Ergon - West Virginia, Inc.
9995 Ohio River Blvd, Post Office Box 356
Newell, West Virginia 26050-0356

April 30, 2018

Bev McKeone, NSR Program Manager
West Virginia Division of Environmental Protection
601-57th Street, SE
Charleston, WV 25304

Tracking Number: 1ZX83W680196534526

RE: Ergon-West Virginia Inc. Newell Refinery
Construction and Modification Permit Application

Dear Ms. McKeone:

Ergon-West Virginia Inc. (EWVI) owns and operates a petroleum refinery (Newell Refinery) that processes crude oil into fuels and other specialty oil and wax products through the use of distillation and chemical reaction processes. The facility is located at 9995 Ohio River Blvd. in Newell, Hancock County, West Virginia. The facility currently operates under West Virginia Department of Environmental Protection (WV DEP) Regulation 13 Permit No. R13-2334AA and Title V Permit No. R30-02900008-2015 as most recently modified on June 5, 2017.

Current Project – Gasoline Tanks
EWVI is submitting the enclosed Construction and Modification Permit Application for the installation of a new gasoline storage tank, a new ethanol storage tank, and modifications to three existing gasoline tanks as well as an increase in throughput for the gasoline/ethanol tank group. The tank throughputs in this application are based on an annual average gasoline tank group throughput of 318,034,433 gallons per year.

Current Project –Feedstock Tank
EWVI is also submitting the enclosed Construction and Modification Permit Application for the installation of a new feedstock tank. The installation of the feedstock tank is not associated with the changes at the gasoline storage tanks, but due to the project timing is included as a part of a single R13 application. The new feedstock tank will allow for the purchase of a new type of feed to replace declining availability of current crude stock. The total charge rate to the refinery will not be increased as a result of this project.

Clarification of Throughput Rates
Through the preparation of this application EWVI discovered a terminology error in the August 2015 Platformer application regarding the equipment operating rate. As shown on the process flow diagram with that application, the naphtha is processed first in the unifiner then the naphtha splitter/platformer. The permit included the following statement:

> "EWVI proposes to increase the platformer's capacity from 3,900 barrels per day (bpd) to 7,500 bpd."

The statement should have read as follows:

> "EWVI proposes to increase the platformer's capacity from 3,900 barrels per day (bpd) to **4,820** bpd."

There is no language in the permit itself that needs updated related to this clarification of throughput; however, EWVI is providing this information as a technical correction to information in a historical permit application.

Suggested Permit Language and Clean-Up Items
EWVI has also attached suggested language for both the R13 permit as well as the modified Title V permit for the new and modified tanks. Additionally, EWVI has included some "cleanup" suggested language for the permits as well further clarifying which tanks are subject to 40 CFR 60, Subparts K/Ka/Kb:

- The following tanks commenced construction prior to the applicability dates of 40 CFR 60, Subpart K/Ka/Kb and have not been 'modified' as that term is defined in 40 CFR 60, Subpart A: TK-4001, 4014, 4015, 4018, 4041, 4052, and 4053.

- The following tanks are potentially subject to 40 CFR 60, Subpart Kb based on the commence construction date and capacity; however, these tanks are exempt based on the vapor pressure of the material stored: TK-4047 and 4051.

Tanks TK-4012 and TK-4013 will not be modified. However, we do note a permit cleanup item related to these two tanks. The emissions unit table in Section 1.0 of the permit shows the tanks to be equipped with mechanical shoe type seals. The floating roof tanks are actually equipped with vapor mounted seal systems. We request the emissions unit table be updated to reflect the vapor mounted seal design.

EWVI also notes two permit cleanup items in Section 5 of the permit related to the main flare. An explanation of the requested changes can be found in Attachments U and V of the application package.

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The application package contains the required application forms and support material. As required, the application is filed with one hard copy and two CDs with the associated application fee of $2,000 ($1,000 40 CSR 13 Application fee plus $1,000 NSPS Requirements fee) in the form of a check.

If you have any questions or comments about the attached information or have additional information requirements, please contact me at (304) 387-7046 or Jack.Azar@ergon.com.

