# 4.0 EMISSIONS UNIT INFORMATION

This section provides specific information for each Emissions Unit (EU) which is not an insignificant activity.

## 4.1 Emissions from Emissions Units

Maximum potential air emissions and the analogous product throughputs from the indicated EUs are listed in Chapter 2.0 (re: Storage tanks see DEQ forms Sections 3: Process and Manufacturing Operations and Section 5: Storage and Handling of Liquid Solvents and Other Volatile Compounds) and in Appendices A, B and C.

A summary of maximum potential Volatile Organic Compound (VOC) emissions and Hazardous Air Pollutant (HAP) emissions from each EU and the total from the facility is provided in Table 4.1

## 4.2 Description of Points of Emission / Definition of Maximum Potential Emissions

This section identifies and describes the emissions units in the facility and lists the basis for the maximum potential emissions from each emissions unit.

4.2.1 External Floating Roof Storage Tanks (EU # 1, 2, 3, 4 and 5):

Gasoline grade or distillate fuel oil grade petroleum products can be stored in these tanks. Emissions from these units are a result of standing and withdrawal losses as calculated per Tanks Version 4.0.9.d methodology[1]. The maximum potential emissions from any one of

[1] **Per the Tanks program "Help File", the TANKS program is designed to estimate air emissions from organic liquids in storage tanks. The U.S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) develops and maintains emission estimating tools to support Federal, State, and local agencies, consultants, and industry with estimating air emissions from various sources. Documentation of emission factors and calculations used to estimate air emissions can be found in "Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources" (AP-42), Section 7.1, Organic Liquid Storage Tanks.**

these tanks occurs when gasoline grade petroleum product is loaded, stored and unloaded at the defined maximum throughput. The maximum throughput for any one of these tanks is defined as the capacity of the pipeline supplying the terminal distributed to four of the five storage tanks (this assumes that one of the four storage tanks is off line for maintenance).

Table 4.1 Maximum Potential Emissions Summary

| EU # | Description | Maximum Potential VOC Emissions (TPY) | Maximum Potential HAP Emissions (TPY) |
|---|---|---|---|
| 1 | Tank 401 | 12.96 | 0.38 |
| 2 | Tank 404 | 12.96 | 0.38 |
| 3 | Tank 411 | 12.96 | 0.38 |
| 4 | Tank 421 | 12.96 | 0.38 |
| 5 | Tank 431 | 13.88 | 0.40 |
| 6 | Tank 402 | 0.49 | 0.015 |
| 7 | Tank 405 | 0.49 | 0.015 |
| 8 | Tank 406 | 0.49 | 0.015 |
| 9 | Transmix Tank 400 | 0.28 | 0.008 |
| 12 | Fugitive Emissions | 0.92 | 0.15 |
| 13 | Soil Vapor Extraction System | 25.9 | 9.37 |
| | Total emissions | 94.2 | 11.5 |

4.2.2 Fixed Roof Tanks (EU # 6, 7 and 8):

Distillate fuel oil grade petroleum products can be stored in these tanks. Emissions from these units are a result of breathing and working losses as calculated per Tanks Version 4.0.9.d methodology. The maximum potential emissions from any one of these tanks occurs when distillate grade petroleum product is loaded, stored and unloaded at the defined maximum throughput. The maximum throughput for any one of these tanks is defined as the capacity of the pipeline supplying the terminal distributed to two of the three storage tanks (this assumes that one of the three storage tanks is off line for maintenance).

4.2.3 Transmix Tank (EU # 9):

The transmix storage tank is fixed roof type and is used to store "slop oil" (ie. off specification petroleum products, residual products from the other storage tanks, water contaminated with petroleum, etc.). Emissions from this unit are a result of breathing and working losses as calculated per Tanks Version 4.0.9.d methodology. The maximum potential emissions from this source occur when gasoline grade petroleum product is loaded, stored and unloaded at the defined maximum throughput.

4.2.4 Fugitive Emissions (EU # 12)

Fugitive emissions are emissions from piping components (i.e. valves, flanges, connectors, etc.) that are "non-point source" in nature. Fugitive emissions are calculated on a "per component" basis and are not based on throughput.

4.2.5 Soil Vapor Extraction (SVE) System (EU # 13):

On September 21, 1998 (amended July 7, 1999) the Division issued Sinclair a permit to construct a soil vapor extraction system at the Boise Products Terminal facility.

## 4.3 Emissions Calculations

4.3.1 Tank Emissions Calculation:

Calculation of VOC and HAP emissions were performed using Tanks Version 4.0.9.d software. The Tanks Version 4.0.9.d outputs for all product storage tanks and the transmix storage tank are provided in Appendix: A.

4.3.2 Fugitive Emissions Calculation:

The maximum potential fugitive emissions for valves, pump seals, fittings and "other" components were calculated were based upon the Protocol for Equipment Leak Emission Estimates[2]. The maximum potential fugitive emissions from drains was based on AP-42

[2] **Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017), Table 2.3, USEPA. Note: "other" components are defined per this protocol as equipment other than fittings, pumps or valves.**

methodology[3]. The fugitive emissions calculation is provided in Appendix: B.

4.3.3 Soil Vapor Extraction System Calculation:

Emission estimates from the SVE system are provided in Appendix: C.

## 4.4 Compliance Monitoring / Record Keeping

Compliance with the defined maximum potential emission limits, as listed in Chapter 2.0, will be based upon monitoring the product throughput of the facility. The maximum product throughput limits are defined in Table 4.2.

By limiting the EU throughputs to the values listed in Table 4.2, the facility will not exceed the major source thresholds for VOC or HAP.

