

**Mullins, Robert A** <robert.a.mullins@wv.gov>

Pre-Draft R30-09900022-2025

1 message

Mullins, Robert A <robert.a.mullins@wv.gov>

Tue, Sep 2, 2025 at 12:24 PM

To: asbrown@marathonpetroleum.com, "Mings, Carla C." <ccmings@marathonpetroleum.com>

Attached is the Pre-Draft Title V Permit Renewal and factsheet for MPLX Terminals LLC's Kenova-TriState Terminal. Please review the document and respond with any questions or comments by September 16, 2025 so that I can address any questions/comment before sending the renewal out to Notice.

Thanks,

--

Robert Mullins

WV Department of Environmental Protection

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304

Phone: (304)926-0499 ext. 41286

2 attachments**Pre-DPPermit R30-09900022-2025.pdf**

1884K

**Pre-DPFactSheet_R30-09900022-2025.pdf**

305K

Mullins, Robert A <robert.a.mullins@wv.gov>

RE: [EXTERNAL] R30-09900022-2025 renewal question

1 message

Mings, Carla C. <ccmings@marathonpetroleum.com>
To: "Mullins, Robert A" <robert.a.mullins@wv.gov>

Mon, Jul 7, 2025 at 11:51 AM

Robert,

Thanks for letting me know! I will work with Amanda next week to get this completed if that is ok.

Thanks,*Carla C. Mings***Adv. Environmental Engineer****Marine Environmental & Product Quality****Terminals Environmental – Ohio Valley Area**

From: Mullins, Robert A <robert.a.mullins@wv.gov>
Sent: Monday, July 7, 2025 11:47 AM
To: Mings, Carla C. <ccmings@marathonpetroleum.com>
Subject: Re: [EXTERNAL] R30-09900022-2025 renewal question

Carla,

I believe you will need to submit a Class I Administrative Update to R13-1352A and a Title V Minor Modification for the permanent removal of equipment. While there should be no changes to the Title V since it was never incorporated it's probably best to include the Minor modification just so there is a record of the removal from both permits that is easier to find than the note buried in the 2010 renewal application.

Thanks,

Robert Mullins

On Mon, Jul 7, 2025 at 11:28 AM Mings, Carla C. <ccmings@marathonpetroleum.com> wrote:

Robert,

Thanks for looking into this and letting me know. I was not having any luck finding it on our side but that may be due to the age of that. What needs done to have the never installed tank removed from the permit? Is that just a letter or does a form need completed? We typically work with Amanda Jennings with Trinity Consultants but she is on vacation this week so I can't easily ask her.

Thanks,

Carla C. Mings

Adv. Environmental Engineer

Marine Environmental & Product Quality

Terminals Environmental – Ohio Valley Area

From: Mullins, Robert A <robert.a.mullins@wv.gov>
Sent: Monday, July 7, 2025 10:29 AM
To: Mings, Carla C. <ccmings@marathonpetroleum.com>
Subject: Re: [EXTERNAL] R30-09900022-2025 renewal question

Carla,

The R13-1352A permit modification was issued in 2007 for the installation of Tank 269. After reviewing further I found where in the Title V 2010 renewal application it was stated that Tank 269 was never installed and the permit writer excluded it and its applicable requirements from the Permit. Can you see about updating permit R13-1352A to have it removed. The Title V permit is supposed to incorporate all applicable requirements which would include those for the non-existent Tank 269 so long as it is in the underlying R13-1352A permit.

Thanks,

Robert Mullins

On Mon, Jul 7, 2025 at 9:51 AM Mings, Carla C. <ccmings@marathonpetroleum.com> wrote:

Robert,

There is not a Tank 269 at Kenova-TriState Terminal. I am not familiar with the R13-1352A permit and why it would have included a Tank 269, but there is not one at the facility.

Thanks,

Carla C. Mings

Adv. Environmental Engineer

Marine Environmental & Product Quality

Terminals Environmental – Ohio Valley Area

From: Mullins, Robert A <robert.a.mullins@wv.gov>
Sent: Tuesday, July 1, 2025 9:54 AM
To: Mings, Carla C. <ccmings@marathonpetroleum.com>
Subject: [EXTERNAL] R30-09900022-2025 renewal question

I've been working on the Title V permit renewal for MPLX Terminal LLC's Kenova - TriState Terminal and have a question.

R13-1352A is one of the underlying permits for this Title V Permit and has a Tank 269 in its emission unit table. This tank seems to have never been included in the Title V permit. I also cannot find it in the current Renewal application other than in a table of emission limits from R13-1352A for the rest of the Tanks in R13-1352A. Is there a Tank 269 at the facility as permitted in R13-1352A?

--

Robert Mullins

WV Department of Environmental Protection

Division of Air Quality

[601 57th Street, SE](#)

[Charleston, WV 25304](#)

Phone: (304)926-0499 ext. 41286



Mullins, Robert A <robert.a.mullins@wv.gov>

Automatic reply: [EXTERNAL] Completeness Determination, Kenova-Tristate Terminal, Application No. R30-09900022-2025

1 message

Mings, Carla C. <ccmings@marathonpetroleum.com>
To: "Mullins, Robert A" <robert.a.mullins@wv.gov>

Wed, Apr 30, 2025 at 1:15 PM

I am traveling to Indianapolis, IN for team meetings beginning Monday, April 28 though Friday, May 2. I have intermittent access to email. If you need immediate assistance, then please call my cell phone at 606-369-0144. If you have an emergency, please contact the emergency response system: 1-877-MAPLINE (1-877-627-5463). For non-urgent items, I will reply upon my return.

Thanks!
Carla Mings

606-369-0144 (Cell)



Mullins, Robert A <robert.a.mullins@wv.gov>

Completeness Determination, Kenova-Tristate Terminal, Application No. R30-09900022-2025

1 message

Mullins, Robert A <robert.a.mullins@wv.gov>

Wed, Apr 30, 2025 at 1:14 PM

To: asbrown@marathonpetroleum.com, ccmings@marathonpetroleum.com

From	Robert Mullins
To	Angela Brown; Carla Mings
Subject	Completeness Determination, Kenova-Tristate Terminal, Application No. R30-09900022-2025

Your Title V renewal application for a permit to operate the above referenced facility was received by this Division on March 20, 2025. After review of said application, it has been determined that the application is administratively complete as submitted. Therefore, the above referenced facility qualifies for an Application Shield.

The applicant has the duty to supplement or correct the application. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information. In addition, an applicant shall provide additional information as necessary to address any requirements that become applicable to the source after the date it filed a complete application but prior to release of a draft permit.

The submittal of a complete application shall not affect the requirement that any source have all **preconstruction permits** required under the rules of the Division.

If during the processing of this application it is determined that additional information is necessary to evaluate or take final action on this application, a request for such information will be made in writing with a reasonable deadline for a response. Until which time as your renewal permit is issued or denied, please continue to operate this facility in accordance with 45CSR30, section 6.3.c. which states: *If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.* This protection shall cease to apply if, subsequent to the completeness determination made pursuant to paragraph 6.1.d. of 45CSR30 and as required by paragraph 4.1.b., the applicant fails to submit by the deadline specified in writing any additional information identified as being needed to process the application.

Please remember, **failure of the applicant to timely submit information required or requested to process the application may cause the Application Shield to be revoked.** Should you have

any questions regarding this determination, please contact me.

Sincerely,

--

Robert Mullins

WV Department of Environmental Protection

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304

Phone: (304)926-0499 ext. 41286



Mink, Stephanie R <stephanie.r.mink@wv.gov>

WV DAQ Title V Permit Application Status for MPLX Terminals LLC Kenova-TriState Terminal; Kenova

2 messages

Mink, Stephanie R <stephanie.r.mink@wv.gov> Tue, Mar 25, 2025 at 9:26 AM
To: "Brown, Angela S." <asbrown@marathonpetroleum.com>, "Mings, Carla C." <ccmings@marathonpetroleum.com>
Cc: Carrie McCumbers <carrie.mccumbers@wv.gov>, Robert A Mullins <robert.a.mullins@wv.gov>

RE: Application Status

MPLX Terminals, LLC

Kenova Tri-State Terminal

Facility ID No. 099-00022

Application No. R30-09900022-2025

Dear Ms. Brown,

Your application for a Title V Permit Renewal for MPLX Terminals, LLC's Kenova Tri-State Terminal was received by this Division on March 20, 2025, and was assigned to Robert "R.A."Mullins.

Should you have any questions, please contact the assigned permit writer, Robert "R.A."Mullins, at 304-926-0499, extension 41286, or Robert.A.Mullins@wv.gov .

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281

McCumbers, Carrie <carrie.mccumbers@wv.gov> Tue, Mar 25, 2025 at 11:03 AM
To: stephanie.r.mink@wv.gov

Your message

To: McCumbers, Carrie
Subject: WV DAQ Title V Permit Application Status for MPLX Terminals LLC Kenova-TriState Terminal; Kenova
Sent: 3/25/25, 9:26:31 AM EDT

was read on 3/25/25, 11:03:07 AM EDT



WV DAQ Title V Reminder Letter for MPLX Terminals, LLC; Kenova - Tri State Terminal

2 messages

Mink, Stephanie R <stephanie.r.mink@wv.gov>

Tue, Nov 19, 2024 at 2:32 PM

To: "Brown, Angela S." <asbrown@marathonpetroleum.com>, "Mings, Carla C." <ccmings@marathonpetroleum.com>

Cc: Carrie McCumbers <carrie.mccumbers@wv.gov>

RE: Title V Permit Renewal Application

MPLX Terminals, LLC

Kenova - Tri State Terminal

Permit No.: R30-09900022-2020

Plant ID No.: 099-00022

Dear Ms. Brown:

On September 22, 2020, the WV Department of Environmental Protection Division of Air Quality issued a Title V permit to MPLX Terminals, LLC's Kenova - Tri State Terminal. Our records indicate that this Title V permit will expire on September 22, 2025, and a Title V permit renewal application is due for submittal on or before March 22, 2025.

In accordance with 45CSR§30-4.1.a.3, a permit renewal application is **timely** if it is submitted at least six (6) months prior to the date of permit expiration. Please bear in mind, the permit application must also be **complete** six (6) months prior to the permit expiration date. Refer to 45CSR§30-4.1.b for what constitutes a complete application. **Please note that as of March 16, 2020, the Division of Air Quality requests that all applications be submitted via email.** Instructions can be found at <https://dep.wv.gov/daq/permitting/Pages/TitleVGuidanceandForms.aspx>.

Please ensure the **timely** and **complete** submittal of the permit renewal application. An application shield will only be granted for an application which is **timely** and **complete**.

Should you have any questions, please contact me or Carrie McCumbers, Title V Program Manager, at 304-926-0499, ext. 41278.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

McCumbers, Carrie <carrie.mccumbers@wv.gov>
To: stephanie.r.mink@wv.gov

Tue, Nov 19, 2024 at 2:55 PM

Your message

To: McCumbers, Carrie
Subject: WV DAQ Title V Reminder Letter for MPLX Terminals, LLC; Kenova - Tri State Terminal
Sent: 11/19/24, 2:32:09 PM EST

was read on 11/19/24, 2:55:43 PM EST

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : MPLX Terminals LLC - Kenova-TriState Terminal; Kenova, West Virginia

[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): 099-00022
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): R30-09900022-2020

- Type of NSR Application (check all that apply):
 - ☐ Construction
 - ☐ Modification
 - ☐ Class I Administrative Update
 - ☐ Class II Administrative Update
 - ☐ Relocation
 - ☐ Temporary
 - ☐ Permit Determination
- Type of 45CSR30 (TITLE V) Application:
 - ☐ Title V Initial
 - ☒ Title V Renewal
 - ☐ Administrative Amendment**
 - ☐ Minor Modification**
 - ☐ Significant Modification**
 - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
 - ☐ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
 - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
Mail checks to:
WVDEP – DAQ – Permitting
Attn: NSR Permitting Secretary
601 57th Street, SE
Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):

☐ Responsible Official/Authorized Representative

- Name: Angela Brown
- Email: asbrown@marathonpetroleum.com
- Phone Number: (419) 421-2629

☒ Company Contact

- Name: Carla Mings
- Email: ccmings@marathonpetroleum.com
- Phone Number: (606) 739-2471

☐ Consultant

- Name:
- Email:
- Phone Number:

TITLE V PERMIT RENEWAL APPLICATION



MPLX Terminals, LLC / Kenova, WV

Prepared By:

TRINITY CONSULTANTS

440 Polaris Parkway
Suite 275
Westerville, OH 43082
(614) 433-0733

March 2025

Project 244916.0017



TABLE OF CONTENTS

1. APPLICATION OVERVIEW	1-1
1.1 Facility Description	1-1
1.2 Facility Updates	1-1
1.3 Organization of Application	1-2
2. REGULATORY APPLICABILITY	2-3
2.1 Federal Regulatory Applicability	2-3
2.1.1 Prevention of Significant Deterioration (PSD) & Nonattainment New Source Review (NANSR) Applicability.....	2-3
2.1.2 Title V Operating Program	2-3
2.1.3 40 CFR 60 – New Source Performance Standards (NSPS).....	2-4
2.1.4 National Emission Standards for Hazardous Air Pollutants (NESHAP).....	2-5
2.2 Compliance Assurance Monitoring.....	2-8
2.3 Risk Management Plan Regulations	2-9
2.4 Stratospheric Ozone Protection Regulations	2-9
2.5 West Virginia SIP Regulations	2-10
2.5.1 45CSR2: To Prevent and Control Particulate Matter Air Pollution from Combustion of Fuel in Indirect Heat Exchangers	2-10
2.5.2 45CSR4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor – State Only.....	2-10
2.5.3 45CSR6: To Prevent and Control Air Pollution from Combustion of Refuse.....	2-11
2.5.4 45CSR7: To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Other Associated Operations.....	2-11
2.5.5 45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides	2-11
2.5.6 45CSR11: Prevention of Air Pollution Emergency Episodes	2-11
2.5.7 45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants	2-12
2.5.8 45CSR16: Standards of Performance for New Stationary Sources	2-12
2.5.9 45CSR21, Section 21: Bulk Gasoline Plant.....	2-12
2.5.10 45CSR21 Section 22: Bulk Gasoline Terminals.....	2-12
2.5.11 45CSR21 Section 23: Gasoline Dispensing Facility	2-13
2.5.12 45CSR21 Section 24: Leaks from Gasoline Tank Trucks	2-13
2.5.13 45CSR21 Sections 27 and 28: Petroleum Liquid Storage in External Floating Roof Tanks and Petroleum Liquid Storage in Fixed Roof Tanks.....	2-13
2.5.14 45CSR21 Section 40: Other Facilities that Emit Volatile Organic Compounds (VOC).....	2-13
2.5.15 45CSR22: Air Quality Management Fee Program	2-14
2.5.16 45CSR30: Requirements for Operating Permits	2-14
2.5.17 45CSR34: Emission Standards for Hazardous Air Pollutants.....	2-14
3. CALCULATION METHODOLOGY	3-15
3.1.1 Routine Emissions from Storage Tanks.....	3-15
3.1.2 Emissions from Tank Landing and Cleaning Events.....	3-15
3.1.3 Fugitive Emissions from Equipment Leaks.....	3-16
3.1.4 Emissions from Marine Barge Loading	3-16
3.1.5 Emissions from Dockside Barge Sampling	3-17
3.1.6 Emissions from Tank 273 Hot Oil Heater.....	3-17
3.1.7 Emissions From Engines.....	3-17

<i>3.1.8 Emissions from Diesel Fueling Operations.....</i>	<i>3-17</i>
<i>3.1.9 Emissions from Roadway Traffic.....</i>	<i>3-17</i>
<i>3.1.10 Cooling Tower Emissions.....</i>	<i>3-18</i>
<i>3.1.11 Oily Sewer System Emissions.....</i>	<i>3-18</i>
<i>3.1.12 Emissions from Gasoline Filter Changeouts.....</i>	<i>3-18</i>
<i>3.1.13 Facility-Wide HAP Emissions.....</i>	<i>3-18</i>
<i>3.1.14 Facility-Wide Emissions</i>	<i>3-19</i>

4. TITLE V FORMS	4-1

ATTACHMENT A. AREA MAP	A-1

ATTACHMENT B. PLOT PLAN	B-1

ATTACHMENT C. PROCESS FLOW DIAGRAM	C-1

ATTACHMENT D. EQUIPMENT TABLE	D-1

ATTACHMENT E. EMISSION UNIT FORM	E-1

ATTACHMENT G. CONTROL DEVICE FORM	G-1

ATTACHMENT H. COMPLIANCE ASSURANCE MONITORING (CAM) FORM	H-1

ATTACHMENT I. SITE-WIDE EMISSION CALCULATIONS	I-1

1. APPLICATION OVERVIEW

MPLX Terminals LLC (MPLX) owns and operates a bulk gasoline terminal in Kenova, West Virginia (WV). The Kenova-TriState Terminal currently operates under West Virginia Permit to Operate R30-09900022-2020, effective October 22, 2020, and modified April 5, 2021, August 3, 2021, and February 4, 2025.

The operating permit for the Kenova-TriState Terminal expires on September 22, 2025, and a renewal application is due March 22, 2025. This document is being submitted as a timely renewal application for the Kenova-TriState Terminal.

1.1 Facility Description

The Kenova-TriState Terminal is located at 23rd Street and the Ohio River, Kenova, West Virginia, 25530, in Wayne County. The oil transfer dock is located at Ohio River Mile Marker 316.3 on the Left Descending Bank. The Kenova-TriState Terminal receives refined petroleum fuels, primarily gasoline and distillate (which may refer to kerosene, jet kerosene, or fuel oil #2) from Marathon Petroleum Company's Catlettsburg, Kentucky, refinery via pipeline.¹ Fuels can be transferred from both tank farms to the oil transfer dock. Towboats are also fueled at the oil transfer dock. However, neither trucks nor railcars are loaded or unloaded with fuels at this facility, except for butane off-loading. Off-loading of barges also occurs occasionally. The Kenova-TriState Terminal is also the source for product to the Cardinal Pipeline, which is a 16" pipeline connecting the Kenova-TriState Terminal with MPLX's terminal in Columbus, Ohio. The Kenova-TriState Terminal has twenty-one (21) above-ground commodity storage tanks located in the Kenova and TriState tank farms. In 2019, the terminal implemented butane unloading, storage, and blending operations.

In addition to the operations listed above, MPLX utilizes ancillary emission units to support and facilitate facility operations (e.g., internal combustion engines, hot oil heater, oily sewer system, etc.) Detailed information for these units is included in the Emission Unit Forms provided under Attachment E to this application.

Area maps and plot plans of the Kenova-TriState Terminal are provided in Attachments A and B, respectively. A process flow diagram depicting facility operations is provided in Attachment C.

1.2 Facility Updates

The following list identifies changes to the site or to the application since the last Title V permit modification was issued in 2021:

- ▶ MPLX submitted two (2) off permit changes to authorize the installation of an 87,000-gallon butane bullet and butane offloading from rail cars on June 6, 2024, and November 26, 2024, respectively.
- ▶ MPLX submitted a Class II Administrative Update request for R13-2277E and an associated Title V minor modification application on September 11, 2024, to increase the permit allowable distillate throughput at the barges from 27,375,000 barrels per year (bbl/yr) to 45,625,000 bbl/yr. R13-2277F was issued final on October 25, 2024, and the associated Title V minor modification was issued on February 4, 2025.
- ▶ Updates to AP-42 Section 7.1 that occurred after submittal of the last Title V renewal application are reflected in the storage tank potential to emit calculations, including updated tank cleaning and landing

¹ Neither the Kenova Terminal nor the Tri-State Terminal is adjacent to or contiguous with the Catlettsburg Refinery (i.e., the refinery is a different stationary source).

calculations. As such, any change to potential emissions is not due to any physical change or change in method of operation of the storage tanks.

- ▶ When reviewing the potential to emit (PTE) calculations for Barge Loading, MPLX noted inaccuracies in the maximum hourly distillate loading rates. MPLX discovered errors in certain process variables used to calculate the maximum distillate loading rates and corrected the values. Specifically, the worst-case hourly distillate loading rate (with gasoline loading at capacity) for Barge Loading was corrected from 6,000 to 7,000 barrels per hour (bbl/hr) to represent maximum equipment capacity. As such, the Barge Loading “maximum simultaneous loading” rate listed in the existing Title V permit (Table 1.1) should be revised from 19,600 bbl/hr to 20,600 bbl/hr. Additionally, the maximum distillate loading rate (without gasoline loading) was also revised downward from 12,000 bbl/hr to 9,000 bbl/hr in the PTE calculations; however, this correction does not require a Title V permit revision. The changes to the hourly rates were not the result of a physical change or change in the method of operation of the Barge Loading emissions unit.² As such, the revision does not trigger an R13 permitting requirement. Furthermore, the increase in hourly loading rates does not change the annual Barge Loading VOC or HAP emissions. The revised distillate loading rates are reflected in Form D, the two (2) Form E’s for the Barge Loading operations, and in the PTE calculations specific to Barge Loading in Attachment I.

MPLX submitted an R13 and Title V modification application to install a backup marine vapor combustion unit (MVCU) for the barge loading operations on 12/17/2024. However, the equipment has not yet been permitted or installed. Therefore, the MVCU is not addressed in this Title V renewal application.

1.3 Organization of Application

This application contains the following information.

- ▶ Section 2: Regulatory Applicability
- ▶ Section 3: Sample Emission Calculations
- ▶ Section 4: WVDEP Application Forms
- ▶ Attachment A: Area Map
- ▶ Attachment B: Plot Plan
- ▶ Attachment C: Process Flow Diagram
- ▶ Attachment D: Equipment Table
- ▶ Attachment E: Emission Unit Forms
- ▶ Attachment F: Schedule of Compliance Form (if applicable)
- ▶ Attachment G: Air Pollution Control Device Form
- ▶ Attachment H: Compliance Assurance Monitoring (CAM) Plan form
- ▶ Attachment I: Site-Wide Emissions Calculations

² The worst-case hourly VOC emissions increased from 69.9 lb/hr to 70.4 lb/hr due to this correction.

2. REGULATORY APPLICABILITY

This section of the permit application summarizes the air permitting requirements and the key air quality regulations that apply to the emission units addressed by this application. Specifically, the applicability of Prevention of Significant Deterioration (PSD) Review, Nonattainment New Source Review (NANSR), New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and West Virginia Title 45 of the Code of State Rules (45CSR) regulations is addressed. Regulations applicable to the Kenova-TriState Terminal are detailed in the “*Applicable Requirements*” sections of the forms provided by the WVDEP contained in Section 4 of this report. This review is presented to supplement and/or add clarification to the information provided in the WVDEP Title V application forms, which fulfill the requirement to include citations and descriptions of applicable statutory and administrative code requirements.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the Kenova-TriState Terminal.

2.1 Federal Regulatory Applicability

2.1.1 Prevention of Significant Deterioration (PSD) & Nonattainment New Source Review (NANSR) Applicability

The applicability of PSD is evaluated for proposed construction, reconstruction, and modification projects that result in an emissions increase of a regulated NSR pollutant for which the area is attaining the NAAQS. The applicability of NANSR is evaluated for projects that result in an emissions increase of a regulated NSR pollutant for which the area is not attaining the NAAQS. Wayne County has been designated “in attainment” or “unclassifiable” with respect to National Ambient Air Quality Standards (NAAQS) for all criteria pollutants.³

Petroleum storage and transfer units with a total storage capacity exceeding three hundred thousand barrels are classified as one of the 28 listed source categories in 45CSR14-2.43.a and are therefore subject to the PSD major source threshold of 100 tpy. The Kenova-TriState Terminal is an existing major source with regard to PSD with facility-wide potential emissions of VOC in excess of 100 tpy.

2.1.2 Title V Operating Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in 45CSR30. The major source potential-to-emit thresholds with respect to the West Virginia Title V operating permit program regulations are: 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, and/or 100 tpy of all other regulated pollutants.

As shown in Attachment I, total potential emissions from the facility exceed the major source thresholds for VOC; therefore, a Title V operating permit is required. The Kenova-TriState Terminal currently operates under TV operating permit 09900022-2020, effective October 22, 2020 (modified 4/5/2021, 8/3/2021, and 2/4/2025). This timely and complete renewal application is being submitted by the renewal deadline of

³ Attainment designations for West Virginia counties are established in 40 CFR 81.349.

March 22, 2025, (i.e., six months prior to the expiration of the Kenova-TriState Terminal's Title V operating permit) in accordance with 45CSR30-4.1.a.3.

2.1.3 40 CFR 60 – New Source Performance Standards (NSPS)

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources in specific source categories to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the Kenova-TriState Terminal.

2.1.3.1 NSPS Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The affected source under 40 CFR 60, Subpart Dc (NSPS Dc) is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989, and that has a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr. NSPS Dc contains emission standards for SO₂ and PM.

As provided in 40 CFR 60.41c, a steam-generating unit is defined as:

...a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart.

The hot oil heater has a heat input capacity of 2.499 MMBtu/hr. Because NSPS Dc does not apply to units with design heat input capacities of less than 10 MMBtu/hr, the provisions of NSPS Dc do not apply to the hot oil heater at the Kenova-TriState Terminal.

2.1.3.2 NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)

NSPS Subpart Kb applies to storage vessels with a capacity greater than or equal to 75 m³ (~19,800 gallons) that are used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. The rule exempts certain storage vessels larger than 75 m³ that store materials with maximum true vapor pressure below certain limits.⁴ Several storage tanks at the Kenova-TriState Terminal are subject to NSPS Kb, based on capacity and the types of materials being stored. The applicability of NSPS Kb to each storage tank is indicated on the Emission Unit Form for each tank, included in Attachment E of this document. All tanks that are subject to this rule are, and will continue to be, operated in compliance with all applicable requirements.

2.1.3.3 NSPS Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)

NSPS Subpart Kc applies to storage vessels with a capacity greater than or equal to (20,000 gallons) that are used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after October 4, 2023. The existing storage tanks at the Kenova-TriState Terminal are not

⁴ Item 19 in the General Form immediately following this application narrative identifies tanks to which the provisions of NSPS Kb do not apply and includes the relevant citation.

subject to this subpart because they have not been constructed, modified, or reconstructed after October 4, 2023.

The new insignificant butane bullet was installed after October 4, 2023, will not be subject to NSPS Kc because the bullet will be pressurized in excess of 29.7 psia will not emit to the atmosphere.

2.1.3.4 NSPS Subpart XX – Standards of Performance for Bulk Gasoline Terminals

NSPS Subpart XX applies to loading racks for gasoline tank trucks. This rule is not applicable to the Kenova-TriState Terminal, because the facility does not operate gasoline tank truck loading racks.

2.1.3.5 40 CFR 60, Subpart XXa – Standards of Performance for Bulk Gasoline Terminals

NSPS Subpart XXa applies to affected facilities at bulk gasoline terminals that load gasoline into gasoline cargo tanks for transport that commenced construction, modification, or reconstruction after June 10, 2022. This rule is not applicable to the Kenova-TriState Terminal, because the facility does not deliver liquid product into gasoline cargo tanks, as defined in 40 CFR 60.501a, to be the delivery tank of a truck or railcar.

2.1.3.6 NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Affected sources under NSPS IIII include compression ignition internal combustion engines. MPLX operates one 510 brake horsepower (bhp) diesel-fired emergency fire pump that was manufactured and installed after July 1, 2006, and is therefore subject to the provisions of NSPS IIII per 40 CFR 60.4200(a)(2)(ii). MPLX also operates a 66 hp diesel-fired engine that was manufactured and installed after April 1, 2006, and is therefore subject to the provisions of NSPS IIII per 40 CFR 60.4200(a)(2)(i). MPLX purchased the emergency fire pump engine certified to meet the emission standards in Table 4 of NSPS IIII pursuant to 40 CFR 60.4205(c), and MPLX purchased the non-emergency engine certified to meet Tier 4 emission standards pursuant to 60.4201(a). MPLX operates and maintains these engines in accordance with the requirements of Subpart IIII.

2.1.4 National Emission Standards for Hazardous Air Pollutants (NESHAP)

Maximum achievable control technology (MACT)-based NESHAPs (located in 40 CFR 61 and 63) require sources that are “major” for HAPs to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. A major source is defined in 40 CFR 63.2 as:

...any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants...

Generally available control technology (GACT)-based NESHAPs (located in 40 CFR 63) require area (i.e., non-major) sources to control emissions to the level achievable by the use of generally available control technologies or management practices to reduce emissions of HAPs.

Based on consideration of the site’s current operating conditions, the Kenova-TriState Terminal has the potential to emit total and individual HAP in quantities less than 25 and 10 tpy respectively. Therefore, the facility is currently considered an area source of HAP.

However, MPLX is complying with MACT rules applicable to major sources of HAP consistent with the current Title V requirements. The following subsection(s) provide applicability determinations for NESHAP standards relevant to the emissions units addressed in this application.

2.1.4.1 40 CFR Part 61, Subpart M – National Emission Standard for Asbestos

NESHAP Subpart M includes standards and requirements for facilities related to the safe handling of asbestos containing materials. This rule is generally applicable to the Kenova-TriState Terminal. MPLX will continue to meet all applicable requirements of this rule.

2.1.4.2 40 CFR Part 61, Subpart BB – National Emission Standard for Benzene Emissions from Benzene Transfer Operations

NESHAP Subpart BB includes standards and requirements for facilities related to the safe handling of benzene containing materials and specifically applies to loading racks at which benzene is loaded into tank trucks, railcars, or marine vessels at benzene production facilities and bulk terminals. However, as provided in 40 CFR 61.300(a), the loading of gasoline, crude oil, natural gas liquids, and petroleum distillates (e.g., fuel oil, diesel, kerosene) are specifically exempted from the regulation; therefore, 40 CFR 61, Subpart BB does not apply to the Kenova-TriState Terminal.

2.1.4.3 40 CFR Part 63, Subpart R – National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)

NESHAP Subpart R applies to bulk gasoline terminals and pipeline breakout stations. MPLX complies with NSPS Kb for affected gasoline storage vessels, MACT Y for the barge loading rack, and the equipment leak standards of Subpart R for valves, pumps, and fittings/connectors in gasoline service. MPLX is operating, and will continue to operate, the Kenova-TriState Terminal in accordance with the requirements of this rule. MPLX does not operate a truck or railcar loading rack; therefore, the Subpart R requirements applicable to truck or railcar loading racks do not apply to the Kenova-TriState Terminal.

U.S. EPA revised Subpart R, effective July 8, 2024. The Kenova-TriState Terminal will comply with the updated rule for equipment leak standards per 40 CFR 63.424. After May 8, 2027, the Kenova-TriState Terminal will comply with the provisions of Subpart R applicable to pipeline breakout stations, including the gasoline storage vessel requirements under 40 CFR 63.423(b) and 63.528(m)(1), (7), and (8).

The fugitive equipment leaks associated with the butane bullet and railcar hose disconnects will not be subject to Subpart R because the components will not be in gasoline service.

The unit-specific forms for Fugitive Components and Storage Tanks included in Attachment E to this application outline the specific applicable requirements of 40 CFR 63, Subpart R.

2.1.4.4 40 CFR Part 63, Subpart Y – National Emission Standards for Marine Tank Vessel Loading Operations

40 CFR 63, Subpart Y applies MACT standards to marine vessel loading operations at major sources of HAP and Reasonably Available Control Technology (RACT) standards to marine tank vessel loading operations that met a minimum gasoline or crude oil throughput. The Kenova-TriState Terminal operates existing marine vessel loading operations; therefore, this rule is applicable to the gasoline barge loading operations. MPLX is operating, and will continue to operate, all marine tank vessel loading facilities in accordance with the requirements of this rule, as applicable.

The unit-specific forms for Gasoline Loading Operations included in Attachment E to this application outline the specific applicable requirements of 40 CFR 63, Subpart Y.

2.1.4.5 40 CFR Part 63, Subpart EEEE – Organic Liquids Distribution (Non-gasoline)

NESHAP Subpart EEEE applies to major sources of HAP that operate organic liquid distribution (OLD) (non-gasoline) facilities. Pursuant to 40 CFR 63.2338(c), affected sources (e.g., storage tanks, transfer racks, equipment leak components) that are part of an affected source under another NESHAP are not subject to Subpart EEEE. In addition, the definition of organic liquids excludes gasoline, distillate oils No. 1 and No. 2, and wastewater, and any non-crude liquid that contains less than 5 percent by weight organic HAP (e.g., butane). There is greater than 5% HAP in two distillate additives used at the terminal stored in Tanks 300 and 301. The additive rack only unloads organic liquids, Tank 300 has a capacity of less than 5,000 gallons, and the contents of Tank 301 do not meet the vapor pressure requirements per Table 2b. Therefore, MPLX is subject only to recordkeeping requirements per 40 CFR 63.2343(a) for Tank 300; no substantive requirements (e.g., control requirements) apply. Tank 301 is subject to additional recordkeeping and reporting requirements under 50 CFR 63.2343(b). For equipment leaks under MACT EEEE, since no affected source would require controls, no equipment leak requirements apply in accordance with 40 CFR 63.2346(c).

2.1.4.6 40 CFR Part 63, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

NESHAP Subpart ZZZZ applies to facilities that operate stationary reciprocating internal combustion engines (RICE). With the prior renewal application, MPLX determined that two engines were installed when the site was a major source of HAP, and the engines comply with the major source provisions of Subpart ZZZZ. MPLX operates one (1) 510 horsepower (HP) diesel-fired emergency RICE for a fire water pump that is subject to the provisions of 40 CFR 63 Subpart ZZZZ. The engine complies with the initial notification requirements pursuant to 40 CFR 63.6590(b)(i) and complies with the requirements for emergency operations, per 40 CFR 63.6640(f). This includes a limit of 100 hours per year for maintenance and testing, of which 50 hours can be for non-emergency operation. The engine is not subject to any Subpart ZZZZ emission limits or operating limits per 40 CFR 63.6600(c).

MPLX also operates one (1) 66 horsepower (HP) diesel-fired non-emergency CI ICE for a backup pump. The engine complies with Subpart ZZZZ by complying with the provisions of 40 CFR 60 Subpart IIII per 40 CFR 63.6590(c).

2.1.4.7 40 CFR Part 63, Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters)

NESHAP Subpart DDDDD applies to boilers and process heaters at major sources of HAP. The Kenova-TriState Terminal utilizes a hot oil heater (heat input of 2.499 MMBtu/hr) to regulate the temperature of the biodiesel stored in Tank 273 (Tank 1S). MPLX determined that the heater was installed when the site was a major source of HAP, and the heater complies with the major source provisions of Subpart DDDDD.

40 CFR 63.7575 defines the criteria for inclusion in the 'unit designed to burn gas 1' subcategory according to the following:

...any boiler or process heater that burns only natural gas, refinery gas, and/or other gas 1 fuels. Gaseous fuel boilers and process heaters that burn liquid fuel for periodic testing of liquid fuel, maintenance, or operator training, not to exceed a combined total of 48 hours during any calendar year, are included in this definition.

Gaseous fuel boilers and process heaters that burn liquid fuel during periods of gas curtailment or gas supply interruptions of any duration are also included in this definition.

The hot oil heater qualifies as a “unit designed to burn gas 1,” since it is a natural gas-fired process heater that will fire diesel only during periods of gas curtailment or gas supply interruptions. The hot oil heater will conduct a tune up every 5 years per 40 CFR 63.7500(e).

2.1.4.8 40 CFR Part 63, Subpart BBBBBB

Per 40 CFR 63.11081(a), NESHAP BBBBBB applies to area source bulk gasoline terminals that are not subject to MACT R, pipeline breakout stations that are not subject to MACT R, pipeline pumping stations, and bulk gasoline plants. The Kenova-TriState Terminal complies with MACT R. Therefore, NESHAP BBBBBB does not apply.

2.2 Compliance Assurance Monitoring

Under 40 CFR 64, the Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emissions units with the initial or renewal Title V operating permit application. CAM Plans are intended to provide an on-going and reasonable assurance of compliance with emission limits for sources that utilize active control devices where existing Title V permit requirements may not be considered sufficient.

Under the general applicability criteria, this regulation applies only to emission units that use a control device to comply with a federally-enforceable requirement (e.g. emission limit) for which the pre-controlled emission levels exceed the major source thresholds under the Title V operating permit program. It should be noted that based on the definitions in the rule, a “control device” does not include passive control measures that act to prevent pollutants from forming, such as the use of seals, lids, or roofs to prevent the release of pollutants, use of low-polluting fuel or feedstocks, or the use of combustion or other process design features or characteristics. Accordingly, none of the storage tanks with floating roofs at the Kenova-TriState Terminal are equipped with a control device with respect to CAM applicability. The only emission unit with a control device (and therefore the only emission unit potentially subject to CAM provisions) is the barge loading operations.

Volatile organic compound (VOC) emissions from barge loading operations are controlled by a vapor recovery unit (VRU) when loading gasoline. 40 CFR 63.562(b)(2) requires that MPLX reduce captured HAP emissions from marine tank vessel loading operations by 97 weight-percent. 40 CFR 63.564(a) and/or 40 CFR 63.654(g)(1) establish monitoring requirements under MACT Y, and MPLX complies with these standards using a Continuous Emissions Monitoring System (CEMS). As provided in 40 CFR 64.2(b)(1)(i), CAM requirements do not apply to MACT emission limits promulgated after November 15, 1990. Because the only applicable emission limit is established in MACT Y, which was promulgated September 19, 1995, the 97 weight-percent limit is not subject to the requirements of CAM.

Loading operations are additionally subject to the reasonably available control technology (RACT) standards established in 40 CFR 63.562(c). Specifically, MPLX must also reduce captured VOC emissions by 95 weight-percent per 40 CFR 63.562(c)(3). However, 40 CFR 64.2(b)(1)(vi) provides that any emission limitations or standards for which a permit issued in accordance with 40 CFR 70 or 40 CFR 71 establishes a continuous compliance determination method is exempt from CAM requirements. MPLX assesses compliance with this limit via use of the CEMS in accordance with the Title V permit. 40 CFR 64.1 defines a *continuous compliance determination method* as:

... a method, specified by the applicable standard or an applicable permit condition, which:

- (1) Is used to determine compliance with an emission limitation or standard on a continuous basis, consistent with the averaging period established for the emission limitation or standard; and*
- (2) Provides data either in units of the standard or correlated directly with the compliance limit.*

Because the CEMS operates on a continuous basis and provides data which directly correlate with the compliance limit,⁵ the CEMS meets the two (2) criteria required to constitute a continuous compliance determination method as defined in 40 CFR 64.1. Therefore, the RACT limit is also exempt from the requirements of CAM in accordance with 40 CFR 64.2(b)(1)(vi).

45CSR34 incorporates by reference applicable MACT requirements; no other SIP rules limit VOC emissions from the loading operations. Therefore, the loading operations are not subject to CAM requirements.

Because no emission unit meets all three applicability criteria (i.e., uses a control device, uses that control device to comply with a federally enforceable emission limit, and has pre-controlled emissions exceeding major source thresholds), CAM is not applicable to any existing emission units at the Kenova-TriState Terminal.

2.3 Risk Management Plan Regulations

Subpart B of 40 CFR 68 outlines requirements for risk management prevention plans pursuant to Section 112(r) of the Clean Air Act. Applicability of the subpart is determined based on the type and quantity of chemicals stored at a facility. Regulated substances in gasoline, when in distribution or related storage for use as fuel for internal combustion engines, are exempt from the threshold determination per 40 CFR 68.115(b)(2)(ii). Therefore, MPLX has evaluated the amount of Section 112(r) substances stored at the Kenova-TriState Terminal after excluding gasoline and determined that the facility will be subject to Section 112(r) due to the storage of butane (not contained within gasoline) in quantities greater than 10,000 pounds at any one time. MPLX submitted a Risk Management Plan (RMP) to U.S. EPA on 9/19/2019, prior to initial start-up of the regulated butane blending operations at the facility. MPLX submitted two additional off-permit changes to support butane blending to install an additional butane bullet and authorize butane offloading from rail cars. An updated RMP was submitted 9/17/24 for the new butane bullet.

2.4 Stratospheric Ozone Protection Regulations

The requirements originating from Title VI of the Clean Air Act, entitled *Protection of Stratospheric Ozone*, are contained in 40 CFR 82. Subparts A through E and Subparts G and H of 40 CFR Part 82 are not applicable to the Kenova-TriState Terminal (as the Kenova-TriState Terminal does not engage in the activities regulated therein). 40 CFR 82 Subpart F, *Recycling and Emissions Reduction*, potentially applies if the facility operates, maintains, repairs, services, or disposes of appliances that utilize Class I or Class II ozone depleting substances. Subpart F generally applies to the facility, and MPLX will continue to operate in compliance with the applicable requirements.

⁵ Per 40 CFR 63.563(b)(6)(iii), the facility shall operate with a block average outlet VOC concentration as determined in 40 CFR 63.564(g)(1) of no more than 1,200 ppmv VOC.

On October 11, 2024, the U.S. EPA finalized Title 40 of the Code of Regulations Part 84 (40 CFR 84) Subpart C Management of Regulated Substances requirements (more commonly known as the HFC Management Rule). This rule will require covered appliances to meet certain servicing, repair, disposal and installation requirements to minimize the release of HFCs and substitutes with a global warming potential (GWP) greater than 53. Facilities that may be affected by this final rule include those that own, operate, service, repair, recycle, dispose, or install equipment containing HFCs or their substitutes with a GWP >53, as well as those that recover, recycle, or reclaim HFCs. The new leak repair provisions apply to appliances with greater than or equal to 15 pounds full charge of HFCs or applicable substitutes starting January 1, 2026. The updated leak provisions do not apply to the Kenova Terminal because the site does not have any equipment with a full charge greater than 15 pounds of HFC or HFC substitutes with GWP >53.

2.5 West Virginia SIP Regulations

This section of the application highlights applicability of specific West Virginia State Implementation Plan (SIP) regulations that may apply to the Kenova-TriState Terminal.

2.5.1 45CSR2: To Prevent and Control Particulate Matter Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45CSR2 contains requirements for particulate matter emissions discharged from fuel burning units. The provisions of 45CSR2-2.14 define “fuel burning units” as the following:

... any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer.

The engines installed at the Kenova-TriState Terminal do not meet the definition of a fuel burning unit since they do not produce power through indirect heat transfer; therefore, they are not subject to the requirements of 45CSR2.

However, the hot oil heater does meet the definition of a fuel burning unit. Pursuant to 45CSR2-3.1, emissions of smoke and/or particulate matter from the hot oil heater must not exceed ten (10) percent opacity based on a six-minute average.

Per 45CSR2-11.1, any fuel burning unit with a heat input of less than ten (10) MMBtu/hr is exempt from sections 4, 5, 6, 8, and 9 of this rule. As the hot oil heater has a heat input capacity of 2.499 MMBtu/hr, the heater is not subject to any requirements from Sections 4, 5, 6, 8, and 9 of this rule.

2.5.2 45CSR4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor – State Only

According to 45CSR4-3:

No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

The Kenova-TriState Terminal is subject to this state-only requirement. MPLX will continue to operate in compliance with this rule by minimizing or eliminating releases that cause objectionable odors.

2.5.3 45CSR6: To Prevent and Control Air Pollution from Combustion of Refuse

According to 45CSR6-3:

The open burning of refuse by any person is prohibited...

The Kenova-TriState Terminal is subject to this state-only requirement. MPLX will continue to operate in compliance with this rule by prohibiting the open burning of refuse.

2.5.4 45CSR7: To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Other Associated Operations

45CSR7 includes provisions intended to prevent and control emissions of particulate matter from manufacturing processes and associated operations. Because the fire water pump engine serves the sole purpose of fire suppression and does not support any manufacturing activities, this engine does not meet the definition of a manufacturing process pursuant to 45CSR7-2.38. Similarly, the backup engine serves to pump excess rainwater to prevent flooding in the tank farm during periods of substantial rainfall. Therefore, the requirements of 45CSR7 do not apply to the engines at the Kenova-TriState Terminal. Furthermore, in accordance with 45CSR7-10.1, the provisions of this rule do not apply to particulate matter emissions regulated by 45CSR2, 3, and 5. Because 45CSR2 establishes an opacity limit for MPLX's hot oil heater, the hot oil heater is exempt from the provisions of 45CSR7.

The requirements of 45CSR7-5 apply to sources of fugitive particulate matter, including the roadways/parking areas and the cooling tower. MPLX complies with the requirements of 45CSR7-5.2 by applying appropriate control measures (i.e., paving) to plant roadways to minimize particulate emissions. MPLX will also comply with the requirements of 45CSR7 for the cooling tower. 45CSR7-5.1 stipulates that the cooling tower must be equipped with a system (which may include process equipment design, control equipment design, or operation and maintenance procedures) to minimize emissions of fugitive particulate emissions. MPLX utilizes a conductivity controller to automatically sample the cooling water line. If the controller receives a sample outside the operating range, it will conduct a blowdown, thus preventing total dissolved solids from accumulating in the cooling water and minimizing particulate emissions.

2.5.5 45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

This rule prevents and controls emissions of sulfur oxides (SO_x) from fuel burning sources, manufacturing process sources, and the combustion of refinery and/or process gas streams. The engines do not meet the definition of *fuel burning source* pursuant to 45CSR10-2.8 or the definition of *manufacturing process* pursuant to 45CSR10-2.11. Because the engines will not fire process or refinery fuel gas, the requirements of 45CSR10 do not apply to the engines.

According to 45CSR10-10.1, any fuel burning unit having a design heat capacity under ten (10) MMBtu/hr is exempt from Section 3 and Sections 6-8 of 45CSR10. The hot oil heater has a heat input capacity of 2.499 MMBtu/hr. Furthermore, the heater does not meet the definition of manufacturing process pursuant to 45CSR10-2.11 and will not fire process or refinery fuel gas. Accordingly, the hot oil heater is not subject to 45CSR10.

2.5.6 45CSR11: Prevention of Air Pollution Emergency Episodes

According to 45CSR11-5.1:

Any person responsible for the operation of a source of air pollutants emitting 100 tons per year or more in a region classified Priority I or II for any pollutant, shall prepare standby plans for reducing the emission of air pollutants during periods of an Air Pollution Alert, Air Pollution Warning, and Air Pollution Emergency.

The Kenova-TriState Terminal is subject to this rule. The facility is located in West Virginia Air Quality Control Region 3 (USEPA AQCR 103). This region is classified as Priority I for particulate matter and Priority III for sulfur oxides, carbon monoxide, nitrogen dioxide, hydrocarbons, and ozone according to the Pollutant Table of 45CSR11.

Facility-wide emissions of particulate matter are below 100 tons per year. When requested by the secretary, MPLX is responsible for providing a written emergency standby plan in accordance with this rule.

2.5.7 45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants

According to 45CSR13-5:

No person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without notifying the Secretary of such intent and obtaining a permit to construct, modify, relocate and operate the stationary source as required in this rule or any other applicable rule promulgated by the Secretary.

The provisions for construction permits under 45CSR13 apply to the Kenova-TriState Terminal. Currently, the Kenova-TriState Terminal has one (1) active construction permit: R13-2277F. In the event that MPLX proposes the construction of an additional unit at the Kenova-TriState Terminal, or modifications to existing units, the proper Rule 13 (R13) permit application procedures would be followed.⁶

2.5.8 45CSR16: Standards of Performance for New Stationary Sources

The provisions of 45CSR16 incorporate by reference the NSPS standards contained in 40 CFR 60. MPLX will continue to comply with applicable NSPS rules, as described in Section 2.1.3 of this report.

2.5.9 45CSR21, Section 21: Bulk Gasoline Plant

45CSR21-21 applies to all unloading, loading, and storage operations at bulk gasoline plants. A bulk gasoline plant is defined as:

... a gasoline storage and distribution facility with an average daily throughput of 76,000 liters (L) (20,000 gallons [gal]) of gasoline or less on a 30-day rolling average

The Kenova-TriState Terminal has a daily gasoline throughput that exceeds 20,000 gallons as a 30-day rolling average. Therefore, 45CSR21-21 does not apply.

2.5.10 45CSR21 Section 22: Bulk Gasoline Terminals

According to 45CSR21-22.1:

⁶ MPLXT does not have any permits issued under 45CSR14 or 45CSR19.

This section 22 applies to all loading racks at any bulk gasoline terminal which deliver liquid product into gasoline tank trucks.

This rule is not applicable to the Kenova-TriState Terminal, as the terminal does not operate loading racks that deliver liquid product into gasoline tank trucks.

2.5.11 45CSR21 Section 23: Gasoline Dispensing Facility

According to 45CSR21-23.1:

This section 23 applies to any gasoline dispensing facility and the appurtenant equipment necessary to a gasoline dispensing facility.

This rule is not applicable to the Kenova-TriState Terminal, as the terminal does not load gasoline into a motor vehicle gasoline tank used to provide fuel to the engine of that motor vehicle.

2.5.12 45CSR21 Section 24: Leaks from Gasoline Tank Trucks

According to 45CSR21-24.1:

This section 24 applies to any gasoline tank truck equipped for gasoline vapor collection.

This rule is not applicable to the Kenova-TriState Terminal, as the terminal does not operate loading racks that deliver liquid product into gasoline tank trucks.

2.5.13 45CSR21 Sections 27 and 28: Petroleum Liquid Storage in External Floating Roof Tanks and Petroleum Liquid Storage in Fixed Roof Tanks

45CSR21-27 applies to petroleum liquid storage in tanks with external floating roofs with capacities greater than 40,000 gallons. 45CSR21-28 applies to petroleum liquid storage in tanks with fixed roofs (including those equipped with internal floating roofs) with capacities greater than 40,000 gallons. These sections of this rule will apply to several storage tanks at the Kenova-TriState Terminal. Tanks greater than 40,000 gallons storing a petroleum liquid with a maximum true vapor pressure less than 10.5 kiloPascals (kPa) (1.5 pounds per square inch atmospheric ([psia])), such as distillate oil or kerosene, are exempt from 45CSR21-27 and 28 if records are maintained of the material stored. The applicability of this rule to each storage tank is indicated on the Emission Unit Form for each tank, included in Attachment E of this document.

2.5.14 45CSR21 Section 40: Other Facilities that Emit Volatile Organic Compounds (VOC)

45CSR21-40 applies to any facility that has aggregate maximum theoretical VOC emissions in excess of 100 tpy in the absence of control devices. In accordance with 45CSR21-40.1.d, sources regulated under Sections 11 through 39 of 45CSR21 (e.g., gasoline storage tanks), as well as barge loading facilities and fuel combustion sources (i.e., the hot oil heater), can be excluded when comparing facility VOC emissions to the 100 tpy applicability threshold. The total VOC emissions from the remaining sources (e.g., tanks subject but exempt from 45CSR21-27 or 28, oily water sewer system, fugitive leaks, etc.) do not exceed 100 tpy. Therefore, the Kenova-TriState Terminal is not subject to 45CSR21-40.

2.5.15 45CSR22: Air Quality Management Fee Program

This rule is generally applicable to the Kenova-TriState Terminal; as applicable, MPLX will pay the appropriate fees (including those associated with permits to construct) in accordance with the rule.

2.5.16 45CSR30: Requirements for Operating Permits

According to 45CSR30-3.1a:

On and after the effective date of the operating permit program, no person shall violate any requirement of a permit issued under this rule nor shall any person operate any of the following sources, except in compliance with a permit issued under section 6.

The Kenova-TriState Terminal is subject to the requirement for a Title V operating permit as a major source, as discussed in Section 2.1.2 of this report. The Kenova-TriState Terminal currently operates in compliance with a Title V operating permit in accordance with this rule. Additionally, MPLX submits (and will continue to submit) a certified emissions statement and pay the corresponding annual fees in accordance with 45CSR30-8.

2.5.17 45CSR34: Emission Standards for Hazardous Air Pollutants

The provisions of 45CSR34 incorporate by reference the NESHAP standards contained in 40 CFR 61 and 63. MPLX will comply with 40 CFR 61, Subpart M, and 40 CFR 63, Subpart R, Y, ZZZZ, and DDDDD as described in Section 2.1.4 of this application.

3. CALCULATION METHODOLOGY

This section of the application provides a discussion of emission calculation methodology used for the emission sources at the Kenova-TriState Terminal. Detailed potential emissions calculations are provided in Appendix I to this report.

3.1.1 Routine Emissions from Storage Tanks

The Kenova-TriState Terminal includes multiple storage tanks that store a variety of petroleum products. MPLX uses TankESP® software to calculate potential routine (working/standing loss) emissions from storage tanks.

TankESP® is a software program that uses the emission factors and formulas from AP-42 Section 7.1 (Organic Liquid Storage Tanks, 10/2024) and calculates emissions based on tank size, roof type and design, throughput, and contents. AP-42 Section 7.1 was revised since the last Title V renewal application was submitted.

Routine emissions are calculated as working losses, which occur due to vapor replacement during the filling and emptying of the tank, and breathing losses, which are caused by vapor expansion and contraction due to temperature variations. Due to the nature of the tank contents, it was assumed that all emissions are VOC emissions.

Information was gathered for each tank concerning its working volume, type, fittings and seals (for floating roof tanks), throughput, and contents. If a tank is able to store more than one type of material throughout the year, emissions for each material were compared and the worst-case emissions were selected. In the case of floating roof tanks that can store either gasoline or distillate fuels, gasoline was used to calculate worst-case emissions. MPLX also considered seasonal variability in the gasoline stored in the tanks; specifically, MPLX applied the following product storage schedule to obtain emissions estimates from the tanks:

- ▶ Gasoline RVP 15: January-February, October-December;
- ▶ Gasoline RVP 13.5: March, September;
- ▶ Gasoline RVP 9: April-August.

The VOC emissions from the tanks were calculated using historical throughputs for the tanks multiplied by a safety factor to give a maximum possible throughput. For tanks that store only distillate fuels, kerosene was used to estimate emissions. For the petroleum contact water tank, a worst-case scenario of a gasoline layer was assumed.

Details of the sizes, types, contents and throughputs of each tank are provided in Attachment E of this application, as well as in the detailed emissions calculations in Attachment I.

3.1.2 Emissions from Tank Landing and Cleaning Events

In addition to routine working and breathing emissions from storage tanks, MPLX also estimated emissions in floating roof tanks due to landing and cleaning events. Landing emissions occur when a floating roof tank has been emptied to the point that the roof is resting on the roof leg supports and is no longer floating on the liquid. Cleaning emissions occur as the tank is further emptied after landing and degassed. In developing these estimates, MPLX determined the combination of material stored and seasonal

meteorological data resulting in the highest potential emissions (e.g., Gasoline RVP 13.5 in September for floating roof tanks storing gasoline) and assumed the tank was landed and cleaned during that month. Landing loss emissions were estimated using the methodology in AP-42 Section 7.1.3.1 (10/2024). Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.

3.1.3 Fugitive Emissions from Equipment Leaks

Fugitive emissions occur through leakage from a variety of fittings that are present on the equipment at the Kenova-TriState Terminal that store and transmit petroleum liquids. These fittings include valves, connectors, flanges, pump seals, and pressure release valves.

Fugitive emissions from equipment leaks are calculated based on the number of components at the Kenova-TriState Terminal and EPA's averaging emission factor method that is described in EPA's Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017) dated November 1995. Emission factors for marketing terminals (Table 2-3) were used to quantify these emissions. Since the EPA document does not provide emission factors for components in heavy liquid service (i.e., jet kerosene), MPLX conservatively applied the light liquid factors to these components as well. Fugitive emissions will also result from the light liquid and gasoline service components required for operation of the butane storage vessels and truck/rail offloading.

Fugitive emissions also result from disconnecting the truck and rail car hoses after butane offloading is completed. Upon disconnect, a small quantity of VOC is emitted from each connector because of the residual butane in the hose. The amount of loss per disconnect event can be estimated using the number of hose connectors disconnected per event, and the amount of loss from each connector. The annual emissions estimate is based off the estimated number of transport trucks and railcars required to offload the maximum amount of butane the site could process in a year divided by the average butane load per truck or railcar.

3.1.4 Emissions from Marine Barge Loading

Hourly emissions from marine barge loading are quantified based on the hydraulic limitations imposed by the piping and pumps associated with the VRU; specifically, only 13,600 bbls/hr of gasoline can be loaded at any given time because of these limitations. Distillate loading is limited to one loading arm (i.e., 7,000 bbl/hr) when gasoline is being loaded at capacity (representing the worst-case scenario from an hourly emissions perspective). Potential emission calculations utilize emission factors provided in AP-42, Section 5.2 (7/08), and account for 100% capture efficiency⁷ and 97% control efficiency⁸ at the VRU when loading gasoline. MPLX does not recover vapors from distillate barge loading, and MPLX does not apply any capture or control efficiencies to distillate loading operations.

Annual emissions are based on the controlled gasoline loading emission factor (uncleaned gasoline barges), the uncontrolled diesel loading emission factor, and the maximum annual loading rate of gasoline and distillate allowed by the permit.

⁷ 100% capture efficiency is assumed in accordance the preamble to MACT Y (May 13, 1994), which indicates that 100% capture efficiency can be applied when vapor tight vessels are loaded. Furthermore, an assist blower maintains a vacuum of at least 1.5 inches water column during loading.

⁸ 97% control efficiency required per 40 CFR 63.562(b)(2).

3.1.5 Emissions from Dockside Barge Sampling

Fugitive dockside emissions result mainly from evaporation when ullage hatches are opened during product quality control sampling and gauging of a gasoline or distillate barge before and after barge loading. An evaporation factor is calculated for emissions during sampling based on an estimated product displacement that occurs during sampling. It is conservatively assumed that every barge will need sampled upon arrival and before departure. Each emission factor is based on worst-case assumptions for barge pressure, ambient temperature, seasonal material loaded/material vapor pressure, vapor space saturation factor, sampling time, etc., derived from a review of actual measured data.

Short term emissions are based on a sample duration of 30 minutes and worst-case seasonal emissions. Long term emissions are based on the sum of seasonal emissions for arrival and departure of all loaded barges.

Certain dockside emissions from depressurization for sampling/gauging are controlled by the VRU and therefore are accounted for in the controlled PTE for the barge loading emission unit using the AP-42 marine loading factors for the VRU.

3.1.6 Emissions from Tank 273 Hot Oil Heater

The hot oil heater provides heat to regulate the temperature of the contents of Tank 273 in order to maintain the stored biodiesel at the appropriate temperature necessary to maintain product quality. Combustion emissions from the natural gas-fired heater are quantified using the factor for natural gas-fired external combustion sources from AP-42 Section 1.4 (7/98) and the maximum heat input capacity.

3.1.7 Emissions From Engines

Emissions from the emergency fire water pump diesel-fired engine are calculated using the manufacturer's engine specifications (e.g., horsepower), the manufacturer's emissions factors, or the emission factors for stationary diesel engines from AP-42 Section 3.4 (10/96) and maximum capacity. MPLX assumes a 500 hr/yr operating limit since the engine is used only during emergencies and scheduled testing. Emissions of SO₂ are based on a 15 ppm limit on sulfur content of diesel fuel pursuant to 40 CFR 60.4207(b) and 40 CFR 1090.305.

Emissions from the diesel-fired tank farm wastewater backup pump engine were determined utilizing the manufacturer's engine specifications (e.g., horsepower) and the Tier 4 standards with the NTE multipliers per 40 CFR 1039.101(e).⁹ Emissions of SO₂ are estimated based on a 15 ppm limit on sulfur content of diesel fuel pursuant to 40 CFR 60.4207(b) and 40 CFR 80.510(b).

3.1.8 Emissions from Diesel Fueling Operations

MPLX is capable of fueling boats. Potential emissions from this process were estimated using assumptions regarding the maximum amount of distillate throughput that would ever be realized at these operations and the emission factor for splash loading operations from Table 5.2.5 in AP-42 Section 5.2 (6/08).

3.1.9 Emissions from Roadway Traffic

Traffic via the paved roadways and parking lots at the Kenova-TriState Terminal will generate fugitive particulate emissions. MPLX quantified these emissions by making assumptions regarding the maximum

⁹ Tier 4 emission factors are found in 40 CFR 1039.101(b) Table 1

amount of vehicular traffic via specific vehicle pathways. MPLX used the calculations and methodologies established in AP-42, Section 13.2.1 (1/2011).

3.1.10 Cooling Tower Emissions

MPLX operates a cooling tower to regulate the temperature of the gasoline supply loop used to operate the adsorber of the vapor recovery unit. Operation of the cooling tower generates a small quantity of particulate emissions. These emissions were quantified using the design recirculation rate of 400 gallons/minute and engineering assumptions regarding the drift loss and relevant characteristics of the water (i.e., conductivity). Emissions were estimated using the methodology provided in AP-42, Section 13.4.2 (1/1995).

3.1.11 Oily Sewer System Emissions

A network of drains, sumps, pipes, and lift stations serve to convey process wastewater (petroleum contact water) to Tank 256. MPLX estimated emissions resulting from this sewer system by determining the number of various components in the system, estimating a maximum possible system throughput, and applying an appropriate emission factor for each component within EPA's Refinery Wastewater Emissions Tool (RWET) (2011). Pollutant-specific emissions were estimated using available sample data for benzene in the wastewater exiting Tank 256 and applying the ratios provided in Table 7-9 of "Emission Estimation Protocol for Petroleum Refineries: Version 3.0 for HAPs present in gasoline or distillate.

3.1.12 Emissions from Gasoline Filter Changeouts

MPLX has quantified the expected fugitive emissions that occur during the changeout of gasoline filters. These emissions were estimated using the volume of gasoline involved during the filter changeout, a conservative engineering estimate of the amount gasoline vapor emitted during the changeout, and the number of expected changeouts each year. Emissions were calculated using the equation below:

$$E = \frac{V_G \times N \times P_G \times \rho_G}{2000}$$

Where:

- E = VOC emissions (tons VOC per year)
- V_G = estimated volume of gasoline per filter changeout (gallons)
- N = estimate number of changeouts per year
- P_G = estimated percentage of gasoline vapor emitted per changeout (%)
- ρ_G = density of gasoline (lb/gallon)
- 2000 = conversion from lbs to tons

3.1.13 Facility-Wide HAP Emissions

MPLX has also included potential HAP emissions calculated using the maximum VOC emissions presented in Attachment I and the HAP content constants for gasoline and distillate given in Table 3.1 of the Gasoline Distribution Industry (Stage I) – Background Information for Proposed Standards Draft Report. When appropriate, MPLX applied factors from AP-42 and other sources as discussed in Sections 3.1-3.12 and as documented in Attachment I.

3.1.14 Facility-Wide Emissions

Additional detailed documentation for each of these sources, including relevant assumptions and calculation methodology, is included in Attachment I. Attachment I also provides a summary of the unit-specific emissions and facility-wide emissions on a pollutant-by-pollutant basis.

4. TITLE V FORMS

The WVDEP permit application forms contained in this application include facility-wide and emission source specific forms for the Kenova-TriState Terminal facility Title V permit. The completed Title V permit forms are included in this section.



**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL
PROTECTION**

DIVISION OF AIR QUALITY

601 57th Street SE

Charleston, WV 25304

Phone: (304) 926-0475

www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. Name of Applicant (As registered with the WV Secretary of State's Office): MPLX Terminals LLC	2. Facility Name or Location: Kenova - TriState Terminal Kenova, Wayne County, West Virginia
3. DAQ Plant ID No.: 099-00022	4. Federal Employer ID No. (FEIN): 311537655
5. Permit Application Type: ☐ Initial Permit ☒ Permit Renewal ☐ Update to Initial/Renewal Permit Application When did operations commence? 01/01/1951 What is the expiration date of the existing permit? 09/22/2025	
6. Type of Business Entity: ☐ Corporation ☐ Partnership ☐ Governmental Agency ☐ Limited Partnership ☒ LLC	7. Is the Applicant the: ☐ Owner ☐ Operator ☒ Both If the Applicant is not both the owner and operator, please provide the name and address of the other party.
8. Number of onsite employees: 72	
9. Governmental Code: ☒ Privately owned and operated; 0 ☐ Federally owned and operated; 1 ☐ State government owned and operated; 2 ☐ County government owned and operated; 3 ☐ Municipality government owned and operated; 4 ☐ District government owned and operated; 5	
10. Business Confidentiality Claims Does this application include confidential information (per 45CSR31)? ☐ • Yes ☒ • No If yes, identify each segment of information on each page that is submitted as confidential, and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "PRECAUTIONARY NOTICE-CLAIMS OF CONFIDENTIALITY" guidance.	

11. Mailing Address		
Street or P.O. Box: 539 South Main Street		
City: Findlay	State: OH	Zip: 45840-3295
Telephone Number: 419-421-3774		Fax Number: 419-421-2905

12. Facility Location (Physical Address)			
Street: 23rd and River Streets	City: Kenova	County: Wayne County	
UTM Easting: 361.323 km	UTM Northing: 4,251.68 km	Zone: ☒ 17 or ☐ 18	
Directions: From Charleston, travel I-64 to the Ceredo/Kenova exit. Take Highway 75 North to Route 60 West. Turn right onto 21st Street, then left on Beech Street. Storage Tank farm on left, second black top road to the right and through flood wall is the office and barge loading			
Portable Source? ☐ Yes ☒ No			
Is facility located within a nonattainment area? ☐ Yes ☒ No		If yes, for what air pollutants?	
Is facility located within 50 miles of another state? ☒ Yes ☐ No		If yes, name the affected state(s). KY, OH	
Is facility located within 100 km of a Class I Area¹? ☐ Yes ☒ No If no, do emissions impact a Class I Area¹? ☐ Yes ☒ No		If yes, name the area(s).	
¹ Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.			

13. Contact Information		
Responsible Official: Angela Brown		Title: Vice President
Street or P.O. Box: 539 South Main Street		
City: Findlay	State: OH	Zip: 45840-3295
Telephone Number: 419-421-2629	Cell Number: 419-421-2905	
E-mail address: asbrown@marathonpetroleum.com		
Environmental Contact: Carla Mings		Title: Adv. Environmental Engineer
Street or P.O. Box: 100 12th Street		
City: Catlettsburg	State: KY	Zip: 41129
Telephone Number: 606-739-2471	Cell Number:	
E-mail address: ccmings@marathonpetroleum.com		
Application Preparer: Carla Mings		Title: Adv. Environmental Engineer
Company: MPLX Terminals LLC		
Street or P.O. Box: 100 12th Street		
City: Catlettsburg	State: KY	Zip: 41129
Telephone Number: 606-739-2471	Cell Number:	
E-mail address: ccmings@marathonpetroleum.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
Petroleum Bulk Stations and Terminals	Gasoline, Distillate, K-1/Jet Fuel	424710	5171
Barge Loading	Petroleum Products	488320	4491

Provide a general description of operations.

The petroleum liquid operation at this terminal involve transportation by pipeline, storage in bulk tanks, and loading or marine barges. The operations have potential sources of evaporation loss through fugitive emissions in transportation, standing/working losses in storage, and emissions from the loading of marine barges.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to "Plot Plan - Guidelines."

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
☒ SIP	☐ FIP
☒ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☒ NESHAP (45CSR34)	☐ Nonattainment NSR (45CSR19)
☒ Section 111 NSPS	☒ Section 112(d) MACT standards
☐ Section 112(g) Case-by-case MACT	☒ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☒ Stratospheric ozone (Title VI)
☒ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☒ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64)
☐ Cross-State Air Pollution Rule (45CSR43)	

19. Non Applicability Determinations
List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies. 45CSR21, Section 21 – Not applicable because Kenova-Tristate Terminal has a daily gasoline throughput that exceeds 20,000 gallons as a 30-day rolling average. 45CSR21, Section 22 – Not applicable because Kenova-TriState Terminal does not have gasoline truck loading facilities. 45CSR21, Section 23 – Not applicable because Kenova-Tristate Terminal does not load gasoline into motor vehicle gasoline tanks to provide fuel to the engine of that motor vehicle. 45CSR21, Section 24 – Not applicable because Kenova-Tristate Terminal does not operate loading racks that deliver liquid product into gasoline tank trucks. 40 CFR 60, Subpart Dc – Not subject because Hot Oil Heater #1 has a heat input capacity of less than 10MMBtu/hr. 40 CFR 60, Subpart XX – Not subject because this facility does not operate gasoline tank truck loading operations. 40 CFR 60, Subpart XXa - Not subject because this facility does not operate gasoline tank truck or rail loading racks. 40 CFR 61, Subpart BB – Not subject because the loading of gasoline and petroleum distillates are specifically exempted per 40 CFR 61.300(a). 40 CFR 63, Subpart Y – Not applicable to Dockside Emissions, since these emissions do not occur during gasoline loading.

19. Non Applicability Determinations (Continued) - Attach additional pages as necessary.

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

40 CFR 63, Subpart EEEE – No affected sources, with the exception of Tank 300 and 301 additive storage, are subject to the OLD MACT because the definition of organic liquids excludes gasoline, distillate oils No. 1 and No. 2, and wastewater, and any non-crude liquid that contains less than 5 percent by weight Table 1 organic HAP. Tank 300 and 301 are not subject to control requirements since the tank capacity and/or stored material vapor pressure do not meet the requirements in Table 2b, item 1.

112(r) RMP – Regulated substances in gasoline service, when in distribution or related storage for use as fuel for internal combustion engines are exempt from the threshold determination per 40 CFR 68.115(b)(2)(ii).

40 CFR 60, Subpart Kb – Not applicable to Tanks 202, 255, 261, 262, and 273 per 40 CFR 60.110b(b) due to vapor pressure of stored materials.

40 CFR 60, Subpart Kc – Not applicable to any existing storage tanks since the tanks have not been modified, constructed, or reconstructed after October 4, 2024.

45CSR21-27 & 28 - Not applicable to Tanks 202, 255, 261, 262, and 273 per 45CSR21-27.1.b.3-4 and 45CSR21-28.1.b.3.

45CSR21-40 - Not subject because facility-wide VOC emissions, when excluding VOC from the following: 1) sources not regulated under section 11 through 39 of 45CSR21, 2) barge loading facilities, and 3) fuel combustion sources, do not exceed 100 tpy.

40 CFR 63, Subpart R - Not applicable to Tanks 202, 255, 261, 262, and 273, since these tanks do not store gasoline.

40 CFR 63, Subpart BBBBBB - The Kenova-TriState Terminal is subject to MACT R and is not a pipeline pumping station or bulk gasoline plant. Therefore, NESHAP BBBBBB does not apply to the Kenova-TriState Terminal.

40 CFR 82, Subpart C leak repair requirements for HFCs will become effective starting 1/1/2026 for appliances with ≥ 15 lbs full charge. The updated leak provisions do not apply to the Kenova Terminal because the site does not have any equipment with a full charge greater than 15 pounds of HFC or HFC substitutes with GWP >53 .

☒ Permit Shield

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements).

Open burning. The open burning of refuse by any person is prohibited except as noted in 45CSR§6-3.1. [45CSR§6-3.1.]

Open burning exemptions. The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause or allow any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible. [45CSR§6-3.2.]

Asbestos. The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them. [40 C.F.R. §61.145(b) and 45CSR34]

Odor. No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. [45CSR§4-3.1 State-Enforceable only.]

Standby plan for reducing emissions. When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11. [45CSR§11-5.2]

Ozone-depleting substances. For those facilities performing maintenance, service, repair or disposal of appliances, the permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 C.F.R. Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the prohibitions and required practices pursuant to 40 C.F.R. §§ 82.154 and 82.156.

b. Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 C.F.R. § 82.158.

c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 C.F.R. § 82.161.

Risk Management Plan. Should this stationary source, as defined in 40 C.F.R. § 68.3, become subject to Part 68, then the owner or operator shall submit a risk management plan (RMP) by the date specified in 40 C.F.R. §68.10 and shall certify compliance with the requirements of Part 68 as part of the annual compliance certification as required by 40 C.F.R. Part 70 or 71. [40 C.F.R. 68]

Emission inventory. The permittee is responsible for submitting, on an annual basis, an emission inventory in accordance with the submittal requirements of the Division of Air Quality. [W.Va. Code § 22-5-4(a)(15)]

MACT Subpart R. Any requirements for site-wide equipment leaks in gasoline service regulated by MACT R are included in the Applicable Requirements section of Attachment E for the LDAR emission unit.

☒ Permit Shield

20. Facility-Wide Applicable Requirements

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Testing:

Stack testing. As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63, if applicable, in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable.
- b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section a of this requirement.
- c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
- d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: 1. the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:
 1. The permit or rule evaluated, with the citation number and language;
 2. The result of the test for each permit or rule condition; and,
 3. A statement of compliance or noncompliance with each permit or rule condition.[WV Code § 22-5-4(a)(15-16) and 45CSR13]

Recordkeeping:

Monitoring information. The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
 - b. The date(s) analyses were performed;
 - c. The company or entity that performed the analyses;
 - d. The analytical techniques or methods used;
 - e. The results of the analyses; and
 - f. The operating conditions existing at the time of sampling or measurement.
- [45CSR§30-5.1.c.2.A.]

