228 | 2.54E-07 | 2.54E-07 |
| 15510-73-3 | Curium-242 | 4.60E-05 | 4.60E-05 |
| 15585-10-1 | Europium-154 | 1.49E-10 | 1.49E-10 |
| 15594-54-4 | Thorium-229 | 3.49E-14 | 3.49E-14 |
| 15715-94-3 | Samarium-151 | 1.55E-07 | 1.55E-07 |
| 15751-77-6 | Zirconium-93 | 6.21E-10 | 6.21E-10 |
| 15757-87-6 | Curium-243 | 3.38E-06 | 3.38E-06 |
| 15758-45-9 | Selenium-79 | 2.94E-04 | 2.94E-04 |
| 15832-50-5 | Tin-126 | 1.83E-04 | 1.83E-04 |
| 378253-40-8 | Barium-137m | 1.29E-03 | 1.29E-03 |
| 378253-44-2 | Cadmium-113m | 3.08E-04 | 3.08E-04 |
| 378782-82-2 | Niobium-93m | 5.69E-10 | 5.69E-10 |
| 7440-29-1 | Thorium-232 | 7.79E-14 | 7.79E-14 |
| 7440-61-1R | Uranium-238 | 4.54E-07 | 4.54E-07 |

¹ The total waste sample activity available for release from the ARL fume hoods (C3V).

² The total waste sample activity available for release from the RLD-VSL-00164 vessel ventilation (C5V).

Table E-2 presents the results for the baseline WTP operating configuration.

Table E-2 Baseline WTP Operating Configuration, Analytical Laboratory Annual Possession Quantity Estimate

| CASRN | Radionuclide | LB-S1 APQ | LB-S2 APQ |
|------------|---------------|-------------------------------|-------------------------------|
| | | C3V (Ci/yr) ⁽¹⁾ | C5V (Ci/yr) ⁽²⁾ |
| 10028-17-8 | Tritium | 3.37E-05 | 9.75E-05 |
| 10045-97-3 | Cesium-137 | 1.25E-03 | 1.48E+01 |
| 10098-91-6 | Yttrium-90 | 1.18E-01 | 4.97E+00 |
| 10098-97-2 | Strontium-90 | 1.18E-01 | 4.97E+00 |
| 10198-40-0 | Cobalt-60 | 2.25E-06 | 1.08E-05 |
| 13966-29-5 | Uranium-234 | 1.33E-06 | 3.61E-05 |
| 13967-48-1 | Ruthenium-106 | 1.85E-14 | 5.78E-14 |
| 13967-70-9 | Cesium-134 | 3.25E-12 | 3.79E-08 |
| 13968-55-3 | Uranium-233 | 2.96E-06 | 1.27E-04 |

**Table E-2 Baseline WTP Operating Configuration, Analytical Laboratory
Annual Possession Quantity Estimate**

| CASRN | Radionuclide | LB-S1 APQ | LB-S2 APQ |
|-------------|------------------|-------------------------------|-------------------------------|
| | | C3V (Ci/yr) ⁽¹⁾ | C5V (Ci/yr) ⁽²⁾ |
| 13981-15-2 | Curium-244 | 2.62E-06 | 1.87E-05 |
| 13981-16-3 | Plutonium-238 | 1.34E-05 | 4.44E-04 |
| 13981-37-8 | Nickel-63 | 4.44E-03 | 1.97E-02 |
| 13982-10-0 | Plutonium-242 | 1.31E-08 | 1.26E-07 |
| 13982-63-3 | Radium-226 | 1.80E-01 | 2.44E-01 |
| 13982-70-2 | Uranium-236 | 4.17E-08 | 1.02E-06 |
| 13994-20-2 | Neptunium-237 | 7.61E-06 | 4.13E-05 |
| 14119-32-5 | Plutonium-241 | 4.99E-05 | 1.70E-03 |
| 14119-33-6 | Plutonium-240 | 4.20E-05 | 1.52E-03 |
| 14133-76-7 | Technetium-99 | 3.02E-02 | 3.70E-02 |
| 14158-29-3 | Uranium-232 | 6.18E-08 | 1.52E-06 |
| 14234-35-6 | Antimony-125 | 3.78E-07 | 6.88E-07 |
| 14331-85-2 | Protactinium-231 | 8.43E-07 | 2.09E-06 |
| 14336-70-0 | Nickel-59 | 7.50E-05 | 3.17E-04 |
| 14391-16-3 | Europium-155 | 2.99E-06 | 5.41E-05 |
| 14596-10-2 | Americium-241 | 1.73E-03 | 4.42E-02 |
| 14683-23-9 | Europium-152 | 1.58E-05 | 9.54E-05 |
| 14762-75-5 | Carbon-14 | 2.54E-04 | 3.84E-04 |
| 14952-40-0 | Actinium-227 | 6.14E-07 | 1.88E-06 |
| 14993-75-0 | Americium-243 | 7.76E-07 | 1.92E-05 |
| 15046-84-1 | Iodine-129 | 8.09E-06 | 1.47E-05 |
| 15117-48-3 | Plutonium-239 | 2.00E-04 | 7.15E-03 |
| 15117-96-1 | Uranium-235 | 5.26E-08 | 1.39E-06 |
| 15262-20-1 | Radium-228 | 9.89E-08 | 1.61E-06 |
| 15510-73-3 | Curium-242 | 2.72E-06 | 1.71E-05 |
| 15585-10-1 | Europium-154 | 4.69E-05 | 7.74E-04 |
| 15594-54-4 | Thorium-229 | 3.78E-08 | 4.09E-07 |
| 15715-94-3 | Samarium-151 | 7.40E-02 | 4.62E-01 |
| 15751-77-6 | Zirconium-93 | 4.44E-04 | 9.58E-04 |
| 15757-87-6 | Curium-243 | 2.19E-07 | 1.51E-06 |
| 15758-45-9 | Selenium-79 | 4.21E-04 | 5.79E-04 |
| 15832-50-5 | Tin-126 | 2.90E-04 | 5.45E-04 |
| 378253-40-8 | Barium-137m | 1.18E-03 | 1.40E+01 |
| 378253-44-2 | Cadmium-113m | 1.43E-04 | 2.70E-04 |
| 378782-82-2 | Niobium-93m | 4.82E-04 | 1.04E-03 |
| 7440-29-1 | Thorium-232 | 6.24E-08 | 1.59E-06 |
| 7440-61-1R | Uranium-238 | 1.60E-06 | 4.00E-05 |