Table 4.2 Maximum Annual Product Throughput Limits

| EU # | Description | Maximum EU Throughput (gpy) |
|---|---|---|
| 1 | Tank 401 | 58,254,000 |
| 2 | Tank 404 | 58,254,000 |
| 3 | Tank 411 | 58,254,000 |
| 4 | Tank 421 | 58,254,000 |
| 5 | Tank 431 | 58,254,000 |
| 6 | Tank 402 | 168,630,000 |
| 7 | Tank 405 | 168,630,000 |
| 8 | Tank 406 | 168,630,000 |
| 9 | Transmix Tank 400 | 38,080 |

[3] **Compilation of Air Pollution Factors, Volume 1 Stationary and Area Point Sources, Section 9.1.3. AP-42, Fourth Edition, September 1985. USEPA. Note: This older version of AP-42 was used as basis for the drain fugitive emission factor because newer versions of AP-42 or EPA-453/R-95-017 did not have a listing for drains. Using the 1985 AP-42 emissions factor provides a conservatively higher emission rate from drains compared to using the "other" equipment emission factor as listed in EPA-453/R-95-017, Table 2.3.**

4.4.1 Storage Tank Monitoring (EU # 1 through 9)

The operator will record the quantity of product received in all storage tanks.

## 4.5 Reporting

As currently required by Operating Permit # 001-0012, there are no periodic reporting requirements.

## 4.6 Sulfur Content

EPA has certified a new method for testing low sulfur fuels at Sinclair Transportation Company's Sinclair Burley Products Terminal. This is the method that EPA requires to show compliance the new Ultra Low Sulfur Diesel regulation. Sinclair is planning to use this same testing devise for fuel samples obtained at the Sinclair Boise Products Terminal. Sinclair requests the Division add the following sentence to Section 2.15.2 of Sinclair Boise Products Terminal's Tier 2 operating permit:

Sinclair may use The Standard Test Method for Sulfur in Gasoline and Diesel Fuel by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry, ASTM D-7039-04 for testing fuels with sulfur contents in the 15 to 500 ppm range (by weight).

## 5.0 EXCESS EMISSIONS PROCEDURES

This section provides a description of excess emissions that may occur as a result of startup, shutdown or maintenance activities. The potential emissions from this facility are based upon the allowable petroleum product throughput. Because there are no air pollution control devices associated with this facility, maximum emissions occur when the facility operates at the maximum petroleum product throughput condition. When the facility is being started up or shut down, less than the maximum potential emissions will be released. Therefore no excess emissions due to startup or shut down should occur.

The following events have been defined as maintenance activities at this facility:

- Pipe cleaning
- Pipe pressure testing
- Replacement of gasket materials
- Tank cleaning (including grit blasting and water washing)
- Tank maintenance
- Instrument maintenance
- Pump maintenance (including disassembly of pumps)

The release of emissions during maintenance activities will be minimized by utilizing standard maintenance practices for the petroleum industry.

Maintenance activities are non-routine and occur on an as needed basis, therefore the frequency of these activities cannot be defined. Because of their infrequent nature, the emissions resulting from maintenance activities are considered insignificant.

# 6.0 INSIGNIFICANT ACTIVITIES

In addition to the insignificant activities listed in IDAPA 16.01.01 Section 317, Sinclair is providing a description of emission units and activities that can be performed at the facility which are insignificant (ie. exempt) for purposes of the operating permit program. This listing provides details on selected activities and does not cover all potential insignificant activities that may occur at this facility.

## 6.1 Presumptively Insignificant Emissions Units

See IDAPA 16.01.01.317.01.a

## 6.2 Exemption Based on Size or Production Rate

See IDAPA 16.01.01.317.01.b. In addition, the following emission units and activities are exempt from the operating permit program based upon size or production rate.

### 6.2.1 Petroleum Product Additives

All gasoline additive and distillate fuel oil additive storage, loading and unloading operations at this facility are exempt per IDAPA 16.01.01.317.01.b.i(3): Operation, loading and unloading of VOC storage tanks (including gasoline storage tanks), ten thousand (10,000) gallons capacity or less, with lids or other appropriate closure, vapor pressure not greater than 80 mm Hg at 21 °C. In addition, any fugitive emissions from the additive system are insignificant.

### 6.2.2 Petroleum Product Sampling

All petroleum product sampling activities at this facility are exempt per IDAPA 16.01.01.317.01.b.i(1): Operation, loading and unloading of VOC storage tanks and storage vessels, with lids or other appropriate closure and less than two hundred sixty (260) gallon capacity (35 $ft^3$), heated only to the minimum extent to avoid solidification if necessary.

### 6.2.3 Maintenance Activities

Maintenance activities are defined as insignificant due to their infrequent nature.

### 6.2.4 Transmix loading / water draw loading

Emissions from the loading of transmix and/or the loading of tank water draws into tank trucks is insignificant because emission from these activities are << 2,000 lbs/yr.

# 7.0 REGULATORY REQUIREMENTS

This section describes the applicable and some of the non-applicable regulatory requirements for this facility.

## 7.1 Non-Applicable Regulatory Requirements

There are numerous other regulatory requirements which do not apply to this facility. There are regulatory requirements (which may apply to other petroleum products storage and distribution facilities) which do not apply to this facility. This section lists these non-applicable regulatory requirements for this facility in an effort to illustrate the comprehensive regulatory research undertaken for this permit application. A brief discussion of the basis for non-applicability of these requirements is included.

### 7.2.1 IDAPA 16 Title 1 Chapter 1 Sections 525 through 538

Because the Sinclair Boise Products Terminal is a Tier 2 facility, registration of emissions and the payment of fees per IDAPA 16 Title 1 Chapter 1 Sections 525 through 538 are not required.

### 7.2.2 Standards of Performance for New Stationary Sources (NSPS):

Subpart K - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction or Modification Commenced After June 11, 1973, and prior to May 19, 1978 does not apply because this facility was constructed or last modified prior to the applicability date.

Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction or Modification Commenced After May 18 1978, and prior to July 23, 1984 does not apply because this facility was constructed or last modified prior to the applicability date.

Subpart Kb - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction or Modification Commenced After July 23, 1984 does not apply because this facility was constructed or last modified prior to the applicability date.

Subpart XX - Standards of Performance for Bulk gasoline Terminals does not apply because this facility was constructed or last modified prior to the applicability date of December 17, 1980.

### 7.2.3 Maximum Achievable Control Technology Standards (MACT)

Gasoline Distribution MACT does not apply because this facility is not a major source of HAPS (ie. this facility does not have the potential to emit 10 tpy of any individual HAP or 25 tpy of any combination of HAPS).