Sincerely,
Jack Azar
Jack Azar
ESHT Manager

cc: Jake Neihaus—Corporate
Katelan Crain—Corporate
~~~~~~~~~~

R13 PERMIT APPLICATION

Ergon - West Virginia, Inc.

Ergon West Virginia, Inc.

Newell Refinery

Prepared By:

TRINITY CONSULTANTS
4500 Brooktree Road
Suite 103
Wexford, PA 15090
(724) 935-2611

April 2018

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WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☒ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☒ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Ergon-West Virginia, Inc. (EWVI)

2. Federal Employer ID No. ***(FEIN):***
721375114

3. Name of facility *(if different from above):*
Newell Refinery

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
9995 Ohio River Blvd, Route 2 South
Newell, WV 26050

5B. Facility's present physical address:
9995 Ohio River Blvd, Route 2 South
Newell, WV 26050

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☐ **YES** ☒ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: This is an existing site owned by Ergon – West Virginia, Inc.
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): The facility is a petroleum refinery that is proposing to construct one (1) 30,000 bbl gasoline tank and one (1) 15,000 bbl ethanol tank. Additionally, this application also seeks to modify three (3) existing 30,000 bbl gasoline tanks.

10. North American Industry Classification System **(NAICS)** code for the facility:
324110

11A. DAQ Plant ID No. (for existing facilities only):
029 – 00008

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-2334AA and R30-02900008-2015 MM02/MM03

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

Two (2) miles south of Newel, WV on State Route 2.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
N/A	Newell	Hancock
12.E. UTM Northing (KM): 4495.1	12F. UTM Easting (KM): 531.0	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
EWVI is proposing to install three tanks: one (1) 30,000 bbl gasoline tank, one (1) 15,000 bbl ethanol tank, and one (1) CDU feed tank. Additionally, EWVI is seeking to modify three (3) existing 30,000 bbl gasoline tanks.

14A. Provide the date of anticipated installation or change: 04/01/2018 – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: TBD

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☒ **YES** ☐ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**
– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	
☐ General Emission Unit, specify		

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

- Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. 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 found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

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.

SIGNATURE Neil Stanton *(Please use blue ink)* DATE: 4/30/18 *(Please use blue ink)*

35B. Printed name of signee: Neil Stanton		35C. Title: Vice President - Refining
35D. E-mail: neil.stanton@ergon.com	36E. Phone: 304-387-7046	36F. FAX:
36A. Printed name of contact person (if different from above): Jack Azar		36B. Title: ESHT Manager
36C. E-mail: Jack.Azar@ergon.com	36D. Phone: 304-387-7046	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

☒ **Attachment A: Business Certificate**
☒ **Attachment B: Map(s)**
☒ **Attachment C: Installation and Start Up Schedule**
☒ **Attachment D: Regulatory Discussion**
☒ **Attachment E: Plot Plan**
☒ **Attachment F: Detailed Process Flow Diagram(s)**
☒ **Attachment G: Process Description**
☒ **Attachment H: Material Safety Data Sheets (MSDS)**
☒ **Attachment I: Emission Units Table**
☒ **Attachment J: Emission Points Data Summary Sheet**
☐ **Attachment K: Fugitive Emissions Data Summary Sheet**
☒ **Attachment L: Emissions Unit Data Sheet(s)**
☐ **Attachment M: Air Pollution Control Device Sheet(s)**
☒ **Attachment N: Supporting Emissions Calculations**
☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
☒ **Attachment P: Public Notice**
☐ **Attachment Q: Business Confidential Claims**
☐ **Attachment R: Authority Forms**
☒ **Attachment S: Title V Permit Revision Information**
☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
☐ *For Title V Administrative Amendments:*
  ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
☐ *For Title V Minor Modifications:*
  ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A – BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
ERGON-WEST VIRGINIA INC
9995 OHIO RIVER BLVD
NEWELL, WV 26050-1195

BUSINESS REGISTRATION ACCOUNT NUMBER: **1050-8935**

This certificate is issued on: **06/11/2010**

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

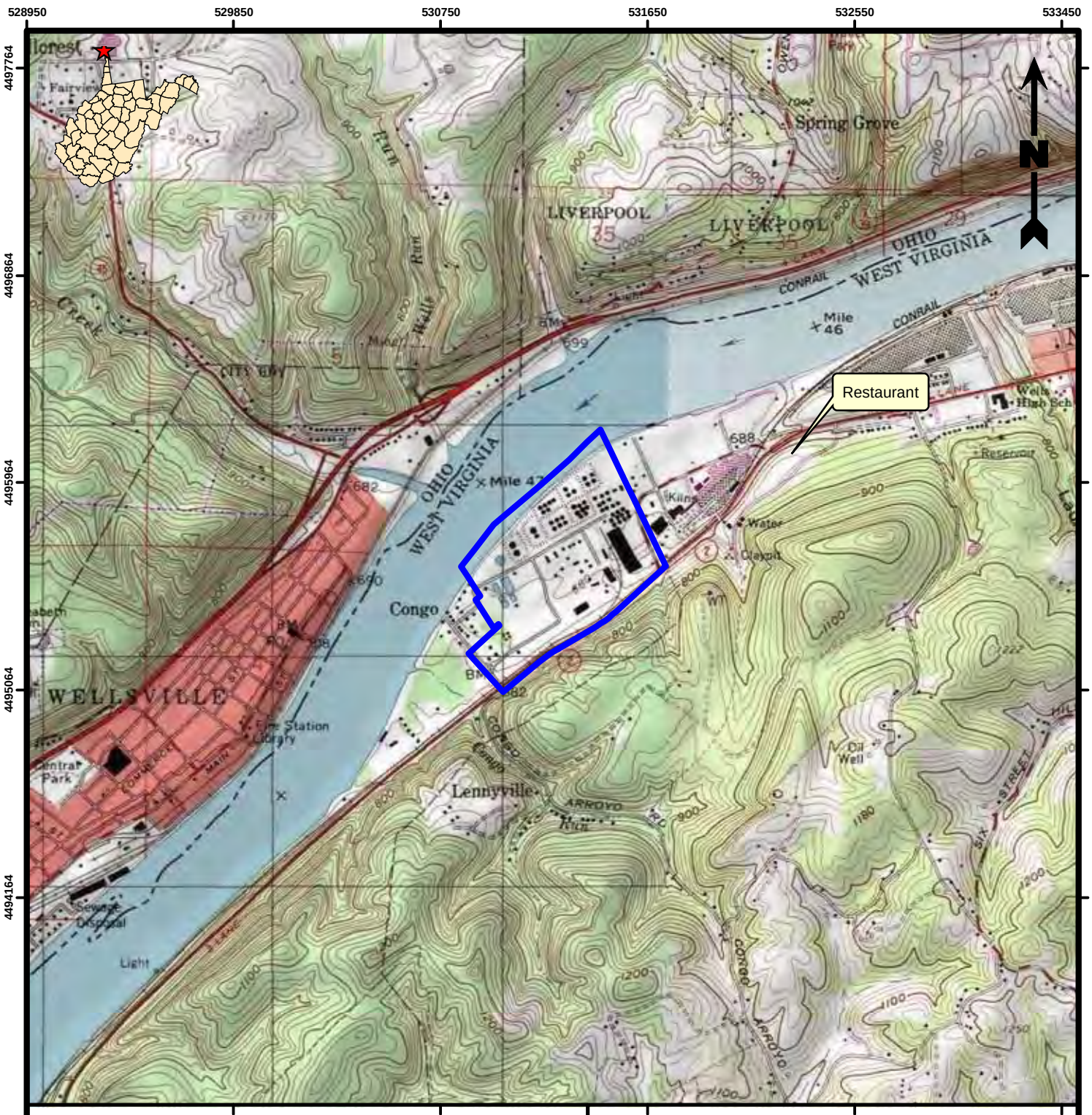
This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L0415898368



Legend

Property Boundary

Reference

Base map comprised of U.S.G.S. 7.5 minute topographic maps, "East Liverpool North, WV", "East Liverpool South, WV", "Westville, WV", and "West Point, OH".

Site Location Map

Title V Renewal Application
Newell, Hancock County, West Virginia

Ergon-West Virginia, Inc
Newell Refinery

PROVIDENCE

Drawn By	LMM	07/16/14
Checked By	LMH	07/16/14
Approved By	JDA	07/16/14

Project Number
098-057

Drawing Number
098-057-A001

B
Attachment

Providence Engineering and Environmental Group LLC

ATTACHMENT C – PROJECT SCHEDULE

ATTACHMENT C - SCHEDULE OF PLANNED INSTALLATION AND START-UP

Unit	Construction/Modification Schedule	Startup Schedule
Modified Gasoline Tank (TK-4004)	Upon issuance of permit	Summer 2018
Modified Gasoline Tank (TK-4005)	Upon issuance of permit	Summer 2018
Modified Gasoline Tank (TK-4006)	Upon issuance of permit	Summer 2018
New Ethanol Tank (TK-4070)	Upon issuance of permit	Summer 2018
New Gasoline Tank (TK-4071)	Upon issuance of permit	Summer 2018
New Feedstock Tank (TK-4072)	Upon issuance of permit	Summer 2018

ATTACHMENT D – REGULATORY APPLICABILITY

This section documents the applicability determinations made for Federal and State air quality regulations. The monitoring, recordkeeping, reporting, and testing plan is presented in Attachment O. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration (PSD) and/or Nonattainment New Source Review programs (NNSR);
- Title V of the 1990 Clean Air Act Amendments;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- West Virginia State Implementation Plan (SIP) regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP R13 permit application forms. In addition to providing a summary of applicable requirements related to this project, 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 proposed sources or proposed modifications at the Newell Refinery. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the Newell Refinery. Regulations that are categorically non-applicable are not discussed.

Table D-1 below shows the increase in allowable emissions as a result of the project for the storage tanks as well as the downstream loading operations.

Table D-1: Increase in Allowable Emissions

Pollutant	Increased Emissions Rate (TPY)
CO	0.43
NO_X	0.09
PM_{10}	0.01
$PM_{2.5}$	0.01
SO_2	1.23
VOC	7.76

Major New Source Review

The federal New Source Review (NSR) program applies to major stationary sources. The NSR program regulates the installation of new major sources or major modifications to existing major sources and it is comprised of two programs: 1) Prevention of Significant Deterioration (PSD) for projects located in areas where specified pollutant levels have met National Ambient Air Quality Standards (NAAQS); and 2) Nonattainment New Source Review (NNSR) for projects located in areas where pollutant levels have not attained the corresponding NAAQS.

The Newell Refinery is located in Hancock County which is currently in an attainment or unclassified status for all NSR pollutants. Therefore, the Major Source Thresholds (MST) are established by the PSD program. Given that the refineries are included in the 'List of 28," the MST are set at 100 tpy for all pollutants. The Newell

Refinery is an existing major source facility since the current site-wide potential-to-emit (PTE) is over the major source threshold for at least one PSD pollutant.

At an existing major source, PSD is triggered if the project net increase is above the Significant Emissions Rate (SER) for any regulated pollutant. Detailed emissions calculations are provided in Attachment N. As the project increase is less than the SER, PSD is not triggered by the proposed project.

Table D-2: NSR Major Modification Thresholds

Pollutant	Significant Emissions Rate (TPY)	NSR Program	Major Modification?
CO	100	PSD	No
NO_X	40	PSD	No
PM_{10}	15	PSD	No
$PM_{2.5}$	10	PSD	No
SO_2	40	PSD	No
VOC	40	PSD	No

Title V Operating Permit 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 West Virginia Code of State Regulations (CSR) 45-30. The major source 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 100 tpy of all other regulated pollutants.[1] The facility PTE for VOC, NO_X, and CO from the Newell Refinery surpass the major source threshold for Title V applicability; therefore, the refinery is a major source with respect to the Title V Program. The facility is current authorized under Title V operating permit is No R30-02900008-2015 MM02/MM03 as most recently modified on June 5, 2017. This application also requests the proposed changes be incorporated into the Title V permit via a minor modification.

New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources 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 Newell Refinery's proposed project.

NSPS Subparts K and Ka - Standards of Performance for Storage Vessels for Petroleum Liquids

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984.

- The proposed storage tanks (4070 & 4071) are expected to commence construction/modification by the beginning of 2018, the units are not subject to Subpart K or Ka.

[1] On June 23, 2014, the U.S Supreme Court decision in the case of *Utility Air Regulatory Group v. EPA* effectively changed the permitting procedures for GHGs under the PSD and Title V programs.

- The existing gasoline storage tanks proposed for modification (4004, 4005, & 4006) commenced construction in 1971 and the tanks have not previously been "modified" as that term is defined in 40 CFR, Subpart A. As such, the existing gasoline storage tanks were not subject to NSPS K or Ka. As with the new tanks, the proposed modification to the gasoline tanks will occur outside of the window of applicability for NSPS K or Ka.

NSPS Subparts Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)

NSPS Subpart Kb, "Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)," applies to storage vessels with a capacity greater than or equal to 75 m^3 (~ 19,813 gal) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.

Requirements of the rule are based on vessel capacity and material maximum true vapor pressure as summarized in the table below.

Table D-3. NSPS Kb Applicability Criteria

Capacity	Maximum True Vapor Pressure	NSPS Kb
≥ 151 m^3 (≥ 39,890 gal)	< 3.5 kPa (< 0.51 psi)	Exempt
≥ 75 m^3 but < 151 m^3 (≥ 19,813 to < 39,890 gal)	< 15.0 kPa (< 2.17 psi)	Exempt
≥ 151 m^3 (≥ 39,890 gal)	≥ 5.2 kPa but < 76.6 kPa (≥ 0.75 to < 11.11 psi)	Floating roof
≥ 75 m^3 but < 151 m^3 (≥ 19,813 to < 39,890 gal)	> 27.6 kPa but < 76.6 kPa (> 4.0 to < 11.11 psi)	Floating roof
≥ 75 m^3 (≥ 39,890 gal)	≥ 76.6 kPa (≥ 11.11 psi)	Closed vent system & control device (or equivalent)

The tanks to be installed or modified in the proposed project are detailed below:

- **TK-4070** – The proposed new ethanol tank will have a capacity of 630,000 gallons. The vapor pressure of ethanol is between 0.75 and 11.11 psi. As such, the tank will be a NSPS Kb "affected facility" subject to the floating roof requirements of the rule.

- **TK-4071** – The proposed new gasoline tank will have a capacity of 1,260,000 gallons. The tank will store gasoline products with a vapor pressure between 0.75 and 11.11 psi. As such, the tank will be a NSPS Kb "affected facility" subject to the floating roof requirements of the rule.

- **TK-4004, TK-4005, and TK-4006** – The proposed modifications to these gasoline tanks will increase the capacity of each tank to 1,260,000 gallons. The tank will continue to store gasoline products with a vapor pressure between 0.75 to 11.11 psi. For an existing source to trigger NSPS applicability if must be "modified" or "reconstructed" as defined in NSPS Subpart A.

NSPS Subpart A defines modification as follows:

> *Modification* means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

In accordance with this definition, a modification must meet two distinct elements to trigger applicability of the rule: 1) a physical change and 2) an increase in emissions. Raising the shell height will constitute a physical change. In regard to the second criteria, the total emission from a floating roof tank is calculated based on the equation below:

Total Loss = Rim Seal Loss + Deck Fitting Loss + Deck Seam Loss + Withdrawal Loss

Withdrawal loss is proportional to tank throughput while the other three losses are not impacted by throughput. An increase in tank throughput would result in an increase in withdraw loss emissions triggering applicability of NSPS Kb.

NSPS Subpart A defines reconstruction as follows:

> *Reconstruction* means the replacement of components of an existing facility to such an extent that:
> (1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and
> (2) It is technologically and economically feasible to meet the applicable standards set forth in this part.

The cost of the proposed changes to TK-4004, TK-4005, and TK-4006 will not exceed 50% of the cost of a new storage tank. As such, the tanks will not be reconstructed under NSPS Kb.

- **TK-4072 –** The proposed new feedstock tank will be a fixed roof tank with a capacity of 1,260,000 gallons. The vapor pressure of the feedstock is less than 0.51 psi. In accordance with 40 CFR 60.110b(b), NSPS Kb will not apply to the tank.

- **TK-4050** – This tank is subject to NSPS Kb including the internal floating roof requirements of the rule. The proposed project has no impact on NSPS applicability for this tank.

- **TK-4012, TK-4013, TK-4014, TK-4015, TK-4016, TK-4052 and TK-4053** – These tanks commenced construction prior to the applicability dates for NSPS K/Ka/Kb. The proposed project does not involve a physical change or a change in the method of operation. Additionally, TK-4052 and 4053 are below the capacity threshold for Kb applicability. As such, the tanks will not be subject to NSPS as a result of the project.

NSPS Subparts GGGa - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006

The platformer unit is currently subject to NSPS GGGa. The process unit will remain subject to NSPS GGGa.

Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. All other NSPS are categorically not applicable to the storage tank project at the Newell Refinery.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The Newell Refinery is an area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type:

- 40 CFR Part 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries
- 40 CFR Part 63 Subpart UUU- National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units

The applicability of these NESHAP Subparts is discussed in the following sections.

40 CFR 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

This subpart applies to affected emission points that are located at facilities that are major sources of HAP and emit a pollutant listed in Table1 of the rule. The Newell Refinery is an area HAP source; as such this rule does not apply.

40 CFR 63 Subpart UUU- National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units

This subpart applies to affected emission points that are located at facilities that are major sources of HAP. The Newell Refinery is an area HAP source; as such this rule does not apply.

West Virginia SIP Regulations

The equipment associated with the proposed project at the Newell Refinery is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment). The following sections address just those regulations applicable to the storage tank emissions sources.

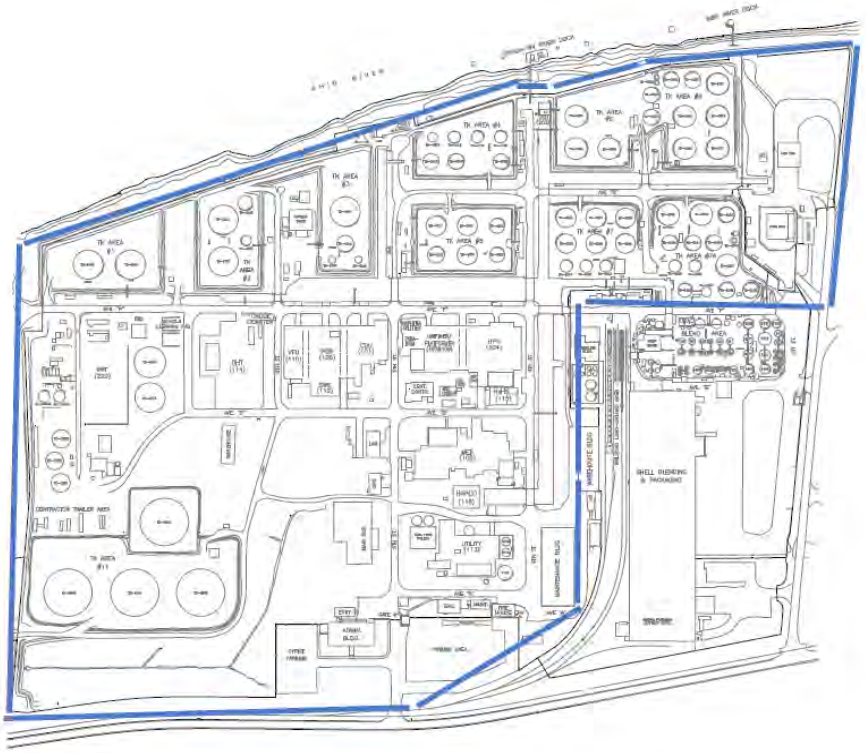
45 CSR 16: Standards of Performance for New Stationary Sources

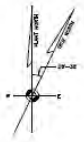
45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CPR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the Newell Refinery, EWVI will be complying with 45 CSR 16.

45 CSR 21-28: Petroleum Liquid Storage in Fixed Roof Tanks

This regulation applies to sources located in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. The Newell Refinery is located in Hancock County; as such, this state rule does not apply.

ATTACHMENT E – PLOT PLAN





SCALE : 1"=120'-0"

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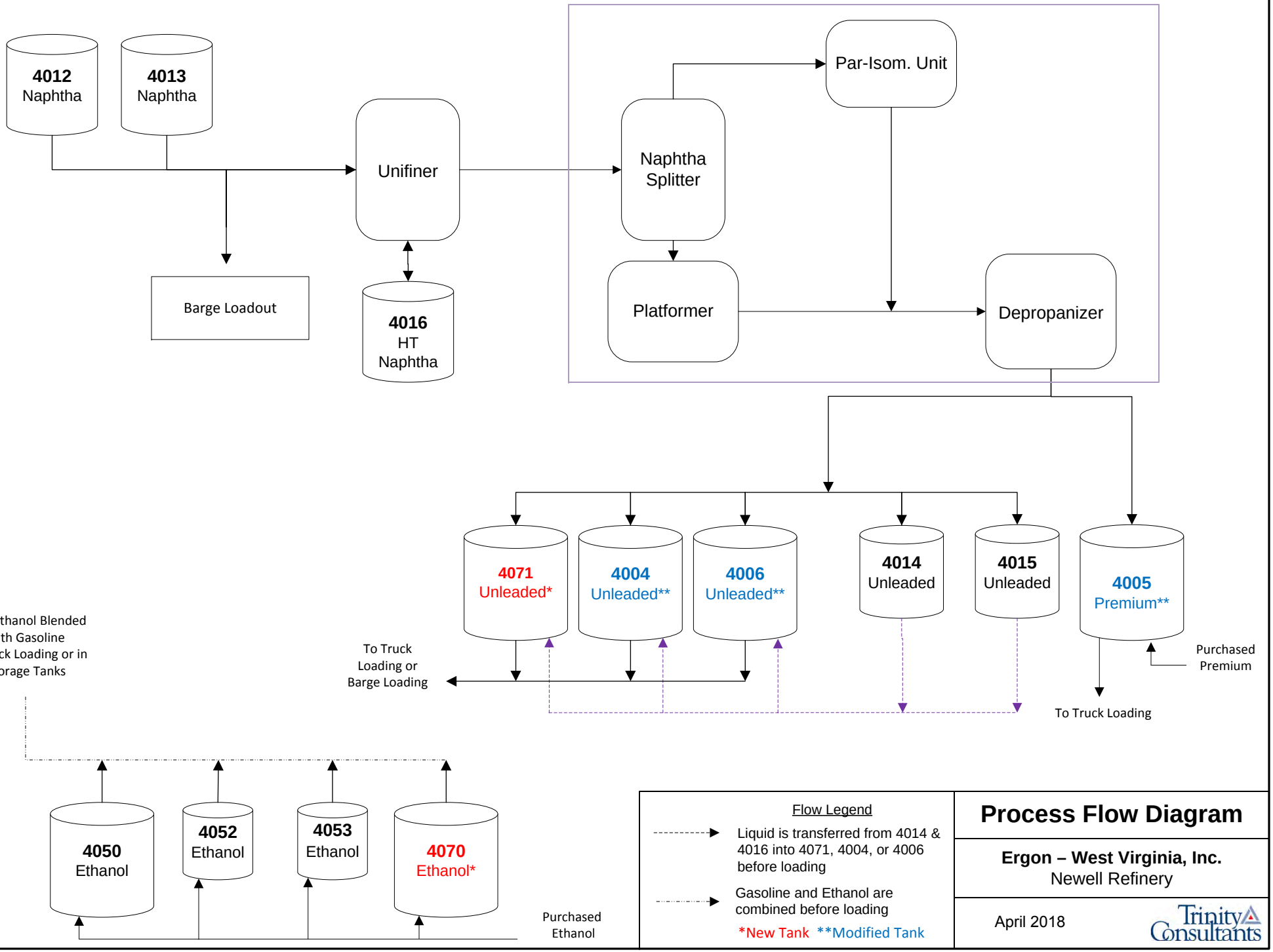
REVISIONS							
NO.	DESCRIPTION	BY	DATE	CHK	DATE	APPR.	DATE
0	ISSUED AS BUILT	JMS	11/8/07			SLJ	11/8/07
1	ADDED FACILITY UPDATES	JMS	8/15/13			SLJ	8/15/13
2	REDRAWN PER DIGITIZED PHOTO 2013	JMS	3/3/14			SLJ	3/3/14

ERGON WEST VIRGINIA, Inc.
Newell, WV

COMPANY	ERGON WEST VIRGINIA, INC.			INDEX	REFINERY	
LOCATION	NEWELL, WEST VIRGINIA			DRAWING TITLE	SITE PLOT PLAN	
DRAWN BY	DATE DRAWN	CAD FILE		DRAWING NO.		REV.
JMS	11/9/07	LAAD155		L-100A01-155		2

ATTACHMENT F – PROCESS FLOW DIAGRAM

Simplified diagram for the purposes of explaining basic facility flow and emission points. The actual design is more complex.



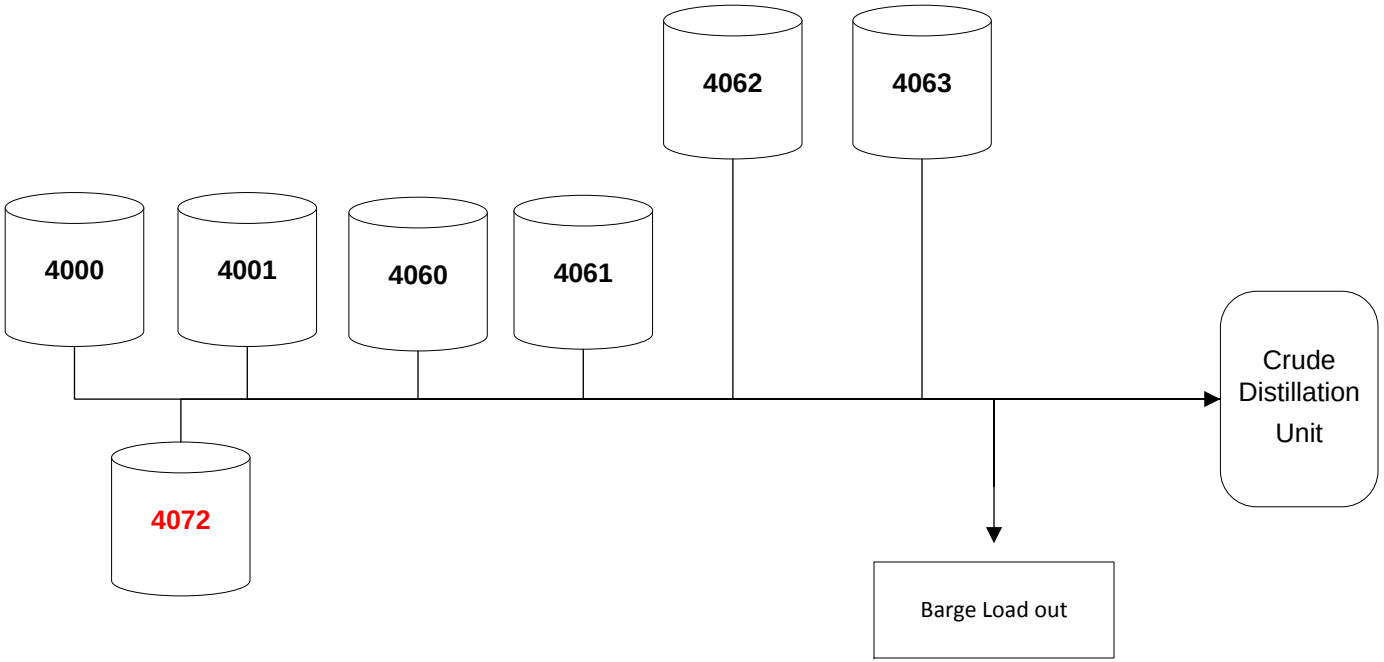
Process Flow Diagram

Ergon – West Virginia, Inc.
Newell Refinery

April 2018

Trinity Consultants

Simplified diagram for the purposes of explaining basic facility flow and emission points. The actual design is more complex.



Flow Legend

*New Tank

Process Flow Diagram

Ergon – West Virginia, Inc.
Newell Refinery

April 2018

Trinity Consultants

ATTACHMENT G – PROCESS DESCRIPTION

The Newell Refinery processes crude oil into fuels and other industrial chemical feedstocks through the use of distillation and chemical reaction processes. The platformer unit represents a stage in this process where naphtha is converted to gasoline. The storage tanks involved in the current project include gasoline, naphtha, and ethanol. Specifically, the proposed project includes the following:

- Add an additional gasoline storage tank (TK-4071);
- Add an additional ethanol storage tank (TK-4070); and
- Modify three existing gasoline tanks (TK-4004, TK-4005, and TK-4006) to increase the shell height and storage capacity of the tanks.

Additionally, the application includes a second unrelated project to install a new feedstock tank.

Gasoline Tanks

The gasoline tank project will allow EWVI to better manage inventory of gasoline products and ethanol. For example, EWVI performs routine periodic inspections of the gasoline storage tanks at the Newell Refinery. These inspections are performed for environmental, safety, and tank integrity purposes. Tank inspections cannot be done while loading in to or out of a tank and require that a tank be emptied. The new gasoline storage tank (TK-4071) will allow EWVI more flexibility for removing a tank from service for completing an inspection. Raising the tank shells for Tanks TK-4004, TK-4005, and TK-4006 will also allow for greater flexibility for removing a tank from service as well as allow for better scheduling for product shipments.

Additionally, the gasoline tank project will also allow for additional throughput from the platformer through the gasoline tanks.

Ethanol Tanks

EWVI purchases ethanol for use in blending with products manufactured at the Newell Refinery. The new ethanol tank (TK-4070) is needed to allow flexibility on delivery of barges. A typical barge load of ethanol is 10,000 to 12,000 gallons. Current ethanol storage capacity is 690,480 gallons. (630,000 for TK-4050 and 30,240 each for TK-4052 & TK-4053). Currently, EWVI must schedule barges at specific times so the tanks are low enough to receive the full barge quantity. Further, if TK-4050 is removed from service for inspection, then use of only TK-4052 and 4053 results in a high tank turnover rate and timing of barge delivery becomes critical. The additional storage tank would allow greater flexibility on the timing of receiving barges of ethanol and reduce the turnover rate for TK-4052 and TK-4053 during periods of ethanol tank inspections.

Feedstock Tank

The crude tank project is proposed to allow for blending of a new feedstock into the crude distillation unit. The new feed is a heavier crude material that is currently used at the facility. Ergon is not increasing the feed rate to the process but rather, offsetting the decline in current crude stock. No physical changes to the refinery processes are needed as a result of the new feed as the refinery is capable of accommodating the feed type as currently operated. The project may marginally skew refinery yield to more heavy products than lighter products when the new crude is charged, but should not otherwise impact other product or unit feed rates.

Permit Changes Requested
Ergon is requesting the gasoline/ethanol tank group throughput limit and plant-wide tank emissions limits be increased as follows:

Category	Current R13AA Limit	Proposed Limit
Gasoline and ethanol tank throughput	282,320,300 gallons per year	318,034,443 gallons per year
Crude oil tank throughput	802,264,890 gallons per year	No change requested
Light crude oil w/vapor pressure up to 11.0 psia tank throughput	306,600,000 gallons per year	No change requested
Heavy products or kerosene tank throughput	406,459,760 gallons per year	No change requested
Heavy products tank throughput	550,817,989 gallons per year	No change requested
Combined emissions from the EWVI storage tanks	5.39 tons per month (tpm) VOC 53.87 tons per year (tpy) VOC	5.79 tons per month (tpm) VOC 57.85 tons per year (tpy) VOC
	0.08 tpm Benzene 0.81 tpy Benzene	0.08 tpm Benzene 0.81 tpy Benzene
	0.65 tpm Total HAP 6.54 tpy Total HAP	0.65 tpm Total HAP 6.54 tpy Total HAP

ATTACHMENT H – SAFETY DATA SHEETS (SDS)

Ergon - West Virginia, Inc.
a company that works™

Material Safety Data Sheet

UNL Premium 93

Date of Preparation: October 1, 2009

Section 1 - Chemical Product and Company Identification