Retention of Records. The permittee shall retain records of all required monitoring data and support information for a period of at least five (5) years from the date of monitoring sample, measurement, report, application, or record creation date. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Where appropriate, records may be maintained in computerized form in lieu of the above records.

[45CSR§30-5.1.c.2.B.]

20. Facility-Wide Applicable Requirements

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Odors. For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. State-Enforceable only.]

Reporting:

Responsible Official. Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
[45CSR§30-4.4 and 5.1.c.3.D.]

Confidential Information. A permittee may request confidential treatment for the submission of reporting required under 45CSR§30-5.1.c.3. pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31. [45CSR§30-5.1.c.3.E.]

Communications. Except for the electronic submittal of the annual certification to the USEPA, all notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, mailed first class or by private carrier with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: 304/926-0475

If to the US EPA:

Associate Director
Office of Enforcement and Permits Review (3AP12)
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Fees. The permittee shall pay fees on an annual basis in accordance with 45CSR30-8. [45CSR30-8]

Compliance certification. The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ. In addition to the annual compliance certification, the permittee may be required to submit certifications more frequently under an applicable requirement of this permit. The annual certification shall be submitted to the DAQ and USEPA on or before March 15 of each year, and shall certify compliance for the period ending December 31. The annual certification to the USEPA shall be submitted in electronic format only. It shall be submitted by e-mail to the following address:
R3_APD_Permits@epa.gov. and DEPAirQualityReports@wv.gov. The permittee shall maintain a copy of the certification on site for five (5) years from submittal of the certification. [45CSR§30-5.3.e.]

New applicable requirements. If any applicable requirement is promulgated during the term of this permit, the permittee will meet such requirements on a timely basis, or in accordance with a more detailed schedule if required by the applicable requirement.
[45CSR§30-4.3.h.1.B.]

20. Facility-Wide Applicable Requirements

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Semi-annual monitoring reports. The permittee shall submit reports of any required monitoring on or before September 15 for the reporting period January 1 to June 30 and on or before March 15 for the reporting period July 1 to December 31. All instances of deviation from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official consistent with 45CSR§30-4.4. The semi-annual monitoring reports shall be submitted in electronic format by e-mail to the following address:

DAQ:
DEPAirQualityReports@wv.gov
[45CSR§30-5.1.c.3.A.]

Deviations.

a. In addition to monitoring reports required by this permit, the permittee shall promptly submit supplemental reports and notices in accordance with the following:

2. Any deviation that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to the Secretary immediately by telephone or telefax email. A written report of such deviation, which shall include the probable cause of such deviation, and any corrective actions or preventative measures taken, shall be submitted by the responsible official within ten (10) days of the deviation.

3. Deviations for which more frequent reporting is required under this permit shall be reported on the more frequent basis.

4. All reports of deviations shall identify the probable cause of the deviation and any corrective actions or preventative measures taken.

[45CSR§30-5.1.c.3.C.]

b. The permittee shall, in the reporting of deviations from permit requirements, including those attributable to upset conditions as defined in this permit, report the probable cause of such deviations and any corrective actions or preventive measures taken in accordance with any rules of the Secretary.

[45CSR§30-5.1.c.3.B.]

Are you in compliance with all facility-wide applicable requirements? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

21. Active Permits/Consent Orders

[illegible]

22. Inactive Permits/Obsolete Permit Conditions

[illegible]

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	4.0
Nitrogen Oxides (NO _x)	4.2
Lead (Pb)	
Particulate Matter (PM _{2.5}) ¹	0.2
Particulate Matter (PM ₁₀) ¹	0.2
Total Particulate Matter (TSP)	0.2
Sulfur Dioxide (SO ₂)	0.01
Volatile Organic Compounds (VOC)	427.5
Hazardous Air Pollutants ²	Potential Emissions
Benzene	3.4
Hexane	6.5
Toluene	5.3
Trimethylpentane (2,2,4)	3.5
Xylene	2.7
Total HAP *	22.1
Regulated Pollutants other than Criteria and HAP	Potential Emissions
¹ PM _{2.5} and PM ₁₀ are components of TSP. ² For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.	

* All HAP emissions >1 tpy and Total HAP emissions are presented. All other individual HAP emissions are included in Attachment I

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)	
☒	1. Air compressors and pneumatically operated equipment, including hand tools.
☐	2. Air contaminant detectors or recorders, combustion controllers or shutoffs.
☒	3. Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
☒	4. Bathroom/toilet vent emissions.
☒	5. Batteries and battery charging stations, except at battery manufacturing plants.
☐	6. Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
☐	7. Blacksmith forges.
☐	8. Boiler water treatment operations, not including cooling towers.
☒	9. Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
☐	10. CO ₂ lasers, used only on metals and other materials which do not emit HAP in the process.
☒	11. Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
☒	12. Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
☒	13. Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
☐	14. Demineralized water tanks and demineralizer vents.
☐	15. Drop hammers or hydraulic presses for forging or metalworking.
☐	16. Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
☐	17. Emergency (backup) electrical generators at residential locations.
☐	18. Emergency road flares.
☒	19. Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO₂, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: See attached Emissions Table

24. Insignificant Activities (Check all that apply)	
☒	20. Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27. Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis: See attached Emissions Table
☐	21. Environmental chambers not using hazardous air pollutant (HAP) gases.
☒	22. Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
☐	23. Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
☒	24. Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
☐	25. Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
☒	26. Fire suppression systems.
☒	27. Firefighting equipment and the equipment used to train firefighters.
☐	28. Flares used solely to indicate danger to the public.
☒	29. Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
☒	30. Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
☒	31. Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
☐	32. Humidity chambers.
☒	33. Hydraulic and hydrostatic testing equipment.
☒	34. Indoor or outdoor kerosene heaters.
☒	35. Internal combustion engines used for landscaping purposes.
☐	36. Laser trimmers using dust collection to prevent fugitive emissions.
☐	37. Laundry activities, except for dry-cleaning and steam boilers.
☐	38. Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
☐	39. Oxygen scavenging (de-aeration) of water.
☐	40. Ozone generators.

24. Insignificant Activities (Check all that apply)	
☒	41. Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.)
☒	42. Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
☐	43. Process water filtration systems and demineralizers.
☒	44. Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
☒	45. Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
☐	46. Routing calibration and maintenance of laboratory equipment or other analytical instruments.
☐	47. Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
☐	48. Shock chambers.
☐	49. Solar simulators.
☒	50. Space heaters operating by direct heat transfer.
☐	51. Steam cleaning operations.
☐	52. Steam leaks.
☐	53. Steam sterilizers.
☒	54. Steam vents and safety relief valves.
☐	55. Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
☒	56. Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.
☒	57. Such other sources or activities as the Director may determine.
☒	58. Tobacco smoking rooms and areas.
☒	59. Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Equipment Table
Fill out the Title V Equipment Table and provide it as ATTACHMENT D .
26. Emission Units
For each emission unit listed in the Title V Equipment Table , fill out and provide an Emission Unit Form as ATTACHMENT E .
For each emission unit not in compliance with an applicable requirement, fill out a Schedule of Compliance Form as ATTACHMENT F .
27. Control Devices
For each control device listed in the Title V Equipment Table , fill out and provide an Air Pollution Control Device Form as ATTACHMENT G .
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the Compliance Assurance Monitoring (CAM) Form(s) for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as ATTACHMENT H .

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

Note: This Certification must be signed by a responsible official as defined in 45CSR§30-2.38.

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

Responsible official (type or print)

Name:

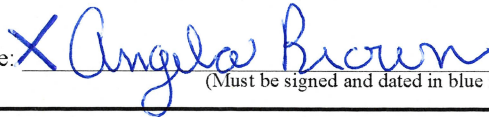
Angela Brown

Title:

Vice President

Responsible official's signature:

Signature:



Signature Date:

3-20-25

(Must be signed and dated in blue ink or have a valid electronic signature)

Note: Please check all applicable attachments included with this permit application:

☒	ATTACHMENT A: Area Map
☒	ATTACHMENT B: Plot Plan(s)
☒	ATTACHMENT C: Process Flow Diagram(s)
☒	ATTACHMENT D: Equipment Table
☒	ATTACHMENT E: Emission Unit Form(s)
☐	ATTACHMENT F: Schedule of Compliance Form(s)
☒	ATTACHMENT G: Air Pollution Control Device Form(s)
☒	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s)

All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/dag, requested by phone (304) 926-0475, and/or obtained through the mail.

Insignificant Activity 19. VOC Emission Table

Emission Unit ^a	VOC	
	PPH	TPY
Butane Storage Tank 1 (Pressurized Vessel)	-	-
Butane Storage Tank 2 (Pressurized Vessel)	-	-
Tank K2	0.21	0.94
Tank K3	0.21	0.94
Gasoline Filter Change Outs ^b	1.63	0.07
Tank 202 (Distillate Fuel Storage)	0.30	1.33
Diesel Fueling Station/Refuel Tank ^b	6.00E-01	0.33
Truck butane unloading - hose disconnects ^b	4.53E-04	5.53E-04
Railcar butane unloading – hose disconnects ^b	2.24E-03	9.81E-03

^a These emission units are not a source of NO_x, SO₂, CO, or PM

^b Emissions presented are lb/event, not lb/hr

Insignificant Activity 20. HAP Emission Table

Emission Unit	Total HAP	
	PPH	TPY
Tank K2	1.12E-02	4.90E-02
Tank K3	1.12E-02	4.90E-02
Gasoline Filter Change Outs ^a	8.47E-02	3.39E-03
Tank 202 (Distillate Fuel Storage)	3.90E-03	1.71E-02
Diesel Fueling Station/Refuel Tank ^a	7.71E-03	4.22E-03

^a Emissions presented are lb/event, not lb/hr

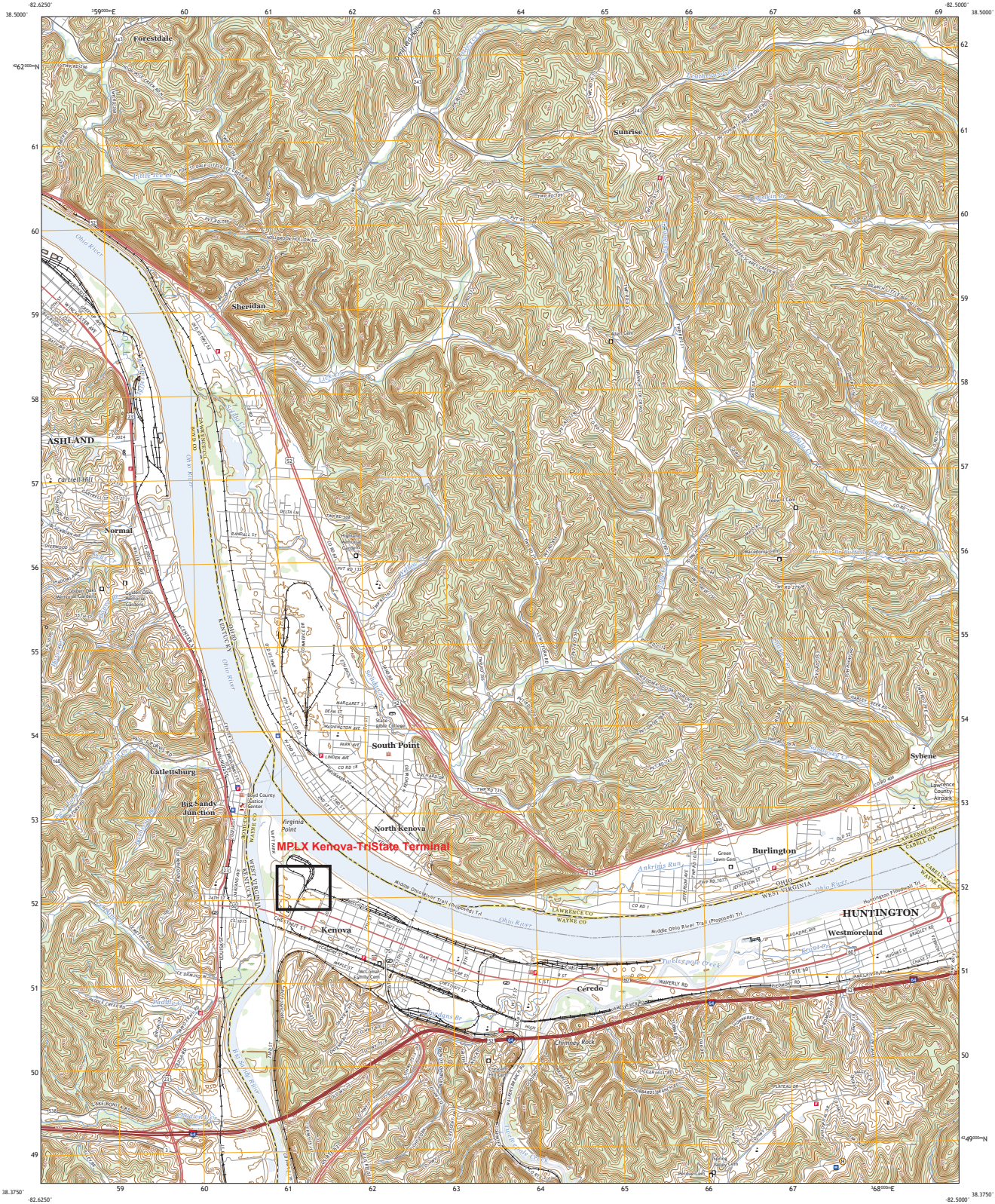
ATTACHMENT A. AREA MAP



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

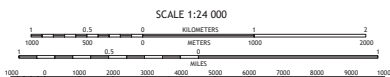
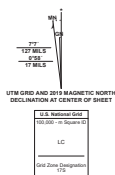


CATLETTSBURG QUADRANGLE
KENTUCKY - OHIO - WEST VIRGINIA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84) Projection and
1 000-meter grid/Universal Transverse Mercator, Zone 17S
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery: NADP June 2017 - July 2020
Roads: U.S. Census Bureau, 2016
Names: National Hydrography Dataset, 2002
Contours: National Elevation Dataset, 2002
Boundaries: Multiple sources; see metadata file 2019
Public Land Survey System: BLM, 2017
Wetlands: FWS National Wetlands Inventory 1983 - 2007



CONTOUR INTERVAL 20 FEET
NORTH AMERICAN DATUM OF 1983
This map was produced to conform with the
National Geospatial Program US Topo Product Standard.

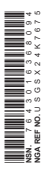


1	2	3
4	5	6
7	8	9

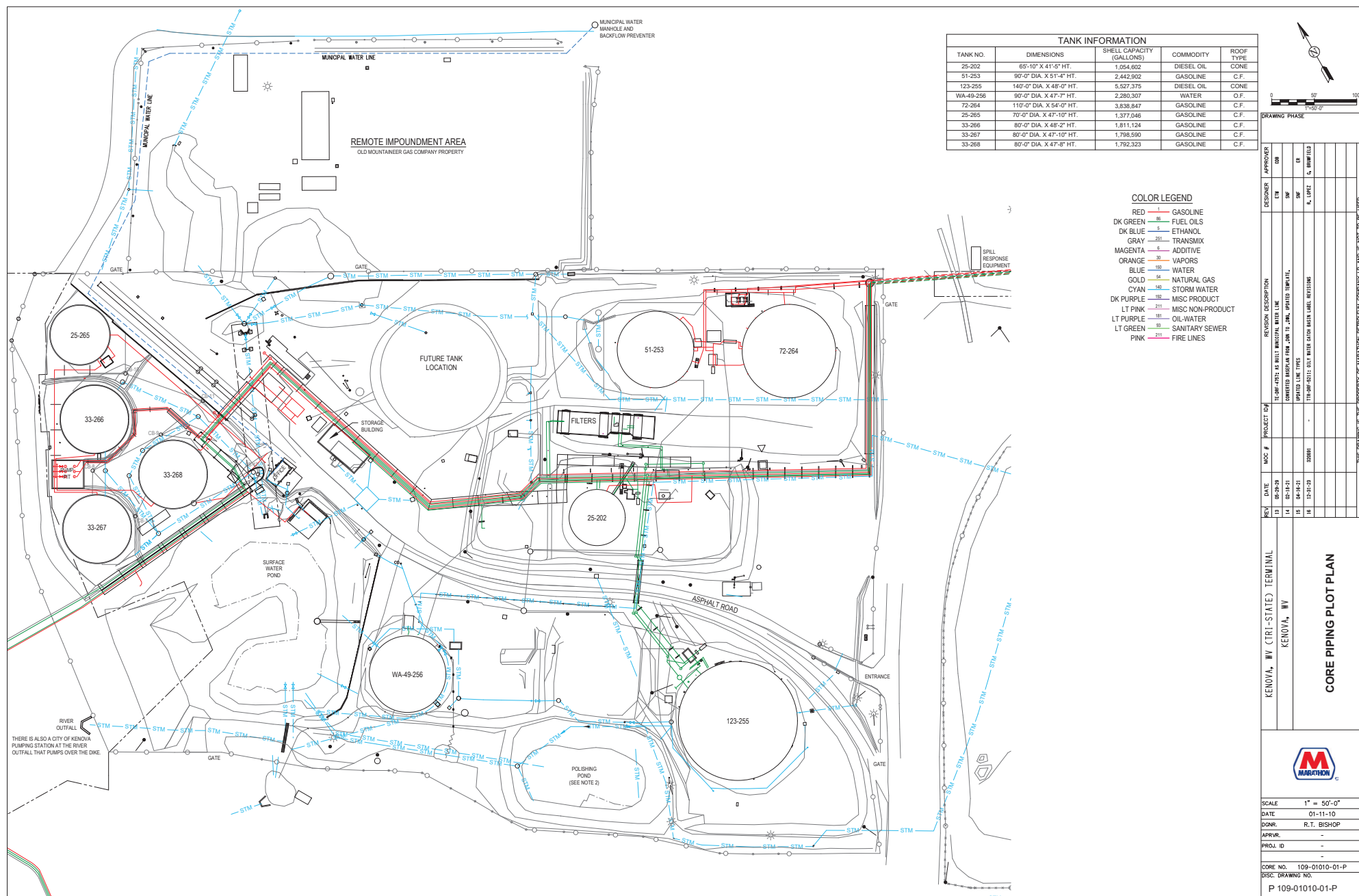
ADJACENT QUADRANGLES

ROAD CLASSIFICATION	
Expressway	Local Connector
Secondary Hwy	Local Road
Interstate Route	US Route
	State Route

CATLETTSBURG, KY, OH, WV
2022



ATTACHMENT B. PLOT PLAN

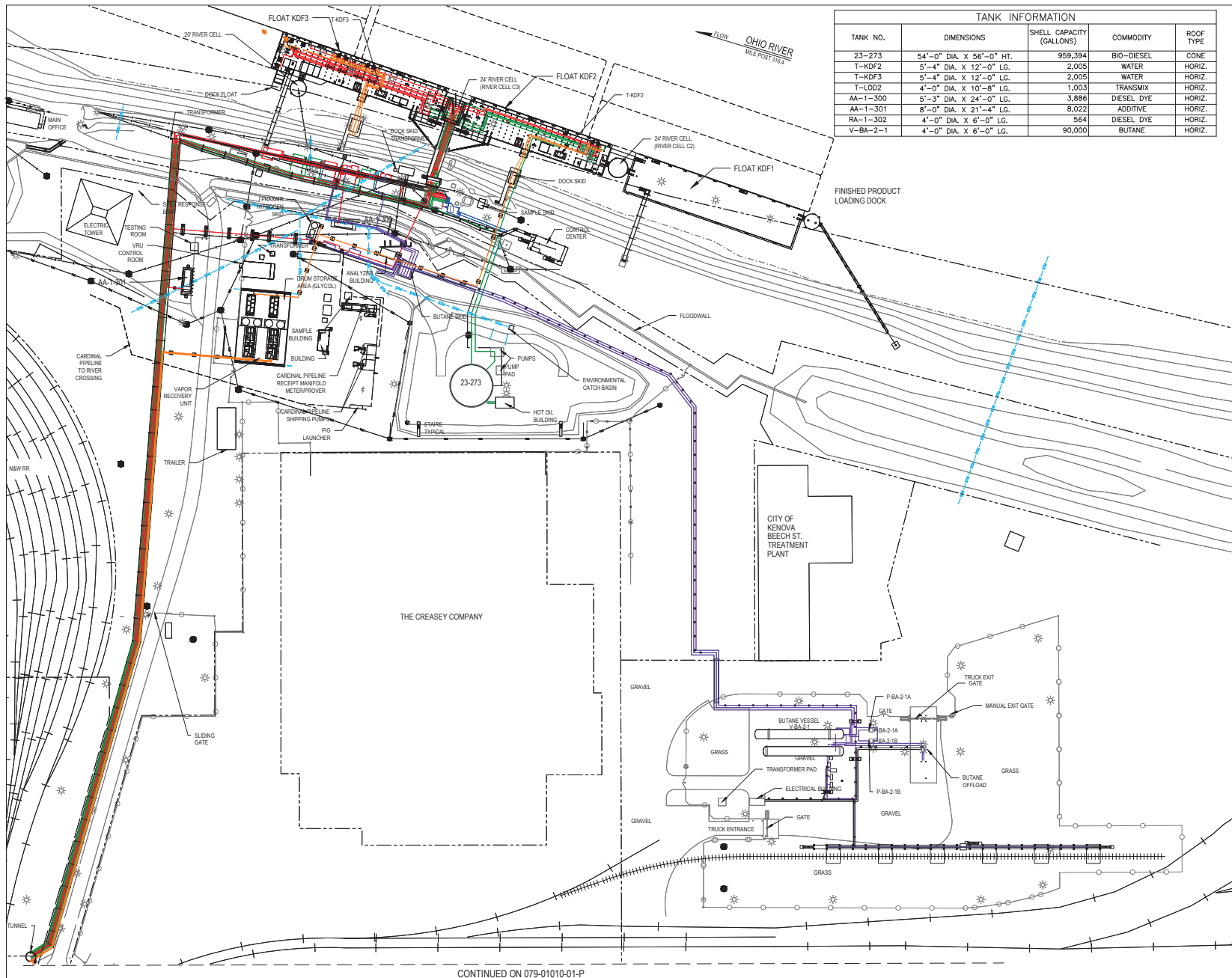


TANK INFORMATION					
TANK NO.	DIMENSIONS	SHELL CAPACITY (GALLONS)	COMMODITY	ROOF TYPE	
25-202	85'-10" X 45'-10" HT.	1,054,662	DIESEL OIL	CONE	
51-101	85'-10" X 45'-10" HT.	2,442,952	GASOLINE	C.F.	
123-255	140'-0" DIA. X 46'-0" HT.	5,527,375	DIESEL OIL	CONE	
WA-49-256	90'-0" DIA. X 47'-10" HT.	2,280,307	WATER	O.F.	
72-284	110'-0" DIA. X 54'-0" HT.	3,836,847	GASOLINE	C.F.	
25-265	70'-0" DIA. X 47'-10" HT.	1,377,046	GASOLINE	C.F.	
33-266	80'-0" DIA. X 46'-0" HT.	1,811,124	GASOLINE	C.F.	
33-267	80'-0" DIA. X 47'-10" HT.	1,799,200	GASOLINE	C.F.	
33-268	80'-0" DIA. X 47'-6" HT.	1,792,323	GASOLINE	C.F.	

COLOR LEGEND

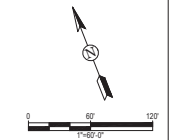
RED	1	GASOLINE
DK GREEN	89	FUEL OILS
DK BLUE	5	ETHANOL
GRAY	231	TRANSMIX
MAGENTA	6	ADDITIVE
ORANGE	30	VAPORS
BLUE	150	WATER
GOLD	54	NATURAL GAS
CYAN	145	STORM WATER
DK PURPLE	192	MISC PRODUCT
LT PINK	211	MISC NON-PRODUCT
LT PURPLE	161	OIL WATER
LT GREEN	93	SANITARY SEWER
PINK	211	SINE LINES

[illegible]



TANK INFORMATION				
TANK NO.	DIMENSIONS	SHELL CAPACITY (GALLONS)	COMMODITY	ROOF TYPE
23-273	54'-0" DIA. X 56'-0" HT.	959,394	BIO-DIESEL	CONE
T-KDF2	5'-4" DIA. X 12'-0" LG.	2,005	WATER	HORIZ.
T-KDF3	5'-4" DIA. X 12'-0" LG.	2,005	WATER	HORIZ.
T-L002	4'-0" DIA. X 10'-8" LG.	1,003	TRANSMIX	HORIZ.
AA-1-300	5'-3" DIA. X 24'-0" LG.	3,866	DIESEL DYE	HORIZ.
AA-1-301	8'-0" DIA. X 21'-4" LG.	8,022	ADDITIVE	HORIZ.
RA-1-302	4'-0" DIA. X 6'-0" LG.	564	DIESEL DYE	HORIZ.
V-BA-2-1	4'-0" DIA. X 6'-0" LG.	90,000	BUTANE	HORIZ.

COLOR LEGEND	
RED	GASOLINE
DK GREEN	FUEL OILS
DK BLUE	ETHANOL
GRAY	TRANSMIX
MAGENTA	ADDITIVE
ORANGE	VAPORS
BLUE	CONTACT WATER
LT BLUE	STORM WATER
GOLD	NATURAL GAS
LT BLUE	STORM WATER
DK PURPLE	MISC PRODUCT
LT PINK	MISC NON-PRODUCT
LT PURPLE	OIL-WATER
LT GREEN	SANITARY SEWER
DK PINK	FIRE LINES



DRAWING PHASE

DESIGNER	APPROVER	REVISION DESCRIPTION	PROJECT #	DATE	REV
AM	BP	MODIFICATION PROJECT	-	08/14/02	1
BP	BP	CONNECTIONS FROM DON TO DING PLANTED IN RIVER	-	08/14/02	2
C. KOLLA	E. BARTO	UPDATES TO DRAWING LINE TYPES	-	08/14/02	3
		ADD PLANT DRAWING UPDATE	-	08/14/02	4

THIS DRAWING IS THE PROPERTY OF MARATHON PETROLEUM COMPANY (P) AND IS NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN PERMISSION OF MARATHON PETROLEUM COMPANY (P).

KENOVA, WV TERMINAL
KENOVA, WV

CORE PIPING PLOT PLAN
SHEET 2

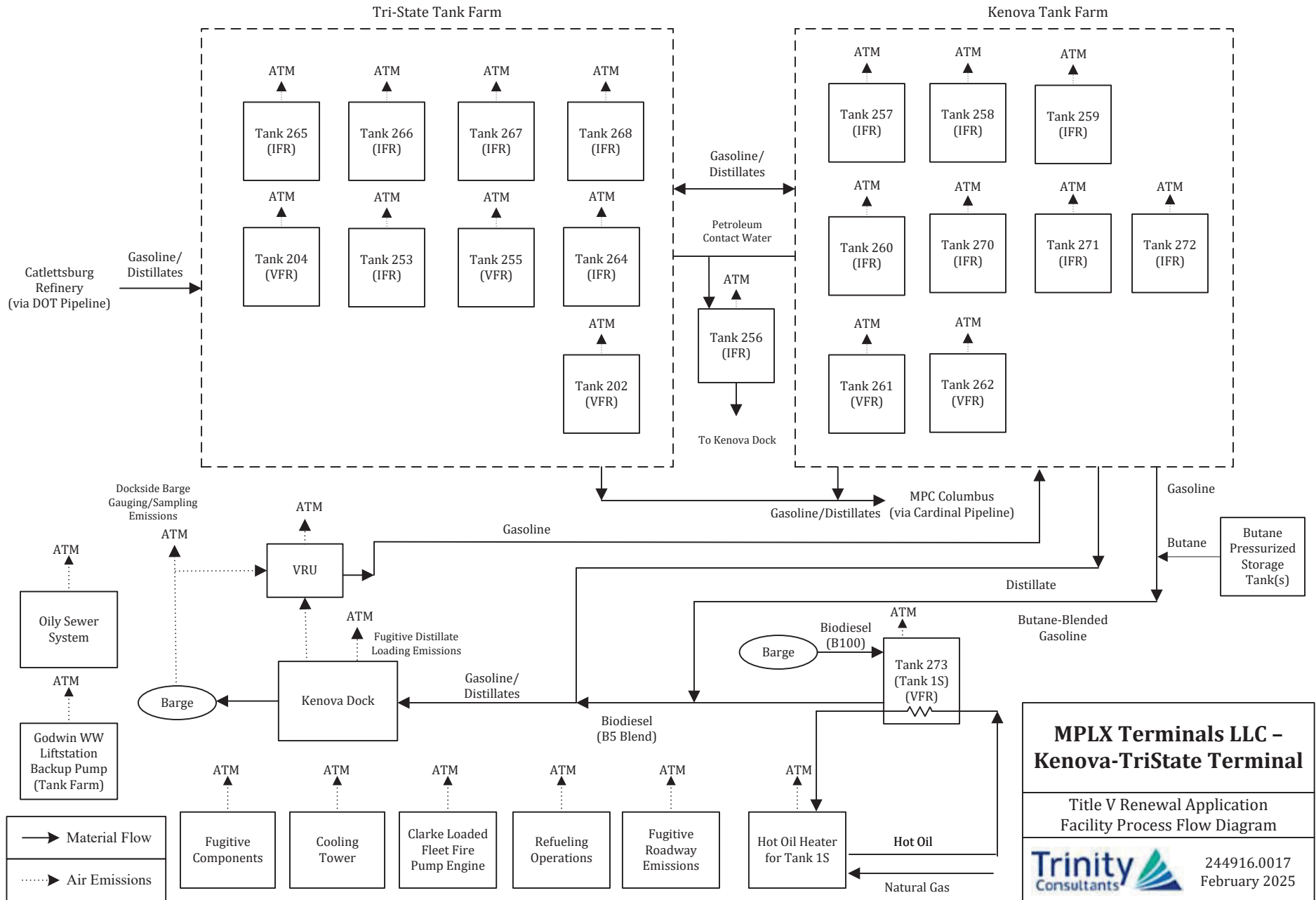


SCALE	1" = 100'-0"
DATE	10-22-02
DRAWN	W.S. WALLENTZ
APPROVED	LARRY FOSTER
PROJ. ID	
CORE NO.	079-01010-02-P
DISC. DRAWING NO.	
P 079-01010-02-P	

CONTINUED ON 079-01010-01-P

ATTACHMENT C. PROCESS FLOW DIAGRAM

Process Flow Diagram for the Kenova-TriState Terminal



ATTACHMENT D. EQUIPMENT TABLE

ATTACHMENT D - Title V Equipment Table
(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Unit ID ¹	Emission Point ID ¹	Emission Unit Description	Year Installed/Modified	Design Capacity *	Control Device ¹
Tank 253	Tank 253	Internal Floating Roof Gasoline/Distillate Fuel Storage Tank	1948/1992	2,444,400 gallons	Primary Shoe w/ Secondary Wiper
Tank 255	Tank 255	Fixed Roof Distillate Fuel Storage Tank	1948	5,527,200 gallons	N/A
Tank 256	Tank 256	External Floating Roof Petroleum Wastewater (with offspec petroleum liquid layer) Storage Tank	1949	2,280,600 gallons	Primary Shoe w/ Secondary Wiper
Tank 257	Tank 257	Internal Floating Roof Gasoline Storage Tank	1951/1995	4,653,600 gallons	Mechanical Shoe Primary Seal
Tank 258	Tank 258	Internal Floating Roof Gasoline Storage Tank	1951/1997	4,397,400 gallons	Mechanical Shoe Primary Seal
Tank 259	Tank 259	Internal Floating Roof Gasoline Storage Tank	1951/2001	4,653,600 gallons	Mechanical Shoe Primary Seal
Tank 260	Tank 260	Internal Floating Roof Gasoline Storage Tank	1968/2002	4,985,400 gallons	Mechanical Shoe Primary Seal
Tank 261	Tank 261	Fixed Cone Roof Distillate Storage Tank	1968/1992	6,631,800 gallons	N/A
Tank 262	Tank 262	Fixed Cone Roof Distillate Storage Tank	1971	6,631,800 gallons	N/A
Tank 264	Tank 264	Internal Floating Roof Gasoline/Distillate Fuel Storage Tank	1990	3,838,800 gallons	Mechanical Shoe w/ Secondary Wiper
Tank 265	Tank 265	Internal Floating Roof Gasoline/ Distillate Fuel Storage Tank	1991	1,377,600 gallons	Primary Foam Log w/ Secondary Wiper
Tank 266	Tank 266	Internal Floating Roof Gasoline/Distillate Fuel Storage Tank	1993	1,810,200 gallons	Mechanical Shoe w/ Secondary Wiper
Tank 267	Tank 267	Internal Floating Roof Gasoline/Distillate Fuel Storage Tank	1993	1,797,600 gallons	Primary Shoe w/ Secondary Wiper
Tank 268	Tank 268	Internal Floating Roof Gasoline/Distillate Fuel Storage Tank	1993	1,793,400 gallons	Primary Shoe w/ Secondary Wiper
Tank 270	Tank 270	Internal Floating Roof Gasoline/Distillate Storage Tank	2001	2,377,200 gallons	Mechanical Shoe Primary Seal
Tank 271	Tank 271	Internal Floating Roof Gasoline/Distillate Storage Tank	2001	2,377,200 gallons	Mechanical Shoe Primary Seal
Tank 272	Tank 272	Internal Floating Roof Gasoline/Distillate Storage Task	2001	2,377,200 gallons	Mechanical Shoe Primary Seal
Tank 273	Tank 273	Cone Roof Storage Tank (Fixed Roof) - Biodiesel / Distillate	2011	957,600 gallons	N/A
LDAR	LDAR	Fugitive Equipment Leaks	N/A	N/A	N/A
Hot Oil Heater #1	Hot Oil Heater #1	Hot Oil Heater for Tank 273	2012	2.499 MMBtu/hr	N/A
Engine #4	Engine #4	Clarke Loaded Fleet Fire Pump Engine	2015	510 hp	N/A
Engine #5	Engine #5	Godwin WW Liftstation Backup Pump	2018	66 hp	N/A
Oily Sewer System	Oily Sewer System	Oily Water Sewer System	N/A	N/A	N/A
Cooling Tower #1	Cooling Tower	Cooling Tower	N/A	400 gpm	N/A
Roadways	Roadways	Paved Facility Roadways	N/A	N/A	N/A

¹For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

ATTACHMENT D - Title V Equipment Table
(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

[illegible]

¹For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

* This value refers to the shell capacity and not the working volume.

** The opening of ullage hatches is not controlled, but depressurization of the barge prior to QA/QC testing is controlled by the VRU.

Title V Equipment Table

Page 1 of 1

Revised 10/14/2021

ATTACHMENT E. EMISSION UNIT FORM

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Engine #5	Emission unit name: Engine for Godwin WW Liftstation Backup Pump	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) 66 hp diesel-fired engine			
Manufacturer: Isuzu	Model number: CP-4LE2X	Serial number: 4LE2XDPCA-02	
Construction date: 02/01/2018	Installation date: 11/01/2018	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 66 hp			
Maximum Hourly Throughput: 3.46 gal/hr	Maximum Annual Throughput: 30,318 gal/yr	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☒ Yes ☐ No		If yes, is it? ☐ Indirect Fired ☒ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 66 hp		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Diesel			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Diesel	15 ppm	N/A	19300 Btu/lb

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.68	2.96
Nitrogen Oxides (NO _x)	0.52	2.26
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	5.5E-03	0.02
Particulate Matter (PM ₁₀)	5.5E-03	0.02
Total Particulate Matter (TSP)	4.9E-03	0.02
Sulfur Dioxide (SO ₂)	7.1E-04	3.1E-03
Volatile Organic Compounds (VOC)	0.25	1.07
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	4.3E-04	1.9E-03
Ethylbenzene	N/A	N/A
Hexane	N/A	N/A
Toluene	1.9E-04	8.2E-04
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	1.3E-04	5.7E-04
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Emission estimates based on the Tier 4 engine standards with the Not-to-Exceed (NTE) multipliers per 40 CFR 1039.101(e). Emissions of SO₂ are estimated based on a 15 ppm limit on sulfur content of diesel fuel pursuant to 40 CFR 60.4207(b) and 40 CFR 1090.305. Refer to Attachment I for detailed emission calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

MPLX determined that this engine was installed while the facility was considered a major source of HAP, and the engine complies with the major source requirements of 40 CFR 63, Subpart ZZZZ.

40 CFR 63.6590(c)(7)

An affected source that meets any of the criteria in 40 CFR 63.6590(c)(1) through (7) must meet the requirements of this part by meeting the requirements of 40 CFR 60, Subpart IIII, for compression ignition engines. No further requirements apply for such engines under this part.

40 CFR 60.4204(b)

Owners and operators of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder must comply with the emission standards for new CI engines in 60.4201 for their 2007 model year and later stationary ICE, as applicable.

40 CFR 60.4206

Must operate and maintain the engine to achieve emission standards over the life of the engine.

40 CFR 60.4207(b)

Must use diesel fuel that meets the requirements of 40 CFR 40 CFR 1090.305 for nonroad diesel fuel.

40 CFR 60.4211(c)

Demonstrate compliance by purchasing an engine certified to the emission standards in 60.4204(b). The engine must be installed and configured according to the manufacturer's emission-related specifications, except as specified in 40 CFR 60.4211(g)

40 CFR 60.4211(a)

If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under 40 CFR 60.4211(g):

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR part 1068, as they apply.

40 CFR 60.4211(g)

If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(1) If you are an owner or operator of a stationary CI internal combustion engine with maximum engine power less than 100 HP, you must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, if you do not install and configure the engine and control device according to the manufacturer's emission-related written instructions, or you change the emission-related settings in a way that is not permitted by the manufacturer, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

N/A

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Engine #4	Emission unit name: Clarke Loaded Fleet Fire Pump Engine	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) 510 hp diesel-fired emergency fire water pump engine			
Manufacturer: John Deere	Model number: 6135HF485	Serial number:	
Construction date: 01/01/2015	Installation date: 02/27/2015	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 510 hp			
Maximum Hourly Throughput: 23.5 gal/hr	Maximum Annual Throughput: 11,750 gal/yr	Maximum Operating Schedule: 500 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☒ Yes ☐ No		If yes, is it? ☐ Indirect Fired ☒ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 510 hp		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Diesel			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Diesel	15 ppm	N/A	19,300 Btu/lb

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.70	0.18
Nitrogen Oxides (NO _x)	3.65	0.91
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	0.14	0.04
Particulate Matter (PM ₁₀)	0.14	0.04
Total Particulate Matter (TSP)	0.13	0.03
Sulfur Dioxide (SO ₂)	0.01	1.39E-03
Volatile Organic Compounds (VOC)	0.14	0.04
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	3.3E-03	8.3E-04
Ethylbenzene	N/A	N/A
Hexane	N/A	N/A
Toluene	1.5E-03	3.7E-04
Trimethylpentene (2,2,4)	N/A	N/A
Xylene	1.0E-03	2.5E-04
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Emissions from the emergency fire water pump diesel-fired engine are calculated using the manufacturer's engine specifications (e.g., horsepower) and the manufacturer's emissions certification data with not-to-exceed (NTE) multipliers per 40 CFR 60.4212(c). MPLX assumes a 500 hour-per-year operating limit since the engine is used only during emergencies. Emissions of SO₂ are estimated based on a 15 ppm limit on sulfur content of diesel fuel pursuant to 40 CFR 60.4207(b) and 40 CFR 1090.305. Refer to Attachment I for detailed emission calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

MPLX determined that this engine was installed while the facility was considered a major source of HAP, and the engine complies with the major source requirements of 40 CFR 63, Subpart ZZZZ.

40 CFR 60.4205(c)

Owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in table 4 to this subpart, for all pollutants.

NMHC+NOX: 4.0 g/kW-hr (3.0 g/hp-hr); CO: 3.5 g/kW-hr (2.6 g/hp-hr); PM: 0.20 g/kW-hr (0.15 g/hp-hr);

40 CFR 60.4206

Operate and maintain the engine to achieve emission standards over the life of the engine.

40 CFR 60.4207(b)

Use diesel fuel that meets the requirements of 40 CFR 1090.305 for nonroad diesel fuel.

40 CFR 60.4209(a)

Install a non-resettable hour meter prior to the startup of the engine

40 CFR 60.4211(a)

If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under 40 CFR 60.4211(g):

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR part 1068, as they apply.

40 CFR 60.4211(c)

Demonstrate compliance by purchasing an engine certified to the emission standards in 60.4205(c). The engine must be installed and configured according to the manufacturer's emission-related specifications, except as specified in 40 CFR 60.4211(g).

40 CFR 60.4211(f)

If you own or operate an emergency stationary ICE, operate the emergency stationary ICE according to the requirements in 40 CFR 60.4211(f)(1) through (3). In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in 40 CFR 60.4211(f)(1) through (3), is prohibited. If you do not operate the engine according to the requirements in 40 CFR 60.4211(f)(1) through (3), the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for the purpose specified in 40 CFR 60.4211(f)(2)(i) for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by 40 CFR 60.4211(f)(3) counts as part of the 100 hours per calendar year allowed by this 40 CFR 60.4211(f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing provided in 40 CFR 60.4211(f)(2).

Per 63.6640(f)(3), MPLX cannot use the emergency engine to supply power as part of a financial arrangement with another entity.

40 CFR 60.4211(g)

If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(3) Keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer. You must conduct subsequent performance testing every 8,760 hours of engine operation or 3 years, whichever comes first, thereafter to demonstrate compliance with the applicable emission standards.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 CFR 63.6590(b)(1)(i)

An affected source which meets either of the criteria in 40 CFR 63.6590(b)(1)(i) through (ii) does not have to meet the requirements of the subpart and of subpart A of this part except for the initial notification requirements of 63.6645(f).

(i) The stationary RICE is a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

40 CFR 63.6640(f)(1)-(3)

If you own or operate an emergency stationary RICE, you must operate the emergency stationary RICE according to the requirements in 40 CFR 63.6640(f)(1) through (3). In order for the engine to be considered an emergency stationary RICE under this subpart, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in 40 CFR 63.6640(f)(1) through (3), is prohibited. If you do not operate the engine according to the requirements in 40 CFR 63.6640(f)(1) through (3), the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on use in emergency situations.

(2) You may operate your emergency stationary RICE for the purpose specified in 40 CFR 63.6640(f)(2)(i) for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by 40 CFR 63.6640(f)(3) and (4) counts as part of the 100 hours per calendar year allowed by this 40 CFR 63.6640(f)(2).

(i) Emergency stationary RICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.

(3) Emergency stationary RICE located at major sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing provided in 40 CFR 63.6640(f)(2). The 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 60.4214(b)

If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

40 CFR 63.6645(f)

If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with 40 CFR 63.6590(b), your notification should include the information in 40 CFR 63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Gasoline Barge Loading	Emission unit name: Gasoline Barge Loading	List any control devices associated with this emission unit: VRU (when loading gas)	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Gasoline Barge Loading			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: N/A	
Construction date: N/A	Installation date: N/A	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):			
Maximum Hourly Throughput: 13,600 bbl/hr (gasoline only) 20,600 bbl/hr (max all loading)	Maximum Annual Throughput: 54.65 million bbl/yr Gasoline	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	66.8 (gas only); 70.4 (worst-case)	134.3 (gas only); 145.8 (worst-case)
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	0.6 (gasoline only) 0.6 (worst-case loading)	1.21 (gasoline only)
Ethylbenzene	0.07 (gasoline only) 0.07 (worst-case loading)	0.13 (gasoline only)
Hexane	1.07 (gasoline only) 1.07 (worst-case loading)	2.15 (gasoline only)
Toluene	0.87 (gasoline only) 0.88 (worst-case loading)	1.75 (gasoline only)
Trimethylpentane (2,2,4)	0.53 (gasoline only) 0.53 (worst-case loading)	1.07 (gasoline only)
Xylene	0.33 (gasoline only) 0.36 (worst-case loading)	0.67 (gasoline only)
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Calculations for gasoline loading based on AP-42 Chapter 5.2 Transportation and Marketing of Petroleum Liquids, Table 5.2-2 "Volatile Organic Compound (VOC) Emission Factors for Gasoline Loading Operations at Marine Terminals," July 2008. Assumes a capture efficiency of 100% in accordance with the preamble to MACT Y (Federal Register: May 13, 1994) for vapor-tight vessels and use of a vacuum assist blower, and a control efficiency of 97% as required by 40 CFR 63.562(b)(2) of MACT Subpart Y. Note - "Worst-case" loading refers to loading the maximum amount of distillate possible when also loading gasoline at maximum capacity. Refer to Attachment I for detailed emission calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 CFR 63.562(a)

The emissions limitations in 40 CFR 63.562(b), (c), and (d) apply during marine tank vessel loading operations.

63.562(b)(1)

(i) Vapor collection system of the terminal.

The owner or operator of a new source with emissions less than 10 and 25 tons and an existing or new source with emissions of 10 or 25 tons shall equip each terminal with a vapor collection system that is designed to collect HAP vapors displaced from marine tank vessels during marine tank vessel loading operations and to prevent HAP vapors collected at one loading berth from passing through another loading berth to the atmosphere, except for those commodities exempted under 40 CFR 63.560(d).

(ii) Ship-to-shore compatibility.

The owner or operator of a new source with emissions less than 10 and 25 tons and an existing or new source with emissions of 10 or 25 tons shall limit marine tank vessel loading operations to those vessels that are equipped with vapor collection equipment that is compatible with the terminal's vapor collection system, except for those commodities exempted under 40 CFR 63.560(d).

(iii) Vapor tightness of marine vessels.

The owner or operator of a new source with emissions less than 10 and 25 tons and an existing or new source with emissions of 10 or 25 tons shall limit marine tank vessel loading operations to those vessels that are vapor tight and to those vessels that are connected to the vapor collection system, except for those commodities exempted under 40 CFR 63.560(d).

63.562(b)(2) MACT standards for existing sources with emissions of 10 or 25 tons.

The owner or operator of an existing source with emissions of 10 or 25 tons, except offshore loading terminals and the VMT source, shall reduce captured HAP emissions from marine tank vessel loading operations by 97 weight-percent, as determined using methods in 40 CFR 63.565(d) and (l).

63.562(b)(5) Prevention of carbon adsorber emissions during regeneration.

The owner or operator of a source subject to 40 CFR 63.562(b)(2), (3), or (4) shall prevent HAP emissions from escaping to the atmosphere from the regeneration of the carbon bed when using a carbon adsorber to control HAP emissions from marine tank vessel loading operations.

63.562(b)(6) Maintenance allowance for loading berths.

The owner or operator of a source subject to 40 CFR 63.562(b)(2), (3) or (4), may apply for approval to the Administrator for a maintenance allowance for loading berths based on a percent of annual throughput or annual marine tank vessel loading operation time for commodities not exempted in 40 CFR 63.560(d). The owner or operator shall maintain records for all maintenance performed on the air pollution control equipment. The Administrator will consider the following in approving the maintenance allowance:

(i) The owner or operator expects to be in violation of the emissions standards due to maintenance;

(ii) Due to conditions beyond the reasonable control of the owner or operator, compliance with the emissions standards during maintenance would result in unreasonable economic hardship;

(iii) The economic hardship cannot be justified by the resulting air quality benefit;

(iv) The owner or operator has given due consideration to curtailing marine vessel loading operations during maintenance;

(v) During the maintenance allowance, the owner or operator will endeavor to reduce emissions from other loading berths that are controlled as well as from the loading berth the owner or operator is seeking the maintenance allowance; and

(vi) During the maintenance allowance, the owner or operator will monitor and report emissions from the loading berth to which the maintenance allowance applies.

63.562(c)(2)

(i) Vapor collection system of the terminal.

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels shall equip each terminal with a vapor collection system that is designed to collect VOC vapors displaced from marine tank vessels during loading and to prevent VOC vapors collected at one loading berth from passing through another loading berth to the atmosphere, except for those commodities exempted under 40 CFR 63.560(d).

(ii) Ship-to-shore compatibility.

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels shall limit marine tank vessel loading operations to those vessels that are equipped with vapor collection equipment that is compatible with the terminal's vapor collection system, except for those commodities exempted under 40 CFR 63.560(d).

(iii) Vapor tightness of marine vessels.

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels shall limit marine tank vessel loading operations to those vessels that are vapor-tight and to those vessels that are connected to the vapor collection system, except for those commodities exempted under 40 CFR 63.560(d).

63.562(c)(3) RACT standard for sources with throughput of 10 M or 200 M barrels, except the VMT source.

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels, except the VMT source, shall reduce captured VOC emissions from marine tank vessel loading operations by 98 weight-percent when using a combustion device or reduce captured VOC emissions by 95 weight-percent when using a recovery device, as determined using methods in 40 CFR 63.565(d) and (l).

63.562(c)(4)

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels, except the VMT source, may meet the requirements of 40 CFR 63.562(c)(3) by reducing gasoline loading emissions to, at most, 1,000 ppmv outlet VOC concentration.

63.562(c)(5) Prevention of carbon adsorber emissions during regeneration.

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels shall prevent HAP emissions from escaping to the atmosphere from the regeneration of the carbon bed when using a carbon adsorber to control HAP emissions from marine tank vessel loading operations.

63.562(c)(6) Maintenance allowance for loading berths.

The owner or operator of a source with throughput of 10 M barrels or 200 M barrels may apply for approval to the Administrator for a maintenance allowance for loading berths based on a percent of annual throughput or annual marine tank vessel loading operation time for commodities not exempted in 40 CFR 63.560(d). The owner or operator shall maintain records for all maintenance performed on the air pollution control equipment. The Administrator will consider the following in approving the maintenance allowance:

- (i) The owner or operator expects to be in violation of the emissions standards due to maintenance;
- (ii) Due to conditions beyond the reasonable control of the owner or operator, compliance with the emissions standards during maintenance would result in unreasonable economic hardship;
- (iii) The economic hardship cannot be justified by the resulting air quality benefit;
- (iv) The owner or operator has given due consideration to curtailing marine vessel loading operations during maintenance;
- (v) During the maintenance allowance, the owner or operator will endeavor to reduce emissions from other loading berths that are controlled as well as from the loading berth the owner or operator is seeking the maintenance allowance; and
- (vi) During the maintenance allowance, the owner or operator will monitor and report emissions from the loading berth to which the maintenance allowance applies.

40 CFR 63.562(e) Operation and maintenance requirements for air pollution control equipment and monitoring equipment

At all times, owners or operators of affected sources shall operate and maintain a source, including associated air pollution control equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether acceptable operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

(1) The Administrator will determine compliance with design, equipment, work practice, or operational emission standards by evaluating an owner or operator's conformance with operation and maintenance requirements.

(2) The owner or operator of an affected source shall develop a written operation and maintenance plan that describes in detail a program of corrective action for varying (i.e., exceeding baseline parameters) air pollution control equipment and monitoring equipment, based on monitoring requirements in 40 CFR 63.564, used to comply with these emissions standards. The plan shall also identify all routine or otherwise predictable continuous monitoring system (thermocouples, pressure transducers, continuous emissions monitors (CEMS), etc.) variances.

(i) The plan shall specify procedures (preventive maintenance) to be followed to ensure that pollution control equipment and monitoring equipment functions properly and variances of the control equipment and monitoring equipment are minimal.

(ii) The plan shall identify all operating parameters to be monitored and recorded for the air pollution control device as indicators of proper operation and shall establish the frequency at which the parameters will be monitored (see 40 CFR 63.564).

(iii) Owners or operators of affected sources shall incorporate a standardized inspection schedule for each component of the control device used to comply with the emissions standards in 40 CFR 63.562(b), (c), and (d). To satisfy the requirements of this paragraph, the owner or operator may use the inspection schedule recommended by the vendor of the control system or any other technical publication regarding the operation of the control system.

(iv) Owners or operators shall develop and implement a continuous monitoring system (CMS) quality control program. The owner or operator shall develop and submit to the Administrator for approval upon request a site-specific performance evaluation test plan for the CMS performance evaluation required in 40 CFR 63.8(e) of subpart A of this part. Each quality control program shall include, at a minimum, a written protocol that describes procedures for initial and any subsequent calibration of the CMS; determination and adjustment of the calibration drift of the CMS; preventive maintenance of the CMS, including spare parts inventory; data recording, calculations, and reporting; and accuracy audit procedures, including sampling and analysis methods. The owner or operation shall maintain records of the procedures that are part of the quality control program developed and implemented for CMS.

63.562(e)(3)

Based on the results of the determination made under 40 CFR 63.562(e)(2), the Administrator may require that an owner or operator of an affected source make changes to the operation and maintenance plan for that source. Revisions may be required if the plan:

- (i) Does not address a variance of the air pollution control equipment or monitoring equipment that has occurred that increases emissions;
- (ii) Fails to provide for operation during a variance of the air pollution control equipment or the monitoring equipment in a manner consistent with safety and good air pollution control practices; or
- (iii) Does not provide adequate procedures for correcting a variance of the air pollution control equipment or monitoring equipment as soon as reasonable.

63.562(e)(4)

If the operation and maintenance plan fails to address or inadequately addresses a variance event at the time the plan was initially developed, the owner or operator shall revise the operation and maintenance plan within 45 working days after such an event occurs. The revised plan shall include procedures for operating and maintaining the air pollution control equipment or monitoring equipment during similar variance events and a program for corrective action for such events.

63.562(e)(5)

The operation and maintenance plan shall be developed by the source's compliance date. The owner or operator shall keep the written operation and maintenance plan on record to be made available for inspection, upon request, by the Administrator for the life of the source. In addition, if the operation and maintenance plan is revised, the owner or operator shall keep previous (i.e., superseded) versions of the plan on record to be made available for inspection upon request by the Administrator for a period of 5 years after each revision to the plan.

63.562(e)(6)

To satisfy the requirements of the operation and maintenance plan, the owner or operator may use the source's standard operating procedures (SOP) manual, an Occupational Safety and Health Administration (OSHA) plan, or other existing plans provided the alternative plans meet the requirements of this section and are made available for inspection when requested by the Administrator.

63.562(e)(7)

In response to an action to enforce the standards set forth in this subpart, you may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by a malfunction, as defined in 40 CFR 63.2. Appropriate penalties may be assessed, however, if the respondent fails to meet its burden of proving all the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

(i) To establish the affirmative defense in any action to enforce such a limit, the owners or operators of a facility must timely meet the notification requirements of 40 CFR 63.562(e)(7)(ii), and must prove by a preponderance of evidence that:

- (A) The excess emissions were caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, or a process to operate in a normal and usual manner; and could not have been prevented through careful planning, proper design or better operation and maintenance practices; and did not stem from any activity or event that could have been foreseen and avoided, or planned for; and were not part of a recurring pattern indicative of inadequate design, operation, or maintenance;
- (B) Repairs were made as expeditiously as possible when the applicable emission limitations were being exceeded. Off-shift and overtime labor were used, to the extent practicable to make these repairs;
- (C) The frequency, amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions;
- (D) If the excess emissions resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- (E) All possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment, and human health;
- (F) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices;
- (G) All of the actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs;
- (H) At all times, the affected facility was operated in a manner consistent with good practices for minimizing emissions; and
- (I) The owner or operator has prepared a written root cause analysis, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue. The analysis shall also specify, using the best monitoring methods and engineering judgment, the amount of excess emissions that were the result of the malfunction.

63.562(e)(7)(ii) Notification.

The owner or operator of the facility experiencing an exceedance of its emission limit(s) during a malfunction shall notify the Administrator by telephone or facsimile (FAX) transmission as soon as possible, but no later than 2 business days after the initial occurrence of the malfunction, if it wishes to avail itself of an affirmative defense to civil penalties for that malfunction. The owner or operator seeking to assert an affirmative defense shall also submit a written report to the Administrator within 45 days of the initial occurrence of the exceedance of the standard in this subpart to demonstrate, with all necessary supporting documentation, that it has met the requirements set forth in 40 CFR 63.562(e)(7)(i). The owner or operator may seek an extension of this deadline for up to 30 additional days by submitting a written request to the Administrator before the expiration of the 45 day period. Until a request for an extension has been approved by the Administrator, the owner or operator is subject to the requirement to submit such report within 45 days of the initial occurrence of the exceedance.

40 CFR 63.563(a) The following procedures shall be used to determine compliance with the emissions limits under 40 CFR 63.562(b)(1), (c)(2), and (d)(1):

(1) Vent stream by-pass requirements for the terminal's vapor collection system.

(i) In accordance with 40 CFR 63.562(b)(1)(i), (c)(2)(i), and (d)(1)(i), each valve in the terminal's vapor collection system that would route displaced vapors to the atmosphere, either directly or indirectly, shall be secured closed during marine tank vessel loading operations either by using a car-seal or a lock-and-key type configuration, or the by-pass line from the valve shall be equipped with a flow indicator, except for those valves used for pressure/vacuum relief, analyzers, instrumentation devices, sampling, and venting for maintenance. Marine tank vessel loading operations shall not be performed with open by-pass lines.

(ii) Repairs shall be made to valves, car-seals, or closure mechanisms no later than 15 days after a change in the position of the valve or a break in the car-seal or closure mechanism is detected or no later than prior to the next marine tank vessel loading operation, whichever is later.

63.563(a)(2) Ship-to-shore compatibility of vapor collection systems.

Marine tank vessel loading operations must be performed only if the marine tank vessel's vapor collection equipment is compatible to the terminal's vapor collection system; marine tank vessel loading operations must be performed only when the marine tank vessel's vapor collection equipment is connected to the terminal's vapor collection system, as required in 40 CFR 63.562(b)(1)(ii), (c)(2)(ii), and (d)(1)(ii).

63.563(a)(3) Pressure/vacuum settings for the marine tank vessel's vapor collection equipment.

During the initial performance test required in 40 CFR 63.562(b)(1), the owner or operator of an affected source shall demonstrate compliance with operating pressure requirements of 33 CFR 154.814 using the procedures in 40 CFR 63.565(b).

63.563(a)(4) Vapor-tightness requirements of the marine vessel.

The owner or operator of an affected source shall use the procedures in 40 CFR 63.562(a)(4)(i), (ii), (iii), or (iv) to ensure that marine tank vessels are vapor tight, as required in 40 CFR 63.562(b)(1)(iii), (c)(2)(iii), and (d)(1)(iii).

(i) Pressure test documentation for determining vapor tightness of the marine vessel.

The owner or operator of a marine tank vessel, who loads commodities containing HAP not determined to be exempt under 40 CFR 63.560(d) at an affected source, shall provide a copy of the vapor-tightness pressure test documentation described in 40 CFR 63.567(i) for each marine tank vessel prior to loading. The date of the test listed in the documentation must be within the preceding 12 months, and the test must be conducted in accordance with the procedures in 40 CFR 63.565(c)(1). Following the date on which the initial performance test is completed, the affected source must check vapor-tightness pressure test documentation for marine tank vessels loaded at positive pressure.

(ii) Leak test documentation for determining vapor tightness of the marine vessel.

If no documentation of the vapor tightness pressure test as described in 40 CFR 63.563(a)(4)(i) is available, the owner or operator of a marine tank vessel, who loads commodities containing HAP not determined to be exempt under 40 CFR 63.560(d) at an affected source, shall provide the leak test documentation described in 40 CFR 63.567(i) for each marine tank vessel prior to loading. The date of the test listed in the documentation must be within the preceding 12 months, and the test must be conducted in accordance with the procedures in 40 CFR 63.565(c)(2). If the marine tank vessel has failed its most recent vapor-tightness leak test at that terminal, the owner or operator of the non-vapor-tight marine tank vessel shall provide documentation that the leaks detected during the previous vapor-tightness test have been repaired and documented with a successful vapor-tightness leak test described in 40 CFR 63.565(c)(2) conducted during loading. If the owner or operator of the marine tank vessel can document that repair is technically infeasible without cleaning and gas freeing or dry-docking the vessel, the owner or operator of the affected source may load the marine tank vessel. Following the date on which the initial performance test is completed, an affected source must check the vapor-tightness leak test documentation for marine tank vessels loaded at positive pressure.

(iii) Leak test performed during loading using Method 21 for determining vapor tightness of the marine vessel.

If no documentation of vapor tightness as described in 40 CFR 63.563(a)(4)(i) or (ii) is available, the owner or operator of a marine tank vessel, who loads commodities containing HAP not determined to be exempt under 40 CFR 63.560(d) at an affected source, shall perform a leak test of the marine tank vessel during marine tank vessel loading operation using the procedures described in 40 CFR 63.565(c)(2).

(A) If no leak is detected, the owner or operator of a marine tank vessel shall complete the documentation described in 40 CFR 63.567(i) prior to departure of the vessel.

(B) If a leak is detected, the owner or operator of the marine tank vessel shall document the vapor-tightness failure for the marine tank vessel prior to departure of the vessel. The leaking component shall be repaired prior to the next marine tank vessel loading operation at a controlled terminal unless the repair is technically infeasible without cleaning and gas freeing or dry-docking the vessel. If the owner or operator of the vessel provides documentation that repair of such equipment is technically infeasible without cleaning and gas freeing or dry-docking the vessel, the equipment responsible for the leak will be excluded from future Method 21 tests until repairs are effected. A copy of this documentation shall be maintained by the owner or operator of the affected source. Repair of the equipment responsible for the leak shall occur the next time the vessel is cleaned and gas freed or dry-docked. For repairs that are technically feasible without dry-docking the vessel, the owner or operator of the affected source shall not load the vessel again unless the marine tank vessel owner or operator can document that the equipment responsible for the leak has been repaired.

63.563(a)(4)(iv) Negative pressure loading.

The owner or operator of an affected source shall ensure that a marine tank vessel is loaded with the product tank below atmospheric pressure (i.e., at negative gauge pressure). The pressure shall be measured between the facility's vapor connection and its manual isolation valve, and the measured pressure must be below atmospheric pressure. Following the date on which the initial performance test is completed, marine tank vessel loading operations for nonvapor-tight vessels must be performed below atmospheric pressure (i.e., at negative gauge pressure) in the product tank.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 63.563(b)(3) Operation and maintenance inspections.

If the 3-hour or 3-cycle block average operating parameters in 40 CFR 63.563(b)(4) through (9), outside the acceptable operating ranges, are measured and recorded, i.e., variances of the pollution control device or monitoring equipment, the owner or operator of the affected source shall perform an unscheduled inspection of the control device and monitoring equipment and review of the parameter monitoring data. The owner or operator of the affected source shall perform an inspection and review when total parameter variance time for the control device is greater than 10 percent of the operating time for marine tank vessel loading operations on a 30-day, rolling-average basis. The inspection and review shall be conducted within 24 hours after passing the allowable variance time of 10 percent. The inspection checklist from the requirements of 40 CFR 63.562(e)(2)(iii) and the monitoring data from requirements in 40 CFR 63.562(e)(2)(ii) and 63.564 should be used to identify any maintenance problems that may be associated with the variance. The unscheduled inspection should encompass all components of the control device and monitoring equipment that can be inspected while in operation. If any maintenance problem is identified during the inspection, the owner or operator of the affected source must take corrective action (e.g., adjustments to operating controls, etc.) as soon as practicable. If no immediate maintenance problems are identified from the inspection performed while the equipment is operating, a complete inspection in accordance with 40 CFR 63.562(e)(2) must be conducted prior to the next marine tank vessel loading operation and corrective action (e.g., replacement of defective parts) must be taken as soon as practicable for any maintenance problem identified during the complete inspection.

40 CFR 63.563(b)(6) Carbon adsorber.

The owner or operator of affected sources complying with 40 CFR 63.563(b)(6)(ii)(B) or (C) shall conduct a performance test once each year.

(i) Compliance determination for carbon bed regeneration. Desorbed hydrocarbons from regeneration of the off-line carbon bed shall be vented to the on-line carbon bed.

(ii) Baseline parameters for required percent recovery efficiency. The owner or operator shall comply with 40 CFR 63.563(b)(6)(ii)(A), (B), or (C).

(A) Outlet VOC concentration limit for required percent recovery efficiency. The owner or operator shall establish as an operating parameter the baseline VOC concentration using the procedures described in 40 CFR 63.565(g). The facility shall be operated with a block average outlet VOC concentration as determined in 40 CFR 63.564(g)(1) no more than 20 percent above the baseline VOC concentration.

40 CFR 63.563(b)(10) Emission estimation.

The owner or operator of a source subject to 40 CFR 63.562(b)(2), (3), and (4) shall use the emission estimation procedures in 40 CFR 63.565(l) to calculate HAP emissions.

40 CFR 63.563(c) Leak detection and repair for vapor collection systems and control devices.

The following procedures are required for all sources subject to 40 CFR 63.562(b) or(c)

40 CFR 63.563(d)

(1) Annual leak detection and repair for vapor collection systems and control devices. The owner or operator of an affected source shall inspect and monitor all ductwork and piping and connections to vapor collection systems and control devices once each calendar year using Method 21.

(2) Ongoing leak detection and repair for vapor collection systems and control devices.

If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method, all ductwork and piping and connections to vapor collection systems and control devices shall be inspected to the extent necessary to positively identify the potential leak and any potential leaks shall be monitored within 5 days by Method 21. Each detection of a leak shall be recorded, and the leak shall be tagged until repaired.

(3) When a leak is detected, a first effort to repair the vapor collection system and control device shall be made within 15 days or prior to the next marine tank vessel loading operation, whichever is later.

63.564(a) Monitoring Requirements

(1) The owner or operator of an affected source shall comply with the monitoring requirements in 63.8 of subpart A of this part in accordance with the provisions for applicability of subpart A to this subpart in Table 1 of 63.560 and the monitoring requirements in this section

(2) Each owner or operator of an affected source shall monitor the parameters specified in this section. All monitoring equipment shall be installed such that representative measurements of emissions or process parameters from the source are obtained. For monitoring equipment purchased from a vendor, verification of the operational status of the monitoring equipment shall include completion of the manufacturer's written specifications or recommendations for installation, operation, and calibration of the system.

(3) Except for system breakdowns, out-of-control periods, repairs, maintenance periods, calibration checks, and zero (low-level) and high-level calibration drift adjustments, all continuous parametric monitoring systems (CPMS) and CEMS shall be in continuous operation while marine tank vessel loading operations are occurring and shall meet minimum frequency of operation requirements. Sources monitoring by use of CEMS and CPMS shall complete a minimum of one cycle of operation (sampling, analyzing, and/or data recording) for each successive 15-minute period.

(4) The owner or operator of a CMS installed in accordance with these emissions standards shall comply with the performance specifications either in performance specification (PS) 8 in 40 CFR part 60, appendix B for CEMS or in 40 CFR 63.7(c)(6) of subpart A of this part for CPMS.

(5) A CEMS is out of control when the measured values (i.e., daily calibrations, multipoint calibrations, and performance audits) exceed the limits specified in either PS 8 or in 40 CFR 63.8(c)(7) of subpart A of this part. The owner or operator of a CEMS that is out of control shall submit all information concerning out of control periods, including start and end dates and hours and descriptions of corrective actions taken, in the excess emissions and continuous monitoring system performance report required in 40 CFR 63.567(e).

40 CFR 63.564(b) Vapor collection system of terminal.

Owners or operators of a source complying with 40 CFR 63.563(a)(1) that uses a vapor collection system that contains valves that could divert a vent stream from a control device used to comply with the provisions of this subpart shall comply with 40 CFR 63.564(b)(1), (2), or (3).

(1) Measure and record the vent stream flowrate of each by-pass line once every 15 minutes. The owner or operator shall install, calibrate, maintain, and operate a flow indicator and data recorder. The flow indicator shall be installed immediately downstream of any valve (i.e., entrance to by-pass line) that could divert the vent stream from the control device to the atmosphere.

(2) Measure the vent stream flowrate of each by-pass line once every 15 minutes. The owner or operator shall install, calibrate, maintain, and operate a flow indicator with either an audio or visual alarm. The flow indicator and alarm shall be installed immediately downstream of any valve (i.e., entrance to by-pass line) that could divert the vent stream from the control device to the atmosphere. The alarm shall be checked every 6 months to demonstrate that it is functioning properly.

(3) Visually inspect the seal or closure mechanism once during each marine tank vessel loading operation and at least once every month to ensure that the valve is maintained in the closed position and that the vent stream is not diverted through the by-pass line; record all times when the car seals have been broken and the valve position has been changed. Each by-pass line valve shall be secured in the closed position with a car-seal or a lock-and-key type configuration.

40 CFR 63.564(c) Pressure/vacuum settings for the marine tank vessel's vapor collection equipment.

Owners or operators of a source complying with 40 CFR 63.563(a)(3) shall measure continuously the operating pressure of the marine tank vessel during loading.

40CFR 63.564(d) Loading at negative pressure.

Owners or operators of a source complying with 40 CFR 63.563(a)(4)(iv) that load vessels at less than atmospheric pressure (i.e., negative gauge pressure) shall measure and record the loading pressure. The owner or operator shall install, calibrate, maintain, and operate a recording pressure measurement device (magnehelic gauge or equivalent device) and an audible and visible alarm system that is activated when the pressure vacuum specified in 40 CFR 63.563(a)(4)(iv) is not attained. The owner or operator shall place the alarm system so that it can be seen and heard where cargo transfer is controlled. The owner or operator shall verify the accuracy of the pressure device once each calendar year with a reference pressure monitor (traceable to National Institute of Standards and Technology (NIST) standards or an independent pressure measurement device dedicated for this purpose).

40 CFR 63.564(g) Carbon adsorber.

For sources complying with 40 CFR 63.563(b)(6), use of a carbon adsorber, the owner or operator shall comply with 40 CFR 63.564(g)(1), (2), or (3).

(1) Outlet VOC concentration.

Monitor the VOC concentrations at the exhaust point of each carbon adsorber unit and record the output from the system. For sources monitoring the outlet VOC concentration established during the performance test, a data acquisition system shall record a concentration every 15 minutes and shall compute and record an average concentration each cycle (same time period or cycle as the performance test) and a 3-cycle block average concentration every third cycle. For sources monitoring the 1,000 ppmv VOC concentration for gasoline loading, a data acquisition system shall record a concentration every 15 minutes and shall compute and record an average concentration each hour and a 3-hour block average concentration every third hour. The owner or operator will install, calibrate, operate, and maintain a CEMS consistent with the requirements of PS 8 to measure the VOC concentration. The daily calibration requirements are required only on days when marine tank vessel loading operations occur.

40 CFR 63.564(j)

63.564(j) Alternate monitoring procedures.

Alternate procedures to those described in this section may be used upon application to, and approval by, the Administrator. The owner or operator shall comply with the procedures for use of an alternative monitoring method in 40 CFR 63.8(f).

40 CFR 63.565(a) Performance testing.

The owner or operator of an affected source in 40 CFR 63.562 shall comply with the performance testing requirements in 40 CFR 63.7 of subpart A of this part in accordance with the provisions for applicability of subpart A to this subpart in Table 1 of 40 CFR 63.560 and the performance testing requirements in this section.

40 CFR 63.565(b) Pressure/vacuum settings of marine tank vessel's vapor collection equipment.

For the purpose of determining compliance with 40 CFR 63.563(a)(3), the following procedures shall be used:

- (1) Calibrate and install a pressure measurement device (liquid manometer, magnehelic gauge, or equivalent instrument) capable of measuring up to the maximum relief set pressure of the pressure-vacuum vents;
- (2) Connect the pressure measurement device to a pressure tap in the terminal's vapor collection system, located as close as possible to the connection with the marine tank vessel; and
- (3) During the performance test required in 40 CFR 63.563(b)(1), record the pressure every 5 minutes while a marine tank vessel is being loaded and record the highest instantaneous pressure and vacuum that occurs during each loading cycle.

40 CFR 63.565(c) Vapor-tightness test procedures for the marine tank vessel.

When testing a vessel for vapor tightness to comply with the marine vessel vapor-tightness requirements of 40 CFR 63.563(a)(4)(i), the owner or operator of a source shall use the methods in either 63.565(c)(1) or (2).

(1) Pressure test for the marine tank vessel.

(i) Each product tank shall be pressurized with dry air or inert gas to no more than the pressure of the lowest pressure relief valve setting.

(ii) Once the pressure is obtained, the dry air or inert gas source shall be shut off.

(iii) At the end of one-half hour, the pressure in the product tank and piping shall be measured. The change in pressure shall be calculated using the following formula:

$$P = P_i - P_f$$

Where:

P=change in pressure, inches of water.

P_i=pressure in tank when air/gas source is shut off, inches of water.