### 7.2.4 Ambient Air Impact Analysis

There are no requirements to analyze the ambient air impact of VOC or HAP emissions from existing facilities.

## APPENDIX: A STORAGE TANK EMISSIONS CALCULATIONS

Calculation of maximum potential VOC emissions and HAP emissions from all product storage tanks, the transmix storage tank and the prover tank were performed using Tanks Version 4.0.9.d software. The emissions reports for these emissions units are provided in this Appendix.

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

**Identification**

| | |
|---|---|
| User Identification: | Tank 401, pt 1 Teir 2 emissions |
| City: | Boise |
| State: | Idaho |
| Company: | Sinlcair Oil Corp. |
| Type of Tank: | External Floating Roof Tank |
| Description: | Tier 2 operating permit renewal Tank 401 pt1, Tank 404 pt2, Tank 411 pt 3, Tank 421 pt4 |

**Tank Dimensions**

| | |
|---|---|
| Diameter (ft): | 60.00 |
| Volume (gallons): | 839,400.00 |
| Turnovers: | 69.00 |

**Paint Characteristics**

| | |
|---|---|
| Internal Shell Condition: | Light Rust |
| Shell Color/Shade: | White/White |
| Shell Condition | Good |

**Roof Characteristics**

| | |
|---|---|
| Type: | Double Deck |
| Fitting Category | Detail |

**Tank Construction and Rim-Seal System**

| | |
|---|---|
| Construction: | Welded |
| Primary Seal: | Mechanical Shoe |
| Secondary Seal | Rim-mounted |

| Deck Fitting/Status | Quantity |
|---|---|
| Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed | 1 |
| Automatic Gauge Float Well/Unbolted Cover, Ungasketed | 1 |
| Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 |
| Slotted Guide-Pole/Sample Well/Ungask. Sliding Cover, w/o Float | 1 |
| Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 |
| Roof Drain (3-in. Diameter)/Open | 1 |
| Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs | 10 |
| Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask. | 1 |

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

TANKS 4.0.9d
Emissions Report - Detail Format

# Liquid Contents of Storage Tank

## Tank 401, pt 1 Teir 2 emissions - External Floating Roof Tank
## Boise, Idaho

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) Avg. | Min. | Max. | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) Avg. | Min. | Max. | Vapor Mol. Weight. | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline (RVP 10) | All | 52.81 | 46.88 | 58.74 | 50.94 | 4.5022 | N/A | N/A | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |
| 2,2,4-Trimethylpentane | | | | | | 0.4825 | N/A | N/A | 114.2300 | 0.0151 | 0.0023 | 114.23 | Option 2: A=6.8118, B=1257.84, C=220.74 |
| Benzene | | | | | | 0.9535 | N/A | N/A | 78.1100 | 0.0188 | 0.0056 | 78.11 | Option 2: A=6.905, B=1211.033, C=220.79 |
| Ethylbenzene | | | | | | 0.0841 | N/A | N/A | 106.1700 | 0.0207 | 0.0005 | 106.17 | Option 2: A=6.975, B=1424.255, C=213.21 |
| Hexane (-n) | | | | | | 1.5821 | N/A | N/A | 86.1700 | 0.0181 | 0.0089 | 86.17 | Option 2: A=6.876, B=1171.17, C=224.41 |
| Isopropyl benzene | | | | | | 0.0389 | N/A | N/A | 120.2000 | 0.0022 | 0.0000 | 120.20 | Option 2: A=6.963, B=1460.793, C=207.78 |
| naphthalene | | | | | | 0.0017 | N/A | N/A | 128.1700 | 0.0013 | 0.0000 | 128.17 | Option 2: A=7.14627, B=1831.571, C=211.821 |
| Toluene | | | | | | 0.2629 | N/A | N/A | 92.1300 | 0.0972 | 0.0079 | 92.13 | Option 2: A=6.954, B=1344.8, C=219.48 |
| Unidentified Components | | | | | | 6.1187 | N/A | N/A | 65.5105 | 0.7021 | 0.9724 | 89.60 | |
| Xylene (-m) | | | | | | 0.0699 | N/A | N/A | 106.1700 | 0.0672 | 0.0015 | 106.17 | Option 2: A=7.009, B=1462.266, C=215.11 |
| Xylene (-o) | | | | | | 0.0547 | N/A | N/A | 106.1700 | 0.0573 | 0.0010 | 106.17 | Option 2: A=6.998, B=1474.679, C=213.69 |

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

## Tank 401, pt 1 Teir 2 emissions - External Floating Roof Tank
## Boise, Idaho

Annual Emission Calcaulations

| | |
|---|---|
| Rim Seal Losses (lb): | 1,670.2111 |
| Seal Factor A (lb-mole/ft-yr): | 0.6000 |
| Seal Factor B (lb-mole/ft-yr (mph)^n): | 0.4000 |
| Average Wind Speed (mph): | 8.7250 |
| Seal-related Wind Speed Exponent: | 1.0000 |
| Value of Vapor Pressure Function: | 0.1031 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 4.5022 |
| Tank Diameter (ft): | 60.0000 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Product Factor: | 1.0000 |
| Withdrawal Losses (lb): | 183.1117 |
| Annual Net Throughput (gal/yr.): | 58,254,000.0000 |
| Shell Clingage Factor (bbl/1000 sqft): | 0.0015 |
| Average Organic Liquid Density (lb/gal): | 5.6000 |
| Tank Diameter (ft): | 60.0000 |
| Roof Fitting Losses (lb): | 24,056.8751 |
| Value of Vapor Pressure Function: | 0.1031 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Product Factor: | 1.0000 |
| Tot. Roof Fitting Loss Fact.(lb-mole/yr): | 3,534.6175 |
| Average Wind Speed (mph): | 8.7250 |
| Total Losses (lb): | 25,910.1978 |

| Roof Fitting/Status | Quantity | Roof Fitting Loss Factors KFa(lb-mole/yr) | KFb(lb-mole/(yr mph^n)) | m | Losses(lb) |
|---|---|---|---|---|---|
| Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed | 1 | 1.60 | 0.00 | 0.00 | 10.8897 |
| Automatic Gauge Float Well/Unbolted Cover, Ungasketed | 1 | 14.00 | 5.40 | 1.10 | 364.2777 |
| Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 | 6.20 | 1.20 | 0.94 | 86.9473 |
| Slotted Guide-Pole/Sample Well/Ungask. Sliding Cover, w/o Float | 1 | 43.00 | 270.00 | 1.40 | 23,438.3135 |
| Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 | 0.47 | 0.02 | 0.97 | 3.9863 |
| Roof Drain (3-in. Diameter)/Open | 1 | 1.50 | 0.21 | 1.70 | 41.1893 |
| Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs | 10 | 0.82 | 0.53 | 0.14 | 102.2821 |
| Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask. | 1 | 0.71 | 0.10 | 1.00 | 8.9891 |