Product Name: UNL Premium 93
Chemical Name: Unleaded Gasoline
Chemical Family: Petroleum Hydrocarbon
Chemical Formula: Mixture
CAS Number: 8006-61-9
Other Designations: Petrol, Unleaded Premium Gasoline
Manufacturer: Ergon -- West Virginia, Inc., P.O. Box 356, Newell, WV 26050
Company Contact: Will Poe, Phone (601) 630-8319 (Vicksburg, MS)

EMERGENCY TELEPHONE NUMBERS:
Ergon -- West Virginia, Inc. (601) 630-8319 (Vicksburg, MS) Normal Business Hours
Chemtrec (800) 424-9300 After Business Hours

Section 2 - Composition / Information on Ingredients

This product may be regulated, have exposure limits or other information identified as the following: Unleaded Gasoline (wholly vaporized). This product is considered a hazardous product under 29 CFR 1910.1200 (Hazard Communication).

Ingredient Name	CAS Number	% vol
Gasoline	8006-61-9	95-100
Benzene	71-43-2	1-5

	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
Ingredient	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Gasoline	300 ppm; 900 mg/ m^3	500 ppm; 1500 mg/ m^3	300 ppm; 890 mg/ m^3	500 ppm; 1480 mg/ m^3			
Benzene	10 ppm	50 ppm	10 ppm; 32 mg/ m^3		None establ.	1 ppm	

Section 3 - Hazards Identification

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

DANGER! EXTREMELY FLAMMABLE. ASPIRATION (INADVERTENT SUCTION) INTO LUNGS CAN PRODUCE CHEMICAL PNEUMONIA OR EVEN DEATH. CONTAINS BENZENE WHICH MAY CAUSE CANCER OR BE TOXIC TO BLOOD-FORMING ORGANS.

HMIS	
H	1
F	3
R	0
PPE†	

†Sec. 8

Material will readily ignite at normal temperatures. Flammable liquid - may release vapors that form flammable mixtures at or above the flash point. Excessive inhalation of this material may cause headache, dizziness and incoordination. Water may be an ineffective extinquishing medium. Foam (preferred), dry chemical, water. Wear full set of protective equipment including chemical goggles and gloves.

Gasoline is either a clear or colored liquid with a strong hydrocarbon odor. Gasoline is a volatile and extremely flammable liquid and may cause flash fires. Keep away from heat, sparks or flame. Gasoline can also contain significant concentrations of benzene, which has been shown to cause cancer or be toxic to blood-forming organs. Never siphon this product by mouth. If swallowed, gasoline may get sucked into the lungs (aspirated) and cause lung damage or even death.

CONSUMER WARNING LABEL:

GASOLINE HEALTH & SAFETY WARNING

- EXTREMELY FLAMMABLE, VAPORS MAY EXPLODE
- HARMFUL OR FATAL IF SWALLOWED
- LONG TERM EXPOSURE TO VAPORS HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP FACE AWAY FROM NOZZLE WHILE FILLING
- KEEP NOZZLE AWAY FROM EYES AND SKIN
- NEVER SIPHON BY MOUTH
- DON'T OVERFILL TANK

FOR USE AS A MOTOR FUEL ONLY

****

Potential Health Effects/Primary Entry Routes

Inhalation: Exposure to vapor concentrations exceeding 1,000 ppm can cause respiratory irritation, headache, dizziness, nausea and loss of coordination. Higher concentrations may cause loss of consciousness, cardiac sensitization, coma and death resulting from respiratory failure. Intentional overexposure to high concentrations of gasoline vapors (such as gasoline sniffing) can cause nervous system and brain damage, convulsions and sudden death from cardiac arrest.

Eye: Eye irritation may result from contact with the liquid or exposure to vapor concentrations above the TLV.

Skin: Prolonged or repeated liquid contact can defeat the skin and lead to irritation and/or dermatitis.

Ingestion: Ingestion may result in nausea, vomiting, diarrhea and restlessness. Aspiration (inadvertent suction) of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis, pulmonary edema/hemorrhage and even death.

Carcinogenicity: The International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence for the carcinogenicity of gasoline in humans. IARC determined that limited evidence of carcinogenicity in animals exists. IARCIS overall evaluation of gasoline, in spite of limited carcinogenicity evidence, has resulted in the IARC designation of gasoline as possibly carcinogenic to humans (Group 2B) because gasoline contains benzene. The National Toxicology Program (NTP), OSHA and IARC have determined that there is sufficient evidence for the carcinogenicity of benzene in humans (Group 1A). IARC has determined that there is inadequate evidence for the carcinogenicity of gasoline engine exhaust in humans or animals. However, IARCIS overall evaluation on gasoline engine exhaust, in spite of the absence of carcinogenicity data, has resulted in the IARC designation of gasoline engine exhaust as possibly carcinogenic to humans (Group 2B) because of the presence of certain engine exhaust components.

Medical Conditions Aggravated by Long-term Exposure (**Chronic Effects) :** Pre-existing eye, skin, respiratory, liver and/or kidney disorders may be aggravated by exposure to gasoline.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. Call a physician.

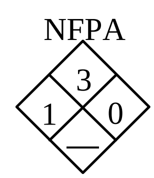
Eye Contact: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Skin Contact: Remove contaminated clothing. Wash affected area with mild soap and water. Launder contaminated clothing before reuse. Get medical attention if skin disorder develops.

Ingestion: If the material is swallowed, get immediate medical attention or advice. Do not induce vomiting.

Notes to Physician: Pulmonary aspiration hazard if swallowed; treat symptomatically.

Section 5 - Fire-Fighting Measures



Flash Point: - 45 °F

Flash Point Method: not available

Burning Rate: not available

Autoignition Temperature: > 500 °F

Lower Flammable Limit (LFL): 1.4

Upper Flammable Limit (UFL): 7.6

Flammability Classification: not available

Extinguishing Media: Foam (preferred), dry chemical, water. Water may be an ineffective extinguishing medium. Use water to cool fire-exposed containers and to protect personnel.

General Fire Hazards: Extremely flammable liquid; material can ignite readily at normal temperatures. Vapors may form flammable mixtures. Empty containers may retain product residue including flammable or explosive vapors. Do not cut, drill, grind, or weld near full, partially full, or empty product containers. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Static charge may accumulate and spark or ignite. Toxic fumes, gases or vapors may evolve on burning.

Hazardous Combustion Products: carbon monoxide and carbon dioxide.

Fire-Fighting Equipment/Instructions: Wear full set of protective equipment including chemical goggles and gloves. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Section 6 - Accidental Release Measures

Containment Procedures: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Clean-Up Procedures: Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using pumps. Wear appropriate protective equipment and clothing during clean-up. Thoroughly wash the area after a spill or leak clean-up. Do not allow the spilled product to enter public drainage system or open water courses.

Evacuation Procedures: Evacuate the area promptly. Keep upwind of the spilled material and isolate exposure.

Special Instructions: Remove soiled clothing and launder before reuse. Avoid skin contact and inhalation of vapors during disposal of spills.

Section 7 - Handling and Storage

Procedures for Handling: Do not breathe gas/fumes/vapor/spray. Use this product with adequate ventilation. Do not get his material in your eyes, on your skin, or on your clothing. Keep this product from heat, sparks, or open flame. Wash thoroughly after handling. Do not reuse the empty container. Wash thoroughly after handling. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or promptly disposed of.

Recommended Storage Methods: Keep the container tightly closed and in a cool, well-ventilated place. Do not store this material in open or unlabeled containers. Eliminate all sources of ignition. Store away from strong oxidizers. This material can accumulate static charge which may cause spark and become an ignition source.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines:

A. General Product Information - Follow the recommended exposure limits.

B. Component Exposure Limits

Gasoline (CAS # 8006-61-9)

ACGIH: TLV: 300 ppm; 890 mg/m3; STEL: 500 ppm; 1480 mg/m3

OSHA: PEL: 300 ppm; 900 mg/m3; STEL: 500 ppm; 1500 mg/m3

Benzene (CAS # 71-43-2)

ACGIH: TLV: 10 ppm; 32 mg/m3; STEL: 500 ppm; 1480 mg/m3

OSHA: PEL: 10 ppm (unless specified in 1910.1028)

STEL: 50 ppm (10 min) (unless specified in 1910.1028)

Ceiling: 25 ppm (unless specified in 1910.1028)

NIOSH: STEL: 1 ppm

Engineering Controls: Use local exhaust ventilation. Explosion-proof exhaust devices are required.

Eye / Face Protection: Wear safety glasses; chemical goggles (if splashing is possible).

Skin Protection: Use impervious gloves for prolonged contact. The use of neoprene gloves is recommended.

Respiratory Protection: For high concentration of vapors or mists use NIOSH/MSHA approved vapor/mist cartridge respirator.

General: Use good industrial hygiene practices.

Section 9 - Physical and Chemical Properties

Physical State: Orange Liquid
Appearance: Clear or colorless
Odor: Petroleum
Odor Threshold: not available
Vapor Pressure: 360-700 mm Hg
Vapor Density (Air=1): 3 - 4
Specific Gravity (H_2O=1): <0.8

Water Solubility: insoluble
Boiling Point: IBP=85°F, EP=435°F
Melting Point: not available
% Volatile: 100
Evaporation Rate: <1 (butyl acetate = 1)
pH: not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable
Hazardous Polymerization: Hazard polymerization will not occur.
Chemical Incompatibilities: This product may react with strong oxidizing agents.
Conditions to Avoid (Stability): Avoid excessive heat and all sources of ignition.
Hazardous Decomposition Products: Smoke, carbon dioxide and carbon monoxide.

Section 11- Toxicological Information

Acute Toxicity / Target Organ Information:

A. General Product / Component Information

Benzene can cause blood and blood-producing system disorders. Aspiration of material into the lungs can cause bronchopneumonia or pulmonary edema. Product can affect the central nervous system, kidney, liver and blood-forming system.

B. Component LD50 / LC50

Benzene (CAS # 71-43-2)

Inhalation, rat: LC50 = 10,000 ppm 7 hr oral, rat: LD50 = 3306 mg/kg

Skin, mouse: LD50 = 48 mg/kg

Epidemiology: Studies have shown that prolonged exposure to the benzene component can cause leukemia and other serious blood disorders and complications to the blood-producing system.

Carcinogenicity:

A. General Product / Component Information - IARC has found gasoline to be a possible human carcinogen.

B. Component Carcinogenicity Listings

Gasoline (CAS # 8006-61-9)

OSHA: Possible Select Carcinogen

IARC: Group 2B - Possibly carcinogenic to humans.

Benzene (CAS # 71-43-2)

ACGIH: (A2) - suspected human carcinogen

OSHA: Select Carcinogen

NIOSH: Y

NTP: Known Carcinogen

IARC: Group 1 - Carcinogenic to humans.

Teratogenicity / Reproductive Effects: Animal studies have shown that repeated exposure to benzene can damage the embryo or fetus.

Neurotoxicity: Excessive exposure can cause dizziness and central nervous system depression.

Mutagenicity: No data available on this product as a whole.

Other Information: No information available.

Section 12 - Ecological Information

Ecotoxicity: No information is available on ecotoxicity of this product. Keep product out of sewers and waterways.
Environmental Fate: No information is available.

Section 13 - Disposal Considerations

U.S. EPA Waste Number & Descriptions:

A. General Product Information - User must test waste using methods described in 40 CFR 261 to determine if it meets applicable definitions of hazardous wastes. As shipped, this product is considered a D001 ignitable waste.

B. Component Waste Numbers - Benzene (CAS # 71-43-2) is listed as a U019 (Ignitable waste, Toxic waste) and D018 hazardous waste.

Disposal Instructions:

Do not allow this material to drain into sewers / water supplies. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulation.

Section 14 - Transport Information

Proper Shipping Name: Gasoline
Hazard Class: 3.1
DOT ID No.: UN1203
Packing Group: II
DOT Shipping Label: Flammable Liquid

Additional Shipping Information:
Packaging containing more than 10 pounds of benzene must be designated "RQ" in the proper shipping name.
International Transportation Regulations:
No additional information.

Section 15 - Regulatory Information

U.S. Federal Regulatory Information:

A. General Product Information - All components of this product are listed on the U.S. EPA TSCA Inventory.

B. Component Information - This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):
Benzene (CAS # 71-43-2, 1 - 5%)
SARA 313: form R reporting required for 0.1% de minimus concentration
CERCLA: final RQ = 10 pounds (4.54 kg)

State Regulations:

A. General Product Information - Unleaded gasoline requires labeling under California Proposition 65.

B. Component Information - The following components appear on one or more of the following state hazardous substance lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Gasoline	8006-61-9	Y	Y	Y	Y	Y	N
Benzene	71-43-2	Y	Y	Y	Y	Y	Y

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

Other Regulations:

A. General Product Information - All known (non-proprietary) components of this product are listed on the EINECS inventory of existing chemicals.

B. Component Information

CANADA

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Componen t	CAS #	%	Minimum Concentration
Gasoline	8006-61-9	95 - 100	1% item 793 (802)
Benzene	71-43-2	1 - 5	0.1% item 153 (277)

Section 16 - Other Information

Key / Legend

N = no; Y = yes; ppm - parts per million; mg/m3 = milligrams per cubic meter of air; ACGIH = American Conference of Governmental Industrial Hygienists; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NIOSH = National Institute of Occupational Safety and Health; NTP = National Toxicology Program; IARC = International Agency for Research on Cancer.

Prepared By: Will Poe **Phone:** (601) 630-8319

Supersedes MSDS Dated:	June 1, 2007	Changed date
	June 1, 2005	Changed date
	December 16, 2003	Changed date
	January 1, 2001	Changed date
	July 19, 1997	Changed date and added more hazards.

Ergon - West Virginia, Inc.
a company that works™

Material Safety Data Sheet

UNL Regular Date of Preparation: October 1, 2009

Section 1 - Chemical Product and Company Identification

Product Name: UNL Regular
Chemical Name: Natural Gasoline
Chemical Family: Petroleum hydrocarbons
Chemical Formula: Mixture
Other Designations: Unleaded Regular Gasoline, Natural Gasoline
CAS Number: 8006-61-9
Manufacturer: Ergon -- West Virginia, Inc., P.O. Box 356, Newell, WV 26050
Company Contact: Will Poe, Phone (601) 630-8319 (Vicksburg, MS)

EMERGENCY TELEPHONE NUMBERS:
Ergon -- West Virginia, Inc. (601) 630-8319 (Vicksburg, MS) Normal Business Hours
Chemtrec (800) 424-9300 After Business Hours

Section 2 - Composition / Information on Ingredients

This product may be regulated, have exposure limits or other information identified as the following: Unleaded Gasoline (wholly vaporized). This product is considered a hazardous product under 29 CFR 1910.1200 (Hazard Communication).

Ingredient Name	CAS Number	% vol
Gasoline	8006-61-9	95-100
Benzene	71-43-2	1-5

	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
Ingredient	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Gasoline	300 ppm; 900 mg/ m^3	500 ppm; 1500 mg/ m^3	300 ppm; 890 mg/ m^3	500 ppm; 1480 mg/ m^3			
Benzene	10 ppm	50 ppm	10 ppm; 32 mg/ m^3			1 ppm	

Section 3 - Hazards Identification

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

DANGER! EXTREMELY FLAMMABLE. ASPIRATION (INADVERTENT SUCTION) INTO LUNGS CAN PRODUCE CHEMICAL PNEUMONIA OR EVEN DEATH. CONTAINS BENZENE WHICH MAY CAUSE CANCER OR BE TOXIC TO BLOOD-FORMING ORGANS.

HMIS	
H	1
F	3
R	0
PPE†	
†Sec. 8	

Material will readily ignite at normal temperatures. Flammable liquid - may release vapors that form flammable mixtures at or above the flash point. Excessive inhalation of this material may cause headache, dizziness and incoordination. Water may be an ineffective extinquishing medium. Foam (preferred), dry chemical, water. Wear full set of protective equipment including chemical goggles and gloves.

Gasoline is either a clear or colored liquid with a strong hydrocarbon odor. Gasoline is a volatile and extremely flammable liquid and may cause flash fires. Keep away from heat, sparks or flame. Gasoline can also contain significant concentrations of benzene, which has been shown to cause cancer or be toxic to blood-forming organs. Never siphon this product by mouth. If swallowed, gasoline may get sucked into the lungs (aspirated) and cause lung damage or even death.

CONSUMER WARNING LABEL:

GASOLINE HEALTH & SAFETY WARNING

- EXTREMELY FLAMMABLE, VAPORS MAY EXPLODE
- HARMFUL OR FATAL IF SWALLOWED
- LONG TERM EXPOSURE TO VAPORS HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP FACE AWAY FROM NOZZLE WHILE FILLING
- KEEP NOZZLE AWAY FROM EYES AND SKIN
- NEVER SIPHON BY MOUTH
- DON'T OVERFILL TANK

FOR USE AS A MOTOR FUEL ONLY

****

Potential Health Effects/Primary Entry Routes

Inhalation: Exposure to vapor concentrations exceeding 1,000 ppm can cause respiratory irritation, headache, dizziness, nausea and loss of coordination. Higher concentrations may cause loss of consciousness, cardiac sensitization, coma and death resulting from respiratory failure. Intentional overexposure to high concentrations of gasoline vapors (such as gasoline sniffing) can cause nervous system and brain damage, convulsions and sudden death from cardiac arrest.

Eye: Eye irritation may result from contact with the liquid or exposure to vapor concentrations above the TLV.

Skin: Prolonged or repeated liquid contact can defeat the skin and lead to irritation and/or dermatitis.

Ingestion: Ingestion may result in nausea, vomiting, diarrhea and restlessness. Aspiration (inadvertent suction) of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis, pulmonary edema/hemorrhage and even death.

Carcinogenicity: The International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence for the carcinogenicity of gasoline in humans. IARC determined that limited evidence of carcinogenicity in animals exists. IARCIS overall evaluation of gasoline, in spite of limited carcinogenicity evidence, has resulted in the IARC designation of gasoline as possibly carcinogenic to humans (Group 2B) because gasoline contains benzene. The National Toxicology Program (NTP), OSHA and IARC have determined that there is sufficient evidence for the carcinogenicity of benzene in humans (Group 1A). IARC has determined that there is inadequate evidence for the carcinogenicity of gasoline engine exhaust in humans or animals. However, IARCIS overall evaluation on gasoline engine exhaust, in spite of the absence of carcinogenicity data, has resulted in the IARC designation of gasoline engine exhaust as possibly carcinogenic to humans (Group 2B) because of the presence of certain engine exhaust components.

Medical Conditions Aggravated by Long-term Exposure (Chronic Effects) : Pre-existing eye, skin, respiratory, liver and/or kidney disorders may be aggravated by exposure to gasoline.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. Call a physician.

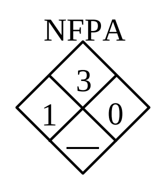
Eye Contact: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Skin Contact: Remove contaminated clothing. Wash affected area with mild soap and water. Launder contaminated clothing before reuse. Get medical attention if skin disorder develops.

Ingestion: If the material is swallowed, get immediate medical attention or advice. Do not induce vomiting.

Notes to Physician: Pulmonary aspiration hazard if swallowed; treat symptomatically.

Section 5 - Fire-Fighting Measures



Flash Point: - 45 °F
Flash Point Method: not available
Burning Rate: not available
Autoignition Temperature: > 500 °F
Lower Flammable Limit (LFL): 1.4
Upper Flammable Limit (UFL): 7.6
Flammability Classification: not available
Extinguishing Media: Foam (preferred), dry chemical, water. Water may be an ineffective extinguishing medium. Use water to cool fire-exposed containers and to protect personnel.

General Fire Hazards: Extremely flammable liquid; material can ignite readily at normal temperatures. Vapors may form flammable mixtures. Empty containers may retain product residue including flammable or explosive vapors. Do not cut, drill, grind, or weld near full, partially full, or empty product containers. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Static charge may accumulate and spark or ignite. Toxic fumes, gases or vapors may evolve on burning.

Hazardous Combustion Products: carbon monoxide and carbon dioxide.

Fire-Fighting Equipment/Instructions: Wear full set of protective equipment including chemical goggles and gloves. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Section 6 - Accidental Release Measures

Containment Procedures: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Clean-Up Procedures: Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using pumps. Wear appropriate protective equipment and clothing during clean-up. Thoroughly wash the area after a spill or leak clean-up. Do not allow the spilled product to enter public drainage system or open water courses.

Evacuation Procedures: Evacuate the area promptly. Keep upwind of the spilled material and isolate exposure.

Special Instructions: Remove soiled clothing and launder before reuse. Avoid skin contact and inhalation of vapors during disposal of spills.

Section 7 - Handling and Storage

Procedures for Handling: Do not breathe gas/fumes/vapor/spray. Use this product with adequate ventilation. Do not get his material in your eyes, on your skin, or on your clothing. Keep this product from heat, sparks, or open flame. Wash thoroughly after handling. Do not reuse the empty container. Wash thoroughly after handling. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or promptly disposed of.