P_f=pressure in tank at the end of one-half hour after air/gas source is shut off, inches of water.

63.565(c)(1)(iv)

The change in pressure, P, shall be compared to the pressure drop calculated using the following formula:

$$PM = 0.861 \frac{P_i a L}{V}$$

Where:

PM=maximum allowable pressure change, inches of water.

P_ia=pressure in tank when air/gas source is shut off, psia.

L=maximum permitted loading rate of vessel, barrels per hour.

V=total volume of product tank, barrels.

(v) If P ≤ PM, the vessel is vapor tight.

63.565(c)(1)(vi)

If P < PM, the vessel is not vapor tight and the source of the leak must be identified and repaired prior to retesting.

63.565(c)(2) Leak test for the marine tank vessel.

Each owner or operator of a source complying with 40 CFR 63.563(a)(4)(ii) or (iii) shall use Method 21 as the vapor-tightness leak test for marine tank vessels. The test shall be conducted during the final 20 percent of loading of each product tank of the marine vessel, and it shall be applied to any potential sources of vapor leaks on the vessel.

40 CFR 63.565(d)(1)-(3)

Initial performance testing was completed as specified by 40 CFR 63.563(b)(1). The rule does not require subsequent testing of the VRU, so the following is for reference only in the event of agency-requested tests.

(1) All testing equipment shall be prepared and installed as specified in the appropriate test methods.

(2) All testing shall be performed during the last 20 percent of loading of a tank or compartment.

(3) All emission testing intervals shall consist of each 5 minute period during the performance test. For each interval, the following shall be performed:

(i) Readings. The reading from each measurement instrument shall be recorded.

(ii) Sampling Sites. Method 1 or 1A of appendix A of part 60 of this chapter, as appropriate, shall be used for selection of sampling sites. Sampling sites shall be located at the inlet and outlet of the combustion device or recovery device except for owners or operators complying with the 1,000 ppmv VOC emissions limit for gasoline vapors under 40 CFR 63.563(b)(6) or (7), where the sampling site shall be located at the outlet of the recovery device.

(iii) Volume exhausted. The volume exhausted shall be determined using Method 2, 2A, 2C, or 2D of appendix A of part 60 of this chapter, as appropriate.

40 CFR 63.565(d)(5) Recovery devices.

The average VOC concentration in the vent upstream and downstream of the control device shall be determined using Method 25A or 25B of appendix A-7 to part 60 of this chapter for recovery devices. The average VOC concentration shall correspond to the volume measurement by taking into account the sampling system response time.

40 CFR 63.565(d)(6)

The VOC mass at the inlet and outlet of the combustion or recovery device during each testing interval shall be calculated as follows:

$$M_j = FKVsCVOC$$

Where:

M_j = mass of VOC at the inlet and outlet of the combustion or recovery device during testing interval j , kilograms (kg).

$F = 10^{-6}$ = conversion factor, (cubic meters VOC/cubic meters air)(1/ppmv) (m³ VOC/m³ air)(1/ppmv).

K = density, kilograms per cubic meter (kg/m³ VOC), standard conditions, 20 °C and 760 mm Hg.

V_s = volume of air-vapor mixture at the inlet and outlet of the combustion or recovery device, cubic meters (m³) at standard conditions, 20 °C and 760 mm Hg.

$CVOC$ = VOC concentration (as measured) at the inlet and outlet of the combustion or recovery device, ppmv, dry basis.

s = standard conditions, 20 °C and 760 mm Hg.

40 CFR 63.565(d)(7)

The VOC mass emission rates at the inlet and outlet of the recovery or combustion device shall be calculated per the equations presented in 63.365(d)(7),

Where:

E_i, E_o = mass flow rate of VOC at the inlet (i) and outlet (o) of the recovery or combustion device, kilogram per hour (kg/hr).

M_{ij}, M_{oj} = mass of VOC at the inlet (i) or outlet (o) during testing interval j , kg.

T = Total time of all testing intervals, hour.

n = number of testing intervals.

40 CFR 63.565(d)(8)

Where Method 25, 25A, or 25B is used to measure the percent reduction in VOC, the percent reduction across the combustion or recovery device shall be calculated per the equation presented in 40 CFR 63.565(d)(8),

Where:

R = control efficiency of control device, percent.

E_i = mass flow rate of VOC at the inlet to the combustion or recovery device as calculated under 40 CFR 63.565(c)(7), kg/hr.

E_o = mass flow rate of VOC at the outlet of the combustion or recovery device, as calculated under 40 CFR 63.565(c)(7), kg/hr.

40 CFR 63.565(d)(9)

Repeat the procedures in 40 CFR 63.565(d)(1) through (d)(8) 3 times. The arithmetic average percent efficiency of the three runs shall determine the overall efficiency of the control device.

40 CFR 63.565(d)(10)

Use of methods other than Method 25, 25A, or 25B shall be validated pursuant to Method 301 of appendix A to part 63 of this chapter.

40 CFR 63.565(g) Baseline outlet VOC concentration.

The procedures in this paragraph shall be used to determine the outlet VOC concentration required in 40 CFR 63.563(b)(4), (6), (7), and (8) for combustion devices except flare, carbon adsorbers, condenser/refrigeration units, and absorbers, respectively, and to monitor the VOC concentration as required in 40 CFR 63.564(e), (g), (h), and (i). The owner or operator shall use the procedures outlined in Method 25A or 25B. For the baseline VOC concentration, the arithmetic average of the outlet VOC concentration from three test runs from 40 CFR 63.565(d) shall be calculated for the control device. The VOC concentration shall be measured at least every 15 minutes. Compliance testing of VOC CEMS shall be performed using PS 8.

40 CFR 63.565(l) Emission estimation procedures.

For sources with emissions less than 10 or 25 tons and sources with emissions of 10 or 25 tons, the owner or operator shall calculate an annual estimate of HAP emissions, excluding commodities exempted by 40 CFR 63.560(d), from marine tank vessel loading operations. Emission estimates and emission factors shall be based on test data, or if test data is not available, shall be based on measurement or estimating techniques generally accepted in industry practice for operating conditions at the source.

40CFR 63.565(m) Alternate test procedures.

(1) Alternate test procedures to those described in this section may be used upon application to, and approval by, the Administrator.
(2) If the owner or operator intends to demonstrate compliance by using an alternative to any test method specified, the owner or operator shall refrain from conducting the performance test until the Administrator approves the use of the alternative method when the Administrator approves the site-specific test plan (if review of the site-specific test plan is requested) or until after the alternative method is approved (see 40 CFR 63.7(f) of subpart A of this part). If the Administrator does not approve the site-specific test plan (if review is requested) or the use of the alternative method within 30 days before the test is scheduled to begin, the performance test dates specified in 40 CFR 63.563(b)(1) shall be extended such that the owner or operator shall conduct the performance test within 60 calendar days after the Administrator approves the site-specific test plan or after use of the alternative method is approved. Notwithstanding the requirements in the preceding two sentences, the owner or operator may proceed to conduct the performance test as required in this section (without the Administrator's prior approval of the site-specific test plan) if he/she subsequently chooses to use the specified testing and monitoring methods instead of an alternative.

40 CFR 63.567(a)

The owner or operator of an affected source shall fulfill all reporting and recordkeeping requirements in 40 CFR 63.9 and 63.10 of subpart A of this part in accordance with the provisions for applicability of subpart A to this subpart in Table 1 of 40 CFR 63.560 and fulfill all reporting and recordkeeping requirements in this section. These reports will be made to the Administrator at the appropriate address identified in 40 CFR 63.13 of subpart A of this part.

- (1) Reports required by subpart A and this section may be sent by U.S. mail, facsimile (fax), or by another courier.
(i) Submittals sent by U.S. mail shall be postmarked on or before the specified date.
(ii) Submittals sent by other methods shall be received by the Administrator on or before the specified date.
(2) If acceptable to both the Administrator and the owner or operator of a source, reports may be submitted on electronic media.

40 CFR 63.567(e)

(1) Schedule for summary report and excess emissions and monitoring system performance reports.
Excess emissions and parameter monitoring exceedances are defined in 40 CFR 63.563(b). The owner or operator of a source subject to these emissions standards that is required to install a CMS shall submit an excess emissions and continuous monitoring system performance report and/or a summary report to the Administrator once each year, except, when the source experiences excess emissions, the source shall comply with a semi-annual reporting format until a request to reduce reporting frequency under 40 CFR 63.567(e)(2) is approved.

(2) Request to reduce frequency of excess emissions and continuous monitoring system performance reports.

An owner or operator who is required to submit excess emissions and continuous monitoring system performance and summary reports on a semi-annual basis may reduce the frequency of reporting to annual if the following conditions are met:

- (i) For 1 full year the source's excess emissions and continuous monitoring system performance reports continually demonstrate that the source is in compliance; and
(ii) The owner or operator continues to comply with all recordkeeping and monitoring requirements specified in this subpart and subpart A of this part.

(3) The frequency of reporting of excess emissions and continuous monitoring system performance and summary reports required may be reduced only after the owner or operator notifies the Administrator in writing of his or her intention to make such a change and the Administrator does not object to the intended change. In deciding whether to approve a reduced frequency of reporting, the Administrator may review information concerning the source's entire previous performance history during the 5-year recordkeeping prior to the intended change, including performance test results, monitoring data, and evaluations of an owner or operator's conformance with operation maintenance requirements. Such information may be used by the Administrator to make a judgement about the source's potential for noncompliance in the future. If the Administrator will notify the owner or operator in writing within 45 days after receiving notice of the owner or operator's intention. The notification from the Administrator to the owner or operator will specify the grounds on which the disapproval is based. In the absence of a notice of disapproval within 45 days, approval is automatically granted.

(4) Content and submittal dates for excess emissions and monitoring system performance reports.

All excess emissions and monitoring system performance reports and all summary reports, if required per 40 CFR 63.567(e)(5) and (6), shall be delivered or postmarked within 30 days following the end of each calendar year, or within 30 days following the end of each six month period, if appropriate. Written reports of excess emissions or exceedances of process or control system parameters shall include all information required in 40 CFR 63.10(c)(5) through (13) of subpart A of this part as applicable in Table 1 of 40 CFR 63.560 and information from any calibration tests in which the monitoring equipment is not in compliance with PS 8 or other methods

used for accuracy testing of temperature, pressure, or flow monitoring devices. The written report shall also include the name, title, and signature of the responsible official who is certifying the accuracy of the report. When no excess emissions or exceedances have occurred or monitoring equipment has not been inoperative, repaired, or adjusted, such information shall be stated in the report. This information will be kept for a minimum of 5 years and made readily available to the Administrator or delegated State authority upon request.

(5) If the total duration of excess emissions or control system parameter exceedances for the reporting period is less than 5 percent of the total operating time for the reporting period, and CMS downtime for the reporting period is less than 10 percent of the total operating time for the reporting period, only the summary report of 40 CFR 63.10(e)(3)(vi) of subpart A of this part shall be submitted, and the full excess emissions and continuous monitoring system performance report of 40 CFR 63.567(e)(4) need not be submitted unless required by the Administrator.

(6) If the total duration of excess emissions or process or control system parameter exceedances for the reporting period is 5 percent or greater of the total operating time for the reporting period, or the total CMS downtime for the reporting period is 10 percent or greater of the total operating time for the reporting period, both the summary report of 40 CFR 63.10(e)(3)(vi) of subpart A of this part and the excess emissions and continuous monitoring system performance report of 40 CFR 63.567 (e)(4) shall be submitted.

40 CFR 63.567(f) Vapor collection system of the terminal.

Each owner or operator of an affected source shall submit with the initial performance test and maintain in an accessible location on site an engineering report describing in detail the vent system, or vapor collection system, used to vent each vent stream to a control device. This report shall include all valves and vent pipes that could vent the stream to the atmosphere, thereby bypassing the control device, and identify which valves are car-sealed opened and which valves are car-sealed closed.

40 CFR 63.567(g)

If a vent system, or vapor collection system, containing valves that could divert the emission stream away from the control device is used, each owner or operator of an affected source shall keep for at least 5 years up-to-date, readily accessible continuous records of:

(1) All periods when flow bypassing the control device is indicated if flow indicators are installed under 40 CFR 63.563(a)(1) and 40 CFR 63.564(b), and

(2) All times when maintenance is performed on car-sealed valves, when the car-seal is broken, and when the valve position is changed (i.e., from open to closed for valves in the vent piping to the control device and from closed to open for valves that vent the stream directly or indirectly to the atmosphere bypassing the control device) if valves are monitored under 40 CFR 63.564(b).

40 CFR 63.567(h)

The owner or operator of an affected source shall keep the vapor-tightness documentation required under 40 CFR 63.563(a)(4) on file at the source in a permanent form available for inspection.

40 CFR 63.567(i) Vapor tightness test documentation for marine tank vessels.

The owner or operator of an affected source shall maintain a documentation file for each marine tank vessel loaded at that source to reflect current test results as determined by the appropriate method in 40 CFR 63.565(c)(1) and (2). Updates to this documentation file shall be made at least once per year. The owner or operator shall include, as a minimum, the following information in this documentation:

(1) Test title;

(2) Marine vessel owner and address;

(3) Marine vessel identification number;

(4) Loading time, according to 40 CFR 63.563(a)(4)(ii) or (iii), if appropriate;

(5) Testing location;

(6) Date of test;

(7) Tester name and signature;

(8) Test results from 40 CFR 63.565(c)(1) or (2), as appropriate;

(9) Documentation provided under 40 CFR 63.563(a)(4)(ii) and (iii)(B) showing that the repair of leaking components attributed to a failure of a vapor-tightness test is technically infeasible without dry-docking the vessel; and

(10) Documentation that a marine tank vessel failing a pressure test or leak test has been repaired.

40 CFR 63.567(j) Emission estimation reporting and recordkeeping procedures.

The owner or operator of each source complying with the emission limits specified in 40 CFR 63.562(b)(2), (3), and (4) shall comply with the following provisions:

- (1) Maintain records of all measurements, calculations, and other documentation used to identify commodities exempted under 40 CFR 63.560(d);
- (2) Keep readily accessible records of the emission estimation calculations performed in 40 CFR 63.565(l) for 5 years; and
- (3) Submit an annual report of the source's HAP control efficiency calculated using the procedures specified in 40 CFR 63.565(l), based on the source's actual throughput.
- (4) Owners or operators of marine tank vessel loading operations specified in 40 CFR 63.560(a)(3) shall retain records of the emissions estimates determined in 40 CFR 63.565(l) and records of their actual throughputs by commodity, for 5 years.

40 CFR 63.567(k) Leak detection and repair of vapor collection systems and control devices.

When each leak of the vapor collection system, or vapor collection system, and control device is detected and repaired as specified in 40 CFR 63.563(c) the following information required shall be maintained for 5 years:

- (1) Date of inspection;
- (2) Findings (location, nature, and severity of each leak);
- (3) Leak determination method;
- (4) Corrective action (date each leak repaired, reasons for repair interval); and
- (5) Inspector name and signature.

40 CFR 63.567(m)

The number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded shall be stated in a semiannual report. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with 40 CFR 63.562(e), including actions taken to correct a malfunction. The report, to be certified by the owner or operator or other responsible official, shall be submitted semiannually and delivered or postmarked by the 30th day following the end of each calendar half.

40 CFR 63.567(n)

(1) As of January 1, 2012 and within 60 days after the date of completing each performance test, as defined in 40 CFR 63.2, and as required in this subpart, you must submit performance test data, except opacity data, electronically to EPA's Central Data Exchange by using the ERT (see http://www.epa.gov/ttn/chief/ert/ert_tool.html/) or other compatible electronic spreadsheet. Only data collected using test methods compatible with ERT are subject to this requirement to be submitted electronically into EPA's WebFIRE database.

(2) All reports required by this subpart not subject to the requirements in 40 CFR 63.567(n)(1) must be sent to the Administrator at the appropriate address listed in 40 CFR 63.13. If acceptable to both the Administrator and the owner or operator of a source, these reports may be submitted on electronic media. The Administrator retains the right to require submittal of reports subject to 40 CFR 63.567(n)(1) in paper format.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Distillate Barge Loading	Emission unit name: Distillate Barge Loading	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Distillate Barge Loading			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: N/A	
Construction date: N/A	Installation date: N/A	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):			
Maximum Hourly Throughput: 9,000 bbl/hr (max, distillate only loading) 7,000 bbl/hr distillate & 13,600 bbl/hr gas (worst-case emissions scenario w/ gas at max rate)	Maximum Annual Throughput: 45.625 million bbl/yr Distillate	Maximum Operating Schedule: 8,760 hours/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	4.5 (distillate only)	11.5 (distillate only)
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	9.1E-04 (distillate only)	2.3E-03(distillate only)
Ethylbenzene	1.8E-03 (distillate only)	4.6E-03 (distillate only)
Hexane	4.5E-04 (distillate only)	1.10E-03 (distillate only)
Toluene	1.2E-02 (distillate only)	3.0E-02 (distillate only)
Trimethylpentane (2,2,4)	NA (distillate only)	NA (distillate only)
Xylene	3.1E-02 (distillate only)	7.9E-02 (distillate only)
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). For distillate loading, AP-42 Section 5.2 Transportation and Marketing of Petroleum Liquids (6/2008) – Table 5.2.6. Note: Emissions presented above are for distillate-only barge loading. Refer to the Gasoline Barge Loading Form E for worst-case combined loading emissions. Refer to Attachment I for detailed emission calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

There are no applicable requirements for loading fuels other than gasoline, such as distillate or kerosene. Refer to the Emission Unit Form for Gasoline Barge Loading for applicable requirements that apply when loading gasoline.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

N/A

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Distillate - Dockside Emissions	Emission unit name: Distillate - Dockside Emissions	List any control devices associated with this emission unit:

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Fugitive evaporative emissions resulting from opening ullage hatches for sampling and/or gauging before and after barge depressurization.

Manufacturer: N/A	Model number: N/A	Serial number: N/A
Construction date: MM/DD/YYYY 1948	Installation date: MM/DD/YYYY 1948	Modification date(s): MM/DD/YYYY N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

Maximum Hourly Throughput: 9,000 bbl/hr (distillate only) 7,000 bbl/hr distillate (worst-case emissions scenario when loading gasoline at max rate)	Maximum Annual Throughput: 45,625,000 bbl/yr (barge loading, distillate)	Maximum Operating Schedule: 8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ☐ Yes ☒ No	If yes, is it? ☐ Indirect Fired ☐ Direct Fired
Maximum design heat input and/or maximum horsepower rating: N/A	Type and Btu/hr rating of burners: N/A

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

N/A

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO _x)		
Lead (Pb)		
Particulate Matter (PM _{2.5})		
Particulate Matter (PM ₁₀)		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO ₂)		
Volatile Organic Compounds (VOC)	0.26 lb/barge	0.23
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
n-hexane	2.6E-05 lb/barge	2.3E-05
Toluene	6.8E-04 lb/barge	6.0E-04
Benzene	5.3E-05 lb/barge	4.6E-05
Ethylbenzene	1.1E-04 lb/barge	9.2E-05
Trimethylpentane (2,2,4)	-	-
Xylene	1.8E-03 lb/barge	1.6E-03
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Emissions occur from opening ullage hatches for inventory gauging and collection of quality control (PQ) samples. An emission factor is calculated for evaporation during sampling based on an estimated product displacement that occurs during sampling. It is conservatively assumed that every barge will need sampled upon arrival and before departure. Short-term emissions are presented as lb/barge values instead of lb/hr values. Refer to Attachment I for detailed emission calculations		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Section 4.1.3 of Permit R13-2277F

The dockside quality assurance/quality control (QA/QC) testing operations shall be in accordance with the following:

- a. Prior to any QA/QC testing (that involves opening deck ullage hatches) after barge loading or prior to barge unloading, the barge shall be depressurized to atmospheric pressure with the exhausted vapors being captured and sent via a closed vent system to the facility's vapor return unit (VRU);
- b. The QA/QC testing shall be performed in as short a time as practicable to mitigate the release of barge vapors through the ullage hatch not to exceed a maximum of 30 minutes per test;
- c. The maximum aggregate emissions from dockside QA/QC testing shall not exceed VOC emissions of 143.24 TPY and HAP emissions of 7.45 TPY;
- d. Compliance with the emission limitations given under 4.1.3(c) shall be based on compliance with the barge loading rate limitations under Table 4.1.3(d) [see attached table]
- e. The maximum constituent HAP percentages of the gasoline and distillate sampled and tested during dockside operations, as averaged over the seasonal periods given under Table 4.1.3(e), shall not exceed the limits under Table 4.1.3(e) [see attached table]



Permit Shield

Applicable Requirements

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Section 4.2.2 of Permit R13-2277F

Seasonal Loading Rates

For the purpose of determining compliance with the maximum seasonal loading rates set forth in section 4.1.3, the permittee shall monitor and record the seasonal loading rate in total barrels of each material as listed under Table 4.1.3(e). [see attached table]

Section 4.2.3 of Permit R13-2277F

Material Constituent Percentages

Compliance with the maximum material constituent percentage limits given under 4.1.3(e) shall be based on applicable MSDS, certified product data sheets, or on approved testing data. The final percentages shall be averaged over each seasonal period given under Table 4.1.3(e) and weighted as based on the volume of liquid used at each percentage.

Section 4.4.1 of Permit R13-2277F

Record of Monitoring. The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

Section 4.4.4 of Permit R13-2277F

The permittee shall, for each occurrence of excess emissions expected to last more than seven (7) days, within one (1) business day of becoming aware of such occurrence, supply the Director by letter (either electronically or by fax) with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions;
- d. The cause and expected duration of the excess emissions;
- e. The estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.3(d): Barge Loading/Unloading Rate Limitations

Time Period	Maximum Loading Rates (bbls)	
	Gasoline	Distillate
September	4,562,500	45,625,000
May-August	18,225,000	
April	4,562,500	
October-March	27,300,000	

Table 4.1.3(e): Material Constituent HAP Percentage Limits

HAP	Gasoline (%)	Distillate (%)
n-Hexane	1.60	0.01
Benzene	0.90	0.02
Cumene	0.01	0.01
Toluene	1.30	0.26
2,2,4-Trimethylpentane	0.80	-
Xylenes	0.50	0.69
Naphthalene	-	0.26
Ethylbenzene	0.10	0.04

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Gasoline - Dockside Emissions	Emission unit name: Gasoline - Dockside Emissions	List any control devices associated with this emission unit:

Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable)

Fugitive evaporative emissions resulting from opening ullage hatches for sampling and/or gauging before and after barge depressurization.

Manufacturer: N/A	Model number: N/A	Serial number: N/A

Construction date: MM/DD/YYYY 1948	Installation date: MM/DD/YYYY 1948	Modification date(s): MM/DD/YYYY N/A

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

Maximum Hourly Throughput: 13,600 bbl/hr (barge loading, gasoline)	Maximum Annual Throughput: 54,650,000 bbl/yr (barge loading, gasoline)	Maximum Operating Schedule: 8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ☐ Yes ☒ No	If yes, is it? ☐ Indirect Fired ☐ Direct Fired

Maximum design heat input and/or maximum horsepower rating: N/A	Type and Btu/hr rating of burners: N/A

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

N/A

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO _x)		
Lead (Pb)		
Particulate Matter (PM _{2.5})		
Particulate Matter (PM ₁₀)		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO ₂)		
Volatile Organic Compounds (VOC)	124.9 -170.3 lb/barge (gasoline only)	143.2 (total, gasoline+distillate)
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
n-hexane	2.72 lb/barge(gasoline only)	2.29 (total, gasoline+distillate)
Toluene	2.21 lb/barge (gasoline only)	1.86 (total, gasoline+distillate)
Benzene	1.53 lb/barge (gasoline only)	1.29 (total, gasoline+distillate)
Ethylbenzene	0.17 lb/barge (gasoline only)	0.14 (total, gasoline+distillate)
Trimethylpentane (2,2,4)	1.36 lb/barge (gasoline only)	1.14 (total, gasoline+distillate)
Xylene	0.85 lb/barge (gasoline only)	0.72 (total, gasoline+distillate)
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Emissions occur from opening ullage hatches for inventory gauging and collection of quality control (PQ) samples. An emission factor is calculated for evaporation during sampling based on an estimated product displacement that occurs during sampling. It is conservatively assumed that every barge will need sampled upon arrival and before departure. Short-term emissions are presented as lb/barge values instead of lb/hr values. Refer to Attachment I for detailed emission calculations		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Section 4.1.3 of Permit R13-2277F

The dockside quality assurance/quality control (QA/QC) testing operations shall be in accordance with the following:

- a. Prior to any QA/QC testing (that involves opening deck ullage hatches) after barge loading or prior to barge unloading, the barge shall be depressurized to atmospheric pressure with the exhausted vapors being captured and sent via a closed vent system to the facility's vapor return unit (VRU);
- b. The QA/QC testing shall be performed in as short a time as practicable to mitigate the release of barge vapors through the ullage hatch not to exceed a maximum of 30 minutes per test;
- c. The maximum aggregate emissions from dockside QA/QC testing shall not exceed VOC emissions of 143.24 TPY and HAP emissions of 7.45 TPY;
- d. Compliance with the emission limitations given under 4.1.3(c) shall be based on compliance with the barge loading rate limitations under Table 4.1.3(d). [see attached table].
- e. The maximum constituent HAP percentages of the gasoline and distillate sampled and tested during dockside operations, as averaged over the seasonal periods given under Table 4.1.3(e), shall not exceed the limits under Table 4.1.3(e). [see attached table].



Permit Shield

Applicable Requirements

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Seasonal Loading Rates

For the purpose of determining compliance with the maximum seasonal loading rates set forth in section 4.1.3, the permittee shall monitor and record the seasonal loading rate in total barrels of each material as listed under Table 4.1.3(e). [see attached table]

Section 4.2.3 of Permit R13-2277F

Material Constituent Percentages

Compliance with the maximum material constituent percentage limits given under 4.1.3(e) shall be based on applicable MSDS, certified product data sheets, or on approved testing data. The final percentages shall be averaged over each seasonal period given under Table 4.1.3(e) and weighted as based on the volume of liquid used at each percentage.

Section 4.4.1 of Permit R13-2277F

Record of Monitoring. The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

Section 4.4.4 of Permit R13-2277F

The permittee shall, for each occurrence of excess emissions expected to last more than seven (7) days, within one (1) business day of becoming aware of such occurrence, supply the Director by letter (either electronically or by fax) with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions;
- d. The cause and expected duration of the excess emissions;
- e. The estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.3(d): Barge Loading/Unloading Rate Limitations

Time Period	Maximum Loading Rates (bbls)	
	Gasoline	Distillate
September	4,562,500	45,625,000
May-August	18,225,000	
April	4,562,500	
October-March	27,300,000	

Table 4.1.3(e): Material Constituent HAP Percentage Limits

HAP	Gasoline (%)	Distillate (%)
n-Hexane	1.60	0.01
Benzene	0.90	0.02
Cumene	0.01	0.01
Toluene	1.30	0.26
2,2,4-Trimethylpentane	0.80	-
Xylenes	0.50	0.69
Naphthalene	-	0.26
Ethylbenzene	0.10	0.04

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Hot Oil Heater #1	Emission unit name: Tank 273 Hot Oil Heater	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) 2.499 MMBtu/hr natural gas-fired heater used to heat oil which maintains temperature of biodiesel storage tank (Tank 273)			
Manufacturer: HEATEC	Model number: HCS-175; H11-130	Serial number: N/A	
Construction date: 2011	Installation date: 2012	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 2.499 MMBtu/hr			
Maximum Hourly Throughput: 2.38E-03 MMscf/hr	Maximum Annual Throughput: 20.8 MMscf/yr	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☒ Yes ☐ No		If yes, is it? ☒ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 2.499 MMBtu/hr		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	SO2 emission factor of 0.6 lb/MMscf PER AP-42	N/A	1,020 Btu/scf

<i>Emissions Data</i>		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.21	0.90
Nitrogen Oxides (NO _x)	0.25	1.07
Lead (Pb)	1.23E-06	5.37E-06
Particulate Matter (PM _{2.5})	0.02	0.08
Particulate Matter (PM ₁₀)	0.02	0.08
Total Particulate Matter (TSP)	4.7E-03	0.02
Sulfur Dioxide (SO ₂)	0.0015	0.01
Volatile Organic Compounds (VOC)	0.01	0.06
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	5.1E-06	2.25E-05
Ethylbenzene	N/A	N/A
Hexane	4.4E-03	1.93E-02
Toluene	8.3E-06	3.65E-05
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	N/A	N/A
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). AP-42 Section 1.4, Tables 1.4-2 and 1.4-3. Refer to attachment I for detailed emission calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

MPLX determined that the hot oil heater was installed while the facility was considered a major source of HAP, and the heater complies with 40 CFR 63, Subpart DDDDD.

45CSR2-3.1

No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning equipment which is 20% opacity or greater based on six minute averages using 40 CFR Part 60, Appendix A, Method 9, and 45CSR16 or other equivalent EPA approved method as approved by the Secretary.

40 CFR 63.7510(g)

For new or reconstructed affected sources (as defined in 40 CFR 63.7490), you must demonstrate initial compliance with the applicable work practice standards in Table 3 to this subpart within the applicable 5-year schedule as specified in 40 CFR 63.7515 (d) following the initial compliance date specified in 40 CFR 63.7495(a). Thereafter, you are required to complete the applicable 5-year tune-up as specified in 40 CFR 63.7515(d).

40 CFR 63.7500(a) and (e) and Table 3, Item 1

Boilers and process heaters designed to burn gas 1 fuels with a heat input capacity of less than or equal to 5 million BTU per hour must complete a tune-up every 5 years as specified in 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or Tables 11 through 15 of 40 CFR 63, Subpart DDDDD, or the operating limits in Table 4 of 40 CFR 63, Subpart DDDDD.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

MPLX complies with smoke and PM emissions limitations by firing only gaseous fuel in this emissions unit.

45CSR2-3.2

Compliance with the visible emission requirements of 45CSR2-3.1 shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of 45CSR2-3.1. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.

40 CFR 63.7545(b)

If you startup your affected source before January 31, 2013, you must submit an Initial Notification not later than 120 days after January 31, 2013.

40 CFR 63.7545(f)

If you operate a unit designed to burn natural gas or other gas 1 fuels and you intend to burn a fuel other than gas 1 fuels during a period of natural gas curtailment or supply interruption, you must submit a notification of alternative fuel use within 48 hours of each period of natural gas curtailment or supply interruption as defined in 63.7575. The notification must include the information in 40 CFR 63.7547(f)(1)-(5).

40 CFR 63.7550(a) – Table 9

You must submit a compliance report every 5 years. The report must contain:
Information required in 40 CFR 63.7550(c)(1) through (5)

40 CFR 63.7540(a)(12)

If your boiler or process heater has a heat input capacity of less than or equal to 5 million Btu per hour and the unit is in the units designed to burn gas 1 subcategory, you must conduct a tune-up of the boiler or process heater every 5 years as specified in 40 CFR 63.7540(a)(10)(i) through (vi) to demonstrate continuous compliance. You may delay the burner inspection specified in 40 CFR 63.7540(a)(10)(i) until the next scheduled or unscheduled unit shutdown, but you must inspect each burner at least once every 72 months.

40 CFR 63.7515(d)

If you are required to meet an applicable tune-up work practice standard, you must conduct a 5-year performance tune-up according to 40 CFR 63.7540(a)(12). Each 5-year tune-up specified in 40 CFR 63.7540(a)(12) must be conducted no more than 61 months after the previous tune-up.

40 CFR 63.7540(a)(10)(i)-(vi)

(10) You must conduct the tune-up while burning the type of fuel (or fuels in case of units that routinely burn a mixture) that provided the majority of the heat input to the boiler or process heater over the 12 months prior to the tune-up.

(i) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may perform the burner inspection any time prior to the tune-up or delay the burner inspection until the next scheduled unit shutdown). At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;

(ii) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available;

(iii) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (you may delay the inspection until the next scheduled unit shutdown);

(iv) Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NOX requirement to which the unit is subject;

(v) Measure the concentrations in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer; and

(vi) Maintain on-site and submit, if requested by the Administrator, a report containing the information in 40 CFR 63.7540(a)(10)(vi) (A) through (C),

(A) The concentrations of CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater;

(B) A description of any corrective actions taken as a part of the tune-up; and

(C) The type and amount of fuel used over the 12 months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period.

40 CFR 63.7555(a)(1)

You must keep records of each notification and report that you submitted to comply, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that you submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv).

40 CFR 63.7560(a)-(c)

(a) Your records must be in a form suitable and readily available for expeditious review, according to 40 CFR 63.10(b)(1).

(b) As specified in 40 CFR 63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record on site, or they must be accessible from on site (for example, through a computer network), for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 CFR 63.10(b)(1). You can keep the records off site for the remaining 3 years.

40 CFR 63.7545(e)(1) and (8)

If you are not required to conduct an initial compliance demonstration as specified in 40 CFR 63.7530(a), the Notification of Compliance Status must only contain the information specified in 63.7545(e)(1) and (8) of this section and must be submitted within 60 days of the compliance date specified at 40 CFR 63.7495(b).

(1) A description of the affected unit(s) including identification of which subcategories the unit is in, the design heat input capacity of the unit, a description of the add-on controls used on the unit to comply with this subpart, description of the fuel(s) burned, including whether the fuel(s) were a secondary material determined by you or the EPA through a petition process to be a non-waste under 40 CFR 241.3, whether the fuel(s) were a secondary material processed from discarded non-hazardous secondary materials within the meaning of 40 CFR 241.3, and justification for the selection of fuel(s) burned during the compliance demonstration.

(8) In addition to the information required in 40 CFR 63.9(h)(2), your notification of compliance status must include the following certification(s) of compliance, as applicable, and signed by a responsible official:

(i) "This facility completed the required initial tune-up for all of the boilers and process heaters covered by 40 CFR part 63 subpart DDDDD at this site according to the procedures in 40 CFR 63.7540(a)(10)(i) through (vi)."

(ii) "This facility has had an energy assessment performed according to 40 CFR 63.7530(e)."

(iii) Except for units that burn only natural gas, refinery gas, or other gas 1 fuel, or units that qualify for a statutory exemption as provided in section 129(g)(1) of the Clean Air Act, include the following: "No secondary materials that are solid waste were combusted in any affected unit."

40 CFR 63.7550(b)(5)

For each affected source that is subject to permitting regulations pursuant to 40 CFR 70 or 71 and if the permitting authority has established dates for submitting semiannual reports pursuant to 70.6(a)(3)(iii)(A) or 71.6(a)(3)(iii)(A), you may submit the first and subsequent compliance reports according to the dates the permitting authority has established in the permit instead of according to the dates in 40 CFR 63.7550(b)(1) through (4).

40 CFR 63.7550(c)(1)

A compliance report must contain the following information depending on how the facility chooses to comply with the limits set in this rule.

(1) If the facility is subject to the requirements of a tune up you must submit a compliance report with the information in 40 CFR 63.7550 (c)(5)(i) through (iii), 40 CFR 63.7550(xiv) and (xvii), and 40 CFR 63.7550(c)(5)(iv) for limited-use boiler or process heater.

40 CFR 63.7550(c)(5)

(i) Company and Facility name and address.

(ii) Process unit information, emissions limitations, and operating parameter limitations.

(iii) Date of report and beginning and ending dates of the reporting period.

(iv) The total operating time during the reporting period.

(xiv) Include the date of the most recent tune-up for each unit subject to only the requirement to conduct an annual, biennial, or 5-year tune-up according to 40 CFR 63.7540(a)(10), (11), or (12) respectively. Include the date of the most recent burner inspection if it was not done annually, biennially, or on a 5-year period and was delayed until the next scheduled or unscheduled unit shutdown.

(xvii) Statement by a responsible official with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: LDAR	Emission unit name: LDAR	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Fugitive component equipment leaks (valves, connectors, pump seals, etc.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: N/A	Installation date: N/A	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): N/A			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: N/A	Maximum Operating Schedule: 8760 hr/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.46	2.01
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	2.09E-03	9.13E-03
Ethylbenzene	3.04E-04	1.33E-03
Hexane	3.66E-03	1.60E-02
Toluene	3.45E-03	1.51E-02
Trimethylpentane (2,2,4)	1.82E-03	7.97E-03
Xylene	2.46E-03	1.08E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Fugitive piping component emissions estimates are based on facility-wide fugitive component counts and factors from "EPA Protocol for Equipment Leak Emission Estimates," Table 2-3: Marketing Terminal Average Emission Factors (November 1995). There are no emission factors for components in heavy liquid service (i.e., distillate); therefore, light liquid emission factors are utilized for components in heavy liquid service. Fugitive emissions also result from disconnecting the truck and rail hoses after butane offloading is completed. Upon disconnect, a small quantity of VOC is emitted from each connector as a result of the residual butane in the hose. The amount of loss per disconnect event can be estimated using the number of hose connectors disconnected per event, and the amount of loss from each connector. The annual emissions estimate is based off the estimated number of transport trucks and rail cars required to offload the maximum amount of butane the site could process in a year and the average butane load per truck. The hourly emissions estimate assumes a maximum of one disconnect event per hour from both truck and rail offloading. Refer to Attachment I for detailed emission calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 CFR 63.420(h)

Each owner or operator of an affected source bulk gasoline terminal or pipeline breakout station is subject to the provisions of 40 CFR part 63, subpart A—
General Provisions, as indicated in Table 1.

40 CFR 63.420(k)

Each owner or operator of an affected source bulk gasoline terminal or pipeline breakout station must comply with the standards at all times. At all times, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the owner or operator to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether a source is operating in compliance with operation and maintenance requirements will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

40 CFR 63.424(a)

Each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to the provisions of this subpart shall implement a leak detection and repair program for all equipment in gasoline service according to the requirements in 40 CFR 63.424 (b) or (c), as applicable in 40 CFR 63.424(e) and minimize gasoline vapor losses according to 40 CFR 63.424(d).

40 CFR 63.424(b)(2)-(4)

Prior to May 8, 2027:

Each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to the provisions of this subpart shall perform a monthly leak inspection of all equipment in gasoline service. For this inspection, detection methods incorporating sight, sound, and smell are acceptable.

63.424(b)(2)

(2) When a leak is detected, an initial attempt at repair shall be made as soon as practicable, but no later than 5 calendar days after the leak is detected. Repair or replacement of leaking equipment shall be completed within 15 calendar days after detection of each leak, except as provided in 40 CFR 63.424(b)(3).

63.424(b)(3)

(3) Delay of repair of leaking equipment will be allowed upon a demonstration to the Administrator that repair within 15 days is not feasible. The owner or operator shall provide the reason(s) a delay is needed and the date by which each repair is expected to be completed.

63.424(b)(4)

(4) As an alternative to compliance with the provisions in 40 CFR 63.424(b)(1) through (3), owners or operators may implement an instrument leak monitoring program that has been demonstrated to the Administrator as at least equivalent.

40 CFR 63.424(c)

Beginning no later than May 8, 2027:

Comply with the requirements in 40 CFR 60.502a(j) except as provided in 40 CFR 63.424(c)(1) through (3)

63.424(c)(1)

(1) The frequency for optical gas imaging (OGI) monitoring shall be semiannually rather than quarterly as specified in 40 CFR 60.502a(j)(1)(i).

63.424(c)(2)

(2) The frequency for Method 21 monitoring of pumps and valves shall be semiannually rather than quarterly as specified in 40 CFR 60.502a(j)(1)(ii)(A) and (B).

63.424(c)(3)

(3) The frequency of monitoring of pressure relief devices shall be semiannually and within 5 calendar days after each pressure release rather than quarterly and within 5 calendar days after each pressure release as specified in 40 CFR 60.502a(j)(4)(i).

40 CFR 63.424(d)

Owners and operators shall not allow gasoline to be handled in a manner that would result in vapor releases to the atmosphere for extended periods of time. Measures to be taken include, but are not limited to, the following:

63.424(d)(1)

(1) Minimize gasoline spills;

63.424(d)(2)

(2) Clean up spills as expeditiously as practicable;

63.424(d)(3)

(3) Cover all open gasoline containers with a gasketed seal when not in use;

63.424(d)(4)

(4) Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices, such as oil/water separators.

40 CFR 63.424(e)(1)

For facilities that commenced construction on or before February 8, 1994, meet the requirements in paragraphs (b) and (d) of 40 CFR 63.424 no later than December 15, 1997. Beginning no later than May 8, 2027, paragraph (b) of 40 CFR 63.424 no longer applies and facilities shall meet the requirements in paragraphs (c) and (d) of 40 CFR 63.424 no later than May 8, 2027.

40 CFR 60.502a(1)(j) as referenced by 40 CFR 63.424(c)

Beginning no later than May 8, 2027

Each owner or operator of a collection of equipment at a bulk gasoline terminal affected facility shall perform leak inspection and repair of all equipment in gasoline service, which includes all equipment in the vapor collection system, the vapor processing system, and each loading rack and loading arm handling gasoline, according to the requirements in 40 CFR 60.502a(j)(1) through (8). The owner or operator must keep a list, summary description, or diagram(s) showing the location of all equipment in gasoline service at the facility.

60.502a(j)(1)

(1) Conduct leak detection monitoring of all pumps, valves, and connectors in gasoline service using either of the methods specified in 40 CFR 60.502a(j)(1)(i) or (ii).

60.502a(j)(1)(i)

(i) Use optical gas imaging (OGI) to semiannually (adjusted per 40 CFR 424(c)(1)) monitor all pumps, valves, and connectors in gasoline service as specified in 40 CFR 60.503a(e)(2).

60.502a(j)(1)(ii)

(ii) Use Method 21 of appendix A-7 to this part as specified in 40 CFR 60.503a(e)(1) and 40 CFR 60.502a(j)(1)(ii)(A) through (C).

40 CFR 60.502a(j)(1)(ii)(A)

(A) All pumps must be monitored to semiannually (adjusted per 40 CFR 424(c)(1)), unless the pump meets one of the requirements in 40 CFR 60.482-1a(d) or 40 CFR 60.482-2a(d) through (g). An instrument reading of 10,000 ppm or greater is a leak.

40 CFR 60.502a(j)(1)(ii)(B)

(B) All valves must be monitored to semiannually (adjusted per 40 CFR 424(c)(1)), unless the valve meets one of the requirements in 40 CFR 60.482-1a(d) or 40 CFR 60.482-7a(f) through (h). An instrument reading of 10,000 ppm or greater is a leak.

40 CFR 60.502a(j)(1)(ii)(C)

(C) All connectors must be monitored annually, unless the connector meets one of the requirements in 40 CFR 60.482-1a(d) or 40 CFR 60.482-11a(e) or (f). An instrument reading of 10,000 ppm or greater is a leak.

60.502a(j)(2)

(2) During normal duties, record leaks identified by audio, visual, or olfactory methods.

60.502a(j)(3)

(3) If evidence of a potential leak is found at any time by audio, visual, olfactory, or any other detection method for any equipment (as defined in 40 CFR 60.501a), a leak is detected.

60.502a(j)(4)

(4) For pressure relief devices, comply with the requirements in 40 CFR 60.502a(j)(4)(i) through (ii).

60.502a(j)(4)(i)

(i) Conduct instrument monitoring of each pressure relief device Semiannually and within 5 calendar days after each pressure releases (adjusted per 40 CFR 424(c)(3)) to detect leaks by the methods specified in 40 CFR 502a(j)(1), except as provided in 40 CFR 60.482-4a(c).

60.502a(j)(4)(ii)

(ii) If emissions are observed when using OGI, a leak is detected. If Method 21 is used, an instrument reading of 10,000 ppm or greater indicates a leak is detected.

60.502a(j)(5)

(5) For sampling connection systems, comply with the requirements in 40 CFR 60.482-5a.

60.502a(j)(6)

(6) For open-ended valves or lines, comply with the requirements in 40 CFR 60.482-6a.

60.502a(j)(7)

(7) When a leak is detected for any equipment, comply with the requirements of 40 CFR 60.502a(j)(7)(i) through (iii).

60.502a(j)(7)(i)

(i) A weatherproof and readily visible identification, marked with the equipment identification number, must be attached to the leaking equipment. The identification on equipment may be removed after it has been repaired.

60.502a(j)(7)(ii)

(ii) An initial attempt at repair shall be made as soon as practicable, but no later than 5 calendar days after the leak is detected. An initial attempt at repair is not required if the leak is detected using OGI and the equipment identified as leaking would require elevating the repair personnel more than 2 meters above a support surface.

60.502a(j)(7)(iii)

(iii) Repair or replacement of leaking equipment shall be completed within 15 calendar days after detection of each leak, except as provided in 40 CFR 60.502a(j)(8).

60.502a(j)(7)(iii)(A)

(A) For leaks identified pursuant to instrument monitoring required under 40 CFR 60.502a(j)(1), the leak is repaired when instrument re-monitoring of the equipment does not detect a leak.

60.502a(j)(7)(iii)(B)

(B) For leaks identified pursuant to 40 CFR 60.502a(j)(2), the leak is repaired when the leak can no longer be identified using audio, visual, or olfactory methods.

60.502a(j)(8)

(8) Delay of repair of leaking equipment will be allowed according to the provisions in 40 CFR 60.502a(j)(8)(i) through (iv). The owner or operator shall provide in the semiannual report specified in 40 CFR 60.505a(c), the reason(s) why the repair was delayed and the date each repair was completed.

60.502a(j)(8)(i)

(i) Delay of repair of equipment will be allowed for equipment that is isolated from the affected facility and that does not remain in gasoline service.

60.502a(j)(8)(ii)

(ii) Delay of repair for valves and connectors will be allowed if:

60.502a(j)(8)(ii)(A)

(A) The owner or operator demonstrates that emissions of purged material resulting from immediate repair are greater than the fugitive emissions likely to result from delay of repair, and

60.502a(j)(8)(ii)(B)

(B) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with 40 CFR 60.482-10a or the requirements in 40 CFR 60.502a(b) or (c), as applicable.

60.502a(j)(8)(iii)

(iii) Delay of repair will be allowed for a valve, but not later than 3 months after the leak was detected, if valve assembly replacement is necessary, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted.

60.502a(j)(8)(iv)

(iv) Delay of repair for pumps will be allowed if:

60.502a(j)(8)(iv)(A)

(A) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system; and

60.502a(j)(8)(iv)(B)

(B) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 63.424(b)(1)

Prior to May 8, 2027:

A log book shall be used and shall be signed by the owner or operator at the completion of each inspection. A section of the log shall contain a list, summary description, or diagram(s) showing the location of all equipment in gasoline service at the facility.

40 CFR 63.424(b)(2)

Prior to May 8, 2027:

Each detection of a liquid or vapor leak shall be recorded in the log book.

40 CFR 63.428(f)(1)

Prior to May 8, 2027:

Each owner or operator complying with the provisions of 40 CFR 63.424(b) shall record the following information in the log book for each leak that is detected:

63.428(f)(1)(i)(i)

The equipment type and identification number;

63.428(f)(1)(ii)(ii)

The nature of the leak (i.e., vapor or liquid) and the method of detection (i.e., sight, sound, or smell);

63.428(f)(1)(iii)(iii)

The date the leak was detected and the date of each attempt to repair the leak;

63.428(f)(1)(iv)(iv)

Repair methods applied in each attempt to repair the leak;

63.428(f)(1)(v)(v)

"Repair delayed" and the reason for the delay if the leak is not repaired within 15 calendar days after discovery of the leak;

63.428(f)(1)(vi)(vi)

The expected date of successful repair of the leak if the leak is not repaired within 15 days; and

63.428(f)(1)(vii)(vii)

The date of successful repair of the leak.

40 CFR 63.428(f)(2)

Beginning no later than May 8, 2027:

Each owner or operator complying with the provisions of 40 CFR 63.424(c) or 40 CFR 60.503a(a)(2) of this chapter shall keep records of the following information:

63.428(f)(2)(i)

(i) Types, identification numbers, and locations of all equipment in gasoline service.

63.428(f)(2)(ii)

(ii) For each leak inspection conducted under 40 CFR 63.424(c) or 40 CFR 60.503a(a)(2) of this chapter, keep the following records:

63.428(f)(2)(ii)(A)

(A) An indication if the leak inspection was conducted under 40 CFR 63.424(c) or 40 CFR 60.503a(a)(2) of this chapter.

63.428(f)(2)(ii)(B)

(B) Leak determination method used for the leak inspection.

63.428(f)(2)(iii)

(iii) For leak inspections conducted with Method 21 of appendix A-7 to part 60 of this chapter, keep the following additional records:

63.428(f)(2)(iii)(A)

(A) Date of inspection.

63.428(f)(2)(iii)(B)

(B) Inspector name.

63.428(f)(2)(iii)(C)

(C) Monitoring instrument identification.

63.428(f)(2)(iii)(D)

(D) Identification of all equipment surveyed and the instrument reading for each piece of equipment.

63.428(f)(2)(iii)(E)

(E) Date and time of instrument calibration and initials of operator performing the calibration.

63.428(f)(2)(iii)(F)

(F) Calibration gas cylinder identification, certification date, and certified concentration.

63.428(f)(2)(iii)(G)

(G) Instrument scale used.

63.428(f)(2)(iii)(H)

(H) Results of the daily calibration drift assessment.

63.428(f)(2)(iv)

(iv) For leak inspections conducted with OGI, keep the records specified in section 12 of appendix K to part 60 of this chapter.

63.428(f)(2)(v)

(v) For each leak that is detected during a leak inspection or by audio/visual/olfactory methods during normal duties, record the following information:

63.428(f)(2)(v)(A)

(A) The equipment type and identification number.

63.428(f)(2)(v)(B)

(B) The date the leak was detected, the name of the person who found the leak, nature of the leak (i.e., vapor or liquid) and the method of detection (i.e., audio/visual/olfactory, Method 21 of appendix A-7 to part 60 of this chapter, or OGI).

63.428(f)(2)(v)(C)

(C) The date of each attempt to repair the leak and the repair methods applied in each attempt to repair the leak.

63.428(f)(2)(v)(D)

(D) The date of successful repair of the leak, the method of monitoring used to confirm the repair, and if Method 21 of appendix A-7 to part 60 of this chapter is used to confirm the repair, the maximum instrument reading measured by Method 21 of appendix A-7 to part 60. If OGI is used to confirm the repair, keep video footage of the repair confirmation.

63.428(f)(2)(v)(E)

(E) For each repair delayed beyond 15 calendar days after discovery of the leak, record "Repair delayed", the reason for the delay, and the expected date of successful repair. The owner or operator (or designate) whose decision it was that repair could not be carried out in the 15-calendar day timeframe must sign the record.

63.428(f)(2)(v)(F)

(F) For each leak that is not repairable, the maximum instrument reading measured by Method 21 of appendix A-7 to part 60 of this chapter at the time the leak is determined to be not repairable, a video captured by the OGI camera showing that emissions are still visible, or a signed record that the leak is still detectable via audio/visual/olfactory methods.

40 CFR 63.428(g)

Each owner or operator of a bulk gasoline terminal or pipeline breakout station shall keep the following records for each deviation of an emissions limitation (including operating limit), work practice standard, or operation and maintenance requirement.

(1) Date, start time, and duration of each deviation.

(2) List of the affected sources or equipment for each deviation, an estimate of the quantity of each regulated pollutant emitted over any emission limit and a description of the method used to estimate the emissions.

(3) Actions taken to minimize emissions.

40 CFR 63.428(h)

Any records required to be maintained by this subpart that are submitted electronically via the U.S. Environmental Protection Agency (EPA) Compliance and Emissions Data Reporting Interface (CEDRI) may be maintained in electronic format. This ability to maintain electronic copies does not affect the requirement for facilities to make records, data, and reports available upon request to a delegated authority or the EPA as part of an on-site compliance evaluation.

40 CFR 63.428(i)

Records of each performance test or performance evaluation conducted and each notification and report submitted to the Administrator for at least 5 years.

40 CFR 63.428(j)

Prior to November 4, 2024, each owner or operator of an affected source under this subpart shall submit performance test reports to the Administrator according to the requirements in § 63.13. Beginning on November 4, 2024, within 60 days after the date of completing each performance test and each CEMS performance evaluation required by this subpart, you must submit the results of the performance test following the procedure specified in § 63.9(k). Data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) and performance evaluations of CEMS measuring RATA pollutants that are supported by the EPA's ERT as listed on the EPA's ERT website (<https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert>) at the time of the test or performance evaluation must be submitted in a file format generated using the EPA's ERT. Alternatively, you may submit an electronic file consistent with the extensible markup language (XML) schema listed on the EPA's ERT website. Data collected using test methods that are not supported by the EPA's ERT and performance evaluations of CEMS measuring RATA pollutants that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test must be included as an attachment in the ERT or alternate electronic file.

40 CFR 63.428(k)

The owner or operator must submit all Notification of Compliance Status reports in PDF format to the EPA following the procedure specified in 40 CFR 63.9(k), except any medium submitted through mail must be sent to the attention of the Gasoline Distribution Sector Lead.

40 CFR 63.428(l)

Prior to May 8, 2027:

63.428(l)(1)

Each owner or operator subject to the provisions of 40 CFR 63.424 shall report to the Administrator a description of the types, identification numbers, and locations of all equipment in gasoline service. For facilities electing to implement an instrument program under 40 CFR 63.424(b)(4), the report shall contain a full description of the program.

63.428(l)(1)(i)

(i) In the case of an existing source or a new source that has an initial startup date before December 14, 1994, the report shall be submitted with the notification of compliance status required under 40 CFR 63.9(h).

63.428(l)(1)(ii)

(ii) In the case of new sources that did not have an initial startup date before December 14, 1994, the report shall be submitted with the application for approval of construction, as described in 40 CFR 63.5(d)

63.428(l)(2)

(2) Each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to the provisions of this subpart shall include in a semiannual report to the Administrator the following information, as applicable:

(iii) The number of equipment leaks not repaired within 5 days after detection.

63.428(l)(3)

(3) Each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to the provisions of this subpart shall submit an excess emissions report to the Administrator in accordance with 40 CFR 63.10(e)(3), whether or not a CMS is installed at the facility. The following occurrences are excess emissions events under this subpart, and the following information shall be included in the excess emissions report, as applicable:

(iv) For each occurrence of an equipment leak for which no repair attempt was made within 5 days or for which repair was not completed within 15 days after detection:

(A) The date on which the leak was detected;

(B) The date of each attempt to repair the leak;

(C) The reasons for the delay of repair; and

(D) The date of successful repair.

40 CFR 63.428(m)(1)

On or after May 8, 2027:

(1) Report the following general facility information:

63.428(m)(1)(i)

(i) Facility name.

63.428(m)(1)(ii)

(ii) Facility physical address, including city, county, and State.

63.428(m)(1)(iii)

(iii) Latitude and longitude of facility's physical location. Coordinates must be in decimal degrees with at least five decimal places.

63.428(m)(1)(iv)

(iv) The following information for the contact person:

63.428(m)(1)(iv)(A)

(A) Name.

63.428(m)(1)(iv)(B)

(B) Mailing address.

63.428(m)(1)(iv)(C)

(C) Telephone number.

(D) Email address.

63.428(m)(1)(v)

(v) The type of facility (bulk gasoline terminal or pipeline breakout station).

63.428(m)(1)(vi)

(vi) Date of report and beginning and ending dates of the reporting period. You are no longer required to provide the date of report when the report is submitted via CEDRI.

63.428(m)(1)(vii)

(vii) Statement by a responsible official, with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report. If your report is submitted via CEDRI, the certifier's electronic signature during the submission process replaces the requirement in 40 CFR 63.428(m)(1)(vii). 63.428(m)(1)(iv)(D)

40 CFR 63.428(m)(6)

Report the following information for each leak inspection required and each leak identified under 40 CFR 63.424(c) and 40 CFR 60.503a(a)(2) of this chapter.

63.428(m)(6)(i)

(i) For each leak detected during a leak inspection required under 40 CFR 63.424(c) and 40 CFR 60.503a(a)(2) of this chapter, report:

63.428(m)(6)(i)(A)

(A) The date of inspection.

63.428(m)(6)(i)(B)

(B) The leak determination method (OGI or Method 21).

63.428(m)(6)(i)(C)

(C) The total number and type of equipment for which leaks were detected.

63.428(m)(6)(i)(D)

(D) The total number and type of equipment for which leaks were repaired within 15 calendar days.

63.428(m)(6)(i)(E)

(E) The total number and type of equipment for which no repair attempt was made within 5 calendar days of the leaks being identified.

63.428(m)(6)(i)(F)

(F) The total number and types of equipment that were placed on the delay of repair, as specified in 40 CFR 60.502a(j)(8) of this chapter.

63.428(m)(6)(ii)

(ii) For leaks identified under 40 CFR 63.424(c) by audio/visual/olfactory methods during normal duties report:

63.428(m)(6)(ii)(A)

(A) The total number and type of equipment for which leaks were identified.

63.428(m)(6)(ii)(B)

(B) The total number and type of equipment for which leaks were repaired within 15 calendar days.

63.428(m)(6)(ii)(C)

(C) The total number and type of equipment for which no repair attempt was made within 5 calendar days of the leaks being identified.

63.428(m)(6)(ii)(D)

(D) The total number and type of equipment placed on the delay of repair, as specified in 40 CFR 60.502a(j)(8) of this chapter.

63.428(m)(6)(iii)

(iii) The total number of leaks on the delay of repair list at the start of the reporting period.

63.428(m)(6)(iv)

(iv) The total number of leaks on the delay of repair list at the end of the reporting period.

63.428(m)(6)(v)

(v) For each leak that was on the delay of repair list at any time during the reporting period, report:

63.428(m)(6)(v)(A)

(A) Unique equipment identification number.

63.428(m)(6)(v)(B)

(B) Type of equipment.

63.428(m)(6)(v)(C)

(C) Leak determination method (OGI, Method 21, or audio/visual/olfactory).

63.428(m)(6)(v)(D)

(D) The reason(s) why the repair was not feasible within 15 calendar days.

63.428(m)(6)(v)(E)

(E) If applicable, the date repair was completed.

40 CFR 63.428(m)(8)

If there were no deviations from the emission limitations, operating parameters, or work practice standards, then provide a statement that there were no deviations from the emission limitations, operating parameters, or work practice standards during the reporting period.

40 CFR 63.428(n)

Each owner or operator of an affected source under this subpart shall submit semiannual compliance reports with the information specified in 40 CFR 63.428(l) or 63.428(m) to the Administrator according to the requirements in 40 CFR 63.13. Beginning on May 8, 2027, or once the report template for this subpart has been available on the CEDRI website (<https://www.epa.gov/electronic-reporting-air-emissions/cedri>) for one year, whichever date is later, you must submit all subsequent semiannual compliance reports using the appropriate electronic report template on the CEDRI website for this subpart and following the procedure specified in 40 CFR 63.9(k), except any medium submitted through mail must be sent to the attention of the Gasoline Distribution Sector Lead. The date report templates become available will be listed on the CEDRI website. Unless the Administrator or delegated State agency or other authority has approved a different schedule for submission of reports, the report must be submitted by the deadline, regardless of the method in which the report is submitted.

There are no applicable requirements for equipment in service other than gasoline (e.g., butane, distillate, etc.).

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Oily Sewer System	Emission unit name: Oily Sewer System	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) System of sumps, drains, junction boxes, etc. which diverts stormwater and process wastewater to Tank 256.			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: N/A	Installation date: N/A	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): N/A			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: N/A	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	5.54	24.3
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	0.04	0.18
Ethylbenzene	0.04	0.17
Hexane	0.20	0.88
Toluene	0.14	0.61
Trimethylpentane (2,2,4)	0.15	0.64
Xylene	0.15	0.66
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Emissions estimates based on EPA's Refinery Wastewater Emissions Tool (RWET) (5/2011) using available sample data for benzene in the wastewater exiting Tank 256 and applying the ratios provided in Table 7-9 of "Emission Estimation Protocol for Petroleum Refineries: Version 3" for HAPs present in gasoline or distillate. Refer to Attachment I for detailed emissions calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

N/A

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Roadways	Emission unit name: Roadways	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Paved facility roadways and parking areas			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: N/A	Installation date: N/A	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): N/A			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 14,657 VMT/yr	Maximum Operating Schedule: 8,760 hr/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	1.6E-03	0.01
Particulate Matter (PM ₁₀)	5.7E-03	0.02
Total Particulate Matter (TSP)	2.6E-02	0.12
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	N/A	N/A
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	N/A	N/A
Ethylbenzene	N/A	N/A
Hexane	N/A	N/A
Toluene	N/A	N/A
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	N/A	N/A
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Emissions estimated in accordance with assumptions regarding facility traffic patterns and the methods provided in AP-42 Section 13.2.1 (January 2011 and November 2006). Hourly emissions based on annual emissions divided by 8,760 hr/yr.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

The owner or operator of a plant shall maintain particulate matter control of the plant premises, and plant owned, leased or controlled access roads, by paving, application of asphalt, chemical dust suppressants or other suitable dust control measures. Good operating practices shall be implemented and when necessary particulate matter suppressants shall be applied in relation to stockpiling and general material handling to minimize particulate matter generation and atmospheric entrainment. [45CSR7-5.2]



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

MPLX has paved all employee parking areas and roads accessed by additive or other delivery trucks.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Cooling Tower	Emission unit name: Cooling Tower	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Cooling tower with 400 gpm recirculation rate			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: N/A	Installation date: N/A	Modification date(s):	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 400 gpm			
Maximum Hourly Throughput: 24,000 gph	Maximum Annual Throughput: 210,240,000 gal/yr	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	3.2E-03	0.01
Particulate Matter (PM ₁₀)	3.2E-03	0.01
Total Particulate Matter (TSP)	3.2E-03	0.01
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	N/A	N/A
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	N/A	N/A
Ethylbenzene	N/A	N/A
Hexane	N/A	N/A
Toluene	N/A	N/A
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	N/A	N/A
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). AP-42 Section 13.4.2 (1/1995). Refer to Attachment I for detailed emissions calculations.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No person shall cause, suffer, allow or permit any manufacturing process or storage structure generating fugitive particulate matter to operate that is not equipped with a system, which may include, but not be limited to, process equipment design, control equipment design or operation and maintenance procedures, to minimize the emissions of fugitive particulate matter. To minimize means such system shall be installed, maintained and operated to ensure the lowest fugitive particulate matter emissions reasonably achievable. [45CSR7-5.1]



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

MPLX utilizes a conductivity controller to automatically sample the cooling water line. If the controller receives a sample outside the operating range, it will conduct a blowdown, thus preventing total dissolved solids from accumulating in the cooling water and minimizing particulate emissions.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 256	Emission unit name: Tank 256	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) External floating roof storage tank containing wastewater with petroleum liquid waste (petroleum wastewater).			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1949	Installation date: 1949	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 2,280,600 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,436,400 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.38	1.7
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	3.40E-03	1.49E-02
Ethylbenzene	3.78E-04	1.66E-03
Hexane	6.05E-03	2.65E-02
Toluene	4.92E-03	2.15E-02
Trimethylpentane (2,2,4)	3.03E-03	1.33E-02
Xylene	1.89E-03	8.28E-03
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates assume a gasoline layer and account for seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

No owner or operator of a petroleum storage vessel with an external floating roof shall store petroleum liquid in that tank unless:

- a. The tank has been fitted with a continuous secondary seal extending from the floating roof to the tank wall (rim-mounted secondary seal); or a closure or other device that controls VOC emissions with an effectiveness equal to or greater than a continuous secondary (rim-mounted secondary) seal and is approved by the Director and the U.S. EPA; and
- b. All seal closure devices must meet the following requirements: there are no visible holes, tears, or other openings in the seal(s) or seal fabric; the seal(s) are intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall; For vapor-mounted primary seals, the accumulated area of gaps exceeding 0.32 centimeters (cm) (0.125 inches [in]) in width between the secondary seal and the tank wall shall not exceed 21.2 square centimeters per meter (cm²/m) (1.0 square inches per foot [in²/ft]) of tank diameter as determined by 45CSR 21-27.6; and
- c. All openings in the external floating roof, except for automatic bleeder vents, rim space vents, and leg sleeves, are: Equipped with covers, seals, or lids in the closed position except when the openings are in actual use; Equipped with projections into the tank that remain below the liquid surface at all times; and
- d. Automatic bleeder vents are closed at all times except when the roof is being floated off or being landed on the roof leg supports;
- e. Rim vents are set to open when the roof is being floated off the leg supports or at the manufacturer's recommended setting; and
- f. Emergency roof drains are provided with slotted membrane fabric covers or equivalent covers which cover at least 90 percent of the area of the opening.

[45CSR§21-27.3 (Tank 256—wastewater with offspec petroleum liquid layer)]



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Monitoring Requirements

The owner or operator of a petroleum liquid storage tank with an external floating roof shall perform routine inspections semiannually (the inspections shall include a visual inspection of the secondary seal gap); and measure the secondary seal gap annually when the floating roof is equipped with a vapor molded primary seal.

[45CSR§21-27.4 (Tank 256 – wastewater with offspec petroleum liquid layer)]

Compliance with inspection requirements shall be determined by physically measuring the length and width of all gaps around the entire circumference of the secondary seal in each place where a 0.32 cm (0.125 inch) uniform diameter probe passes freely (without forcing or binding against the seal) between the seal and tank wall; and summing the area of the individual gaps.

[45CSR§21-27.6 (Tank 256 – wastewater with offspec petroleum liquid layer)]

Recordkeeping Requirements

The owner or operator of any petroleum liquid storage tank with an external floating roof shall maintain the following records in a readily accessible location for at least three (3) years and shall make copies of the records available to the Director upon verbal or written request:

1. Records of the types of petroleum liquids stored;
2. Records of the maximum true vapor pressure of the liquid as stored; and
3. Records of the results of the inspections performed in accordance with 45CSR21-27.4.

[45CSR§21-27.5 (Tank 256 – wastewater with offspec petroleum liquid layer)]

Reporting Requirements

The owner or operator of any facility containing sources subject to 45CSR21-27 shall comply with excess emission reporting requirements in 45CSR 21-5.2.

[45CSR§21-27.7 (Tank 256 – wastewater with offspec petroleum liquid layer)]

The owner or operator shall, for each occurrence of excess emissions expected to last more than 7 days, within 1 business day of becoming aware of such occurrence, supply the Director by letter with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions; and

d. The cause and expected duration of the excess emissions.
e. For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
[45CSR§21-5.2. (Tank 256 – wastewater with offspec petroleum liquid layer)]

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 255	Emission unit name: Tank 255	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Vertical fixed cone roof storage tank containing distillate fuel (Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1948	Installation date: 1948	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 5,527,200 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,522,780,880 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.86	8.15
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	3.72E-04	1.63E-03
Ethylbenzene	7.44E-04	3.26E-03
Hexane	1.86E-04	8.15E-04
Toluene	4.84E-03	2.12E-02
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	1.28E-02	5.62E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on storage of the distillate material with the highest vapor pressure which is kerosene. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

N/A

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 261	Emission unit name: Tank 261	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Vertical fixed cone roof distillate storage tank (Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 1968	Installation date: 1968	Modification date(s): 1992	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 6,631,800 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,493,858,240 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.97	8.6
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	3.93E-04	1.72E-03
Ethylbenzene	7.86E-04	3.44E-03
Hexane	1.97E-04	8.61E-04
Toluene	5.11E-03	2.24E-02
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	1.36E-02	5.94E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on storage of the distillate material with the highest vapor pressure which is kerosene. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

N/A

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 262	Emission unit name: Tank 262	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Vertical fixed cone roof distillate storage tank (Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 1971	Installation date: 1971	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 6,631,800 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,495,438,520 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/AN
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.97	8.62
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	3.93E-04	1.72E-03
Ethylbenzene	7.87E-04	3.45E-03
Hexane	1.97E-04	8.62E-04
Toluene	5.11E-03	2.24E-02
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	1.36E-02	5.94E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on storage of the distillate material with the highest vapor pressure which is kerosene. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

N/A

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 273/1S	Emission unit name: Tank 273/1S	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Cone Roof Storage Tank (Fixed Roof) - Biodiesel / #2 Diesel			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 2011	Installation date: 2011	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 957,600 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 65,167,019 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	2.48	10.85
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	N/A	N/A
Ethylbenzene	N/A	N/A
Hexane	N/A	N/A
Toluene	N/A	N/A
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	N/A	N/A
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on biodiesel. The maximum throughput is determined from the R13 permit limit.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

The maximum emissions from the specified tanks shall not exceed the limitations as given in the Table 4.1.1. Tank Emissions Limitations. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.1. (Tanks 1S, 270, 271, and 272)]

The maximum annual throughput for Tanks 1S, 270, 271, and 272 shall not exceed the limitations as given in Table 4.1.2. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.2. (Tanks 1S, 270, 271, and 272)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed for Tanks 1S/273, 270, 271, and 272 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13 - Permit R13-2277F, Condition 4.1.7. (Tanks 1S, 270, 271, 272)]



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

For the purpose of determining compliance with the maximum throughput limits set forth in section 4.1.2 of R13-2277F, the permittee shall monitor and record the annual throughput of each tank listed.

[45CSR13 - Permit R13-2277F, Condition 4.2.1. (Tanks 1S, 270, 271, 272)]

Emission Limit Averaging Time.

Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

[45CSR13 - Permit R13-2277F, Condition 3.2.1.]

The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

[45CSR13 - Permit R13-2277F, Condition 4.4.1.]

The permittee shall, for each occurrence of excess emissions expected to last more than 7 days, within 1 business day of becoming aware of such occurrence, supply the Director by letter with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions;
- d. The cause and expected duration of the excess emissions;
- e. The estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

[45CSR13 - Permit R13-2277F, Condition 4.4.4]

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.1.:Tank Emission Limitations⁽¹⁾

Pollutant	Emission Limitations (TPY)				
	Tank 1S	Tank 270	Tank 271	Tank 272	Total
VOCs	10.85	4.72	4.72	4.72	25.01
Total HAPs	0.01	0.25	0.25	0.25	0.76

(1) Tank emissions based on emission factors using the methodology as given in AP-42, Chapter 7.1 (using TankESP® software) and the throughputs as limited under 4.1.2.

Table 4.1.2.: Tank Throughput Limitations

Emission Unit ID	Maximum Annual	
	barrels/year	gallons/year
Tank 1S⁽¹⁾	1,551,596	65,167,019
Tank 270⁽²⁾	36,500,000	1,533,000,017
Tank 271⁽²⁾	36,500,000	1,533,000,017
Tank 272⁽²⁾	36,500,000	1,533,000,017

(1) Only biodiesel or #2 diesel fuel shall be stored in Tank

(2) Only gasoline or distillate shall be stored in Tanks 270, 271, and 272.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 300	Emission unit name: Tank 300	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Additive Storage Tank & Unload Rack			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1999	Installation date: 1999	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 3,780 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 44,970 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	2.16E-04	9.47E-04
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	N/A	N/A
Ethylbenzene	3.07E-05	1.34E-04
Hexane	N/A	N/A
Toluene	N/A	N/A
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	9.16E-05	4.01E-04
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 63.2343(a)

For each storage tank subject to 40 CFR 63 Subpart EEEE having a capacity of less than 18.9 cubic meters (5,000 gallons) and for each transfer rack subject to 40 CFR 63 Subpart EEEE that only unloads organic liquids (i.e., no organic liquids are loaded at any of the transfer racks), you must keep documentation that verifies that each storage tank and transfer rack identified in 40 CFR 63.2343 (a) is not required to be controlled. The documentation must be kept up-to-date (i.e., all such emission sources at a facility are identified in the documentation regardless of when the documentation was last compiled) and must be in a form suitable and readily available for expeditious inspection and review according to 40 CFR 63.10(b)(1), including records stored in electronic form in a separate location. The documentation may consist of identification of the tanks and transfer racks identified in 40 CFR 63.2343(a) on a plant site plan or process and instrumentation diagram (P&ID).

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 301	Emission unit name: Tank 301	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Additive Storage Tank & Unload Rack			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: N/A	Installation date: 5/20/2005	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 8,020 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 76,884 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	2.4E-03	1.03E-02
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	N/A	N/A
Ethylbenzene	N/A	N/A
Hexane	N/A	N/A
Toluene	N/A	N/A
Trimethylpentane (2,2,4)	N/A	N/A
Xylene	3.7E-04	1.6E-03
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A



Permit Shield

Applicable Requirements

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 63.2343(b)(4)(i)

Beginning no later than the compliance dates specified in 40 CFR 63.2342(e), the requirements specified in paragraphs 63.2343(b)(1) through (3) apply to the storage tanks at an existing affected source subject to this subpart having a capacity of 18.9 cubic meters (5,000 gallons) or more that are not subject to control based on the criteria specified in 40 CFR 63 Subpart EEEE Table 2b , items 1 through 3.