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

## Emissions Report for: Annual

**Tank 401, pt 1 Teir 2 emissions - External Floating Roof Tank**
**Boise, Idaho**

| | Losses(lbs) | | | | |
|---|---|---|---|---|---|
| Components | Rim Seal Loss | Withdrawl Loss | Deck Fitting Loss | Deck Seam Loss | Total Emissions |
| Gasoline (RVP 10) | 1,670.21 | 183.11 | 24,056.88 | 0.00 | 25,910.20 |
| Benzene | 9.27 | 3.44 | 133.52 | 0.00 | 146.23 |
| Ethylbenzene | 0.90 | 3.79 | 12.97 | 0.00 | 17.66 |
| Hexane (-n) | 14.81 | 3.31 | 213.29 | 0.00 | 231.41 |
| naphthalene | 0.00 | 0.24 | 0.02 | 0.00 | 0.26 |
| Xylene (-m) | 2.43 | 12.31 | 34.98 | 0.00 | 49.71 |
| Xylene (-o) | 1.62 | 10.49 | 23.32 | 0.00 | 35.44 |
| Toluene | 13.22 | 17.80 | 190.34 | 0.00 | 221.36 |
| 2,2,4-Trimethylpentane | 3.77 | 2.76 | 54.27 | 0.00 | 60.80 |
| Isopropyl benzene | 0.04 | 0.40 | 0.64 | 0.00 | 1.08 |
| Unidentified Components | 1,624.16 | 128.56 | 23,393.53 | 0.00 | 25,146.24 |

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

**Identification**

| | |
|---|---|
| User Identification: | Tank 402 pt 6 tier 2 emissions |
| City: | Boise |
| State: | Idaho |
| Company: | Sinclair Oil Corp. |
| Type of Tank: | Vertical Fixed Roof Tank |
| Description: | Tank 402 pt6, Tank 405 pt 7, Tank 406 pt 8 |

**Tank Dimensions**

| | |
|---|---|
| Shell Height (ft): | 40.00 |
| Diameter (ft): | 60.00 |
| Liquid Height (ft) : | 39.00 |
| Avg. Liquid Height (ft): | 20.00 |
| Volume (gallons): | 839,800.00 |
| Turnovers: | 210.00 |
| Net Throughput(gal/yr): | 168,630,000.00 |
| Is Tank Heated (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | White/White |
| Shell Condition | Good |
| Roof Color/Shade: | White/White |
| Roof Condition: | Good |

**Roof Characteristics**

| | |
|---|---|
| Type: | Cone |
| Height (ft) | 2.00 |
| Slope (ft/ft) (Cone Roof) | 0.07 |

**Breather Vent Settings**

| | |
|---|---|
| Vacuum Settings (psig): | -0.03 |
| Pressure Settings (psig) | 0.03 |

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

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

**Tank 402 pt 6 tier 2 emissions - Vertical Fixed Roof Tank**
**Boise, Idaho**

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) Avg. | Min. | Max. | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) Avg. | Min. | Max. | Vapor Mol. Weight. | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Distillate fuel oil no. 2 | All | 52.81 | 46.88 | 58.74 | 50.94 | 0.0053 | 0.0041 | 0.0070 | 130.0000 | | | 188.00 | Option 1: VP50 = .0045 VP60 = .0074 |
| naphthalene | | | | | | 0.0017 | 0.0013 | 0.0023 | 128.1700 | 0.0017 | 0.0008 | 128.17 | Option 2: A=7.14627, B=1831.571, C=211.821 |
| Toluene | | | | | | 0.2629 | 0.2166 | 0.3174 | 92.1300 | 0.0002 | 0.0143 | 92.13 | Option 2: A=6.954, B=1344.8, C=219.48 |
| Unidentified Components | | | | | | 0.0051 | 0.0051 | 0.0051 | 131.2807 | 0.9972 | 0.9690 | 188.32 | |
| Xylene (-m) | | | | | | 0.0699 | 0.0561 | 0.0865 | 106.1700 | 0.0006 | 0.0114 | 106.17 | Option 2: A=7.009, B=1462.266, C=215.11 |
| Xylene (-o) | | | | | | 0.0547 | 0.0437 | 0.0679 | 106.1700 | 0.0003 | 0.0045 | 106.17 | Option 2: A=6.998, B=1474.679, C=213.69 |

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

## Tank 402 pt 6 tier 2 emissions - Vertical Fixed Roof Tank
## Boise, Idaho

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 111.8430 |
| Vapor Space Volume (cu ft): | 58,433.6233 |
| Vapor Density (lb/cu ft): | 0.0001 |
| Vapor Space Expansion Factor: | 0.0420 |
| Vented Vapor Saturation Factor: | 0.9942 |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 58,433.6233 |
| Tank Diameter (ft): | 60.0000 |
| Vapor Space Outage (ft): | 20.6667 |
| Tank Shell Height (ft): | 40.0000 |
| Average Liquid Height (ft): | 20.0000 |
| Roof Outage (ft): | 0.6667 |
| Roof Outage (Cone Roof) | |
| Roof Outage (ft): | 0.6667 |
| Roof Height (ft): | 2.0000 |
| Roof Slope (ft/ft): | 0.0700 |
| Shell Radius (ft): | 30.0000 |
| Vapor Density | |
| Vapor Density (lb/cu ft): | 0.0001 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0053 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 512.4830 |
| Daily Average Ambient Temp. (deg. F): | 50.9208 |
| Ideal Gas Constant R (psia cuft / (lb-mol-deg R)): | 10.731 |
| Liquid Bulk Temperature (deg. R): | 510.6108 |
| Tank Paint Solar Absorptance (Shell): | 0.1700 |
| Tank Paint Solar Absorptance (Roof): | 0.1700 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,400.5355 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.0420 |
| Daily Vapor Temperature Range (deg. R): | 23.7125 |
| Daily Vapor Pressure Range (psia): | 0.0030 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0053 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 0.0041 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 0.0070 |
| Daily Avg. Liquid Surface Temp. (deg R): | 512.4830 |
| Daily Min. Liquid Surface Temp. (deg R): | 506.5548 |
| Daily Max. Liquid Surface Temp. (deg R): | 518.4111 |
| Daily Ambient Temp. Range (deg. R): | 23.6750 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.9942 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 0.0053 |