Recommended Storage Methods: Keep the container tightly closed and in a cool, well-ventilated place. Do not store this material in open or unlabeled containers. Eliminate all sources of ignition. Store away from strong oxidizers. This material can accumulate static charge which may cause spark and become an ignition source.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines:

A. General Product Information - Follow the recommended exposure limits.

B. Component Exposure Limits

Gasoline (CAS # 8006-61-9)

ACGIH: TLV: 300 ppm; 890 mg/m3; STEL: 500 ppm; 1480 mg/m3

OSHA: PEL: 300 ppm; 900 mg/m3; STEL: 500 ppm; 1500 mg/m3

Benzene (CAS # 71-43-2)

ACGIH: TLV: 10 ppm; 32 mg/m3; STEL: 500 ppm; 1480 mg/m3

OSHA: PEL: 10 ppm (unless specified in 1910.1028)

STEL: 50 ppm (10 min) (unless specified in 1910.1028)

Ceiling: 25 ppm (unless specified in 1910.1028)

NIOSH: STEL: 1 ppm

Engineering Controls: Use local exhaust ventilation. Explosion-proof exhaust devices are required.

Eye / Face Protection: Wear safety glasses; chemical goggles (if splashing is possible).

Skin Protection: Use impervious gloves for prolonged contact. The use of neoprene gloves is recommended.

Respiratory Protection: For high concentration of vapors or mists use NIOSH/MSHA approved vapor/mist cartridge respirator.

General: Use good industrial hygiene practices.

Section 9 - Physical and Chemical Properties

Physical State: Amber
Appearance: Liquid
Odor: Petroleum
Odor Threshold: not available
Vapor Pressure: 300-400 mm Hg
Vapor Density (Air=1): 3 - 4
Specific Gravity (H_2O=1): 0.74

Water Solubility: insoluble
Boiling Point: IBP=140°F, EP=440°F
Melting Point: not available
% Volatile: 100
Evaporation Rate: <1 (butyl acetate = 1)
pH: not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable
Hazardous Polymerization: Hazard polymerization will not occur.
Chemical Incompatibilities: This product may react with strong oxidizing agents.
Conditions to Avoid (Stability): Avoid excessive heat and all sources of ignition.
Hazardous Decomposition Products: Smoke, carbon dioxide and carbon monoxide.

Section 11- Toxicological Information

Acute Toxicity / Target Organ Information:

A. General Product / Component Information

Benzene can cause blood and blood-producing system disorders. Aspiration of material into the lungs can cause bronchopneumonia or pulmonary edema. Product can affect the central nervous system, kidney, liver and blood-forming system.

B. Component LD50 / LC50

Benzene (CAS # 71-43-2)

Inhalation, rat: LC50 = 10,000 ppm 7 hr oral, rat: LD50 = 3306 mg/kg

Skin, mouse: LD50 = 48 mg/kg

Epidemiology: Studies have shown that prolonged exposure to the benzene component can cause leukemia and other serious blood disorders and complications to the blood-producing system.

Carcinogenicity:

A. General Product / Component Information - IARC has found gasoline to be a possible human carcinogen.

B. Component Carcinogenicity Listings

Gasoline (CAS # 8006-61-9)

OSHA: Possible Select Carcinogen

IARC: Group 2B - Possibly carcinogenic to humans.

Benzene (CAS # 71-43-2)

ACGIH: (A2) - suspected human carcinogen

OSHA: Select Carcinogen

NIOSH: Y

NTP: Known Carcinogen

IARC: Group 1 - Carcinogenic to humans.

Teratogenicity / Reproductive Effects: Animal studies have shown that repeated exposure to benzene can damage the embryo or fetus.

Neurotoxicity: Excessive exposure can cause dizziness and central nervous system depression.

Mutagenicity: No data available on this product as a whole.

Other Information: No information available.

Section 12 - Ecological Information

Ecotoxicity: No information is available on ecotoxicity of this product. Keep product out of sewers and waterways.
Environmental Fate: No information is available.

Section 13 - Disposal Considerations

U.S. EPA Waste Number & Descriptions:

A. General Product Information - User must test waste using methods described in 40 CFR 261 to determine if it meets applicable definitions of hazardous wastes. As shipped, this product is considered a D001 ignitable waste.

B. Component Waste Numbers - Benzene (CAS # 71-43-2) is listed as a U019 (Ignitable waste, Toxic waste) and D018 hazardous waste.

Disposal Instructions:

Do not allow this material to drain into sewers / water supplies. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulation.

Section 14 - Transport Information

Proper Shipping Name: Gasoline
Hazard Class: 3.1
DOT ID No.: UN1203
Packing Group: II
DOT Shipping Label: Flammable Liquid

Additional Shipping Information:
Packaging containing more than 10 pounds of benzene must be designated "RQ" in the proper shipping name.

International Transportation Regulations:
No additional information.

Section 15 - Regulatory Information

U.S. Federal Regulatory Information:

A. General Product Information - All components of this product are listed on the U.S. EPA TSCA Inventory.

B. Component Information - This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):
Benzene (CAS # 71-43-2, 1 - 5%)
SARA 313: form R reporting required for 0.1% de minimus concentration
CERCLA: final RQ = 10 pounds (4.54 kg)

State Regulations:

A. General Product Information - Unleaded gasoline requires labeling under California Proposition 65.

B. Component Information - The following components appear on one or more of the following state hazardous substance lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Gasoline	8006-61-9	Y	Y	Y	Y	Y	N
Benzene	71-43-2	Y	Y	Y	Y	Y	Y

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

Other Regulations:

A. General Product Information - All known (non-proprietary) components of this product are listed on the EINECS inventory of existing chemicals.

B. Component Information

CANADA

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	%	Minimum Concentration
Gasoline	8006-61-9	95 - 100	1% item 793 (802)
Benzene	71-43-2	1 - 5	0.1% item 153 (277)

Section 16 - Other Information

Key / Legend
N = no; Y = yes; ppm - parts per million; mg/m3 = milligrams per cubic meter of air; ACGIH = American Conference of Governmental Industrial Hygienists; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NIOSH = National Institute of Occupational Safety and Health; NTP = National Toxicology Program; IARC = International Agency for Research on Cancer.

Prepared By: Will Poe **Phone:** (601) 630-8319

Supersedes MSDS Dated:	June 1, 2007	Changed date
	June 1, 2005	Changed date
	December 26, 2003	Changed date
	January 1, 2001	Changed date
	July 19, 1997	Changed date, contact, and added additional hazards.

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**Denatured Fuel Ethanol**
Version #	04
Issue date	08-December-2010
Revision date	12-August-2014
Supersedes date	12-August-2014
CAS #	Mixture
Synonym(s)	Ethanol * Ethyl alcohol
Manufacturer/Supplier	Cargill, Incorporated Minneapolis, MN 55440 US
General Information:	1-800-370-7386
Emergency	24 Hour Emergency: 1-800-424-9300

2. Hazards Identification

Physical state	Liquid.
Appearance	Colorless liquid.
Emergency overview	WARNING! Flammable liquid and vapor. Causes severe eye irritation. Causes skin irritation. Mist or vapor irritating to eyes and respiratory tract. High vapor concentrations may cause central nervous system effects.
OSHA regulatory status	This product is hazardous according to OSHA 29 CFR 1910.1200.
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Eye contact. Skin contact.
Eyes	Causes severe eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort.
Skin	Causes skin irritation. Exposure may cause redness, itching and inflammation.
Inhalation	Inhalation of vapors or mists of the product may be irritating to the respiratory system. Symptoms may include coughing, difficulty breathing and shortness of breath. Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of coordination.
Ingestion	Ingestion may cause irritation and malaise.
Target organs	Eyes. Skin. Kidneys. Respiratory system. Central nervous system.
Chronic effects	Ethanol may cause reproductive effects. Possible cancer hazard - may cause cancer based on animal data. Repeated or prolonged exposure to the substance can produce target organ damage.
Potential environmental effects	Not expected to be harmful to aquatic organisms.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Ethanol	64-17-5	95.24 - 98.04
Natural gasoline	8006-61-9	1.96 - 4.76

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

First aid procedures

Eye contact Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention. In case of irritation from airborne exposure, move to fresh air. Get medical attention if symptoms persist.

Skin contact	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Inhalation	If symptomatic, move to fresh air. Get medical attention if symptoms persist.
Ingestion	Seek medical advice.

5. Fire Fighting Measures

Flammable properties	Flammable liquid and vapor. Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. The fire could easily be spread by the use of water in an area where the water could not be contained.
Extinguishing media	
Suitable extinguishing media	Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Fire fighting equipment/instructions	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Specific methods	Use water spray to cool unopened containers. Use water with caution: Material will float and may ignite on the surface of water. Prevent build-up of vapors or gasses to explosive concentrations.
Hazardous combustion products	Carbon oxides.

6. Accidental Release Measures

Personal precautions	Wear appropriate personal protective equipment (See Section 8).
Methods for cleaning up	Eliminate all ignition sources. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Large Spills: Use water spray to disperse vapors and dilute spill to a nonflammable mixture. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.

7. Handling and Storage

Handling	Avoid breathing high vapor concentrations. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.
Storage	Keep away from heat, spark, open flames and other sources of ignition. Store in tightly closed original container in a well-ventilated place. Non-corrosive in the presence of glass. Corrosive to zinc-galvanized metals. Mildly corrosive to aluminum metal in continual contact, but is suitable for intermittent contact such as transport equipment. Store away from incompatible materials (See Section 10).

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Ethanol (CAS 64-17-5)	STEL	1000 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Ethanol (CAS 64-17-5)	PEL	1900 mg/m3 1000 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Ethanol (CAS 64-17-5)	TWA	1880 mg/m3 1000 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Ethanol (CAS 64-17-5)	STEL	1000 ppm

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
Ethanol (CAS 64-17-5)	STEL	1000 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Ethanol (CAS 64-17-5)	STEL	1000 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Ethanol (CAS 64-17-5)	TWA	1880 mg/m3 1000 ppm
Natural gasoline (CAS 8006-61-9)	STEL	1480 mg/m3 500 ppm
	TWA	890 mg/m3 300 ppm

Mexico. Occupational Exposure Limit Values

Components	Type	Value
Ethanol (CAS 64-17-5)	TWA	1900 mg/m3 1000 ppm

Biological limit values No biological exposure limits noted for the ingredient(s).

Engineering controls Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye / face protection Wear safety glasses with side shields (or goggles). Wear a full-face respirator, if needed.

Skin protection Wear chemical-resistant gloves, footwear and protective clothing appropriate for risk of exposure. Contact glove manufacturer for specific information.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister.

Hand protection Wear protective gloves.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance Colorless liquid.

Physical state Liquid.

Form Liquid.

Color Colorless.

Odor Mild characteristic odor.

Odor threshold Not available.

pH 6.5 - 9

Vapor pressure 3.99 (Natural gasoline denaturant)

Vapor density 1.6

Boiling point 165 - 175.01 °F (73.89 - 79.45 °C)

Melting point/Freezing point -173 °F (-113.89 °C)

Solubility (water) Complete.

Specific gravity 0.789

Flash point 50.0 - 55.0 °F (10.0 - 12.8 °C)

Flammability limits in air, upper, % by volume	19 %
Flammability limits in air, lower, % by volume	3.3 %
Auto-ignition temperature	> 689 °F (> 365 °C)
Evaporation rate	3.2 (Butyl acetate = 1)
Viscosity	1.074 x 10-3 Pa-S (25°C)
Percent volatile	100 %
Partition coefficient (n-octanol/water)	-0.28 (Log Kow)

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions. Non-corrosive in the presence of glass. Corrosive to zinc-galvanized metals. Mildly corrosive to aluminum metal in continual contact, but is suitable for intermittent contact such as transport equipment.
Conditions to avoid	Heat, sparks, flames, elevated temperatures.
Incompatible materials	Oxidizing materials, nitrates, acids, peroxides, potassium dioxide, bromine hexafluoride, acetyl bromide and sodium metal
Hazardous decomposition products	No hazardous decomposition products are known.
Possibility of hazardous reactions	Due to vigorous reaction, ethanol should not be mixed with incompatible materials. Hazardous polymerization does not occur.

11. Toxicological Information

Sensitization	No sensitizing effects known.
Acute effects	May be fatal if inhaled.
Chronic effects	Repeated exposure of laboratory animals to high concentrations of gasoline vapors has cause kidney and liver damage. It has also caused cancer in rats and mice.
Carcinogenicity	Contains material which may cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Natural gasoline (CAS 8006-61-9)	2B Possibly carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive effects	Ethanol has demonstrated human effects of reproductive toxicity.

12. Ecological Information

Ecotoxicity	Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the environment.
Environmental effects	Not available.
Aquatic toxicity	Not available.
Persistence and degradability	No data available.
Bioaccumulation / accumulation	No data available.

Bioaccumulative potential

Octanol/water partition coefficient log Kow

Denatured Fuel Ethanol (CAS Mixture)	-0.284, (Log Kow)

Mobility in environmental media	No data available.

13. Disposal Considerations

Waste codes	D001: Waste Flammable material with a flash point <140 °F
Disposal instructions	Dispose in accordance with applicable federal, state, and local regulations. If discarded, this product is considered a RCRA ignitable waste, D001.
Waste from residues / unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN1987
Proper shipping name	Alcohols, n.o.s. (Ethanol)
Hazard class	3
Labels required	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
Additional information:	
Special provisions	172, IB2, T7, TP1, TP8, TP28
Packaging exceptions	4b, 150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1987
UN proper shipping name	Alcohols, n.o.s. (Ethanol)
Transport hazard class(es)	3
Packing group	II
ERG code	3L

IMDG

UN number	UN1987
UN proper shipping name	ALCOHOLS, N.O.S. (Ethanol)
Transport hazard class(es)	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
EmS	F-E, S-D

TDG

UN number	UN1987
Proper shipping name	ALCOHOLS, N.O.S. (Ethanol)
Hazard class	3
Packing group	II
Marine pollutant	D

15. Regulatory Information

US federal regulations This product is hazardous according to OSHA 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Natural gasoline: 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

Drug Enforcement Administration (DEA) (21 CFR 1308.11-15) Not controlled

Canadian regulations This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS status Controlled

WHMIS classification B2 - Flammable Liquids
D2A - Other Toxic Effects-VERY TOXIC
D2B - Other Toxic Effects-TOXIC

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

State regulations

US - California Hazardous Substances (Director's): Listed substance

Ethanol (CAS 64-17-5) Listed.
Natural gasoline (CAS 8006-61-9) Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Methanol (CAS 67-56-1) Listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Methanol (CAS 67-56-1) Listed: March 16, 2012 Developmental toxin.

US. Massachusetts RTK - Substance List

Ethanol (CAS 64-17-5) Listed.
Natural gasoline (CAS 8006-61-9) Listed.

US. New Jersey Worker and Community Right-to-Know Act

Ethanol (CAS 64-17-5)
Natural gasoline (CAS 8006-61-9)

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

Mexico regulations This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

16. Other Information

HMIS® ratings Health: 2*
Flammability: 3
Physical hazard: 0

NFPA ratings

Disclaimer	To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.
Prepared by	Not available.

SAFETY DATA SHEET

THE INTERNATIONAL GROUP, INC.

1. Identification

Product identifier **0200 Series Products (Petrofibe®)**

Other means of identification See page 8

SDS number **0200 Series (928960)_USA_English**

Recommended use Further processing , Misc. multiple uses

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company Name The International Group Inc.

Address 50 Salome Dr.
Toronto
ON, M1S2A8, CA

Telephone 001-(416)-293-4151

E-mail -

Contact person -

Emergency phone number 001-(416)-293-4151
001-(800)-561-3509

CHEMTREC (North Amerca) 001-(800)-424-9300

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

OSHA defined hazards Not classified.

This product does not meet the criteria for classification according to OSHA Hazard Communication Standard (OSHA GHS).

Label elements

Hazard symbol None.

Signal word None.

Hazard statement The product does not meet the criteria for classification.

Precautionary statement

Prevention Observe good industrial hygiene practices.

Response Wash hands after handling.

Storage Store away from incompatible materials.

Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Foots oil		64742-67-2	100

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	Solid: No specific first aid measures noted. If fumes from heated product are inhaled: Move to fresh air. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Solid: No specific first aid measures noted. If burned by contact with hot material, cool molten material adhering to skin as quickly as possible with water, and see a physician for removal of adhering material and treatment of burn.
Eye contact	Solid: No specific first aid measures noted. Exposure to fumes, vapors or smoke of over heated product can result in irritation of eyes. Direct contact of molten material will cause injury and burns. When handling of molten product eye shield must be worn at all times. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Should an accident occur, flush eyes with generous amounts of water for at least 15 minutes. Administer prompt first aid measures. Get medical attention if irritation develops and persists.
Ingestion	Solid: No specific first aid measures noted. Not acutely toxic by ingestion. If material is ingested, do not induce vomiting. Contact with hot product may cause severe burns. Get medical attention immediately.
Most important symptoms/effects, acute and delayed	Eye and skin contact: When heated, contact with molten product can cause injury and burns.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	If you feel unwell, seek medical advice (show the label where possible). Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water on molten material: Explosion hazard could result.
Specific hazards arising from the chemical	By heating and fire, irritating vapors/gases may be formed. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Cool containers exposed to heat with water spray and remove container, if no risk is involved. Do not direct water at source of leak or safety devices as icing may occur. Use water spray to cool unopened containers. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers exposed to flames with water until well after the fire is out.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Handle as a thermoplastic. With molten spills, allow the material to solidify and cool. Keep material out of sewers and watercourses by diking or impounding. Recover and place into appropriate containers for recycling or disposal, according to prevailing local, state and federal laws. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Allow material to solidify, and scrape up. Following product recovery, flush area with water. Small Spills: Where possible allow molten material to solidify naturally. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water.

7. Handling and storage

Precautions for safe handling

When kept in molten state, inert gas blanketing may be used to avoid material degradation. As a solid, avoid contamination by keeping in closed containers. Do not handle until all safety precautions have been read and understood. Heat only in areas with appropriate exhaust ventilation. Do not breathe fume/mist/vapors. Avoid contact with molten material. When using, do not eat, drink or smoke. Observe good industrial hygiene practices. Do not empty into drains. Avoid release to the environment. Wash contaminated clothing before reuse. The material is a solid at room temperature exhibiting elevated temperature softening characteristics. Above its softening point, the material liquefies and flows more readily as the temperature increases. The material may be used as a hot liquid for application purposes and requires caution in handling.

Conditions for safe storage, including any incompatibilities

Keep away from heat, sparks and open flame. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS). When kept in molten state, inert gas blanketing may be used to avoid material degradation. As a solid, avoid contamination by keeping in closed containers.

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Ensure adequate ventilation, especially in confined areas. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear approved safety goggles. Wear a face shield when working with molten material.

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Skin protection

Other

The material may be utilized in molten form. Proper protective splash resistant clothing, thermal gloves, splash resistant shoes, and eye shields must be worn to prevent injury. Use molten material in well ventilated areas. When working in confined areas, use of appropriate respiratory gear is recommended.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state	Solid.