40 CFR 63.2343(b)(1)-(3)

(1)

(i) You must submit the information in 40 CFR 63.2386(c)(1), (2), (3), and (10)(i) in either the Notification of Compliance Status, according to the schedule specified in Table 12 of 40 CFR Subpart EEEE, or in your first Compliance report, according to the schedule specified in 40 CFR 63.2386(b), whichever occurs first.

(ii)

(A) If you submit your first Compliance report before your Notification of Compliance Status, the Notification of Compliance Status must contain the information specified in 40 CFR 63.2386(d)(3) and (4) if any of the changes identified in 63.2343(d) have occurred since the filing of the first Compliance report. If none of the changes identified in 63.2343(d) have occurred since the filing of the first Compliance report, you do not need to report the information specified in 40 CFR 63.2386(c)(10)(i) when you submit your Notification of Compliance Status.

(B) If you submit your Notification of Compliance Status before your first Compliance report, your first Compliance report must contain the information specified in 40 CFR 63.2386(d)(3) and (4) if any of the changes specified in 63.2343(d) have occurred since the filing of the Notification of Compliance Status.

(iii) If you are already submitting a Notification of Compliance Status or a first Compliance report under 40 CFR 63.2386(c), you do not need to submit a separate Notification of Compliance Status or first Compliance report for each storage tank that meets the conditions identified in 63.2343(b) (i.e., a single Notification of Compliance Status or first Compliance report should be submitted).

(2)

(i) You must submit a subsequent Compliance report according to the schedule in 40 CFR 63.2386(b) whenever any of the events in 63.2343(d) occur, as applicable.

(ii) Your subsequent Compliance reports must contain the information in 40 CFR 63.2386(c)(1), (2), (3) and, as applicable, in 40 CFR 63.2386(d)(3) and (4). If you are already submitting a subsequent Compliance report under 40 CFR 63.2386(d), you do not need to submit a separate subsequent Compliance report for each storage tank that meets the conditions identified in 63.2343(b)(i.e., a single subsequent Compliance report should be submitted).

(3) For each storage tank that meets the conditions identified in 63.2343(b), you must keep documentation, including a record of the annual average true vapor pressure of the total Table 1 organic HAP in the stored organic liquid, that verifies the storage tank is not required to be controlled under this subpart. The documentation must be kept up-to-date and must be in a form suitable and readily available for expeditious inspection and review according to 40 CFR 63.10(b)(1), including records stored in electronic form in a separate location.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 253	Emission unit name: Tank 253	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1948	Installation date: 1948	Modification date(s): 1992	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 2,444,400 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,400,770,680 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.61	2.7
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	5.48E-03	2.40E-02
Ethylbenzene	6.09E-04	2.67E-03
Hexane	9.74E-03	4.27E-02
Toluene	7.92E-03	3.47E-02
Trimethylpentane (2,2,4)	4.87E-03	2.13E-02
Xylene	3.04E-03	1.33E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Please refer to Table E-2. Applicable Requirements for IFR Tanks.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

Please refer to Table E-2. Applicable Requirements for IFR Tanks.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 257	Emission unit name: Tank 257	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 1951	Installation date: 1951	Modification date(s): 1995	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 4,653,600 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,452,643,037 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.66	7.3
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	1.50E-02	6.56E-02
Ethylbenzene	1.66E-03	7.29E-03
Hexane	2.66E-02	1.17E-01
Toluene	2.16E-02	9.47E-02
Trimethylpentane (2,2,4)	1.33E-02	5.83E-02
Xylene	8.32E-03	3.64E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Please refer to Table E-2. Applicable Requirements for IFR Tanks.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

Please refer to Table E-2. Applicable Requirements for IFR Tanks.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 258	Emission unit name: Tank 258	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 1951	Installation date: 1951	Modification date(s): 1997	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 4,397,400 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,162,185,802 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.85	8.1
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	1.67E-02	7.30E-02
Ethylbenzene	1.85E-03	8.11E-03
Hexane	2.96E-02	1.30E-01
Toluene	2.41E-02	1.05E-01
Trimethylpentane (2,2,4)	1.48E-02	6.49E-02
Xylene	9.26E-03	4.06E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Please refer to Table E-2. Applicable Requirements for IFR Tanks.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

Please refer to Table E-2. Applicable Requirements for IFR Tanks.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 259	Emission unit name: Tank 259	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 1951	Installation date: 1951	Modification date(s): 2001	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 4,653,600 gallons (shell capacity from 2014 OIS)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,313,226,078 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.47	6.4
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	1.32E-02	5.79E-02
Ethylbenzene	1.47E-03	6.43E-03
Hexane	2.35E-02	1.03E-01
Toluene	1.91E-02	8.36E-02
Trimethylpentane (2,2,4)	1.18E-02	5.15E-02
Xylene	7.34E-03	3.22E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Please refer to Table E-2. Applicable Requirements for IFR Tanks.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

Please refer to Table E-2. Applicable Requirements for IFR Tanks.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 260	Emission unit name: Tank 260	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 1968	Installation date: 1968	Modification date(s): 2002	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 4,985,400 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 2,615,260,683 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.53	6.7
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	1.37E-02	6.02E-02
Ethylbenzene	1.53E-03	6.69E-03
Hexane	2.44E-02	1.07E-01
Toluene	1.98E-02	8.69E-02
Trimethylpentane (2,2,4)	1.22E-02	5.35E-02
Xylene	7.63E-03	3.34E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Please refer to Table E-2. Applicable Requirements for IFR Tanks.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

Please refer to Table E-2. Applicable Requirements for IFR Tanks.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 264	Emission unit name: Tank 264	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1990	Installation date: 1990	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 3,838,800 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,204,322,156 gallons	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.74	3.3
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	6.70E-03	2.93E-02
Ethylbenzene	7.44E-04	3.26E-03
Hexane	1.19E-02	5.22E-02
Toluene	9.67E-03	4.24E-02
Trimethylpentane (2,2,4)	5.95E-03	2.61E-02
Xylene	3.72E-03	1.63E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is assumed to be six (6) times the maximum throughput realized between 2019-2024. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Please refer to Table E-2. Applicable Requirements for IFR Tanks.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (*Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.*)

Please refer to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 265	Emission unit name: Tank 265	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1991	Installation date: 1991	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 1,377,600 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,134,000,000 gallons (R13-1352A)	Maximum Operating Schedule: 8,760	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.64	2.81
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	5.77E-03	2.53E-02
Ethylbenzene	6.41E-04	2.81E-03
Hexane	1.03E-02	4.49E-02
Toluene	8.33E-03	3.65E-02
Trimethylpentane (2,2,4)	5.13E-03	2.25E-02
Xylene	3.20E-03	1.40E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Emissions to the atmosphere of volatile organic compounds (VOC) from operations associated with the tanks in section 4.1.5 shall not exceed the rates provided in 4.1.5. [see attached table]

[45CSR13 – Permit No. R13-1352, Condition 4.1.5. (Tanks 265, 266, 267, & 268)]

Annual throughput of gasoline through each of the four (4) permitted tanks (265, 266, 267, 268) shall not exceed 1,134 x 10⁶ gallons per year. For the purposes of this permit, a calendar year is defined as any one of a series of twelve consecutive months. [45CSR13 – Permit No. R13-1352, Condition 4.1.6. (Tanks 265, 266, 267, & 268)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.11.; 45CSR13 – Permit No. R13-1352, Condition 4.1.8.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The permittee shall record the throughput of gasoline through the tank on a monthly and yearly basis. These records shall be maintained on site for a period of no less than five (5) years for inspection by the Director or a duly authorized representative of the Director.

[45CSR13 – Permit No. R13-1352, Condition 4.4.5.]

Annual emissions shall be calculated by the fifteenth day of the subsequent month utilizing the equations listed in Section 7 of AP-42. A twelve month running total of emissions will be maintained to verify compliance with the long term emission limitations. Each month a new twelve month total shall be calculated using the previous twelve months data. Compliance with the hourly emission limits shall be demonstrated by dividing the monthly calculated annual emissions by the number of hours in a year to obtain an hourly average. Records indicating the hourly and twelve month rolling total emissions shall be maintained for a period of no less than five (5) years.

[45CSR13 – Permit No. R13-1352, Condition 4.4.6.]

Record of Maintenance of Air Pollution Control Equipment. For all relevant pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 – Permit No. R13-1352, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment. For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- The equipment involved.
 - Steps taken to minimize emissions during the event.
 - The duration of the event.
 - The estimated increase in emissions during the event.
- For each such case associated with an equipment malfunction, the additional information shall also be recorded:
- The cause of the malfunction.
 - Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
[45CSR13 – Permit No. R13-1352, Condition 4.4.3. (Tanks 265, 266, 267, 268)]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.5 Emission Limits

Tank	lb_m/hr	lb_m/yr
265	0.64	5614
266	0.63	5457
267	0.63	5457
268	0.63	5457
269	0.62	5400

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 266	Emission unit name: Tank 266	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1993	Installation date: 1993	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 1,810,200 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,134,000,000 gallons (R13-1352A)	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.63	2.73
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	5.61E-03	2.46E-02
Ethylbenzene	6.23E-04	2.73E-03
Hexane	9.97E-03	4.37E-02
Toluene	8.10E-03	3.55E-02
Trimethylpentane (2,2,4)	4.98E-03	2.18E-02
Xylene	3.11E-03	1.36E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Emissions to the atmosphere of volatile organic compounds (VOC) from operations associated with the tanks in section 4.1.5 shall not exceed the rates provided in 4.1.5. [see attached table]

[45CSR13 – Permit No. R13-1352, Condition 4.1.5. (Tanks 265, 266, 267, & 268)]

Annual throughput of gasoline through each of the four (4) permitted tanks (265, 266, 267, 268) shall not exceed 1,134 x 10⁶ gallons per year. For the purposes of this permit, a calendar year is defined as any one of a series of twelve consecutive months. [45CSR13 – Permit No. R13-1352, Condition 4.1.6. (Tanks 265, 266, 267, & 268)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.11.; 45CSR13 – Permit No. R13-1352, Condition 4.1.8.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The permittee shall record the throughput of gasoline through associated tanks on a monthly and yearly basis. These records shall be maintained on site for a period of no less than five (5) years for inspection by the Director or a duly authorized representative of the Director.

[45CSR13 – Permit No. R13-1352, Condition 4.4.5.]

Annual emissions shall be calculated by the fifteenth day of the subsequent month utilizing the equations listed in Section 7 of AP-42. A twelve month running total of emissions will be maintained to verify compliance with the long term emission limitations. Each month a new twelve month total shall be calculated using the previous twelve months data. Compliance with the hourly emission limits shall be demonstrated by dividing the monthly calculated annual emissions by the number of hours in a year to obtain an hourly average. Records indicating the hourly and twelve month rolling total emissions shall be maintained for a period of no less than five (5) years.

[45CSR13 – Permit No. R13-1352, Condition 4.4.6.]

Record of Maintenance of Air Pollution Control Equipment. For all relevant pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 – Permit No. R13-1352, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment. For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- The equipment involved.
- Steps taken to minimize emissions during the event.
- The duration of the event.
- The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- The cause of the malfunction.
- Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
[45CSR13 – Permit No. R13-1352, Condition 4.4.3.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.5 Emission Limits

Tank	lb_m/hr	lb_m/yr
265	0.64	5614
266	0.63	5457
267	0.63	5457
268	0.63	5457
269	0.62	5400

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 267	Emission unit name: Tank 267	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1993	Installation date: 1993	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 1,797,600 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,134,000,000 gallons (R13-1352A)	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.63	2.73
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	5.61E-03	2.46E-02
Ethylbenzene	6.23E-04	2.73E-03
Hexane	9.97E-03	4.37E-02
Toluene	8.10E-03	3.55E-02
Trimethylpentane (2,2,4)	4.98E-03	2.18E-02
Xylene	3.11E-03	1.36E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Emissions to the atmosphere of volatile organic compounds (VOC) from operations associated with the tanks in section 4.1.5 shall not exceed the rates provided in 4.1.5. [see attached table]

[45CSR13 – Permit No. R13-1352, Condition 4.1.5. (Tanks 265, 266, 267, & 268)]

Annual throughput of gasoline through each of the four (4) permitted tanks (265, 266, 267, 268) shall not exceed 1,134 x 10⁶ gallons per year. For the purposes of this permit, a calendar year is defined as any one of a series of twelve consecutive months. [45CSR13 – Permit No. R13-1352, Condition 4.1.6. (Tanks 265, 266, 267, & 268)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.11.; 45CSR13 – Permit No. R13-1352, Condition 4.1.8.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The permittee shall record the throughput of gasoline through associated tanks on a monthly and yearly basis. These records shall be maintained on site for a period of no less than five (5) years for inspection by the Director or a duly authorized representative of the Director.

[45CSR13 – Permit No. R13-1352, Condition 4.4.5.]

Annual emissions shall be calculated by the fifteenth day of the subsequent month utilizing the equations listed in Section 7 of AP-42. A twelve month running total of emissions will be maintained to verify compliance with the long term emission limitations. Each month a new twelve month total shall be calculated using the previous twelve months data. Compliance with the hourly emission limits shall be demonstrated by dividing the monthly calculated annual emissions by the number of hours in a year to obtain an hourly average. Records indicating the hourly and twelve month rolling total emissions shall be maintained for a period of no less than five (5) years.

[45CSR13 – Permit No. R13-1352, Condition 4.4.6.]

Record of Maintenance of Air Pollution Control Equipment. For all relevant pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 – Permit No. R13-1352, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment. For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- The equipment involved.
- Steps taken to minimize emissions during the event.
- The duration of the event.
- The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- The cause of the malfunction.
- Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
[45CSR13 – Permit No. R13-1352, Condition 4.4.3.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.5 Emission Limits

Tank	lb_m/hr	lb_m/yr
265	0.64	5614
266	0.63	5457
267	0.63	5457
268	0.63	5457
269	0.62	5400

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 268	Emission unit name: Tank 268	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: N/A	Model number: N/A	Serial number: N/A	
Construction date: 1993	Installation date: 1993	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 1,793,400 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,134,000,000 gallons (R13-1352A)	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	0.63	2.73
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	5.61E-03	2.46E-02
Ethylbenzene	6.23E-04	2.73E-03
Hexane	9.97E-03	4.37E-02
Toluene	8.10E-03	3.55E-02
Trimethylpentane (2,2,4)	4.98E-03	2.18E-02
Xylene	3.11E-03	1.36E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Emissions to the atmosphere of volatile organic compounds (VOC) from operations associated with the tanks in section 4.1.5 shall not exceed the rates provided in 4.1.5. [see attached table]

45CSR13 – Permit No. R13-1352, Condition 4.1.5. (Tanks 265, 266, 267, & 268)]

Annual throughput of gasoline through each of the four (4) permitted tanks (265, 266, 267, 268) shall not exceed 1,134 x 10⁶ gallons per year. For the purposes of this permit, a calendar year is defined as any one of a series of twelve consecutive months. [45CSR13 – Permit No. R13-1352, Condition 4.1.6. (Tanks 265, 266, 267, & 268)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.11.; 45CSR13 – Permit No. R13-1352, Condition 4.1.8.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The permittee shall record the throughput of gasoline through associated tanks on a monthly and yearly basis. These records shall be maintained on site for a period of no less than five (5) years for inspection by the Director or a duly authorized representative of the Director.

[45CSR13 – Permit No. R13-1352, Condition 4.4.5.]

Annual emissions shall be calculated by the fifteenth day of the subsequent month utilizing the equations listed in Section 7.1.3.2 of AP-42. A twelve month running total of emissions will be maintained to verify compliance with the long term emission limitations. Each month a new twelve month total shall be calculated using the previous twelve months data. Compliance with the hourly emission limits shall be demonstrated by dividing the monthly calculated annual emissions by the number of hours in a year to obtain an hourly average. Records indicating the hourly and twelve month rolling total emissions shall be maintained for a period of no less than five (5) years.

[45CSR13 – Permit No. R13-1352, Condition 4.4.6.]

Record of Maintenance of Air Pollution Control Equipment. For all relevant pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 – Permit No. R13-1352, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment. For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event.
- c. The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
- f. Steps taken to correct the malfunction.
- g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
[45CSR13 – Permit No. R13-1352, Condition 4.4.3.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.5 Emission Limits

Tank	lb_m/hr	lb_m/yr
265	0.64	5614
266	0.63	5457
267	0.63	5457
268	0.63	5457
269	0.62	5400

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 270	Emission unit name: Tank 270	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 2001	Installation date: 2001	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 2,377,200 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,533,000,017 gallons (R13-2277F)	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.08	4.72
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	9.70E-03	4.25E-02
Ethylbenzene	1.08E-03	4.72E-03
Hexane	1.72E-02	7.55E-02
Toluene	1.40E-02	6.14E-02
Trimethylpentane (2,2,4)	8.62E-03	3.78E-02
Xylene	5.39E-03	2.36E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

The maximum emissions from the specified tanks shall not exceed the limitations as given in the Table 4.1.1. Tank Emissions Limitations. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.1. (Tanks 1S, 270, 271, and 272)]

The maximum annual throughput for Tanks 1S, 270, 271, and 272 shall not exceed the limitations as given in Table 4.1.2. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.2. (Tanks 1S, 270, 271, and 272)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed for Tanks 1S/273, 270, 271, and 272 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.10; 45CSR13 - Permit R13-2277F, Condition 4.1.7. (Tanks 1S, 270, 271, and 272)]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

For the purpose of determining compliance with the maximum throughput limits set forth in section 4.1.2 of R13-2277F, the permittee shall monitor and record the annual throughput of each tank.

[45CSR13 - Permit R13-2277F, Condition 4.2.1. (Tanks 1S, 270, 271, 272)]

Emission Limit Averaging Time.

Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

[45CSR13 - Permit R13-2277F, Condition 3.2.1.]

Record of Monitoring.

The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

[45CSR13 - Permit R13-2277F, Condition 4.4.1.]

Record of Maintenance of Air Pollution Control Equipment.

For all pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 - Permit R13-2277F, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment.

For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event.
- c. The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
- f. Steps taken to correct the malfunction.
- g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

[45CSR13 - Permit R13-2277F, Condition 4.4.3.]

The permittee shall, for each occurrence of excess emissions expected to last more than 7 days, within 1 business day of becoming aware of such occurrence, supply the Director by letter with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions;
- d. The cause and expected duration of the excess emissions;
- e. The estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

[45CSR13 - Permit R13-2277F, Condition 4.4.4.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.1.:Tank Emission Limitations⁽¹⁾

Pollutant	Emission Limitations (TPY)				
	Tank 1S	Tank 270	Tank 271	Tank 272	Total
VOCs	10.85	4.72	4.72	4.72	25.01
Total HAPs	0.01	0.25	0.25	0.25	0.76

(1) Tank emissions based on emission factors using the methodology as given in AP-42, Chapter 7.1 (using TankESP® software) and the throughputs as limited under 4.1.2.

Table 4.1.2.: Tank Throughput Limitations

Emission Unit ID	Maximum Annual	
	barrels/year	gallons/year
Tank 1S⁽¹⁾	1,551,596	65,167,019
Tank 270⁽²⁾	36,500,000	1,533,000,017
Tank 271⁽²⁾	36,500,000	1,533,000,017
Tank 272⁽²⁾	36,500,000	1,533,000,017

(1) Only biodiesel or #2 diesel fuel shall be stored in Tank

(2) Only gasoline or distillate shall be stored in Tanks 270, 271, and 272.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 271	Emission unit name: Tank 271	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 2001	Installation date: 2001	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 2,377,200 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,533,000,017 gallons (R13-2277F)	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.08	4.72
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	9.70E-03	4.25E-02
Ethylbenzene	1.08E-03	4.72E-03
Hexane	1.72E-02	7.55E-02
Toluene	1.40E-02	6.14E-02
Trimethylpentane (2,2,4)	8.62E-03	3.78E-02
Xylene	5.39E-03	2.36E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. The emissions from one RVP change roof landing is included in the routine annual emissions. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

The maximum emissions from the specified tanks shall not exceed the limitations as given in the Table 4.1.1. Tank Emissions Limitations. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.1. (Tanks 1S, 270, 271, and 272)]

The maximum annual throughput for Tanks 1S, 270, 271, and 272 shall not exceed the limitations as given in Table 4.1.2. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.2. (Tanks 1S, 270, 271, and 272)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed for Tanks 1S/273, 270, 271, and 272 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.10; 45CSR13 - Permit R13-2277F, Condition 4.1.7. (Tanks 1S, 270, 271, 272)]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

For the purpose of determining compliance with the maximum throughput limits set forth in section 4.1.2 of R13-2277F, the permittee shall monitor and record the annual throughput of each tank.

[45CSR13 - Permit R13-2277F, Condition 4.2.1. (Tanks 1S, 270, 271, 272)]

Emission Limit Averaging Time.

Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

[45CSR13 - Permit R13-2277F, Condition 3.2.1.]

Record of Monitoring.

The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

[45CSR13 - Permit R13-2277F, Condition 4.4.1.]

Record of Maintenance of Air Pollution Control Equipment.

For all pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 - Permit R13-2277F, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment.

For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event.
- c. The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
- f. Steps taken to correct the malfunction.
- g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

[45CSR13 - Permit R13-2277F, Condition 4.4.3.]

The permittee shall, for each occurrence of excess emissions expected to last more than 7 days, within 1 business day of becoming aware of such occurrence, supply the Director by letter with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions;
- d. The cause and expected duration of the excess emissions;
- e. The estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

[45CSR13 - Permit R13-2277F, Condition 4.4.4.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.1.:Tank Emission Limitations⁽¹⁾

Pollutant	Emission Limitations (TPY)				
	Tank 1S	Tank 270	Tank 271	Tank 272	Total
VOCs	10.85	4.72	4.72	4.72	25.01
Total HAPs	0.01	0.25	0.25	0.25	0.76

(1) Tank emissions based on emission factors using the methodology as given in AP-42, Chapter 7.1 (using TankESP® software) and the throughputs as limited under 4.1.2.

Table 4.1.2.: Tank Throughput Limitations

Emission Unit ID	Maximum Annual	
	barrels/year	gallons/year
Tank 1S⁽¹⁾	1,551,596	65,167,019
Tank 270⁽²⁾	36,500,000	1,533,000,017
Tank 271⁽²⁾	36,500,000	1,533,000,017
Tank 272⁽²⁾	36,500,000	1,533,000,017

(1) Only biodiesel or #2 diesel fuel shall be stored in Tank

(2) Only gasoline or distillate shall be stored in Tanks 270, 271, and 272.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: Tank 272	Emission unit name: Tank 272	List any control devices associated with this emission unit: N/A	
Provide a description of the emission unit (type, method of operation, design parameters, etc.; for engines, please indicate compression or spark ignition, lean or rich, four or two stroke, non-emergency or emergency, certified or not certified, as applicable) Internal floating roof storage tank containing gasoline / distillate (Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Products described as distillate may include fuel oil #2, kerosene, and jet A fuel.)			
Manufacturer: Marathon field constructed	Model number: Marathon field constructed	Serial number: Marathon field constructed	
Construction date: 2001	Installation date: 2001	Modification date(s): N/A	
Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp): 2,377,200 gallons (shell capacity from OIS 2014)			
Maximum Hourly Throughput: N/A	Maximum Annual Throughput: 1,533,000,017 gallons (R13-2277F)	Maximum Operating Schedule: 8,760 hours	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? ☐ Yes ☒ No		If yes, is it? ☐ Indirect Fired ☐ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: N/A		Type and Btu/hr rating of burners: N/A	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. N/A			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
N/A			

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	N/A	N/A
Nitrogen Oxides (NO _x)	N/A	N/A
Lead (Pb)	N/A	N/A
Particulate Matter (PM _{2.5})	N/A	N/A
Particulate Matter (PM ₁₀)	N/A	N/A
Total Particulate Matter (TSP)	N/A	N/A
Sulfur Dioxide (SO ₂)	N/A	N/A
Volatile Organic Compounds (VOC)	1.08	4.72
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Benzene	9.70E-03	4.25E-02
Ethylbenzene	1.08E-03	4.72E-03
Hexane	1.72E-02	7.55E-02
Toluene	1.40E-02	6.14E-02
Trimethylpentane (2,2,4)	8.62E-03	3.78E-02
Xylene	5.39E-03	2.36E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). Potential emissions presented above reflect the R13 permit limits, as applicable. TanksESP® storage tank calculation software version 5.3.1.19, which uses the 10/2024 version of EPA's AP-42 Chapter 7 equations. Emissions estimates are based on gasoline and account for the seasonal RVP variations. The maximum throughput is determined from the R13 permit limit. Hourly emissions are estimated by dividing the annual emissions by 8,760 hr/yr. Note that given the unique and infrequent nature of these emissions and the established historical precedent, cleaning and landing loss emissions were not included in the potential emissions for each individual tank. Cleaning and landing loss emissions are reflected in the facility-wide potential to emit in Attachment I.		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

The maximum emissions from the specified tanks shall not exceed the limitations as given in the Table 4.1.1. Tank Emissions Limitations. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.1. (Tanks 1S, 270, 271, and 272)]

The maximum annual throughput for Tanks 1S, 270, 271, and 272 shall not exceed the limitations as given in Table 4.1.2. [see attached table]

[45CSR13 - Permit R13-2277F, Condition 4.1.2. (Tanks 1S, 270, 271, and 272)]

Operation and Maintenance of Air Pollution Control Equipment.

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed for Tanks 1S/273, 270, 271, and 272 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR13-5.10; 45CSR13 - Permit R13-2277F, Condition 4.1.7. (Tanks 1S, 270, 271, 272)]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

For the purpose of determining compliance with the maximum throughput limits set forth in section 4.1.2 of R13-2277F, the permittee shall monitor and record the annual throughput of each tank.

[45CSR13 - Permit R13-2277F, Condition 4.2.1. (Tanks 1S, 270, 271, 272)]

Emission Limit Averaging Time.

Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

[45CSR13 - Permit R13-2277F, Condition 3.2.1.]

Record of Monitoring.

The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

[45CSR13 - Permit R13-2277F, Condition 4.4.1.]

Record of Maintenance of Air Pollution Control Equipment.

For all pollution control equipment, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

[45CSR13 - Permit R13-2277F, Condition 4.4.2.]

Record of Malfunctions of Air Pollution Control Equipment.

For all relevant air pollution control equipment, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event.
- c. The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
- f. Steps taken to correct the malfunction.
- g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

[45CSR13 - Permit R13-2277F, Condition 4.4.3.]

The permittee shall, for each occurrence of excess emissions expected to last more than 7 days, within 1 business day of becoming aware of such occurrence, supply the Director by letter with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions;
- d. The cause and expected duration of the excess emissions;
- e. The estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

[45CSR13 - Permit R13-2277F, Condition 4.4.4.]

Please refer also to Table E-2. Applicable Requirements for IFR Tanks

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Table 4.1.1.:Tank Emission Limitations⁽¹⁾

Pollutant	Emission Limitations (TPY)				
	Tank 1S	Tank 270	Tank 271	Tank 272	Total
VOCs	10.85	4.72	4.72	4.72	25.01
Total HAPs	0.01	0.25	0.25	0.25	0.76

(1) Tank emissions based on emission factors using the methodology as given in AP-42, Chapter 7.1 (using TankESP® software) and the throughputs as limited under 4.1.2.

Table 4.1.2.: Tank Throughput Limitations

Emission Unit ID	Maximum Annual	
	barrels/year	gallons/year
Tank 1S⁽¹⁾	1,551,596	65,167,019
Tank 270⁽²⁾	36,500,000	1,533,000,017
Tank 271⁽²⁾	36,500,000	1,533,000,017
Tank 272⁽²⁾	36,500,000	1,533,000,017

(1) Only biodiesel or #2 diesel fuel shall be stored in Tank

(2) Only gasoline or distillate shall be stored in Tanks 270, 271, and 272.

Table E-2. Applicable Requirements for EUs 253, 257, 258, 259, 260, 264, 265, 266, 267, 268, 270, 271, & 272

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 CFR 63.420(g)

Each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to Subpart R that is also subject to applicable provisions of 40 CFR 60, Subpart Kb, shall comply only with the provisions in each subpart that contain the most stringent control requirements for that facility.

40 CFR 63.420(k)

Each owner or operator of an affected source bulk gasoline terminal or pipeline breakout station must comply with the standards in this part at all times. At all times, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the owner or operator to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether a source is operating in compliance with operation and maintenance requirements will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

40 CFR 60.112b(a)(1)-(2)

The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m³ containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa but less than 76.6 kPa or with a design capacity greater than or equal to 75 m³ but less than 151 m³ containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa but less than 76.6 kPa, shall equip each storage vessel with one of the following:

a. A fixed roof in combination with an internal floating roof meeting the following specifications:

1. The internal floating roof shall rest or float on the liquid surface (but not necessarily in complete contact with it) inside a storage vessel that has a fixed roof. The internal floating roof shall be floating on the liquid surface at all times, except during initial fill and during those intervals when the storage vessel is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible.

2. Each internal floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof:

i. A foam- or liquid-filled seal mounted in contact with the liquid (liquid-mounted seal). A liquid mounted seal means a foam- or liquid-filled seal mounted in contact with the liquid between the wall of the storage vessel and the floating roof continuously around the circumference of the tank.

ii. Two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the storage vessel and the edge of the internal floating roof. The lower seal may be vapor-mounted, but both must be continuous.

iii. A mechanical shoe seal. A mechanical shoe seal is a metal sheet held vertically against the wall of the storage vessel by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

3. Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the liquid surface.

4. Each opening in the internal floating roof except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains is to be equipped with a cover or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. The cover or lid shall be equipped with a gasket. Covers on each access hatch and automatic gauge float well shall be bolted except when they are in use.

5. Automatic bleeder vents shall be equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports.

6. Rim space vents shall be equipped with a gasket and are to be set to open only when the internal floating roof is not floating or at the manufacturer's recommended setting.

7. Each penetration of the internal floating roof for the purpose of sampling shall be a sample well. The sample well shall have a slit fabric cover that covers at least 90 percent of the opening.

8. Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.

9. Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

b. An external floating roof, defined as a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof, which meets the following specifications:

1. Each external floating roof shall be equipped with a closure device between the wall of the storage vessel and the roof edge. The closure device is to consist of two seals, one above the other. The lower seal is referred to as the primary seal, and the upper seal is referred to as the secondary seal. The primary seal shall be either a mechanical shoe seal or a liquid-mounted seal. Except as provided in 40 CFR 60.113b(b)(4), the seal shall completely cover the annular space between the edge of the floating roof and tank wall. The secondary seal shall completely cover the annular space between the external floating roof and the wall of the storage vessel in a continuous fashion except as allowed in 40 CFR 60.113b(b)(4).

2. Except for automatic bleeder vents and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the liquid surface. Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof is to be equipped with a gasketed cover, seal, or lid that is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. Automatic bleeder vents are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. Rim vents are to be set to open when the roof is being floated off the roof legs supports or at the manufacturer's recommended setting. Automatic bleeder vents and rim space vents are to be gasketed. Each emergency roof drain is to be provided with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening.

3. The roof shall be floating on the liquid at all times (i.e., off the roof leg supports) except during initial fill until the roof is lifted off leg supports and when the tank is completely emptied and subsequently refilled. The process of filling, emptying, or refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

40 CFR 60.114b NSPS Kb - Alternative means of emission limitation.

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in emissions at least equivalent to the reduction in emissions achieved by any requirement in 40 CFR 60.112b, the Administrator will publish in the Federal Register a notice permitting the use of the alternative means for purposes of compliance with that requirement.

(b) Any notice under 40 CFR 60.114b(a) will be published only after notice and an opportunity for a hearing.

(c) Any person seeking permission under this section shall submit to the Administrator a written application including:

(1) An actual emissions test that uses a full-sized or scale-model storage vessel that accurately collects and measures all VOC emissions from a given control device and that accurately simulates wind and accounts for other emission variables such as temperature and barometric pressure.

(2) An engineering evaluation that the Administrator determines is an accurate method of determining equivalence.

(d) The Administrator may condition the permission on requirements that may be necessary to ensure operation and maintenance to achieve the same emissions reduction as specified in 40 CFR 60.112b.

45CSR21-28.3

No owner or operator of a petroleum liquid storage tank with a fixed roof shall store petroleum liquid in that tank unless:

a. The tank is equipped with an internal floating roof equipped with a closure seal or seals to close the space between the roof edge and tank wall; or an equally effective alternative control, approved by the Director and the U.S. EPA.

b. The tank is maintained such that there are no visible holes, tears, or other openings in the seal or any seal fabric or materials; and

c. All openings, except stub drains, are equipped with covers, lids, or seals such that the cover, lid, or seal is in the closed position at all times except when in actual use; automatic bleeder vents are closed at all times except when the roof is being floated off or being landed on the roof leg supports; and rim vents, if provided, are set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting.

40 CFR 63.423(a)

(a) Each owner or operator of a bulk gasoline terminal shall equip each gasoline storage vessel according to the requirements of (a) (1) or (2), as applicable in 40 CFR 423(c).

(1) Equip each gasoline storage vessel with a design capacity greater than or equal to 75 m³ according to the requirements in 40 CFR 60.112b(a)(1) through (4), except for the requirements in 40 CFR 60.112b(a)(1)(iv) through (ix) and (a)(1)(ii).

(2) Equip each external floating roof gasoline storage vessel with a design capacity greater than or equal to 75 m³ according to the requirements in 40 CFR 60.112b(a)(2)(ii) if such storage vessel does not currently meet the requirements in 40 CFR 63.423(a)(1).

40 CFR 63.423(b)

Additional requirements apply after May 8, 2027

(b) Each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to Subpart R shall equip each gasoline storage vessel according to the requirements in 40 CFR 63.423(b)(1) and, if a floating roof is used, either 63.423(b)(2) or (3), as applicable in 63.423(c).

(1) Equip, maintain, and operate each gasoline storage vessel with a design capacity greater than or equal to 75 m³ according to the requirements in 40 CFR 60.112b(a)(1) through (4), except for the requirements in 40 CFR 60.112b(a)(1)(iv) through (ix).

Alternatively, equip, maintain, and operate each affected gasoline storage vessel with a design capacity greater than or equal to 75 m³ according to the requirements in 40 CFR 63, Subpart WW as specified in 40 CFR 60.110b(e)(5).

(2) Equip, maintain, and operate each internal floating control system to maintain the vapor concentration within the storage vessel above the floating roof at or below 25 percent of the lower explosive limit (LEL) on a 5-minute rolling average basis without the use of purge gas. This standard may require additional controls beyond those specified in 63.423(b)(1). Compliance with 63.423(b)(2) shall be determined using the methods in 63.425(j). A deviation of the LEL level is considered an inspection failure under 40 CFR 60.113b(a)(2) or 63.1063(d)(2) and must be remedied as such. Any repairs made must be confirmed effective through re-monitoring of the LEL and meeting the level in 40 CFR 63.423(b)(2) within the timeframes specified in 40 CFR 60.113b(a)(2) or 40 CFR 63.1063(e), as applicable.

(3) Equip, maintain, and operate each gasoline external floating roof storage vessel with a design capacity greater than or equal to 75 m³ with fitting controls as specified in 40 CFR 60.112b(a)(2)(ii).

40 CFR 63.423(c)(2)

New compliance date for RTR requirements

(2) Beginning no later than May 8, 2027, 40 CFR 63.423(a) no longer applies and each gasoline storage vessel shall meet the requirements in 40 CFR 63.423(b)(1) and (2) no later than May 8, 2027. If applicable, the fitting controls required in 40 CFR 63.423(b)(3) must be installed the next time the storage vessel is completely emptied and degassed, or by May 8, 2034, whichever occurs first.



Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 60.116b(b)-(c) & 40 CFR 63.427(e)

The permittee shall keep readily accessible records showing the dimensions of the storage vessel and an analysis showing the capacity of the storage vessel for the life of the source. In addition, the permittee shall maintain a record of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period. These records shall be maintained for a period of no less than five (5) years.

40 CFR 60.113b

For all the inspections required by 40 CFR 60.113b(b)(6), the owner or operator shall notify the Administrator in writing at least 30 days prior to the filling or refilling of each storage vessel to afford the Administrator the opportunity to inspect the storage vessel prior to refilling.

If the inspection required by 40 CFR 60.113b(b)(6) is not planned and the owner or operator could not have known about the inspection 30 days in advance of refilling the tank, the owner or operator shall notify the Administrator at least 7 days prior to the refilling of the storage vessel. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification including the written documentation may be made in writing and sent by express mail so that it is received by the Administrator at least 7 days prior to the refilling.

45CSR21-28.4

The owner or operator of a petroleum liquid storage tank with a fixed roof shall perform routine, semi-annual, visual inspections of the internal floating roof and its closure seal or seals through roof hatches; and perform a complete inspection of cover and seal whenever the tank is emptied for non-operational reasons or at least every 5 years, whichever is more frequent.

45CSR21-28.5

The owner or operator of any petroleum liquid storage tank with a fixed roof or external floating roof shall maintain the following records in a readily accessible location for at least three (3) years and shall make copies of the records available to the Director upon verbal or written request:

1. Records of the types of petroleum liquids stored in that tank;
2. Records of the maximum true vapor pressure of the liquid as stored; and
3. Records of the results of the inspections performed in accordance 45CSR21-28.4.

45CSR21-28.6 & 21-5.2

The owner or operator of any facility containing sources subject to 45CSR21-28 shall comply with the requirements in 45CSR21-5.2.

The owner or operator shall, for each occurrence of excess emissions expected to last more than 7 days, within 1 business day of becoming aware of such occurrence, supply the Director by letter with the following information:

- a. The name and location of the facility;
- b. The subject sources that caused the excess emissions;
- c. The time and date of first observation of the excess emissions; and
- d. The cause and expected duration of the excess emissions.
- e. For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- f. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

40 CFR 63.425(d) & 40 CFR 60.113b

(d) The owner or operator of each storage vessel as specified in 40 CFR 60.112b(a) shall meet the requirements of this section. The applicable paragraph for a particular storage vessel depends on the control equipment installed to meet the requirements of 40 CFR 60.112b and 40 CFR 60.425(j), if applicable.

a.

1. Visually inspect the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the storage vessel with VOL. If there are holes, tears, or other openings in the primary seal, the secondary seal, or the seal fabric or defects in the internal floating roof, or both, the owner or operator shall repair the items before filling the storage vessel.
2. For vessels equipped with a liquid-mounted or mechanical shoe primary seal, visually inspect the internal floating roof and the primary seal or the secondary seal (if one is in service) through manholes and roof hatches on the fixed roof at least once every 12 months after initial fill. If the internal floating roof is not resting on the surface of the VOL inside the storage vessel, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric, the owner or operator shall repair the items or empty and remove the storage vessel from service within 45 days. If a failure that is detected during inspections required in this paragraph cannot be repaired within 45 days and if the vessel cannot be emptied within 45 days, a 30-day extension may be requested from the Administrator in the inspection report required 40 CFR 60.115b(a)(3). Such a request for an extension must document that alternate storage capacity is unavailable and specify a schedule of actions the company will take that will assure that the control equipment will be repaired or the vessel will be emptied as soon as possible.
3. For vessels equipped with a double-seal system as specified in 40 CFR 60.112b(a)(1)(ii)(B):
 - i. Visually inspect the vessel as specified in 40 CFR 60.113b(a)(4) at least every 5 years; or
 - ii. Visually inspect the vessel as specified in 40 CFR 60.113b(a)(2).

4. Visually inspect the internal floating roof, the primary seal, the secondary seal (if one is in service), gaskets, slotted membranes and sleeve seals (if any) each time the storage vessel is emptied and degassed. If the internal floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal or the seal fabric, or the gaskets no longer close off the liquid surfaces from the atmosphere, or the slotted membrane has more than 10 percent open area, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before refilling the storage vessel with VOL. In no event shall inspections conducted in accordance with this provision occur at intervals greater than 10 years in the case of vessels conducting the annual visual inspection as specified in 60.113b(a)(2) and (a)(3)(ii) and at intervals no greater than 5 years in the case of vessels specified in 60.113b(a)(3)(i).

b. After installing the control equipment required to meet 60.112b(a)(2) (external floating roof), the owner or operator shall:

1. Determine the gap areas and maximum gap widths, between the primary seal and the wall of the storage vessel and between the secondary seal and the wall of the storage vessel according to the following frequency.

i. Measurements of gaps between the tank wall and the primary seal (seal gaps) shall be performed during the hydrostatic testing of the vessel or within 60 days of the initial fill with VOL and at least once every 5 years thereafter.

ii. Measurements of gaps between the tank wall and the secondary seal shall be performed within 60 days of the initial fill with VOL and at least once per year thereafter.

iii. If any source ceases to store VOL for a period of 1 year or more, subsequent introduction of VOL into the vessel shall be considered an initial fill for the purposes of 40 CFR 60.113b(b)(1)(i) and b(1)(ii) above.

2. Determine gap widths and areas in the primary and secondary seals individually by the following procedures:

i. Measure seal gaps, if any, at one or more floating roof levels when the roof is floating off the roof leg supports.

ii. Measure seal gaps around the entire circumference of the tank in each place where a 0.32-cm diameter uniform probe passes freely (without forcing or binding against seal) between the seal and the wall of the storage vessel and measure the circumferential distance of each such location.

iii. The total surface area of each gap described in 40 CFR 60.113b(b)(2)(ii) shall be determined by using probes of various widths to measure accurately the actual distance from the tank wall to the seal and multiplying each such width by its respective circumferential distance.

3. Add the gap surface area of each gap location for the primary seal and the secondary seal individually and divide the sum for each seal by the nominal diameter of the tank and compare each ratio to the respective standards in 40 CFR 60.113b(b)(4).

4. Make necessary repairs or empty the storage vessel within 45 days of identification in any inspection for seals not meeting the requirements listed in 40 CFR 60.113b(b)(4)(i) and (ii):

i. The accumulated area of gaps between the tank wall and the mechanical shoe or liquid-mounted primary seal shall not exceed 212 cm² per meter of tank diameter, and the width of any portion of any gap shall not exceed 3.81 cm. One end of the mechanical shoe is to extend into the stored liquid, and the other end is to extend a minimum vertical distance of 61 cm above the stored liquid surface. There are to be no holes, tears, or other openings in the shoe, seal fabric, or seal envelope.

ii. The secondary seal is to be installed above the primary seal so that it completely covers the space between the roof edge and the tank wall except as provided in 40 CFR 60.113b(b)(2)(iii). The accumulated area of gaps between the tank wall and the secondary seal shall not exceed 21.2 cm² per meter of tank diameter, and the width of any portion of any gap shall not exceed 1.27 cm. There are to be no holes, tears, or other openings in the secondary seal or seal fabric.

iii. If a failure that is detected during inspections required in 40 CFR 60.113b(b)(1) cannot be repaired within 45 days and if the vessel cannot be emptied within 45 days, a 30-day extension may be requested from the Administrator in the inspection report required in 60.115b(b)(4). Such extension request must include a demonstration of unavailability of alternate storage capacity and a specification of a schedule that will assure that the control equipment will be repaired or the vessel will be emptied as soon as possible.

5. Notify the Administrator 30 days in advance of any gap measurements required by 40 CFR 60.113b(b)(1) to afford the Administrator the opportunity to have an observer present.

6. Visually inspect the external floating roof, the primary seal, secondary seal, and fittings each time the vessel is emptied and degassed.

i. If the external floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal or the seal fabric, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before filling or refilling the storage vessel with VOL.

40 CFR 63.425(j) - Additional requirements after May 8, 2027

LEL monitoring procedures. Compliance with the vapor concentration below the LEL level for internal floating roof storage vessels at 63.423(b)(2) shall be determined based on the procedures specified in (j)(1) through (5) of 40 CFR 63.425(j). If tubing is necessary to obtain the measurements, the tubing must be non-crimping and made of Teflon or other inert material.

(1) LEL monitoring must be conducted at least once every 12 months and at other times upon request by the Administrator. If the measurement cannot be performed due to wind speeds exceeding those specified in 40 CFR 63.425(j)(3)(iii), the measurement must be performed within 30 days of the previous attempt.

(2) The calibration of the LEL meter must be checked per manufacturer specifications immediately before and after the measurements as specified in 40 CFR 63.425(j)(2)(i) and (ii). If tubing will be used for the measurements, the tubing must be attached during calibration so that the calibration gas travels through the entire measurement system.

(i) Conduct the span check using a calibration gas recommended by the LEL meter manufacturer. The calibration gas must contain a single hydrocarbon at a concentration corresponding to 50 percent of the LEL (e.g., 2.50 percent by volume when using methane as the calibration gas). The vendor must provide a Certificate of Analysis for the gas, and the certified concentration must be within ± 2 percent (e.g., 2.45 percent—2.55 percent by volume when using methane as the calibration gas). The LEL span response must be between 49 percent and 51 percent. If the span check prior to the measurements does not meet this requirement, the LEL meter must be recalibrated or replaced. If the span check after the measurements does not meet this requirement, the LEL meter must be recalibrated or replaced, and the measurements must be repeated.

(ii) Check the instrumental offset response using a certified compressed gas cylinder of zero air or an ambient environment that is free of organic compounds. The pre-measurement instrumental offset response must be 0 percent LEL. If the LEL meter does not meet this requirement, the LEL meter must be recalibrated or replaced.

(3) Conduct the measurements as specified in 40 CFR 63.425(j)(3)(i) through (iv).

(i) Measurements of the vapors within the internal floating roof storage vessel must be collected no more than 3 feet above the internal floating roof.

(ii) Measurements shall be taken for a minimum of 20 minutes, logging the measurements at least once every 15 seconds, or until one 5-minute average as determined according to 40 CFR 63.425(j)(5)(ii) exceeds the level specified in 63.423(b)(2).

(iii) Measurements shall be taken when the wind speed at the top of the tank is 5 mph or less to the extent practicable, but in no case shall measurements be taken when the sustained wind speed at top of tank is greater than the annual average wind speed at the site or 15 mph, whichever is less.

(iv) Measurements should be conducted when the internal floating roof is floating with limited product movement (limited filling or emptying of the tank).

(4) To determine the actual vapor concentration within the storage vessel, the percent of the LEL "as the calibration gas" must be corrected according to one of the following procedures. Alternatively, if the LEL meter used has correction factors that can be selected from the meter's program, you may enable this feature to automatically apply one of the correction factors specified in 40 CFR 63.425(j)(4)(i) and (ii).

(i) Multiply the measurement by the published gasoline vapor correction factor for the specific LEL meter and calibration gas used.

(ii) If there is no published correction factor for gasoline vapors for the specific LEL meter used, multiply the measurement by the published correction factor for butane as a surrogate for determining the LEL of gasoline vapors. The correction factor must correspond to the calibration gas used.

(5) Use the calculation procedures in 40 CFR 63.425(j)(5)(i) through (iii) to determine compliance with the LEL level.

(i) For each minute while measurements are being taken, determine the one-minute average reading as the arithmetic average of the corrected individual measurements (taken at least once every 15 seconds) during the minute.

(ii) Starting with the end of the fifth minute of data, calculate a five-minute rolling average as the arithmetic average of the previous five one-minute readings determined under 40 CFR 63.425(j)(5)(i). Determine a new five-minute average reading for every subsequent one-minute reading.

(iii) Each five-minute rolling average must meet the LEL level specified in 40 CFR 63.423(b)(2).

40 CFR 60.116b(d)

The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m³ storing a liquid with a maximum true vapor pressure that is normally less than 5.2 kPa or with a design capacity greater than or equal to 75 m³ but less than 151 m³ storing a liquid with a maximum true vapor pressure that is normally less than 27.6 kPa shall notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds the respective maximum true vapor pressure values for each volume range. Beginning October 15, 2024, all subsequent notifications must be submitted in PDF format following the procedures specified in 40 CFR 60.115b(e).

40 CFR 60.115b(e)-(g)

e) An owner or operator required to submit notifications or reports following the procedures specified in this paragraph (e) must submit notifications or reports to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), which can be accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov/>). The EPA will make all the information submitted through CEDRI available to the public without further notice to the owner or operator. Do not use CEDRI to submit information the owner or operator claims as CBI.

f) Owners and operators may assert a claim of EPA system outage for failure to timely comply with the electronic submittal requirement. To assert a claim of EPA system outage, owners and operators must meet the requirements outlined in 40 CFR 60.115b(f)(1) through (7).

g) Owners and operators may assert a claim of force majeure for failure to timely comply with the electronic submittal requirement. To assert a claim of force majeure, you must meet the requirements outlined in 40 CFR 60.115b(g)(1) through (5).

40 CFR 60.115b & 40 CFR 63.428(e)

The owner or operator of each storage vessel as specified in 40 CFR 60.112b(a) shall keep records and furnish reports as required by this section depending upon the control equipment installed to meet the requirements of 40 CFR 60.112b. The owner or operator shall keep copies of all reports and records required by this section for at least 5 years.

a. After installing control equipment in accordance with 40 CFR 60.112b(a)(1), the owner or operator shall meet the following requirements.

1. Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of 40 CFR 60.112b(a)(1) and 60.113b(a)(1). This report shall be an attachment to the notification required by 40 CFR 60.7(a)(3).

2. Keep a record of each inspection performed as required by 40 CFR 60.113b(a)(1)-(a)(4). Each record shall identify the storage vessel on which the inspection was performed and shall contain the date the vessel was inspected and the observed condition of each component of the control equipment (seals, internal floating roof, and fittings).

3. If any of the conditions described in 40 CFR 60.113b(a)(2) are detected during the inspection required by 40 CFR 60.113b(a)(2), a report shall be furnished to the Administrator within 30 days of the inspection. Each report shall identify the storage vessel, the nature of the defects, and the date the storage vessel was emptied or the nature of and date the repair was made. Beginning October 15, 2024, all subsequent reports must be submitted in PDF format following the procedures in 40 CFR 60.115b(e).

4. After each inspection required by 40 CFR 60.113b(a)(3) that finds holes or tears in the seal or seal fabric, or defects in the internal floating roof, or other control equipment defects listed in 40 CFR 60.113b(a)(3)(ii), a report shall be furnished to the Administrator within 30 days of the inspection. The report shall identify the storage vessel and the reason it did not meet the specifications of 40 CFR 60.112b(a)(1) or 60.113b(a)(3) and list each repair made. Beginning October 15, 2024, all subsequent reports must be submitted in PDF format following the procedures in 40 CFR 60.115b(e).

b. After installing control equipment in accordance with 40 CFR 60.112b(a)(2) (external floating roof), the owner or operator shall meet the following requirements.

1. Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of 40 CFR 60.112b(a)(2) and 60.113b(b)(2)-(4). This report shall be an attachment to the notification required by 40 CFR 60.7(a)(3).

2. Within 60 days of performing the seal gap measurements required by 40 CFR 60.113b(b)(1), furnish the Administrator with a report that contains the date of measurement, the raw data obtained in the measurement, and the calculations described in 40 CFR 60.113b(b)(2)-(3). Beginning October 15, 2024, all subsequent reports must be submitted in PDF format following the procedures in 40 CFR 60.115b(e).

3. Keep a record of each gap measurement performed as required by 40 CFR 60.113b(b). Each record shall identify the storage vessel in which the measurement was performed and shall contain the date of measurement, the raw data obtained in the measurement, and the calculations described in 40 CFR 60.113b(b)(2)-(3).

4. After each seal gap measurement that detects gaps exceeding the limitations specified by 40 CFR 60.113b(b)(4), submit a report to the Administrator within 30 days of the inspection. The report will identify the vessel and contain the information specified in 40 CFR 60.115b(b)(2) and the date the vessel was emptied or the repairs made and date of repair. Beginning October 15, 2024, all subsequent reports must be submitted in PDF format following the procedures in 40 CFR 60.115b(e).

40 CFR 63.428(e)(1)-(9) - Starting May 8, 2027

For each storage vessel complying with 63.423(b)(2), keep records of each LEL monitoring event:

(1) Date and time of the LEL monitoring, and the storage vessel being monitored.

(2) A description of the monitoring event (e.g., monitoring conducted concurrent with visual inspection required under 40 CFR 60.113b(a)(2) of this chapter or 40 CFR 63.1063(d)(2); monitoring that occurred on a date other than the visual inspection required under 40 CFR 60.113b(a)(2) or 40 CFR 63.1063(d)(2); re-monitoring due to high winds; re-monitoring after repair attempt).

(3) Wind speed at the top of the storage vessel on the date of LEL monitoring.

(4) The LEL meter manufacturer and model number used, as well as an indication of whether tubing was used during the LEL monitoring, and if so, the type and length of tubing used.

(5) Calibration checks conducted before and after making the measurements, including both the span check and instrumental offset. This includes the hydrocarbon used as the calibration gas, the Certificate of Analysis for the calibration gas(es), the results of the calibration check, and any corrective action for calibration checks that do not meet the required response.

(6) Location of the measurements and the location of the floating roof.

(7) Each measurement (taken at least once every 15 seconds). The records should indicate whether the recorded values were automatically corrected using the meter's programming. If the values were not automatically corrected, record both the raw (as the calibration gas) and corrected measurements, as well as the correction factor used.

(8) Each 5-minute rolling average reading.

(9) If the vapor concentration of the storage vessel was above 25 percent of the LEL on a 5-minute rolling average basis, a description of whether the floating roof was repaired, replaced, or taken out of gasoline service.

40 CFR 63.420(h) and Table 1 of 40 CFR 63, Subpart R

Comply with the provision of 40 CFR 63, Subpart A as specified in Table 1 of Subpart R.

40 CFR 63.428(g)

Each owner or operator of a bulk gasoline terminal or pipeline breakout station shall keep the following records for each deviation of an emissions limitation (including operating limit), work practice standard, or operation and maintenance requirement.

(1) Date, start time, and duration of each deviation.

(2) List of the affected sources or equipment for each deviation, an estimate of the quantity of each regulated pollutant emitted over any emission limit and a description of the method used to estimate the emissions.

(3) Actions taken to minimize emissions.

40 CFR 63.428(h)

Any records required to be maintained by 40 CFR 63, Subpart R that are submitted electronically via the U.S. Environmental Protection Agency (EPA) Compliance and Emissions Data Reporting Interface (CEDRI) may be maintained in electronic format. This ability to maintain electronic copies does not affect the requirement for facilities to make records, data, and reports available upon request to a delegated authority or the EPA as part of an on-site compliance evaluation.

40 CFR 63.428(i)

Records of each performance test or performance evaluation conducted and each notification and report submitted to the Administrator for at least 5 years.

63.428(l)(2) Prior to May 8, 2027

(2) Include in a semiannual report to the Administrator the following information

(ii) Periodic reports as specified in 40 CFR 60.115b.

40 CFR 63.428(m)(1), (7), (8)

Reporting requirements after May 8, 2027

On or after May 8, 2027, you must submit to the Administrator semiannual reports with the applicable information in 40 CFR 63.428 (m)(1)-(8) following the procedure specified in 40 CFR 63.428(n).

(1) Report the following general facility information:

(i) Facility name.

(ii) Facility physical address, including city, county, and State.

(iii) Latitude and longitude of facility's physical location. Coordinates must be in decimal degrees with at least five decimal places.

(iv) The following information for the contact person:

(A) Name.

(B) Mailing address.

(C) Telephone number.

(D) Email address.

(v) The type of facility (bulk gasoline terminal or pipeline breakout station).

(vi) Date of report and beginning and ending dates of the reporting period. You are no longer required to provide the date of report when the report is submitted via CEDRI.

(vii) Statement by a responsible official, with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report. If your report is submitted via CEDRI, the certifier's electronic signature during the submission process replaces the requirement in 63.428(m)(1)(vii).

(7) For each gasoline storage vessel subject to requirements in 40 CFR 63.423, report:

(i) The information specified in 40 CFR 60.115b(a) or (b) or deviations in measured parameter values from the plan specified in 40 CFR 60.115b(c), depending upon the control equipment installed, or, if applicable, the information specified in 40 CFR 63.1066(b).

(ii) If you are complying with 40 CFR 63.423(b)(2), for each deviation in LEL monitoring, report:

(A) Date and start and end times of the LEL monitoring, and the storage vessel being monitored.

(B) Description of the monitoring event, e.g., monitoring conducted concurrent with visual inspection required under 40 CFR 60.113b(a)(2) or 40 CFR 63.1063(d)(2); monitoring that occurred on a date other than the visual inspection required under 40 CFR 60.113b(a)(2) or 40 CFR 63.1063(d)(2); re-monitoring due to high winds; re-monitoring after repair attempt.

(C) Wind speed in miles per hour at the top of the storage vessel on the date of LEL monitoring.

(D) The highest 5-minute rolling average reading during the monitoring event.

(E) Whether the floating roof was repaired, replaced, or taken out of gasoline service. If the floating roof was repaired or replaced, also report the information in 63.428(m)(7)(ii)(A) - (D) for each re-monitoring conducted to confirm the repair.

(8) If there were no deviations from the emission limitations, operating parameters, or work practice standards, then provide a statement that there were no deviations from the emission limitations, operating parameters, or work practice standards during the reporting period. If there were no periods during which a continuous monitoring system (including a CEMS or CPMS) was inoperable or out-of-control, then provide a statement that there were no periods during which a continuous monitoring system was inoperable or out-of-control during the reporting period.

40 CFR 63.428(n)

Each owner or operator of an affected source shall submit semiannual compliance reports with the information specified in 63.428(l) or (m) to the Administrator according to the requirements in 40 CFR 63.13.

Beginning on May 8, 2027, or once the report template has been available on the CEDRI website

(<https://www.epa.gov/electronic-reporting-air-emissions/cedri>) for one year, whichever date is later, you must submit all subsequent semiannual compliance reports using the appropriate electronic report template on the CEDRI website for 40 CFR 63, Subpart R and following the procedure specified in 40 CFR 63.9(k), except any medium submitted through mail must be sent to the attention of the Gasoline Distribution Sector Lead. The date report templates become available will be listed on the CEDRI website. Unless the Administrator or delegated State agency or other authority has approved a different schedule for submission of reports, the report must be submitted by the deadline specified, regardless of the method in which the report is submitted.

Are you in compliance with all applicable requirements for this emission unit? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT G. CONTROL DEVICE FORM

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number:

0001

List all emission units associated with this control device.

Barge Loading

Manufacturer:

John Zink

Model number:

HAM54001650101085B

Installation date: MM/DD/YYYY

03/01/1999

Type of Air Pollution Control Device:

☐ Baghouse/Fabric Filter ☐ Venturi Scrubber ☐ Multiclone
☒ Carbon Bed Absorber ☐ Packed Tower Scrubber ☐ Single Cyclone
☐ Carbon Drum(s) ☐ Other Wet Scrubber ☐ Cyclone Bank
☐ Catalytic Incinerator ☐ Condenser ☐ Settling Chamber
☐ Thermal Incinerator ☐ Flare ☐ Other (describe) _____
☐ Wet Plate Electrostatic Precipitator ☐ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Volatile Organic Compounds	100%	97+%
Hazardous Air Pollutants	100%	97+%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

Pressure Drop: minimum = 2.0 inches H₂O, average = 5.0 inches H₂O, and maximum = 14.0 inches H₂O Inlet Gas Flow: average = 750 ft³/min and maximum = 1,520 ft³/min Inlet Gas Temperatures: average = 80 deg. F and maximum = 180 deg. F Outlet Gas Flow: 750 ft³/min and maximum = 1,520 ft³/min Outlet Gas Temperatures: average = 100 deg. F and maximum = 180 deg. F

Is this device subject to the CAM requirements of 40 C.F.R. 64? ☐ Yes ☒ No

If Yes, Complete ATTACHMENT H

If No, Provide justification.

Barge loading is subject to MACT Y, which requires that MPLX reduce captured HAP emissions from marine tank vessel loading operations by 97 weight-percent. CAM requirements do not apply to MACT emission limits promulgated after November 15, 1990. Because MACT Y was promulgated September 19, 1995, the 97 weight-percent standard is not subject to the requirements of CAM.

Loading operations are additionally subject to the reasonably available control technology (RACT) standards established in 40 CFR 63.562(c). Specifically, MPLX must also reduce captured VOC emissions by 95 weight-percent per 40 CFR 63.562(c)(3). Because the VRU CEMS operates on a continuous basis and provides data which directly correlates with the compliance limit (as specified by the MACT-level monitoring requirements), the CEMS meets the two (2) criteria required to constitute a continuous compliance determination method as defined in 40 CFR 64.1. Therefore, the RACT limit is also exempt from the requirements of CAM in accordance with 40 CFR 64.2(b)(1)(vi).

Refer to Section 2.1.4 of the attached application narrative for additional details.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

A stack test was conducted on June 1, 2011. The Gasoline Terminal Air Emission Source Test was conducted in accordance with procedures established and the test methods referenced in 40 CFR 63, Subpart Y, which specifically included: Method 2, Method 2A, Method 25B, Method 21, and 40 CFR 63.565(b)(3).

MPLX operates a continuous emissions monitoring system (CEMS) in accordance with the requirements of 40 CFR 63, Subpart Y to monitor the outlet VOC concentration at the outlet of each of the carbon absorber units.

ATTACHMENT H. COMPLIANCE ASSURANCE MONITORING (CAM) FORM

ATTACHMENT H - Compliance Assurance Monitoring (CAM) Plan Form

For definitions and information about the CAM rule, please refer to 40 CFR Part 64. Additional information (including guidance documents) may also be found at <http://www.epa.gov/ttn/emc/cam.html>

CAM APPLICABILITY DETERMINATION

1) Does the facility have a PSEU (Pollutant-Specific Emissions Unit considered separately with respect to EACH regulated air pollutant) that is subject to CAM (40 CFR Part 64), which must be addressed in this CAM plan submittal? To determine applicability, a PSEU must meet all of the following criteria (*If No, then the remainder of this form need not be completed*): ☐ YES ☒ NO

- a. The PSEU is located at a major source that is required to obtain a Title V permit;
- b. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant that is NOT exempt;

LIST OF EXEMPT EMISSION LIMITATIONS OR STANDARDS:

- NSPS (40 CFR Part 60) or NESHAP (40 CFR Parts 61 and 63) proposed after 11/15/1990.
 - Stratospheric Ozone Protection Requirements.
 - Acid Rain Program Requirements.
 - Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR §64.1.
 - An emission cap that meets the requirements specified in 40 CFR §70.4(b)(12).
- c. The PSEU uses an add-on control device (as defined in 40 CFR §64.1) to achieve compliance with an emission limitation or standard;
 - d. The PSEU has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than the Title V Major Source Threshold Levels; AND
 - e. The PSEU is NOT an exempt backup utility power emissions unit that is municipally-owned.

BASIS OF CAM SUBMITTAL

2) Mark the appropriate box below as to why this CAM plan is being submitted as part of an application for a Title V permit:

☐ RENEWAL APPLICATION. ALL PSEUs for which a CAM plan has NOT yet been approved need to be addressed in this CAM plan submittal.

☐ INITIAL APPLICATION (submitted after 4/20/98). ONLY large PSEUs (i. e., PSEUs with potential post-control device emissions of an applicable regulated air pollutant that are equal to or greater than Major Source Threshold Levels) need to be addressed in this CAM plan submittal.

☐ SIGNIFICANT MODIFICATION TO LARGE PSEUs. ONLY large PSEUs being modified after 4/20/98 need to be addressed in this cam plan submittal. For large PSEUs with an approved CAM plan, Only address the appropriate monitoring requirements affected by the significant modification.

3) ^a BACKGROUND DATA AND INFORMATION

Complete the following table for all PSEUs that need to be addressed in this CAM plan submittal. This section is to be used to provide background data and information for each PSEU In order to supplement the submittal requirements specified in 40 CFR §64.4. If additional space is needed, attach and label accordingly.

PSEU DESIGNATION	DESCRIPTION	POLLUTANT	CONTROL DEVICE	^b EMISSION LIMITATION or STANDARD	^c MONITORING REQUIREMENT
<u>EXAMPLE</u> Boiler No. 1	Wood-Fired Boiler	PM	Multiclone	45CSR§2-4.1.c.; 9.0 lb/hr	Monitor pressure drop across multiclone: Weekly inspection of multiclone

^a If a control device is common to more than one PSEU, one monitoring plan may be submitted for the control device with the affected PSEUs identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a). If a single PSEU is controlled by more than one control device similar in design and operation, one monitoring plan for the applicable control devices may be submitted with the applicable control devices identified and any conditions that must be maintained or monitored in accordance with 40 CFR §64.3(a).

^b Indicate the emission limitation or standard for any applicable requirement that constitutes an emission limitation, emission standard, or standard of performance (as defined in 40 CFR §64.1).

^c Indicate the monitoring requirements for the PSEU that are required by an applicable regulation or permit condition.

CAM MONITORING APPROACH CRITERIA

Complete this section for EACH PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide monitoring data and information for EACH indicator selected for EACH PSEU in order to meet the monitoring design criteria specified in 40 CFR §64.3 and §64.4. If more than two indicators are being selected for a PSEU or if additional space is needed, attach and label accordingly with the appropriate PSEU designation, pollutant, and indicator numbers.

4a) PSEU Designation:	4b) Pollutant:	4c) ^a Indicator No. 1:	4d) ^a Indicator No. 2:
5a) GENERAL CRITERIA Describe the <u>MONITORING APPROACH</u> used to measure the indicators:			
^b Establish the appropriate <u>INDICATOR RANGE</u> or the procedures for establishing the indicator range which provides a reasonable assurance of compliance:			
5b) PERFORMANCE CRITERIA Provide the <u>SPECIFICATIONS FOR OBTAINING REPRESENTATIVE DATA</u> , such as detector location, installation specifications, and minimum acceptable accuracy:			
^c For new or modified monitoring equipment, provide <u>VERIFICATION PROCEDURES</u> , including manufacturer's recommendations, <u>TO CONFIRM THE OPERATIONAL STATUS</u> of the monitoring:			
Provide <u>QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PRACTICES</u> that are adequate to ensure the continuing validity of the data, (i.e., daily calibrations, visual inspections, routine maintenance, RATA, etc.):			
^d Provide the <u>MONITORING FREQUENCY</u> :			
Provide the <u>DATA COLLECTION PROCEDURES</u> that will be used:			
Provide the <u>DATA AVERAGING PERIOD</u> for the purpose of determining whether an excursion or exceedance has occurred:			

^a Describe all indicators to be monitored which satisfies 40 CFR §64.3(a). Indicators of emission control performance for the control device and associated capture system may include measured or predicted emissions (including visible emissions or opacity), process and control device operating parameters that affect control device (and capture system) efficiency or emission rates, or recorded findings of inspection and maintenance activities.

^b Indicator Ranges may be based on a single maximum or minimum value or at multiple levels that are relevant to distinctly different operating conditions, expressed as a function of process variables, expressed as maintaining the applicable indicator in a particular operational status or designated condition, or established as interdependent between more than one indicator. For CEMS, COMS, or PEMS, include the most recent certification test for the monitor.

^c The verification for operational status should include procedures for installation, calibration, and operation of the monitoring equipment, conducted in accordance with the manufacturer's recommendations, necessary to confirm the monitoring equipment is operational prior to the commencement of the required monitoring.

^d Emission units with post-control PTE ≥ 100 percent of the amount classifying the source as a major source (i.e., Large PSEU) must collect four or more values per hour to be averaged. A reduced data collection frequency may be approved in limited circumstances. Other emission units must collect data at least once per 24 hour period.

RATIONALE AND JUSTIFICATION

Complete this section for EACH PSEU that needs to be addressed in this CAM plan submittal. This section may be copied as needed for each PSEU. This section is to be used to provide rationale and justification for the selection of EACH indicator and monitoring approach and EACH indicator range in order to meet the submittal requirements specified in 40 CFR §64.4.

6a) PSEU Designation:

6b) Regulated Air Pollutant:

7) **INDICATORS AND THE MONITORING APPROACH:** Provide the rationale and justification for the selection of the indicators and the monitoring approach used to measure the indicators. Also provide any data supporting the rationale and justification. Explain the reasons for any differences between the verification of operational status or the quality assurance and control practices proposed, and the manufacturer's recommendations. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

8) **INDICATOR RANGES:** Provide the rationale and justification for the selection of the indicator ranges. The rationale and justification shall indicate how EACH indicator range was selected by either a COMPLIANCE OR PERFORMANCE TEST, a TEST PLAN AND SCHEDULE, or by ENGINEERING ASSESSMENTS. Depending on which method is being used for each indicator range, include the specific information required below for that specific indicator range. (If additional space is needed, attach and label accordingly with the appropriate PSEU designation and pollutant):

- COMPLIANCE OR PERFORMANCE TEST (Indicator ranges determined from control device operating parameter data obtained during a compliance or performance test conducted under regulatory specified conditions or under conditions representative of maximum potential emissions under anticipated operating conditions. Such data may be supplemented by engineering assessments and manufacturer's recommendations). The rationale and justification shall INCLUDE a summary of the compliance or performance test results that were used to determine the indicator range, and documentation indicating that no changes have taken place that could result in a significant change in the control system performance or the selected indicator ranges since the compliance or performance test was conducted.
- TEST PLAN AND SCHEDULE (Indicator ranges will be determined from a proposed implementation plan and schedule for installing, testing, and performing any other appropriate activities prior to use of the monitoring). The rationale and justification shall INCLUDE the proposed implementation plan and schedule that will provide for use of the monitoring as expeditiously as practicable after approval of this CAM plan, except that in no case shall the schedule for completing installation and beginning operation of the monitoring exceed 180 days after approval.
- ENGINEERING ASSESSMENTS (Indicator Ranges or the procedures for establishing indicator ranges are determined from engineering assessments and other data, such as manufacturers' design criteria and historical monitoring data, because factors specific to the type of monitoring, control device, or PSEU make compliance or performance testing unnecessary). The rationale and justification shall INCLUDE documentation demonstrating that compliance testing is not required to establish the indicator range.