| | |
|---|---|
| Vapor Space Outage (ft): | 20.6667 |
| Working Losses (lb): | 858.7921 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0053 |
| Annual Net Throughput (gal/yr.): | 168,630,000.0000 |
| Annual Turnovers: | 210.0000 |
| Turnover Factor: | 0.3095 |
| Maximum Liquid Volume (gal): | 839,800.0000 |
| Maximum Liquid Height (ft): | 39.0000 |
| Tank Diameter (ft): | 60.0000 |
| Working Loss Product Factor: | 1.0000 |
| Total Losses (lb): | 970.6350 |

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

## Emissions Report for: Annual

**Tank 402 pt 6 tier 2 emissions - Vertical Fixed Roof Tank**
**Boise, Idaho**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Distillate fuel oil no. 2 | 858.79 | 111.84 | 970.64 |
| naphthalene | 0.68 | 0.09 | 0.77 |
| Toluene | 12.29 | 1.60 | 13.89 |
| Xylene (-m) | 9.80 | 1.28 | 11.07 |
| Xylene (-o) | 3.83 | 0.50 | 4.33 |
| Unidentified Components | 832.20 | 108.38 | 940.58 |

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

**Identification**

| | |
|---|---|
| User Identification: | Tank 431, pt5 Tier 2 emissions |
| City: | Boise |
| State: | Idaho |
| Company: | Sinlcair Oil Corp. |
| Type of Tank: | External Floating Roof Tank |
| Description: | Tank 431 pt5 |

**Tank Dimensions**

| | |
|---|---|
| Diameter (ft): | 110.00 |
| Volume (gallons): | 3,328,800.00 |
| Turnovers: | 17.50 |

**Paint Characteristics**

| | |
|---|---|
| Internal Shell Condition: | Light Rust |
| Shell Color/Shade: | White/White |
| Shell Condition | Good |

**Roof Characteristics**

| | |
|---|---|
| Type: | Pontoon |
| Fitting Category | Detail |

**Tank Construction and Rim-Seal System**

| | |
|---|---|
| Construction: | Welded |
| Primary Seal: | Mechanical Shoe |
| Secondary Seal | Rim-mounted |

| Deck Fitting/Status | Quantity |
|---|---|
| Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed | 1 |
| Automatic Gauge Float Well/Unbolted Cover, Ungasketed | 1 |
| Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 |
| Slotted Guide-Pole/Sample Well/Ungask. Sliding Cover, w/o Float | 1 |
| Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 |
| Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed | 18 |
| Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed | 20 |
| Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask. | 1 |

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

TANKS 4.0.9d
Emissions Report - Detail Format

# Liquid Contents of Storage Tank

## Tank 431, pt5 Tier 2 emissions - External Floating Roof Tank
## Boise, Idaho

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) Avg. | Min. | Max. | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) Avg. | Min. | Max. | Vapor Mol. Weight. | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline (RVP 10) | All | 52.81 | 46.88 | 58.74 | 50.94 | 4.5022 | N/A | N/A | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |
| 2,2,4-Trimethylpentane | | | | | | 0.4825 | N/A | N/A | 114.2300 | 0.0151 | 0.0023 | 114.23 | Option 2: A=6.8118, B=1257.84, C=220.74 |
| Benzene | | | | | | 0.9535 | N/A | N/A | 78.1100 | 0.0188 | 0.0056 | 78.11 | Option 2: A=6.905, B=1211.033, C=220.79 |
| Ethylbenzene | | | | | | 0.0841 | N/A | N/A | 106.1700 | 0.0207 | 0.0005 | 106.17 | Option 2: A=6.975, B=1424.255, C=213.21 |
| Hexane (-n) | | | | | | 1.5821 | N/A | N/A | 86.1700 | 0.0181 | 0.0089 | 86.17 | Option 2: A=6.876, B=1171.17, C=224.41 |
| Isopropyl benzene | | | | | | 0.0389 | N/A | N/A | 120.2000 | 0.0022 | 0.0000 | 120.20 | Option 2: A=6.963, B=1460.793, C=207.78 |
| naphthalene | | | | | | 0.0017 | N/A | N/A | 128.1700 | 0.0013 | 0.0000 | 128.17 | Option 2: A=7.14627, B=1831.571, C=211.821 |
| Toluene | | | | | | 0.2629 | N/A | N/A | 92.1300 | 0.0972 | 0.0079 | 92.13 | Option 2: A=6.954, B=1344.8, C=219.48 |
| Unidentified Components | | | | | | 6.1187 | N/A | N/A | 65.5105 | 0.7021 | 0.9724 | 89.60 | |
| Xylene (-m) | | | | | | 0.0699 | N/A | N/A | 106.1700 | 0.0672 | 0.0015 | 106.17 | Option 2: A=7.009, B=1462.266, C=215.11 |
| Xylene (-o) | | | | | | 0.0547 | N/A | N/A | 106.1700 | 0.0573 | 0.0010 | 106.17 | Option 2: A=6.998, B=1474.679, C=213.69 |