Form	Soft solid.
Color	Off-white to brown.
Odor	Petroleum.
Odor threshold	No data available.
pH	Not applicable.
Melting point/freezing point	86 - 194 °F (30 - 90 °C)
Initial boiling point and boiling range	> 572 °F (> 300 °C)
Flash point	> 302.0 °F (> 150.0 °C) ASTM D-93
Evaporation rate	< 0.01 (Butyl acetate = 1)
Flammability (solid, gas)	Will support a flame above flash point.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	No data available.
Flammability limit - upper (%)	No data available.
Explosive limit - lower (%)	0.9 % v/v
Explosive limit - upper (%)	7 % v/v
Vapor pressure	< 0.01 mm Hg (77 °F/25 °C)
Vapor density	> 5 (Air = 1)
Relative density	0.85 - 0.92 (77 °F/25 °C)
Solubility(ies)	
Solubility (water)	< 0.1 % (68 °F/20 °C)
Partition coefficient (n-octanol/water)	No data available.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Other information	
Partition coefficient (oil/water)	< 0.01
Percent volatile	< 1 % v/v

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.
Conditions to avoid	Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Decomposition of this product can generate carbon dioxide, carbon monoxide and other products such as aldehyldes and ketones depending on conditions of oxidation.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Not relevant at normal room temperatures. When heated, irritating vapors may be formed. Wax fumes have been reported to be irritating to the respiratory tract, especially to sensitized persons.
Skin contact	Health injuries are not known or expected under normal use. Molten material will produce thermal burns.
Eye contact	Health injuries are not known or expected under normal use. Molten material will produce thermal burns.
Ingestion	Health injuries are not known or expected under normal use. Contact with hot material can cause thermal burns which may result in permanent damage.
Symptoms related to the physical, chemical and toxicological characteristics	Eye and skin contact: Contact with molten material may cause thermal burns.

Information on toxicological effects

Acute toxicity	Not expected to be acutely toxic.
Skin corrosion/irritation	Thermal burn hazard - contact with hot material may cause thermal burns.
Serious eye damage/eye irritation	Not classified. Direct contact of molten product to the eyes will cause thermal burns and eye injury.
Respiratory or skin sensitization	
Respiratory sensitization	Not classified.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	Not classified.

Carcinogenicity Not expected to be hazardous by OSHA criteria.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity Not classified.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Solid product: Not likely, due to the form of the product.

Chronic effects Not expected to be hazardous by OSHA criteria. Exposure to vapors, fumes, or smoke from molten material handled in confined areas can produce irritation of respiratory tracts, and possible physical discomfort to sensitive individuals.

Further information None.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil The product is insoluble in water.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

General information This product is not regulated as dangerous goods for solid. Shipped hot molten product requires a class 9 “HOT” with statement: Elevated temperature material, liquid, N.O.S. 9, UN3257, III (WAX)

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

Not Listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 18-August-2015

Revision date -

Version # 01

HMIS® ratings
Health: 1
Flammability: 1
Physical hazard: 0

NFPA ratings

Disclaimer

This material safety data sheet is offered for your information only. We believe the statements, technical information and recommendations contained here in are reliable, but are given without warranty or guarantee of any kind, expressed or implied. THE INTERNATIONAL GROUP, INC. assumes no responsibility for any loss, damage or expense, direct or consequential, arising from the use of our material. It is the responsibility of the user to determine the suitability and completeness of such information for the required use or application. We do not assume any legal responsibility for nor do we give permission, inducement or recommendation to practice any patented invention without a license. Further, it is the user's obligation to utilize this material in full compliance with all health, safety and environmental regulations.

PRODUCT NUMBER
0201A
0202C
0205A
0205D
0208A
0208B
0211A
0212A
0217A
0218A
0225A
0260A
0260U
0293A
R-6429A

ATTACHMENT I –EMISSIONS UNIT TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
4004	TK-4004	Floating roof, Gasoline tank	2018	1,260,000 gal	Modified	N/A
4005	TK-4005	Floating roof, Gasoline tank	2018	1,260,000 gal	Modified	N/A
4006	TK-4006	Floating roof, Gasoline tank	2018	1,260,000 gal	Modified	N/A
4070	TK-4071	Floating roof, Gasoline tank	2018	1,260,000 gal	New	N/A
4071	TK-4070	Fixed roof, Ethanol tank	2018	630,000 gal	New	N/A
4072	TK-4072	Fixed Roof, Feedstock tank	2018	1,260,000 gal	New	N/A

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J – EMISSION POINTS DATA SUMMARY

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr*	lb/hr	ton/yr*			
TK-4004	Tank	TK-4004	Tank 4004	N/A	N/A	N/A	N/A	VOC Total HAPs	--	2.12 0.48	--	2.12 0.48	Gas/Vapor	O AP-42	N/A
TK-4005	Tank	TK-4005	Tank 4005	N/A	N/A	N/A	N/A	VOC Total HAPs	--	2.09 0.47	--	2.09 0.47	Gas/Vapor	O AP-42	N/A
TK-4006	Tank	TK-4006	Tank 4006	N/A	N/A	N/A	N/A	VOC Total HAPs	--	2.12 0.48	--	2.12 0.48	Gas/Vapor	O AP-42	N/A
TK-4071	Tank	TK-4071	Tank 4071	N/A	N/A	N/A	N/A	VOC Total HAPs	--	2.12 0.48	--	2.12 0.48	Gas/Vapor	O AP-42	N/A
TK-4070	Tank	TK-4070	Tank 4070	N/A	N/A	N/A	N/A	VOC Total HAPs	--	0.06 <0.01	--	0.06 <0.01	Gas/Vapor	O AP-42	N/A
TK-4072	Tank	TK-4072	Tank 4072	N/A	N/A	N/A	N/A	VOC Total HAPs	--	1.43 0.06	--	1.43 0.06	Gas/Vapor	O AP-42	N/A

*Note, individual tank emissions data is provided for informational purposes only. EWVI is not requesting individual tank emissions limitations. EWVI requests tank emissions limits remain grouped as in the current permit. Suggested updated permit language is attached to this application utilizing the same approach.

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km) *	
		Temp. (^{o}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
TK-4004	N/A	N/A	N/A	N/A	680	N/A	531.25	4,495.35
TK-4005	N/A	N/A	N/A	N/A	680	N/A	531.25	4,495.35
TK-4006	N/A	N/A	N/A	N/A	680	N/A	531.25	4,495.35
TK-4070	N/A	N/A	N/A	N/A	680	N/A	531.25	4,495.35
TK-4071	N/A	N/A	N/A	N/A	680	N/A	531.25	4,495.35
TK-4072	N/A	N/A	N/A	N/A	680	N/A	531.25	4,495.35

* Coordinates shown are for the facility.

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name N/A	2. Tank Name TK-4004, TK-4005, TK-4006
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) TK-4004, TK-4005, TK-4006	4. Emission Point Identification No. (as assigned on *Equipment List Form*) TK-4004, TK-4005, TK-4006
5. Date of Commencement of Construction (for existing tanks) TK-4004, TK-4005, TK-4006 installed 1971	
6. Type of change ☐ New Construction ☐ New Stored Material ☒ Other Tank Modification	
7. Description of Tank Modification (if applicable) TK-4004, TK-4005, TK-4006: The tanks will be modified to add eight (8) feet to the shell height. Current shell height is 40 feet and current nominal volume is 24,000 bbl. New shell height will be 48 feet and new nominal volume will be 30,000 bbl.	
7A. Does the tank have more than one mode of operation? ☐ Yes ☒ No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). N/A	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Condition 7.1.1 limits the throughput for the tank group (gasoline / ethanol).	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 30,000 bbl each	
9A. Tank Internal Diameter (ft) 67'	9B. Tank Internal Height (or Length) (ft) 48'
10A. Maximum Liquid Height (ft)	10B. Average Liquid Height (ft)
11A. Maximum Vapor Space Height (ft) N/A	11B. Average Vapor Space Height (ft) N/A
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 30,000 bbl each	

13A. Maximum annual throughput (gal/yr) TK-4004, TK-4006, & TK-4071 91,980,000 ga/yr combined TK-4005 – 7,588,350 gal/yr	13B. Maximum daily throughput (gal/day)
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)	
15. Maximum tank fill rate (gal/min) TK-4004/4006 3.9 and TK-4005 38.9	
16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading	
17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply	
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☐ Fixed Roof ___ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
- ☒ External Floating Roof X pontoon roof ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☐ Internal Floating Roof ___ vertical column support ___ self-supporting
- ☐ Variable Vapor Space ___ lifter roof ___ diaphragm
- ☐ Pressurized ___ spherical ___ cylindrical
- ☐ Underground
- ☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: ☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)		
20A. Shell Color White	20B. Roof Color White	20C. Year Last Painted
21. Shell Condition (if metal and unlined): ☐ No Rust ☒ Light Rust ☐ Dense Rust ☐ Not applicable		
22A. Is the tank heated? ☐ YES ☒ NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig):		
24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft)		
25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: (check one) ☒ Metallic (Mechanical) Shoe Seal ☐ Vapor Mounted Resilient Seal	☐ Liquid Mounted Resilient Seal ☐ Other (describe):	
25C. Is the Floating Roof equipped with a Secondary Seal? ☒ YES ☐ NO		
25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☒ Rim ☐ Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☒ NO		

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH

BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
1		

AUTOMATIC GAUGE FLOAT WELL

BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL

BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL

PIPE COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT

SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL

WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER

WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:
1	

RIM VENT

WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)

OPEN:	90% CLOSED:
	1

STUB DRAIN

1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

3 adjustable center area & 8 adjustable pontoon area – ungasketed

26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Pittsburgh, PA	
28. Daily Average Ambient Temperature (°F)	50
29. Annual Average Maximum Temperature (°F)	60
30. Annual Average Minimum Temperature (°F)	40
31. Average Wind Speed (miles/hr)	
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))	
33. Atmospheric Pressure (psia)	14.17

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F) 26	34B. Maximum (°F) 72
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F) 26	36B. Corresponding Vapor Pressure (psia) 3.5872
37A. Average Liquid Surface Temperature (°F) 52	37B. Corresponding Vapor Pressure (psia) 6.2050
38A. Maximum Liquid Surface Temperature (°F) 75	38B. Corresponding Vapor Pressure (psia) 9.0657

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A.	Material Name or Composition	Gasoline		
39B.	CAS Number	See Attached SDS		
39C.	Liquid Density (lb/gal)	See Attached SDS		
39D.	Liquid Molecular Weight (lb/lb-mole)	92		
39E.	Vapor Molecular Weight (lb/lb-mole)	62		

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)	6.0 psia (average)		
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method[1]
		Amount	Units		
Refer to Attachment N for detail emission calculations					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name N/A	2. Tank Name TK-4071
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) TK-4071	4. Emission Point Identification No. (as assigned on *Equipment List Form*) TK-4071
5. Date of Commencement of Construction (for existing tanks) NA	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) TK-4071 is a new tank.	
7A. Does the tank have more than one mode of operation? ☐ Yes ☒ No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). N/A	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Condition 7.1.1 limits the throughput for the tank group (gasoline / ethanol).	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 30,000 bbl	
9A. Tank Internal Diameter (ft) 67'	9B. Tank Internal Height (or Length) (ft) 48'
10A. Maximum Liquid Height (ft)	10B. Average Liquid Height (ft)
11A. Maximum Vapor Space Height (ft) N/A	11B. Average Vapor Space Height (ft) N/A
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 30,000 bbl	

13A. Maximum annual throughput (gal/yr) TK-4004, TK-4006, & TK-4071 91,980,000 ga/yr combined	13B. Maximum daily throughput (gal/day)

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☐ Fixed Roof ___ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
- ☒ External Floating Roof X pontoon roof ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☐ Internal Floating Roof ___ vertical column support ___ self-supporting
- ☐ Variable Vapor Space ___ lifter roof ___ diaphragm
- ☐ Pressurized ___ spherical ___ cylindrical
- ☐ Underground
- ☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color White	20B. Roof Color White	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☒ Not applicable

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig):

24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☒ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☒ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☒ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☒ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH

BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
1		

AUTOMATIC GAUGE FLOAT WELL

BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL

BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL

PIPE COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT

SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL

WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER

WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:
1	

RIM VENT

WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)

OPEN:	90% CLOSED:
	1

STUB DRAIN

1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

3 adjustable center area & 8 adjustable pontoon area – ungasketed

26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Pittsburgh, PA	
28. Daily Average Ambient Temperature (°F)	50
29. Annual Average Maximum Temperature (°F)	60
30. Annual Average Minimum Temperature (°F)	40
31. Average Wind Speed (miles/hr)	
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))	
33. Atmospheric Pressure (psia)	14.17

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F) 26	34B. Maximum (°F) 72
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F) 26	36B. Corresponding Vapor Pressure (psia) 3.5872
37A. Average Liquid Surface Temperature (°F) 52	37B. Corresponding Vapor Pressure (psia) 6.2050
38A. Maximum Liquid Surface Temperature (°F) 75	38B. Corresponding Vapor Pressure (psia) 9.0657

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A.	Material Name or Composition	Gasoline		
39B.	CAS Number	See Attached SDS		
39C.	Liquid Density (lb/gal)	See Attached SDS		
39D.	Liquid Molecular Weight (lb/lb-mole)	92		
39E.	Vapor Molecular Weight (lb/lb-mole)	62		

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)	6.0 psia (average)		
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method[1]
		Amount	Units		
Refer to Attachment N for detail emission calculations					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name N/A	2. Tank Name TK-4070
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) TK-4070	4. Emission Point Identification No. (as assigned on *Equipment List Form*) TK-4070
5. Date of Commencement of Construction (for existing tanks)	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable)	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). N/A	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Condition 7.1.1 limits the throughput for the tank group (gasoline / ethanol).	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 15,000 bbl.	
9A. Tank Internal Diameter (ft) 48'	9B. Tank Internal Height (or Length) (ft) 48'
10A. Maximum Liquid Height (ft) 42' 8.5"	10B. Average Liquid Height (ft) 21' 4"
11A. Maximum Vapor Space Height (ft) N/A	11B. Average Vapor Space Height (ft) N/A
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 15,000 bbl.	

13A. Maximum annual throughput (gal/yr) 6,647,159 gal/yr	13B. Maximum daily throughput (gal/day)

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) 10.6

15. Maximum tank fill rate (gal/min) 36.4

16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☐ Fixed Roof ___ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof ___ other (describe)
- ☐ External Floating Roof pontoon roof ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☒ Internal Floating Roof X vertical column support ___ self-supporting
- ☐ Variable Vapor Space ___ lifter roof ___ diaphragm
- ☐ Pressurized ___ spherical ___ cylindrical
- ☐ Underground
- ☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color White	20B. Roof Color White	20C. Year Last Painted N/A

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☒ Not applicable

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): -0.03 to 0.03

24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed: TBD

25B. Primary Seal Type: (check one)
☒ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☒ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☒ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☒ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH		
BOLT COVER, GASKETED: 1	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED: 1	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL	
PIPE COLUMN – SLIDING COVER, GASKETED: 1	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT	
SLIDING COVER, GASKETED: 1	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER	
WEIGHTED MECHANICAL ACTUATION, GASKETED: 1	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

RIM VENT	
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)	
OPEN:	90% CLOSED:

STUB DRAIN
1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

Roof Leg – 4 center area adjustable & 5 pontoon area adjustable - ungasketed

26. Complete the following section for **Internal Floating Roof Tanks** ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☒ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns: 1	26G. Diameter of each column: 1

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Pittsburgh, PA	
28. Daily Average Ambient Temperature (°F)	50
29. Annual Average Maximum Temperature (°F)	60
30. Annual Average Minimum Temperature (°F)	40
31. Average Wind Speed (miles/hr)	
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))	
33. Atmospheric Pressure (psia)	14.17

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F) 26	34B. Maximum (°F) 72
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F) 27	36B. Corresponding Vapor Pressure (psia) 0.2464
37A. Average Liquid Surface Temperature (°F) 52	37B. Corresponding Vapor Pressure (psia) 0.6708
38A. Maximum Liquid Surface Temperature (°F) 75	38B. Corresponding Vapor Pressure (psia) 1.2188

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A.	Material Name or Composition	Ethanol		
39B.	CAS Number	64-17-5		
39C.	Liquid Density (lb/gal)	Specific Gravity 0.789		
39D.	Liquid Molecular Weight (lb/lb-mole)	47.1		
39E.	Vapor Molecular Weight (lb/lb-mole)	51.2		

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)	0.631 psia average		
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Refer to Attachment N for detail emission calculations					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name N/A	2. Tank Name TK-4072
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) TK-4072	4. Emission Point Identification No. (as assigned on *Equipment List Form*) TK-4072
5. Date of Commencement of Construction (for existing tanks) NA	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) TK-4072 is a new tank.	
7A. Does the tank have more than one mode of operation? ☐ Yes ☒ No (e.g. Is there more than one product stored in the tank?)	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). N/A	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Condition 7.1.1 limits the throughput for the tank group (gasoline / ethanol).	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 30,000 bbl	
9A. Tank Internal Diameter (ft) 70'	9B. Tank Internal Height (or Length) (ft) 48'
10A. Maximum Liquid Height (ft)	10B. Average Liquid Height (ft)
11A. Maximum Vapor Space Height (ft) N/A	11B. Average Vapor Space Height (ft) N/A
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 30,000 bbl	

13A. Maximum annual throughput (gal/yr) TK-4000, TK-4001, TK-4060, TK-4061, and TK-4072 802,264,890 ga/yr combined	13B. Maximum daily throughput (gal/day)

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
17.75

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
- ☐ External Floating Roof X pontoon roof ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☐ Internal Floating Roof ___ vertical column support ___ self-supporting
- ☐ Variable Vapor Space ___ lifter roof ___ diaphragm
- ☐ Pressurized ___ spherical ___ cylindrical
- ☐ Underground
- ☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color White	20B. Roof Color White	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☒ Not applicable

22A. Is the tank heated? ☒ YES ☐ NO

22B. If YES, provide the operating temperature (°F) 170 F

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig):

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft) 0.0625

25. Complete the following section for **Floating Roof Tanks** ☒ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☒ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL	
PIPE COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT	
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER	
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

RIM VENT	
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)	
OPEN:	90% CLOSED:

STUB DRAIN
1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Pittsburgh, PA