RATIONALE AND JUSTIFICATION:

ATTACHMENT I. SITE-WIDE EMISSION CALCULATIONS

Table I-1 - Potential Emissions Summary: Kenova-TriState Terminal

EU ID	Description/ Product Stored	Tank Type	Capacity (gallons)	Install Date	Potential Emissions (tpy)												
					VOC	PM _{FILT}	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}	Max Ind. HAP	HAP (Total)
Tank 300	Additive Storage Tank	VFR	3,780	1999	9.47E-04												5.35E-04
Tank 301	Additive Storage Tank	VFR	8,020	N/A	1.03E-02												2.10E-03
Tank 202	Distillate Fuel Storage Tank ^a	VFR	1,054,580	1938	1.3											1.33E-04	0.02
Tank 253	Gasoline / Distillate Fuel Storage Tank ^c	IFR	2,444,400	1948 (Modified 1992)	2.7											4.27E-02	0.14
Tank 255	Distillate Fuel Storage Tank ^a	VFR	5,527,200	1948	8.1											8.15E-04	0.10
Tank 256	Petroleum Waste Water Storage Tank ^b	EFR	2,280,600	1949	1.7											2.65E-02	0.09
Tank 257	Gasoline Storage Tank	IFR	4,653,600	1951 (Modified 2008)	7.3											1.17E-01	3.80E-01
Tank 258	Gasoline Storage Tank	IFR	4,397,400	1951 (Modified 1997)	8.1											0.13	0.42
Tank 259	Gasoline Storage Tank	IFR	4,653,600	1951 (Modified 2007)	6.4											1.03E-01	0.34
Tank 260	Gasoline Storage Tank	IFR	4,985,400	1968 (Modified 2004)	6.7											1.07E-01	0.35
Tank 261	Distillate Fuel Storage Tank ^a	VFR	6,631,800	1968 (Modified 2003)	8.6											8.61E-04	0.11
Tank 262	Distillate Fuel Storage Tank ^a	VFR	6,631,800	1971	8.6											8.62E-04	0.11
Tank 264	Gasoline / Distillate Fuel Storage Tank ^c	IFR	3,838,800	1990	3.3											5.22E-02	0.17
Tank 265	Gasoline / Distillate Fuel Storage Tank ^c	IFR	1,377,600	1991	2.8											4.49E-02	0.15
Tank 266	Gasoline / Distillate Fuel Storage Tank ^c	IFR	1,810,200	1993	2.7											4.37E-02	0.14
Tank 267	Gasoline / Distillate Fuel Storage Tank ^c	IFR	1,797,600	1993	2.7											4.37E-02	0.14
Tank 268	Gasoline / Distillate Fuel Storage Tank ^c	IFR	1,793,400	1993	2.7											4.37E-02	0.14
Tank 270	Gasoline Storage Tank	IFR	2,377,200	2001	4.7											7.55E-02	0.25
Tank 271	Gasoline Storage Tank	IFR	2,377,200	2001	4.7											7.55E-02	0.25
Tank 272	Gasoline Storage Tank	IFR	2,377,200	2001	4.7											7.55E-02	0.25
Tank 273	Cone Roof Storage Tank (Fixed Roof) - Biodiesel / Distillate	VFR	957,600	2011	10.9												0.01
Tank K2	Assumed RVP 10 gasoline	HFR	1,974	2007	0.9											1.50E-02	0.05
Tank K3	Assumed RVP 10 gasoline	HFR	1,974	2007	0.9											1.50E-02	0.05
Landing/Cleaning Losses	(Floating Roof Tanks)	N/A	N/A	N/A	9.96											0.16	0.52
Oil Sewer System	Assumed RVP 10 gasoline	N/A	N/A	N/A	24.26											0.88	3.25
Gasoline Filter Change-outs		N/A	N/A	N/A	6.5E-02											1.04E-03	3.39E-03
Barge Loading	Gasoline + Distillate	N/A	N/A	1948	145.8											2.15	7.14
Dockside Emissions		N/A	N/A	1948	143.2											2.29	7.45
Fugitive Equipment Leaks - LL/GV (Gasoline Service)		N/A	N/A	N/A	1.00											1.59E-02	0.05
Fugitive Equipment Leaks - HL (Distillate Service)					0.84											8.39E-05	0.01
Fugitive Equipment Leaks - Butane Service		N/A	N/A	N/A	0.17												
Hot Oil Heater for Tank 273		N/A	2,499 MMBtu/hr	2011	0.06	0.02	0.08	0.08	1.07	0.90	0.01	1280.39	0.02	2.41E-03	1281.7	1.93E-02	0.02
Loaded Fleet Fire Pump Engine		N/A	N/A	2015	0.04	0.03	0.04	0.04	0.91	0.18	1.39E-03	145.53	5.90E-03	1.18E-03	146.00		3.46E-03
Lift Station Backup Pump		N/A	N/A	2018	1.07	0.02	0.02	0.02	2.26	2.96	3.13E-03	328.50	0.01	2.66E-03	329.58		7.80E-03
Diesel Fueling Station		N/A	N/A	N/A	0.33											3.29E-05	4.22E-03
Roadway Emissions		N/A	N/A	N/A		0.12	0.02	0.01									
Cooling Tower		N/A	N/A	N/A		0.01	0.01	0.01									
Butane Truck Hose Disconnects		N/A	N/A	2019	5.5E-04												
Pressurized Butane Bullet 2		N/A	87,000	2024													
Butane Railcar Hose Disconnects		N/A	N/A	2024	0.01												
Pressurized Butane Bullet 1		N/A	90,000	2019													
Total Emissions:					427.5	0.2	0.2	0.2	4.2	4.0	0.01	1,754.4	0.04	0.01	1,757.3	6.5	22.1

^a Products described as distillate may include fuel oil #2, kerosene, and jet A fuel. Emissions estimates are based on the material with the highest vapor pressure which is kerosene.

^b Worst-case material properties of the wastewater assume a gasoline layer exists on top of the stored liquid.

^c Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Emissions estimates are based on storage of gasoline RVP 15 from October - February, RVP 13.5 during March and September, and RVP 9 from April - August.

Table I-2 - Facility-Wide HAP Calculations

HAP EMISSIONS FACTORS

Arithmetic Average HAP to VOC Ratio (Percent by Weight)

HAP	Gasoline	Distillate
Hexane	1.60%	0.01%
Benzene	0.90%	0.02%
Cumene	0.01%	0.01%
Toluene	1.30%	0.26%
2,2,4-Trimethylpentane	0.80%	0.00%
Xylene	0.50%	0.69%
Naphthalene	0.00%	0.255%
Ethylbenzene	0.10%	0.04%

^aPotential gasoline HAP emissions are based on the factors provided in the Gasoline Distribution Industry (Stage I) - Background Information for Proposed Standards Draft Report (Table 3.1). Cumene data is taken from SDS. Distillate HAP factors calculated using data from the Karin Ritter (API) memo to the Gasoline Distribution MACT Workgroup dated 2/8/95 containing speciation data submitted by various API member companies.

POTENTIAL HAP EMISSIONS CALCULATIONS^b

EU ID	Description	Material Stored/Loaded ^e	VOC (tpy)	Hexane (tpy)	Benzene (tpy)	Toluene (tpy)	2,2,4-Trimethylpentane (tpy)	Xylene (tpy)	Ethylbenzene (tpy)	Total HAP ^c (tpy)
Tank 300	Additive Storage Tank	Distillate Additives/Dyes	9.47E-04	-	-	-	-	4.01E-04	1.34E-04	5.35E-04
Tank 301	Additive Storage Tank	Lubricity Additive	1.03E-02	-	-	-	-	1.62E-03	-	2.10E-03
Tank 202	Distillate Fuel Storage Tank	Distillate	1.33	1.33E-04	2.66E-04	3.45E-03	0.00E+00	9.17E-03	5.31E-04	1.71E-02
Tank 253	Gasoline / Distillate Fuel Storage Tank	Gasoline	2.67	4.27E-02	2.40E-02	3.47E-02	2.13E-02	1.33E-02	2.67E-03	1.39E-01
Tank 255	Distillate Fuel Storage Tank	Distillate	8.15	8.15E-04	1.63E-03	2.12E-02	0.00E+00	5.62E-02	3.26E-03	1.05E-01
Tank 256	Petroleum Waste Water Storage Tank	Wastewater	1.66	2.65E-02	1.49E-02	2.15E-02	1.33E-02	8.28E-03	1.66E-03	8.63E-02
Tank 257	Gasoline Storage Tank	Gasoline	7.29	1.17E-01	6.56E-02	9.47E-02	5.83E-02	3.64E-02	7.29E-03	3.80E-01
Tank 258	Gasoline Storage Tank	Gasoline	8.11	1.30E-01	7.30E-02	1.05E-01	6.49E-02	4.06E-02	8.11E-03	4.23E-01
Tank 259	Gasoline Storage Tank	Gasoline	6.4	1.03E-01	5.79E-02	8.36E-02	5.15E-02	3.22E-02	6.43E-03	3.35E-01
Tank 260	Gasoline Storage Tank	Gasoline	6.7	1.07E-01	6.02E-02	8.69E-02	5.35E-02	3.34E-02	6.69E-03	3.48E-01
Tank 261	Distillate Fuel Storage Tank	Distillate	8.6	8.61E-04	1.72E-03	2.24E-02	0.00E+00	5.94E-02	3.44E-03	1.11E-01
Tank 262	Distillate Fuel Storage Tank	Distillate	8.6	8.62E-04	1.72E-03	2.24E-02	0.00E+00	5.94E-02	3.45E-03	1.11E-01
Tank 264	Gasoline / Distillate Fuel Storage Tank	Gasoline	3.3	5.22E-02	2.93E-02	4.24E-02	2.61E-02	1.63E-02	3.26E-03	1.70E-01
Tank 265	Gasoline / Distillate Fuel Storage Tank	Gasoline	2.8	4.49E-02	2.53E-02	3.65E-02	2.25E-02	1.40E-02	2.81E-03	1.46E-01
Tank 266	Gasoline / Distillate Fuel Storage Tank	Gasoline	2.73	4.37E-02	2.46E-02	3.55E-02	2.18E-02	1.36E-02	2.73E-03	1.42E-01
Tank 267	Gasoline / Distillate Fuel Storage Tank	Gasoline	2.7	4.37E-02	2.46E-02	3.55E-02	2.18E-02	1.36E-02	2.73E-03	1.42E-01
Tank 268	Gasoline / Distillate Fuel Storage Tank	Gasoline	2.7	4.37E-02	2.46E-02	3.55E-02	2.18E-02	1.36E-02	2.73E-03	1.42E-01
Tank 270	Gasoline Storage Tank	Gasoline	4.7	7.55E-02	4.25E-02	6.14E-02	3.78E-02	2.36E-02	4.72E-03	0.25
Tank 271	Gasoline Storage Tank	Gasoline	4.7	7.55E-02	4.25E-02	6.14E-02	3.78E-02	2.36E-02	4.72E-03	0.25
Tank 272	Gasoline Storage Tank	Gasoline	4.7	7.55E-02	4.25E-02	6.14E-02	3.78E-02	2.36E-02	4.72E-03	0.25
Tank 273	Cone Roof Biodiesel Storage Tank ^f	Biodiesel	10.9	-	-	-	-	-	-	0.01
Tank K2	Assumed RVP 10 gasoline	Gasoline	0.94	1.50E-02	8.46E-03	1.22E-02	7.52E-03	4.70E-03	9.41E-04	4.90E-02

Table I-2 - Facility-Wide HAP Calculations

HAP EMISSIONS FACTORS^a

Arithmetic Average HAP to VOC Ratio (Percent by Weight)

HAP	Gasoline	Distillate
Hexane	1.60%	0.01%
Benzene	0.90%	0.02%
Cumene	0.01%	0.01%
Toluene	1.30%	0.26%
2,2,4-Trimethylpentane	0.80%	0.00%
Xylene	0.50%	0.69%
Naphthalene	0.00%	0.255%
Ethylbenzene	0.10%	0.04%

^aPotential gasoline HAP emissions are based on the factors provided in the Gasoline Distribution Industry (Stage I) - Background Information for Proposed Standards Draft Report (Table 3.1). Cumene data is taken from SDS. Distillate HAP factors calculated using data from the Karin Ritter (API) memo to the Gasoline Distribution MACT Workgroup dated 2/8/95 containing speciation data submitted by various API member companies.

POTENTIAL HAP EMISSIONS CALCULATIONS^b

EU ID	Description	Material Stored/Loaded ^c	VOC (tpy)	Hexane (tpy)	Benzene (tpy)	Toluene (tpy)	2,2,4-Trimethylpentane (tpy)	Xylene (tpy)	Ethylbenzene (tpy)	Total HAP ^c (tpy)
Tank K3	Assumed RVP 10 gasoline	Gasoline	0.94	1.50E-02	8.46E-03	1.22E-02	7.52E-03	4.70E-03	9.41E-04	4.90E-02
Landing/Cleaning Losses	[Floating Roof Tanks]	Gasoline	9.96	1.59E-01	8.97E-02	1.30E-01	7.97E-02	4.98E-02	9.96E-03	5.19E-01
Oily Sewer System	Assumed RVP 10 gasoline	See Wastewater Calculations	24.26	0.88	0.18	0.61	0.64	0.66	0.17	3.25
Gasoline Filter Change-outs		Gasoline	6.5E-02	1.04E-03	5.85E-04	8.45E-04	5.20E-04	3.25E-04	6.50E-05	3.39E-03
Hot Oil Heater for Tank 273		See Hot Oil Heater Calculations	0.06	1.93E-02	2.25E-05	3.65E-05	-	-	-	2.03E-02
Loaded Fleet Fire Pump Engine		See Engine Calculations	0.0	-	8.33E-04	3.65E-04	-	2.54E-04	-	3.46E-03
Lift Station Backup Pump		See Engine Calculations	1.07	-	1.88E-03	8.24E-04	-	5.74E-04	-	7.80E-03
Diesel Fueling Station		NA	0.3	3.29E-05	6.57E-05	8.54E-04	0.00E+00	2.27E-03	1.31E-04	4.22E-03
Roadway Emissions		NA	-	-	-	-	-	-	-	-
Cooling Tower		NA	-	-	-	-	-	-	-	-
Barge Loading		Gasoline	134.3	2.15	1.21	1.75	1.07	0.67	0.13	7.00
Barge Loading		Distillate	11.5	1.1E-03	2.3E-03	3.0E-02	0.0E+00	7.9E-02	4.6E-03	1.5E-01
Dockside Emissions		Gasoline	143.0	2.29	1.29	1.86	1.14	0.72	0.14	7.45
Dockside Emissions		Distillate	0.23	2.3E-05	4.6E-05	6.0E-04	0.0E+00	1.6E-03	9.2E-05	3.0E-03
Fugitive Equipment Leaks - LL/GV (Gasoline Service)		Gasoline ^d	1.00	1.6E-02	9.0E-03	1.3E-02	8.0E-03	5.0E-03	1.0E-03	5.2E-02
Fugitive Equipment Leaks - HL (Distillate Service)		Distillate ^d	0.84	8.4E-05	1.7E-04	2.2E-03	0.0E+00	5.8E-03	3.4E-04	0.01
Fugitive Equipment Leaks -Butane		Butane	0.17	-	-	-	-	-	-	-
Pressurized Butane Bullet 2		Butane	-	-	-	-	-	-	-	-
Butane Truck Hose Disconnects		Butane	5.5E-04	-	-	-	-	-	-	-
Butane Railcar Hose Disconnects		Butane	9.81E-03	-	-	-	-	-	-	-
Pressurized Butane Bullet 1		Butane	-	-	-	-	-	-	-	-
Total Emissions:			427.5	6.5	3.4	5.3	3.5	2.7	0.5	22.1

Maximum Individual HAP Emissions

Emissions	Hexane (tpy)
Maximum Individual HAP	6.5

^b Individual HAP Emission (tpy) = Individual HAP to VOC Ratio (Percent by Weight) * VOC (tpy), with the exception of engines, heater, and oily sewer system.

^c Note that these calculations conservatively assume that total HAP is equal to the sum of the individual HAP shown (with the exception of engines, heater, and oily sewer system)

^d Assumes that HAP concentration in VOC emissions from Piping Components is consistent with the worst-case product being transmitted via the relevant pipes.

^e Calculations assume 'distillate' refers to diesel, kerosene, jet fuel, or distillate additives.

^f Tank 273 emissions are based on Total HAP limit from R13-2277F, assuming all HAP is naphthalene.

Table I-3 - Storage Tank Potential Emissions

EU ID	Description/ Product Stored ^a	Product Modeled ^{a,b,c}	Diameter (ft)	Height (ft) or Length (ft) for HRT	Capacity ^d (gallons)	Max Throughput ^e (gal/yr)	VOC R13 Permit Limit (lb/yr)	AP-42 Calculated Annual Routine Emissions ^f (lb/yr)	RVP Change Annual Emissions (lb/yr) ^f	Landing and Cleaning Annual Emissions (lb/yr) ^f	VOC Potential Emissions (tpy)	VOC Potential Emissions (lbs/hr) ^{h,i}
Tank 300	Additive Storage Tank	Unisol® Liquid Red BK-50	5.25	24	3,780	44,970		2	-	-	9.47E-04	2.16E-04
Tank 301	Additive Storage Tank	HITEC® 4142M Fuel Additive	8	21.33	8,020	76,884		21	-	-	1.03E-02	2.36E-03
Tank 202	Distillate Fuel Storage Tank	Jet Kerosene	65.83	41.42	1,054,580	382,039,272		2,657	-	-	1.33	0.30
Tank 253	Gasoline / Distillate Fuel Storage Tank	Gasoline (Seasonal RVP)	90	51.33	2,444,400	1,400,770,680		4,696	638	1,146	2.67	0.61
Tank 255	Distillate Fuel Storage Tank	Jet Kerosene	140	48	5,527,200	2,522,780,880		16,299	-	-	8.15	1.86
Tank 256	Petroleum Waste Water Storage Tank	Gasoline (Seasonal RVP)	90	47.92	2,280,600	1,436,400		3,314		1,185	1.66	0.38
Tank 257	Gasoline Storage Tank	Gasoline (Seasonal RVP)	120	55	4,653,600	2,452,643,037		13,397	1,175	2,228	7.29	1.66
Tank 258	Gasoline Storage Tank	Gasoline (Seasonal RVP)	120	52	4,397,400	2,162,185,802		15,018	1,207	1,948	8.11	1.85
Tank 259	Gasoline Storage Tank	Gasoline (Seasonal RVP)	120	55	4,653,600	2,313,226,078		11,585	1,282	2,063	6.43	1.47
Tank 260	Gasoline Storage Tank	Gasoline (Seasonal RVP)	120	58.92	4,985,400	2,615,260,683		12,216	1,155	2,302	6.69	1.53
Tank 261	Distillate Fuel Storage Tank	Jet Kerosene	150	50.17	6,631,800	2,493,858,240		17,223	-	-	8.61	1.97
Tank 262	Distillate Fuel Storage Tank	Jet Kerosene	150	50.17	6,631,800	2,495,438,520		17,230	-	-	8.62	1.97
Tank 264	Gasoline / Distillate Fuel Storage Tank	Gasoline (Seasonal RVP)	110	54	3,838,800	1,204,322,156		5,504	1,015	1,869	3.26	0.74
Tank 265	Gasoline / Distillate Fuel Storage Tank	Gasoline (Seasonal RVP)	70	47.83	1,377,600	1,134,000,000	5,614	4,961	411	813	2.81	0.64
Tank 266	Gasoline / Distillate Fuel Storage Tank	Gasoline (Seasonal RVP)	80	48.17	1,810,200	1,134,000,000	5,457	4,438	674	1,047	2.73	0.63
Tank 267	Gasoline / Distillate Fuel Storage Tank	Gasoline (Seasonal RVP)	80	47.83	1,797,600	1,134,000,000	5,457	4,603	571	1,058	2.73	0.63
Tank 268	Gasoline / Distillate Fuel Storage Tank	Gasoline (Seasonal RVP)	80	47.67	1,793,400	1,134,000,000	5,457	4,457	553	1,040	2.73	0.63
Tank 270	Gasoline Storage Tank	Gasoline (Seasonal RVP)	85	56	2,377,200	1,533,000,017	9,440	8,961	474	1,054	4.72	1.08
Tank 271	Gasoline Storage Tank	Gasoline (Seasonal RVP)	85	56	2,377,200	1,533,000,017	9,440	9,004	497	1,074	4.72	1.08
Tank 272	Gasoline Storage Tank	Gasoline (Seasonal RVP)	85	56	2,377,200	1,533,000,017	9,440	9,002	520	1,102	4.72	1.08
Tank K2	Oily Wastewater (Assumed RVP 10 Gasoline)	Gasoline RVP 10	5.33	12	1,974	731,056		1,881	-	-	0.94	0.21
Tank K3	Oily Wastewater (Assumed RVP 10 Gasoline)	Gasoline RVP 10	5.33	12	1,974	731,056		1,881	-	-	0.94	0.21
Tank 273	Biodiesel B-100 Storage Tank	B100 Virgin Soybean Oil	54	56	957,600	65,167,019	21,700	21,561	-	-	10.85	2.48
Total:								189,909	10,172	19,927	100.7	

^a Products described as distillate may include fuel oil #2, kerosene, and jet A fuel. Emissions estimates for distillate storage are based on the material with the highest vapor pressure which is kerosene.

^b Worst-case material properties of the wastewater are to assume a gasoline layer.

^c Materials stored in the gasoline tanks may include distillate fuel and gasoline products with seasonal RVP variations. Emissions estimates are based on gasoline and account for the seasonal RVP variations.

^d The capacity provided here refers to the shell capacity (rather than the working volume.)

^e Maximum throughput is the permitted throughput limit (1,134 million gal/yr for Tanks 265-268 from R13-1352A, 1,533 million gal/yr for Tanks 270-272 from R13-2277F, and 65 million gal/yr for Tank 273 from R13-2277F), where applicable; Tanks K2, and K3 conservatively assume a throughput of one turnover per day. For all other tanks, the maximum throughput is assumed to be six (6) times the maximum throughput realized over the 2019-2024 timeframe.

^f Emissions estimated using AP-42 Chapter 7.1 (10/24) with TankESP® software. Landing and Cleaning Loss worst case PTE assumes tanks are cleaned once per year in September. RVP Change worst case PTE assumes a roof landing and service change occur once per year from RVP 13.5 to 15.

^g Annual Average VOC Emissions (lb/hr) calculated as: VOC Potential Emissions (lbs/yr) / 8,760 (hr/yr)

^h VOC PTE is determined based on AP-42 emission calculations (if no permit limit exists) or the allowable R13 permit limit. When based on AP-42, the PTE includes one RVP change landing for floating roof tanks per year as routine.

ⁱ Landing and cleaning emissions are maintenance emissions and are not considered in each individual tank PTE.

DIMENSIONAL ANALYSIS / POTENTIAL PROCESS DATA

Mass Conversion	2,000 lb/ton		
Gasoline Storage Schedule			
March/September	RVP 13.5		
October-February	RVP 15		
April-August	RVP 9		

Table I-4 - Marine Barge Loading Potential Emissions

PROCESS PARAMETERS / DIMENSIONAL ANALYSIS

Maximum Gasoline Loading Rate	13,600 bbl/hr
Distillate Loading Rate (for Worst-Case Loading)	7,000 bbl/hr
Maximum Distillate Loading Rate (No Gas Loading)	9,000 bbl/hr
Average Barge Capacity	25,000 bbl/barge
Maximum Annual Loading Rate - Gasoline	54,650,000 bbl/yr
Maximum Annual Loading Rate - Diesel	45,625,000 bbl/yr
Maximum Annual Operating Schedule	365 day/yr
Mass Conversion	1000 gal/Mgal
Mass Conversion	2000 lb/ton
Volume Conversion	42 gal/bbl

Loading is hydraulically limited
Worst-case loading assumes gasoline is being loaded at capacity, and only 1 loading line can load distillate simultaneously.
Loading is hydraulically limited
Permit Limit
Permit Limit (5x25,000 bbl barges/day)

GASOLINE LOADING EMISSIONS

Hourly Loading Rate	571 Mgal/hr
Annual Loading Rate	2,295,300 Mgal/yr
VOC Emission Factor	3.9 lbs/Mgal
% Capture Efficiency of VRU	100% [%]
% Control Efficiency of VRU	97% [%]
Overall Efficiency of VRU	97% [%]
Uncontrolled Emissions	2,228 lbs VOC/hr
Uncontrolled Emissions	8,951,670 lbs VOC/yr
Uncontrolled Emissions	4,476 tpy
Controlled Emissions	66.8 lbs VOC/hr
Controlled Emissions	268,550 lbs VOC/yr
Estimated Emissions	134.3 tpy

= Maximum Gasoline Loading Capacity (bbl/hr) * 42 (gal/bbl) / 1000 gal/Mgal
= Maximum Annual Gasoline Loading Rate (gal/yr) / 1000 gal/Mgal * 42 gal/bbl
Emission Factor for uncleaned barges from AP-42 Section 5.2, Table 5.2-2 (07/2008)
For treatment to MACT 1 (way 1.3, 1994), which indicates that 100% capture efficiency can be applied when vapor tight vessels are loaded. Also, an assist blower maintains a vacuum of at least 1.5 inches water column during loading
40 CFR 63.562(b)(2) - MACT Y
= % Capture Efficiency * % Control Efficiency
= Estimated Throughput (Mgal/hr) * Emission factor (lb/Mgal)
= Estimated Throughput (Mgal/yr) * Emission factor (lb/Mgal)
= Uncontrolled Emissions (lb/yr) / 2000 (lb/ton)
= Throughput (Mgal/hr) * Emission Factor (lb/Mgal) * (1 - Overall Efficiency of VRU)
= Throughput (Mgal/yr) * Emission Factor (lb/Mgal) * (1 - Overall Efficiency of VRU)
= Controlled Emissions (lb/yr) / 2000 (lb/ton)

DISTILLATE LOADING EMISSIONS

Estimated Throughput	378 Mgal/hr
Estimated Throughput	1,916,250 Mgal/yr
Emission Factor	0.012 lbs/Mgal
% Capture Efficiency of VRU	0% [%]
% Control Efficiency of VRU	0% [%]
Overall Efficiency of VRU	0% [%]
Uncontrolled Emissions	4.5 lbs VOC/hr
Uncontrolled Emissions	22,995 lbs VOC/yr
Uncontrolled Emissions	11.5 tpy
Controlled Emissions	4.5 lbs VOC/hr
Controlled Emissions	22,995 lbs VOC/yr
Estimated Emissions	11.5 tpy

= Maximum Distillate Loading Rate (bbl/hr) * 42 (gal/bbl) / 1000 gal/Mgal.
= Maximum Annual Diesel Loading Rate (gal/yr) / 1000 gal/Mgal * 42 gal/bbl
Emission Factor for barge loading of distillate #2 from AP-42 Section 5.2, Table 5.2-6 (07/2008)
MPC only recovers vapors from gasoline barge loading
MPC only recovers vapors from gasoline barge loading
= % Capture Efficiency * % Control Efficiency
= Estimated Throughput (Mgal/hr) * Emission factor (lb/Mgal)
= Estimated Throughput (Mgal/yr) * Emission factor (lb/Mgal)
= Uncontrolled Emissions (lb/yr) / 2000 (lb/ton)
= Throughput (Mgal/hr) * Emission Factor (lb/Mgal) * (1 - Overall Efficiency of VRU)
= Throughput (Mgal/yr) * Emission Factor (lb/Mgal) * (1 - Overall Efficiency of VRU)
= Controlled Emissions (lb/yr) / 2000 (lb/ton)

WORST-CASE HOURLY LOADING EMISSIONS

Worst-case hourly emissions occur when gasoline is loaded at capacity, and the remaining available loading arm is used to load distillate.

Estimated Gasoline Throughput	571 Mgal/hr
Estimated Distillate Throughput	294 Mgal/hr
Gasoline VOC Emission Factor	3.9 lbs/Mgal
Distillate VOC Emission Factor	0.012 lbs/Mgal
% Capture Efficiency of VRU (gas loading)	100% [%]
% Control Efficiency of VRU (gas loading)	97% [%]
Overall Efficiency of VRU (gas loading)	97% [%]
Uncontrolled Emissions	2,231 lbs VOC/hr
Controlled Emissions	70.4 lbs VOC/hr

= Gasoline Loading Capacity (bbl/hr) * 42 (gal/bbl) / 1000 gal/Mgal
= Distillate Loading Rate during Gasoline Loading (bbl/hr) * 42 (gal/bbl) / 1000 gal/Mgal.
Emission Factor for uncleaned barges from AP-42 Section 5.2, Table 5.2-2 (07/2008)
Emission Factor for barge loading of distillate oil from AP-42 Section 5.2, Table 5.2-6 (07/2008)
For treatment to MACT 1 (way 1.3, 1994), which indicates that 100% capture efficiency can be applied when vapor tight vessels are loaded. Also, an assist blower maintains a vacuum of at least 1.5 inches water column during loading
40 CFR 63.562(b)(2) - MACT Y
= % Capture Efficiency * % Control Efficiency
= Estimated Gasoline Throughput (Mgal/hr) * Gasoline Emission factor (lb/Mgal) + Estimated Distillate Throughput (Mgal/hr) * Distillate Emission factor (lb/Mgal)
= Gasoline Throughput (Mgal/hr) * Gasoline Emission Factor (lb/Mgal) * (1 - Overall Efficiency of VRU) + Estimated Distillate Throughput (Mgal/hr) * Distillate Emission factor (lb/Mgal)

SUMMARY OF MAXIMUM BARGE LOADING EMISSIONS

Maximum Hourly VOC Emissions	70.4 lb/hr
Maximum Annual VOC Emissions	145.8 tpy

Worst-case emissions occur when gasoline is loaded at capacity and the remaining available loading arm is used for distillate.
Sum of annual diesel and gasoline loading emissions.

Table I-5 - Dockside Emissions

PROCESS PARAMETERS

Maximum Annual Loading Rate - Gasoline	54,650,000 bbl/yr	Permit Limit
Maximum Annual Loading Rate - Distillate	45,625,000 bbl/yr	Permit Limit
September Loading - Gasoline	4,562,500 bbl	Permit Limit
May-August (Summer) Loading - Gasoline	18,225,000 bbl	Permit Limit
April Loading - Gasoline	4,562,500 bbl	Permit Limit
October-March (Winter) Loading - Gasoline	27,300,000 bbl	Permit Limit

DIMENSIONAL ANALYSIS

Mass Conversion	2,000 lb/ton

UNCONTROLLED EMISSION FACTORS

Dockside emissions resulting from opening ullage hatches or other activities conducted in preparation for product quality control (PQ) gauging/ sampling. An evaporation factor is calculated for emissions during sampling based on an estimated product displacement that occurs during sampling. It is conservatively assumed that every barge will need sampled upon arrival and before departure. Each emission factor is based on worst-case assumptions for barge pressure, ambient temperature, seasonal material loaded/material vapor pressure, vapor space saturation factor, sampling time, etc., derived from a review of actual measured data.

SAMPLING EVAPORATION-ARRIVAL

Time Period	Gasoline (lb/bbl)	Gasoline (lb/barge)	Distillate (lb/bbl)	Distillate (lb/barge)
September	3.3E-03	85.1	5.1E-06	0.13
May-August (Summer)	2.4E-03	62.4		
April	2.6E-03	67.9		
October-March (Winter)	2.7E-03	68.9		

SAMPLING EVAPORATION-DEPARTURE

Time Period	Gasoline (lb/bbl)	Gasoline (lb/barge)	Distillate (lb/bbl)	Distillate (lb/barge)
September	3.3E-03	85.1	5.1E-06	0.13
May-August (Summer)	2.4E-03	62.4		
April	2.6E-03	67.9		
October-March (Winter)	2.7E-03	68.9		

Table I-5 - Dockside Emissions

TOTAL UNCONTROLLED SHORT-TERM EMISSIONS

Time Period	Total Sampling Evaporation - Gasoline (lb/barge)	Total Sampling Evaporation - Distillate (lb/barge)
September	170.3	0.26
May-August (Summer)	124.9	
April	135.8	
October-March (Winter)	137.9	

MAXIMUM SHORT-TERM EMISSIONS

Max Short-Term Gasoline Emissions	170.3 lb/barge
Max Short-Term Distillate Emissions	0.26 lb/barge

UNCONTROLLED ANNUAL EMISSIONS

Uncontrolled Emissions (tpy) = Seasonal Emission Factor by Fuel (lb/bbl) x Maximum Seasonal Annual Loading Rate by Fuel (bbl/yr) / 2000 (lb/ton)

Time Period	Sampling Evaporation - Arrival - Gasoline (tpy)	Sampling Evaporation - Arrival - Distillate (tpy)	Sampling Evaporation - Departure - Gasoline (tpy)	Sampling Evaporation - Departure - Distillate (tpy)	Total (tpy)
September	7.47	0.12	7.47	0.12	
May-August (Summer)	21.89		21.89		
April	5.96		5.96		
October-March (Winter)	36.19		36.19		
Total:	71.51	0.12	71.51	0.12	143.2

Table I-5 - Dockside Emissions

HAP VAPOR SPECIATION

Pollutant	Gasoline (%)	Distillate (%)
Hexane	1.60%	0.01%
Benzene	0.90%	0.02%
Cumene	0.01%	0.01%
Toluene	1.30%	0.26%
2,2,4-Trimethylpentane	0.80%	-
Xylene	0.50%	0.69%
Naphthalene	-	0.255%
Ethylbenzene	0.10%	0.04%

HAP EMISSIONS

*Short-Term HAP Emissions (lb/barge) = MaxShort-Term Emissions (lb/barge) * Vapor HAP Speciation (%)*

*Annual Ind. HAP Emissions (tpy) = Total VOC Emissions (tpy) * Vapor Ind. HAP Speciation (%)*

Pollutant	Short-Term Gasoline HAP Emissions (lb/barge)	Annual Gasoline HAP (tpy)	Short-Term Distillate HAP Emissions (lb/barge)	Annual Distillate HAP (tpy)	Total HAP (tpy)
Hexane	2.72	2.29	2.6E-05	2.3E-05	2.29
Benzene	1.53	1.29	5.3E-05	4.6E-05	1.29
Cumene	0.02	0.01	2.6E-05	2.3E-05	0.01
Toluene	2.21	1.86	6.8E-04	6.0E-04	1.86
2,2,4-Trimethylpentane	1.36	1.14	-	-	1.14
Xylene	0.85	0.72	1.8E-03	1.6E-03	0.72
Naphthalene	-	-	6.7E-04	5.9E-04	5.9E-04
Ethylbenzene	0.17	0.14	1.1E-04	9.2E-05	0.14
Total HAP	8.87	7.45	3.4E-03	3.0E-03	7.45

Table I-6 - Gas Filter Changes Potential Emissions

Filter Changeouts per Year	80 filter change / yr	
Amount of Gasoline per Filter ^a	0.50 gallon / filter	
Amount of Gasoline per Year	40 gallons / yr	= No. Filter Change (filter change/yr) * Volume of Gasoline in Filters (gallon/filter)
Gasoline Vapor Emitted per Changeout ^a	50%	Conservative, since the vacuum truck is continuously connected to the vessel
Density of Gasoline ^b	6.5 lb/gallon	
VOC Emissions per Event	1.63 lb VOC/event	= Volume of Gasoline per Filter (gal/filter) * % of Gasoline Vapor Emitted * Gasoline Density (lb/gal)
VOC Emissions per Year	130 lb VOC/year	= Volume of Gasoline (gal/yr) * Percent Gasoline Vapor Emitted * Gasoline Density (lb/gal)
VOC Emissions per Year	0.07 tons VOC/year	= VOC Emissions (lb/yr) / 2000 (lb/ton)

^a Estimates based on conservative engineering judgement

^b American Petroleum Institute (API), Alcohols and Ethers, Table B-1. Publication 4261, June 2001.

Table I-7 - Tow Boat Diesel Fueling Station Potential Emissions

DIMENSIONAL ANALYSIS

Time Conversion	365 day/yr	NIST SP1038
Mass Conversion	2,000 lb/ton	

POTENTIAL PROCESS DATA

Boats Filled per Day	3 boats/day	<i>The frequency of fueling operations is estimated to be 3 boats per day at a maximum MPC personnel</i> <i>The volume of the fuel tanks is estimated be between 4,000 and 20,000 gallons by MPC personnel</i> <i>No. 2 Diesel Throughput (gal/day) = Boats Filled Per Day (boats/day) * Volume of Boat Fuel Tanks (gal/boat)</i> <i>= No. 2 Diesel Throughput (gal/day) * 365 (day/yr) / 1,000 (gal/10³ gal)</i>
Volume of Boat Fuel Tanks	20,000 gal/boat	
No. 2 Diesel Throughput	60,000 gal/day	
No. 2 Diesel Throughput	21,900 10 ³ gal/yr	

EMISSION FACTORS AND OPERATING PARAMETERS

VOC Emission Factor	0.030 lbs/10 ³ gal	Emissions factor was obtained from AP-42 Chapter 5, Table 5.2.5 for splash loading of tank trucks. There are no diesel factors for vehicle refueling in Table 5.2-7.

POTENTIAL EMISSIONS CALCULATIONS

VOC Emissions	0.60 lbs/boat	= No. 2 Diesel Throughput (gal/boat) * VOC Emission Factor (lbs/10 ³ gal) / 1,000 (gal/10 ³ gal)
VOC Emissions	1.80 lbs/day	= No. 2 Diesel Throughput (gal/day) * VOC Emission Factor (lbs/10 ³ gal) / 1,000 (gal/10 ³ gal)
VOC Emissions	0.33 tpy	= No. 2 Diesel Throughput (10 ³ gal/yr) * VOC Emissions Factor (lbs/10 ³ gal) / 2,000 (lbs/ton)

Table I-8 - Hot Oil Heater Potential Emissions

POTENTIAL PROCESS DATA

Manufacturer	HEATEC
Year Installed	2011
Fuel Used	Natural Gas
Higher Heating Value (HHV) (Btu/scf)	1,050 Btu/scf
Standard Heating Value (Btu/scf)	1,020 Btu/scf
Heat Input (MMBtu/hr)	2.499 MMBtu/hr
Fuel Consumption (mmscf/hr)	2.38E-03 mmscf/hr
Fuel Consumption (mmscf/yr)	20.85 mmscf/yr
Potential Annual Hours of Operation (hr/yr)	8,760 hr/yr

AP-42 Table 1.4.1, footnote 'a' (basis of emission factors)

DIMENSIONAL ANALYSIS

Mass Conversion (g/lb)	453.59 g/lb
Mass Conversion (g/kg)	1,000 g/kg

EMISSION FACTORS^{a,b,c}

NO _x	100 lb/MMscf
CO	84 lb/MMscf
SO ₂	0.6 lb/MMscf
PM Total	7.6 lb/MMscf
PM Condensable	5.7 lb/MMscf
PM ₁₀ (Filterable)	1.9 lb/MMscf
PM _{2.5} (Filterable)	1.9 lb/MMscf
VOC	5.5 lb/MMscf
Hexane	1.80 lb/MMscf
Total HAP	1.89 lb/MMscf
CO ₂	53.06 kg/MMBtu
CH ₄	1.0E-03 kg/MMBtu
N ₂ O	1.0E-04 kg/MMBtu
CO ₂ (GWP)	1
CH ₄ (GWP)	28
N ₂ O (GWP)	265

Factor for Uncontrolled Small Boilers from AP-42, Section 1.4, Table 1.4-1

Factor for Uncontrolled Small Boilers from AP-42, Section 1.4, Table 1.4-1

^a Criteria pollutant and HAP emission factors from AP-42, Section 1.4, Tables 1.4-2 and 1.4-3, unless otherwise noted.

^b GHG emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2 for natural gas.

^c Total CO₂e emission calculations based on global warming potentials as provided in Table A-1 of Part 98, Subpart A.

POTENTIAL EMISSIONS CALCULATIONS

Pollutant	Potential Emissions	
	(lb/hr) ^{d,f}	(tons/yr) ^e
NO _x	0.25	1.07
CO	0.21	0.90
SO ₂	1.47E-03	0.01
PM Total	0.02	0.08
PM Condensable	0.01	0.06
PM ₁₀ (Filterable)	4.66E-03	0.02
PM _{2.5} (Filterable)	4.66E-03	0.02
VOC	0.01	0.06
Hexane	4.41E-03	1.93E-02
Total HAP	4.63E-03	2.03E-02
CO ₂	292.326	1,280
CH ₄	0.006	2.41E-02
N ₂ O	0.001	2.41E-03
CO ₂ e	292.6	1,282

^d For non-GHG pollutants: Emission Rate (lb/hr) = Firing Rate (MMBtu/hr) * Emission Factor (lb/MMscf) / Standard Heat Content (Btu/scf)

^e Annual Emissions (tons/yr) = Hourly Emissions (lb/hr) * Operating Hours (hr/yr) * (1 ton/2000 lb).

^f For GHG Pollutants: GHG Emission Rate (lb/hr) = Heat Input (MMBtu/hr) * Emission Factor (kg/MMBtu) * 1,000 (g/kg) / 453.59237 (g/lb) / 2,000 (lb/ton)

Table I-9 - Cooling Tower Potential Emissions

PROCESS PARAMETERS

Drift Loss	0.005 %
Total Flow Capacity	400 gpm
Maximum Operating Days of Operation per Year	365 days/yr
Maximum Operating Hours	24 hr/day
Density of Water	8.345 lb/gal
Total Liquid Drift Loss	0.417 lbs drift/Mgal
Total Dissolved Solids Content	0.05 mhos/m
Total Dissolved Solids Content	500 µmhos/cm
Total Dissolved Solids Content	320 ppm
PM ₁₀ Emission Factor	0.0001 lbs/Mgal

Assumed

Manufacturer specifications (BAC U148042801-RH Drawings.pdf)

Total Liquid Drift Loss (lbs drift/Mgal) = [Drift Loss (gal drift/gal flow) * Density of Water (8.345 lbs drift/gal drift) * (1000 gal flow/Mgal flow)].

Cooling water is city water. Maximum of range provided for drinking water in "Water Conductivity" from LENNTECH

(<http://www.lennotech.com/applications/ultrapure/conductivity/water-conductivity.htm>)

= TDS Content (mhos/m) / 1E-6 (umhos/mhos) / 100 (cm/m)

= TDS Content (umhos/cm) / (10³) * 640. Conversion is based on Equation 16-1 on page 1145 of Wastewater Engineering, Metcalf and Eddy.

= TDS Content (ppm) / (10⁶) * Total Liquid Drift Loss (lbs drift/Mgal) per AP-42, Section 13.4.2 (January 1995).

POTENTIAL EMISSIONS CALCULATIONS

	PM ₁₀ Emissions ^a (lb/hr)	PM ₁₀ Emissions ^b (tpy)
Cooling Tower	3.2E-03	0.01

^a Potential PM₁₀ Emissions (lb/hr) = PM₁₀ Emission Factor (lb/Mgal) * Total Flow Capacity (gpm) * (60 min/hr) / 1000 (gal/Mgal)

^b Potential PM₁₀ Emissions (tpy) = Potential PM₁₀ Emissions (lb/hr) * 365 (days/yr) * 24 (hr/day) / 2000 (lb/ton)

DIMENSIONAL ANALYSIS

Time Conversion	60 min/hr
Mass Conversion	2000 lb/ton
Volume Conversion	1000 gal/Mgal
Length Conversion	100 cm/m
Conductance Conversion	1.00E-06 µmhos/mhos

Table I-10 - Loaded Fleet Fire Pump (Tier 3) Engine Potential Emissions

OPERATING PARAMETERS

Fuel Used	Diesel	
Power Output	510 bhp	
Heat Input Capacity	3.57 MMBtu/hr	= Power Output (hp) * 7000 (Btu/(hp-hr)) * 1×10^{-6} MMBtu/Btu
Operating Hours	500 hr/yr	Emergency use only
Estimated Hourly Fuel Usage	23.50 Gal/hr	Per manufacturer specifications for Clarke JX6H-UFAD60 (25JAN12 Data Sheet C132901 Rev E for 510 HP/1760 RPM)
Maximum Annual Fuel Usage	11,750 Gal/yr	= Estimated Hourly Fuel Usage * Operating Hours (500 hrs/yr)

DIMENSIONAL ANALYSIS

Power Conversion	7,000 Btu/hp-hr	per Footnote 'a' to Table 3.3-1 in AP-42 Section 3.3
General Conversion	1,000,000 Units/MMUnit	
Mass Conversion	0.4536 kg/lb	NIST
Mass Conversion	1,000 g/kg	
Mass Conversion	453.592 g/lb	
Mass Conversion	2,000 lb/ton	
Sulfur Dioxide (SO ₂), Molecular Weight	64 lb/lb-mole	NIST Chemistry WebBook, SRD 69
Sulfur (S), Molecular Weight	32 lb/lb-mole	NIST Chemistry WebBook, SRD 69

EMISSION FACTOR DEVELOPMENT

Diesel Heat Content	19,300 Btu/lb	AP-42 Section 3.3, Table 3.3-1, Footnote 'c'
Not to Exceed Multiplier	1.25	40 CFR 60.4212(c)
Sulfur Content (Non-Road Diesel Fuel)	15 ppm	40 CFR 60.4207(b) and 40 CFR 1090.305

Table I-10 - Loaded Fleet Fire Pump (Tier 3) Engine Potential Emissions

EMISSION FACTORS

Pollutant	Emission Factor	Units	Source
NO _x	3.25 g/hp-hr		Per emissions data for Clarke JX6H-UFAD60 (4APRIL15 Data Sheet for 510 HP/1760 RPM)
CO	0.63 g/hp-hr		Per emissions data for Clarke JX6H-UFAD60 (4APRIL15 Data Sheet for 510 HP/1760 RPM)
SO ₂	0.0055 lb/hr		= (Sulfur Content (ppm) x 10 ⁻⁶) x [Heat Input Capacity -(MMBtu/hr) x 10 ⁶ (btu/MMBtu) / Diesel Energy Content (btu/lb)] x [1 lbmole SO ₂ / 1 lbmole S] x [SO ₂ M.W./ Sulfur M.W.]
Filterable PM	0.11 g/hp-hr		Per emissions data for Clarke JX6H-UFAD60 (4APRIL15 Data Sheet for 510 HP/1760 RPM)
Condensable PM Factor	0.0077 lb/MMBtu		AP-42, Section 3.4, Table 3.4-2 (10/96)
Filterable PM Factor	0.062 lb/MMBtu		AP-42, Section 3.4, Table 3.4-2 (10/96)
Condensable PM	0.01 g/hp-hr		Condensable emission factor (g/hp-hr) = (Condensable Particulate Emission Factor (lb/MMBtu) / (Filterable Particulate Emission Factor (lb/MMBtu)) * Filterable Emission Factor (g/hp-hr); where the ratio is taken from section AP-42, Section 3.4, Table 3.4-2 (10/96) to account for the absence of condensable factor in mfr specs
Total PM	0.13 g/hp-hr		= Filterable PM/PM ₁₀ EF (lb/MMBtu) + Condensable PM EF (lb/MMBtu)
TOC	0.13 g/hp-hr		Per emissions data for total hydrocarbons for Clark JX6H-UFAD60 (4APRIL15 Data Sheet for 510 HP/1760 RPM)
CO ₂	73.96 kg/MMBtu		40 CFR 98, Subpart C, Table C-1 for Distillate Fuel Oil No. 2
CH ₄	3.00E-03 kg/MMBtu		40 CFR 98, Subpart C, Table C-2 for Petroleum
N ₂ O	6.00E-04 kg/MMBtu		40 CFR 98, Subpart C, Table C-2 for Petroleum
CO ₂	163.05 lb/MMBtu		= CO ₂ EF (kg/MMBtu) / 0.4536 (kg/lb)
CH ₄	6.61E-03 lb/MMBtu		= CH ₄ EF (kg/MMBtu) / 0.4536 (kg/lb)
N ₂ O	1.32E-03 lb/MMBtu		= N ₂ O EF (kg/MMBtu) / 0.4536 (kg/lb)
GWP - CO ₂	1		Table A-1 of 40 CFR 98, Subpart A
GWP - CH ₄	28		Table A-1 of 40 CFR 98, Subpart A
GWP - N ₂ O	265		Table A-1 of 40 CFR 98, Subpart A

POTENTIAL EMISSIONS CALCULATIONS

Pollutant	(lb/hr) ^a	(tons/yr) ^b
NO _x	3.65	0.91
CO	0.70	0.18
SO ₂	0.01	1.39E-03
Filterable PM/PM ₁₀	0.13	0.03
Condensable PM	0.02	3.93E-03
Total PM	0.14	0.04
TOC	0.14	0.04
CO ₂	582.10	145.53
CH ₄	2.36E-02	5.90E-03
N ₂ O	4.72E-03	1.18E-03
CO ₂ e	584.01	146.00

$$= \text{CO}_2 \text{ Emission (lb/hr or tpy)} * \text{CO}_2 \text{ GWP} + \text{CH}_4 \text{ Emissions (lb/hr or tpy)} * \text{CH}_4 \text{ GWP} + \text{N}_2\text{O Emissions (lb/hr or tpy)} * \text{N}_2\text{O GWP}$$

^a Hourly Calculations (lb/hr) = Emission Factor (g/hp-hr) * 510 (hp) / 453.593 (g/lb) / 2,000 (lb/ton)

or Hourly Calculations (lb/hr) = Emission Factor (lb/MMBtu) * Heat Input Capacity (MMBtu/hr) / 2,000 (lb/ton)

^b Annual Calculations (tpy) = Emission Factor (g/hp-hr) * 500 (hrs/yr) * 510 (hp) / 453.593 (g/lb) / 2,000 (lb/ton)

or Annual Calculations (tpy) = Emission Factor (lb/MMBtu) * Heat Input Capacity (MMBtu/hr) * Operating Hours (hr/yr) / 2,000 (lb/ton)

Table I-11 - Tank Farm Lift Station Backup Pump (Tier 4) Engine Potential Emissions

OPERATING PARAMETERS

Fuel Used	Diesel	
Power Output	49.0 kW	Per manufacturer specifications for Isuzu 4LE2X (4L Lit Sheet for 66 HP/2400 RPM)
Heat Input Capacity	0.46 MMBtu/hr	= Power Output (kW) * 1.341 hp// kW * 7000 (Btu/(hp-hr)) * 1x10 ⁻⁶ MMBtu/Btu
Operating Hours	8,760 hr/yr	
Maximum Hourly Fuel Usage	24.4 lb/hr	Per CARB Certification for Isuzu 4LE2X (66 HP/2400 RPM)
Maximum Hourly Fuel Usage	3.46 gal/hr	=Maximum hourly fuel usage (lb/hr) / Density of distillate oil (lb/gal)
Maximum Annual Fuel Usage	30,318 gal/yr	= Maximum Hourly Fuel Usage * Operating Hours (8,760 hrs/yr)

DIMENSIONAL ANALYSIS

Power Conversion	7,000 Btu/hp-hr	AP-42 Section 3.3, Table 3.3-1, Footnote 'a'
Power Conversion	745.6999 W/hp	NIST1038
Mass Conversion	453.59 g/lb	NIST1038
Mass Conversion	0.4536 kg/lb	NIST1038
Mass Conversion	2,000 lb/ton	NIST1038
Time Conversion	24 hr/day	
Density of Diesel	7.05 lb/gal	Density of distillate oil from Densities of Selected Substances, pg A-7, AP-42 Appendix A, (9/85)
Sulfur Dioxide (SO ₂), Molecular Weight	64.064 lb/lb-mole	NIST Chemistry WebBook, SRD 69
Sulfur (S), Molecular Weight	32.065 lb/lb-mole	NIST Chemistry WebBook, SRD 69

EMISSION FACTOR DEVELOPMENT

Diesel Energy Content	19,300 Btu/lb	AP-42 Section 3.3, Table 3.3-1, Footnote 'c'
Not to Exceed Multiplier - NO _x , PM, and NMHC	1.50	40 CFR 1039.101(e)(3). Assumes worst-case for all pollutants listed
Not to Exceed Multiplier - CO	1.25	40 CFR 1039.101(e)
Sulfur Content (Non-Road Diesel Fuel)	15 ppm	40 CFR 60.4207(b) and 40 CFR 80.510(b)

Table I-11 - Tank Farm Lift Station Backup Pump (Tier 4) Engine Potential Emissions

EMISSION FACTORS

Pollutant	Emission Factor	Units	
NO _x +NMHC	7.05 g/kW-hr		Final Tier 4 Certified, 40 CFR 1039.101(b) Table 1, 19 ≤ kW ≤ 56(g/kW-hr), x Not to Exceed Multiplier (1.5)
NO _x Tier 4 Std for 56<kW<130 kW engine	0.40 g/kW-hr		Final Tier 4 Certified, 40 CFR 1039.101(b) Table 1, 56 ≤ kW ≤ 130 (g/kW-hr), x Not to Exceed Multiplier (1.5)
NMHC Tier 4 Std for 56<kW<130 kW engine	0.19 g/kW-hr		Final Tier 4 Certified, 40 CFR 1039.101(b) Table 1, 56 ≤ kW ≤ 130(g/kW-hr), x Not to Exceed Multiplier (1.5)
NO _x	4.78 g/kW-hr		= NOX+NMHC std (g/kW-hr) * NOX Tier 4 std for 56-130 kW engine (g/kW-hr) / [NOX Tier 4 std for 56-130 kW engine (g/kW-hr)+NMHC Tier 4 std for 56-130 kW engine (g/kW-hr)]
NMHC	2.27 g/kW-hr		= NOX+NMHC std (g/kW-hr) * NOX Tier 4 std for 56-130 kW engine (g/kW-hr)/[NMHC Tier 4 std for 56-130 kW engine (g/kW-hr)+NMHC Tier 4 std for 56-130 kW engine (g/kW-hr)]
CO	6.25 g/kW-hr		Final Tier 4 Certified, 40 CFR 1039.101(b) Table 1, 19 ≤ kW ≤ 56(g/kW-hr), x Not to Exceed Multiplier (1.5)
SO ₂	7.14E-04 lb/hr		= (Sulfur Content (ppm) * 10 ⁻⁶) * [Heat Input Capacity (MMBtu/hr) * 10 ⁶ (Btu/MMBtu) / Diesel Energy Content (Btu/lb)] * [1 lbmole SO ₂ / 1 lbmole S] * [SO ₂ M.W./ Sulfur M.W.]
Filterable PM/PM ₁₀	0.05 g/kW-hr		Final Tier 4 Certified, 40 CFR 1039.101(b) Table 1, 19 ≤ kW ≤ 56(g/kW-hr), x Not to Exceed Multiplier (1.5)
Condensable PM Factor	7.70E-03 lb/MMBtu		AP-42, Section 3.4, Table 3.4-2
Filterable PM Factor	0.06 lb/MMBtu		AP-42, Section 3.4, Table 3.4-2
Condensable PM	5.59E-03 g/kW-hr		= (Condensable Particulate Emission Factor (lb/MMBtu) / (Filterable Particulate Emission Factor (lb/MMBtu)) * Filterable Emission Factor (g/kW-hr) where the ratio is taken from section AP-42, Section 3.4, Table 3.4-2
Total PM	0.05 g/kW-hr		= Filterable PM/PM ₁₀ EF (g/kW-hr) + Condensable PM EF (g/kW-hr)
Formaldehyde	1.18E-03 lb/MMBtu		AP-42, Section 3.3, Table 3.3-2
Total HAP	3.87E-03 lb/MMBtu		AP-42, Section 3.3, Table 3.3-2
CO ₂	73.96 kg/MMBtu		40 CFR 98, Subpart C, Table C-1 for Distillate Fuel Oil No. 2
CH ₄	3.00E-03 kg/MMBtu		40 CFR 98, Subpart C, Table C-2 for Petroleum
N ₂ O	6.00E-04 kg/MMBtu		40 CFR 98, Subpart C, Table C-2 for Petroleum
GWP - CO ₂	1		Table A-1 of 40 CFR 98, Subpart A
GWP - CH ₄	28		Table A-1 of 40 CFR 98, Subpart A
GWP - N ₂ O	265		Table A-1 of 40 CFR 98, Subpart A

Table I-11 - Tank Farm Lift Station Backup Pump (Tier 4) Engine Potential Emissions

POTENTIAL EMISSIONS

Pollutant	(lbs/hr)	(tons/yr)
NO _x ^a	0.52	2.26
CO ^a	0.68	2.96
SO ₂ ^b	7.14E-04	3.13E-03
Filterable PM/PM _{2.5} /PM ₁₀ ^a	4.86E-03	2.13E-02
Condensable PM ^a	6.04E-04	2.64E-03
Total PM ^a	5.46E-03	2.39E-02
VOC ^a	0.25	1.07
Formaldehyde ^c	5.43E-04	2.38E-03
Total HAP ^c	1.78E-03	7.80E-03
CO ₂ ^d		328.50
CH ₄ ^d		1.33E-02
N ₂ O ^d		2.66E-03
CO ₂ e ^e		329.58

^a Hourly Emissions (lbs/hr) = Emission Factor (g/kW-hr) * Maximum Power Output (kW) / 453.59 (g/lb)

Annual Emission (tpy) = Emission Factor (g/kW-hr) * Maximum Power Output (kW) * Operating hours (hr/yr) / 453.59 (g/lb) / 2,000 (lbs/ton)

^b Hourly Emissions (lbs/hr) = SO₂ Emission Factor (lb/hr)

Annual Emission (tpy) = SO₂ Emission Factor (lb/hr) * Operating hours (hr/yr) / 2,000 (lbs/ton)

^c Hourly Emission (lbs/hr) = Emission Factor (lb/MMBtu) * Maximum Heat Input Capacity (MMBtu/hr)

Annual Emission (tons/yr) = Emission Factor (lb/MMBtu) * Maximum Heat Input Capacity (MMBtu/hr) * Operating Hours (hrs/yr) / 2,000 (lbs/ton)

^d Annual Emissions (tons/yr) = Emission Factor (kg/MMBtu) * Maximum Heat Input Capacity (MMBtu/hr) * Operating Hours (hrs/yr) / 0.4536 (kg/lb) / 2,000 (lbs/ton)

^e CO₂e Emissions (tons/yr) = Annual CO₂ Emission (tpy) * CO₂ GWP + Annual CH₄ Emissions (tpy) * CH₄ GWP + Annual N₂O Emissions (tpy) * N₂O GWP

Table I-12 - Paved Roads Potential Emissions

$E = [k (sL)^{0.91} (W)^{1.02} + C] * (1-P/4N)$	AP-42 Section 13.2.1, Equation 1 (January 2011); Emission factor equation for Paved Roads, AP-42 Section 13.2.1, Equation 1 (January 2011). Equation 1 has been modified to add the C factors from the November 2006 edition of AP-42 into the empirical equation to account for emissions from tire wear, brake wear, and exhaust.

SITE PARAMETERS

One-Way Road Lengths ^a

Path 1 - Office Employees	0.22 miles
Path 2 - Far Dock Operators	0.81 miles
Path 3 - A-300 (Dye) Truck Traffic	0.22 miles
Path 4 - A-301 (Additive) Truck Traffic	0.17 miles
Path 5 - Butane Truck Enter Path	0.14 miles
Path 6 - Butane Truck Exit Path	0.10 miles

^a Length of each road segment is determined using Google Earth

Vehicle Pathways

Vehicle Type	Entering Weight (tons)	Entering Pathway	Exiting Weight (tons)	Exiting Pathway	Annual Maximum (#/year)	VMT Entering the Facility on Paved Roads (miles/yr) ~	VMT Exiting the Facility on Paved Roads (miles/yr) ~
Employee Cars	2	1	2	1	14,600	3,180	3,180
Employee Cars (Far Dock Operators)	2	2	2	2	1,825	1,469	1,469
Raw Material Trucks (A-300)	40	3	13	3	4	1	1
Raw Material Trucks (A-301)	40	4	13	4	4	1	1
Butane Trucks - Unloading at the facility	40	5	13	6	2,442	342	244

^b Total VMT on Paved Roads = Total Length of the Paved Pathway Travelled by each Vehicle (miles) * Max. Number of Vehicles Travelling the Pathway (Vehicles/yr)

Average Vehicle Weight	3.6 tons	Weighted against vehicle miles travelled on paved roads Sum of VMT for all vehicles entering and exiting facility on paved roads AP-42 Section 13.2.1, Table 13.2.1-2 (January 2011) AP-42 Section 13.2.2, Figure 13.2.2-1
Total Vehicle Miles Travelled	9,888 VMT/yr	
Silt Loading (s)	0.6 g/m ²	
Number of Days in Averaging Period (N)	365 days	
Number of Days w/ at least 0.01" of Precipitation	140 days	

Table I-12 - Paved Roads Potential Emissions

EMISSION PARAMETERS ^c

Particle Size Multiplier (k) - PM	0.011 lb/VMT	AP-42 Section 13.2.1, Table 13.2.1-1 (January 2011)
Particle Size Multiplier (k) - PM ₁₀	0.0022 lb/VMT	AP-42 Section 13.2.1, Table 13.2.1-1 (January 2011)
Particle Size Multiplier (k) - PM _{2.5}	0.00054 lb/VMT	AP-42 Section 13.2.1, Table 13.2.1-1 (January 2011)
Empirical Constant, a	0.91	AP-42 Section 13.2.1, Equation (1) (January 2011)
Empirical Constant, b	1.02	AP-42 Section 13.2.1, Equation (1) (January 2011)
Brake Wear and Tire Wear Factor (C) - PM/PM ₁₀	0.00047 lb/VMT	AP-42, Section 13.2.1, Table 13.2.1-2 (November 2006)
Brake Wear and Tire Wear Factor (C) - PM _{2.5}	0.00036 lb/VMT	AP-42, Section 13.2.1, Table 13.2.1-2 (November 2006)
PM Emission Factor	2.3E-02 lb/VMT	$E = [k (s)^{0.91} (W)^{1.02} + C] * (1-P/4N)$, where N=365 day/yr
PM ₁₀ Emission Factor	5.0E-03 lb/VMT	$E = [k (s)^{0.91} (W)^{1.02} + C] * (1-P/4N)$
PM _{2.5} Emission Factor	1.5E-03 lb/VMT	$E = [k (s)^{0.91} (W)^{1.02} + C] * (1-P/4N)$

^c PM = PM₃₀

DIMENSIONAL ANALYSIS

1 ton	2,000 lbs	NIST SP1038
1 yr	365 days	

POTENTIAL EMISSIONS

Pollutant	(tpy) ^d
PM	0.12
PM ₁₀	0.02
PM _{2.5}	0.007

^d Emissions (tpy) = Emissions (lb/day) * 365 (days/yr) / 2000 (lb/ton)

Table I-13 - LDAR Components Potential Emissions

EMISSION FACTORS AND OPERATING PARAMETERS

Component Type	Heavy Liquid Service ^b		Light Liquid Service		Gas Vapor Service	
	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr
Valve	4.30E-05	9.48E-05	4.30E-05	9.48E-05	1.30E-05	2.87E-05
Pump Seal	5.40E-04	1.19E-03	5.40E-04	1.19E-03		
Fitting	8.00E-06	1.76E-05	8.00E-06	1.76E-05	4.20E-05	9.26E-05
Other (e.g., PRD)	1.30E-04	2.87E-04	1.30E-04	2.87E-04	1.20E-04	2.65E-04

^a EPA Protocol for Equipment Leak Emission Estimates, Office of Air Quality, Planning and Standards, Research Triangle Park, NC 27711. EPA-453/R-95-017 November 1995, Table 2-3 Marketing Terminal Average Emission Factors

^b Factors for heavy liquid are assumed to be equivalent to factors used for light liquids from EPA Protocol for Equipment Leak Emission Estimates, Office of Air Quality, Planning and Standards, Research Triangle Park, NC 27711. EPA-453/R-95-017 November 1995, Table 2-3 Marketing Terminal Average Emission Factors (used due to absence of heavy liquid factors in Table 2-3; applies emission factor provided for 'Connectors' to 'Fittings')

DIMENSIONAL ANALYSIS

Time Conversion	365 day/yr	NIST SP1038 NIST SP1038
Time Conversion	24 hr/day	
Mass Conversion	2,000 lb/ton	
Mass Conversion	0.454 kg/lb	

COMPONENT COUNT ESTIMATES - GASOLINE/DISTILLATE SERVICE

No. of Components	Heavy Liquid Service	Light Liquid Service	Gas Vapor Service
Valves	1,088	974	185
Pump Seals	22	20	
Fittings/Connectors	3,062	2,623	556
Other (e.g., PRDs)	29	25	4

fittings include connectors, flanges, and threaded unions

Table I-13 - LDAR Components Potential Emissions

COMPONENT COUNT ESTIMATES - BUTANE SERVICE (NO HAP)

No. of Components	Heavy Liquid Service	Light Liquid Service	Gas Vapor Service
Valves		131	79
Pump Seals		8	
Fittings/Connectors		743	207
Other (e.g., PRDs)		47	20

fittings include connectors, flanges, and threaded unions

COMPOSITION DATA

VOC Composition	100%	Assuming 100% of material is VOC

POTENTIAL EMISSIONS CALCULATIONS - GASOLINE/DISTILLATE SERVICE

Emissions by Component Type (lb/yr) = No. of Components * EF for Component (lb/hr) * 365 (day/yr) * 24 (hr/day) * VOC Composition (%)

Component Type	Heavy Liquid Service (lb/yr)	Light Liquid Service (lb/yr)	Gas Vapor Service (lb/yr)
Valves	904	809	46
Pump Seals	229	209	0
Fittings	473	405	451
Other	73	63	9
Total	1,679	1,485	507

POTENTIAL EMISSIONS CALCULATIONS - BUTANE SERVICE (NO HAP)

Emissions by Component Type (lb/yr) = No. of Components * EF for Component (lb/hr) * 365 (day/yr) * 24 (hr/day) * VOC Composition (%)

Component Type	Heavy Liquid Service (lb/yr)	Light Liquid Service (lb/yr)	Gas Vapor Service (lb/yr)
Valves	-	49	66
Pump Seals	-	38	0
Fittings	-	52	32
Other	-	54	50
Total	-	193	148

POTENTIAL EMISSIONS TOTALS

Total LDAR VOC PTE
4,012 lb/yr
2.01 tpy

Table I-14 - Butane Truck Hose Disconnect Potential Emissions

DIMENSIONAL ANALYSIS

Volume Conversion	42 gallons/bbl
Volume Conversion	3,785.41 cc/gal
Mass Conversion	2,000 lb/ton

BUTANE OFFLOAD SYSTEM HOSE DISCONNECT LOSSES - TRUCKS

Butane transport truck load	192.5 bbl/truck	Average Truck capacity varies from 180 to 205 bbl.
Disconnect losses per connector	0.35 cc/event	Estimate release volume from TODO disconnect joints
Disconnect losses per connector	9.25E-05 gallons/event	Disconnect losses per connect (cc/event) / Conversion factor (cc/gallon)
Butane Density	4.9 lb/gal	at 60 °F
Connectors disconnected per event	1 connector	One hose, one connector at each end of hose. Only one side will be disconnected per unloading event.
Transport trucks per hour	1 trucks/hr	Assumes no more than one truck can be unloaded per hour
Transport trucks per day	20 trucks/day	Estimated maximum number of trucks
Transport trucks per year	2,442 trucks/yr	Estimated based on maximum of 470,000 bbls and average truck capacity of 192.5 bbl.
Disconnect events per year	2,442 events per year	= Transport Trucks per year * number of connectors disconnected per truck

POTENTIAL EMISSIONS - TRUCKS

VOC from Hose Disconnect Events	4.53E-04 lb/hr	= Disconnect losses per connector (gal/event) * Butane Density (lb/gal) * No. Connectors * Disconnect events (events/hr). Assumes 1 truck per hour max.
VOC from Hose Disconnect Events	9.06E-03 lb/day	= Disconnect losses per connector (gal/event) * Butane Density (lb/gal) * No. Connectors * Disconnect events (events/day).
VOC from Hose Disconnect Events	5.53E-04 tons/year	= Disconnect losses per connector (gal/event) * Butane Density (lb/gal) * No. Connectors * Disconnect events (events/yr) / 2,000 (lb/ton)

Table I-15 - Butane Railcar Offload Hose Disconnect Emissions

DIMENSIONAL ANALYSIS

Volume Conversion	1,728 in ³ /ft ³	NIST SP1038
Time Conversion	365 days/yr	
Mass Conversion	2,000 lb/ton	

BUTANE RAIL OFFLOAD SYSTEM - STINGER PIPE VENTS

Transport railcars per day	6 railcars/day	Manufacturer Specifications
Number of Stinger Pipe Vents	2 vents per railcar unloaded	
Pipe Diameter	2 in	
Pipe Length	24 in	Manufacturer Specifications
Pipe Volume	75.40 in ³	$= [\pi * diameter (in)^2 / 4] * Length (in)$
Pipe Volume	0.04 ft ³	$= Pipe Volume (in^3) / 1,728 in^3/ft^3$
Pipe Pressure	10 psi	Client Supplied
Pipe Temperature	527.67 °R	Ambient Temperature
Gas Constant	10.73 (psi * ft ³)/(lb-mol * °R)	NIST WebBook, SRD 69
Butane Molecular Weight	58.12 lb/lb-mol	
Butane Released per Railcar	4.48E-03 lb/car	

$$= [(Pipe Volume (ft^3) * Pipe Pressure (psi)) / (Pipe Temp (°R) * Gas Constant ((psi * ft^3)/(lb-mol * °R)))] * Butane MW (lb/lbmol)$$

POTENTIAL EMISSIONS - STINGER PIPE VENTS

Daily VOC Emissions	0.05 lb/day	$= Butane Released per Railcar (lb/railcar) * Number of Railcars (railcars/day) * Number of Stinger Pipe Vents per Railcar (vents/railcar)$
Annual VOC Emissions	0.01 tpy	$= Daily Emissions (lb/day) * 365 (days/yr) / 2000 (lb/ton)$

Table I-16 - Wastewater System Potential Emissions

This sheet is used for wastewater collection systems. Directions: 1) input the number of collection system components for each process drainage area; 2) input the process drainage area point-of-generation concentrations and flow rate (yellow boxes); 3) review the default air emissions control efficiencies and change if necessary; and 4) record the collection system air emissions and wastewater concentrations for downstream process units air emissions calculations (green boxes).

Collection System Component	Process Drainage Area #1
Number of uncontrolled drains	0
Number of sealed drains	46
Linear meters of open trench	0
Number of uncontrolled manholes	0
Number of sealed manholes	0
Number of uncontrolled junction boxes	0
Number of controlled junction boxes	23
Number of uncontrolled lift stations	0
Number of controlled lift stations	1
Number of uncontrolled sumps	0
Number of controlled sumps	10

Includes catch basins and junction boxes

Collection System Component Air Emissions Control	Control Efficiency, %	Default Control Efficiency, %
Drain water seal	95	95
Manhole seal	95	95
Junction box water seal	95	95
Lift station control (e.g., carbon adsorption)	95	95
Sump control (e.g., carbon adsorption)	95	95

	Process Drainage Area #1			
Wastewater flow rate (Q)	1.68E-03	m ³ /s		
Compound Name	POG Concentration ^a	Units	Air Emissions	Units
Methanol	0.0000	g/m ³	0	g/s
Benzene	101.3164	g/m ³	0.005189255	g/s
Carbon disulfide	0.0000	g/m ³	0	g/s
Methyl ethyl ketone	0.0000	g/m ³	0	g/s
Naphthalene	29.3817	g/m ³	0.001026649	g/s
Cumene	37.4870	g/m ³	0.002158839	g/s
Ethylbenzene	89.1584	g/m ³	0.004770573	g/s
Styrene	0.0000	g/m ³	0	g/s
1,3-Butadiene	0.0000	g/m ³	0	g/s
Ethylene glycol	0.0000	g/m ³	0	g/s
Methyl isobutyl ketone	0.0000	g/m ³	0	g/s
Toluene	334.3440	g/m ³	0.017510324	g/s
Phenol	0.0000	g/m ³	0	g/s
n-Hexane	354.6072	g/m ³	0.025386867	g/s
Cresols (total)	0.0000	g/m ³	0	g/s
Xylenes	364.7389	g/m ³	0.018873689	g/s
Methyl tert-butyl ether	0.0000	g/m ³	0	g/s
Biphenyl, 1,1-	0.0000	g/m ³	0	g/s
Carbonyl sulfide	0.0000	g/m ³	0	g/s
Dichloroethane, 1,2-	0.0000	g/m ³	0	g/s
Diethanolamine	0.0000	g/m ³	0	g/s
Trimethylpentane, 2,2,4-	199.5932	g/m ³	0.018488348	g/s
n-Butane (VOC Surrogate)	8206.6244	g/m ³	0.698009349	g/s

Assumes Wastewater Flow = 2013 BWON TAB Max Organic Phase Flow from Tank 256 (scaled up x 6) + 2013 BWON TAB Aqueous Flow

^aFor benzene, POG concentration obtained from 'Kenova TAB Contribution' spreadsheet.

^bFor non-benzene pollutants, POG concentration obtained using the ratios from Table 7-9. Refinery Wastewater Contaminant Concentrations as a Ratio to Benzene provided in "Emission Estimation Protocol for Petroleum Refineries" Version 3 (4/2015); specifically, Pollutant Concentration (g/m³) = Benzene Concentration (g/m³) * Table 7-9. Pollutant-Specific Factor

Table I-16 - Wastewater System Potential Emissions

This sheet is used for wastewater collection systems. Directions: 1) input the number of collection system components for each process drainage area; 2) input the process drainage area point-of-generation concentrations and flow rate (yellow boxes); 3) review the default air emissions control efficiencies and change if necessary; and 4) record the collection system air emissions and wastewater concentrations for downstream process units air emissions calculations (green boxes).