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

## Tank 431, pt5 Tier 2 emissions - External Floating Roof Tank
## Boise, Idaho

| Annual Emission Calcaulations | |
|---|---|
| Rim Seal Losses (lb): | 3,062.0536 |
| Seal Factor A (lb-mole/ft-yr): | 0.6000 |
| Seal Factor B (lb-mole/ft-yr (mph)^n): | 0.4000 |
| Average Wind Speed (mph): | 8.7250 |
| Seal-related Wind Speed Exponent: | 1.0000 |
| Value of Vapor Pressure Function: | 0.1031 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 4.5022 |
| Tank Diameter (ft): | 110.0000 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Product Factor: | 1.0000 |
| Withdrawal Losses (lb): | 99.8791 |
| Annual Net Throughput (gal/yr.): | 58,254,000.0000 |
| Shell Clingage Factor (bbl/1000 sqft): | 0.0015 |
| Average Organic Liquid Density (lb/gal): | 5.6000 |
| Tank Diameter (ft): | 110.0000 |
| Roof Fitting Losses (lb): | 24,598.2242 |
| Value of Vapor Pressure Function: | 0.1031 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Product Factor: | 1.0000 |
| Tot. Roof Fitting Loss Fact.(lb-mole/yr): | 3,614.1566 |
| Average Wind Speed (mph): | 8.7250 |
| Total Losses (lb): | 27,760.1569 |

| Roof Fitting/Status | Quantity | Roof Fitting Loss Factors KFa(lb-mole/yr) | KFb(lb-mole/(yr mph^n)) | m | Losses(lb) |
|---|---|---|---|---|---|
| Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed | 1 | 1.60 | 0.00 | 0.00 | 10.8897 |
| Automatic Gauge Float Well/Unbolted Cover, Ungasketed | 1 | 14.00 | 5.40 | 1.10 | 364.2777 |
| Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 | 6.20 | 1.20 | 0.94 | 86.9473 |
| Slotted Guide-Pole/Sample Well/Ungask. Sliding Cover, w/o Float | 1 | 43.00 | 270.00 | 1.40 | 23,438.3135 |
| Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask. | 1 | 0.47 | 0.02 | 0.97 | 3.9863 |
| Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed | 18 | 2.00 | 0.37 | 0.91 | 480.2564 |
| Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed | 20 | 0.82 | 0.53 | 0.14 | 204.5641 |
| Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask. | 1 | 0.71 | 0.10 | 1.00 | 8.9891 |

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

## Emissions Report for: Annual

**Tank 431, pt5 Tier 2 emissions - External Floating Roof Tank**
**Boise, Idaho**

| | Losses(lbs) | | | | |
|---|---|---|---|---|---|
| Components | Rim Seal Loss | Withdrawl Loss | Deck Fitting Loss | Deck Seam Loss | Total Emissions |
| Gasoline (RVP 10) | 3,062.05 | 99.88 | 24,598.22 | 0.00 | 27,760.16 |
| Benzene | 17.00 | 1.88 | 136.53 | 0.00 | 155.40 |
| Ethylbenzene | 1.65 | 2.07 | 13.26 | 0.00 | 16.98 |
| Hexane (-n) | 27.15 | 1.81 | 218.08 | 0.00 | 247.04 |
| naphthalene | 0.00 | 0.13 | 0.02 | 0.00 | 0.15 |
| Xylene (-m) | 4.45 | 6.71 | 35.77 | 0.00 | 46.93 |
| Xylene (-o) | 2.97 | 5.72 | 23.85 | 0.00 | 32.54 |
| Toluene | 24.23 | 9.71 | 194.63 | 0.00 | 228.56 |
| 2,2,4-Trimethylpentane | 6.91 | 1.51 | 55.49 | 0.00 | 63.91 |
| Isopropyl benzene | 0.08 | 0.22 | 0.65 | 0.00 | 0.95 |
| Unidentified Components | 2,977.62 | 70.13 | 23,919.95 | 0.00 | 26,967.69 |

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

**Identification**

| | |
|---|---|
| User Identification: | Tmix pt 9 tier 2 emissions |
| City: | Boise |
| State: | Idaho |
| Company: | Sinclair Oil Corp. |
| Type of Tank: | Vertical Fixed Roof Tank |
| Description: | transmix tier 2 emissions |

**Tank Dimensions**

| | | |
|---|---|---|
| Shell Height (ft): | | 20.00 |
| Diameter (ft): | | 6.00 |
| Liquid Height (ft) : | | 18.00 |
| Avg. Liquid Height (ft): | | 5.00 |
| Volume (gallons): | | 3,808.00 |
| Turnovers: | | 10.00 |
| Net Throughput(gal/yr): | | 38,080.00 |
| Is Tank Heated (y/n): | N | |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | White/White |
| Shell Condition | Good |
| Roof Color/Shade: | White/White |
| Roof Condition: | Good |

**Roof Characteristics**

| | | |
|---|---|---|
| Type: | Cone | |
| Height (ft) | | 2.00 |
| Slope (ft/ft) (Cone Roof) | | 0.67 |

**Breather Vent Settings**

| | |
|---|---|
| Vacuum Settings (psig): | -0.03 |
| Pressure Settings (psig) | 0.03 |