28. Daily Average Ambient Temperature (°F) 50
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia) 14.17

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F) 170
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia) 3.5872
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia) 6.2050
38A. Maximum Liquid Surface Temperature (°F) 170	38B. Corresponding Vapor Pressure (psia) 9.0657

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A.	Material Name or Composition	Feed stock		
39B.	CAS Number	NA		
39C.	Liquid Density (lb/gal)			
39D.	Liquid Molecular Weight (lb/lb-mole)	387		
39E.	Vapor Molecular Weight (lb/lb-mole)	190		

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Refer to Attachment N for detail emission calculations					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Summary Table
Current Limits Proposed Permit Limits
ERGON - West Virginia, Inc., Newell Refinery

	Current Limits R30-02900008-2015 MM02 and MM03						Proposed Limits						Increased Potential Discharge (Proposed Limit - Current Limit)
Pollutants	TLOAD & OXIDIZER		MLD & MLDOX		STORAGE TANKS		TLOAD & OXIDIZER		MLD & MLDOX		STORAGE TANKS		
	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY	TPY
CO	0.20	1.98	0.27	2.63	NA	NA	0.21	2.12	0.29	2.92	NA	NA	0.43
NOx	0.04	0.36	0.05	0.48	NA	NA	0.04	0.39	0.05	0.54	NA	NA	0.09
PM2.5	0.01	0.04	0.01	0.05	NA	NA	0.00	0.04	0.01	0.06	NA	NA	0.01
PM10	0.01	0.04	0.01	0.05	NA	NA	0.00	0.04	0.01	0.06	NA	NA	0.01
PM	0.01	0.04	0.01	0.05	NA	NA	0.00	0.04	0.01	0.06	NA	NA	0.01
SO2	0.02	1.16	0.08	0.72	NA	NA	0.13	1.26	0.19	1.85	NA	NA	1.23
VOC	1.57	15.77	1.09	10.86	5.39	53.87	1.82	18.17	1.22	12.24	5.79	57.85	7.76
Total HAP	0.27	2.68	0.11	1.05	0.65	6.54	0.32	3.22	0.13	1.30	0.65	6.54	0.79
Benzene	0.03	0.26	0.01	0.05	0.08	0.81	0.03	0.32	0.01	0.08	0.08	0.81	0.09

Storage Tanks
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Product	Tank No.	Working Capacity (gal)	Revised April 2018									
			Estimated Tank Throughput (gal)	Estimated Turnovers	Total VOC Emissions (ton/yr)	Benezene Emissions (ton/yr)	Hexane Emissions (ton/yr)	Iso-Octane Emissions (ton/yr)	Toluene Emissions (ton/yr)	Ethylbenzene Emissions (ton/yr)	Xylene Emissions (ton/yr)	Isopropyl Benzene Emissions (ton/yr)
Crude/Charge												
	4000	2,310,000	114,975,000	49.8	1.470	0.009	0.006	0.001	0.015	0.006	0.021	0.001
	4001	2,310,000	114,975,000	49.8	1.470	0.009	0.006	0.001	0.015	0.006	0.021	0.001
	4060	4,540,000	176,295,000	38.8	2.210	0.013	0.009	0.002	0.022	0.009	0.031	0.002
	4061	5,040,000	176,295,000	35.0	2.210	0.013	0.009	0.002	0.022	0.009	0.031	0.002
	4062	5,040,000	153,300,000	30.4	12.270	0.074	0.750	Neg	0.064	0.007	0.092	0.002
	4063	5,040,000	153,300,000	30.4	12.270	0.074	0.750	Neg	0.064	0.007	0.092	0.002
	4072	1,260,000	23,000,000	18.3	1.430	0.009	0.006	0.001	0.014	0.006	0.020	0.001
Totals for Group		**24,280,000**	**889,140,000**		**33.330**	**0.200**	**1.529**	**0.007**	**0.201**	**0.043**	**0.287**	**0.012**
Gasoline [1]												
	4004	1,050,000	32,850,000	31.3	2.121	0.038	0.021	0.085	0.148	0.030	0.148	0.011
	4005	1,050,000	8,130,375	7.7	2.086	0.038	0.021	0.083	0.146	0.029	0.146	0.010
	4006	1,050,000	32,850,000	31.3	2.121	0.038	0.021	0.085	0.148	0.030	0.148	0.011
	4071	1,260,000	32,850,000	26.1	2.121	0.038	0.021	0.085	0.148	0.030	0.148	0.011
	4070	630,000	7,121,956	11.3	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	4012	630,000	65,152,500	103.4	1.697	0.031	0.017	0.068	0.119	0.024	0.119	0.008
	4013	630,000	65,152,500	103.4	1.767	0.032	0.018	0.071	0.124	0.025	0.124	0.009
	4014	315,000	32,348,971	102.7	1.557	0.028	0.016	0.062	0.109	0.022	0.109	0.008
	4015	315,000	29,939,300	95.0	1.551	0.028	0.016	0.062	0.109	0.022	0.109	0.008
	4016	315,000	2,025,000	6.4	1.479	0.027	0.015	0.059	0.104	0.021	0.104	0.007
	4050	630,000	7,121,956	11.3	0.058	0.001	0.001	0.002	0.004	0.001	0.004	0.000
	4052	30,240	2,258,438	74.7	0.602	0.001	0.000	0.001	0.002	0.000	0.002	0.000
	4053	30,240	2,258,438	74.7	0.602	0.001	0.000	0.001	0.002	0.000	0.002	0.000
Totals for Group			**320,059,433**		**17.820**	**0.298**	**0.166**	**0.662**	**1.159**	**0.232**	**1.159**	**0.083**
Heavy Product / Kerosene												
	4002	2,310,000	102,200,000	44.2	0.140	0.0000	0.0000	Neg	0.0002	0.0002	0.0004	0.0000
	4003	2,310,000	134,904,000	58.4	0.183	0.0000	0.0000	Neg	0.0002	0.0002	0.0006	0.0000
	4009	1,260,000	44,457,000	35.3	1.996	0.0001	0.0001	Neg	0.0026	0.0025	0.0062	0.0000
	4011	1,260,000	44,457,000	35.3	1.996	0.0001	0.0001	Neg	0.0026	0.0025	0.0062	0.0000
	4054	625,000	7,665,000	12.3	0.344	0.0000	0.0000	Neg	0.0004	0.0004	0.0011	0.0000
	4055	625,000	7,665,000	12.3	0.344	0.0000	0.0000	Neg	0.0004	0.0004	0.0011	0.0000
	4056	625,000	16,863,000	27.0	0.734	0.0000	0.0000	Neg	0.0010	0.0009	0.0023	0.0000
	4057	625,000	16,863,000	27.0	0.734	0.0000	0.0000	Neg	0.0010	0.0009	0.0023	0.0000
Totals for Group			**375,074,000**		**6.330**	**0.000**	**0.000**	**0.000**	**0.008**	**0.008**	**0.020**	**0.000**
Heavy Products												
	4007	2,310,000	25,677,750	11.1	0.011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4008	1,260,000	19,545,750	15.5	0.001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4010	1,260,000	19,545,750	15.5	0.001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4017	840,000	51,738,750	61.6	0.014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4018	704,970	25,677,750	36.4	0.011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4019	704,970	42,924,000	60.9	0.012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4020	840,000	41,391,000	49.3	0.014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4021	840,000	41,391,000	49.3	0.014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4022	571,200	10,347,750	18.1	0.004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4023	571,200	31,043,250	54.3	0.009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4024	840,000	18,242,700	21.7	0.008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4025	840,000	18,242,700	21.7	0.008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4026	840,000	10,424,000	12.4	0.004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4027	840,000	32,959,500	39.2	0.013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4028 [2]	210,000	1,981,478	9.4	0.089	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000
	4029	65,100	1,500,000	23.0	0.001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4030	65,100	1,500,000	23.0	0.001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4031	315,000	8,814,750	28.0	0.004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4032	315,000	8,814,750	28.0	0.004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4033	315,000	5,212,200	16.5	0.002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4034 [2]	840,000	7,925,911	9.4	0.003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4035	840,000	21,845,250	26.0	0.009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Storage Tanks
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Product	Tank No.	Working Capacity (gal)	Revised April 2018									
			Estimated Tank Throughput (gal)	Estimated Turnovers	Total VOC Emissions (ton/yr	Benezene Emissions (ton/yr)	Hexane Emissions (ton/yr)	Iso-Octane Emissions (ton/yr)	Toluene Emissions (ton/yr)	Ethylbenzene Emissions (ton/yr)	Xylene Emissions (ton/yr)	Isopropyl Benzene Emissions (ton/yr)
	4036	315,000	2,299,000	7.3	0.001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4037	315,000	2,299,000	7.3	0.001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4038	840,000	21,845,250	26.0	0.009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4039	1,260,000	32,959,500	26.2	0.014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4040 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4041	630,000	7,560,000	12.0	0.003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4042 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4043 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4044 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4045 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4046 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4047 [3]				0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4048	504,000	8,431,500	16.7	0.004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4051	1,260,000	10,347,750	8.2	0.004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4065		15,330,000		0.007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4103	127,000	1,500,000		0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4104	127,000	1,500,000		0.010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Totals for Group			**550,817,989**		**0.371**	**0.0000**	**0.0000**	**0.0000**	**0.0001**	**0.0000**	**0.0011**	**0.0000**
Totals					**57.851**	**0.498**	**1.695**	**0.670**	**1.369**	**0.283**	**1.467**	**0.095**

Notes:

1) All straight run gasoline produced from the Crude Distillation Unit goes through 4012 or 4013.
However the amount of gasoline presented is post-Platformer. Assumed approx. 80% yield from Platformer Unit.
Thus the potential production amount was increased by about 25% and split equally between 4012 and 4013.
Conservatively assumed 6 turnovers in 4016 during operation turnarounds.
Assumed 100% of gasoline routed to 4014 and 4015 as reformulated gasoline batch adjustment and sampling.
Assumed 100% of the gasoline was stored in sales tanks 4004 and 4006 prior to load out.
Premium gasoline is barged into the plant and stored in 4005 prior to loading. Historically the amount is about 10% of gasoline sold.

2) Tanks 4028 and 4034 store recovered oil; however, light end constituents have been removed so these products are now equivalent to other heavy products.

3) Tanks are in heavy product service and are leased to Quaker State. Conservatively assumed 0.01 tons/yr emissions

4) Neg. = Negligible amount of benzene in product.

5) HAP Emissions (ton/yr) = (Total VOCs) x (HAP Vapor Weight %)

Product	Benzene Vapor Weight %	Hexane Vapor Weight %	Iso-Octane apor Weight '	Toluene Vapor Weight %	Ethylbenzene Vapor Weight %	Xylene Vapor Weight %	Isopropyl Benzene Vapor Weight %
Gasoline	1.8	1	4	7	1.4	7	0.5
Penn Crude	0.6	0.4	0.1	1	0.4	1.4	0.1
HVY Products/Kero	0.004	0.005		0.13	0.127	0.31	
ALS Crude	0.08	6.11		0.52	0.055	0.75	0.02
HVY Products	0.0008	0.0001		0.032	0.013	0.29	

6) Tanks 4052/4053 have been converted to ethanol storage (April 2007)

Truck Loading
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions

Location	Product	Quantity	Max loading rate	Loading Losses[1]	VOC Emissions		Benzene	Benzene Emissions	
		Mgal/yr	Mgal/min	lb/Mgal	lb/hr	tpy	Wt %	lb/hr	tpy
TLOAD	Diesel[2]	134,904	0.75	1.30E-02	0.586	0.878	0.00%	0.00	0.000
	Gasoline	116,752	0.75	4.85E+00	2.835	3.678	1.80%	0.05	0.066
	No. 6 Fuel Oil	13,650	0.75	1.23E-03	0.055	0.008	0.00%	0.00	0.000
	Kerosene	15,330	0.75	1.23E-02	0.553	0.094	0.00%	0.00	0.000
	Lube Oil	136,920	0.75	2.23E-03	0.100	0.152	0.17%	0.00	0.000
TLOAD Loading Emissions		**417,556**			**4.129**	**4.210**		0.05	**0.066**

[1]The emissions at the Truck Loading area area are controlled by a thermal oxidizer, Factors are taken for AP-42 ch. 5.2. Capture efficiency of 98.7% can be used for truck loading when the trucks are tightness tested at least annually.
[2]Throughputs changed for these products.

Loading Losses (AP-42 ch. 5.2)				Eqn. L=12.46(SPM/T)*C					
Diesel		Gasoline		No.6 Fuel Oil		Kerosene		Lube Oil	
S	0.5	S	0.5	S	1.45	S	0.5	S	0.5
P	0.009	P	6.6	P	0.0002	P	0.0085	P	0.001
M	130	M	66	M	190	M	130	M	200
T	560	T	560	T	560	T	560	T	560
C	1	C	1	C	1	C	1	C	1
L	0.01301625	L	4.84605	L	0.001225975	L	0.012293125	L	0.002225

S= saturation factor (ch. 5.2)
P= True Vapor Pressure of liquid loaded (psia) (ch 7.1)
M= molecular weight of vapors (lb/lb-mole) (ch 7.1)
T= temperature of bulk liquid loaded (R)
C= control efficiency

Truck Loading
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions - TLOAD

Hexane	Hexane Emissions		Toluene	Toluene Emissions		Ethylbenzene	Ethylbenzene Emissions		Xylene	Xylene Emissions	
Wt %	lb/hr	tpy	Wt %	lb/hr	tpy	Wt %	lb/hr	tpy	Wt %	lb/hr	tpy
0.01%	0.000	0.000	0.13%	0.001	0.001	0.13%	0.001	0.001	0.31%	0.002	0.003
1.00%	0.028	0.037	7.00%	0.198	0.257	1.40%	0.040	0.051	7.00%	0.198	0.257
0.01%	0.000	0.000	0.13%	0.000	0.000	0.13%	0.000	0.000	0.31%	0.000	0.000
0.01%	0.000	0.000	0.13%	0.001	0.000	0.13%	0.001	0.000	0.31%	0.002	0.000
0.40%	0.000	0.001	1.00%	0.001	0.002	0.40%	0.000	0.001	1.40%	0.001	0.002
		0.037		**0.201**	**0.260**		**0.042**	**0.053**		**0.204**	**0.263**

Truck Loading - Thermal Oxidizer
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions

Location	Product	Quantity Mgal/yr	Max Loading Mgal/min	Loading Losses[1] lb/Mgal	VOC Emissions lb/hr	VOC Emissions tpy	Benzene Wt %	Benzene Emissions lb/hr	Benzene Emissions tpy
OXIDIZER	Gasoline	116,752	0.75	2.42E-01	10.76	13.96	1.80%	0.19	0.251
					10.76	**13.96**		**0.19**	**0.251**

[1]The emissions at the Truck Loading area area are controlled by a thermal oxidizer, Factors are taken for AP-42 ch. 5.2.
Capture efficiency of 98.7% can be used for truck loading when the trucks are tightness tested at least annually.
[2]Throughputs changed for these products.

Loading Losses (AP-42 ch. 5.2)	
Eqn. L=12.46(SPM/T)*C	
Gasoline	
S	0.5
P	6.6
M	66
T	560
C	0.05
$L_{(uncontrolled)}$	4.84605
$L_{(controlled)}$	0.2423025

S= saturation factor (ch. 5.2)
P= True Vapor Pressure of liquid loaded (psia) (ch 7.1)
M= molecular weight of vapors (lb/lb-mole) (ch 7.1)
T= temperature of bulk liquid loaded (R)
C= control efficiency

Truck Thermal Oxidizer Product Inputs (lbs)	Total Product Combusted (lbs/yr)	Heat Value of Product (Btu/lb)[(c)]	Heat Ratings (MMBtu/hr)	Total Energy Combusted (MMBtu/yr)
Thermal Oxidizer				
Natural Gas (enriching gas)[(a)]	43,223	20,267	0.10	876
Natural Gas (pilot gas) [(a)]	64,834	20,267	0.15	1,314
Gasoline Loading Losses [(b)]	463,765	18,352	0.20	8,511
total:	571,822		0.45	10,701

Pollutants	Emission Factors (lb/MMBtu)	Thermal Oxidizer Est. Emissions (ton/yr)	Thermal Oxidizer Est. Emissions (lb/hr)	
Thermal Oxidizer				
NO_x	0.068	0.36	0.08	
CO	0.370	1.98	0.45	
SO_2	0.005 lb SO2/lb HCV	1.16	0.26	
VOC	5% of Uncombusted VOC	13.96	10.76	
PM	0.007	0.04	0.002	
PM_{10}	0.007	0.04	0.009	
$PM_{2.5}$[(d)]	100% of PM_{10}	0.04	0.009	
CO_{2e}	Totals	630.78	52.76	**Global Warming Potential**
CO_2	117.65	629.49	52.65	1
N_2O (Low NOx Burner)	6.27E-04	1.04	0.09	310
CH_4	2.25E-03	0.25	0.02	21

Notes:
a) Thermal Oxidizer Pilots are rated at 0.15 MMBtu/hr and fired with purchased natural gas. Enriching gas was estimated at 0.1 MMBtu/hr
b) Based on total amount of uncombusted loading losses.
c) Heating Values the Lower Heating Values taken from Hydrogen Analysis Resource Center: Lower and Higher Heating Values of Hydrogen and Fuels
d) PM_{10} and $PM_{2.5}$ are 100% of Total PM emissions, from CEIDARS PM2.5 Emission Factor Table

References:
Emission Factors for NOx, CO and VOC obtained from EPA AP-42, Chapter 13.5 *Flares, and for PM from EPA AP-42, Chapter 1.4, Natural Gas Combustion.*
SO2 emission factors are based on the expected sulfur content of the products combusted in the thermal oxidizer @ 0.5% S per lb crude oil.
SO_2 emissions from natural gas are negligible.

Truck Loading - Thermal Oxidizer
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions - OXIDIZER **SCENARIO 2**

Hexane	Hexane Emissions		Toluene	Toluene Emissions		Ethylbenzene	Ethylbenzene Emissions		Xylene	Xylene Emissions	
Wt %	lb/hr	tpy	Wt %	lb/hr	tpy	Wt %	lb/hr	tpy	Wt %	lb/hr	tpy
1.00%	0.11	0.140	7.00%	0.75	0.977	1.40%	0.15	0.195	7.00%	0.75	0.977
	0.11	**0.140**		**0.75**	**0.977**		**0.15**	**0.195**		0.75	**0.977**

Marine Barge Loading
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions

Location	Product	Quantity	Max Loading	Loading Losses[2]	VOC Emissions		Benzene	Benzene Emissions	
		Mgal/yr	Mgal/min	lb/Mgal	lb/hr	tpy	Wt %	lb/hr	tpy
MLD	Gasoline[1,3]	62,031	1.40	3.90E+00	4.26	1.572	1.80%	0.08	0.028
	ALS Crude[1]	306,600	3.50	1.53E+00	4.17	3.046	0.08%	0.00	0.002
	Diesel	37,065	1.40	1.56E-02	1.31	0.289	0.00%	0.00	0.000
	Kerosene	46,000	1.40	1.23E-02	1.03	0.283	0.00%	0.00	0.000
	Lube Oil	30,660	1.40	2.23E-03	0.19	0.034	0.17%	0.00	0.000
Total Barge Loading Emissions		**482,356**			**10.964**	**5.225**		**0.080**	**0.031**

[1]The throughput were changed for these compounds.

[2]The gasoline and the ALS Crude loadings are controlled by a thermal oxidizer.

[3]Barge loading emissions for gasoline are given as 3.9 lb/Mgal transferred to an unclean barge.

*Naphtha loading emissions are calculated in the gasoline calculations.

*MLD emissions are the Diesel, Kerosene, and Lube Oil loading losses plus 5% of ALS, Naphtha, and Gasoline when C=1

Eqn. L=12.46(SPM/T)*C

Diesel		Kerosene		Lube Oil		Gasoline	
S	0.6	S	0.5	S	0.5	S	0.5
P	0.009	P	0.0085	P	0.001	P	6.6
M	130	M	130	M	200	M	66
T	560	T	560	T	560	T	560
C	1	C	1	C	1	C	1
L	0.0156195	L	0.012293125	L	0.002225	L	4.84605

Eqn. $C_L=(C_A+C_G)*C$

ALS Crude	
C_A	0.731
C_G	0.79764
P	11
M	50
G	1.02
T	520
C	1
C_L	1.52864

S= saturation factor (ch. 5.2)
P= True Vapor Pressure of liquid loaded (psia) (ch 7.1)
M= molecular weight of vapors (lb/lb-mole) (ch 7.1)
T= temperature of bulk liquid loaded (R)(average ambient temperature for Pittsburg, PA)
C= control efficiency

C_A= arrival emission factor (table 5.2-3)
C_G= generated emission factor
G= vapor growth factor (given as 1.02 dimensionless)

Marine Barge Loading
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions - MLD

Hexane	Hexane Emissions	Toluene	Toluene Emissions	Ethylbenzene	Ethylbenzene Emissions	Xylene	Xylene Emissions
Wt %	tpy	Wt %	tpy	Wt %	tpy	Wt %	tpy
1.00%	0.016	7.00%	0.110	1.40%	0.022	7.00%	0.110
6.11%	0.186	0.52%	0.016	0.06%	0.002	0.75%	0.023
0.01%	0.000	0.13%	0.000	0.13%	0.000	0.31%	0.001
0.01%	0.000	0.13%	0.000	0.13%	0.000	0.31%	0.001
0.40%	0.000	1.00%	0.000	0.40%	0.000	1.40%	0.000
	0.202		**0.127**		**0.025**		**0.135**

Marine Barge Loading - Thermal Oxidizer
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions

Location	Product	Quantity	Max Loading	Loading Losses[2]	VOC Emissions		Benzene	Benzene Emissions		Hexane
		Mgal/yr	Mgal/min	lb/Mgal	lb/hr	tpy	Wt %	lb/hr	tpy	Wt %
MLDOX	Gasoline[1,3]	62,031	1.40	7.80E-02	6.47	2.388	1.80%	0.12	0.043	1.00%
	Light Crude[1]	306,600	3.50	3.06E-02	6.34	4.626	0.08%	0.01	0.004	6.11%
MLDOX Loading Emissions		**346,987**			**12.80**	**7.01**		**0.122**	**0.047**	

[1]The throughput were changed for these compounds.
[2]The gasoline and the ALS Crude loadings are controlled by a thermal oxidizer.
[3]Barge loading emissions for gasoline are given as 3.9 lb/Mgal transferred to an unclean barge, with a 98% control efficiency.
*Naphtha loading emissions are calculated in the gasoline calculations.
*MLD emissions are the Diesel, Kerosene, and Lube Oil loading losses plus 5% of ALS, Naphtha, and Gasoline when C=1

Eqn. L=12.46(SPM/T)*C								Eqn. $C_L=(C_A+C_G)*C$	
Diesel		Kerosene		Lube Oil		Gasoline		ALS Crude	
S	0.6	S	0.5	S	0.5	S	0.5	C_A	0.731
P	0.009	P	0.0085	P	0.001	P	6.6	C_G	0.79764
M	130	M	130	M	200	M	66	P	11
T	560	T	560	T	560	T	560	M	50
C	1	C	1	C	1	C	0.02	G	1.02
L	0.0156195	L	0.012293125	L	0.002225	$L_{(uncontrolled)}$	4.84605	T	520
						$L_{(controlled)}$	0.096921	C	0.02
								$C_{L\ (uncontrolled)}$	1.52864
								$C_{L\ (controlled)}$	0.0305728

S= saturation factor (ch. 5.2)
P= True Vapor Pressure of liquid loaded (psia) (ch 7.1)
M= molecular weight of vapors (lb/lb-mole) (ch 7.1)
T= temperature of bulk liquid loaded (R)(average ambient temperature for Pittsburg, PA)
C= control efficiency

C_A= arrival emission factor (table 5.2-3)
C_G= generated emission factor
G= vapor growth factor (given as 1.02 dimensionless)

Marine Barge Loading - Thermal Oxidizer
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Loading Area Emissions - MLDOX

Hexane Emissions	Toluene	Toluene Emissions	Ethylbenzene	Ethylbenzene Emissions	Xylene	Xylene Emissions
tpy	Wt %	tpy	Wt %	tpy	Wt %	tpy
0.024	7.00%	0.167	1.40%	0.033	7.00%	0.167
0.283	0.52%	0.024	0.06%	0.003	0.75%	0.035
0.307		**0.191**		**0.036**		**0.202**

Marine Thermal Oxidizer Product Inputs (lbs)	Total Product Combusted (lbs/yr)	Heat Value of Product (Btu/lb)[(c)]	Heat Ratings (MMBtu/hr)	Total Energy Combusted (MMBtu/yr)
Thermal Oxidizer				
Natural Gas (enriching gas)[(a)]	43,223	20,267	0.10	876
Natural Gas (pilot gas) [(a)]	64,834	20,267	0.15	1,314
Product Loading Losses [(b)]	655,761	18,352	-	12,035
total:	763,818			14,225

Pollutants	Emission Factors (lb/MMBtu)	Thermal Oxidizer Est. Emissions (ton/yr)
Thermal Oxidizer		
NO_x	0.068	0.48
CO	0.370	2.63
SO_2	0.005 lb SO2/lb HCV	1.64
PM	0.007	0.05
$PM_{2.5}$[(d)]	100% of PM_{10}	0.05
CO_{2e}	117.647	836.74

Marine Barge Loading - Thermal Oxidizer
PTE Estimated Emissions
ERGON - West Virginia, Inc., Newell Refinery

Notes:

a) Thermal Oxidizer Pilots are rated at 0.15 MMBtu/hr and fired with purchased natural gas. Enriching gas was estimated at 0.1 MMBtu/hr
b) Product Loading Losses is the combination of quantity (Mgal/yr)* Loading Losses (lb/Mgal)* Capture Effiency (95%) for gasoline and light crude loaded, taken from above.
c) Heating Values the Lower Heating Values taken from Hydrogen Analysis Resource Center: Lower and Higher Heating Values of Hydrogen and Fuels
d) $PM_{2.5}$ is 100% of PM_{10} emissions, from CEIDARS PM2.5 Emission Factor Table

References:

Emission Factors for NOx, CO and VOC obtained from EPA AP-42, Chapter 13.5 *Flares,*
and for PM from EPA AP-42, Chapter 1.4, *Natural Gas Combustion.* SO_2 emission factors
are based on the expected sulfur content of the products combusted in the thermal oxidizer @ 0.5% S per lb crude oil.
VOC emissions from the thermal oxidizer are calculated in the Truck-Rail Loading Spreadsheet.
SO_2 emissions from natural gas are negligible.

Example Calculation:

Calculated emissions (ton/yr) = [emission factor (lb/MMBtu)] x [total energy usage (MMBtu/yr)] x [ton/ 2000 lb]
Example NO_x calculation = 0.068 (lb/MMBtu) x 15,087 (MMBtu/yr) x (1 ton/2000 lb) = 0.51 ton/yr

Fixed-Roof Tank Emissions - Monthly

Based on AP-42, November 2006, Section 7.1.3.1.

Tool Last Updated: 12/14/15 *Click Here to Go Back to Cover Page*

Reporting Year	*2018*

Tank Reference Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Tank ID	Enter only Tank ID in this tab.			TBD
Tank Name	Text Description of Tank Name	TK_{name}		New Crude Feed Tank