OUTPUTS								
Compound Name	Total Emissions	Units	Collection System Effluent Concentration	Units	POG Total Load	Units	Total Emissions	Units
Methanol	0.000000	g/s					0.00	lb/yr
Benzene	0.005189	g/s					360.78	lb/yr
Carbon disulfide	0.000000	g/s					0.00	lb/yr
Methyl ethyl ketone	0.000000	g/s					0.00	lb/yr
Naphthalene	0.001027	g/s					71.38	lb/yr
Cumene	0.002159	g/s					150.09	lb/yr
Ethylbenzene	0.004771	g/s					331.67	lb/yr
Styrene	0.000000	g/s					0.00	lb/yr
1,3-Butadiene	0.000000	g/s					0.00	lb/yr
Ethylene glycol	0.000000	g/s					0.00	lb/yr
Methyl isobutyl ketone	0.000000	g/s					0.00	lb/yr
Toluene	0.017510	g/s					1217.40	lb/yr
Phenol	0.000000	g/s					0.00	lb/yr
n-Hexane	0.025387	g/s					1765.02	lb/yr
Cresols (total)	0.000000	g/s					0.00	lb/yr
Xylenes	0.018874	g/s					1312.19	lb/yr
Methyl tert-butyl ether	0.000000	g/s					0.00	lb/yr
Biphenyl, 1,1-	0.000000	g/s					0.00	lb/yr
Carbonyl sulfide	0.000000	g/s					0.00	lb/yr
Dichloroethane, 1,2-	0.000000	g/s					0.00	lb/yr
Diethanolamine	0.000000	g/s					0.00	lb/yr
Trimethylpentane, 2,2,4-	0.018488	g/s					1285.40	lb/yr
n-Butane (VOC Surrogate)	0.698009	g/s					48529.09	lb/yr
Total HAP Emissions							6,493.9	lb/yr
Total HAP Emissions							3.25	tpy
Total VOC Emissions							48,529.1	lb/yr
Total VOC Emissions							24.3	tpy

Compound Name	fe, Drains	fe, Sealed Drains	fe, Trenches	fe, Manholes	fe, Sealed Manholes	fe, Junction Boxes	fe, Controlled Junction Boxes	fe, Lift Stations	fe, Controlled Lift Stations	fe, Sumps	fe, Controlled Sumps
Methanol	0.000E+00	0.000E+00	4.298E-03	0.000E+00	0.000E+00	1.245E-02	6.223E-04	3.253E-02	1.626E-03	2.080E-03	1.040E-04
Benzene	2.263E-01	1.131E-02	3.986E-02	5.690E-02	2.845E-03	8.712E-02	4.356E-03	2.544E-01	1.272E-02	4.925E-03	2.462E-04
Carbon disulfide	2.854E-01	1.427E-02	4.830E-02	7.211E-02	3.605E-03	1.049E-01	5.243E-03	3.071E-01	1.536E-02	5.600E-03	2.800E-04
Methyl ethyl ketone	6.518E-02	3.259E-03	1.684E-02	1.547E-02	7.736E-04	3.878E-02	1.939E-03	1.108E-01	5.540E-03	3.083E-03	1.542E-04
Naphthalene	1.407E-01	7.033E-03	2.762E-02	3.488E-02	1.744E-03	6.143E-02	3.071E-03	1.781E-01	8.904E-03	3.946E-03	1.973E-04
Cumene	2.600E-01	1.300E-02	4.467E-02	6.556E-02	3.278E-03	9.722E-02	4.861E-03	2.844E-01	1.422E-02	5.309E-03	2.655E-04
Ethylbenzene	2.384E-01	1.192E-02	4.158E-02	6.001E-02	3.000E-03	9.074E-02	4.537E-03	2.652E-01	1.326E-02	5.063E-03	2.531E-04
Styrene	2.015E-01	1.008E-02	3.632E-02	5.053E-02	2.527E-03	7.969E-02	3.985E-03	2.323E-01	1.162E-02	4.642E-03	2.321E-04
1,3-Butadiene	3.166E-01	1.583E-02	5.275E-02	8.012E-02	4.006E-03	1.142E-01	5.710E-03	3.349E-01	1.674E-02	5.956E-03	2.978E-04
Ethylene glycol	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Methyl isobutyl ketone	9.682E-02	4.841E-03	2.136E-02	2.361E-02	1.180E-03	4.828E-02	2.414E-03	1.390E-01	6.950E-03	3.445E-03	1.722E-04
Toluene	2.324E-01	1.162E-02	4.073E-02	5.847E-02	2.923E-03	8.895E-02	4.447E-03	2.598E-01	1.299E-02	4.994E-03	2.497E-04
Phenol	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.104E-03	5.521E-05
n-Hexane	3.343E-01	1.671E-02	5.528E-02	8.467E-02	4.233E-03	1.195E-01	5.976E-03	3.507E-01	1.753E-02	6.159E-03	3.079E-04
Cresols (total)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.603E-03	8.013E-05	3.078E-04	1.539E-05	1.667E-03	8.334E-05
Xylenes	2.291E-01	1.145E-02	4.025E-02	5.762E-02	2.881E-03	8.795E-02	4.398E-03	2.569E-01	1.284E-02	4.956E-03	2.478E-04
Methyl tert-butyl ether	1.455E-01	7.276E-03	2.832E-02	3.613E-02	1.807E-03	6.289E-02	3.144E-03	1.824E-01	9.121E-03	4.001E-03	2.001E-04
Biphenyl, 1,1-	1.216E-01	6.079E-03	2.490E-02	2.997E-02	1.499E-03	5.570E-02	2.785E-03	1.611E-01	8.053E-03	3.728E-03	1.864E-04
Carbonyl sulfide	3.025E-01	1.512E-02	5.074E-02	7.649E-02	3.825E-03	1.100E-01	5.499E-03	3.223E-01	1.612E-02	5.795E-03	2.898E-04
Dichloroethane, 1,2-	1.779E-01	8.895E-03	3.294E-02	4.446E-02	2.223E-03	7.260E-02	3.630E-03	2.113E-01	1.056E-02	4.371E-03	2.186E-04
Diethanolamine	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Trimethylpentane, 2,2,4-	4.467E-01	2.233E-02	7.134E-02	1.136E-01	5.679E-03	1.532E-01	7.662E-03	4.509E-01	2.254E-02	7.443E-03	3.722E-04
n-Butane (VOC Surrogate)	4.061E-01	2.031E-02	6.554E-02	1.031E-01	5.157E-03	1.411E-01	7.053E-03	4.147E-01	2.073E-02	6.979E-03	3.490E-04

Table I-16 - Wastewater System Potential Emissions

This sheet is used for wastewater collection systems. Directions: 1) input the number of collection system components for each process drainage area; 2) input the process drainage area point-of-generation concentrations and flow rate (yellow boxes); 3) review the default air emissions control efficiencies and change if necessary; and 4) record the collection system air emissions and wastewater concentrations for downstream process units air emissions calculations (green boxes).

Process Parameters / Conversion Factors

Benzene Concentration in Aqueous Phase	3.30 ppmw	Assumes benzene concentration is the maximum concentration obtained from 'Kenova TAB Contribution' spreadsheet
Benzene Concentration in Organic Phase	8,688 ppmw	Assumes benzene concentration is the maximum concentration obtained from 'Kenova TAB Contribution' spreadsheet
Aqueous Flow	12,538,218 gal/yr	Obtained from 'Kenova TAB Contribution' spreadsheet
Organic Flow	214,136 gal/yr	Obtained from 'Kenova TAB Contribution' spreadsheet
Liquid Density of Aqueous Phase	8.35 lb/gal	assumes water
Liquid Density of Organic Phase	5.60 lb/gal	Per AP-42, Table 7.1-2 (assumes gasoline RVP 10)
Mass Aqueous Flow	104,636,500 lb/yr	= Volumetric Flow Rate (gal/yr) * Density (lb/gal)
Mass Organic Flow	1,199,160 lb/yr	= Volumetric Flow Rate (gal/yr) * Density (lb/gal)
Benzene Flow	10,763 lb/yr	= (Aq Benzene Concentration (ppmw) * Aq Mass Flow (lb/yr) + Org Benzene Concentration (ppmw) * Org Mass Flow (lb/yr)) / (1,000,000 ppm)
Weighted Avg Benzene Concentration	101.7 ppmw	= Total Benzene Flow (lb/yr) / Total Liquid Flow (lb/yr) / 1,000,000 (ppmw)
Weighted Avg Liquid Density	8.31 lb/gal	= (Aq Benzene Density (lb/gal) * Aq Mass Flow (lb/yr) + Org Benzene Density (lb/gal) * Org Mass Flow (lb/yr)) / (Total Liquid Flow (gal/yr))
Weighted Avg Liquid Density	996,272.6 g/m ³	= Weighted Avg Liquid Density (lb/gal) * 453.593 (g/lb) x 264.17 (gal/m ³)
Benzene Weighted Average Concentration	101.3 g/m ³	= Weighted Avg Benzene Concentration (ppmw) * Weighted Avg Liquid Density (g/m ³) / 1,000,000 (ppmw)
Volume Conversion	264.17 gal/m ³	
Conversion	1,000,000 units/MMUnit	
Time Conversion	8,760 hr/yr	
Time Conversion	3,600 sec/hr	
Mass Conversion	2,000 lb/ton	
Mass Conversion	0.45 kg/lb	
Mass Conversion	1,000 g/kg	

**Table 7-9. Refinery Wastewater Contaminant Concentrations as a Ratio to Benzene
Emission Estimation Protocol for Petroleum Refineries Version 3 (4/2015)**

CAS	HAP	Mass Concentration Ratio of Compounds to the Concentration of Benzene	
		Inlet to OWS	Outlet from OWS
540841	Trimethylpentane, 2,2,4-	1.97	0.022
71432	Benzene	1	1
98828	Cumene	0.37	0.013
100414	Ethylbenzene	0.88	0.086
110543	N-Hexane	3.5	0.047
91203	Naphthalene	0.29	0.02
108883	Toluene	3.3	0.8
1330207	Xylenes	3.6	0.33
VOC	n-Butane (VOC Surrogate)	81	17

Table I-17 - Fuel Additive and Dye Potential HAP Emissions

Temperature Data

Daily Average Ambient Temperature	515.42 °R	AP-42 Table 7.1-7 and Equation 1-32 (10/24) for Huntington, WV
Liquid Bulk Temperature	516.36 °R	AP-42 Chapter 7.1 Equation 1-33 (10/24)
Tank Paint Solar Absorptance	0.25 dimensionless	AP-42 Table 7.1-6 (10/24) for white paint in average condition
Daily Total Solar Insolation Factor	1250 BTU/ft ² -d	AP-42 Table 7.1-7 (10/24) for Huntington, WV
Daily Average Liquid Surface Temperature	14.38 °C	AP-42 Chapter 7.1 Equation 1-30 (10/24)

Unisol® Liquid Red BK-50 Properties

Molecular Weight of Liquid Stock	162 lb/lb-mol	TankESP
Molecular Weight of Vapor Stock	130 lb/lb-mol	TankESP
Vapor Pressure at 20 °C	4.575 mmHg	Per Unisol Liquid Red BK-50 SDS 3/13/24
Vapor Pressure at 20 °C	0.09 psia	

HiTEC® 4142M Fuel Additive Properties

Molecular Weight of Liquid Stock	162 lb/lb-mol	TankESP
Molecular Weight of Vapor Stock	130 lb/lb-mol	TankESP
Vapor Pressure at 13.74 °C	0.05 psia	TankESP

Material	Component	A ^a	B ^a	C ^a	Vapor Pressure (mmHg) ^b	Vapor Pressure (psi _a) ^c	MW (lb/lb-mole) ^d	Liquid Weight Fraction ⁱ	Liquid Mole Fraction ^e	Partial Pressure (psi _a) ^f	Vapor Mole Fraction ^g	Vapor Weight Fraction ^h
Unisol® Liquid Red BK-50 Calculation	Xylene	7.009	1426.3	215.11	6.2	0.12	106.17	0.25	0.38	0.05	0.52	0.42
	Ethylbenzene	6.975	1424.255	213.21	5.2	0.10	106.17	0.10	0.15	0.02	0.17	0.14
HiTEC® 4142M Fuel Additive Calculation	Xylene	7.009	1426.266	215.11	6.2	0.12	106.16	0.049	0.07	0.009	0.19	0.16
	Cumene	6.93666	1460.793	207.78	2.3	0.04	120.19	0.049	0.05	0.002	0.05	0.05

^a AP-42 Table 7.1-5 (10/24)

^b Vapor Pressure (mmHg) = 10^A [A-(B/(T_{LA} (°C)+C))]

^c Vapor Pressure (psi_a) = Vapor Pressure (mmHg)/51.7149

^d NIST

^e Liquid Mole Fraction = Weight Fraction of Component * Molecular Weight of Liquid Stock (lb/lb-mol) / Molecular Weight of Component (lb/lb-mol)

^f Partial Pressure (psi_a) = Vapor Pressure of Component (psi_a) * Liquid Mole Fraction

^g Vapor Mole Fraction = Partial Pressure (psi_a) / Vapor Pressure of Component (psi_a)

^h Vapor Weight Fraction = Vapor Mole Fraction * Molecular Weight of Component (lb/lb-mol) / Molecular Weight of Liquid Stock (lb/lb-mol)

HAP Emissions

Tank	VOC (tpy)	Material Used	Component	Emission Rate (tpy) ⁱ
Tank 300	9.47E-04	Unisol® Liquid Red BK-50	Xylene	4.0E-04
			Ethylbenzene	1.3E-04
Tank 301	1.03E-02	HiTEC® 4142M Fuel Additive	Xylene	1.6E-03
			Cumene	4.8E-04

ⁱ Emission Rate (tpy) = VOC (tpy) * Vapor Weight Fraction

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 23-273
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 34.53 degrees F
Avg Daily Temp Range, ΔTa: 15.64 degrees F
Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: 0.25
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>5.51</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>1038.25</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>190.57</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>given by user</u>		
Liquid Surface Temp, T _{la} :	<u>56.2</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0510</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00277</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>42.49174</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 129,300 bbl per month
Days this Period: 31 days
Turnover Rate: 69.1 turnovers per year
Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 14.999008 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 60.00 deg F P_{vx} = 0.057 psia
T_{ln} = 52.50 deg F P_{vn} = 0.045 psia
ΔP_V = 0.012227 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0257098
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9282747
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: January 2024
Standing Storage Loss: 133.95 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,206.97</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,340.92</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>133.95</u>	lb per	month
Working Loss(with control):	<u>1,206.97</u>	lb per	month
Total Emissions(with control):	<u>1,340.92</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 23-273
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.4 degrees F
Avg Daily Temp Range, ΔTa: 17.06 degrees F
Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: 0.25
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>	
Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid VaporPressure:	<u></u> psi (if specified)	A: <u>5.51</u>
ASTM Distillation Slope:	<u></u> (if specified)	B: <u>1038.25</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol	C: <u>190.57</u>
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>	
Liquid Surface Temp, T _{la} :	<u>57.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0534</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00288</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>45.34459</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u></u> degrees F	
Min Liquid Bulk Temp:	<u></u> degrees F	
Heating cycle frequency:	<u></u> days	

Operational Data:

Throughput: 129,300 bbl per month
Days this Period: 29 days
Turnover Rate: 73.9 turnovers per year
Turnover Factor, K_N: 0.573

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 17.211222 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 61.98 deg F P_{vx} = 0.061 psia
T_{ln} = 53.37 deg F P_{vn} = 0.047 psia
ΔP_V = 0.0145731 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0300704
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9251974
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

February 2024
Standing Storage Loss: 151.98 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,197.26</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,349.25</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>151.98</u>	lb per	month
Working Loss(with control):	<u>1,197.26</u>	lb per	month
Total Emissions(with control):	<u>1,349.25</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>5.51</u>
Reid VaporPressure:		(if specified)	B: <u>1038.25</u>
ASTM Distillation Slope:		(if specified)	C: <u>190.57</u>
Molecular Weight, M _V :	<u>292.2</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>70.0</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>		
Liquid Surface Temp, T _{la} :	<u>61.4</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0599</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00319</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>52.71372</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 31 days
 Turnover Rate: 69.1 turnovers per year
 Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.62795 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 66.51 deg F P_{vx} = 0.070 psia
 T_{ln} = 56.20 deg F P_{vn} = 0.051 psia
 ΔP_V = 0.0192297 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0367193
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9168023
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: March 2024
 Standing Storage Loss: 217.48 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,389.26</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,606.74</u>	lb per	month
	0.8	tons per	month
Standing Storage Loss(with control):	<u>217.48</u>	lb per	month
Working Loss(with control):	<u>1,389.26</u>	lb per	month
Total Emissions(with control):	<u>1,606.74</u>	lb per	month
	<u>0.8</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.73 degrees F
 Avg Daily Temp Range, ΔTa: 21.92 degrees F
 Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid): B100 Virgin Soybean Oil

Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid VaporPressure:	<u> </u> psi (if specified)	A: <u>5.51</u>
ASTM Distillation Slope:	<u> </u> (if specified)	B: <u>1038.25</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol	C: <u>190.57</u>
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>	
Liquid Surface Temp, T _{la} :	<u>66.2</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0696</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00363</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>62.45392</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u> </u> degrees F	
Min Liquid Bulk Temp:	<u> </u> degrees F	
Heating cycle frequency:	<u> </u> days	

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 30 days
 Turnover Rate: 71.4 turnovers per year
 Turnover Factor, K_N: 0.587

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 24.096488 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 72.25 deg F P_{vx} = 0.083 psia
 T_{ln} = 60.20 deg F P_{vn} = 0.058 psia
 ΔP_V = 0.0254242 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0433828
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9046932
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

April 2024
 Standing Storage Loss: 279.53 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,545.79</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,825.32</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>279.53</u>	lb per	month
Working Loss(with control):	<u>1,545.79</u>	lb per	month
Total Emissions(with control):	<u>1,825.32</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 23-273
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 64.175 degrees F
Avg Daily Temp Range, ΔTa: 20.97 degrees F
Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>	
Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid VaporPressure:	<u></u> psi (if specified)	A: <u>5.51</u>
ASTM Distillation Slope:	<u></u> (if specified)	B: <u>1038.25</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol	C: <u>190.57</u>
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>	
Liquid Surface Temp, T _{la} :	<u>69.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0767</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00395</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>68.89997</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u></u> degrees F	
Min Liquid Bulk Temp:	<u></u> degrees F	
Heating cycle frequency:	<u></u> days	

Operational Data:

Throughput: 129,300 bbl per month
Days this Period: 31 days
Turnover Rate: 69.1 turnovers per year
Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 24.179088 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 75.49 deg F P_{vx} = 0.091 psia
T_{ln} = 63.41 deg F P_{vn} = 0.064 psia
ΔP_V = 0.0276227 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0434136
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.8960297
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

May 2024
Standing Storage Loss: 311.48 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,721.98</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,033.47</u>	lb per	month
	1.0	tons per	month
Standing Storage Loss(with control):	<u>311.48</u>	lb per	month
Working Loss(with control):	<u>1,721.98</u>	lb per	month
Total Emissions(with control):	<u>2,033.47</u>	lb per	month
	<u>1.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 72.255 degrees F
 Avg Daily Temp Range, ΔTa: 19.53 degrees F
 Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid): B100 Virgin Soybean Oil

Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid VaporPressure:	<u> </u> psi (if specified)	A: <u>5.51</u>
ASTM Distillation Slope:	<u> </u> (if specified)	B: <u>1038.25</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol	C: <u>190.57</u>
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>	
Liquid Surface Temp, T _{la} :	<u>72.9</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0848</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00431</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>75.77195</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u> </u> degrees F	
Min Liquid Bulk Temp:	<u> </u> degrees F	
Heating cycle frequency:	<u> </u> days	

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 30 days
 Turnover Rate: 71.4 turnovers per year
 Turnover Factor, K_N: 0.587

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.690285 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 78.81 deg F P_{vx} = 0.101 psia
 T_{ln} = 66.96 deg F P_{vn} = 0.071 psia
 ΔP_V = 0.029407 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0423255
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.8862145
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: June 2024
 Standing Storage Loss: 317.50 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,837.12</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,154.62</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>317.50</u>	lb per	month
Working Loss(with control):	<u>1,837.12</u>	lb per	month
Total Emissions(with control):	<u>2,154.62</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>5.51</u>
Reid VaporPressure:		(if specified)	B: <u>1038.25</u>
ASTM Distillation Slope:		(if specified)	C: <u>190.57</u>
Molecular Weight, M _V :	<u>292.2</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>70.0</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>		
Liquid Surface Temp, T _{la} :	<u>74.2</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0880</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00446</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>78.33118</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 31 days
 Turnover Rate: 69.1 turnovers per year
 Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.889197 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 79.89 deg F P_{vx} = 0.104 psia
 T_{ln} = 68.44 deg F P_{vn} = 0.074 psia
 ΔP_V = 0.0292888 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0407094
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.8824054
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

July 2024
 Standing Storage Loss: 324.57 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,943.04</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,267.60</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>324.57</u>	lb per	month
Working Loss(with control):	<u>1,943.04</u>	lb per	month
Total Emissions(with control):	<u>2,267.60</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>5.51</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>1038.25</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>190.57</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>given by user</u>		
Liquid Surface Temp, T _{la} :	<u>73.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0870</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00441</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>77.5067</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 31 days
 Turnover Rate: 69.1 turnovers per year
 Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.051672 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 79.52 deg F P_{vx} = 0.103 psia
 T_{ln} = 67.99 deg F P_{vn} = 0.073 psia
 ΔP_V = 0.0292096 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0410417
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.8836417
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

August 2024
 Standing Storage Loss: 324.27 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,922.86</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,247.14</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>324.27</u>	lb per	month
Working Loss(with control):	<u>1,922.86</u>	lb per	month
Total Emissions(with control):	<u>2,247.14</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 23-273
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 67.64 degrees F
Avg Daily Temp Range, ΔTa: 21.02 degrees F
Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: 0.25
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>	
Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid VaporPressure:	<u></u> psi (if specified)	A: <u>5.51</u>
ASTM Distillation Slope:	<u></u> (if specified)	B: <u>1038.25</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol	C: <u>190.57</u>
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>	
Liquid Surface Temp, T _{la} :	<u>70.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0791</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00406</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>70.98582</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u></u> degrees F	
Min Liquid Bulk Temp:	<u></u> degrees F	
Heating cycle frequency:	<u></u> days	

Operational Data:

Throughput: 129,300 bbl per month
Days this Period: 30 days
Turnover Rate: 71.4 turnovers per year
Turnover Factor, K_N: 0.587

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.787069 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 76.19 deg F P_{vx} = 0.093 psia
T_{ln} = 64.80 deg F P_{vn} = 0.067 psia
ΔP_V = 0.0266941 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0406322
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.893114
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

September 2024
Standing Storage Loss: 288.90 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,727.84</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,016.73</u>	lb per	month
	1.0	tons per	month
Standing Storage Loss(with control):	<u>288.90</u>	lb per	month
Working Loss(with control):	<u>1,727.84</u>	lb per	month
Total Emissions(with control):	<u>2,016.73</u>	lb per	month
	<u>1.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: 0.25
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>5.51</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>1038.25</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>190.57</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>given by user</u>		
Liquid Surface Temp, T _{la} :	<u>65.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0685</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00358</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>61.3661</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 31 days
 Turnover Rate: 69.1 turnovers per year
 Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.985542 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 71.18 deg F P_{vx} = 0.081 psia
 T_{ln} = 60.19 deg F P_{vn} = 0.058 psia
 ΔP_V = 0.0228733 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0392325
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9061038
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: October 2024
 Standing Storage Loss: 257.89 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,560.08</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,817.97</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>257.89</u>	lb per	month
Working Loss(with control):	<u>1,560.08</u>	lb per	month
Total Emissions(with control):	<u>1,817.97</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 23-273
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 46.445 degrees F
 Avg Daily Temp Range, ΔTa: 18.49 degrees F
 Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>5.51</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>1038.25</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>190.57</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>given by user</u>		
Liquid Surface Temp, T _{la} :	<u>61.2</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0596</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00317</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>52.34478</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 129,300 bbl per month
 Days this Period: 30 days
 Turnover Rate: 71.4 turnovers per year
 Turnover Factor, K_N: 0.587

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 17.738983 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 65.61 deg F P_{vx} = 0.068 psia
 T_{ln} = 56.74 deg F P_{vn} = 0.052 psia
 ΔP_V = 0.0164489 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0309908
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9172382
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

November 2024
 Standing Storage Loss: 176.82 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,350.10</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,526.93</u>	lb per	month
	0.8	tons per	month
Standing Storage Loss(with control):	<u>176.82</u>	lb per	month
Working Loss(with control):	<u>1,350.10</u>	lb per	month
Total Emissions(with control):	<u>1,526.93</u>	lb per	month
	<u>0.8</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 23-273
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.145 degrees F
Avg Daily Temp Range, ΔTa: 15.41 degrees F
Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>54</u> ft	shell alpha: 0.25
Tank Height:	<u>56</u> ft	roof color: white paint
Maximum Fill Height:	<u>55</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>54</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.5625</u> ft
Average outage, H _{VO} :	<u>28.5625</u> ft	H _{vo} : <u>28.5625</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>B100 Virgin Soybean Oil</u>	
Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid VaporPressure:	<u></u> psi (if specified)	A: <u>5.51</u>
ASTM Distillation Slope:	<u></u> (if specified)	B: <u>1038.25</u>
Molecular Weight, M _V :	<u>292.2</u> lb/lb-mol	C: <u>190.57</u>
Liquid Bulk Temp, T _b :	<u>70.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>given by user</u>	
Liquid Surface Temp, T _{la} :	<u>57.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0527</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00285</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>44.50057</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u></u> degrees F	
Min Liquid Bulk Temp:	<u></u> degrees F	
Heating cycle frequency:	<u></u> days	

Operational Data:

Throughput: 129,300 bbl per month
Days this Period: 31 days
Turnover Rate: 69.1 turnovers per year
Turnover Factor, K_N: 0.601

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 14.60129 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 60.90 deg F P_{vx} = 0.059 psia
T_{ln} = 53.60 deg F P_{vn} = 0.047 psia
ΔP_V = 0.0122214 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0248831
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9261178
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: December 2024
Standing Storage Loss: 133.01 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,241.20</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,374.20</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>133.01</u>	lb per	month
Working Loss(with control):	<u>1,241.20</u>	lb per	month
Total Emissions(with control):	<u>1,374.20</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 34.53 degrees F
 Avg Daily Temp Range, ΔTa: 15.64 degrees F
 Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0035</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 35.90083 degree F per AP-42 equation 1-32, 1-33, 1-34
 Max Liquid Bulk Temp: degrees F
 Min Liquid Bulk Temp: degrees F
 Heating cycle frequency: days

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 31 days
 Turnover Rate: 373.4 turnovers per year
 Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 14.363588 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 39.02 deg F P_{vx} = 0.004 psia
 T_{ln} = 31.84 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0009198 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0248667

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9960383

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for:

January 2024

Standing Storage Loss: 4.79 lb per month

AP-42 eqn 1-4

Working Loss:	<u>90.12</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>94.92</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>4.79</u>	lb per	month
Working Loss(with control):	<u>90.12</u>	lb per	month
Total Emissions(with control):	<u>94.92</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.4 degrees F
 Avg Daily Temp Range, ΔTa: 17.06 degrees F
 Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0039</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00010</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>39.39111</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 29 days
 Turnover Rate: 399.2 turnovers per year
 Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 16.583958 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 42.85 deg F P_{vx} = 0.005 psia
 T_{ln} = 34.56 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0011808 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0291493
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9955415
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

February 2024
 Standing Storage Loss: 5.88 lb per month

AP-42 eqn 1-4

Working Loss:	<u>98.65</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>104.53</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>5.88</u>	lb per	month
Working Loss(with control):	<u>98.65</u>	lb per	month
Total Emissions(with control):	<u>104.53</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.45501</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 31 days
 Turnover Rate: 373.4 turnovers per year
 Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 19.975733 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 52.49 deg F P_{vx} = 0.006 psia
 T_{ln} = 42.50 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0018752 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0353088
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9939277
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

March 2024
 Standing Storage Loss: 10.18 lb per month

AP-42 eqn 1-4

Working Loss:	<u>135.01</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>145.19</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>10.18</u>	lb per	month
Working Loss(with control):	<u>135.01</u>	lb per	month
Total Emissions(with control):	<u>145.19</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 25-202
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 56.73 degrees F
Avg Daily Temp Range, ΔTa: 21.92 degrees F
Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.2</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0080</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00019</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.44399</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
Days this Period: 30 days
Turnover Rate: 385.9 turnovers per year
Turnover Factor, K_N: 0.244

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.444011 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 65.03 deg F P_{vx} = 0.010 psia
T_{ln} = 53.31 deg F P_{vn} = 0.007 psia
ΔP_V = 0.003128 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0411946
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9910014
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: April 2024
Standing Storage Loss: 16.63 lb per month

AP-42 eqn 1-4

Working Loss:	<u>193.99</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>210.62</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>16.63</u>	lb per	month
Working Loss(with control):	<u>193.99</u>	lb per	month
Total Emissions(with control):	<u>210.62</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 64.175 degrees F
 Avg Daily Temp Range, ΔTa: 20.97 degrees F
 Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>66.9</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0103</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00024</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>68.38505</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 31 days
 Turnover Rate: 373.4 turnovers per year
 Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.642147 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 72.85 deg F P_{vx} = 0.012 psia
 T_{ln} = 61.03 deg F P_{vn} = 0.009 psia
 ΔP_V = 0.0039469 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0409609
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9884288
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: May 2024
 Standing Storage Loss: 21.65 lb per month

AP-42 eqn 1-4

Working Loss:	<u>248.94</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>270.59</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>21.65</u>	lb per	month
Working Loss(with control):	<u>248.94</u>	lb per	month
Total Emissions(with control):	<u>270.59</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 72.255 degrees F
 Avg Daily Temp Range, ΔTa: 19.53 degrees F
 Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0134</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00030</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>76.859</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 30 days
 Turnover Rate: 385.9 turnovers per year
 Turnover Factor, K_N: 0.244

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.28093 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 81.10 deg F P_{vx} = 0.016 psia
 T_{ln} = 69.45 deg F P_{vn} = 0.011 psia
 ΔP_V = 0.0049045 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0396522
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9849791
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: June 2024
 Standing Storage Loss: 25.91 lb per month

AP-42 eqn 1-4

Working Loss:	<u>315.82</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>341.73</u>	lb per	month
	0.2	tons per	month
Standing Storage Loss(with control):	<u>25.91</u>	lb per	month
Working Loss(with control):	<u>315.82</u>	lb per	month
Total Emissions(with control):	<u>341.73</u>	lb per	month
	<u>0.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 25-202
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 75.57 degrees F
Avg Daily Temp Range, ΔTa: 18.84 degrees F
Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0149</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00033</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.03227</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
Days this Period: 31 days
Turnover Rate: 373.4 turnovers per year
Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.497083 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 84.12 deg F P_{vx} = 0.018 psia
T_{ln} = 72.87 deg F P_{vn} = 0.012 psia
ΔP_V = 0.0051735 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0379537
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9834259
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: July 2024
Standing Storage Loss: 28.11 lb per month

AP-42 eqn 1-4

Working Loss:	<u>350.66</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>378.77</u>	lb per	month
	0.2	tons per	month
Standing Storage Loss(with control):	<u>28.11</u>	lb per	month
Working Loss(with control):	<u>350.66</u>	lb per	month
Total Emissions(with control):	<u>378.77</u>	lb per	month
	<u>0.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0145</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00033</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.03181</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 31 days
 Turnover Rate: 373.4 turnovers per year
 Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.572189 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.25 deg F P_{vx} = 0.017 psia
 T_{ln} = 71.96 deg F P_{vn} = 0.012 psia
 ΔP_V = 0.0050667 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0381555
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9838691
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

August 2024
 Standing Storage Loss: 27.55 lb per month AP-42 eqn 1-4

Working Loss:	<u>341.76</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>369.31</u>	lb per	month
	0.2	tons per	month
Standing Storage Loss(with control):	<u>27.55</u>	lb per	month
Working Loss(with control):	<u>341.76</u>	lb per	month
Total Emissions(with control):	<u>369.31</u>	lb per	month
	<u>0.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 25-202
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 67.64 degrees F
Avg Daily Temp Range, ΔTa: 21.02 degrees F
Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>69.9</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0113</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00026</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.0149</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
Days this Period: 30 days
Turnover Rate: 385.9 turnovers per year
Turnover Factor, K_N: 0.244

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.136599 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 75.39 deg F P_{vx} = 0.013 psia
T_{ln} = 64.32 deg F P_{vn} = 0.009 psia
ΔP_V = 0.0040107 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0378746
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9873097
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: September 2024
Standing Storage Loss: 21.14 lb per month

AP-42 eqn 1-4

Working Loss:	<u>269.12</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>290.26</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>21.14</u>	lb per	month
Working Loss(with control):	<u>269.12</u>	lb per	month
Total Emissions(with control):	<u>290.26</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 25-202
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 56.66 degrees F
Avg Daily Temp Range, ΔTa: 21.86 degrees F
Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0078</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00018</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>59.17155</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
Days this Period: 31 days
Turnover Rate: 373.4 turnovers per year
Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 21.176508 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 63.60 deg F P_{vx} = 0.009 psia
T_{ln} = 53.01 deg F P_{vn} = 0.007 psia
ΔP_V = 0.002753 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0368656
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9912524
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

October 2024
Standing Storage Loss: 14.99 lb per month

AP-42 eqn 1-4

Working Loss:	<u>190.99</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>205.98</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>14.99</u>	lb per	month
Working Loss(with control):	<u>190.99</u>	lb per	month
Total Emissions(with control):	<u>205.98</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 46.445 degrees F
 Avg Daily Temp Range, ΔTa: 18.49 degrees F
 Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.06959</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 30 days
 Turnover Rate: 385.9 turnovers per year
 Turnover Factor, K_N: 0.244

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 16.988298 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 51.76 deg F P_{vx} = 0.006 psia
 T_{ln} = 43.26 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0015941 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0293975
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9939241
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: November 2024
 Standing Storage Loss: 8.21 lb per month

AP-42 eqn 1-4

Working Loss:	<u>133.78</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>141.99</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>8.21</u>	lb per	month
Working Loss(with control):	<u>133.78</u>	lb per	month
Total Emissions(with control):	<u>141.99</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 25-202
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>65.83</u> ft	shell alpha: 0.25
Tank Height:	<u>41.42</u> ft	roof color: white paint
Maximum Fill Height:	<u>40.42</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>39.42</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>0.68573</u> ft
Average outage, H _{VO} :	<u>21.395729</u> ft	H _{vo} : <u>21.3957</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0038</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.3924</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 758,014 bbl per month
 Days this Period: 31 days
 Turnover Rate: 373.4 turnovers per year
 Turnover Factor, K_N: 0.247

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.961497 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.45 deg F P_{vx} = 0.004 psia
 T_{ln} = 34.47 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.00097 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0239144
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9956587
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 5.03 lb per month

AP-42 eqn 1-4

Working Loss:	<u>98.30</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>103.33</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>5.03</u>	lb per	month
Working Loss(with control):	<u>98.30</u>	lb per	month
Total Emissions(with control):	<u>103.33</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.080** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **123.14** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **381.38** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **123.14** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **381.38** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [F_r] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, F_r

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (F_r): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [F_d] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, F_d

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **8** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **200** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **38.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.422** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,250,000** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **125.03** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **383.28** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **125.03** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **383.28** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **8** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **200** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.700** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1269** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,250,000** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **142.50** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **400.74** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **142.50** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **400.74** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **25-265**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psiaAvg Ambient Temp, Taa: **56.73** degrees FAvg Daily Solar Insolation, I: **1545** Btu / ft² dayAvg Wind Speed, V: **6.71** mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **70** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**roof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **8** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **9** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **57.9** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **59.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **4.524** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.0951** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per monthEmissions Estimate for: **April 2024**Days This Period: **30** Control Efficiency= **0**Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18**Standing Storage Loss:** **103.37** lb per monthWithdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19**Withdrawal Loss:** **258.25** lb per month**Total Emissions:** **361.62** lb per month per AP-42 equation 2-1**0.2** tons per month**Standing Storage Loss(with control):** **103.37** lb per month**Withdrawal Loss(with control):** **258.25** lb per month**Total Emissions(with control):** **361.62** lb per month**0.2** tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.261** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1146** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **128.67** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **386.92** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **128.67** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **386.92** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.157** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1404** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **152.53** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **410.77** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **152.53** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **410.77** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.535** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1521** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **170.74** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **428.99** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **170.74** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **428.99** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **74.885** degrees F

Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day

Avg Wind Speed, V: **4.25** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.430** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1488** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **167.04** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **425.28** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **167.04** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **425.28** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.653** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **8.30** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **8.61** lb per this period

Total Emissions: **16.91** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **8.30** lb per

Withdrawal Loss(with control): **8.61** lb per this period

Total Emissions(with control): **16.91** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>25-265</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>70</u> ft	
Height of Deck Legs:	<u>7.33</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0012414</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.3303908</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>28,211</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:		<u>per AP-42 equation 1-5</u>
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$ <u>21.73</u> deg F (deg R); daily temperature range in the vapor space		
$T =$ <u>67.6</u> deg F; daily average temperature of the heel		
$P =$ <u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature		
$T_{min} =$ <u>62.21</u> deg F $P_{min} =$ <u>7.5474</u> psia		
$T_{max} =$ <u>73.07</u> deg F $P_{max} =$ <u>9.1820</u> psia		
$\Delta PB =$ <u>0</u> assuming open vent pathways through the floating roof deck		
$P_a =$ <u>14.25743</u> psia; atmospheric pressure		
$\Delta PV =$ <u>1.6346</u> psia		
$KE =$ <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		<u>per AP-42 equation 1-21</u>
$KS =$ <u>0.235988071</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{1000}$
for an EFRT, = $0.57 \frac{D P^* M V}{1000}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

205.2 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

201 lb

Standing Idle Loss, This Period:

200.9733772	lb	(without controls)
0.000	% control efficiency while standing idle	
200.9733772	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.769155031}{0.769155031}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{10} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 200.97338 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 200.97338 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 200.97338 lbTotal Losses with control: 200.97338 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **8** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.653** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **27**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **224.18** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **249.64** lb per this period

Total Routine Emissions (with control): **473.82** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 28215.43 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
411 lb

Filling Loss, This Period:
411.3 lb (without controls)
0.000 % control efficiency while refilling
411.3 lb (with controls)

Total Emissions: 885.10602 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service-RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **42** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **8** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **200** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **8.653** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **8.30** lb per this period

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **8.61** lb per this period

Total Emissions: **16.91** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **8.30** lb per

Withdrawal Loss(with control): **8.61** lb per this period

Total Emissions(with control): **16.91** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>	
Location: <u>Kenova, WV</u>	
Calculations for Tank No.: <u>25-265</u>	
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024	
Meteorological Data:	
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F
Avg Daily Temp Range:	<u>21.02</u> degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u> mph
Tank Data:	
Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>70</u> ft
Height of Deck Legs:	<u>3.33</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft (if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0012414</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>3.3303908</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>12,817</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)
Service Data:	
Service (stored liquid):	<u>Gasoline RVP_X</u> (if specified)
Reid Vapor Pressure:	<u>13.5</u> psi (if specified)
ASTM Distillation Slope:	<u>3</u>
Molecular Weight, M _v :	<u>66</u> lb/lb-mol
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F
Liquid Bulk Temp Basis?	<u>same as Taa</u>
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless
Stock liquid density, W _l :	<u>5.6</u> lb/gal
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F
Operational Data:	
Duration of Event, nd:	<u>1</u> days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>
Calculated Values:	
Vapor Space Expansion Factor, KE:	per AP-42 equation 1-5
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$	
where:	
$\Delta TV =$	<u>21.73</u> deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F; daily average temperature of the heel
$P =$	<u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F
$T_{max} =$	<u>73.07</u> deg F
$\Delta PB =$	<u>0</u> assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia
$KE =$ <u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:	per AP-42 equation 1-21
$KS = 1 / (1 + 0.053 P_{hv}) < S$	
$KS =$ <u>0.404713603</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

159.9 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

201 lb

Standing Idle Loss, This Period:

159.8869415	lb	(without controls)
0.000	% control efficiency while standing idle	
159.8869415	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

41 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **25-265**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **70** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **8** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.704** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2779** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **281.75** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **249.64** lb per this period**Total Routine Emissions (with control):** **531.39** lb per this period

per AP-42 equation 2-1

0.3 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 12816.85 ft3
Previous Sa: 0.35

Filling Loss:
Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
436 lb

Limit on Filling Loss from Resident Vapors:
41 lb

Filling Loss from Resident Vapors:
41 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
210 lb

Filling Loss, This Period:
250.8 lb (without controls)
0.000 % control efficiency while refilling
250.8 lb (with controls)

Total Emissions: 782.16088 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.887** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1987** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **223.07** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **481.32** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **223.07** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **481.32** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: MPLX Terminals, LLCLocation: Kenova, WVCalculations for Tank No.: 25-265Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psiaAvg Ambient Temp, Taa: 46.445 degrees FAvg Daily Solar Insolation, I: 675.82 Btu / ft² dayAvg Wind Speed, V: 5.82 mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: cone-roof tank with IFRAverage alpha: 0.25Tank Diameter, D: 70 ftRim Seal Type: Mechanical-Shoe Primary with Rim-Mounted Secondaryroof color: **white paint**roof condition: **Average**roof alpha: **0.25** $L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

 $L_r = [F_r] \times [P^* M_v K_c]$ defining a Rim Seal Emission Factor, F_r $F_r = [(K_{ra} + K_{rb} V^n) D]$ Rim Seal Emission Factor (F_r): 42 lb-mol/yr $L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

 $L_d = [F_d] \times [P^* M_v K_c]$ defining a Deck Seam Emission Factor, F_d $F_d = [(K_d S_d) D^2]$ Deck Seam Emission Factor (F_d): 0 lb-mol/yr $L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

 $F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

 $K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): 8 lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): 150 lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): 200 lb-mol/yrNumber of columns, N_c : 1Effective column diameter, F_c : 1 feet

Service Data:

Service (stored liquid): Gasoline RVP_XProduct Factor, K_C : 1Reid Vapor Pressure: 15 psi (if specified)ASTM Distillation Slope: 3 (if specified)Molecular Weight, M_v : 66 lb/lb-mol givenLiquid Bulk Temp, T_b : 47.0 degrees FConstant Temp Tank? NO tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12Liquid Surface Temp, T_{la} : 47.5 degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va} : 6.441 psia per AP-42 equation 1-24, 1-25, 1-26 $P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$ Vapor Pressure Function, P^* : 0.1492 dimensionless per AP-42 equation 2-4Liquid density, W_l : 5.6 lb/galClingage factor, C_s : 0.0015 bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : 2,250,000 bbl per monthEmissions Estimate for: November 2024Days This Period: 30 Control Efficiency= 0Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18**Standing Storage Loss:** 162.04 lb per monthWithdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19**Withdrawal Loss:** 258.25 lb per month**Total Emissions:** 420.29 lb per month per AP-42 equation 2-10.2 tons per month**Standing Storage Loss(with control):** 162.04 lb per month**Withdrawal Loss(with control):** 258.25 lb per month**Total Emissions(with control):** 420.29 lb per month0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **25-265**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.145** degrees F
Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **70** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **42** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **8** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **150** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **200** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.345** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1169** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **131.26** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **258.25** lb per month

Total Emissions: **389.51** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **131.26** lb per month

Withdrawal Loss(with control): **258.25** lb per month

Total Emissions(with control): **389.51** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.081** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **114.44** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **340.01** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **114.44** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **340.01** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **186** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.424** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,250,000** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **116.22** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **341.79** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **116.22** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **341.79** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.703** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1270** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **132.48** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **358.05** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **132.48** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **358.05** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.73** degrees F
 Avg Daily Solar Insolation, I: **1545** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.528** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.0952** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **96.12** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **321.69** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **96.12** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **321.69** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.265** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1147** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **119.66** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **345.23** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **119.66** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **345.23** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **72.255** degrees F
 Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.162** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1406** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **141.87** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **367.44** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **141.87** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **367.44** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **75.57** degrees F
 Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
 Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

$$L_r = [F_r] \times [P^* M_v K_c]$$

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

$$L_d = [F_d] \times [P^* M_v K_c]$$

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

$$F_{fi} = N_{fi} [K_{fi}]$$

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.540** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1523** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **158.81** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **384.38** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **158.81** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **384.38** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.435** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1489** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **155.35** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **380.92** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **155.35** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **380.92** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **7.72** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **7.52** lb per this period

Total Emissions: **15.24** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **7.72** lb per

Withdrawal Loss(with control): **7.52** lb per this period

Total Emissions(with control): **15.24** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>33-266</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>80</u> ft	
Height of Deck Legs:	<u>7.67</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011457</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.6701039</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>38,554</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.227918241</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\pi K E W V V K S$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \pi D P^* M V$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

270.9 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

242 lb

Standing Idle Loss, This Period:

242.2733772 lb (without controls)

0.000 % control efficiency while standing idle

242.2733772 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: 0.25
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average

Tank Type:	cone-roof tank with IFR	
Average alpha:	0.25	
Tank Diameter, D:	80	ft
Height of Deck Legs:	7.67	ft
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	2.828	ft
Depth of Heel in Sump:	0.25	ft (if partial heel (liquid only in sump))
Slope of Bottom:	0	in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid surface)
Eff. Ht of Liquid Heel:	0.0011457	ft (equivalent depth across the entire bottom)
Height of Vapor Space:	7.6701039	ft (below the landed floating roof deck)
Vapor Space Volume, VV:	38,554	ft ³
Constant Temp Tank?	NO	(only if both roof and shell are insulated)

Service (stored liquid):	Gasoline RVP_X	(if specified)
Reid Vapor Pressure:	13.5	psi (if specified)
ASTM Distillation Slope:	3	
Molecular Weight, M _v :	66	lb/lb-mol
Heel Bulk Temp, T _b :	67.64	degrees F
Liquid Bulk Temp Basis?	calculated from ambient	
Heel Surface Temp, T _{la} :	67.6	degrees F
TVP of Liquid in the Heel, P _{va} :	8.333	psia
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	0.2161	dimensionless
Stock liquid density, Wl:	5.6	lb/gal
Stock Vapor Density, WV:	9.72E-02	lb/ft3
Vapor Space Temperature, T _v :	67.64	degrees F

Duration of Event, nd: 1 days this period
Heel Condition: **Partial Heel (liquid only in sump)**

Vapor Space Expansion Factor, KE:

$$KE = \{ \Delta TV / (T + 459.67) \} + \{ (\Delta PV - \Delta PB) / (P_a - P) \}$$

per AP-42 equation 1-5

where:

$\Delta TV = \frac{21.73}{\text{deg F (deg R)}}$; daily temperature range in the vapor space

$T = \frac{67.6}{\text{deg F}}$; daily average temperature of the heel

$P = \frac{8.3331}{\text{psia}}$; TVP of liquid in the heel at the daily average temperature

$T_{min} = \frac{62.21}{\text{deg F}}$ $P_{min} = \frac{7.5474}{\text{psia}}$

$T_{max} = \frac{73.07}{\text{deg F}}$ $P_{max} = \frac{9.1820}{\text{psia}}$

$\Delta PB = \frac{0}{\text{assuming open vent pathways through the floating roof deck}}$

$P_a = \frac{14.25743}{\text{psia}}$; atmospheric pressure

$\Delta PV = \frac{1.6346}{\text{psia}}$

$KE = \frac{0.317131376}{\text{}}$

Vented Vapor Saturation Factor, KS:

$KS = 1 / (1 + 0.053 P_{hv}) < S$ per AP-42 equation 1-21

$KS = 0.227918241$

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.823036425}{0.823036425}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{0.00375} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 242.27338 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 242.27338 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 242.27338 lbTotal Losses with control: 242.27338 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **27**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **208.48** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **218.05** lb per this period

Total Routine Emissions (with control): **426.53** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 38559.91 ft3
Previous Sa: 0.35

Filling Loss:
Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
562 lb

Filling Loss, This Period:
562.1 lb (without controls)
0.000 % control efficiency while refilling
562.1 lb (with controls)

Total Emissions: 988.61933 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **7.72** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **7.52** lb per this period

Total Emissions: **15.24** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **7.72** lb per

Withdrawal Loss(with control): **7.52** lb per this period

Total Emissions(with control): **15.24** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>33-266</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>80</u> ft	
Height of Deck Legs:	<u>5.25</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011457</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>5.2501039</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>26,390</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.301319755</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

245.1 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

242 lb

Standing Idle Loss, This Period:

242.2733772	lb	(without controls)
0.000	%	control efficiency while standing idle
242.2733772	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **33-266**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **80** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **0** lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yrNumber of columns, N_c: **1**Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.710** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2782** dimensionless per AP-42 equation 2-4Liquid density, W_l: **5.6** lb/galClingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **262.04** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **218.05** lb per this period**Total Routine Emissions (with control):** **480.09** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 26389.9 ft3
Previous Sa: 0.35

Filling Loss:
Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
898 lb

Limit on Filling Loss from Resident Vapors:
0 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
432 lb

Filling Loss, This Period:
431.7 lb (without controls)
0.000 % control efficiency while refilling
431.7 lb (with controls)

Total Emissions: 911.8391 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.66** degrees F
 Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.890** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1988** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **207.39** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **432.96** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **207.39** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **432.96** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.443** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **150.61** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **376.18** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **150.61** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **376.18** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-266**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.145** degrees F
Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

$$L_r = [F_r] \times [P^* M_v K_c]$$

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

$$L_d = [F_d] \times [P^* M_v K_c]$$

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

$$F_{fi} = N_{fi} [K_{fi}]$$

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **138** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.346** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **121.99** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **347.56** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **121.99** lb per

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **347.56** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **34.53** degrees F
 Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **22** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.081** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **125.36** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **350.93** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **125.36** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **350.93** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **22** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.424** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **127.32** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **352.88** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **127.32** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **352.88** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **45.66** degrees F
 Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **22** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **204** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.703** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1270** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,250,000** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **145.13** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **370.70** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **145.13** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **370.70** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **22** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **204** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **4.528** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.0952** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,250,000** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **105.30** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **330.87** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **105.30** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **330.87** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **64.175** degrees F
Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.266** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1147** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **131.09** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **356.66** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **131.09** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **356.66** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.162** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1406** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **155.41** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **380.98** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **155.41** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **380.98** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.540** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1523** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **173.97** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **399.54** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **173.97** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **399.54** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **74.885** degrees F
 Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
 Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.435** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1490** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **170.18** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **395.75** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **170.18** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **395.75** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **8.46** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **7.52** lb per this period

Total Emissions: **15.98** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **8.46** lb per

Withdrawal Loss(with control): **7.52** lb per this period

Total Emissions(with control): **15.98** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>33-267</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>80</u> ft	
Height of Deck Legs:	<u>7.83</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011457</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.8301039</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>39,358</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE =	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
KS =	<u>1 / (1 + 0.053 P hv) < S</u>	<u>per AP-42 equation 1-21</u>
KS =	<u>0.224305622</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{1000}$ per AP-42 equation 3-6, 3-7
for an EFRT, = $0.57 \frac{D P^* M V}{1000}$ per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

272.1 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

242 lb

Standing Idle Loss, This Period:

242.2733772	lb	(without controls)
0.000	% control efficiency while standing idle	
242.2733772	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 33-267

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>80</u> ft
Height of Deck Legs:	<u>7.83</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011457</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.8301039</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>39,358</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, Tla:	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, Wl:	<u>5.6</u>	lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, Tv:	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

$KE =$ 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

$KS =$ 0.224305622

per AP-42 equation 1-21

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.826884821}{0.826884821}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa:

0.35

Initial Purge Loss:

0

lb

Vapor control efficiency for Initial Purge:

0

Initial Purge Loss with control:

0

lb

Daily Vapor Purge:

Purge Day (exclude initial purge):

0

day(s)

Saturation factor, S:

0.500

Daily Purge loss:

0

lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV:

0.00375

Molecular Weight of Calibration Gas, MV:

72.15

g/mol

Continued forced ventilation emissions, LCV:

6135.433018

lb

per AP-42 equation 4-10

Vapor Limit:

242.27338

lb

per AP-42 equation 4-12, 4-13

Cleaning Loss:

242.27338

lb

per AP-42 equation 4-1

Vapor control efficiency:

0

Cleaning Loss with control:

242.27338

lb

Total Losses with control:

242.27338

lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **33-267**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **80** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **22** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **228.38** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **218.05** lb per this period**Total Routine Emissions (with control):** **446.43** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 39364.15 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

0 lb

Limit on Filling Loss from Resident Vapors:

-1 lb

Filling Loss from Resident Vapors:

0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

574 lb

Filling Loss, This Period:

573.8	lb	(without controls)
0.000	% control efficiency while refilling	
573.8	lb	(with controls)

Total Emissions: 1020.2443 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **8.46** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **7.52** lb per this period

Total Emissions: **15.98** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **8.46** lb per

Withdrawal Loss(with control): **7.52** lb per this period

Total Emissions(with control): **15.98** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>33-267</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>80</u> ft	
Height of Deck Legs:	<u>4</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011457</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>4.0001039</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>20,107</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.361445987</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{D}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

224.0 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

242 lb

Standing Idle Loss, This Period:

224.0105997	lb	(without controls)
0.000	% control efficiency while standing idle	
224.0105997	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

18 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **33-267**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **80** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **22** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.710** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2782** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **287.05** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **218.05** lb per this period**Total Routine Emissions (with control):** **505.10** lb per this period

per AP-42 equation 2-1

0.3 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 20106.72 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
684 lb

Limit on Filling Loss from Resident Vapors:
18 lb

Filling Loss from Resident Vapors:
18 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
329 lb

Filling Loss, This Period:
347.2 lb (without controls)
0.000 % control efficiency while refilling
347.2 lb (with controls)

Total Emissions: 852.32003 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.890** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1988** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **227.19** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **452.76** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **227.19** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **452.76** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **22** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **134** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.444** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **164.99** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **390.55** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **164.99** lb per

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **390.55** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-267**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.145** degrees F
Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **22** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **134** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **204** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.346** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **133.63** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **359.20** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **133.63** lb per

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **359.20** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.081** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **115.68** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **341.25** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **115.68** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **341.25** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.4** degrees F
 Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.424** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **117.48** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **343.05** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **117.48** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **343.05** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.703** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1270** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **133.92** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **359.48** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **133.92** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **359.48** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.528** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.0952** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **97.16** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **322.73** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **97.16** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **322.73** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.266** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1147** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **120.96** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **346.53** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **120.96** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **346.53** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **72.255** degrees F
 Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.162** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1406** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **143.41** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **368.98** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **143.41** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **368.98** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **75.57** degrees F
 Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
 Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.541** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1523** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **160.53** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **386.10** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **160.53** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **386.10** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.435** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1490** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **157.03** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **382.60** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **157.03** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **382.60** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **7.81** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **7.52** lb per this period

Total Emissions: **15.32** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **7.81** lb per

Withdrawal Loss(with control): **7.52** lb per this period

Total Emissions(with control): **15.32** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>	
Location: <u>Kenova, WV</u>	
Calculations for Tank No.: <u>33-268</u>	
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024	
Meteorological Data:	
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F
Avg Daily Temp Range:	<u>21.02</u> degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u> mph
Tank Data:	
Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>80</u> ft
Height of Deck Legs:	<u>7.5</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.887</u> ft (if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011589</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.5001434</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>37,700</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)
Service Data:	
Service (stored liquid):	<u>Gasoline RVP_X</u> (if specified)
Reid Vapor Pressure:	<u>13.5</u> psi (if specified)
ASTM Distillation Slope:	<u>3</u>
Molecular Weight, M _v :	<u>66</u> lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F
Liquid Bulk Temp Basis?	<u>same as Taa</u>
Heel Surface Temp, Tla:	<u>67.6</u> degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless
Stock liquid density, Wl:	<u>5.6</u> lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F
Operational Data:	
Duration of Event, nd:	<u>1</u> days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>
Calculated Values:	
Vapor Space Expansion Factor, KE:	per AP-42 equation 1-5
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$	
where:	
$\Delta TV =$	<u>21.73</u> deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F; daily average temperature of the heel
$P =$	<u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F
$T_{max} =$	<u>73.07</u> deg F
$\Delta PB =$	<u>0</u> assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia
$KE =$ <u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:	per AP-42 equation 1-21
$KS = 1 / (1 + 0.053 P_{hv}) < S$	
$KS =$ <u>0.231885436</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{1000}$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \frac{K_e D P^* M V}{1000}$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

269.5 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

245 lb

Standing Idle Loss, This Period:

245.0585253 lb (without controls)

0.000 % control efficiency while standing idle

245.0585253 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.818761017}{0.818761017}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{100} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 245.05853 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 245.05853 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 245.05853 lbTotal Losses with control: 245.05853 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **33-268**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **80** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **210.74** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **218.05** lb per this period**Total Routine Emissions (with control):** **428.78** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 37705.66 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
550 lb

Filling Loss, This Period:
549.6 lb (without controls)
0.000 % control efficiency while refilling
549.6 lb (with controls)

Total Emissions: 978.42119 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **33-268**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psiaAvg Ambient Temp, Taa: **67.64** degrees FAvg Daily Solar Insolation, I: **1403.94** Btu / ft² dayAvg Wind Speed, V: **4.47** mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **80** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**roof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.658** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2295** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **75,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **1** Control Efficiency= **0**Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18**Standing Storage Loss:** **7.81** lb per this periodWithdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19**Withdrawal Loss:** **7.52** lb per this period**Total Emissions:** **15.32** lb per this period per AP-42 equation 2-1**0.0** tons per this period**Standing Storage Loss(with control):** **7.81** lb per**Withdrawal Loss(with control):** **7.52** lb per this period**Total Emissions(with control):** **15.32** lb per this period**0.0** tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>33-268</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>80</u> ft	
Height of Deck Legs:	<u>3.75</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.887</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011589</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>3.7501434</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>18,850</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.376467916</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e D P^* M V}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

218.7 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

245 lb

Standing Idle Loss, This Period:

218.7407694	lb	(without controls)
0.000	% control efficiency while standing idle	
218.7407694	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

26 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **33-268**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **80** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.710** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2782** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,175,000** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **264.88** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **218.05** lb per this period**Total Routine Emissions (with control):** **482.93** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 18850.28 ft3
Previous Sa: 0.35

Filling Loss:
Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
641 lb

Limit on Filling Loss from Resident Vapors:
26 lb

Filling Loss from Resident Vapors:
26 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
308 lb

Filling Loss, This Period:
334.7 lb (without controls)
0.000 % control efficiency while refilling
334.7 lb (with controls)

Total Emissions: 817.64455 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.890** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1989** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **209.64** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **435.20** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **209.64** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **435.20** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.444** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **152.24** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **377.81** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **152.24** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **377.81** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **33-268**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.145** degrees F
 Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
 Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **80** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **48** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **140** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **188** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.346** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,250,000** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **123.30** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **225.57** lb per month

Total Emissions: **348.87** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **123.30** lb per month

Withdrawal Loss(with control): **225.57** lb per month

Total Emissions(with control): **348.87** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **34.53** degrees F
 Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **186** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.082** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,779,307** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **114.20** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **361.53** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **114.20** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **361.53** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.425** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **115.98** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **363.31** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **115.98** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **363.31** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.704** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1271** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **132.22** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **379.55** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **132.22** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **379.55** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.529** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.0953** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **95.94** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **343.27** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **95.94** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **343.27** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **186** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.267** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1148** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,779,307** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **119.44** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **366.77** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **119.44** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **366.77** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.164** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1406** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **141.61** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **388.94** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **141.61** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **388.94** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **186** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **6.542** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1523** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,779,307** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **158.51** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **405.85** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **158.51** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **405.85** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **186** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **6.437** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1490** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,779,307** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **155.06** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **402.39** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **155.06** lb per

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **402.39** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

$$L_r = [F_r] \times [P^* M_v K_c]$$

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

$$L_d = [F_d] \times [P^* M_v K_c]$$

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

$$F_{fi} = N_{fi} [K_{fi}]$$

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.660** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2296** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **92,644** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **7.71** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **8.24** lb per this period

Total Emissions: **15.95** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **7.71** lb per

Withdrawal Loss(with control): **8.24** lb per this period

Total Emissions(with control): **15.95** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>	
Location: <u>Kenova, WV</u>	
Calculations for Tank No.: <u>51-253</u>	
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024	
Meteorological Data:	
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F
Avg Daily Temp Range:	<u>21.02</u> degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u> mph
Tank Data:	
Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>90</u> ft
Height of Deck Legs:	<u>6.83</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2</u> ft (if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009568</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.8302778</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>43,452</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)
Service Data:	
Service (stored liquid):	<u>Gasoline RVP_X</u> (if specified)
Reid Vapor Pressure:	<u>13.5</u> psi (if specified)
ASTM Distillation Slope:	<u>3</u>
Molecular Weight, M _v :	<u>66</u> lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F
Liquid Bulk Temp Basis?	<u>same as Taa</u>
Heel Surface Temp, Tla:	<u>67.6</u> degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless
Stock liquid density, Wl:	<u>5.6</u> lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F
Operational Data:	
Duration of Event, nd:	<u>1</u> days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>
Calculated Values:	
Vapor Space Expansion Factor, KE:	per AP-42 equation 1-5
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$	
where:	
$\Delta TV =$	<u>21.73</u> deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F; daily average temperature of the heel
$P =$	<u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F
$T_{max} =$	<u>73.07</u> deg F
$\Delta PB =$	<u>0</u> assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia
$KE =$ <u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:	per AP-42 equation 1-21
$KS = 1 / (1 + 0.053 P_{hv}) < S$	
$KS =$ <u>0.248965238</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = nd KE WV VV KS

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \text{ nd D P}^* \text{ MV}$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

333.5 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

256 lb

Standing Idle Loss, This Period:

256.06 lb (without controls)

0.000 % control efficiency while standing idle

256.06 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 51-253

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>90</u> ft
Height of Deck Legs:	<u>6.83</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009568</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.8302778</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>43,452</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, T _b :	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, W _l :	<u>5.6</u>	lb/gal
Stock Vapor Density, W _v :	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, T _v :	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

$KE =$ 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

per AP-42 equation 1-21

$KS =$ 0.248965238

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.837149974}{0.837149974}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa:

0.35

Initial Purge Loss:

0

lb

Vapor control efficiency for Initial Purge:

0

Initial Purge Loss with control:

0

lb

Daily Vapor Purge:

Purge Day (exclude initial purge):

0

day(s)

Saturation factor, S:

0.500

Daily Purge loss:

0

lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV:

0.00375

Molecular Weight of Calibration Gas, MV:

72.15

g/mol

Continued forced ventilation emissions, LCV:

6135.433018

lb

per AP-42 equation 4-10

Vapor Limit:

256.06

lb

per AP-42 equation 4-12, 4-13

Cleaning Loss:

256.06

lb

per AP-42 equation 4-1

Vapor control efficiency:

0

Cleaning Loss with control:

256.06

lb

Total Losses with control:

256.06

lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.660** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2296** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,686,663** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **27**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **208.08** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **239.09** lb per this period

Total Routine Emissions (with control): **447.17** lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 43458.44 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
634 lb

Filling Loss, This Period:
633.5 lb (without controls)
0.000 % control efficiency while refilling
633.5 lb (with controls)

Total Emissions: 1080.6731 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.660** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2296** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **92,644** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **7.71** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **8.24** lb per this period

Total Emissions: **15.95** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **7.71** lb per

Withdrawal Loss(with control): **8.24** lb per this period

Total Emissions(with control): **15.95** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>51-253</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>90</u> ft	
Height of Deck Legs:	<u>3.67</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009568</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>3.6702778</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>23,349</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.381534374</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{D P^* M V}{K_e W V V K_s}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

274.6 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

256 lb

Standing Idle Loss, This Period:

256.06	lb	(without controls)
0.000	% control efficiency while standing idle	
256.06	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **51-253**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **90** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **25** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.712** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2783** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,686,663** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **261.55** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **239.09** lb per this period**Total Routine Emissions (with control):** **500.64** lb per this period

per AP-42 equation 2-1

0.3 tons per this period

Stock Vapor Density, WV:

0.1090693

lb/ft3

Temperature for Refill TVP:

67.64

TVP for Refill:

9.3511478

If the previous record is roof-landing, out-of-sevice, or tank-cleaning,

Previous stock vapor density (*Wv):

9.72E-02

lb/ft3

Previous volume of vapor space (*Vv):

23349.3

ft3

Previous Sa:

0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

794

lb

Limit on Filling Loss from Resident Vapors:

0

lb

Filling Loss from Resident Vapors:

0

lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

382

lb

Filling Loss, This Period:

382.0

lb

(without controls)

0.000

% control efficiency while refilling

382.0

lb

(with controls)

Total Emissions:

882.64249

lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.66** degrees F
 Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.892** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1989** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **206.98** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **454.31** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **206.98** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **454.31** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **25** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **107** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.444** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **150.29** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **397.63** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **150.29** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **397.63** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **51-253**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **37.145** degrees F

Avg Daily Solar Insolation, I: **518.91** Btu / ft² day

Avg Wind Speed, V: **6.26** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **90** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **54** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **25** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **107** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **186** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.347** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,779,307** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **121.72** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **247.33** lb per month

Total Emissions: **369.06** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **121.72** lb per month

Withdrawal Loss(with control): **247.33** lb per month

Total Emissions(with control): **369.06** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.080** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **365.77** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **651.56** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **365.77** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **651.56** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.4** degrees F
 Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.423** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **371.42** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **657.21** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **371.42** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **657.21** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.701** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1270** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **423.33** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **709.12** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **423.33** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **709.12** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.73** degrees F
 Avg Daily Solar Insolation, I: **1545** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.525** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.0952** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **307.10** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **592.89** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **307.10** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **592.89** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **64.175** degrees F
Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.263** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1146** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **382.28** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **668.07** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **382.28** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **668.07** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **72.255** degrees F
 Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.158** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1404** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **453.18** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **738.97** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **453.18** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **738.97** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.536** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1521** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **507.29** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **793.08** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **507.29** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **793.08** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.431** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1488** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **496.27** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **782.06** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **496.27** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **782.06** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **101,389** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **24.67** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **9.53** lb per this period

Total Emissions: **34.19** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **24.67** lb per

Withdrawal Loss(with control): **9.53** lb per this period

Total Emissions(with control): **34.19** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>52-270</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>85</u> ft	
Height of Deck Legs:	<u>6.33</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.3299969</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>35,920</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:		<u>per AP-42 equation 1-5</u>
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$ <u>21.73</u> deg F (deg R); daily temperature range in the vapor space		
$T =$ <u>67.6</u> deg F; daily average temperature of the heel		
$P =$ <u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature		
$T_{min} =$ <u>62.21</u> deg F $P_{min} =$ <u>7.5474</u> psia		
$T_{max} =$ <u>73.07</u> deg F $P_{max} =$ <u>9.1820</u> psia		
$\Delta PB =$ <u>0</u> assuming open vent pathways through the floating roof deck		
$P_a =$ <u>14.25743</u> psia; atmospheric pressure		
$\Delta PV =$ <u>1.6346</u> psia		
$KE =$ <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		<u>per AP-42 equation 1-21</u>
$KS =$ <u>0.263457853</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = nd KE WV VV KS

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \text{ nd D P}^* \text{ MV}$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

291.7 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

265 lb

Standing Idle Loss, This Period:

264.9883772 lb (without controls)

0.000 % control efficiency while standing idle

264.9883772 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F
Avg Daily Temp Range:	<u>21.02</u>	degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u>	mph

roof alpha: **0.25**

Constant Temp Tank? NO (only if both roof and shell are insulated)

Vapor Space Temperature, T_v : **67.64** degrees F

Heel Condition: Partial Heel (liquid only in sump)

KS = 0.263457853

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.804003188}{0.804003188}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{0.00375} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 264.98838 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 264.98838 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 264.98838 lbTotal Losses with control: 264.98838 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **52-270**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **85** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yrNumber of columns, N_c: **1**Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4Liquid density, W_l: **5.6** lb/galClingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,940,278** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **666.03** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **276.26** lb per this period**Total Routine Emissions (with control):** **942.29** lb per this period

per AP-42 equation 2-1

0.5 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 35925.88 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

0 lb

Limit on Filling Loss from Resident Vapors:

-1 lb

Filling Loss from Resident Vapors:

0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

524 lb

Filling Loss, This Period:

523.7	lb	(without controls)
0.000	% control efficiency while refilling	
523.7	lb	(with controls)

Total Emissions: 1465.9722 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **595** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **101,389** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **24.67** lb per this period

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **9.53** lb per this period

Total Emissions: **34.19** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **24.67** lb per

Withdrawal Loss(with control): **9.53** lb per this period

Total Emissions(with control): **34.19** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>52-270</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>85</u> ft	
Height of Deck Legs:	<u>2.25</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>2.2499969</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>12,768</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE =	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
KS =	<u>1 / (1 + 0.053 P_h v) < S</u>	<u>per AP-42 equation 1-21</u>
KS =	<u>0.5</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

196.8 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

265 lb

Standing Idle Loss, This Period:		
196.7721748	lb	(without controls)
0.000	%	control efficiency while standing idle
196.7721748	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

68 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **52-270**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **85** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.706** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2779** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,940,278** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **837.09** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **276.26** lb per this period**Total Routine Emissions (with control):** **1,113.35** lb per this period

per AP-42 equation 2-1

0.6 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 12767.61 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
434 lb

Limit on Filling Loss from Resident Vapors:
68 lb

Filling Loss from Resident Vapors:
68 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
209 lb

Filling Loss, This Period:
277.1 lb (without controls)
0.000 % control efficiency while refilling
277.1 lb (with controls)

Total Emissions: 1390.454 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.888** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1987** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **662.69** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **948.48** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **662.69** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **948.48** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.442** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **481.35** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **767.14** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **481.35** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **767.14** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-270**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.145** degrees F
Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **595** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO**

tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.345** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1169** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **389.90** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **675.69** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **389.90** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **675.69** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [F_r] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, F_r

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (F_r): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [F_d] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, F_d

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **599** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.080** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **3,041,667** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **368.60** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **654.39** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **368.60** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **654.39** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.423** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **374.30** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **660.09** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **374.30** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **660.09** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **45.66** degrees F
 Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.701** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1270** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **426.60** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **712.39** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **426.60** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **712.39** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **56.73** degrees F

Avg Daily Solar Insolation, I: **1545** Btu / ft² day

Avg Wind Speed, V: **6.71** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [F_r] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, F_r

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (F_r): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [F_d] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, F_d

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **599** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **59.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **4.525** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.0952** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **3,041,667** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **309.48** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **595.27** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **309.48** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **595.27** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.263** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1146** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **385.24** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **671.03** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **385.24** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **671.03** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **72.255** degrees F
 Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.158** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1404** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **456.68** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **742.47** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **456.68** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **742.47** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.536** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1521** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **511.22** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **797.01** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **511.22** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **797.01** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.431** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1488** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **500.11** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **785.90** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **500.11** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **785.90** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **101,389** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **24.86** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **9.53** lb per this period

Total Emissions: **34.38** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **24.86** lb per

Withdrawal Loss(with control): **9.53** lb per this period

Total Emissions(with control): **34.38** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>52-271</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>85</u> ft	
Height of Deck Legs:	<u>6.58</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.5799969</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>37,338</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.256010667</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\pi K E W V V K S$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \pi D P^* M V$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

294.6 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

265 lb

Standing Idle Loss, This Period:

264.9883772 lb (without controls)

0.000 % control efficiency while standing idle

264.9883772 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 52-271

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>85</u> ft
Height of Deck Legs:	<u>6.58</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.5799969</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>37,338</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, T _b :	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, W _l :	<u>5.6</u>	lb/gal
Stock Vapor Density, W _v :	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, T _v :	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

KE = 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

KS = 0.256010667

per AP-42 equation 1-21

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.812081997}{0.812081997}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{0.00375} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 264.98838 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 264.98838 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 264.98838 lbTotal Losses with control: 264.98838 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **52-271**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psiaAvg Ambient Temp, Taa: **67.64** degrees FAvg Daily Solar Insolation, I: **1403.94** Btu / ft² dayAvg Wind Speed, V: **4.47** mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **85** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**roof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,940,278** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **671.18** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **276.26** lb per this period**Total Routine Emissions (with control):** **947.44** lb per this period

per AP-42 equation 2-1

0.5 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 37344.5 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
544 lb

Filling Loss, This Period:
544.4 lb (without controls)
0.000 % control efficiency while refilling
544.4 lb (with controls)

Total Emissions: 1491.8053 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **101,389** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **24.86** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **9.53** lb per this period

Total Emissions: **34.38** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **24.86** lb per

Withdrawal Loss(with control): **9.53** lb per this period

Total Emissions(with control): **34.38** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>52-271</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>85</u> ft	
Height of Deck Legs:	<u>2.5</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>2.4999969</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>14,186</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.475254535</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{W D P^* M V}{K_e}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

207.8 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

265 lb

Standing Idle Loss, This Period:

207.8152921	lb	(without controls)
0.000	% control efficiency while standing idle	
207.8152921	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

57 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **52-271**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **85** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.706** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2779** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,940,278** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **843.57** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **276.26** lb per this period**Total Routine Emissions (with control):** **1,119.83** lb per this period

per AP-42 equation 2-1

0.6 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 14186.24 ft3
Previous Sa: 0.35

Filling Loss:
Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
483 lb

Limit on Filling Loss from Resident Vapors:
57 lb

Filling Loss from Resident Vapors:
57 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
232 lb

Filling Loss, This Period:
289.3 lb (without controls)
0.000 % control efficiency while refilling
289.3 lb (with controls)

Total Emissions: 1409.0935 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.66** degrees F
 Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.888** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1987** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **667.82** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **953.61** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **667.82** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **953.61** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **46.445** degrees F

Avg Daily Solar Insolation, I: **675.82** Btu / ft² day

Avg Wind Speed, V: **5.82** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.442** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **485.07** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **770.86** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **485.07** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **770.86** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-271**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.145** degrees F
Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.345** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1169** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **392.91** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.79** lb per month