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

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

**Tmix pt 9 tier 2 emissions - Vertical Fixed Roof Tank**
**Boise, Idaho**

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) Avg. | Min. | Max. | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) Avg. | Min. | Max. | Vapor Mol. Weight. | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline (RVP 10) | All | 52.81 | 46.88 | 58.74 | 50.94 | 4.5022 | 3.9947 | 5.0604 | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |
| 2,2,4-Trimethylpentane | | | | | | 0.4825 | 0.4033 | 0.5744 | 114.2300 | 0.0151 | 0.0023 | 114.23 | Option 2: A=6.8118, B=1257.84, C=220.74 |
| Benzene | | | | | | 0.9535 | 0.8024 | 1.1277 | 78.1100 | 0.0188 | 0.0056 | 78.11 | Option 2: A=6.905, B=1211.033, C=220.79 |
| Ethylbenzene | | | | | | 0.0841 | 0.0677 | 0.1039 | 106.1700 | 0.0207 | 0.0005 | 106.17 | Option 2: A=6.975, B=1424.255, C=213.21 |
| Hexane (-n) | | | | | | 1.5821 | 1.3458 | 1.8516 | 86.1700 | 0.0181 | 0.0089 | 86.17 | Option 2: A=6.876, B=1171.17, C=224.41 |
| Isopropyl benzene | | | | | | 0.0389 | 0.0308 | 0.0488 | 120.2000 | 0.0022 | 0.0000 | 120.20 | Option 2: A=6.963, B=1460.793, C=207.78 |
| naphthalene | | | | | | 0.0017 | 0.0013 | 0.0023 | 128.1700 | 0.0013 | 0.0000 | 128.17 | Option 2: A=7.14627, B=1831.571, C=211.821 |
| Toluene | | | | | | 0.2629 | 0.2166 | 0.3174 | 92.1300 | 0.0972 | 0.0079 | 92.13 | Option 2: A=6.954, B=1344.8, C=219.48 |
| Unidentified Components | | | | | | 6.1187 | 6.0944 | 6.0945 | 65.5105 | 0.7021 | 0.9724 | 89.60 | |
| Xylene (-m) | | | | | | 0.0699 | 0.0561 | 0.0865 | 106.1700 | 0.0672 | 0.0015 | 106.17 | Option 2: A=7.009, B=1462.266, C=215.11 |
| Xylene (-o) | | | | | | 0.0547 | 0.0437 | 0.0679 | 106.1700 | 0.0573 | 0.0010 | 106.17 | Option 2: A=6.998, B=1474.679, C=213.69 |

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

## Tmix pt 9 tier 2 emissions - Vertical Fixed Roof Tank
## Boise, Idaho

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 296.4784 |
| Vapor Space Volume (cu ft): | 442.9646 |
| Vapor Density (lb/cu ft): | 0.0540 |
| Vapor Space Expansion Factor: | 0.1608 |
| Vented Vapor Saturation Factor: | 0.2110 |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 442.9646 |
| Tank Diameter (ft): | 6.0000 |
| Vapor Space Outage (ft): | 15.6667 |
| Tank Shell Height (ft): | 20.0000 |
| Average Liquid Height (ft): | 5.0000 |
| Roof Outage (ft): | 0.6667 |
| Roof Outage (Cone Roof) | |
| Roof Outage (ft): | 0.6667 |
| Roof Height (ft): | 2.0000 |
| Roof Slope (ft/ft): | 0.6700 |
| Shell Radius (ft): | 3.0000 |
| Vapor Density | |
| Vapor Density (lb/cu ft): | 0.0540 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 4.5022 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 512.4830 |
| Daily Average Ambient Temp. (deg. F): | 50.9208 |
| Ideal Gas Constant R (psia cuft / (lb-mol-deg R)): | 10.731 |
| Liquid Bulk Temperature (deg. R): | 510.6108 |
| Tank Paint Solar Absorptance (Shell): | 0.1700 |
| Tank Paint Solar Absorptance (Roof): | 0.1700 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,400.5355 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.1608 |
| Daily Vapor Temperature Range (deg. R): | 23.7125 |
| Daily Vapor Pressure Range (psia): | 1.0656 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 4.5022 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 3.9947 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 5.0604 |
| Daily Avg. Liquid Surface Temp. (deg R): | 512.4830 |
| Daily Min. Liquid Surface Temp. (deg R): | 506.5548 |
| Daily Max. Liquid Surface Temp. (deg R): | 518.4111 |
| Daily Ambient Temp. Range (deg. R): | 23.6750 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.2110 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 4.5022 |

| | |
|---|---|
| Vapor Space Outage (ft): | 15.6667 |
| Working Losses (lb): | 269.4142 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 4.5022 |
| Annual Net Throughput (gal/yr.): | 38,080.0000 |
| Annual Turnovers: | 10.0000 |
| Turnover Factor: | 1.0000 |
| Maximum Liquid Volume (gal): | 3,808.0000 |
| Maximum Liquid Height (ft): | 18.0000 |
| Tank Diameter (ft): | 6.0000 |
| Working Loss Product Factor: | 1.0000 |
| Total Losses (lb): | 565.8926 |

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

## Emissions Report for: Annual

**Tmix pt 9 tier 2 emissions - Vertical Fixed Roof Tank**
**Boise, Idaho**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Gasoline (RVP 10) | 269.41 | 296.48 | 565.89 |
| Benzene | 1.50 | 1.65 | 3.14 |
| Ethylbenzene | 0.15 | 0.16 | 0.31 |
| Hexane (-n) | 2.39 | 2.63 | 5.02 |
| naphthalene | 0.00 | 0.00 | 0.00 |
| Toluene | 2.13 | 2.35 | 4.48 |
| Xylene (-o) | 0.26 | 0.29 | 0.55 |
| Xylene (-m) | 0.39 | 0.43 | 0.82 |
| 2,2,4-Trimethylpentane | 0.61 | 0.67 | 1.28 |
| Isopropyl benzene | 0.01 | 0.01 | 0.01 |
| Unidentified Components | 261.99 | 288.30 | 550.29 |

# TANKS 4.0.9d
## Emissions Report - Detail Format
## Total Emissions Summaries - All Tanks in Report

### Emissions Report for: Annual

| Tank Identification | | | | Losses (lbs) |
|---|---|---|---|---|
| Tank 401, pt 1 Teir 2 emissions | Sinlcair Oil Corp. | External Floating Roof Tank | Boise, Idaho | 25,910.20 |
| Tank 402 pt 6 tier 2 emissions | Sinclair Oil Corp. | Vertical Fixed Roof Tank | Boise, Idaho | 970.64 |
| Tank 431, pt5 Tier 2 emissions | Sinlcair Oil Corp. | External Floating Roof Tank | Boise, Idaho | 27,760.16 |
| Tmix pt 9 tier 2 emissions | Sinclair Oil Corp. | Vertical Fixed Roof Tank | Boise, Idaho | 565.89 |
| Total Emissions for all Tanks: | | | | 55,206.88 |

## APPENDIX: B FUGITIVE EMISSIONS CALCULATIONS

The maximum potential fugitive emissions calculation was based upon the Protocol for Equipment Leak Emissions Estimates (EPA-453/R-95-017, Table 2-3) and AP-42 methodology and is listed in this Appendix.