Actual Location		Loc_{Act}		Newell
Location for Calculation Purposes		Loc_{Calc}		Pittsburgh, Pennsylvania
Tank/Roof Type		TK_{roof}		VFR - Cone
Normal Capacity		Cap	gal	1,260,000
Diameter		D	ft	70
Shell Height or Length		H_S	ft	48
Effective Diameter	= $((H_S * D) / (\pi/4))^{0.5}$ {horiz. tanks only, Eqn. 1-13} = D {all other fixed roof tanks}	D_E	ft	70.0
Effective Height	= π/4 * D {horiz. tanks only, Eqn. 1-14} = H_S {all other fixed roof tanks}	H_E	ft	48.0
External Shell Color		SC_{ext}		White
External Shell Paint Condition		PC_{Shell}		Good
Roof Color/Shade		RC		White
Roof Paint Condition		PC_{Roof}		Good
Tank Shell Solar Absorbance		α_{Shell}		0.17
Tank Roof Paint Solar Absorbance		α_{Roof}		0.17
Total Tank Paint Solar Absorbance	= $(\alpha_{Shell} + \alpha_{Roof}) / 2$ {Note A, Table 7.1-6}	α_{Tot}		0.17
Ideal Gas Constant,		R	psia ft^3 / lbmole °R	10.731
Ambient Pressure		P_A	psia	14.109

Tank Reference Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Underground Tank?		UT		Aboveground
Heated Tank?		HT		Yes
Liquid Bulk Temperature	Heated Tanks Only	T_B	Degrees F	170.0
Insulated Tank?		IT		Fully
Pressure Tank?		PT		Atmospheric
Normal Operating Pressure	Only for Pressure Tanks	P_I	psig	0.0
Vapor Tight Roof		VTR		No
Control Device	= *None {No vapor tight roof}* = *User Specified*	CD		None
Control Device Efficiency		CD_{Eff}	%	--
Maximum Liquid Height		H_{LX}	ft	45.0
Dome Tank Roof Height	= $R_R - (R_R^2 - (D / 2)^2)^{0.5}$ {dome roof with D = 2 * R_S, Eqn. 1-19}	H_R	ft	--
Roof Outage	= S_R * (D / 2) / 3 {cone roof, Eqn. 1-16 and 1-17} = $H_R * ({}^1/_2 + {}^1/_8 * (H_R / (D / 2))^2)$ {dome roof, Eqn. 1-18}	H_{RO}	ft	0.7
Breather Vent Pressure Setting	= 0 {No vapor tight roof, AP-42 Pg. 7.1-13 Note 3}	P_{BP}	psig	0.00
Breather Vent Vacuum Setting	= User Specified = Default +/-0.03 psig if unknown	P_{BV}	psig	0.00
Breather Vent Pressure Setting Range	= *0 {No vapor tight roof}* = $P_{BP} - P_{BV}$ *{Eqn. 1-11}*	ΔP_B	psig	0.00
Dome Roof Radius	Dome Roofs Only = user input between 0.8 to 1.2 * D {AP-42 7.1-15} = 1.0 * D {default if blank}	R_R	ft	--
Cone Roof Slope	Cone Roofs Only Default = 0.0625 ft/ft	S_R	ft/ft	0.0625
Tank Maximum Liquid Volume	= π/4 * D_E^2 * H_{LX} {Eqn. 1-31} Though not stated in AP-42, use DE in place of D for hor. tanks.	V_{LX}	ft^3	173,180
Days per Year	For leap years, days = 366	t_{yr}	days/yr	365

Emission Summary

Annual Throughput, gal	23,000,004	**Annual Emissions**	1.43
Annual Turnovers	17.75		

Month	Emissions, lbs	Emissions, tons
Jan	239.03	0.120
Feb	239.03	0.120
Mar	239.03	0.120
Apr	239.03	0.120
May	239.03	0.120
Jun	239.03	0.120
Jul	239.03	0.120
Aug	239.03	0.120
Sep	239.03	0.120
Oct	239.03	0.120
Nov	239.03	0.120
Dec	239.03	0.120

Note: The emission summary table is pulled into the Tank Emissions tab using cell references A31:B42. The emission summary must remain at this cell reference to function properly.

Calculations						1	2	3	4	5	6	7	8	9
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil					Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):			= User specified		Residual oil no. 6	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6
Speciation Profile	Select from list (add new in 'Speciation Input' tab):			= User specified		--	--	--	--	--	--	--	--	--
Speciation Profile Type				= User specified		None	None	None	None	None	None	None	None	None
Monthly Throughput		Q	gal/month	= User specified		1,916,667	1,916,667	1,916,667	1,916,667	1,916,667	1,916,667	1,916,667	1,916,667	1,916,667
Days-In-Service	Total days per month minus the days tank has a service change, is out of service, or for non-routine events.	t_{IS}	days			31	28	31	30	31	30	31	31	30
Constant in the vapor pressure equation	Used in ΔP_V only for petroleum liquids. If full speciation profile specified, leave blank.	B	°R	= Not Applicable {Organic liquids and full speciation profiles}		8,933	8,933	8,933	8,933	8,933	8,933	8,933	8,933	8,933
Average Liquid Height	Leave blank if unknown. Not applicable for horizontal Tanks. Fill out for tanks operating on level control.	H_L	ft	= User specified if known = H_{LX} / 2 {default}		22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Vapor Space Outage		H_{VO}	ft	= (H_E / 2) {horizontal tanks only, Eqn. 1-14} = H_S - H_L + H_{RO} {all other fixed roof tanks, Eqn. 1-15}		26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2
Daily Total Solar Insolation Factor		I	Btu / ft^2 day			552	794	1,117	1,452	1,736	1,922	1,881	1,663	1,333
Vent Setting Correction Factor		K_B		= 1 {(P_{BP} ≤ 0.03 or P_{BV} ≥ -0.03 psig) and (K_N * (P_{BP} + P_A) / (P_I + P_A)) ≤ 1.0, Eqn. 1-36} = (((P_I + P_A) / K_N) - $P_{VA,Tla}$) / (P_{BP} + P_A - $P_{VA,Tla}$) {Eqn. 1-37}		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Vapor Space Expansion Factor	Per AP-42 7.1-12, use Eqn. 1-6 if PVA,Tb < 0.1 psia. Tank location is always known for this tool. True vapor pressure based on liquid stock. If KE < 0, no standing losses occur. Per API MPMS Ch. 19.1.2.1.4.2, K_E ≥ 0.	K_E		= (ΔT_V / (T_{LA} + 459.67 °R)) + ((ΔP_V - ΔP_B) / (P_A - $P_{VA,Tla}$)) ≥ 0 {$P_{VA,Tla}$ ≥ 0.1 psia or P_{BP} > 0.03 psig or P_{BV} < -0.03 psig, Eqn. 1-7} = (0.0018 $°R^{-1}$) * ΔT_V {$P_{VA,Tla}$ < 0.1 psia, Eqn. 1-5}		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Working Loss Turnover (Saturation) Factor	Per Eqn. 1-29, annual threshold for turnovers is 36. Equation modified to a monthly form by converting the monthly turnovers to a theoretical annual turnover equivalent.	K_N		= (180 + (N * t_{yr} / t_{IS})) / (6 * (N * t_{yr} / t_{IS})) {(N * t_{yr} / t_{IS}) > 36, Eqn. 1-29} = 1 {(N * t_{yr} / t_{IS}) ≤ 36, Eqn. 1-29}		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Working Loss Product Factor		K_P		= 0.75 {crude oils, Eqn. 1-29} = 1 {all other organic liquids}		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Vented Vapor Saturation Factor	Constant 0.053 has units of 1/(psia-ft). True vapor pressure based on liquid surface.	K_S		= 1 / (1 + 0.053 * $P_{VA,Tla}$ * H_{VO}) {Eqn. 1-20}		0.956	0.956	0.956	0.956	0.956	0.956	0.956	0.956	0.956
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M_V of each component.	M_V	lb/lb-mole	= VOL data of tank contents {partial speciation} M_V = Σ (M_{Vi} * ($P_{VA,Tla}$/$P_{VA,Tla}$)) M_L = 1 / Σ (Z_{Li} / M_L) {full speciation, Eqn. 1-22}		190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
Liquid Molecular Weight		M_L	lb/lb-mole			387.0	387.0	387.0	387.0	387.0	387.0	387.0	387.0	387.0
Number of Turnovers per Month	Constant 5.614 has units of ft^3/bbl.	N		= 5.614 * Q * (bbl / 42 gal) / V_{LX} {Eqn. 1-30}		1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Average Daily Minimum Ambient Temperature		T_{AN}	°F			18.50	20.30	29.80	38.80	48.40	56.90	61.60	60.20	53.50
Average Daily Maximum Ambient Temperature		T_{AX}	°F			33.70	36.90	49.00	60.30	70.60	78.90	82.60	80.80	74.30
Daily Average Ambient Temperature		T_{AA}	°F	= (T_{AX} + T_{AN}) / 2 {Eqn. 1-27}		26.10	28.60	39.40	49.55	59.50	67.90	72.10	70.50	63.90
Daily Minimum Liquid Surf. Temperature, F		T_{LN}	°F	= T_{LA} - 0.25 * ΔT_V {Fig. 7.1-17}		170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00
Daily Maximum Liquid Surf. Temperature, F		T_{LX}	°F	= T_{LA} + 0.25 * ΔT_V {Fig. 7.1-17}		170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00
Daily Vapor Temperature Range	Constant 0.028 has units of (°R-ft^2-day/Btu)	ΔT_V	°R	= 0 {heated and fully insulated tanks only} = 0.72 * (T_{AX} - T_{AN}) + 0.028 * α_{Tot} * I {Eqn. 1-8}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Calculations		10	11	12
Parameter Title	**Notes**	**Oct**	**Nov**	**Dec**
Service		**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):	Residual oil no. 6	Residual oil no. 6	Residual oil no. 6
Speciation Profile	Select from list (add new in 'Speciation Input' tab):	--	--	--
Speciation Profile Type		None	None	None
Monthly Throughput		1,916,667	1,916,667	1,916,667
Days-In-Service	Total days per month minus the days tank has a service change, is out of service, or for non-routine events.	31	30	31
Constant in the vapor pressure equation	Used in ΔP_V only for petroleum liquids. If full speciation profile specified, leave blank.	8,933	8,933	8,933
Average Liquid Height	Leave blank if unknown. Not applicable for horizontal Tanks. Fill out for tanks operating on level control.	22.5	22.5	22.5
Vapor Space Outage		26.2	26.2	26.2
Daily Total Solar Insolation Factor		959	581	446
Vent Setting Correction Factor		1.000	1.000	1.000
Vapor Space Expansion Factor	Per AP-42 7.1-12, use Eqn. 1-6 if PVA,Tb < 0.1 psia. Tank location is always known for this tool. True vapor pressure based on liquid stock. If KE < 0, no standing losses occur. Per API MPMS Ch. 19.1.2.1.4.2, $K_E \geq 0$.	0.0000	0.0000	0.0000
Working Loss Turnover (Saturation) Factor	Per Eqn. 1-29, annual threshold for turnovers is 36. Equation modified to a monthly form by converting the monthly turnovers to a theoretical annual turnover equivalent.	1.00	1.00	1.00
Working Loss Product Factor		1.00	1.00	1.00
Vented Vapor Saturation Factor	Constant 0.053 has units of 1/(psia-ft). True vapor pressure based on liquid surface.	0.956	0.956	0.956
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M_V of each component.	190.0	190.0	190.0
Liquid Molecular Weight		387.0	387.0	387.0
Number of Turnovers per Month	Constant 5.614 has units of ft^3/bbl.	1.48	1.48	1.48
Average Daily Minimum Ambient Temperature		42.30	34.10	24.40
Average Daily Maximum Ambient Temperature		62.50	50.40	38.60
Daily Average Ambient Temperature		52.40	42.25	31.50
Daily Minimum Liquid Surf. Temperature, F		170.00	170.00	170.00
Daily Maximum Liquid Surf. Temperature, F		170.00	170.00	170.00
Daily Vapor Temperature Range	Constant 0.028 has units of (°R-ft^2-day/Btu)	0.00	0.00	0.00

Calculations						2	3	4	5	6	7	8	9	10
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	T_{LA}	°F	= T_B {heated and/or fully insulated tanks only} = (0.44 * T_{AA}) + (0.56 * T_B) + (0.0079 * α_{Tot} * I) {Eqn. 1-26}		170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00
Liquid Bulk Temperature	If T_{LA} is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated. α_{TOT} is not applicable for fully insulated tanks.	T_B	°F	= specified by user {heated tanks only} = T_{AA} {fully insulated but not heated tanks only} = T_{AA} + (6 * α_{Tot} - 1) {Eqn. 1-28}		170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	$P_{VA,Tla}$	psia	*{full speciation profiles, Eqn. 1-22}:* Sum of partial true vapor pressures components. *{partial/no speciation profiles}:* Vapor pressures at T (°F) based on P_{VA} values in VOLs tab at ΔT (°F) increments by interpolating between the P_{VA} values at the next highest/lowest T. $P_{VA,T} = (T - T_{Low}) / (T_{High} - T_{Low}) * (P_{VA,T,High} - P_{VA,T,Low}) + P_{VA,T,Low}$		0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332
Vapor Pressure at Daily Min. Liquid Surf. Temp.	Used for ΔP_V. Per AP-42 7.1-13 Note 5, P_{VN} uses T_{LN}.	P_{VN}	psia			0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332
Vapor Pressure at Daily Max. Liquid Surf. Temp.	Used for ΔP_V. Per AP-42 7.1-13 Note 5, P_{VX} uses T_{LX}.	P_{VX}	psia			0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332	0.0332
Daily Vapor Pressure Range	Eqn. 1-10 is alt. method per AP-42 7.1-13. Used as primary method for Petroleum Distillates & Crude. True vapor pressure based on liquid surface.	ΔP_V	psia	= P_{VX} - P_{VN} {Eqn. 1-9} = (0.50 * B * $P_{VA,Tla}$ * ΔT_V) / (T_{LA} + 459.67 °R)^2 {petroleum liquids if B is known, Eqn. 1-10}		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vapor Density		W_V	lb/ft^3	= (M_V * $P_{VA,Tla}$) / (R * (T_{LA} + 459.67 °R)) {Eqn. 1-21}		0.00093	0.00093	0.00093	0.00093	0.00093	0.00093	0.00093	0.00093	0.00093
Vapor Space Volume		V_V	ft^3	= (π/4 * D_E^2) * H_{VO} {Eqn. 1-3}		100,942	100,942	100,942	100,942	100,942	100,942	100,942	100,942	100,942
Standing Storage Loss	Uncontrolled emissions. No standing or breathing losses occur for underground tanks per AP-42 7.1-14.	L_S	lbs/month	= 0 {underground tanks only} = t_{IS} * V_V * W_V * K_E * K_S {Eqn. 1-2 and 1-4}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Loss	Uncontrolled emissions. True vapor pressure based on liquid surface. Constant 0.0010 derived from Eqn. 1-32, 1-33, and 1-35 assuming T_{LA} = 63 °F.	L_W	lbs/month	= Q * (5.614 ft^3/bbl) * (bbl / 42 gal) * (M_V * $P_{VA,Tla}$) / (R * (T_{LA} + 459.67 °R)) * K_N * K_P * K_B {Eqn. 1-29}		239.03	239.03	239.03	239.03	239.03	239.03	239.03	239.03	239.03
Total Losses	**Uncontrolled emissions.**	**L_T**	**lbs/month**	**= (L_S + L_W) {Eqn. 1-1}**		**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**
Total Losses	**Controlled emissions, if applicable. Note: some species have 0% efficiencies with activated carbon.**	**$L_{T,CD}$**	**lbs/month**	**= Not Applicable {no CD} = L_T * (1 - CD_{Eff}) {CD}**		**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**	**239.03**

Calculations		11	12	13
Parameter Title	**Notes**	**Oct**	**Nov**	**Dec**
Service		**Main Service**	**Main Service**	**Main Service**
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	170.00	170.00	170.00
Liquid Bulk Temperature	If T_{LA} is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated. α_{TOT} is not applicable for fully insulated tanks.	170.00	170.00	170.00
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	0.0332	0.0332	0.0332
Vapor Pressure at Daily Min. Liquid Surf. Temp.	Used for ΔP_V. Per AP-42 7.1-13 Note 5, P_{VN} uses $T_{LN.}$	0.0332	0.0332	0.0332
Vapor Pressure at Daily Max. Liquid Surf. Temp.	Used for ΔP_V. Per AP-42 7.1-13 Note 5, P_{VX} uses $T_{LX.}$	0.0332	0.0332	0.0332
Daily Vapor Pressure Range	Eqn. 1-10 is alt. method per AP-42 7.1-13. Used as primary method for Petroleum Distillates & Crude. True vapor pressure based on liquid surface.	0.000	0.000	0.000
Vapor Density		0.00093	0.00093	0.00093
Vapor Space Volume		100,942	100,942	100,942
Standing Storage Loss	Uncontrolled emissions. No standing or breathing losses occur for underground tanks per AP-42 7.1-14.	0.00	0.00	0.00
Working Loss	Uncontrolled emissions. True vapor pressure based on liquid surface. Constant 0.0010 derived from Eqn. 1-32, 1-33, and 1-35 assuming T_{LA} = 63 °F.	239.03	239.03	239.03
Total Losses	**Uncontrolled emissions.**	**239.03**	**239.03**	**239.03**
Total Losses	**Controlled emissions, if applicable. Note: some species have 0% efficiencies with activated carbon.**	**239.03**	**239.03**	**239.03**

Floating Roof Tank Emissions

Based on AP-42, November 2006, Section 7.1.3.2.

Tool Last Updated: 12/14/15 *Click Here to Go Back to Cover Page*

Reporting Year	*2017*

Tank Reference Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Tank ID	Enter only Tank ID in this tab.			4071S2
Tank Name		TK_{name}		Gasoline EFR Scenario 2 New
Actual Location		Loc_{Act}		Newell, West Virginia
Location for Calculation Purposes		Loc_{Calc}		Pittsburgh, Pennsylvania
Tank Roof Type		TK_{roof}		EFR - Pontoon
Normal Capacity		Cap	gal	1,260,000
Diameter		D	ft	67.0
Shell Height or Length		H_S	ft	48.0
External Shell Color		SC_{ext}		White
External Shell Paint Condition		PC_{Shell}		Good
Roof Color/Shade		RC		White
Roof Paint Condition		PC_{Roof}		Good
Tank Shell Solar Absorbance		α_{Shell}		0.17
Tank Roof Paint Solar Absorbance		α_{Roof}		0.17
Total Tank Paint Solar Absorbance	= (α_{Shell} + α_{Roof}) / 2 {Note A, Table 7.1-6}	α_{Tot}		0.17
Ideal Gas Constant,		R	psia ft^3 / lbmole °R	10.731
Ambient Pressure		P_A	psia	14.109
Rim-Seal System		$TK_{RimSeal}$		Mechanical-shoe/Rim-mounted
Tank Fittings		$TK_{Fittings}$		Detail

Floating Roof Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Heated Tank?		HT		No
Liquid Bulk Temperature	Heated Tanks Only	T_B	Degrees F	--
Number of fixed roof support columns		N_{Col}		0
Effective Column Diameter	1.1 for 9" by 7" built-up column 0.7 for 8" diameter pipe column 1.0 for unknown pipe column	F_C	(col perimeter/π) ft	1.0
Internal Shell Condition		SC_{int}		Light Rust
Tank Construction		TK_{Const}		Welded
Deck Type		TK_{Deck}		--
Total Length of Deck Seams		L_{Seam}	ft	--
Area of deck	= π * D^2 / 4 {Eqn. 2-9}	A_{deck}	ft^2	3,525.7
Deck Seam Length Factor	= L_{Seam} / A_{deck} {Eqn. 2-9} = 0.20 ft/ft^2 {5' wide sheet} = 0.17 ft/ft^2 {6' wide sheet} = 0.14 ft/ft^2 {7' wide sheet} = 0.33 ft/ft^2 {5' x 7.5' panels} = 0.28 ft/ft^2 {5' 12' panels} = 0.20 ft/ft^2 {most common type}	S_D	ft/ft^2	--
Deck Construction (IFR w/Bolted Decks Only)	Not applicable if L_{Seam} specified.	$TK_{DeckConst}$		--
Zero wind speed rim seal loss factor	AP-42 Table 7.1-8	K_{RA}	lb-mole/ft-yr	0.6
Wind speed dependent rim seal loss factor	AP-42 Table 7.1-8	K_{RB}	lb-mole/$(mph)^n$-ft-yr	0.4
Fitting Wind Speed Correction Factor	= 0.7 {EFR Tanks Only} = 0.0 {IFR and Domed EFR Tanks Only} {Eqn. 2-7}	K_V		0.7
Seal related wind speed exponent		n		1.0
Days per Year	For leap years, days = 366	t_{yr}	days/yr	365

Emission Summary

Annual Throughput, gal	**32,850,000**	**Annual Turnovers**	**26.07**	Note: The emission summary table is pulled into the Tank Emissions tab using cell references A31:B42. The emission summary must remain at this cell reference to function properly.
Annual Emissions, tons	**2.12**			
Month	**Normal Operation Loss, lbs**	**Emissions, tpy**		
Jan	218.03	0.109		
Feb	208.11	0.104		
Mar	299.71	0.150		
Apr	362.70	0.181		
May	426.34	0.213		
Jun	473.66	0.237		
Jul	512.72	0.256		
Aug	465.41	0.233		
Sep	401.19	0.201		
Oct	340.47	0.170		
Nov	291.19	0.146		
Dec	242.09	0.1210		

Calculations						1	2	3	4	5	6	7	8
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil					Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):			= User specified		Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):			= User specified		Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type				= User specified		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		Q	gal/month	= User specified		2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500
Days-In-Service	Input "0" for OOS	t_{IS}	days	= User specified		31	28	31	30	31	30	31	31
Shell Clingage Factor		C_S	bbl / 1000 ft^2	{Table 7.1-10}		0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	F_F	lb-mole/yr	= [(N_{F1} * K_{F1}) + (N_{F2} * K_{F2}) + … + (N_{Fnf} * K_{Fnf})] {Eqn. 2-6}		231.2	229.4	231.2	225.6	200.5	185.4	174.2	166.5
Daily Total Solar Insolation Factor		I	Btu / ft^2 day			552	794	1,117	1,452	1,736	1,922	1,881	1,663
Product Factor	Eqn. 2-3	K_C		= 0.4 {crude oils} = 1.0 {all other org. liquids}		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	K_D	lb-mole / ft-month	= 0.0 {IFR Tank with welded deck and all EFR Tanks} = 0.14 * t_{IS} / t_{yr} {bolted deck}		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	M_V	lb/lb-mole	= VOL data of tank contents {partial speciation} M_V = Σ (M_{Vi} * ($P_{VA,Tla}$-/$P_{VA,Tla}$)) M_L = 1 / Σ (Z_{Li} / M_L) {full speciation, Eqn. 1-22}		62.0	62.0	62.0	62.0	62.0	62.0	62.0	62.0
Liquid Molecular Weight		M_L	lb/lb-mole			92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
Liquid Density at 60 °F		W_L	lb/gal	= VOL data of tank contents {partial speciation} = Σ (M_{L-i} * Z_{Li}) {full speciation, Eqn. 1-22}		5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		T_{AN}	°F			18.50	20.30	29.80	38.80	48.40	56.90	61.60	60.20
Average Daily Maximum Ambient Temperature		T_{AX}	°F			33.70	36.90	49.00	60.30	70.60	78.90	82.60	80.80
Daily Average Ambient Temperature		T_{AA}	°F	= (T_{AX} + T_{AN}) / 2 {Eqn. 1-27}		26.10	28.60	39.40	49.55	59.50	67.90	72.10	70.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	T_{LA}	°F	= (0.44 * T_{AA}) + (0.56 * T_B) + (0.0079 * α_{Tot} * I) {Eqn. 1-26}		26.85	29.68	40.91	51.51	61.84	70.49	74.64	72.74
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	T_B	degrees F	= specified by user {heated tanks only} = T_{AA} + 6 * α_{Tot} - 1 {Eqn. 1-28}		26.12	28.62	39.42	49.57	59.52	67.92	72.12	70.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	$P_{VA,Tla}$	psia	*{full speciation profiles, Eqn. 1-22}:* Sum of partial true vapor pressures components. *{partial/no speciation profiles}:* Vapor pressures at T (°F) based on P_{VA} values in VOLs tab at ΔT (°F) increments by interpolating between the P_{VA} values at the next highest/lowest T. $P_{VA,T}$ = (T - T_{Low}) / (T_{High} - T_{Low}) * ($P_{VA,T,High}$ - $P_{VA,T,Low}$) + $P_{VA,T,Low}$		3.5872	3.8085	4.7996	5.9147	7.1915	8.4206	9.0657	8.7664
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	$P_{VA,Tb}$	psia			3.5316	3.7244	4.6572	5.6964	6.8870	8.0390	8.6695	8.4248
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	P_f		= ($P_{VA,Tb}$ / P_A) / (1 + (1 - $P_{VA,Tb}$ / P_A)$^{0.5}$)^2 {Eqn. 2-3}		0.0719	0.0765	0.0998	0.1286	0.1659	0.2078	0.2339	0.2235
Average Ambient Wind Speed	Monthly Average	v	mph	= 0 {Domed EFR and all IFR tanks, Eqn. 2-3 Note 3}		10.6	10.5	10.6	10.3	8.9	8.0	7.3	6.8
Rim Seal Loss		L_R	lb/month	= (K_{Ra} + K_{Rb} * v^n) * D * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn. 2-2}		122.78	116.97	170.45	207.18	243.46	269.61	290.45	261.74
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	L_{WD}	lb/month	= 0.943 * (Q / (42 gal/bbl)) * C_S * W_L / D * (1 + (N_{Col} * F_C / D)) {Eqn. 2-4}		7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71
Deck Fitting Loss		L_F	lb/month	= F_F * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn 2-5}		87.55	83.43	121.55	147.82	175.18	196.35	214.56	195.96
Deck Seam Loss		L_D	lb/month	= 0 {welded IFR and all EFR tanks} = K_D * S_D * D^2 * P_f * M_V * K_C {Eqn. 2-9}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**L_T**	**lb/month**	**= L_R + L_{WD} + L_F + L_D {Eqn. 2-1}**		**218.03**	**208.11**	**299.71**	**362.70**	**426.34**	**473.66**	**512.72**	**465.41**

Parameter Title	Notes	Calculatio 9 Sep	10 Oct	11 Nov	12 Dec
Service		**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		2,737,500	2,737,500	2,737,500	2,737,500
Days-In-Service	Input "0" for OOS	30	31	30	31
Shell Clingage Factor		0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	175.8	192.0	216.5	225.6
Daily Total Solar Insolation Factor		1,333	959	581	446
Product Factor	Eqn. 2-3	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	62.0	62.0	62.0	62.0
Liquid Molecular Weight		92.0	92.0	92.0	92.0
Liquid Density at 60 °F		5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		53.50	42.30	34.10	24.40