Total Emissions: **678.70** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **392.91** lb per month

Withdrawal Loss(with control): **285.79** lb per month

Total Emissions(with control): **678.70** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **34.53** degrees F

Avg Daily Solar Insolation, I: **570.26** Btu / ft² day

Avg Wind Speed, V: **6.93** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.080** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1097** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **368.60** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **654.29** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **368.60** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **654.29** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **37.4** degrees F

Avg Daily Solar Insolation, I: **828.29** Btu / ft² day

Avg Wind Speed, V: **6.71** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.423** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1191** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **374.30** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **659.99** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **374.30** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **659.99** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.701** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1270** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **426.60** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **712.29** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **426.60** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **712.29** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

$$L_r = [F_r] \times [P^* M_v K_c]$$

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

$$L_d = [F_d] \times [P^* M_v K_c]$$

$$F_d = [(K_d S_d) D^2]$$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

$$F_{fi} = N_{fi} [K_{fi}]$$

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **599** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **59.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **4.525** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.0952** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **3,041,667** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **309.48** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **595.17** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **309.48** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **595.17** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.263** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1146** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **385.24** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **670.93** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **385.24** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **670.93** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.158** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1404** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **456.68** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **742.37** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **456.68** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **742.37** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **75.57** degrees F

Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day

Avg Wind Speed, V: **4.7** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.536** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1521** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **511.22** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **796.91** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **511.22** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **796.91** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **74.885** degrees F
 Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
 Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.431** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1488** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **500.11** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **785.80** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **500.11** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **785.80** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **101,389** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **24.86** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **9.52** lb per this period

Total Emissions: **34.38** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **24.86** lb per

Withdrawal Loss(with control): **9.52** lb per this period

Total Emissions(with control): **34.38** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>52-272</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>85</u> ft	
Height of Deck Legs:	<u>6.91</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.9099969</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>39,211</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE = <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		
KS = <u>0.24680186</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\pi D K E W V V K S$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \pi D P^* M V$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

298.3 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

265 lb

Standing Idle Loss, This Period:

264.9883772 lb (without controls)

0.000 % control efficiency while standing idle

264.9883772 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 52-272

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>85</u> ft
Height of Deck Legs:	<u>6.91</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.9099969</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>39,211</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, Tla:	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
	$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, Wl:	<u>5.6</u>	lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, Tv:	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

$KE =$ 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

$KS =$ 0.24680186

per AP-42 equation 1-21

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.821807492}{0.821807492}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa:

0.35

Initial Purge Loss:

0

lb

Vapor control efficiency for Initial Purge:

0

Initial Purge Loss with control:

0

lb

Daily Vapor Purge:

Purge Day (exclude initial purge):

0

day(s)

Saturation factor, S:

0.500

Daily Purge loss:

0

lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV:

0.00375

Molecular Weight of Calibration Gas, MV:

72.15

g/mol

Continued forced ventilation emissions, LCV:

6135.433018

lb

per AP-42 equation 4-10

Vapor Limit:

264.98838

lb

per AP-42 equation 4-12, 4-13

Cleaning Loss:

264.98838

lb

per AP-42 equation 4-1

Vapor control efficiency:

0

Cleaning Loss with control:

264.98838

lb

Total Losses with control:

264.98838

lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **52-272**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psiaAvg Ambient Temp, Taa: **67.64** degrees FAvg Daily Solar Insolation, I: **1403.94** Btu / ft² dayAvg Wind Speed, V: **4.47** mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **85** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**roof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,940,278** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **671.18** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **276.17** lb per this period**Total Routine Emissions (with control):** **947.34** lb per this period

per AP-42 equation 2-1

0.5 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 39217.09 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
572 lb

Filling Loss, This Period:
571.7 lb (without controls)
0.000 % control efficiency while refilling
571.7 lb (with controls)

Total Emissions: 1519.0095 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.654** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2293** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **101,389** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **24.86** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **9.52** lb per this period

Total Emissions: **34.38** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **24.86** lb per

Withdrawal Loss(with control): **9.52** lb per this period

Total Emissions(with control): **34.38** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>52-272</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
		roof alpha: <u>0.25</u>
Tank Data:		
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>85</u> ft	
Height of Deck Legs:	<u>2.75</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.828</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0011101</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>2.7499969</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>15,605</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.451559144</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

217.2 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

265 lb

Standing Idle Loss, This Period:

217.1993934	lb	(without controls)
0.000	%	control efficiency while standing idle
217.1993934	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

48 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **52-272**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **85** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.706** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2779** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,940,278** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **843.57** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **276.17** lb per this period**Total Routine Emissions (with control):** **1,119.73** lb per this period

per AP-42 equation 2-1

0.6 tons per this period

Stock Vapor Density, WV:

0.1090693

lb/ft3

Temperature for Refill TVP:

67.64

TVP for Refill:

9.3511478

If the previous record is roof-landing, out-of-sevice, or tank-cleaning,

Previous stock vapor density (*Wv):

9.72E-02

lb/ft3

Previous volume of vapor space (*Vv):

15604.86

ft3

Previous Sa:

0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

531

lb

Limit on Filling Loss from Resident Vapors:

48

lb

Filling Loss from Resident Vapors:

48

lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

255

lb

Filling Loss, This Period:

303.1

lb

(without controls)

0.000

% control efficiency while refilling

303.1

lb

(with controls)

Total Emissions:

1422.822

lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **56.66** degrees F

Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day

Avg Wind Speed, V: **4.92** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [F_r] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, F_r

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (F_r): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [F_d] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, F_d

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **599** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **58.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **7.888** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1987** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **3,041,667** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **667.82** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **953.51** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **667.82** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **953.51** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **46.445** degrees F

Avg Daily Solar Insolation, I: **675.82** Btu / ft² day

Avg Wind Speed, V: **5.82** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.442** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **485.07** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **770.76** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **485.07** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **770.76** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **52-272**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **37.145** degrees F

Avg Daily Solar Insolation, I: **518.91** Btu / ft² day

Avg Wind Speed, V: **6.26** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **85** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **493** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **85** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **599** lb-mol/yr

Number of columns, N_c: **1**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **37.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.345** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1169** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **3,041,667** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **392.91** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q C_s W_l)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **285.69** lb per month

Total Emissions: **678.60** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **392.91** lb per month

Withdrawal Loss(with control): **285.69** lb per month

Total Emissions(with control): **678.60** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **34.53** degrees F
 Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

$$L_r = [F_r] \times [P^* M_v K_c]$$

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

$$L_d = [F_d] \times [P^* M_v K_c]$$

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

$$F_{fi} = N_{fi} [K_{fi}]$$

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.083** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1098** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **218.50** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **401.53** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **218.50** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **401.53** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.4** degrees F
 Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **66** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **355** lb-mol/yr

Number of columns, N_c : **7**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.427** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1192** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,389,528** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **221.96** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **404.98** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **221.96** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **404.98** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **45.66** degrees F
 Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.708** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1272** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **253.09** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **436.11** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **253.09** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **436.11** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.73** degrees F
 Avg Daily Solar Insolation, I: **1545** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [F_r] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, F_r

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (F_r): **66** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [F_d] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, F_d

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **355** lb-mol/yr

Number of columns, N_c : **7**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **4.533** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.0954** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,389,528** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **183.68** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **366.70** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **183.68** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **366.70** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **355** lb-mol/yr

Number of columns, N_c : **7**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **66.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.272** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1149** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,389,528** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **228.71** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **411.73** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **228.71** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **411.73** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.170** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1408** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **271.20** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **454.22** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **271.20** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **454.22** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **75.57** degrees F
 Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
 Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.548** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1525** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **303.57** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **486.59** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **303.57** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **486.59** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.442** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **296.92** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **479.94** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **296.92** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **479.94** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.666** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2298** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **79,651** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **14.76** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **6.10** lb per this period

Total Emissions: **20.86** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **14.76** lb per

Withdrawal Loss(with control): **6.10** lb per this period

Total Emissions(with control): **20.86** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>72-264</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>110</u> ft	
Height of Deck Legs:	<u>7.25</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010813</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.2495799</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>68,895</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE = <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		
KS = <u>0.237992573</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V}{K_s}$
for an EFRT, = $0.57 \frac{D P^* M V}{K_s}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

505.4 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

432 lb

Standing Idle Loss, This Period:

432.2675183	lb	(without controls)
0.000	% control efficiency while standing idle	
432.2675183	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 72-264

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>110</u> ft
Height of Deck Legs:	<u>7.25</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010813</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.2495799</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>68,895</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, T _b :	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, W _l :	<u>5.6</u>	lb/gal
Stock Vapor Density, W _v :	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, T _v :	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

$KE =$ 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

per AP-42 equation 1-21

$KS =$ 0.237992573

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.899097463}{0.899097463}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{10} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 432.26752 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 432.26752 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 432.26752 lbTotal Losses with control: 432.26752 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: MPLX Terminals, LLCLocation: Kenova, WVCalculations for Tank No.: 72-264Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psiaAvg Ambient Temp, Taa: 67.64 degrees FAvg Daily Solar Insolation, I: 1403.94 Btu / ft² dayAvg Wind Speed, V: 4.47 mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: cone-roof tank with IFRAverage alpha: 0.25Tank Diameter, D: 110 ftRim Seal Type: Mechanical-Shoe Primary with Rim-Mounted Secondaryroof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): 66 lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): 0 lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): 21 lb-mol/yrDeck Fittings Emission Factor (Ffi-n): 268 lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): 355 lb-mol/yrNumber of columns, Nc: 7Effective column diameter, Fc: 1 feet

Service Data:

Service (stored liquid): Gasoline RVP_XProduct Factor, K_C: 1Reid Vapor Pressure: 13.5 psi (if specified)ASTM Distillation Slope: 3 (if specified)Molecular Weight, M_v: 66 lb/lb-mol givenLiquid Bulk Temp, T_b: 68.7 degrees FConstant Temp Tank? NO tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12Liquid Surface Temp, T_{la}: 69.8 degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: 8.666 psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: 0.2298 dimensionless per AP-42 equation 2-4Liquid density, Wl: 5.6 lb/galClingage factor, Cs: 0.0015 bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: 2,309,877 bbl per this periodEmissions Estimate for: September 2024Days This Period: 27

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): 398.42 lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): 176.92 lb per this period**Total Routine Emissions (with control):** 575.34 lb per this period

per AP-42 equation 2-1

0.3 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 68905.34 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
1,004 lb

Filling Loss, This Period:
1,004.4 lb (without controls)
0.000 % control efficiency while refilling
1,004.4 lb (with controls)

Total Emissions: 1579.7841 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.666** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2298** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **79,651** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **14.76** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **6.10** lb per this period

Total Emissions: **20.86** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **14.76** lb per

Withdrawal Loss(with control): **6.10** lb per this period

Total Emissions(with control): **20.86** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>72-264</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>110</u> ft	
Height of Deck Legs:	<u>3.75</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010813</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>3.7495799</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>35,633</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE = <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		
KS = <u>0.376503194</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

413.5 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

432 lb

Standing Idle Loss, This Period:

413.5333694	lb	(without controls)
0.000	%	control efficiency while standing idle
413.5333694	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

19 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **72-264**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **110** ftRim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yrNumber of columns, Nc: **7**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.719** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2786** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,309,877** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **500.85** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **176.92** lb per this period**Total Routine Emissions (with control):** **677.78** lb per this period

per AP-42 equation 2-1

0.3 tons per this period

Stock Vapor Density, WV:

0.1090693

lb/ft3

Temperature for Refill TVP:

67.64

TVP for Refill:

9.3511478

If the previous record is roof-landing, out-of-sevice, or tank-cleaning,

Previous stock vapor density (*Wv):

9.72E-02

lb/ft3

Previous volume of vapor space (*Vv):

35633.45

ft3

Previous Sa:

0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

1,212

lb

Limit on Filling Loss from Resident Vapors:

19

lb

Filling Loss from Resident Vapors:

19

lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

583

lb

Filling Loss, This Period:

601.7

lb

(without controls)

0.000

% control efficiency while refilling

601.7

lb

(with controls)

Total Emissions:

1279.4869

lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.896** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1991** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **396.19** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **579.21** lb per month per AP-42 equation 2-1

0.3 tons per month

Standing Storage Loss(with control): **396.19** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **579.21** lb per month

0.3 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **66** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **268** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **355** lb-mol/yr

Number of columns, Nc: **7**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.446** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,389,528** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **287.60** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **470.62** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **287.60** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **470.62** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **72-264**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.145** degrees F
 Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
 Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **110** ft

Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **66** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **268** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **355** lb-mol/yr

Number of columns, N_c : **7**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **38.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.348** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,389,528** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **232.90** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **183.02** lb per month

Total Emissions: **415.92** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **232.90** lb per month

Withdrawal Loss(with control): **183.02** lb per month

Total Emissions(with control): **415.92** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **34.53** degrees F
 Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.085** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1098** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,290,051** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **757.34** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,053.18** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **757.34** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,053.18** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.4** degrees F
 Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **43** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.429** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1193** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,290,051** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **769.43** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,065.26** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **769.43** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,065.26** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.711** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1272** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,290,051** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **877.50** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,173.34** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **877.50** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,173.34** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **43** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.536** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.0954** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,290,051** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **636.96** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **932.79** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **636.96** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **932.79** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **64.175** degrees F
Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **66.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.276** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1150** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,290,051** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **793.20** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,089.03** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **793.20** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,089.03** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **43** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **491** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.175** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1409** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,290,051** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **940.66** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,236.49** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **940.66** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,236.49** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **78.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **6.553** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1527** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,290,051** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **1,052.91** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,348.75** lb per month per AP-42 equation 2-1

0.7 tons per month

Standing Storage Loss(with control): **1,052.91** lb per

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,348.75** lb per month

0.7 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **74.885** degrees F

Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day

Avg Wind Speed, V: **4.25** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.447** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,290,051** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **1,029.77** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,325.61** lb per month per AP-42 equation 2-1

0.7 tons per month

Standing Storage Loss(with control): **1,029.77** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,325.61** lb per month

0.7 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **69.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **8.671** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.2300** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **143,002** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **51.17** lb per this period

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **9.86** lb per this period

Total Emissions: **61.04** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **51.17** lb per

Withdrawal Loss(with control): **9.86** lb per this period

Total Emissions(with control): **61.04** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>	
Location: <u>Kenova, WV</u>	
Calculations for Tank No.: <u>90-258</u>	
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024	
Meteorological Data:	
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F
Avg Daily Temp Range:	<u>21.02</u> degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u> mph
Tank Data:	
Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>120</u> ft
Height of Deck Legs:	<u>6.33</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.593</u> ft (if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009501</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.329439</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>71,584</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)
Service Data:	
Service (stored liquid):	<u>Gasoline RVP_X</u> (if specified)
Reid Vapor Pressure:	<u>13.5</u> psi (if specified)
ASTM Distillation Slope:	<u>3</u>
Molecular Weight, M _v :	<u>66</u> lb/lb-mol
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F
Liquid Bulk Temp Basis?	<u>same as Taa</u>
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless
Stock liquid density, W _l :	<u>5.6</u> lb/gal
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F
Operational Data:	
Duration of Event, nd:	<u>1</u> days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>
Calculated Values:	
Vapor Space Expansion Factor, KE:	per AP-42 equation 1-5
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$	
where:	
$\Delta TV =$	<u>21.73</u> deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F; daily average temperature of the heel
$P =$	<u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F
$T_{max} =$	<u>73.07</u> deg F
$\Delta PB =$	<u>0</u> assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia
$KE =$ <u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:	per AP-42 equation 1-21
$KS = 1 / (1 + 0.053 P_{hv}) < S$	
$KS =$ <u>0.263474954</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\pi K E W V V K S$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \pi D P^* M V$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

581.4 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

452 lb

Standing Idle Loss, This Period:

452.0173407 lb (without controls)

0.000 % control efficiency while standing idle

452.0173407 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 90-258

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>120</u> ft
Height of Deck Legs:	<u>6.33</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.593</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009501</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.329439</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>71,584</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, Tla:	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, Wl:	<u>5.6</u>	lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, Tv:	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

$KE =$ 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

per AP-42 equation 1-21

$KS =$ 0.263474954

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{1}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.902917758}{1}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{1} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 452.01734 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 452.01734 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 452.01734 lbTotal Losses with control: 452.01734 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, N_c: **8**

Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.671** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2300** dimensionless per AP-42 equation 2-4

Liquid density, W_l: **5.6** lb/gal

Clingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,147,050** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **27**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **1,381.72** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **285.97** lb per this period

Total Routine Emissions (with control): **1,667.69** lb per this period

per AP-42 equation 2-1

0.8 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 71595.01 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
1,044 lb

Filling Loss, This Period:
1,043.6 lb (without controls)
0.000 % control efficiency while refilling
1,043.6 lb (with controls)

Total Emissions: 2711.3418 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **69.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **8.671** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.2300** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **143,002** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **51.17** lb per this period

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **9.86** lb per this period

Total Emissions: **61.04** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **51.17** lb per

Withdrawal Loss(with control): **9.86** lb per this period

Total Emissions(with control): **61.04** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>	
Location: <u>Kenova, WV</u>	
Calculations for Tank No.: <u>90-258</u>	
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024	
Meteorological Data:	
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F
Avg Daily Temp Range:	<u>21.02</u> degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u> mph
Tank Data:	
Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>120</u> ft
Height of Deck Legs:	<u>4.08</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2.593</u> ft (if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009501</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>4.079439</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>46,137</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)
Service Data:	
Service (stored liquid):	<u>Gasoline RVP_X</u> (if specified)
Reid Vapor Pressure:	<u>13.5</u> psi (if specified)
ASTM Distillation Slope:	<u>3</u>
Molecular Weight, M _v :	<u>66</u> lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F
Liquid Bulk Temp Basis?	<u>same as Taa</u>
Heel Surface Temp, Tla:	<u>67.6</u> degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless
Stock liquid density, Wl:	<u>5.6</u> lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F
Operational Data:	
Duration of Event, nd:	<u>1</u> days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>
Calculated Values:	
Vapor Space Expansion Factor, KE:	per AP-42 equation 1-5
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$	
where:	
$\Delta TV =$	<u>21.73</u> deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F; daily average temperature of the heel
$P =$	<u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F
$T_{max} =$	<u>73.07</u> deg F
$\Delta PB =$	<u>0</u> assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia
$KE =$ <u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:	per AP-42 equation 1-21
$KS = 1 / (1 + 0.053 P_{hv}) < S$	
$KS =$ <u>0.356925661</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

507.6 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

452 lb

Standing Idle Loss, This Period:

452.0173407	lb	(without controls)
0.000	% control efficiency while standing idle	
452.0173407	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **90-258**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **43** lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yrNumber of columns, N_c: **8**Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.724** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2789** dimensionless per AP-42 equation 2-4Liquid density, W_l: **5.6** lb/galClingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,147,050** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **1,737.09** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **285.97** lb per this period**Total Routine Emissions (with control):** **2,023.07** lb per this period

per AP-42 equation 2-1

1.0 tons per this period

Stock Vapor Density, WV:

0.1090693

lb/ft3

Temperature for Refill TVP:

67.64

TVP for Refill:

9.3511478

If the previous record is roof-landing, out-of-sevice, or tank-cleaning,

Previous stock vapor density (*Wv):

9.72E-02

lb/ft3

Previous volume of vapor space (*Vv):

46137.37

ft3

Previous Sa:

0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

1,570

lb

Limit on Filling Loss from Resident Vapors:

0

lb

Filling Loss from Resident Vapors:

0

lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

755

lb

Filling Loss, This Period:

754.8

lb

(without controls)

0.000

% control efficiency while refilling

754.8

lb

(with controls)

Total Emissions:

2777.8921

lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.66** degrees F
 Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **58.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **7.899** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1992** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,290,051** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **1,373.63** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,669.46** lb per month per AP-42 equation 2-1

0.8 tons per month

Standing Storage Loss(with control): **1,373.63** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,669.46** lb per month

0.8 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **43** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,230** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.448** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1494** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,290,051** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **996.89** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,292.73** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **996.89** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,292.73** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **90-258**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.145** degrees F
 Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
 Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **43** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **491** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,230** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **38.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.350** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,290,051** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **807.22** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **295.84** lb per month

Total Emissions: **1,103.06** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **807.22** lb per month

Withdrawal Loss(with control): **295.84** lb per month

Total Emissions(with control): **1,103.06** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **34.53** degrees F
 Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.084** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1098** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **523.03** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **828.52** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **523.03** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **828.52** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.4** degrees F
 Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.428** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1192** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **531.34** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **836.83** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **531.34** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **836.83** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.709** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1272** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **605.92** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **911.41** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **605.92** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **911.41** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.534** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.0954** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **439.79** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **745.28** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **439.79** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **745.28** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **66.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.274** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1150** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **547.64** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **853.13** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **547.64** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **853.13** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **72.255** degrees F
 Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.173** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1409** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **649.42** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **954.91** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **649.42** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **954.91** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **75.57** degrees F
 Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
 Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.551** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1526** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **726.92** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **1,032.41** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **726.92** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **1,032.41** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **74.885** degrees F

Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day

Avg Wind Speed, V: **4.25** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.445** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **710.97** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **1,016.46** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **710.97** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **1,016.46** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.669** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.2299** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **152,991** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **35.33** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **10.18** lb per this period

Total Emissions: **45.52** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **35.33** lb per

Withdrawal Loss(with control): **10.18** lb per this period

Total Emissions(with control): **45.52** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>95-259</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>120</u> ft	
Height of Deck Legs:	<u>6.5</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010417</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.4997916</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>73,511</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE = <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		
KS = <u>0.258353591</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V}{K_s}$
for an EFRT, = $0.57 \frac{D P^* M V}{K_s}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

585.4 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

496 lb

Standing Idle Loss, This Period:

495.594185	lb	(without controls)
0.000	% control efficiency while standing idle	
495.594185	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Tank Cleaning

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 95-259

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average
			roof alpha: <u>0.25</u>

Tank Data:

Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>120</u> ft
Height of Deck Legs:	<u>6.5</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010417</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>6.4997916</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>73,511</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u>	psi (if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u>	lb/lb-mol
Heel Bulk Temp, Tb:	<u>67.64</u>	degrees F
Liquid Bulk Temp Basis?	<u>calculated from ambient</u>	
Heel Surface Temp, Tla:	<u>67.6</u>	degrees F
TVP of Liquid in the Heel, Pva:	<u>8.333</u>	psia
		same as Taa
		per AP-42 equation 1-24, 1-25, 1-26
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u>	dimensionless
		per AP-42 equation 2-4
Stock liquid density, Wl:	<u>5.6</u>	lb/gal
Stock Vapor Density, WV:	<u>9.72E-02</u>	lb/ft ³
		per AP-42 equation 1-22
Vapor Space Temperature, Tv:	<u>67.64</u>	degrees F

Operational Data:

Duration of Event, nd:	<u>1</u>	days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV =$	<u>21.73</u>	deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u>	deg F; daily average temperature of the heel
$P =$	<u>8.3331</u>	psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u>	deg F
$T_{max} =$	<u>73.07</u>	deg F
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u>	psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u>	psia

$KE =$ 0.317131376

Vented Vapor Saturation Factor, KS:

$$KS = 1 / (1 + 0.053 P_{hv}) < S$$

$KS =$ 0.258353591

per AP-42 equation 1-21

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.906170562}{0.906170562}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{100} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 495.59418 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 495.59418 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 495.59418 lbTotal Losses with control: 495.59418 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **95-259**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.669** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2299** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,436,743** bbl per this period

Emissions Estimate for:

September 2024Days This Period: **27**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **953.99** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **295.31** lb per this period**Total Routine Emissions (with control):** **1,249.30** lb per this period

per AP-42 equation 2-1

0.6 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 73522.69 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
1,072 lb

Filling Loss, This Period:
1,071.7 lb (without controls)
0.000 % control efficiency while refilling
1,071.7 lb (with controls)

Total Emissions: 2321.0312 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.669** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2299** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **152,991** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **35.33** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **10.18** lb per this period

Total Emissions: **45.52** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **35.33** lb per

Withdrawal Loss(with control): **10.18** lb per this period

Total Emissions(with control): **45.52** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>95-259</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>120</u> ft	
Height of Deck Legs:	<u>4.25</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010417</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>4.2497916</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>48,064</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.34759143</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e D P^* M V}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

515.0 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

496 lb

Standing Idle Loss, This Period:

495.594185	lb	(without controls)
0.000	% control efficiency while standing idle	
495.594185	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: MPLX Terminals, LLCLocation: Kenova, WVCalculations for Tank No.: 95-259Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 67.64 degrees F
Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day
Avg Wind Speed, V: 4.47 mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: cone-roof tank with IFRAverage alpha: 0.25Tank Diameter, D: 120 ftRim Seal Type: Mechanical-Shoe Primary with NO Secondary

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): 696 lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): 0 lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): 21 lb-mol/yrDeck Fittings Emission Factor (Ffi-n): 133 lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): 850 lb-mol/yrNumber of columns, Nc: 1Effective column diameter, Fc: 1 feet

Service Data:

Service (stored liquid): Gasoline RVP_XProduct Factor, K_C: 1Reid Vapor Pressure: 15 psi (if specified)ASTM Distillation Slope: 3 (if specified)Molecular Weight, M_v: 66 lb/lb-mol givenLiquid Bulk Temp, T_b: 68.7 degrees FConstant Temp Tank? NO tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12Liquid Surface Temp, T_{la}: 69.8 degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: 9.722 psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: 0.2788 dimensionless per AP-42 equation 2-4Liquid density, Wl: 5.6 lb/galClingage factor, Cs: 0.0015 bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: 4,436,743 bbl per this periodEmissions Estimate for: September 2024Days This Period: 28

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): 1,199.30 lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): 295.31 lb per this periodTotal Routine Emissions (with control): 1,494.61 lb per this period

per AP-42 equation 2-1

0.7 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 48064.01 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
1,635 lb

Limit on Filling Loss from Resident Vapors:
0 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
786 lb

Filling Loss, This Period:
786.3 lb (without controls)
0.000 % control efficiency while refilling
786.3 lb (with controls)

Total Emissions: 2280.9583 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **58.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **7.898** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1991** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **948.50** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **1,253.99** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **948.50** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **1,253.99** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.448** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **688.44** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **993.93** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **688.44** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **993.93** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **95-259**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **37.145** degrees F

Avg Daily Solar Insolation, I: **518.91** Btu / ft² day

Avg Wind Speed, V: **6.26** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **133** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **850** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.349** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,589,734** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **557.48** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **305.49** lb per month

Total Emissions: **862.97** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **557.48** lb per month

Withdrawal Loss(with control): **305.49** lb per month

Total Emissions(with control): **862.97** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **11** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,005** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.084** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1098** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,866,355** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **618.86** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **954.44** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **618.86** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **954.44** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **11** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,005** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.428** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1192** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,866,355** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **628.70** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **964.27** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **628.70** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **964.27** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **45.66** degrees F
 Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.709** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1272** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,866,355** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **716.95** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **1,052.52** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **716.95** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **1,052.52** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.73** degrees F
Avg Daily Solar Insolation, I: **1545** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **11** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,005** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **4.534** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.0954** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,866,355** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **520.38** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **855.95** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **520.38** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **855.95** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **64.175** degrees F
Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **11** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,005** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **66.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.274** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1150** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,866,355** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **647.99** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **983.56** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **647.99** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **983.56** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.173** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1409** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,866,355** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **768.41** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **1,103.99** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **768.41** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **1,103.99** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.551** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1526** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,866,355** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **860.12** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **1,195.70** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **860.12** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **1,195.70** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.445** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,866,355** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **841.25** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **1,176.82** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **841.25** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **1,176.82** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.669** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2299** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **162,212** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **41.81** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **11.19** lb per this period

Total Emissions: **52.99** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **41.81** lb per

Withdrawal Loss(with control): **11.19** lb per this period

Total Emissions(with control): **52.99** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>96-257</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>120</u> ft	
Height of Deck Legs:	<u>7.5</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010417</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.4991667</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>84,814</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F	$P_{min} =$ <u>7.5474</u> psia
$T_{max} =$	<u>73.07</u> deg F	$P_{max} =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.231908634</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{1000}$
for an EFRT, = $0.57 \frac{D P^* M V}{1000}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

606.3 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

496 lb

Standing Idle Loss, This Period:

495.594185	lb	(without controls)
0.000	% control efficiency while standing idle	
495.594185	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

page 1

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Meteorological Data:

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F
Avg Daily Temp Range:	<u>21.02</u>	degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u>	mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

 roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

Tank Data:

Tank Type:	cone-roof tank with IFR	
Average alpha:	0.25	
Tank Diameter, D:	120	ft
Height of Deck Legs:	7.5	ft
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	3.464	ft
Depth of Heel in Sump:	0.25	ft (if partial heel (liquid only in sump))
Slope of Bottom:	0	in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid surface)
Eff. Ht of Liquid Heel:	0.0010417	ft (equivalent depth across the entire bottom)
Height of Vapor Space:	7.4991667	ft (below the landed floating roof deck)
Vapor Space Volume, VV:	84,814	ft ³
Constant Temp Tank?	NO	(only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	Gasoline RVP_X	(if specified)
Reid Vapor Pressure:	13.5 psi	(if specified)
ASTM Distillation Slope:	3	
Molecular Weight, M _v :	66 lb/lb-mol	
Heel Bulk Temp, T _b :	67.64 degrees F	
Liquid Bulk Temp Basis?	calculated from ambient	
Heel Surface Temp, T _{la} :	67.6 degrees F	same as T _{aa}
TVP of Liquid in the Heel, P _{va} :	8.333 psia	per AP-42 equation 1-24, 1-25, 1-26
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	0.2161 dimensionless	per AP-42 equation 2-4
Stock liquid density, W _l :	5.6 lb/gal	
Stock Vapor Density, W _v :	9.72E-02 lb/ft ³	per AP-42 equation 1-22
Vapor Space Temperature, T _v :	67.64 degrees F	

Operational Data:

Duration of Event, nd: 1 days this period

Heel Condition: **Partial Heel (liquid only in sump)**

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV = \frac{21.73}{\text{deg F (deg R)}}$; daily temperature range in the vapor space

$T = \frac{67.6}{\text{deg F}}$; daily average temperature of the heel

$P = \frac{8.3331}{\text{psia}}$; TVP of liquid in the heel at the daily average temperature

$T_{min} = \frac{62.21}{\text{deg F}}$ $P_{min} = \frac{7.5474}{\text{psia}}$

$T_{max} = \frac{73.07}{\text{deg F}}$ $P_{max} = \frac{9.1820}{\text{psia}}$

$\Delta PB = 0$ assuming open vent pathways through the floating roof deck

$P_a = \frac{14.25743}{\text{psia}}$; atmospheric pressure

$\Delta PV = \frac{1.6346}{\text{psia}}$

$KE = \frac{0.317131376}{\text{}}$

Vented Vapor Saturation Factor, KS:

$KS = 1 / (1 + 0.053 P_{hv}) < S$ per AP-42 equation 1-21

$KS = 0.231908634$

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.921900439}{0.921900439}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{100} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 495.59418 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 495.59418 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 495.59418 lbTotal Losses with control: 495.59418 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **96-257**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yrNumber of columns, Nc: **8**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.669** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2299** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,704,143** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **1,128.79** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **324.39** lb per this period**Total Routine Emissions (with control):** **1,453.18** lb per this period

per AP-42 equation 2-1

0.7 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 84825.36 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
1,237 lb

Filling Loss, This Period:
1,236.5 lb (without controls)
0.000 % control efficiency while refilling
1,236.5 lb (with controls)

Total Emissions: 2689.7025 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.669** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2299** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **162,212** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **41.81** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **11.19** lb per this period

Total Emissions: **52.99** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **41.81** lb per

Withdrawal Loss(with control): **11.19** lb per this period

Total Emissions(with control): **52.99** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>	
Location: <u>Kenova, WV</u>	
Calculations for Tank No.: <u>96-257</u>	
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024	
Meteorological Data:	
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F
Avg Daily Temp Range:	<u>21.02</u> degrees F
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day
Avg Wind Speed, V:	<u>4.47</u> mph
Tank Data:	
Tank Type:	<u>cone-roof tank with IFR</u>
Average alpha:	<u>0.25</u>
Tank Diameter, D:	<u>120</u> ft
Height of Deck Legs:	<u>3.67</u> ft
Height of Liquid Heel:	ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>3.464</u> ft (if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft (if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:	ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0010417</u> ft (equivalent depth across the entire bottom)
Height of Vapor Space:	<u>3.6691667</u> ft (below the landed floating roof deck)
Vapor Space Volume, VV:	<u>41,497</u> ft ³
Constant Temp Tank?	<u>NO</u> (only if both roof and shell are insulated)
Service Data:	
Service (stored liquid):	<u>Gasoline RVP_X</u> (if specified)
Reid Vapor Pressure:	<u>13.5</u> psi (if specified)
ASTM Distillation Slope:	<u>3</u>
Molecular Weight, M _v :	<u>66</u> lb/lb-mol
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F
Liquid Bulk Temp Basis?	<u>same as Taa</u>
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$	
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless
Stock liquid density, W _l :	<u>5.6</u> lb/gal
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F
Operational Data:	
Duration of Event, nd:	<u>1</u> days this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>
Calculated Values:	
Vapor Space Expansion Factor, KE:	per AP-42 equation 1-5
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$	
where:	
$\Delta TV =$	<u>21.73</u> deg F (deg R); daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F; daily average temperature of the heel
$P =$	<u>8.3331</u> psia; TVP of liquid in the heel at the daily average temperature
$T_{min} =$	<u>62.21</u> deg F
$T_{max} =$	<u>73.07</u> deg F
$\Delta PB =$	<u>0</u> assuming open vent pathways through the floating roof deck
$P_a =$	<u>14.25743</u> psia; atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia
$KE =$ <u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:	per AP-42 equation 1-21
$KS = 1 / (1 + 0.053 P_{hv}) < S$	
$KS =$ <u>0.381605822</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\frac{K_e W V V K_s}{P^* M V}$
for an EFRT, = $0.57 \frac{K_e W V V K_s}{P^* M V}$

per AP-42 equation 3-6, 3-7
per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

488.1 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

496 lb

Standing Idle Loss, This Period:

488.1112759	lb	(without controls)
0.000	%	control efficiency while standing idle
488.1112759	lb	(with controls)

Limit on Filling Loss from Resident Vapors:

7 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **96-257**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yrNumber of columns, Nc: **8**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.722** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2788** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,704,143** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **1,419.06** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **324.39** lb per this period**Total Routine Emissions (with control):** **1,743.45** lb per this period

per AP-42 equation 2-1

0.9 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 41497.3 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
1,412 lb

Limit on Filling Loss from Resident Vapors:
7 lb

Filling Loss from Resident Vapors:
7 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
679 lb

Filling Loss, This Period:

686.4	lb	(without controls)
0.000	% control efficiency while refilling	
686.4	lb	(with controls)

Total Emissions: 2429.845 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.66** degrees F
 Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **11** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **1,005** lb-mol/yr

Number of columns, N_c : **8**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **58.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **7.898** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1991** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **4,866,355** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **1,122.30** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **1,457.88** lb per month per AP-42 equation 2-1

0.7 tons per month

Standing Storage Loss(with control): **1,122.30** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **1,457.88** lb per month

0.7 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.448** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,866,355** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **814.59** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **1,150.16** lb per month per AP-42 equation 2-1

0.6 tons per month

Standing Storage Loss(with control): **814.59** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **1,150.16** lb per month

0.6 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-257**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.145** degrees F
Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

Guidepole Emission Factor (Ffgp): **11** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **298** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **1,005** lb-mol/yr

Number of columns, Nc: **8**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.349** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **4,866,355** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **659.63** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **335.58** lb per month

Total Emissions: **995.21** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **659.63** lb per month

Withdrawal Loss(with control): **335.58** lb per month

Total Emissions(with control): **995.21** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **34.53** degrees F
Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **35.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **35.4** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.083** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1098** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **533.88** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **878.40** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **533.88** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **878.40** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **38.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.427** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1192** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **542.32** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **886.84** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **542.32** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **886.84** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [F_r] \times [P^* M_v K_c]$

$F_r = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, F_r

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [F_d] \times [P^* M_v K_c]$

$F_d = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, F_d

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **868** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **46.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.708** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1272** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **5,189,009** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **618.38** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **962.90** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **618.38** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **962.90** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.73** degrees F
 Avg Daily Solar Insolation, I: **1545** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **59.1** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.533** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.0954** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **448.79** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **793.31** lb per month per AP-42 equation 2-1

0.4 tons per month

Standing Storage Loss(with control): **448.79** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **793.31** lb per month

0.4 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **64.175** degrees F
 Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
 Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **868** lb-mol/yr

Number of columns, N_c : **1**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **65.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **66.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.272** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1149** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **5,189,009** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **558.81** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **903.33** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **558.81** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **903.33** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **72.255** degrees F
Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **73.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **75.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.170** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1408** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **662.62** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **1,007.15** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **662.62** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **1,007.15** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.548** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1525** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **741.71** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **1,086.24** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **741.71** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **1,086.24** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

$L_r = [Fr] \times [P^* M_v K_c]$

$Fr = [(K_{ra} + K_{rb} V^n) D]$

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

$L_d = [Fd] \times [P^* M_v K_c]$

$Fd = [(K_d S_d) D^2]$

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

$F_{fi} = N_{fi} [K_{fi}]$

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **77.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.442** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1492** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **725.47** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **1,069.99** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **725.47** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **1,069.99** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **68.7** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **8.666** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2298** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **172,967** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **36.05** lb per this period

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **11.48** lb per this period

Total Emissions: **47.54** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **36.05** lb per

Withdrawal Loss(with control): **11.48** lb per this period

Total Emissions(with control): **47.54** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>96-260</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	cone-roof tank with IFR	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>120</u> ft	
Height of Deck Legs:	<u>8.75</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid surface)
Eff. Ht of Liquid Heel:	<u>0.0009028</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>8.749375</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>98,953</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, Mw:	<u>66</u> lb/lb-mol	
Heel Bulk Temp, Tb:	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, Tla:	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, Pva:	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, Wl:	<u>5.6</u> lb/gal	
Stock Vapor Density, WV:	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, Tv:	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	Partial Heel (liquid only in sump)	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (Pa - P)\}$		
where:		
$\Delta TV =$	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
$T =$	<u>67.6</u> deg F;	daily average temperature of the heel
$P =$	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
$Tmin =$	<u>62.21</u> deg F	$Pmin =$ <u>7.5474</u> psia
$Tmax =$	<u>73.07</u> deg F	$Pmax =$ <u>9.1820</u> psia
$\Delta PB =$	<u>0</u>	assuming open vent pathways through the floating roof deck
$Pa =$	<u>14.25743</u> psia;	atmospheric pressure
$\Delta PV =$	<u>1.6346</u> psia	
$KE =$	<u>0.317131376</u>	
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P hv) < S$	<u>per AP-42 equation 1-21</u>	
$KS =$	<u>0.205583503</u>	

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\pi D K E W V V K S$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \pi D P^* M V$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

627.0 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

430 lb

Standing Idle Loss, This Period:

429.52 lb (without controls)

0.000 % control efficiency while standing idle

429.52 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

page 1

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Meteorological Data:

Avg Atmos Pressure, Pa:	14.257432	psia
Avg Ambient Temp, Taa:	67.64	degrees F
Avg Daily Temp Range:	21.02	degrees F
Avg Daily Solar Insolation, I:	1403.94	Btu / ft ² day
Avg Wind Speed, V:	4.47	mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

 roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

Tank Data:

Tank Type:	cone-roof tank with IFR	
Average alpha:	0.25	
Tank Diameter, D:	120	ft
Height of Deck Legs:	8.75	ft
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	2	ft
Depth of Heel in Sump:	0.25	ft (if partial heel (liquid only in sump))
Slope of Bottom:	0	in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid surface)
Eff. Ht of Liquid Heel:	0.0009028	ft (equivalent depth across the entire bottom)
Height of Vapor Space:	8.749375	ft (below the landed floating roof deck)
Vapor Space Volume, VV:	98,953	ft ³
Constant Temp Tank?	NO	(only if both roof and shell are insulated)

Service Data:

Service (stored liquid):	Gasoline RVP_X	(if specified)
Reid Vapor Pressure:	13.5 psi	(if specified)
ASTM Distillation Slope:	3	
Molecular Weight, M _v :	66 lb/lb-mol	
Heel Bulk Temp, T _b :	67.64 degrees F	
Liquid Bulk Temp Basis?	calculated from ambient	
Heel Surface Temp, T _{la} :	67.6 degrees F	same as T _{aa}
TVP of Liquid in the Heel, P _{va} :	8.333 psia	per AP-42 equation 1-24, 1-25, 1-26
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	0.2161 dimensionless	per AP-42 equation 2-4
Stock liquid density, W _l :	5.6 lb/gal	
Stock Vapor Density, W _v :	9.72E-02 lb/ft ³	per AP-42 equation 1-22
Vapor Space Temperature, T _v :	67.64 degrees F	

Operational Data:

Duration of Event, nd: 1 days this period

Heel Condition: **Partial Heel (liquid only in sump)**

Calculated Values:

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV = \frac{21.73}{\text{deg F (deg R)}}$; daily temperature range in the vapor space

$T = \frac{67.6}{\text{deg F}}$; daily average temperature of the heel

$P = \frac{8.3331}{\text{psia}}$; TVP of liquid in the heel at the daily average temperature

$T_{min} = \frac{62.21}{\text{deg F}}$ $P_{min} = \frac{7.5474}{\text{psia}}$

$T_{max} = \frac{73.07}{\text{deg F}}$ $P_{max} = \frac{9.1820}{\text{psia}}$

$\Delta PB = 0$ assuming open vent pathways through the floating roof deck

$P_a = \frac{14.25743}{\text{psia}}$; atmospheric pressure

$\Delta PV = \frac{1.6346}{\text{psia}}$

$KE = \frac{0.317131376}{\text{}}$

Vented Vapor Saturation Factor, KS:

$KS = 1 / (1 + 0.053 P_{hv}) < S$ per AP-42 equation 1-21

$KS = 0.205583503$

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{0.5}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.935893929}{0.935893929}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

Sa: 0.35Initial Purge Loss: 0 lbVapor control efficiency for Initial Purge: 0Initial Purge Loss with control: 0 lb

Daily Vapor Purge:

Purge Day (exclude initial purge): 0 day(s)Saturation factor, S: 0.500Daily Purge loss: 0 lb

per AP-42 equation 4-2

Continued Forced Ventilation:

Average vapor concentration, CV: 0.00375Molecular Weight of Calibration Gas, MV: 72.15 g/mol

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{15} \text{ lb}$$

per AP-42 equation 4-10

Vapor Limit: 429.52 lb

per AP-42 equation 4-12, 4-13

Cleaning Loss: 429.52 lb

per AP-42 equation 4-1

Vapor control efficiency: 0Cleaning Loss with control: 429.52 lbTotal Losses with control: 429.52 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **96-260**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yrNumber of columns, N_c: **1**Effective column diameter, F_c: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **13.5** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **8.666** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2298** dimensionless per AP-42 equation 2-4Liquid density, W_l: **5.6** lb/galClingage factor, C_s: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,016,042** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **27**

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **973.47** lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **333.04** lb per this period**Total Routine Emissions (with control):** **1,306.51** lb per this period

per AP-42 equation 2-1

0.7 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 98963.31 ft3
Previous Sa: 0.35

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
0 lb

Limit on Filling Loss from Resident Vapors:
-1 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
1,443 lb

Filling Loss, This Period:
1,442.7 lb (without controls)
0.000 % control efficiency while refilling
1,442.7 lb (with controls)

Total Emissions: 2749.1777 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: MPLX Terminals, LLCLocation: Kenova, WVCalculations for Tank No.: 96-260Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psiaAvg Ambient Temp, Taa: 67.64 degrees FAvg Daily Solar Insolation, I: 1403.94 Btu / ft² dayAvg Wind Speed, V: 4.47 mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: cone-roof tank with IFRAverage alpha: 0.25Tank Diameter, D: 120 ftRim Seal Type: Mechanical-Shoe Primary with NO Secondaryroof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): 696 lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): 0 lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): 21 lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): 151 lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): 868 lb-mol/yrNumber of columns, N_c : 1Effective column diameter, F_c : 1 feet

Service Data:

Service (stored liquid): Gasoline RVP_XProduct Factor, K_C : 1Reid Vapor Pressure: 13.5 psi (if specified)ASTM Distillation Slope: 3 (if specified)Molecular Weight, M_v : 66 lb/lb-mol givenLiquid Bulk Temp, T_b : 68.7 degrees FConstant Temp Tank? NO tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12Liquid Surface Temp, T_{la} : 69.8 degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va} : 8.666 psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : 0.2298 dimensionless per AP-42 equation 2-4Liquid density, W_l : 5.6 lb/galClingage factor, C_s : 0.0015 bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : 172,967 bbl per this periodEmissions Estimate for: September 2024Days This Period: 1 Control Efficiency= 0Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18**Standing Storage Loss:** 36.05 lb per this periodWithdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19**Withdrawal Loss:** 11.48 lb per this period**Total Emissions:** 47.54 lb per this period per AP-42 equation 2-10.0 tons per this period**Standing Storage Loss(with control):** 36.05 lb per**Withdrawal Loss(with control):** 11.48 lb per this period**Total Emissions(with control):** 47.54 lb per this period0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>96-260</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>cone-roof tank with IFR</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>120</u> ft	
Height of Deck Legs:	<u>3.92</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009028</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>3.919375</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>44,327</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>8.333</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.2161</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>9.72E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:	<u>per AP-42 equation 1-5</u>	
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
ΔTV =	<u>21.73</u> deg F (deg R);	daily temperature range in the vapor space
T =	<u>67.6</u> deg F;	daily average temperature of the heel
P =	<u>8.3331</u> psia;	TVP of liquid in the heel at the daily average temperature
Tmin =	<u>62.21</u> deg F	Pmin = <u>7.5474</u> psia
Tmax =	<u>73.07</u> deg F	Pmax = <u>9.1820</u> psia
ΔPB =	<u>0</u>	assuming open vent pathways through the floating roof deck
P _a =	<u>14.25743</u> psia;	atmospheric pressure
ΔPV =	<u>1.6346</u> psia	
KE = <u>0.317131376</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		
KS = <u>0.366164791</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = nd KE WV VV KS

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \text{ nd D P}^* \text{ MV}$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

500.3 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

430 lb

Standing Idle Loss, This Period:

429.52 lb (without controls)

0.000 % control efficiency while standing idle

429.52 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service - RVP Change

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **96-260**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **67.64** degrees F
Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$Lr = [(Kra + Krb V^n) D] \times [P^* Mv Kc]$$

per AP-42 equation 2-3

$$Lr = [Fr] \times [P^* Mv Kc]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(Kra + Krb V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$Ld = [(Kd Sd) D^2] \times [P^* Mv Kc]$$

per AP-42 equation 2-18

$$Ld = [Fd] \times [P^* Mv Kc]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(Kd Sd) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$Lfi = [Ffi] \times [P^* Mv Kc]$$

per AP-42 equation 2-13

$$Ffi = Nfi [Kfi]$$

per AP-42 equation 2-14

$$Kfi = [Kfai + Kfbi (Kv V)^{mi}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **68.7** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **69.8** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **9.719** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [Pva/Pa] / [1 + (1 - Pva/Pa)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2786** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,016,042** bbl per this periodEmissions Estimate for: **September 2024**Days This Period: **28**

$$\text{Standing Storage Loss (Lr + Ld + Lf)} = [Fr + Fd + Ff] \times [P^* Mv Kc]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): **1,223.75** lb per this period

$$\text{Withdrawal Loss (Lwd)} = [(0.943 Q Cs Wl)/D] \times [1 + (Nc Fc)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): **333.04** lb per this period**Total Routine Emissions (with control):** **1,556.79** lb per this period

per AP-42 equation 2-1

0.8 tons per this period

Stock Vapor Density, WV: 0.1090693 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 9.3511478
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 9.72E-02 lb/ft3
Previous volume of vapor space (*Vv): 44327.09 ft3
Previous Sa: 0.35

Filling Loss:
Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:
1,508 lb

Limit on Filling Loss from Resident Vapors:
0 lb

Filling Loss from Resident Vapors:
0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:
725 lb

Filling Loss, This Period:
725.2 lb (without controls)
0.000 % control efficiency while refilling
725.2 lb (with controls)

Total Emissions: 2281.9944 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**Location: **Kenova, WV**Calculations for Tank No.: **96-260**Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psiaAvg Ambient Temp, Taa: **56.66** degrees FAvg Daily Solar Insolation, I: **1044.79** Btu / ft² dayAvg Wind Speed, V: **4.92** mphshell color: **white paint**shell condition: **Average**shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**Average alpha: **0.25**Tank Diameter, D: **120** ftRim Seal Type: **Mechanical-Shoe Primary with NO Secondary**roof color: **white paint**roof condition: **Average**roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **21** lb-mol/yrDeck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yrNumber of columns, Nc: **1**Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**Product Factor, K_C: **1**Reid Vapor Pressure: **15** psi (if specified)ASTM Distillation Slope: **3** (if specified)Molecular Weight, M_v: **66** lb/lb-mol givenLiquid Bulk Temp, T_b: **57.4** degrees FConstant Temp Tank? **NO** tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**Liquid Surface Temp, T_{la}: **58.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: **7.896** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1991** dimensionless per AP-42 equation 2-4Liquid density, Wl: **5.6** lb/galClingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per monthEmissions Estimate for: **October 2024**Days This Period: **31** Control Efficiency= **0**Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18**Standing Storage Loss:** **968.01** lb per monthWithdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19**Withdrawal Loss:** **344.52** lb per month**Total Emissions:** **1,312.53** lb per month per AP-42 equation 2-1**0.7** tons per month**Standing Storage Loss(with control):** **968.01** lb per month**Withdrawal Loss(with control):** **344.52** lb per month**Total Emissions(with control):** **1,312.53** lb per month**0.7** tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

$$L_r = [F_r] \times [P^* M_v K_c]$$

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

$$L_d = [F_d] \times [P^* M_v K_c]$$

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

$$F_{fi} = N_{fi} [K_{fi}]$$

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

Guidepole Emission Factor (Ffgp): **21** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **151** lb-mol/yr

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

per AP-42 equation 2-3

defining a Rim Seal Emission Factor, Fr

per AP-42 equation 2-18

defining a Deck Seam Emission Factor, Fd

per AP-42 equation 2-13

per AP-42 equation 2-14

per AP-42 equation 2-15

(all deck fittings other than the guidepole)

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.0** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **47.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.446** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1493** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **702.69** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (N_c F_c)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **1,047.22** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **702.69** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **1,047.22** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **96-260**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia

Avg Ambient Temp, Taa: **37.145** degrees F

Avg Daily Solar Insolation, I: **518.91** Btu / ft² day

Avg Wind Speed, V: **6.26** mph

shell color: **white paint**

shell condition: **Average**

shell alpha: **0.25**

Tank Data:

Tank Type: **cone-roof tank with IFR**

Average alpha: **0.25**

Tank Diameter, D: **120** ft

Rim Seal Type: **Mechanical-Shoe Primary with NO Secondary**

roof color: **white paint**

roof condition: **Average**

roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$

per AP-42 equation 2-3

$L_r = [Fr] \times [P^* M_v K_c]$

defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **696** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$

per AP-42 equation 2-18

$L_d = [Fd] \times [P^* M_v K_c]$

defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$

per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$

per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **21** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **151** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **868** lb-mol/yr

Number of columns, Nc: **1**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **37.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **38.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.348** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1170** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **5,189,009** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **569.05** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **344.52** lb per month

Total Emissions: **913.58** lb per month per AP-42 equation 2-1

0.5 tons per month

Standing Storage Loss(with control): **569.05** lb per month

Withdrawal Loss(with control): **344.52** lb per month

Total Emissions(with control): **913.58** lb per month

0.5 tons per month

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 34.53 degrees F
 Avg Daily Temp Range, ΔTa: 15.64 degrees F
 Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0035</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 36.02624 degree F per AP-42 equation 1-32, 1-33, 1-34
 Max Liquid Bulk Temp: degrees F
 Min Liquid Bulk Temp: degrees F
 Heating cycle frequency: days

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 31 days
 Turnover Rate: 467.2 turnovers per year
 Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.660784 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 38.91 deg F P_{vx} = 0.004 psia
 T_{ln} = 32.08 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0008764 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0234406

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9952789

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for: January 2024

Standing Storage Loss: 24.35 lb per month AP-42 eqn 1-4

Working Loss:	<u>557.41</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>581.76</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>24.35</u>	lb per	month
Working Loss(with control):	<u>557.41</u>	lb per	month
Total Emissions(with control):	<u>581.76</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.4 degrees F
 Avg Daily Temp Range, ΔTa: 17.06 degrees F
 Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:		(if specified)	B: <u>8933</u>
ASTM Distillation Slope:		(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0040</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00010</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>39.57326</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:			
Min Liquid Bulk Temp:			
Heating cycle frequency:			

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 29 days
 Turnover Rate: 499.5 turnovers per year
 Turnover Factor, K_N: 0.227

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 15.890174 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 42.77 deg F P_{vx} = 0.005 psia
 T_{ln} = 34.82 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0011344 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0277482
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9946822
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

February 2024
 Standing Storage Loss: 30.16 lb per month

AP-42 eqn 1-4

Working Loss:	<u>612.58</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>642.74</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>30.16</u>	lb per	month
Working Loss(with control):	<u>612.58</u>	lb per	month
Total Emissions(with control):	<u>642.74</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 123-255
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 45.66 degrees F
Avg Daily Temp Range, ΔTa: 19.58 degrees F
Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.71071</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
Days this Period: 31 days
Turnover Rate: 467.2 turnovers per year
Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 19.254352 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 52.43 deg F P_{vx} = 0.006 psia
T_{ln} = 42.81 deg F P_{vn} = 0.005 psia
ΔP_V = 0.0018142 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0338726
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9927511
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

March 2024
Standing Storage Loss: 52.68 lb per month

AP-42 eqn 1-4

Working Loss:	<u>836.63</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>889.31</u>	lb per	month
	0.4	tons per	month
Standing Storage Loss(with control):	<u>52.68</u>	lb per	month
Working Loss(with control):	<u>836.63</u>	lb per	month
Total Emissions(with control):	<u>889.31</u>	lb per	month
	<u>0.4</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.73 degrees F
 Avg Daily Temp Range, ΔTa: 21.92 degrees F
 Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0081</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00019</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.78375</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 30 days
 Turnover Rate: 482.8 turnovers per year
 Turnover Factor, K_N: 0.229

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.722341 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 65.02 deg F P_{vx} = 0.010 psia
 T_{ln} = 53.66 deg F P_{vn} = 0.007 psia
 ΔP_V = 0.0030461 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0397835
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9892513
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

April 2024
 Standing Storage Loss: 86.73 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,205.16</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,291.89</u>	lb per	month
	0.6	tons per	month
Standing Storage Loss(with control):	<u>86.73</u>	lb per	month
Working Loss(with control):	<u>1,205.16</u>	lb per	month
Total Emissions(with control):	<u>1,291.89</u>	lb per	month
	<u>0.6</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 123-255
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 64.175 degrees F
Avg Daily Temp Range, ΔTa: 20.97 degrees F
Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>67.1</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0104</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00024</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 68.7702 degree F per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp: degrees F
Min Liquid Bulk Temp: degrees F
Heating cycle frequency: days

Operational Data:

Throughput: 5,005,518 bbl per month
Days this Period: 31 days
Turnover Rate: 467.2 turnovers per year
Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.048266 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 72.89 deg F P_{vx} = 0.012 psia
T_{ln} = 61.37 deg F P_{vn} = 0.009 psia
ΔP_V = 0.0038681 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0398116

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9861775

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for:

May 2024
Standing Storage Loss: 113.59 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,544.99</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,658.58</u>	lb per	month
	0.8	tons per	month
Standing Storage Loss(with control):	<u>113.59</u>	lb per	month
Working Loss(with control):	<u>1,544.99</u>	lb per	month
Total Emissions(with control):	<u>1,658.58</u>	lb per	month
	<u>0.8</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 72.255 degrees F
 Avg Daily Temp Range, ΔTa: 19.53 degrees F
 Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0135</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00031</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>77.28019</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 30 days
 Turnover Rate: 482.8 turnovers per year
 Turnover Factor, K_N: 0.229

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.828164 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 81.19 deg F P_{vx} = 0.016 psia
 T_{ln} = 69.78 deg F P_{vn} = 0.011 psia
 ΔP_V = 0.0048363 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0387842
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9820624
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

June 2024
 Standing Storage Loss: 136.77 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,963.67</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,100.44</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>136.77</u>	lb per	month
Working Loss(with control):	<u>1,963.67</u>	lb per	month
Total Emissions(with control):	<u>2,100.44</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0150</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00034</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.44049</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 31 days
 Turnover Rate: 467.2 turnovers per year
 Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.063388 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 84.22 deg F P_{vx} = 0.018 psia
 T_{ln} = 73.19 deg F P_{vn} = 0.013 psia
 ΔP_V = 0.0051012 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0371271
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.980219
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

July 2024
 Standing Storage Loss: 148.32 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,176.37</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,324.68</u>	lb per	month
	1.2	tons per	month
Standing Storage Loss(with control):	<u>148.32</u>	lb per	month
Working Loss(with control):	<u>2,176.37</u>	lb per	month
Total Emissions(with control):	<u>2,324.68</u>	lb per	month
	<u>1.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:		(if specified)	B: <u>8933</u>
ASTM Distillation Slope:		(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0145</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00033</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.41117</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 31 days
 Turnover Rate: 467.2 turnovers per year
 Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.04186 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.31 deg F P_{vx} = 0.017 psia
 T_{ln} = 72.28 deg F P_{vn} = 0.012 psia
 ΔP_V = 0.0049724 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0371473
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9807544
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

August 2024
 Standing Storage Loss: 144.66 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,120.35</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,265.01</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>144.66</u>	lb per	month
Working Loss(with control):	<u>2,120.35</u>	lb per	month
Total Emissions(with control):	<u>2,265.01</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 67.64 degrees F
 Avg Daily Temp Range, ΔTa: 21.02 degrees F
 Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>70.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0114</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00026</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.32364</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 30 days
 Turnover Rate: 482.8 turnovers per year
 Turnover Factor, K_N: 0.229

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.41715 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 75.36 deg F P_{vx} = 0.013 psia
 T_{ln} = 64.65 deg F P_{vn} = 0.010 psia
 ΔP_V = 0.0038963 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0364961
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9848632
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: September 2024
 Standing Storage Loss: 109.82 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,670.88</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,780.70</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>109.82</u>	lb per	month
Working Loss(with control):	<u>1,670.88</u>	lb per	month
Total Emissions(with control):	<u>1,780.70</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0078</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00018</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>59.40131</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 31 days
 Turnover Rate: 467.2 turnovers per year
 Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.281679 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 63.49 deg F P_{vx} = 0.009 psia
 T_{ln} = 53.35 deg F P_{vn} = 0.007 psia
 ΔP_V = 0.0026449 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0351218
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9895693
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

October 2024
 Standing Storage Loss: 76.98 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,182.85</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,259.84</u>	lb per	month
	0.6	tons per	month
Standing Storage Loss(with control):	<u>76.98</u>	lb per	month
Working Loss(with control):	<u>1,182.85</u>	lb per	month
Total Emissions(with control):	<u>1,259.84</u>	lb per	month
	<u>0.6</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 46.445 degrees F
 Avg Daily Temp Range, ΔTa: 18.49 degrees F
 Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 48.21821 degree F per AP-42 equation 1-32, 1-33, 1-34
 Max Liquid Bulk Temp: degrees F
 Min Liquid Bulk Temp: degrees F
 Heating cycle frequency: days

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 30 days
 Turnover Rate: 482.8 turnovers per year
 Turnover Factor, K_N: 0.229

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 16.158007 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 51.62 deg F P_{vx} = 0.006 psia
 T_{ln} = 43.55 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0015193 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0277505

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9927602

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for:

November 2024

Standing Storage Loss: 41.76 lb per month

AP-42 eqn 1-4

Working Loss:	<u>828.88</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>870.64</u>	lb per	month
	0.4	tons per	month
Standing Storage Loss(with control):	<u>41.76</u>	lb per	month
Working Loss(with control):	<u>828.88</u>	lb per	month
Total Emissions(with control):	<u>870.64</u>	lb per	month
	<u>0.4</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 123-255
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>140</u> ft	shell alpha: 0.25
Tank Height:	<u>48</u> ft	roof color: white paint
Maximum Fill Height:	<u>47</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>46</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.45833</u> ft
Average outage, H _{VO} :	<u>25.458333</u> ft	H _{vo} : <u>25.4583</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0039</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.50651</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 5,005,518 bbl per month
 Days this Period: 31 days
 Turnover Rate: 467.2 turnovers per year
 Turnover Factor, K_N: 0.231

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.253858 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.33 deg F P_{vx} = 0.004 psia
 T_{ln} = 34.71 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0009223 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.022486
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9948281
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 25.46 lb per month

AP-42 eqn 1-4

Working Loss:	<u>607.87</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>633.33</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>25.46</u>	lb per	month
Working Loss(with control):	<u>607.87</u>	lb per	month
Total Emissions(with control):	<u>633.33</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 34.53 degrees F
 Avg Daily Temp Range, ΔTa: 15.64 degrees F
 Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0035</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 36.03082 degree F per AP-42 equation 1-32, 1-33, 1-34
 Max Liquid Bulk Temp: degrees F
 Min Liquid Bulk Temp: degrees F
 Heating cycle frequency: days

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.635124 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 38.90 deg F P_{vx} = 0.004 psia
 T_{ln} = 32.09 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0008748 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0233886

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9950591

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for: January 2024
 Standing Storage Loss: 29.19 lb per month

AP-42 eqn 1-4

Working Loss:	<u>584.17</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>613.36</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>29.19</u>	lb per	month
Working Loss(with control):	<u>584.17</u>	lb per	month
Total Emissions(with control):	<u>613.36</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLCLocation: Kenova, WVCalculations for Tank No.: 151-261Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.4 degrees F
Avg Daily Temp Range, ΔTa: 17.06 degrees F
Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: <u>white paint</u>
Average alpha:	<u>0.25</u>	shell condition: <u>Average</u>
Tank Diameter:	<u>150</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>50.17</u> ft	roof color: <u>white paint</u>
Maximum Fill Height:	<u>49.17</u> ft	roof condition: <u>Average</u>
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>	
Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid Vapor Pressure:	<u> </u> psi (if specified)	A: <u>12.39</u>
ASTM Distillation Slope:	<u> </u> (if specified)	B: <u>8933</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol	C: <u> </u>
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>	
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0040</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00010</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>39.57991</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u> </u> degrees F	
Min Liquid Bulk Temp:	<u> </u> degrees F	
Heating cycle frequency:	<u> </u> days	

Operational Data:

Throughput: 4,948,132 bbl per month
Days this Period: 29 days
Turnover Rate: 410.7 turnovers per year
Turnover Factor, K_N: 0.240

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 15.864844 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 42.77 deg F P_{vx} = 0.005 psia
T_{ln} = 34.83 deg F P_{vn} = 0.003 psia
ΔP_V = 0.0011327 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.027697
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9944345
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

February 2024Standing Storage Loss: 36.17 lb per monthAP-42 eqn 1-4

Working Loss:	<u>640.29</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>676.46</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>36.17</u>	lb per	month
Working Loss(with control):	<u>640.29</u>	lb per	month
Total Emissions(with control):	<u>676.46</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.72004</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 19.228014 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 52.43 deg F P_{vx} = 0.006 psia
 T_{ln} = 42.82 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0018119 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0338202
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9924138
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

March 2024
 Standing Storage Loss: 63.19 lb per month

AP-42 eqn 1-4

Working Loss:	<u>876.86</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>940.05</u>	lb per	month
	0.5	tons per	month
Standing Storage Loss(with control):	<u>63.19</u>	lb per	month
Working Loss(with control):	<u>876.86</u>	lb per	month
Total Emissions(with control):	<u>940.05</u>	lb per	month
	<u>0.5</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.73 degrees F
 Avg Daily Temp Range, ΔTa: 21.92 degrees F
 Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0081</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00019</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.79616</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 30 days
 Turnover Rate: 397.0 turnovers per year
 Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.695992 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 65.02 deg F P_{vx} = 0.010 psia
 T_{ln} = 53.67 deg F P_{vn} = 0.007 psia
 ΔP_V = 0.0030431 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.039732
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9887525
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: April 2024
 Standing Storage Loss: 104.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,261.48</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,365.52</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>104.05</u>	lb per	month
Working Loss(with control):	<u>1,261.48</u>	lb per	month
Total Emissions(with control):	<u>1,365.52</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 64.175 degrees F
 Avg Daily Temp Range, ΔTa: 20.97 degrees F
 Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>67.1</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0104</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00024</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>68.78426</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.026583 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 72.89 deg F P_{vx} = 0.012 psia
 T_{ln} = 61.38 deg F P_{vn} = 0.009 psia
 ΔP_V = 0.0038652 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0397697
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.985538
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

May 2024
 Standing Storage Loss: 136.28 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,619.37</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,755.65</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>136.28</u>	lb per	month
Working Loss(with control):	<u>1,619.37</u>	lb per	month
Total Emissions(with control):	<u>1,755.65</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 72.255 degrees F
 Avg Daily Temp Range, ΔTa: 19.53 degrees F
 Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0135</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00031</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>77.29556</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 30 days
 Turnover Rate: 397.0 turnovers per year
 Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.811633 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 81.20 deg F P_{vx} = 0.016 psia
 T_{ln} = 69.79 deg F P_{vn} = 0.011 psia
 ΔP_V = 0.0048338 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0387526
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9812358
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: June 2024
 Standing Storage Loss: 164.10 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,055.48</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,219.58</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>164.10</u>	lb per	month
Working Loss(with control):	<u>2,055.48</u>	lb per	month
Total Emissions(with control):	<u>2,219.58</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0150</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00034</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.45539</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.047553 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 84.22 deg F P_{vx} = 0.018 psia
 T_{ln} = 73.20 deg F P_{vn} = 0.013 psia
 ΔP_V = 0.0050986 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.037097
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9793095
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

July 2024
 Standing Storage Loss: 177.94 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,281.14</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,459.08</u>	lb per	month
	1.2	tons per	month
Standing Storage Loss(with control):	<u>177.94</u>	lb per	month
Working Loss(with control):	<u>2,281.14</u>	lb per	month
Total Emissions(with control):	<u>2,459.08</u>	lb per	month
	<u>1.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0145</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00033</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.42502</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.022497 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.31 deg F P_{vx} = 0.017 psia
 T_{ln} = 72.30 deg F P_{vn} = 0.012 psia
 ΔP_V = 0.004969 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0371105
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9798693
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: August 2024
 Standing Storage Loss: 173.52 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,222.40</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,395.92</u>	lb per	month
	1.2	tons per	month
Standing Storage Loss(with control):	<u>173.52</u>	lb per	month
Working Loss(with control):	<u>2,222.40</u>	lb per	month
Total Emissions(with control):	<u>2,395.92</u>	lb per	month
	<u>1.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 151-261
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 67.64 degrees F
Avg Daily Temp Range, ΔTa: 21.02 degrees F
Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>70.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0114</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00026</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.33491</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
Days this Period: 30 days
Turnover Rate: 397.0 turnovers per year
Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 21.390883 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 75.36 deg F P_{vx} = 0.013 psia
T_{ln} = 64.67 deg F P_{vn} = 0.010 psia
ΔP_V = 0.0038921 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0364457
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9841646
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: September 2024
Standing Storage Loss: 131.70 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,748.91</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,880.62</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>131.70</u>	lb per	month
Working Loss(with control):	<u>1,748.91</u>	lb per	month
Total Emissions(with control):	<u>1,880.62</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0078</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00018</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>59.4097</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.249008 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 63.49 deg F P_{vx} = 0.009 psia
 T_{ln} = 53.36 deg F P_{vn} = 0.007 psia
 ΔP_V = 0.0026409 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0350581
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9890859
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

October 2024

Standing Storage Loss: 92.30 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,239.70</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,332.00</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>92.30</u>	lb per	month
Working Loss(with control):	<u>1,239.70</u>	lb per	month
Total Emissions(with control):	<u>1,332.00</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 46.445 degrees F
 Avg Daily Temp Range, ΔTa: 18.49 degrees F
 Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.22364</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 30 days
 Turnover Rate: 397.0 turnovers per year
 Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 16.127692 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 51.62 deg F P_{vx} = 0.006 psia
 T_{ln} = 43.56 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0015166 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0276904
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9924238
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

November 2024
 Standing Storage Loss: 50.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>867.53</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>917.58</u>	lb per	month
	0.5	tons per	month
Standing Storage Loss(with control):	<u>50.05</u>	lb per	month
Working Loss(with control):	<u>867.53</u>	lb per	month
Total Emissions(with control):	<u>917.58</u>	lb per	month
	<u>0.5</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-261
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0039</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.51068</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,948,132 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.2 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.228021 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.33 deg F P_{vx} = 0.004 psia
 T_{ln} = 34.72 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0009206 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0224338
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9945874
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 30.52 lb per month

AP-42 eqn 1-4

Working Loss:	<u>637.05</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>667.56</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>30.52</u>	lb per	month
Working Loss(with control):	<u>637.05</u>	lb per	month
Total Emissions(with control):	<u>667.56</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 34.53 degrees F
 Avg Daily Temp Range, ΔTa: 15.64 degrees F
 Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0035</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>36.03082</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.635124 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 38.90 deg F P_{vx} = 0.004 psia
 T_{ln} = 32.09 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0008748 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0233886
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9950591
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

January 2024
 Standing Storage Loss: 29.19 lb per month

AP-42 eqn 1-4

Working Loss:	<u>584.42</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>613.61</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>29.19</u>	lb per	month
Working Loss(with control):	<u>584.42</u>	lb per	month
Total Emissions(with control):	<u>613.61</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.4 degrees F
 Avg Daily Temp Range, ΔTa: 17.06 degrees F
 Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0040</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00010</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>39.57991</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 29 days
 Turnover Rate: 411.0 turnovers per year
 Turnover Factor, K_N: 0.240

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 15.864844 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 42.77 deg F P_{vx} = 0.005 psia
 T_{ln} = 34.83 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0011327 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.027697
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9944345
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

February 2024
 Standing Storage Loss: 36.17 lb per month

AP-42 eqn 1-4

Working Loss:	<u>640.57</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>676.74</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>36.17</u>	lb per	month
Working Loss(with control):	<u>640.57</u>	lb per	month
Total Emissions(with control):	<u>676.74</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.72004</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 19.228014 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 52.43 deg F P_{vx} = 0.006 psia
 T_{ln} = 42.82 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0018119 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0338202
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9924138
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

March 2024
 Standing Storage Loss: 63.19 lb per month

AP-42 eqn 1-4

Working Loss:	<u>877.23</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>940.43</u>	lb per	month
	0.5	tons per	month
Standing Storage Loss(with control):	<u>63.19</u>	lb per	month
Working Loss(with control):	<u>877.23</u>	lb per	month
Total Emissions(with control):	<u>940.43</u>	lb per	month
	<u>0.5</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 151-262
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 56.73 degrees F
Avg Daily Temp Range, ΔTa: 21.92 degrees F
Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0081</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00019</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.79616</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
Days this Period: 30 days
Turnover Rate: 397.3 turnovers per year
Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.695992 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 65.02 deg F P_{vx} = 0.010 psia
T_{ln} = 53.67 deg F P_{vn} = 0.007 psia
ΔP_V = 0.0030431 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.039732
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9887525
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: April 2024
Standing Storage Loss: 104.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,262.03</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,366.07</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>104.05</u>	lb per	month
Working Loss(with control):	<u>1,262.03</u>	lb per	month
Total Emissions(with control):	<u>1,366.07</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 64.175 degrees F
 Avg Daily Temp Range, ΔTa: 20.97 degrees F
 Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>67.1</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0104</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00024</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>68.78426</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.026583 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 72.89 deg F P_{vx} = 0.012 psia
 T_{ln} = 61.38 deg F P_{vn} = 0.009 psia
 ΔP_V = 0.0038652 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0397697
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.985538
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

May 2024
 Standing Storage Loss: 136.28 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,620.06</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,756.35</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>136.28</u>	lb per	month
Working Loss(with control):	<u>1,620.06</u>	lb per	month
Total Emissions(with control):	<u>1,756.35</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC

Location: Kenova, WV

Calculations for Tank No.: 151-262

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 72.255 degrees F
Avg Daily Temp Range, ΔTa: 19.53 degrees F
Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:		(if specified)	B: <u>8933</u>
ASTM Distillation Slope:		(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0135</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00031</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>77.29556</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:			
Min Liquid Bulk Temp:			
Heating cycle frequency:			