Sinclair Boise Products Terminal
Tier 2 Renewal 4/18/07, Rev. #1
Fugitive Emissions
EU#12

Re: Protocol for Equipment Leak Emission Estimates
(EPA-453/R-95-017, Table 2-3)
AP-42, 4 ed, (Fugitive Emission Factors, Table 9.1-2)

Fugitive VOC emissions

| | Source | Pump Seals | Valves | Fittings | Drains | Others | VOC Emission Rate (TPY) |
|---|---|---|---|---|---|---|---|
| 1 | Gasoline service | | | | | | |
| | Quantity | 10 | 200 | 400 | 1 | 20 | |
| | Emissions Factor (lb/hr-source | 0.00119 | 0.0000948 | 0.0000176 | 0.07 | 0.000287 | |
| | Emissions (TPY) | 0.052122 | 0.0830448 | 0.0308352 | 0.3066 | 0.0251412 | 0.50 |
| 2 | Distillate oil service | | | | | | |
| | Quantity | 6 | 100 | 200 | 1 | 20 | |
| | Emissions Factor (lb/hr-source | 0.00119 | 0.0000948 | 0.0000176 | 0.07 | 0.000287 | |
| | Emissions (TPY) | 0.031273 | 0.0415224 | 0.0154176 | 0.3066 | 0.0251412 | 0.42 |
| | TOTAL VOC EMISSIONS | | | | | | 0.92 |

Fugitive emissions - gasoline service

| | Component | Liquid Mass Fraction | VOC Emission Rate (TPY) | HAP Emission Rate (TPY) |
|---|---|---|---|---|
| 1 | Benzene | 0.0188 | 0.0094 | 0.0094 |
| 2 | Hexane | 0.0181 | 0.0090 | 0.0090 |
| 3 | Xylene-o | 0.0573 | 0.0285 | 0.0285 |
| 4 | Xylene-m | 0.0672 | 0.0334 | 0.0334 |
| 5 | Xylene-p | 0.0000 | 0.0000 | 0.0000 |
| 6 | Toluene | 0.0972 | 0.0484 | 0.0484 |
| 7 | Ethylbenzene | 0.0207 | 0.0103 | 0.0103 |
| 8 | Naphthalene | 0.0013 | 0.0006 | 0.0006 |
| 9 | Trimethylpentane (2,2,4 | 0.0151 | 0.0075 | 0.0075 |
| 10 | Cumene | 0.0022 | 0.0011 | 0.0011 |
| 11 | Gasoline(RVP10) | 0.7021 | 0.3495 | |
| | TOTAL | 1.0000 | 0.4977 | 0.1483 |

Fugitive emissions - fuel oil service

| | Component | Liquid Mass Fraction | VOC Emission Rate (TPY) | HAP Emission Rate (TPY) |
|---|---|---|---|---|
| 1 | Benzene | 0.0000 | 0.0000 | 0.0000 |
| 2 | Hexane | 0.0000 | 0.0000 | 0.0000 |
| 3 | Xylene-o | 0.0003 | 0.0001 | 0.0001 |
| 4 | Xylene-m | 0.0006 | 0.0003 | 0.0003 |
| 5 | Xylene-p | 0.0000 | 0.0000 | 0.0000 |
| 6 | Toluene | 0.0002 | 0.0001 | 0.0001 |
| 7 | Ethylbenzene | 0.0000 | 0.0000 | 0.0000 |
| 8 | Naphthalene | 0.0017 | 0.0007 | 0.0007 |
| 9 | Trimethylpentane (2,2,4 | 0.0000 | 0.0000 | 0.0000 |
| 10 | Cumene | 0.0000 | 0.0000 | 0.0000 |
| 11 | Fuel Oil | 0.9972 | 0.4188 | |
| | TOTAL | 1.0000 | 0.4200 | 0.0012 |

TOTAL VOC EMISSION RATE (TPY)= 0.92
TOTAL HAP EMISSION RATE (TPY)= 0.15

# APPENDIX: C SVE SYSTEM EMISSIONS CALCULATIONS

The maximum potential emissions calculation for the SVE system is listed in this Appendix.
Basis:

| | | | |
|---|---|---|---|
| SVE vent flowrate | 400 | scfm | |
| Corrected flowrate (altitude) | 361.5 | scfm | (at 13.28 psia, 60 F) |
| VOC (as hexane) | 1200 | ppm | (assumed average VOC concentration) |
| VOC flowrate | 0.434 | scfm | |
| MW | 86.2 | lb/lb mole | |

$$\text{VOC} = \frac{0.434\ \text{scf}}{\text{min}} \cdot \frac{\text{lb mole}}{379.6\ \text{scf}} \cdot \frac{86.2\ \text{lb}}{\text{lb mole}} \cdot \frac{60\ \text{min}}{\text{hr}} = 5.91$$

$$\text{VOC} = \frac{5.91\ \text{lb}}{\text{hr}} \cdot \frac{8760\ \text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2000\ \text{lb}} = 25.9\ \frac{\text{ton}}{\text{yr}}$$

Calculate HAP emissions:
Total HAP based upon gasoline vapor speciation

Total VOC emission rate 25.9 TPY

| | Component | Vapor Mass Fraction | Emission Rate (TPY) | HAP Emission Rate (TPY) |
|---|---|---|---|---|
| 1 | Benzene | 0.0288 | 0.7446 | 0.7446 |
| 2 | Hexane | 0.0611 | 1.5823 | 1.5823 |
| 3 | Xylene-o | 0.0022 | 0.0569 | 0.0569 |
| 4 | Xylene-m | 0.0088 | 0.2278 | 0.2278 |
| 5 | Xylene-p (inc. with o & m) | 0.0000 | 0.0000 | 0.0000 |
| 6 | Toluene | 0.0079 | 0.2040 | 0.2040 |
| 7 | Ethylbenzene | 0.0045 | 0.1170 | 0.1170 |
| 8 | Naphthalene | 0.0015 | 0.0400 | 0.0400 |
| 9 | Trimethylpentane (2,2,4) | 0.2454 | 6.3533 | 6.3533 |
| 10 | Cumene | 0.0017 | 0.0441 | 0.0441 |
| 11 | Gasoline(RVP10) | 0.6380 | 16.5149 | |
| | SUBTOTAL | 1.00 | 25.9 | 9.37 |