**Table E-2 Baseline WTP Operating Configuration, Analytical Laboratory
Annual Possession Quantity Estimate**

| CASRN | Radionuclide | LB-S1 APQ | LB-S2 APQ |
|-------|--------------|-------------------------------|-------------------------------|
| | | C3V (Ci/yr) ⁽¹⁾ | C5V (Ci/yr) ⁽²⁾ |

¹ The total waste sample activity available for release from the ARL fume hoods (C3V).

² The total waste sample activity available for release from the AHL ventilation (C5V), RLD-VSL-00164, and RLD-VSL-00165.

Table E-3 Lab C2V Ventilation Square Footage

| Room | Identification | Width (ft) | Length (ft) | Area (ft ²) | Area (cm ²) | Ventilation | Reference(s) |
|---------|-----------------------------|------------|-------------|-------------------------|-------------------------|-------------|-------------------------|
| A-0112 | Decon Room | 15.33 | 26.58 | 407.47 | 378,552.02 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0121 | PPE Room | 16.00 | 24.00 | 384.00 | 356,747.67 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0120 | Dewar Filling | 13.50 | 15.00 | 202.50 | 188,128.66 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0122 | RL13-Rad Counting | 20.00 | 48.00 | 960.00 | 891,869.18 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0112A | Rad Control Counting | 12.00 | 12.00 | 144.00 | 133,780.38 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0160 | Filter Room | 46.00 | 150.75 | 6,934.50 | 6,442,361.31 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0165 | Fan Room | 60.00 | 34.25 | 2,055.00 | 1,909,157.47 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0166 | Filter Room | 39.75 | 40.00 | 1,590.00 | 1,477,158.37 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0172 | C2 Maintenance Shop | 29.00 | 57.25 | 1,660.25 | 1,542,422.72 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0172A | Vacuum Pump Room | 31.00 | 57.25 | 1,774.75 | 1,648,796.70 | C2V | 24590-LAB-M8C-C2V-00001 |
| A-0172B | Electrical Maintenance Shop | 10.00 | 20.00 | 200.00 | 185,806.08 | C2V | 24590-LAB-M8C-C2V-00001 |

Table E-4 presents the results for the APQ emissions associated with LB-C2 general areas.

Table E-4 LB-C2 General Areas APQ and Emissions Summary

| Emission Unit | Total Surface Area (cm ²) ¹ | APQ (Ci/yr) ^{2,4} | Unabated Emissions (Ci/yr) ³ | Abated Emissions (Ci/yr) ⁵ |
|-------------------|--|----------------------------|---|---------------------------------------|
| LAB LB-C2 (alpha) | 1.52E+07 | 2.73E-07 | 2.73E-10 | 1.37E-13 |
| LAB LB-C2 (beta) | 1.52E+07 | 1.37E-05 | 1.37E-08 | 6.83E-12 |

24590-LAB-RPT-ENV-18-001, Rev 1
WTP Analytical Laboratory Emissions Estimate

| Emission Unit | Total Surface Area (cm²)¹ | APQ (Ci/yr)^{2,4} | Unabated Emissions (Ci/yr)³ | Abated Emissions (Ci/yr)⁵ |
|----------------------|--|----------------------------------|---|---|
|----------------------|--|----------------------------------|---|---|

Note:

- 1 A total surface area of 1.52E+07 cm² is based on the rooms and square footages identified in Table E-3. Each room designation and square footage designation has a reference.
- 2 APQ for alpha radiation is calculated by [surface contamination limit of 20 disintegrations per minute/100 cm² multiplied by the total surface area (cm²) multiplied by 20% (assumed percent of surface that is contaminated)] divided by [3.7E+10 disintegrations per second per curie multiplied by 60 seconds per minute].
- 3 Unabated emissions are calculated by multiplying the APQ by the release rate of 1.00E-03 as described under WAC 246-247-030 (21).
- 4 APQ for beta radiation is calculated by [surface contamination limit of 1,000 disintegrations per minute/100 cm² multiplied by the total surface area (cm²) multiplied by 20% (assumed percent of surface that is contaminated)] divided by [3.7E+10 disintegrations per second per curie multiplied by 60 seconds per minute].

Abated emissions are calculated based on single-stage of HEPA filtration with a decontamination factor of 2,000 (99.95% efficient).