Operational Data:

Throughput: 4,951,267 bbl per month
Days this Period: 30 days
Turnover Rate: 397.3 turnovers per year
Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.811633 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 81.20 deg F P_{vx} = 0.016 psia
T_{ln} = 69.79 deg F P_{vn} = 0.011 psia
ΔP_V = 0.0048338 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0387526
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9812358
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

June 2024
Standing Storage Loss: 164.10 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,056.38</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,220.48</u>	lb per	month
	1.1	tons per	month
Standing Storage Loss(with control):	<u>164.10</u>	lb per	month
Working Loss(with control):	<u>2,056.38</u>	lb per	month
Total Emissions(with control):	<u>2,220.48</u>	lb per	month
	<u>1.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC

Location: Kenova, WV

Calculations for Tank No.: 151-262

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:		(if specified)	B: <u>8933</u>
ASTM Distillation Slope:		(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0150</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00034</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.45539</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:			
Min Liquid Bulk Temp:			
Heating cycle frequency:			

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.047553 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 84.22 deg F P_{vx} = 0.018 psia
 T_{ln} = 73.20 deg F P_{vn} = 0.013 psia
 ΔP_V = 0.0050986 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.037097
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9793095
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

July 2024
 Standing Storage Loss: 177.94 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,282.13</u>	lb per	month	AP-42 eqn 1-35
Total Emissions (w/o heating cycle loss):	<u>2,460.07</u>	lb per	month	AP-42 eqn 1-1
	1.2	tons per	month	
Standing Storage Loss(with control):	<u>177.94</u>	lb per	month	
Working Loss(with control):	<u>2,282.13</u>	lb per	month	
Total Emissions(with control):	<u>2,460.07</u>	lb per	month	
	<u>1.2</u>	tons per	month	

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0145</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00033</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.42502</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.022497 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.31 deg F P_{vx} = 0.017 psia
 T_{ln} = 72.30 deg F P_{vn} = 0.012 psia
 ΔP_V = 0.004969 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0371105
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9798693
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: August 2024
 Standing Storage Loss: 173.52 lb per month

AP-42 eqn 1-4

Working Loss:	<u>2,223.36</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2,396.88</u>	lb per	month
	1.2	tons per	month
Standing Storage Loss(with control):	<u>173.52</u>	lb per	month
Working Loss(with control):	<u>2,223.36</u>	lb per	month
Total Emissions(with control):	<u>2,396.88</u>	lb per	month
	<u>1.2</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC

Location: Kenova, WV

Calculations for Tank No.: 151-262

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 67.64 degrees F
 Avg Daily Temp Range, ΔTa: 21.02 degrees F
 Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:		(if specified)	B: <u>8933</u>
ASTM Distillation Slope:		(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>70.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0114</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00026</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.33491</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:			
Min Liquid Bulk Temp:			
Heating cycle frequency:			

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 30 days
 Turnover Rate: 397.3 turnovers per year
 Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.390883 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 75.36 deg F P_{vx} = 0.013 psia
 T_{ln} = 64.67 deg F P_{vn} = 0.010 psia
 ΔP_V = 0.0038921 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0364457
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9841646
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

September 2024

Standing Storage Loss: 131.70 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,749.68</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,881.38</u>	lb per	month
	0.9	tons per	month
Standing Storage Loss(with control):	<u>131.70</u>	lb per	month
Working Loss(with control):	<u>1,749.68</u>	lb per	month
Total Emissions(with control):	<u>1,881.38</u>	lb per	month
	<u>0.9</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0078</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00018</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>59.4097</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.249008 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 63.49 deg F P_{vx} = 0.009 psia
 T_{ln} = 53.36 deg F P_{vn} = 0.007 psia
 ΔP_V = 0.0026409 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0350581
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9890859
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

October 2024
 Standing Storage Loss: 92.30 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1,240.24</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1,332.54</u>	lb per	month
	0.7	tons per	month
Standing Storage Loss(with control):	<u>92.30</u>	lb per	month
Working Loss(with control):	<u>1,240.24</u>	lb per	month
Total Emissions(with control):	<u>1,332.54</u>	lb per	month
	<u>0.7</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: 151-262
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 46.445 degrees F
Avg Daily Temp Range, ΔTa: 18.49 degrees F
Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0054</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00013</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.22364</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
Days this Period: 30 days
Turnover Rate: 397.3 turnovers per year
Turnover Factor, K_N: 0.242

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 16.127692 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 51.62 deg F P_{vx} = 0.006 psia
T_{ln} = 43.56 deg F P_{vn} = 0.005 psia
ΔP_V = 0.0015166 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0276904
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9924238
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

November 2024
Standing Storage Loss: 50.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>867.91</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>917.96</u>	lb per	month
	0.5	tons per	month
Standing Storage Loss(with control):	<u>50.05</u>	lb per	month
Working Loss(with control):	<u>867.91</u>	lb per	month
Total Emissions(with control):	<u>917.96</u>	lb per	month
	<u>0.5</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: 151-262
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>FixedRoof</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>150</u> ft	shell alpha: 0.25
Tank Height:	<u>50.17</u> ft	roof color: white paint
Maximum Fill Height:	<u>49.17</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>48.17</u> ft	
Fixed Roof Type:	<u>column-supported(cone)</u>	effective roof height: <u>1.5625</u> ft
Average outage, H _{VO} :	<u>26.6475</u> ft	H _{vo} : <u>26.6475</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Jet kerosene</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>12.39</u>
Reid VaporPressure:	<u></u> psi	(if specified)	B: <u>8933</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u></u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0039</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.51068</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 4,951,267 bbl per month
 Days this Period: 31 days
 Turnover Rate: 384.5 turnovers per year
 Turnover Factor, K_N: 0.245

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.228021 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.33 deg F P_{vx} = 0.004 psia
 T_{ln} = 34.72 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0009206 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0224338
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9945874
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 30.52 lb per month

AP-42 eqn 1-4

Working Loss:	<u>637.32</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>667.84</u>	lb per	month
	0.3	tons per	month
Standing Storage Loss(with control):	<u>30.52</u>	lb per	month
Working Loss(with control):	<u>637.32</u>	lb per	month
Total Emissions(with control):	<u>667.84</u>	lb per	month
	<u>0.3</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-300
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 34.53 degrees F
Avg Daily Temp Range, ΔTa: 15.64 degrees F
Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:		(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:		(if specified)	C: <u>77.3334</u>
Molecular Weight, M _v :	<u>130</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>35.0</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>35.5</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0031</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _v :	<u>0.00008</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>36.03576</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 89 bbl per month
Days this Period: 31 days
Turnover Rate: 22.0 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 13.607437 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 38.90 deg F P_{vx} = 0.004 psia
T_{ln} = 32.09 deg F P_{vn} = 0.003 psia
ΔP_V = 0.0010275 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0233433
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9996587
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

January 2024

Standing Storage Loss: 0.01 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.04</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.05</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.01</u>	lb per	month
Working Loss(with control):	<u>0.04</u>	lb per	month
Total Emissions(with control):	<u>0.05</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.4 degrees F
 Avg Daily Temp Range, ΔTa: 17.06 degrees F
 Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>	
Product Factor, K _P :	<u>1</u>	Vapor Pressure Constants:
Reid Vapor Pressure:	<u> </u> psi (if specified)	A: <u>2.20025</u>
ASTM Distillation Slope:	<u> </u> (if specified)	B: <u>237.181</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol	C: <u>77.3334</u>
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F	
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>	
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0037</u> psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>39.58708</u> degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:	<u> </u> degrees F	
Min Liquid Bulk Temp:	<u> </u> degrees F	
Heating cycle frequency:	<u> </u> days	

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 29 days
 Turnover Rate: 23.6 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 15.837512 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 42.76 deg F P_{vx} = 0.004 psia
 T_{ln} = 34.84 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0013355 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0276563
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9996011
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

February 2024
 Standing Storage Loss: 0.02 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.04</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.06</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.02</u>	lb per	month
Working Loss(with control):	<u>0.04</u>	lb per	month
Total Emissions(with control):	<u>0.06</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:		(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:		(if specified)	C: <u>77.3334</u>
Molecular Weight, M _v :	<u>130</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>46.5</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>47.6</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0054</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _v :	<u>0.00013</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>48.73011</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 31 days
 Turnover Rate: 22.0 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 19.199595 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 52.43 deg F P_{vx} = 0.006 psia
 T_{ln} = 42.83 deg F P_{vn} = 0.004 psia
 ΔP_V = 0.0021133 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0337849
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9994145
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

March 2024
 Standing Storage Loss: 0.03 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.06</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.10</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.03</u>	lb per	month
Working Loss(with control):	<u>0.06</u>	lb per	month
Total Emissions(with control):	<u>0.10</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.73 degrees F
 Avg Daily Temp Range, ΔTa: 21.92 degrees F
 Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0084</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00020</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.80954</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 30 days
 Turnover Rate: 22.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.667562 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 65.02 deg F P_{vx} = 0.010 psia
 T_{ln} = 53.68 deg F P_{vn} = 0.007 psia
 ΔP_V = 0.0033697 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0396995
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9990851
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

April 2024
 Standing Storage Loss: 0.06 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.10</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.16</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.06</u>	lb per	month
Working Loss(with control):	<u>0.10</u>	lb per	month
Total Emissions(with control):	<u>0.16</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 64.175 degrees F
 Avg Daily Temp Range, ΔTa: 20.97 degrees F
 Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:		(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:		(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>65.5</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>67.1</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0109</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00025</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>68.79943</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 31 days
 Turnover Rate: 22.0 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.003187 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 72.89 deg F P_{vx} = 0.013 psia
 T_{ln} = 61.39 deg F P_{vn} = 0.009 psia
 ΔP_V = 0.0040617 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0397383
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9988091
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for: May 2024
 Standing Storage Loss: 0.08 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.13</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.21</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.08</u>	lb per	month
Working Loss(with control):	<u>0.13</u>	lb per	month
Total Emissions(with control):	<u>0.21</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-300
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 72.255 degrees F
Avg Daily Temp Range, ΔTa: 19.53 degrees F
Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:		(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:		(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>73.7</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>75.5</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0141</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00032</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>77.31216</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 89 bbl per month
Days this Period: 30 days
Turnover Rate: 22.8 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.793796 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 81.20 deg F P_{vx} = 0.017 psia
T_{ln} = 69.80 deg F P_{vn} = 0.012 psia
ΔP_V = 0.004742 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.038712
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9984593
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

June 2024
Standing Storage Loss: 0.10 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.16</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.26</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.10</u>	lb per	month
Working Loss(with control):	<u>0.16</u>	lb per	month
Total Emissions(with control):	<u>0.26</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>77.3334</u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>78.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0155</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00035</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.47147</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 31 days
 Turnover Rate: 22.0 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.030468 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 84.22 deg F P_{vx} = 0.018 psia
 T_{ln} = 73.21 deg F P_{vn} = 0.013 psia
 ΔP_V = 0.0048571 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0370475
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9983093
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: July 2024
 Standing Storage Loss: 0.10 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.17</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.28</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.10</u>	lb per	month
Working Loss(with control):	<u>0.17</u>	lb per	month
Total Emissions(with control):	<u>0.28</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:		(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:		(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>76.2</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>77.8</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0151</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00034</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>79.43996</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 31 days
 Turnover Rate: 22.0 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.001605 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.31 deg F P_{vx} = 0.018 psia
 T_{ln} = 72.31 deg F P_{vn} = 0.013 psia
 ΔP_V = 0.0047731 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0370571
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9983525
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

August 2024
 Standing Storage Loss: 0.10 lb per month AP-42 eqn 1-4

Working Loss:	<u>0.17</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.27</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.10</u>	lb per	month
Working Loss(with control):	<u>0.17</u>	lb per	month
Total Emissions(with control):	<u>0.27</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 67.64 degrees F
 Avg Daily Temp Range, ΔTa: 21.02 degrees F
 Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>70.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0120</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00027</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.34708</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 30 days
 Turnover Rate: 22.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.36254 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 75.36 deg F P_{vx} = 0.014 psia
 T_{ln} = 64.68 deg F P_{vn} = 0.010 psia
 ΔP_V = 0.0039996 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0363992
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9986952
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for: September 2024
 Standing Storage Loss: 0.08 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.14</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.21</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.08</u>	lb per	month
Working Loss(with control):	<u>0.14</u>	lb per	month
Total Emissions(with control):	<u>0.21</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-300
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 56.66 degrees F
Avg Daily Temp Range, ΔTa: 21.86 degrees F
Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0081</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00019</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>59.41875</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 89 bbl per month
Days this Period: 31 days
Turnover Rate: 22.0 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 20.213756 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 63.48 deg F P_{vx} = 0.010 psia
T_{ln} = 53.38 deg F P_{vn} = 0.007 psia
ΔP_V = 0.00294 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0350107
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9991145
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

October 2024

Standing Storage Loss: 0.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.09</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.15</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.05</u>	lb per	month
Working Loss(with control):	<u>0.09</u>	lb per	month
Total Emissions(with control):	<u>0.15</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 46.445 degrees F
 Avg Daily Temp Range, ΔTa: 18.49 degrees F
 Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:		(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:		(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u>	lb/lb-mol	
Liquid Bulk Temp, T _b :	<u>47.0</u>	degrees F	
Constant Temp Tank?	<u>NO</u>		tank must be insulated for temperature to be constant
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>47.6</u>	degrees F	per AP-42 equation 1-27, 1-28, 1-29
True Vapor Pressure, P:	<u>0.0054</u>	psia	per AP-42 equation 1-24, 1-25, 1-26
Stock Vapor Density, W _V :	<u>0.00013</u>	lb/ft ³	per AP-42 equation 1-22
Heating Cycles: Vapor Space Temp., T _v :	<u>48.22949</u>	degree F	per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp:		degrees F	
Min Liquid Bulk Temp:		degrees F	
Heating cycle frequency:		days	

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 30 days
 Turnover Rate: 22.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 16.094983 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 51.61 deg F P_{vx} = 0.006 psia
 T_{ln} = 43.57 deg F P_{vn} = 0.005 psia
 ΔP_V = 0.0017689 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0276434
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9994155
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

November 2024
 Standing Storage Loss: 0.03 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.06</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.09</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.03</u>	lb per	month
Working Loss(with control):	<u>0.06</u>	lb per	month
Total Emissions(with control):	<u>0.09</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-300
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>12.666</u> ft	shell alpha: 0.25
Tank Height:	<u>4.12334</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1233395</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1233395</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0616706</u> ft	H _{vo} : <u>2.06167</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Diesel Additives and Dyes</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>2.20025</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>237.181</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>77.3334</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	calculated from ambient, per AP-42 equation 1-31		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0035</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00009</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.51517</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 89 bbl per month
 Days this Period: 31 days
 Turnover Rate: 22.0 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.200144 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.32 deg F P_{vx} = 0.004 psia
 T_{ln} = 34.72 deg F P_{vn} = 0.003 psia
 ΔP_V = 0.0010848 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0223893
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9996152
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 0.02 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.04</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.06</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.02</u>	lb per	month
Working Loss(with control):	<u>0.04</u>	lb per	month
Total Emissions(with control):	<u>0.06</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 34.53 degrees F
 Avg Daily Temp Range, ΔTa: 15.64 degrees F
 Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _v :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0199</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.00049</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>35.98396</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 31 days
 Turnover Rate: 13.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.897723 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 38.95 deg F P_{vx} = 0.023 psia
 T_{ln} = 32.00 deg F P_{vn} = 0.017 psia
 ΔP_V = 0.005894 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.024268
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9966982
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

January 2024

Standing Storage Loss: 0.20 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.42</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.61</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.20</u>	lb per	month
Working Loss(with control):	<u>0.42</u>	lb per	month
Total Emissions(with control):	<u>0.61</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-301
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.4 degrees F
Avg Daily Temp Range, ΔTa: 17.06 degrees F
Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0228</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00055</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>39.51185</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
Days this Period: 29 days
Turnover Rate: 14.7 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 16.124073 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 42.80 deg F P_{vx} = 0.027 psia
T_{ln} = 34.74 deg F P_{vn} = 0.019 psia
ΔP_V = 0.0075851 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0286671
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9962117
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

February 2024
Standing Storage Loss: 0.25 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.47</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.72</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.25</u>	lb per	month
Working Loss(with control):	<u>0.47</u>	lb per	month
Total Emissions(with control):	<u>0.72</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0323</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00077</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.6245</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 31 days
 Turnover Rate: 13.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 19.497554 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 52.45 deg F P_{vx} = 0.039 psia
 T_{ln} = 42.70 deg F P_{vn} = 0.027 psia
 ΔP_V = 0.0118625 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0350539
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.994651
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

March 2024
 Standing Storage Loss: 0.45 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.66</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1.11</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.45</u>	lb per	month
Working Loss(with control):	<u>0.66</u>	lb per	month
Total Emissions(with control):	<u>1.11</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.73 degrees F
 Avg Daily Temp Range, ΔTa: 21.92 degrees F
 Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0490</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00114</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.66921</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 30 days
 Turnover Rate: 14.3 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.965641 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 65.02 deg F P_{vx} = 0.059 psia
 T_{ln} = 53.54 deg F P_{vn} = 0.040 psia
 ΔP_V = 0.0189141 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0413625
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9919148
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for: April 2024
 Standing Storage Loss: 0.75 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.98</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1.73</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.75</u>	lb per	month
Working Loss(with control):	<u>0.98</u>	lb per	month
Total Emissions(with control):	<u>1.73</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-301
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 64.175 degrees F
Avg Daily Temp Range, ΔTa: 20.97 degrees F
Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>67.1</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0630</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00144</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>68.64035</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
Days this Period: 31 days
Turnover Rate: 13.8 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.248484 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 72.88 deg F P_{vx} = 0.075 psia
T_{ln} = 61.25 deg F P_{vn} = 0.052 psia
ΔP_V = 0.0229266 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0415252
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9896188
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: May 2024
Standing Storage Loss: 0.99 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1.24</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2.22</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.99</u>	lb per	month
Working Loss(with control):	<u>1.24</u>	lb per	month
Total Emissions(with control):	<u>2.22</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-301
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 72.255 degrees F
Avg Daily Temp Range, ΔTa: 19.53 degrees F
Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0810</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00183</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>77.13819</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
Days this Period: 30 days
Turnover Rate: 14.3 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.980807 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 81.16 deg F P_{vx} = 0.095 psia
T_{ln} = 69.67 deg F P_{vn} = 0.068 psia
ΔP_V = 0.027049 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0406236
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9866894
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

June 2024
Standing Storage Loss: 1.18 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1.57</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2.74</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>1.18</u>	lb per	month
Working Loss(with control):	<u>1.57</u>	lb per	month
Total Emissions(with control):	<u>2.74</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0888</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00199</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.30286</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 31 days
 Turnover Rate: 13.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.209602 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 84.18 deg F P_{vx} = 0.104 psia
 T_{ln} = 73.08 deg F P_{vn} = 0.076 psia
 ΔP_V = 0.0278701 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0389909
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.985424
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for: July 2024
 Standing Storage Loss: 1.27 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1.71</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2.98</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>1.27</u>	lb per	month
Working Loss(with control):	<u>1.71</u>	lb per	month
Total Emissions(with control):	<u>2.98</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-301
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 74.885 degrees F
Avg Daily Temp Range, ΔTa: 19.71 degrees F
Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0866</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00195</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.28327</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
Days this Period: 31 days
Turnover Rate: 13.8 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 22.220652 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 83.29 deg F P_{vx} = 0.101 psia
T_{ln} = 72.18 deg F P_{vn} = 0.074 psia
ΔP_V = 0.0273936 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0390474
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9857864
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

August 2024
Standing Storage Loss: 1.25 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1.67</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2.91</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>1.25</u>	lb per	month
Working Loss(with control):	<u>1.67</u>	lb per	month
Total Emissions(with control):	<u>2.91</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 67.64 degrees F
 Avg Daily Temp Range, ΔTa: 21.02 degrees F
 Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>70.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0689</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00157</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.21955</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 30 days
 Turnover Rate: 14.3 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.659701 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 75.37 deg F P_{vx} = 0.081 psia
 T_{ln} = 64.54 deg F P_{vn} = 0.058 psia
 ΔP_V = 0.0227469 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0382706
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9886609
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

September 2024

Standing Storage Loss: 0.96 lb per month

AP-42 eqn 1-4

Working Loss:	<u>1.35</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>2.30</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.96</u>	lb per	month
Working Loss(with control):	<u>1.35</u>	lb per	month
Total Emissions(with control):	<u>2.30</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0475</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00111</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>59.32385</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 31 days
 Turnover Rate: 13.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.583356 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 63.53 deg F P_{vx} = 0.056 psia
 T_{ln} = 53.24 deg F P_{vn} = 0.040 psia
 ΔP_V = 0.016582 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0366766
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9921535
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

October 2024

Standing Storage Loss: 0.67 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.95</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1.62</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.67</u>	lb per	month
Working Loss(with control):	<u>0.95</u>	lb per	month
Total Emissions(with control):	<u>1.62</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: AA-1-301
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 46.445 degrees F
Avg Daily Temp Range, ΔTa: 18.49 degrees F
Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0323</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00077</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.1681</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
Days this Period: 30 days
Turnover Rate: 14.3 turnovers per year
Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 16.437927 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 51.67 deg F P_{vx} = 0.038 psia
T_{ln} = 43.45 deg F P_{vn} = 0.028 psia
ΔP_V = 0.0099909 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0288917
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.9946546
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

November 2024
Standing Storage Loss: 0.36 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.66</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>1.02</u>	lb per	month
	<u>0.0</u>	tons per	month
Standing Storage Loss(with control):	<u>0.36</u>	lb per	month
Working Loss(with control):	<u>0.66</u>	lb per	month
Total Emissions(with control):	<u>1.02</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: AA-1-301
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>14.7399</u> ft	shell alpha: 0.25
Tank Height:	<u>6.28319</u> ft	roof color: white paint
Maximum Fill Height:	<u>5.283184</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>4.283184</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>3.1415933</u> ft	H _{vo} : <u>3.14159</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Lubricity Additive</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: <u>3.50968</u>
Reid Vapor Pressure:	<u></u> psi	(if specified)	B: <u>367.471</u>
ASTM Distillation Slope:	<u></u>	(if specified)	C: <u>103.145</u>
Molecular Weight, M _V :	<u>130</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>0.0221</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.00054</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.46804</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	<u></u> degrees F		
Min Liquid Bulk Temp:	<u></u> degrees F		
Heating cycle frequency:	<u></u> days		

Operational Data:

Throughput: 153 bbl per month
 Days this Period: 31 days
 Turnover Rate: 13.8 turnovers per year
 Turnover Factor, K_N: 1.000

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.492428 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.37 deg F P_{vx} = 0.025 psia
 T_{ln} = 34.63 deg F P_{vn} = 0.019 psia
 ΔP_V = 0.0061961 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0233315
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.9963292
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi = 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 0.21 lb per month

AP-42 eqn 1-4

Working Loss:	<u>0.46</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>0.67</u>	lb per	month
	0.0	tons per	month
Standing Storage Loss(with control):	<u>0.21</u>	lb per	month
Working Loss(with control):	<u>0.46</u>	lb per	month
Total Emissions(with control):	<u>0.67</u>	lb per	month
	<u>0.0</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF2
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 34.53 degrees F
Avg Daily Temp Range, ΔTa: 15.64 degrees F
Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.0882</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.06314</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>35.96664</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 31 days
Turnover Rate: 685.7 turnovers per year
Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 13.994825 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 38.96 deg F P_{vx} = 5.457 psia
T_{ln} = 31.96 deg F P_{vn} = 4.740 psia
ΔP_V = 0.7174123 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.0999624
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.6392015
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

January 2024
Standing Storage Loss: 16.74 lb per month

AP-42 eqn 1-4

Working Loss:	<u>108.19</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>124.93</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>16.74</u>	lb per	month
Working Loss(with control):	<u>108.19</u>	lb per	month
Total Emissions(with control):	<u>124.93</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF2
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.4 degrees F
Avg Daily Temp Range, ΔTa: 17.06 degrees F
Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.4346</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06696</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>39.48668</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 29 days
Turnover Rate: 733.0 turnovers per year
Turnover Factor, K_N: 0.208

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 16.219928 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 42.81 deg F P_{vx} = 5.887 psia
T_{ln} = 34.70 deg F P_{vn} = 5.010 psia
ΔP_V = 0.876494 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1250859
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.6238765
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: February 2024
Standing Storage Loss: 20.29 lb per month

AP-42 eqn 1-4

Working Loss:	<u>113.20</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>133.49</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>20.29</u>	lb per	month
Working Loss(with control):	<u>113.20</u>	lb per	month
Total Emissions(with control):	<u>133.49</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF2
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 45.66 degrees F
Avg Daily Temp Range, ΔTa: 19.58 degrees F
Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.7184</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06920</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.58917</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 31 days
Turnover Rate: 685.7 turnovers per year
Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} **AP-42 eqn 1-5**
where:
ΔT_V = 19.597222 deg F (deg R); daily temperature range in the vapor space **AP-42 eqn 1-6, 1-7, 1-8**
T_{lx} = 52.46 deg F P_{vx} = 6.286 psia
T_{ln} = 42.66 deg F P_{vn} = 5.193 psia
ΔP_V = 1.0931104 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1596231
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) **AP-42 eqn 1-21**
K_S = 0.6118577
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 **AP-42 eqn 1-40**
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] **AP-42 eqn 1-41**
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: March 2024
Standing Storage Loss: 28.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>118.57</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>146.62</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>28.05</u>	lb per	month
Working Loss(with control):	<u>118.57</u>	lb per	month
Total Emissions(with control):	<u>146.62</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF2
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.73 degrees F
 Avg Daily Temp Range, ΔTa: 21.92 degrees F
 Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>4.5440</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.05371</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.62226</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 30 days
 Turnover Rate: 708.6 turnovers per year
 Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.065349 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 65.02 deg F P_{vx} = 5.085 psia
 T_{ln} = 53.49 deg F P_{vn} = 4.050 psia
 ΔP_V = 1.0353978 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.1448656
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.6648577
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: April 2024
 Standing Storage Loss: 20.78 lb per month

AP-42 eqn 1-4

Working Loss:	<u>91.42</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>112.20</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>20.78</u>	lb per	month
Working Loss(with control):	<u>91.42</u>	lb per	month
Total Emissions(with control):	<u>112.20</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF2
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 64.175 degrees F
 Avg Daily Temp Range, ΔTa: 20.97 degrees F
 Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>67.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.2864</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06155</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>68.58714</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 23.330536 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 72.87 deg F P_{vx} = 5.904 psia
 T_{ln} = 61.21 deg F P_{vn} = 4.722 psia
 ΔP_V = 1.1826182 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.1694335
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.6303414
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

May 2024
 Standing Storage Loss: 27.28 lb per month

AP-42 eqn 1-4

Working Loss:	<u>105.46</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>132.74</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>27.28</u>	lb per	month
Working Loss(with control):	<u>105.46</u>	lb per	month
Total Emissions(with control):	<u>132.74</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF2
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 72.255 degrees F
Avg Daily Temp Range, ΔTa: 19.53 degrees F
Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.1878</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.07090</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 77.08 degree F per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp: _____ degrees F
Min Liquid Bulk Temp: _____ degrees F
Heating cycle frequency: _____ days

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 30 days
Turnover Rate: 708.6 turnovers per year
Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.043362 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 81.15 deg F P_{vx} = 6.878 psia
T_{ln} = 69.62 deg F P_{vn} = 5.554 psia
ΔP_V = 1.3247722 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1997998

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.5929663

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for: June 2024

Standing Storage Loss: 33.74 lb per month

AP-42 eqn 1-4

Working Loss:	<u>120.68</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>154.41</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>33.74</u>	lb per	month
Working Loss(with control):	<u>120.68</u>	lb per	month
Total Emissions(with control):	<u>154.41</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF2
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 75.57 degrees F
 Avg Daily Temp Range, ΔTa: 18.84 degrees F
 Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: <u>white paint</u>
Average alpha:	<u>0.25</u>	shell condition: <u>Average</u>
Tank Diameter:	<u>9.02421</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>4.18617</u> ft	roof color: <u>white paint</u>
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: <u>Average</u>
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.5665</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.07480</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.24646</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.269522 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 84.17 deg F P_{vx} = 7.265 psia
 T_{ln} = 73.04 deg F P_{vn} = 5.923 psia
 ΔP_V = 1.3423255 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.2081041
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5785547
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: July 2024
 Standing Storage Loss: 37.38 lb per month

AP-42 eqn 1-4

Working Loss:	<u>128.17</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>165.55</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>37.38</u>	lb per	month
Working Loss(with control):	<u>128.17</u>	lb per	month
Total Emissions(with control):	<u>165.55</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF2
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.4589</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.07371</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.23086</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.293924 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.28 deg F P_{vx} = 7.149 psia
 T_{ln} = 72.13 deg F P_{vn} = 5.823 psia
 ΔP_V = 1.3262078 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.2038507
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5825795
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

August 2024
 Standing Storage Loss: 36.33 lb per month AP-42 eqn 1-4

Working Loss:	<u>126.31</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>162.64</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>36.33</u>	lb per	month
Working Loss(with control):	<u>126.31</u>	lb per	month
Total Emissions(with control):	<u>162.64</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF2
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 67.64 degrees F
 Avg Daily Temp Range, ΔTa: 21.02 degrees F
 Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: <u>white paint</u>
Average alpha:	<u>0.25</u>	shell condition: <u>Average</u>
Tank Diameter:	<u>9.02421</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>4.18617</u> ft	roof color: <u>white paint</u>
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: <u>Average</u>
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>69.9</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>8.6838</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.10061</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.1769</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 30 days
 Turnover Rate: 708.6 turnovers per year
 Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.759102 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 75.37 deg F P_{vx} = 9.561 psia
 T_{ln} = 64.50 deg F P_{vn} = 7.871 psia
 ΔP_V = 1.6906131 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.3336418
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5093412
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: September 2024
 Standing Storage Loss: 68.67 lb per month

AP-42 eqn 1-4

Working Loss:	<u>171.24</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>239.90</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>68.67</u>	lb per	month
Working Loss(with control):	<u>171.24</u>	lb per	month
Total Emissions(with control):	<u>239.90</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF2
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>7.9081</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.09372</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 59.2921 degree F per AP-42 equation 1-32, 1-33, 1-34
 Max Liquid Bulk Temp: _____ degrees F
 Min Liquid Bulk Temp: _____ degrees F
 Heating cycle frequency: _____ days

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.706988 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 63.54 deg F P_{vx} = 8.690 psia
 T_{ln} = 53.19 deg F P_{vn} = 7.183 psia
 ΔP_V = 1.5075395 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.2679556

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5326868

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for: October 2024

Standing Storage Loss: 55.52 lb per month AP-42 eqn 1-4

Working Loss:	<u>160.59</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>216.11</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>55.52</u>	lb per	month
Working Loss(with control):	<u>160.59</u>	lb per	month
Total Emissions(with control):	<u>216.11</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF2
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 46.445 degrees F
Avg Daily Temp Range, ΔTa: 18.49 degrees F
Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.4533</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.07816</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.14757</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 30 days
Turnover Rate: 708.6 turnovers per year
Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 16.552642 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 51.69 deg F P_{vx} = 6.982 psia
T_{ln} = 43.41 deg F P_{vn} = 5.957 psia
ΔP_V = 1.0255922 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1563621
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.5827894
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

November 2024
Standing Storage Loss: 28.60 lb per month

AP-42 eqn 1-4

Working Loss:	<u>133.02</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>161.63</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>28.60</u>	lb per	month
Working Loss(with control):	<u>133.02</u>	lb per	month
Total Emissions(with control):	<u>161.63</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF2
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.145 degrees F
Avg Daily Temp Range, ΔTa: 15.41 degrees F
Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.3529</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06609</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.45227</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 31 days
Turnover Rate: 685.7 turnovers per year
Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} **AP-42 eqn 1-5**
where:
ΔT_V = 13.590197 deg F (deg R); daily temperature range in the vapor space **AP-42 eqn 1-6, 1-7, 1-8**
T_{lx} = 41.39 deg F P_{vx} = 5.725 psia
T_{ln} = 34.60 deg F P_{vn} = 5.000 psia
ΔP_V = 0.7254592 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1020409
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) **AP-42 eqn 1-21**
K_S = 0.6274234
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 **AP-42 eqn 1-40**
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] **AP-42 eqn 1-41**
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

December 2024
Standing Storage Loss: 17.56 lb per month

AP-42 eqn 1-4

Working Loss:	<u>113.25</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>130.81</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>17.56</u>	lb per	month
Working Loss(with control):	<u>113.25</u>	lb per	month
Total Emissions(with control):	<u>130.81</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 34.53 degrees F
 Avg Daily Temp Range, ΔTa: 15.64 degrees F
 Avg Daily Solar Insolation, I: 570.26 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>35.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>35.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.0882</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06314</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>35.96664</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.994825 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 38.96 deg F P_{vx} = 5.457 psia
 T_{ln} = 31.96 deg F P_{vn} = 4.740 psia
 ΔP_V = 0.7174123 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.0999624
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.6392015
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: January 2024
 Standing Storage Loss: 16.74 lb per month

AP-42 eqn 1-4

Working Loss:	<u>108.19</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>124.93</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>16.74</u>	lb per	month
Working Loss(with control):	<u>108.19</u>	lb per	month
Total Emissions(with control):	<u>124.93</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF3
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 37.4 degrees F
Avg Daily Temp Range, ΔTa: 17.06 degrees F
Avg Daily Solar Insolation, I: 828.29 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>38.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.8</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.4346</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06696</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>39.48668</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 29 days
Turnover Rate: 733.0 turnovers per year
Turnover Factor, K_N: 0.208

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} **AP-42 eqn 1-5**
where:
ΔT_V = 16.219928 deg F (deg R); daily temperature range in the vapor space **AP-42 eqn 1-6, 1-7, 1-8**
T_{lx} = 42.81 deg F P_{vx} = 5.887 psia
T_{ln} = 34.70 deg F P_{vn} = 5.010 psia
ΔP_V = 0.876494 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1250859
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) **AP-42 eqn 1-21**
K_S = 0.6238765
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 **AP-42 eqn 1-40**
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] **AP-42 eqn 1-41**
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

February 2024
Standing Storage Loss: 20.29 lb per month

AP-42 eqn 1-4

Working Loss:	<u>113.20</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>133.49</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>20.29</u>	lb per	month
Working Loss(with control):	<u>113.20</u>	lb per	month
Total Emissions(with control):	<u>133.49</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 45.66 degrees F
 Avg Daily Temp Range, ΔTa: 19.58 degrees F
 Avg Daily Solar Insolation, I: 1162.71 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>46.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.7184</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.06920</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.58917</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 19.597222 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 52.46 deg F P_{vx} = 6.286 psia
 T_{ln} = 42.66 deg F P_{vn} = 5.193 psia
 ΔP_V = 1.0931104 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.1596231
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.6118577
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: March 2024
 Standing Storage Loss: 28.05 lb per month

AP-42 eqn 1-4

Working Loss:	<u>118.57</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>146.62</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>28.05</u>	lb per	month
Working Loss(with control):	<u>118.57</u>	lb per	month
Total Emissions(with control):	<u>146.62</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF3
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 56.73 degrees F
Avg Daily Temp Range, ΔTa: 21.92 degrees F
Avg Daily Solar Insolation, I: 1545 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: <u>white paint</u>
Average alpha:	<u>0.25</u>	shell condition: <u>Average</u>
Tank Diameter:	<u>9.02421</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>4.18617</u> ft	roof color: <u>white paint</u>
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: <u>Average</u>
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.9</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>59.3</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>4.5440</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.05371</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>60.62226</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 30 days
Turnover Rate: 708.6 turnovers per year
Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.065349 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 65.02 deg F P_{vx} = 5.085 psia
T_{ln} = 53.49 deg F P_{vn} = 4.050 psia
ΔP_V = 1.0353978 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1448656
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.6648577
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for: April 2024
Standing Storage Loss: 20.78 lb per month

AP-42 eqn 1-4

Working Loss:	<u>91.42</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>112.20</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>20.78</u>	lb per	month
Working Loss(with control):	<u>91.42</u>	lb per	month
Total Emissions(with control):	<u>112.20</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF3
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 64.175 degrees F
Avg Daily Temp Range, ΔTa: 20.97 degrees F
Avg Daily Solar Insolation, I: 1751.36 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>65.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>67.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.2864</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.06155</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>68.58714</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 31 days
Turnover Rate: 685.7 turnovers per year
Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.330536 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 72.87 deg F P_{vx} = 5.904 psia
T_{ln} = 61.21 deg F P_{vn} = 4.722 psia
ΔP_V = 1.1826182 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1694335
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.6303414
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

May 2024
Standing Storage Loss: 27.28 lb per month

AP-42 eqn 1-4

Working Loss:	<u>105.46</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>132.74</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>27.28</u>	lb per	month
Working Loss(with control):	<u>105.46</u>	lb per	month
Total Emissions(with control):	<u>132.74</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF3
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 72.255 degrees F
Avg Daily Temp Range, ΔTa: 19.53 degrees F
Avg Daily Solar Insolation, I: 1915.24 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>73.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>75.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.1878</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.07090</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 77.08 degree F per AP-42 equation 1-32, 1-33, 1-34
Max Liquid Bulk Temp: _____ degrees F
Min Liquid Bulk Temp: _____ degrees F
Heating cycle frequency: _____ days

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 30 days
Turnover Rate: 708.6 turnovers per year
Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
where:
ΔT_V = 23.043362 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
T_{lx} = 81.15 deg F P_{vx} = 6.878 psia
T_{ln} = 69.62 deg F P_{vn} = 5.554 psia
ΔP_V = 1.3247722 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.1997998

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
K_S = 0.5929663

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for: June 2024

Standing Storage Loss: 33.74 lb per month

AP-42 eqn 1-4

Working Loss:	<u>120.68</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>154.41</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>33.74</u>	lb per	month
Working Loss(with control):	<u>120.68</u>	lb per	month
Total Emissions(with control):	<u>154.41</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
Location: Kenova, WV
Calculations for Tank No.: T-KDF3
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 75.57 degrees F
Avg Daily Temp Range, ΔTa: 18.84 degrees F
Avg Daily Solar Insolation, I: 1856.28 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>77.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>78.6</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.5665</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.07480</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>80.24646</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
Days this Period: 31 days
Turnover Rate: 685.7 turnovers per year
Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} **AP-42 eqn 1-5**
where:
ΔT_V = 22.269522 deg F (deg R); daily temperature range in the vapor space **AP-42 eqn 1-6, 1-7, 1-8**
T_{lx} = 84.17 deg F P_{vx} = 7.265 psia
T_{ln} = 73.04 deg F P_{vn} = 5.923 psia
ΔP_V = 1.3423255 psia
ΔP_B = 0.06 psi; vent setting range
K_E = 0.2081041
Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) **AP-42 eqn 1-21**
K_S = 0.5785547
Vent Setting Correction Factor, K_B:
K_B = 1; except when:
K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 **AP-42 eqn 1-40**
K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] **AP-42 eqn 1-41**
where:
P_{BP} = 0.03 psig; vent pressure setting
P_I = 0 psig; initial gauge pressure (nominal operating pressure)
K_B = 1
Control Effi= 0

Emissions Estimate for:

July 2024
Standing Storage Loss: 37.38 lb per month

AP-42 eqn 1-4

Working Loss:	<u>128.17</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>165.55</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>37.38</u>	lb per	month
Working Loss(with control):	<u>128.17</u>	lb per	month
Total Emissions(with control):	<u>165.55</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 74.885 degrees F
 Avg Daily Temp Range, ΔTa: 19.71 degrees F
 Avg Daily Solar Insolation, I: 1725.05 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: <u>white paint</u>
Average alpha:	<u>0.25</u>	shell condition: <u>Average</u>
Tank Diameter:	<u>9.02421</u> ft	shell alpha: <u>0.25</u>
Tank Height:	<u>4.18617</u> ft	roof color: <u>white paint</u>
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: <u>Average</u>
Minimum Liquid Level:	<u>1</u> ft	roof alpha: <u>0.25</u>
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>9</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>76.2</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>77.7</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.4589</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.07371</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>79.23086</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 22.293924 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 83.28 deg F P_{Vx} = 7.149 psia
 T_{ln} = 72.13 deg F P_{Vn} = 5.823 psia
 ΔP_V = 1.3262078 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.2038507
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5825795
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: August 2024
 Standing Storage Loss: 36.33 lb per month

AP-42 eqn 1-4

Working Loss:	<u>126.31</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>162.64</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>36.33</u>	lb per	month
Working Loss(with control):	<u>126.31</u>	lb per	month
Total Emissions(with control):	<u>162.64</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 67.64 degrees F
 Avg Daily Temp Range, ΔTa: 21.02 degrees F
 Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>13.5</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>68.7</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>69.9</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>8.6838</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.10061</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>71.1769</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 30 days
 Turnover Rate: 708.6 turnovers per year
 Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 21.759102 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 75.37 deg F P_{vx} = 9.561 psia
 T_{ln} = 64.50 deg F P_{vn} = 7.871 psia
 ΔP_V = 1.6906131 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.3336418
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5093412
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for: September 2024
 Standing Storage Loss: 68.67 lb per month

AP-42 eqn 1-4

Working Loss:	<u>171.24</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>239.90</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>68.67</u>	lb per	month
Working Loss(with control):	<u>171.24</u>	lb per	month
Total Emissions(with control):	<u>239.90</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 56.66 degrees F
 Avg Daily Temp Range, ΔTa: 21.86 degrees F
 Avg Daily Solar Insolation, I: 1044.79 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>57.4</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>58.4</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>7.9081</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.09372</u> lb/ft ³	per AP-42 equation 1-22	

Heating Cycles: Vapor Space Temp., T_v: 59.2921 degree F per AP-42 equation 1-32, 1-33, 1-34
 Max Liquid Bulk Temp: _____ degrees F
 Min Liquid Bulk Temp: _____ degrees F
 Heating cycle frequency: _____ days

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 20.706988 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 63.54 deg F P_{vx} = 8.690 psia
 T_{ln} = 53.19 deg F P_{vn} = 7.183 psia
 ΔP_V = 1.5075395 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.2679556

Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5326868

Vent Setting Correction Factor, K_B:

K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41

where:

P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)

K_B = 1

Control Effi= 0

Emissions Estimate for: October 2024

Standing Storage Loss: 55.52 lb per month AP-42 eqn 1-4

Working Loss:	<u>160.59</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>216.11</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>55.52</u>	lb per	month
Working Loss(with control):	<u>160.59</u>	lb per	month
Total Emissions(with control):	<u>216.11</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 46.445 degrees F
 Avg Daily Temp Range, ΔTa: 18.49 degrees F
 Avg Daily Solar Insolation, I: 675.82 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{vo} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _v :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>47.0</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>47.5</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>6.4533</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _v :	<u>0.07816</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>48.14757</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 30 days
 Turnover Rate: 708.6 turnovers per year
 Turnover Factor, K_N: 0.209

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 16.552642 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 51.69 deg F P_{vx} = 6.982 psia
 T_{ln} = 43.41 deg F P_{vn} = 5.957 psia
 ΔP_V = 1.0255922 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.1563621
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.5827894
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

November 2024
 Standing Storage Loss: 28.60 lb per month

AP-42 eqn 1-4

Working Loss:	<u>133.02</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>161.63</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>28.60</u>	lb per	month
Working Loss(with control):	<u>133.02</u>	lb per	month
Total Emissions(with control):	<u>161.63</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Fixed-Roof Tanks

page 1 of 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations,

Company: MPLX Terminals, LLC
 Location: Kenova, WV
 Calculations for Tank No.: T-KDF3
 Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
 Avg Ambient Temp, Taa: 37.145 degrees F
 Avg Daily Temp Range, ΔTa: 15.41 degrees F
 Avg Daily Solar Insolation, I: 518.91 Btu / ft² day

Tank Data:

Tank Type:	<u>Horizontal</u>	shell color: white paint
Average alpha:	<u>0.25</u>	shell condition: Average
Tank Diameter:	<u>9.02421</u> ft	shell alpha: 0.25
Tank Height:	<u>4.18617</u> ft	roof color: white paint
Maximum Fill Height:	<u>3.1861713</u> ft	roof condition: Average
Minimum Liquid Level:	<u>1</u> ft	roof alpha: 0.25
Net Working Height:	<u>2.1861713</u> ft	
Fixed Roof Type:	<u>horizontal tank</u>	effective roof height: <u>0</u> ft
Average outage, H _{VO} :	<u>2.0930865</u> ft	H _{VO} : <u>2.09309</u> ft
Max Vent Setting:	<u>0.03</u> psig	
Min Vent Setting:	<u>-0.03</u> psig	

Service Data:

Service (stored liquid):	<u>Gasoline RVP_X</u>		Vapor Pressure Constants:
Product Factor, K _P :	<u>1</u>		A: _____
Reid Vapor Pressure:	<u>15</u> psi	(if specified)	B: _____
ASTM Distillation Slope:	<u>3</u>	(if specified)	C: _____
Molecular Weight, M _V :	<u>66</u> lb/lb-mol		
Liquid Bulk Temp, T _b :	<u>37.5</u> degrees F		
Constant Temp Tank?	<u>NO</u>	tank must be insulated for temperature to be constant	
Liquid Bulk Temp Basis?	<u>calculated from ambient, per AP-42 equation 1-31</u>		
Liquid Surface Temp, T _{la} :	<u>38.0</u> degrees F	per AP-42 equation 1-27, 1-28, 1-29	
True Vapor Pressure, P:	<u>5.3529</u> psia	per AP-42 equation 1-24, 1-25, 1-26	
Stock Vapor Density, W _V :	<u>0.06609</u> lb/ft ³	per AP-42 equation 1-22	
Heating Cycles: Vapor Space Temp., T _v :	<u>38.45227</u> degree F	per AP-42 equation 1-32, 1-33, 1-34	
Max Liquid Bulk Temp:	_____ degrees F		
Min Liquid Bulk Temp:	_____ degrees F		
Heating cycle frequency:	_____ days		

Operational Data:

Throughput: 1,451 bbl per month
 Days this Period: 31 days
 Turnover Rate: 685.7 turnovers per year
 Turnover Factor, K_N: 0.210

Calculated Values:

Vapor Space Expansion Factor, K_E = {ΔT_V / (T + 459.67)} + {(ΔP_V - ΔP_B) / (P_A - P)} AP-42 eqn 1-5
 where:
 ΔT_V = 13.590197 deg F (deg R); daily temperature range in the vapor space AP-42 eqn 1-6, 1-7, 1-8
 T_{lx} = 41.39 deg F P_{vx} = 5.725 psia
 T_{ln} = 34.60 deg F P_{vn} = 5.000 psia
 ΔP_V = 0.7254592 psia
 ΔP_B = 0.06 psi; vent setting range
 K_E = 0.1020409
 Vented Vapor Saturation Factor, K_S = 1 / (1 + 0.053 P H_{VO}) AP-42 eqn 1-21
 K_S = 0.6274234
 Vent Setting Correction Factor, K_B:
 K_B = 1; except when:
 K_N [(P_{BP} + P_A) / (P_I + P_A)] > 1 AP-42 eqn 1-40
 K_B = [(P_I + P_A) / K_N - P] / [P_{BP} + P_A - P] AP-42 eqn 1-41
 where:
 P_{BP} = 0.03 psig; vent pressure setting
 P_I = 0 psig; initial gauge pressure (nominal operating pressure)
 K_B = 1
 Control Effi= 0

Emissions Estimate for:

December 2024
 Standing Storage Loss: 17.56 lb per month

AP-42 eqn 1-4

Working Loss:	<u>113.25</u>	lb per	month
Total Emissions (w/o heating cycle loss):	<u>130.81</u>	lb per	month
	0.1	tons per	month
Standing Storage Loss(with control):	<u>17.56</u>	lb per	month
Working Loss(with control):	<u>113.25</u>	lb per	month
Total Emissions(with control):	<u>130.81</u>	lb per	month
	<u>0.1</u>	tons per	month

AP-42 eqn 1-35
AP-42 eqn 1-1

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **January 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **34.53** degrees F
 Avg Daily Solar Insolation, I: **570.26** Btu / ft² day
 Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
 Average alpha: **0.25**
 Tank Diameter, D: **90** ft
 Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **303** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **92** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **396** lb-mol/yr

Number of columns, N_c : **0**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **35.2** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **36.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.174** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.1122** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,850** bbl per month

Emissions Estimate for: **January 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **248.99** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **249.24** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **248.99** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **249.24** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **February 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **37.4** degrees F
Avg Daily Solar Insolation, I: **828.29** Btu / ft² day
Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **296** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **91** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **387** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, Kc: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, Mv: **66** lb/lb-mol given

Liquid Bulk Temp, Tb: **38.4** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, Tla: **40.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, Pva: **5.566** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1231** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **February 2024**

Days This Period: **29** Control Efficiency= **0**

Standing Storage Loss (Lr + Ld + Lf) = [Fr + Fd + Ff] × [P* Mv Kc] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **249.80** lb per month

Withdrawal Loss (Lwd) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **250.05** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **249.80** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **250.05** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **March 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **45.66** degrees F
Avg Daily Solar Insolation, I: **1162.71** Btu / ft² day
Avg Wind Speed, V: **6.93** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$ per AP-42 equation 2-3
 $L_r = [Fr] \times [P^* M_v K_c]$ defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **303** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$ per AP-42 equation 2-18
 $L_d = [Fd] \times [P^* M_v K_c]$ defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$ per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$ per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$ per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **92** lb-mol/yr (all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **396** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.1** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **49.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **5.909** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1330** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **March 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **295.13** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **295.38** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **295.13** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **295.38** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **April 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **56.73** degrees F
 Avg Daily Solar Insolation, I: **1545** Btu / ft² day
 Avg Wind Speed, V: **6.71** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
 Average alpha: **0.25**
 Tank Diameter, D: **90** ft
 Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**
 roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$ per AP-42 equation 2-3
 $L_r = [Fr] \times [P^* M_v K_c]$ defining a Rim Seal Emission Factor, Fr

$Fr = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (Fr): **296** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$ per AP-42 equation 2-18
 $L_d = [Fd] \times [P^* M_v K_c]$ defining a Deck Seam Emission Factor, Fd

$Fd = [(K_d S_d) D^2]$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$ per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$ per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$ per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **91** lb-mol/yr (all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **387** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **58.6** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **61.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **4.749** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P*: **0.1009** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **April 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **211.86** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **212.11** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **211.86** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **212.11** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **May 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **64.175** degrees F
Avg Daily Solar Insolation, I: **1751.36** Btu / ft² day
Avg Wind Speed, V: **5.59** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**
roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$ per AP-42 equation 2-3
 $L_r = [F_r] \times [P^* M_v K_c]$ defining a Rim Seal Emission Factor, F_r

$F_r = [(K_{ra} + K_{rb} V^n) D]$

Rim Seal Emission Factor (F_r): **255** lb-mol/yr

$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$ per AP-42 equation 2-18
 $L_d = [F_d] \times [P^* M_v K_c]$ defining a Deck Seam Emission Factor, F_d

$F_d = [(K_d S_d) D^2]$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$ per AP-42 equation 2-13

$F_{fi} = N_{fi} [K_{fi}]$ per AP-42 equation 2-14

$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$ per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **87** lb-mol/yr (all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **342** lb-mol/yr

Number of columns, N_c : **0**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **66.3** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **69.6** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **5.549** psia per AP-42 equation 1-24, 1-25, 1-26

$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$

Vapor Pressure Function, P^* : **0.1226** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,850** bbl per month

Emissions Estimate for: **May 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **234.98** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **235.23** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **234.98** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **235.23** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **June 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **72.255** degrees F
 Avg Daily Solar Insolation, I: **1915.24** Btu / ft² day
 Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
 Average alpha: **0.25**
 Tank Diameter, D: **90** ft
 Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **231** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **84** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **315** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **74.5** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **78.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.514** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1514** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **June 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **258.60** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **258.85** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **258.60** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **258.85** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **July 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **75.57** degrees F
Avg Daily Solar Insolation, I: **1856.28** Btu / ft² day
Avg Wind Speed, V: **4.7** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **223** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **83** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **306** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **77.8** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **81.3** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.898** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1638** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **July 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **280.91** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **281.16** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **280.91** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **281.16** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **August 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **74.885** degrees F
Avg Daily Solar Insolation, I: **1725.05** Btu / ft² day
Avg Wind Speed, V: **4.25** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **207** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **81** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **288** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **9** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **76.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **80.2** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.762** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1594** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **August 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **257.03** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **257.28** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **257.03** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **257.28** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - 1 Day Normal Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **67.64** degrees F
 Avg Daily Solar Insolation, I: **1403.94** Btu / ft² day
 Avg Wind Speed, V: **4.47** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
 Average alpha: **0.25**
 Tank Diameter, D: **90** ft
 Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **215** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **82** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **297** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, Kc: **1**

Reid Vapor Pressure: **13.5** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, Mw: **66** lb/lb-mol given

Liquid Bulk Temp, Tb: **69.3** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, Tla: **72.0** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, Pva: **9.005** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.2446** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **95** bbl per this period

Emissions Estimate for: **September 2024**

Days This Period: **1** Control Efficiency= **0**

Standing Storage Loss (Lr + Ld + Lf) = [Fr + Fd + Ff] × [P* Mv Kc] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **13.12** lb per this period

Withdrawal Loss (Lwd) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.01** lb per this period

Total Emissions: **13.13** lb per this period per AP-42 equation 2-1

0.0 tons per this period

Standing Storage Loss(with control): **13.12** lb per

Withdrawal Loss(with control): **0.01** lb per this period

Total Emissions(with control): **13.13** lb per this period

0.0 tons per this period

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Roof Landing

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: <u>MPLX Terminals, LLC</u>		
Location: <u>Kenova, WV</u>		
Calculations for Tank No.: <u>WA-49-256</u>		
Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: September 2024		
Meteorological Data:		
Avg Atmos Pressure, Pa:	<u>14.257432</u> psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u> degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u> degrees F	shell alpha: <u>0.25</u>
Avg Daily Solar Insolation, I:	<u>1403.94</u> Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u> mph	roof condition: Average
Tank Data:		roof alpha: <u>0.25</u>
Tank Type:	<u>EFRT</u>	
Average alpha:	<u>0.25</u>	
Tank Diameter, D:	<u>90</u> ft	
Height of Deck Legs:	<u>7.25</u> ft	
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	<u>2</u> ft	(if partial heel)
Depth of Heel in Sump:	<u>0.25</u> ft	(if partial heel (liquid only in sump))
Slope of Bottom:	<u>0</u> in/ft	(positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid s
Eff. Ht of Liquid Heel:	<u>0.0009568</u> ft	(equivalent depth across the entire bottom)
Height of Vapor Space:	<u>7.2502778</u> ft	(below the landed floating roof deck)
Vapor Space Volume, VV:	<u>46,124</u> ft ³	
Constant Temp Tank?	<u>NO</u>	(only if both roof and shell are insulated)
Service Data:		
Service (stored liquid):	<u>Gasoline RVP_X</u>	(if specified)
Reid Vapor Pressure:	<u>10</u> psi	(if specified)
ASTM Distillation Slope:	<u>3</u>	
Molecular Weight, M _v :	<u>66</u> lb/lb-mol	
Heel Bulk Temp, T _b :	<u>67.64</u> degrees F	
Liquid Bulk Temp Basis?	<u>same as Taa</u>	
Heel Surface Temp, T _{la} :	<u>67.6</u> degrees F	<u>same as Taa</u>
TVP of Liquid in the Heel, P _{va} :	<u>6.001</u> psia	<u>per AP-42 equation 1-24, 1-25, 1-26</u>
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	<u>0.1357</u> dimensionless	<u>per AP-42 equation 2-4</u>
Stock liquid density, W _l :	<u>5.6</u> lb/gal	
Stock Vapor Density, W _v :	<u>7.00E-02</u> lb/ft ³	<u>per AP-42 equation 1-22</u>
Vapor Space Temperature, T _v :	<u>67.64</u> degrees F	
Operational Data:		
Duration of Event, nd:	<u>1</u> days	this period
Heel Condition:	<u>Partial Heel (liquid only in sump)</u>	
Calculated Values:		
Vapor Space Expansion Factor, KE:		<u>per AP-42 equation 1-5</u>
$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$		
where:		
$\Delta TV =$ <u>21.73</u> deg F (deg R); daily temperature range in the vapor space		
$T =$ <u>67.6</u> deg F; daily average temperature of the heel		
$P =$ <u>6.0010</u> psia; TVP of liquid in the heel at the daily average temperature		
$T_{min} =$ <u>62.21</u> deg F $P_{min} =$ <u>5.4115</u> psia		
$T_{max} =$ <u>73.07</u> deg F $P_{max} =$ <u>6.6407</u> psia		
$\Delta PB =$ <u>0</u> assuming open vent pathways through the floating roof deck		
$P_a =$ <u>14.25743</u> psia; atmospheric pressure		
$\Delta PV =$ <u>1.2293</u> psia		
$KE =$ <u>0.190102756</u>		
Vented Vapor Saturation Factor, KS:		
$KS = 1 / (1 + 0.053 P_{hv}) < S$		<u>per AP-42 equation 1-21</u>
$KS =$ <u>0.302482465</u>		

(continue)

Estimated Emissions:

Standing Idle Loss:

for an IFRT, = $\pi D K E W V V K S$

per AP-42 equation 3-6, 3-7

for an EFRT, = $0.57 \pi D P^* M V$

per AP-42 equation 3-10

Calculated Standing Idle Loss, This Period:

459.6 lb

Limit on Standing Idle Loss (weight of available liquid in the heel):

256 lb

Standing Idle Loss, This Period:

256.06 lb (without controls)

0.000 % control efficiency while standing idle

256.06 lb (with controls)

Limit on Filling Loss from Resident Vapors:

0 lb

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Nov 2006) emission factors and equations.

Avg Atmos Pressure, Pa:	<u>14.257432</u>	psia	shell color: white paint
Avg Ambient Temp, Taa:	<u>67.64</u>	degrees F	shell condition: Average
Avg Daily Temp Range:	<u>21.02</u>	degrees F	shell alpha: 0.25
Avg Daily Solar Insolation, I:	<u>1403.94</u>	Btu / ft ² day	roof color: white paint
Avg Wind Speed, V:	<u>4.47</u>	mph	roof condition: Average

Tank Type:	EFRT	
Average alpha:	0.25	
Tank Diameter, D:	90	ft
Height of Deck Legs:	7.25	ft
Height of Liquid Heel:		ft (if full heel, above bottom of shell)
Diameter of Sump:	2	ft
Depth of Heel in Sump:	0.25	ft (if partial heel (liquid only in sump))
Slope of Bottom:	0	in/ft (positive for cone-down, negative for cone-up)
Height of Liquid at Shell:		ft (if liquid in cone-down bottom, height from bottom of shell to liquid surface)
Eff. Ht of Liquid Heel:	0.0009568	ft (equivalent depth across the entire bottom)
Height of Vapor Space:	7.2502778	ft (below the landed floating roof deck)
Vapor Space Volume, VV:	46,124	ft ³
Constant Temp Tank?	NO	(only if both roof and shell are insulated)

Service (stored liquid):	Gasoline RVP_X	(if specified)
Reid Vapor Pressure:	10	psi (if specified)
ASTM Distillation Slope:	3	
Molecular Weight, M _v :	66	lb/lb-mol
Heel Bulk Temp, T _b :	67.64	degrees F
Liquid Bulk Temp Basis?	calculated from ambient	
Heel Surface Temp, T _{la} :	67.6	degrees F
TVP of Liquid in the Heel, P _{va} :	6.001	psia
$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$		
Vapor Pressure Function, P*:	0.1357	dimensionless
Stock liquid density, Wl:	5.6	lb/gal
Stock Vapor Density, WV:	7.00E-02	lb/ft3
Vapor Space Temperature, T _v :	67.64	degrees F

Duration of Event, nd: 1 days this period

Heel Condition: **Partial Heel (liquid only in sump)**

Vapor Space Expansion Factor, KE:

$$KE = \{\Delta TV / (T + 459.67)\} + \{(\Delta PV - \Delta PB) / (P_a - P)\}$$

per AP-42 equation 1-5

where:

$\Delta TV = \frac{21.73}{\text{deg F (deg R)}}$; daily temperature range in the vapor space

$T = \frac{67.6}{\text{deg F}}$; daily average temperature of the heel

$P = \frac{6.0010}{\text{psia}}$; TVP of liquid in the heel at the daily average temperature

$T_{min} = \frac{62.21}{\text{deg F}}$ $P_{min} = \frac{5.4115}{\text{psia}}$

$T_{max} = \frac{73.07}{\text{deg F}}$ $P_{max} = \frac{6.6407}{\text{psia}}$

$\Delta PB = \frac{0}{\text{assuming open vent pathways through the floating roof deck}}$

$P_a = \frac{14.25743}{\text{psia}}$; atmospheric pressure

$\Delta PV = \frac{1.2293}{\text{psia}}$

$KE = \frac{0.190102756}{\text{}}$

Vented Vapor Saturation Factor, KS:

$KS = 1 / (1 + 0.053 P_{hv}) < S$ per AP-42 equation 1-21

$KS = 0.302482465$

Calculated Values:

Saturation Factor S:

$$S = \frac{0.5}{1}$$

Filling saturation correction factor for wind Csf:

$$Csf = \frac{0.847817401}{1}$$

per AP-42 equation 3-21

Vapor Space Purge:

Initial Purge:

$$Sa = \frac{0.2739087}{1}$$

$$\text{Initial Purge Loss} = \frac{0}{1} \text{ lb}$$

$$\text{Vapor control efficiency for Initial Purge} = \frac{0}{1}$$

$$\text{Initial Purge Loss with control} = \frac{0}{1} \text{ lb}$$

Daily Vapor Purge:

$$\text{Purge Day (exclude initial purge)} = \frac{0}{1} \text{ day(s)}$$

$$\text{Saturation factor, S} = \frac{0.500}{1}$$

$$\text{Daily Purge loss} = \frac{0}{1} \text{ lb}$$

per AP-42 equation 4-2

Continued Forced Ventilation:

$$\text{Average vapor concentration, CV} = \frac{0.00375}{1}$$

$$\text{Molecular Weight of Calibration Gas, MV} = \frac{72.15}{1} \text{ g/mol}$$

Continued forced ventilation emissions, LCV:

$$\frac{6135.433018}{1} \text{ lb}$$

per AP-42 equation 4-10

$$\text{Vapor Limit} = \frac{256.06}{1} \text{ lb}$$

per AP-42 equation 4-12, 4-13

$$\text{Cleaning Loss} = \frac{256.06}{1} \text{ lb}$$

per AP-42 equation 4-1

$$\text{Vapor control efficiency} = \frac{0}{1}$$

$$\text{Cleaning Loss with control} = \frac{256.06}{1} \text{ lb}$$

$$\text{Total Losses with control} = \frac{256.06}{1} \text{ lb}$$

Sample Calculation of Estimated Emissions - Floating-Roof Tanks - Change of Service

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: MPLX Terminals, LLCLocation: Kenova, WVCalculations for Tank No.: WA-49-256Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **September 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: 14.257432 psia
Avg Ambient Temp, Taa: 67.64 degrees F
Avg Daily Solar Insolation, I: 1403.94 Btu / ft² day
Avg Wind Speed, V: 4.47 mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: EFRT
Average alpha: 0.25
Tank Diameter, D: 90 ft
Rim Seal Type: Mechanical-Shoe Primary with Rim-Mounted Secondary

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [Fr] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$Fr = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): 215 lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [Fd] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$Fd = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): 0 lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{gp}): 0 lb-mol/yrDeck Fittings Emission Factor (F_{fi-n}): 82 lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): 297 lb-mol/yrNumber of columns, N_c: 0Effective column diameter, F_c: 1 feet

Service Data:

Service (stored liquid): Gasoline RVP_XProduct Factor, K_C: 1Reid Vapor Pressure: 13.5 psi (if specified)ASTM Distillation Slope: 3 (if specified)Molecular Weight, M_v: 66 lb/lb-mol givenLiquid Bulk Temp, T_b: 69.3 degrees FConstant Temp Tank? NO tank must be insulated for temperature to be constantLiquid Bulk Temp Basis? calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12Liquid Surface Temp, T_{la}: 72.0 degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10True Vapor Pressure, P_{va}: 9.005 psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: 0.2446 dimensionless per AP-42 equation 2-4Liquid density, W_l: 5.6 lb/galClingage factor, C_s: 0.0015 bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: 2,755 bbl per this periodEmissions Estimate for: September 2024Days This Period: 27

$$\text{Standing Storage Loss } (L_r + L_d + L_f) = [Fr + Fd + Ff] \times [P^* M_v K_c]$$

per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss (with control): 354.17 lb per this period

$$\text{Withdrawal Loss } (L_{wd}) = [(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$$

per AP-42 equation 2-19

Withdrawal Loss (with control): 0.24 lb per this periodTotal Routine Emissions (with control): 354.42 lb per this period

per AP-42 equation 2-1

0.2 tons per this period

Stock Vapor Density, WV: 0.0971952 lb/ft3
Temperature for Refill TVP: 67.64
TVP for Refill: 8.3331095
If the previous record is roof-landing, out-of-sevice, or tank-cleaning,
Previous stock vapor density (*Wv): 7.00E-02 lb/ft3
Previous volume of vapor space (*Vv): 46130.36 ft3
Previous Sa: 0.273909

Filling Loss:

Calculated Filling Loss from Resident Vapors {= *Wv *Vv Sa}:

0 lb

Limit on Filling Loss from Resident Vapors:

-1 lb

Filling Loss from Resident Vapors:

0 lb

Filling Loss from Incoming Vapors {= Wv Vv Sg}:

672 lb

Filling Loss, This Period:

672.5	lb	(without controls)
0.000	% control efficiency while refilling	
672.5	lb	(with controls)

Total Emissions: 1026.8739 lb per

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **October 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **56.66** degrees F
Avg Daily Solar Insolation, I: **1044.79** Btu / ft² day
Avg Wind Speed, V: **4.92** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, F_r

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (F_r): **231** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, F_d

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (F_d): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (F_{fgp}): **0** lb-mol/yr

Deck Fittings Emission Factor (F_{fi-n}): **84** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors ($F_r + F_d + F_f$): **315** lb-mol/yr

Number of columns, N_c : **0**

Effective column diameter, F_c : **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C : **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v : **66** lb/lb-mol given

Liquid Bulk Temp, T_b : **57.9** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la} : **59.9** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va} : **8.131** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P^* : **0.2081** dimensionless per AP-42 equation 2-4

Liquid density, W_l : **5.6** lb/gal

Clingage factor, C_s : **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q : **2,850** bbl per month

Emissions Estimate for: **October 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss ($L_r + L_d + L_f$) = $[F_r + F_d + F_f] \times [P^* M_v K_c]$ per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **367.20** lb per month

Withdrawal Loss (L_{wd}) = $[(0.943 Q C_s W_l)/D] \times [1 + (N_c F_c)/D]$ per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **367.45** lb per month per AP-42 equation 2-1

0.2 tons per month

Standing Storage Loss(with control): **367.20** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **367.45** lb per month

0.2 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **November 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
Avg Ambient Temp, Taa: **46.445** degrees F
Avg Daily Solar Insolation, I: **675.82** Btu / ft² day
Avg Wind Speed, V: **5.82** mph

shell color: **white paint**
shell condition: **Average**
shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
Average alpha: **0.25**
Tank Diameter, D: **90** ft
Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
roof condition: **Average**
roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **264** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **88** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **351** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, K_C: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, M_v: **66** lb/lb-mol given

Liquid Bulk Temp, T_b: **47.3** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, T_{la}: **48.5** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, P_{va}: **6.576** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1534** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **November 2024**

Days This Period: **30** Control Efficiency= **0**

Standing Storage Loss (L_r + L_d + L_f) = [Fr + Fd + Ff] × [P* M_v K_c] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **292.16** lb per month

Withdrawal Loss (L_{wd}) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **292.41** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **292.16** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **292.41** lb per month

0.1 tons per month

Sample Calculation of Estimated Emissions - Floating-Roof Tanks

page 1

The emissions estimates calculated below are based on EPA's AP-42 Chapter 7.1 (Post 2018) emission factors and equations.

Company: **MPLX Terminals, LLC**

Location: **Kenova, WV**

Calculations for Tank No.: **WA-49-256**

Emission estimates per EPA's AP-42 Chapter 7.1 (Post 2018), for: **December 2024**

Meteorological Data:

Avg Atmos Pressure, Pa: **14.257432** psia
 Avg Ambient Temp, Taa: **37.145** degrees F
 Avg Daily Solar Insolation, I: **518.91** Btu / ft² day
 Avg Wind Speed, V: **6.26** mph

shell color: **white paint**
 shell condition: **Average**
 shell alpha: **0.25**

Tank Data:

Tank Type: **EFRT**
 Average alpha: **0.25**
 Tank Diameter, D: **90** ft
 Rim Seal Type: **Mechanical-Shoe Primary with Rim-Mounted Secondary**

roof color: **white paint**
 roof condition: **Average**
 roof alpha: **0.25**

$$L_r = [(K_{ra} + K_{rb} V^n) D] \times [P^* M_v K_c]$$

per AP-42 equation 2-3

$$L_r = [F_r] \times [P^* M_v K_c]$$

defining a Rim Seal Emission Factor, Fr

$$F_r = [(K_{ra} + K_{rb} V^n) D]$$

Rim Seal Emission Factor (Fr): **279** lb-mol/yr

$$L_d = [(K_d S_d) D^2] \times [P^* M_v K_c]$$

per AP-42 equation 2-18

$$L_d = [F_d] \times [P^* M_v K_c]$$

defining a Deck Seam Emission Factor, Fd

$$F_d = [(K_d S_d) D^2]$$

Deck Seam Emission Factor (Fd): **0** lb-mol/yr

$$L_{fi} = [F_{fi}] \times [P^* M_v K_c]$$

per AP-42 equation 2-13

$$F_{fi} = N_{fi} [K_{fi}]$$

per AP-42 equation 2-14

$$K_{fi} = [K_{fai} + K_{fbi} (K_v V)^{m_i}]$$

per AP-42 equation 2-15

Guidepole Emission Factor (Ffgp): **0** lb-mol/yr

Deck Fittings Emission Factor (Ffi-n): **89** lb-mol/yr

(all deck fittings other than the guidepole)

Total Emission Factors (Fr + Fd + Ff): **369** lb-mol/yr

Number of columns, Nc: **0**

Effective column diameter, Fc: **1** feet

Service Data:

Service (stored liquid): **Gasoline RVP_X**

Product Factor, Kc: **1**

Reid Vapor Pressure: **15** psi (if specified)

ASTM Distillation Slope: **3** (if specified)

Molecular Weight, Mw: **66** lb/lb-mol given

Liquid Bulk Temp, Tb: **37.8** degrees F

Constant Temp Tank? **NO** tank must be insulated for temperature to be constant

Liquid Bulk Temp Basis? **calculated from ambient, per AP-42 equation 1-31, 2-8, 2-9, 2-11, or 2-12**

Liquid Surface Temp, Tla: **38.7** degrees F per AP-42 equation 2-5, 2-6, 2-7, or 2-10

True Vapor Pressure, Pva: **5.434** psia per AP-42 equation 1-24, 1-25, 1-26

$$P^* = [P_{va}/P_a] / [1 + (1 - P_{va}/P_a)^{0.5}]^2$$

Vapor Pressure Function, P*: **0.1194** dimensionless per AP-42 equation 2-4

Liquid density, Wl: **5.6** lb/gal

Clingage factor, Cs: **0.0015** bbl per 1000 sq.ft.

Operational Data:

Throughput, Q: **2,850** bbl per month

Emissions Estimate for: **December 2024**

Days This Period: **31** Control Efficiency= **0**

Standing Storage Loss (Lr + Ld + Lf) = [Fr + Fd + Ff] × [P* Mv Kc] per AP-42 equations 2-2, 2-3, 2-13, 2-18

Standing Storage Loss: **246.85** lb per month

Withdrawal Loss (Lwd) = [(0.943 Q Cs Wl)/D] × [1 + (Nc Fc)/D] per AP-42 equation 2-19

Withdrawal Loss: **0.25** lb per month

Total Emissions: **247.10** lb per month per AP-42 equation 2-1

0.1 tons per month

Standing Storage Loss(with control): **246.85** lb per month

Withdrawal Loss(with control): **0.25** lb per month

Total Emissions(with control): **247.10** lb per month

0.1 tons per month