Average Daily Maximum Ambient Temperature		74.30	62.50	50.40	38.60
Daily Average Ambient Temperature		63.90	52.40	42.25	31.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	65.70	53.70	43.04	32.11
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	63.92	52.42	42.27	31.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	7.7208	6.1687	5.0088	4.0077
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	7.4728	6.0192	4.9322	3.9585
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	0.1864	0.1382	0.1071	0.0821
Average Ambient Wind Speed	Monthly Average	7.4	8.4	9.8	10.3
Rim Seal Loss		226.53	193.04	165.32	136.79
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	7.71	7.71	7.71	7.71
Deck Fitting Loss		166.95	139.72	118.17	97.59
Deck Seam Loss		0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**401.19**	**340.47**	**291.19**	**242.09**

Floating Roof Tank Emissions

Based on AP-42, November 2006, Section 7.1.3.2.

Tool Last Updated: 12/14/15 *Click Here to Go Back to Cover Page*

Reporting Year	*2017*

Tank Reference Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Tank ID	Enter only Tank ID in this tab.			4070S2
Tank Name		TK_{name}		Ethanol Scenario 2 New
Actual Location		Loc_{Act}		Newell, West Virginia
Location for Calculation Purposes		Loc_{Calc}		Pittsburgh, Pennsylvania
Tank Roof Type		TK_{roof}		IFR - Column Supported Roof
Normal Capacity		Cap	gal	630,000
Diameter		D	ft	48.0
Shell Height or Length		H_S	ft	48.0
External Shell Color		SC_{ext}		White
External Shell Paint Condition		PC_{Shell}		Good
Roof Color/Shade		RC		White
Roof Paint Condition		PC_{Roof}		Good
Tank Shell Solar Absorbance		α_{Shell}		0.17
Tank Roof Paint Solar Absorbance		α_{Roof}		0.17
Total Tank Paint Solar Absorbance	= (α_{Shell} + α_{Roof}) / 2 {Note A, Table 7.1-6}	α_{Tot}		0.17
Ideal Gas Constant,		R	psia ft^3 / lbmole °R	10.731
Ambient Pressure		P_A	psia	14.109
Rim-Seal System		$TK_{RimSeal}$		Mechanical-shoe/Rim-mounted
Tank Fittings		$TK_{Fittings}$		Detail

Floating Roof Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Heated Tank?		HT		No
Liquid Bulk Temperature	Heated Tanks Only	T_B	Degrees F	--
Number of fixed roof support columns		N_{Col}		1
Effective Column Diameter	1.1 for 9" by 7" built-up column 0.7 for 8" diameter pipe column 1.0 for unknown pipe column	F_C	(col perimeter/π) ft	1.0
Internal Shell Condition		SC_{int}		Light Rust
Tank Construction		TK_{Const}		--
Deck Type		TK_{Deck}		Welded
Total Length of Deck Seams		L_{Seam}	ft	--
Area of deck	= π * D^2 / 4 {Eqn. 2-9}	A_{deck}	ft^2	1,809.6
Deck Seam Length Factor	= L_{Seam} / A_{deck} {Eqn. 2-9} = 0.20 ft/ft^2 {5' wide sheet} = 0.17 ft/ft^2 {6' wide sheet} = 0.14 ft/ft^2 {7' wide sheet} = 0.33 ft/ft^2 {5' x 7.5' panels} = 0.28 ft/ft^2 {5' 12' panels} = 0.20 ft/ft^2 {most common type}	S_D	ft/ft^2	--
Deck Construction (IFR w/Bolted Decks Only)	Not applicable if L_{Seam} specified.	$TK_{DeckConst}$		--
Zero wind speed rim seal loss factor	AP-42 Table 7.1-8	K_{RA}	lb-mole/ft-yr	0.6
Wind speed dependent rim seal loss factor	AP-42 Table 7.1-8	K_{RB}	lb-mole/$(mph)^n$-ft-yr	0.4
Fitting Wind Speed Correction Factor	= 0.7 {EFR Tanks Only} = 0.0 {IFR and Domed EFR Tanks Only} {Eqn. 2-7}	K_V		0.0
Seal related wind speed exponent		n		1.0
Days per Year	For leap years, days = 366	t_{yr}	days/yr	365

Emission Summary

Annual Throughput, gal	**7,121,952**	**Annual Turnovers**	**11.30**	Note: The emission summary table is pulled into the Tank Emissions tab using cell references A31:B42. The emission summary must remain at this cell reference to function properly.
Annual Emissions, tons	**0.06**			
Month	**Normal Operation Loss, lbs**	**Emissions, tpy**		
Jan	5.45	0.003		
Feb	5.42	0.003		
Mar	7.02	0.004		
Apr	8.56	0.004		
May	11.05	0.006		
Jun	13.26	0.007		
Jul	15.14	0.008		
Aug	14.54	0.007		
Sep	12.01	0.006		
Oct	9.35	0.005		
Nov	7.31	0.004		
Dec	6.01	0.0030		

Calculations						1	2	3	4	5	6	7	8
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil					Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):			= User specified		Ethyl alcohol	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol
Speciation Profile	Select from list (add new in 'Speciation Input' tab):			= User specified		Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline
Speciation Profile Type				= User specified		Full Speciation	Full Speciation	Full Speciation	Full Speciation	Full Speciation	Full Speciation	Full Speciation	Full Speciation
Monthly Throughput		Q	gal/month	= User specified		593,496	593,496	593,496	593,496	593,496	593,496	593,496	593,496
Days-In-Service	Input "0" for OOS	t_{IS}	days	= User specified		31	28	31	30	31	30	31	31
Shell Clingage Factor		C_S	bbl / 1000 ft^2	{Table 7.1-10}		0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	F_F	lb-mole/yr	= [(N_{F1} * K_{F1}) + (N_{F2} * K_{F2}) + … + (N_{Fnf} * K_{Fnf})] {Eqn. 2-6}		110.6	110.6	110.6	110.6	110.6	110.6	110.6	110.6
Daily Total Solar Insolation Factor		I	Btu / ft^2 day			552	794	1,117	1,452	1,736	1,922	1,881	1,663
Product Factor	Eqn. 2-3	K_C		= 0.4 {crude oils} = 1.0 {all other org. liquids}		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	K_D	lb-mole / ft-month	= 0.0 {IFR Tank with welded deck and all EFR Tanks} = 0.14 * t_{IS} / t_{yr} {bolted deck}		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	M_V	lb/lb-mole	= VOL data of tank contents {partial speciation} M_V = Σ (M_{Vi} * ($P_{VA,Tla}$/$P_{VA,Tla}$))		52.6	52.4	51.7	51.1	50.6	50.3	50.1	50.2
Liquid Molecular Weight		M_L	lb/lb-mole	M_L = 1 / Σ (Z_{Li} / M_L) {full speciation, Eqn. 1-22}		47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1
Liquid Density at 60 °F		W_L	lb/gal	= VOL data of tank contents {partial speciation} = Σ (M_{L-i} * Z_{Li}) {full speciation, Eqn. 1-22}		6.55	6.55	6.55	6.55	6.55	6.55	6.55	6.55
Average Daily Minimum Ambient Temperature		T_{AN}	°F			18.50	20.30	29.80	38.80	48.40	56.90	61.60	60.20
Average Daily Maximum Ambient Temperature		T_{AX}	°F			33.70	36.90	49.00	60.30	70.60	78.90	82.60	80.80
Daily Average Ambient Temperature		T_{AA}	°F	= (T_{AX} + T_{AN}) / 2 {Eqn. 1-27}		26.10	28.60	39.40	49.55	59.50	67.90	72.10	70.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	T_{LA}	°F	= (0.44 * T_{AA}) + (0.56 * T_B) + (0.0079 * α_{Tot} * I) {Eqn. 1-26}		26.85	29.68	40.91	51.51	61.84	70.49	74.64	72.74
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	T_B	degrees F	= specified by user {heated tanks only} = T_{AA} + 6 * α_{Tot} - 1 {Eqn. 1-28}		26.12	28.62	39.42	49.57	59.52	67.92	72.12	70.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	$P_{VA,Tla}$	psia	*{full speciation profiles, Eqn. 1-22}:* Sum of partial true vapor pressures components. *{partial/no speciation profiles}:* Vapor pressures at T (°F) based on P_{VA} values in VOLs tab at ΔT (°F) increments by interpolating between the P_{VA} values at the next highest/lowest T. $P_{VA,T}$ = (T - T_{Low}) / (T_{High} - T_{Low}) * ($P_{VA,T,High}$ - $P_{VA,T,Low}$) + $P_{VA,T,Low}$		0.2464	0.2730	0.4062	0.5823	0.8163	1.0726	1.2188	1.1500
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	$P_{VA,Tb}$	psia			0.2399	0.2627	0.3856	0.5457	0.7574	0.9898	1.1280	1.0735
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	P_f		= ($P_{VA,Tb}$ / P_A) / (1 + (1 - $P_{VA,Tb}$ / P_A)$^{0.5}$)^2 {Eqn. 2-3}		0.0043	0.0047	0.0069	0.0099	0.0138	0.0182	0.0208	0.0198
Average Ambient Wind Speed	Monthly Average	v	mph	= 0 {Domed EFR and all IFR tanks, Eqn. 2-3 Note 3}		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rim Seal Loss		L_R	lb/month	= (K_{Ra} + K_{Rb} * v^n) * D * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn. 2-2}		0.55	0.54	0.88	1.19	1.71	2.16	2.55	2.43
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	L_{WD}	lb/month	= 0.943 * (Q / (42 gal/bbl)) * C_S * W_L / D * (1 + (N_{Col} * F_C / D)) {Eqn. 2-4}		2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78
Deck Fitting Loss		L_F	lb/month	= F_F * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn 2-5}		2.12	2.09	3.36	4.58	6.56	8.31	9.80	9.32
Deck Seam Loss		L_D	lb/month	= 0 {welded IFR and all EFR tanks} = K_D * S_D * D^2 * P_f * M_V * K_C {Eqn. 2-9}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**L_T**	**lb/month**	**= L_R + L_{WD} + L_F + L_D {Eqn. 2-1}**		**5.45**	**5.42**	**7.02**	**8.56**	**11.05**	**13.26**	**15.14**	**14.54**

Parameter Title	Notes	Calculatio 9 Sep	10 Oct	11 Nov	12 Dec
Service		**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol	Ethyl alcohol
Speciation Profile	Select from list (add new in 'Speciation Input' tab):	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline	Ethanol with Natural Gasoline
Speciation Profile Type		Full Speciation	Full Speciation	Full Speciation	Full Speciation
Monthly Throughput		593,496	593,496	593,496	593,496
Days-In-Service	Input "0" for OOS	30	31	30	31
Shell Clingage Factor		0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	110.6	110.6	110.6	110.6
Daily Total Solar Insolation Factor		1,333	959	581	446
Product Factor	Eqn. 2-3	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_p into monthly emissions by scaling by the time in service for the month.	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	50.5	51.0	51.6	52.2
Liquid Molecular Weight		47.1	47.1	47.1	47.1
Liquid Density at 60 °F		6.55	6.55	6.55	6.55
Average Daily Minimum Ambient Temperature		53.50	42.30	34.10	24.40
Average Daily Maximum Ambient Temperature		74.30	62.50	50.40	38.60
Daily Average Ambient Temperature		63.90	52.40	42.25	31.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	65.70	53.70	43.04	32.11
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	63.92	52.42	42.27	31.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	0.9230	0.6261	0.4371	0.2979
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	0.8723	0.6002	0.4257	0.2917
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	0.0160	0.0109	0.0077	0.0052
Average Ambient Wind Speed	Monthly Average	0.0	0.0	0.0	0.0
Rim Seal Loss		1.91	1.36	0.94	0.67
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	2.78	2.78	2.78	2.78
Deck Fitting Loss		7.32	5.21	3.59	2.56
Deck Seam Loss		0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**12.01**	**9.35**	**7.31**	**6.01**

Floating Roof Tank Emissions

Based on AP-42, November 2006, Section 7.1.3.2.

Tool Last Updated: 12/14/15 *Click Here to Go Back to Cover Page*

Reporting Year	*2017*

Tank Reference Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Tank ID	Enter only Tank ID in this tab.			4006S2
Tank Name		TK_{name}		Gasoline EFR Scenario 2
Actual Location		Loc_{Act}		Newell, West Virginia
Location for Calculation Purposes		Loc_{Calc}		Pittsburgh, Pennsylvania
Tank Roof Type		TK_{roof}		EFR - Pontoon
Normal Capacity		Cap	gal	1,260,000
Diameter		D	ft	67.0
Shell Height or Length		H_S	ft	48.0
External Shell Color		SC_{ext}		White
External Shell Paint Condition		PC_{Shell}		Good
Roof Color/Shade		RC		White
Roof Paint Condition		PC_{Roof}		Good
Tank Shell Solar Absorbance		α_{Shell}		0.17
Tank Roof Paint Solar Absorbance		α_{Roof}		0.17
Total Tank Paint Solar Absorbance	= (α_{Shell} + α_{Roof}) / 2 {Note A, Table 7.1-6}	α_{Tot}		0.17
Ideal Gas Constant,		R	psia ft^3 / lbmole °R	10.731
Ambient Pressure		P_A	psia	14.109
Rim-Seal System		$TK_{RimSeal}$		Mechanical-shoe/Rim-mounted
Tank Fittings		$TK_{Fittings}$		Detail

Floating Roof Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Heated Tank?		HT		No
Liquid Bulk Temperature	Heated Tanks Only	T_B	Degrees F	--
Number of fixed roof support columns		N_{Col}		0
Effective Column Diameter	1.1 for 9" by 7" built-up column 0.7 for 8" diameter pipe column 1.0 for unknown pipe column	F_C	(col perimeter/π) ft	1.0
Internal Shell Condition		SC_{int}		Light Rust
Tank Construction		TK_{Const}		Welded
Deck Type		TK_{Deck}		--
Total Length of Deck Seams		L_{Seam}	ft	--
Area of deck	= π * D^2 / 4 {Eqn. 2-9}	A_{deck}	ft^2	3,525.7
Deck Seam Length Factor	= L_{Seam} / A_{deck} {Eqn. 2-9} = 0.20 ft/ft^2 {5' wide sheet} = 0.17 ft/ft^2 {6' wide sheet} = 0.14 ft/ft^2 {7' wide sheet} = 0.33 ft/ft^2 {5' x 7.5' panels} = 0.28 ft/ft^2 {5' 12' panels} = 0.20 ft/ft^2 {most common type}	S_D	ft/ft^2	--
Deck Construction (IFR w/Bolted Decks Only)	Not applicable if L_{Seam} specified.	$TK_{DeckConst}$		--
Zero wind speed rim seal loss factor	AP-42 Table 7.1-8	K_{RA}	lb-mole/ft-yr	0.6
Wind speed dependent rim seal loss factor	AP-42 Table 7.1-8	K_{RB}	lb-mole/$(mph)^n$-ft-yr	0.4
Fitting Wind Speed Correction Factor	= 0.7 {EFR Tanks Only} = 0.0 {IFR and Domed EFR Tanks Only} {Eqn. 2-7}	K_V		0.7
Seal related wind speed exponent		n		1.0
Days per Year	For leap years, days = 366	t_{yr}	days/yr	365

Emission Summary

Annual Throughput, gal	**32,850,000**	**Annual Turnovers**	**26.07**
Annual Emissions, tons	**2.12**		

Month	Normal Operation Loss, lbs	Emissions, tpy
Jan	218.03	0.109
Feb	208.11	0.104
Mar	299.71	0.150
Apr	362.70	0.181
May	426.34	0.213
Jun	473.66	0.237
Jul	512.72	0.256
Aug	465.41	0.233
Sep	401.19	0.201
Oct	340.47	0.170
Nov	291.19	0.146
Dec	242.09	0.1210

Note: The emission summary table is pulled into the Tank Emissions tab using cell references A31:B42. The emission summary must remain at this cell reference to function properly.

Calculations						1	2	3	4	5	6	7	8
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil					Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):			= User specified		Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):			= User specified		Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type				= User specified		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		Q	gal/month	= User specified		2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500
Days-In-Service	Input "0" for OOS	t_{IS}	days	= User specified		31	28	31	30	31	30	31	31
Shell Clingage Factor		C_S	bbl / 1000 ft^2	{Table 7.1-10}		0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	F_F	lb-mole/yr	= [(N_{F1} * K_{F1}) + (N_{F2} * K_{F2}) + … + (N_{Fnf} * K_{Fnf})] {Eqn. 2-6}		231.2	229.4	231.2	225.6	200.5	185.4	174.2	166.5
Daily Total Solar Insolation Factor		I	Btu / ft^2 day			552	794	1,117	1,452	1,736	1,922	1,881	1,663
Product Factor	Eqn. 2-3	K_C		= 0.4 {crude oils} = 1.0 {all other org. liquids}		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	K_D	lb-mole / ft-month	= 0.0 {IFR Tank with welded deck and all EFR Tanks} = 0.14 * t_{IS} / t_{yr} {bolted deck}		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	M_V	lb/lb-mole	= VOL data of tank contents {partial speciation} M_V = Σ (M_{Vi} * ($P_{VA,Tla}$-/$P_{VA,Tla}$)) M_L = 1 / Σ (Z_{Li} / M_L) {full speciation, Eqn. 1-22}		62.0	62.0	62.0	62.0	62.0	62.0	62.0	62.0
Liquid Molecular Weight		M_L	lb/lb-mole			92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
Liquid Density at 60 °F		W_L	lb/gal	= VOL data of tank contents {partial speciation} = Σ (M_{L-i} * Z_{Li}) {full speciation, Eqn. 1-22}		5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		T_{AN}	°F			18.50	20.30	29.80	38.80	48.40	56.90	61.60	60.20
Average Daily Maximum Ambient Temperature		T_{AX}	°F			33.70	36.90	49.00	60.30	70.60	78.90	82.60	80.80
Daily Average Ambient Temperature		T_{AA}	°F	= (T_{AX} + T_{AN}) / 2 {Eqn. 1-27}		26.10	28.60	39.40	49.55	59.50	67.90	72.10	70.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	T_{LA}	°F	= (0.44 * T_{AA}) + (0.56 * T_B) + (0.0079 * α_{Tot} * I) {Eqn. 1-26}		26.85	29.68	40.91	51.51	61.84	70.49	74.64	72.74
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	T_B	degrees F	= specified by user {heated tanks only} = T_{AA} + 6 * α_{Tot} - 1 {Eqn. 1-28}		26.12	28.62	39.42	49.57	59.52	67.92	72.12	70.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	$P_{VA,Tla}$	psia	*{full speciation profiles, Eqn. 1-22}:* Sum of partial true vapor pressures components. *{partial/no speciation profiles}:* Vapor pressures at T (°F) based on P_{VA} values in VOLs tab at ΔT (°F) increments by interpolating between the P_{VA} values at the next highest/lowest T. $P_{VA,T}$ = (T - T_{Low}) / (T_{High} - T_{Low}) * ($P_{VA,T,High}$ - $P_{VA,T,Low}$) + $P_{VA,T,Low}$		3.5872	3.8085	4.7996	5.9147	7.1915	8.4206	9.0657	8.7664
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	$P_{VA,Tb}$	psia			3.5316	3.7244	4.6572	5.6964	6.8870	8.0390	8.6695	8.4248
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	P_f		= ($P_{VA,Tb}$ / P_A) / (1 + (1 - $P_{VA,Tb}$ / P_A)$^{0.5}$)^2 {Eqn. 2-3}		0.0719	0.0765	0.0998	0.1286	0.1659	0.2078	0.2339	0.2235
Average Ambient Wind Speed	Monthly Average	v	mph	= 0 {Domed EFR and all IFR tanks, Eqn. 2-3 Note 3}		10.6	10.5	10.6	10.3	8.9	8.0	7.3	6.8
Rim Seal Loss		L_R	lb/month	= (K_{Ra} + K_{Rb} * v^n) * D * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn. 2-2}		122.78	116.97	170.45	207.18	243.46	269.61	290.45	261.74
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	L_{WD}	lb/month	= 0.943 * (Q / (42 gal/bbl)) * C_S * W_L / D * (1 + (N_{Col} * F_C / D)) {Eqn. 2-4}		7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71
Deck Fitting Loss		L_F	lb/month	= F_F * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn 2-5}		87.55	83.43	121.55	147.82	175.18	196.35	214.56	195.96
Deck Seam Loss		L_D	lb/month	= 0 {welded IFR and all EFR tanks} = K_D * S_D * D^2 * P_f * M_V * K_C {Eqn. 2-9}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**L_T**	**lb/month**	**= L_R + L_{WD} + L_F + L_D {Eqn. 2-1}**		**218.03**	**208.11**	**299.71**	**362.70**	**426.34**	**473.66**	**512.72**	**465.41**

Parameter Title	Notes	Calculatio 9 Sep	10 Oct	11 Nov	12 Dec
Service		**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		2,737,500	2,737,500	2,737,500	2,737,500
Days-In-Service	Input "0" for OOS	30	31	30	31
Shell Clingage Factor		0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	175.8	192.0	216.5	225.6
Daily Total Solar Insolation Factor		1,333	959	581	446
Product Factor	Eqn. 2-3	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	62.0	62.0	62.0	62.0
Liquid Molecular Weight		92.0	92.0	92.0	92.0
Liquid Density at 60 °F		5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		53.50	42.30	34.10	24.40
Average Daily Maximum Ambient Temperature		74.30	62.50	50.40	38.60
Daily Average Ambient Temperature		63.90	52.40	42.25	31.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	65.70	53.70	43.04	32.11
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	63.92	52.42	42.27	31.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	7.7208	6.1687	5.0088	4.0077
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	7.4728	6.0192	4.9322	3.9585
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	0.1864	0.1382	0.1071	0.0821
Average Ambient Wind Speed	Monthly Average	7.4	8.4	9.8	10.3
Rim Seal Loss		226.53	193.04	165.32	136.79
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	7.71	7.71	7.71	7.71
Deck Fitting Loss		166.95	139.72	118.17	97.59
Deck Seam Loss		0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**401.19**	**340.47**	**291.19**	**242.09**

Floating Roof Tank Emissions

Based on AP-42, November 2006, Section 7.1.3.2.

Tool Last Updated: 12/14/15 *Click Here to Go Back to Cover Page*

Reporting Year	*2017*

Tank Reference Parameters				
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Value**
Tank ID	Enter only Tank ID in this tab.			4005S2
Tank Name		TK_{name}		Prem Gasoline EFR Scenario 2
Actual Location		Loc_{Act}		Newell, West Virginia
Location for Calculation Purposes		Loc_{Calc}		Pittsburgh, Pennsylvania
Tank Roof Type		TK_{roof}		EFR - Pontoon
Normal Capacity		Cap	gal	1,260,000
Diameter		D	ft	67.0
Shell Height or Length		H_S	ft	48.0
External Shell Color		SC_{ext}		White
External Shell Paint Condition		PC_{Shell}		Good
Roof Color/Shade		RC		White
Roof Paint Condition		PC_{Roof}		Good
Tank Shell Solar Absorbance		α_{Shell}		0.17
Tank Roof Paint Solar Absorbance		α_{Roof}		0.17
Total Tank Paint Solar Absorbance	= (α_{Shell} + α_{Roof}) / 2 {Note A, Table 7.1-6}	α_{Tot}		0.17
Ideal Gas Constant,		R	psia ft^3 / lbmole °R	10.731
Ambient Pressure		P_A	psia	14.109
Rim-Seal System		$TK_{RimSeal}$		Mechanical-shoe/Rim-mounted
Tank Fittings		$TK_{Fittings}$		Detail

Floating Roof Parameters				
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Value**
Heated Tank?		HT		No
Liquid Bulk Temperature	Heated Tanks Only	T_B	Degrees F	--
Number of fixed roof support columns		N_{Col}		0
Effective Column Diameter	1.1 for 9" by 7" built-up column 0.7 for 8" diameter pipe column 1.0 for unknown pipe column	F_C	(col perimeter/π) ft	1.0
Internal Shell Condition		SC_{int}		Light Rust
Tank Construction		TK_{Const}		Welded
Deck Type		TK_{Deck}		--
Total Length of Deck Seams		L_{Seam}	ft	--
Area of deck	= π * D^2 / 4 {Eqn. 2-9}	A_{deck}	ft^2	3,525.7
Deck Seam Length Factor	= L_{Seam} / A_{deck} {Eqn. 2-9} = 0.20 ft/ft^2 {5' wide sheet} = 0.17 ft/ft^2 {6' wide sheet} = 0.14 ft/ft^2 {7' wide sheet} = 0.33 ft/ft^2 {5' x 7.5' panels} = 0.28 ft/ft^2 {5' 12' panels} = 0.20 ft/ft^2 {most common type}	S_D	ft/ft^2	--
Deck Construction (IFR w/Bolted Decks Only)	Not applicable if L_{Seam} specified.	$TK_{DeckConst}$		--
Zero wind speed rim seal loss factor	AP-42 Table 7.1-8	K_{RA}	lb-mole/ft-yr	0.6
Wind speed dependent rim seal loss factor	AP-42 Table 7.1-8	K_{RB}	lb-mole/$(mph)^n$-ft-yr	0.4
Fitting Wind Speed Correction Factor	= 0.7 {EFR Tanks Only} = 0.0 {IFR and Domed EFR Tanks Only} {Eqn. 2-7}	K_V		0.7
Seal related wind speed exponent		n		1.0
Days per Year	For leap years, days = 366	t_{yr}	days/yr	365

Emission Summary				
Annual Throughput, gal	**8,130,375**	**Annual Turnovers**	**6.45**	Note: The emission summary table is pulled into the Tank Emissions tab using cell references A31:B42. The emission summary must remain at this cell reference to function properly.
Annual Emissions, tons	**2.09**			
Month	**Normal Operation Loss, lbs**	**Emissions, tpy**		
Jan	212.24	0.106		
Feb	202.31	0.101		
Mar	293.91	0.147		
Apr	356.90	0.178		
May	420.54	0.210		
Jun	467.86	0.234		
Jul	506.93	0.253		
Aug	459.61	0.230		
Sep	395.39	0.198		
Oct	334.67	0.167		
Nov	285.39	0.143		
Dec	236.29	0.1181		

Calculations						1	2	3	4	5	6	7	8
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil					Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):			= User specified		Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):			= User specified		Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type				= User specified		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		Q	gal/month	= User specified		677,531	677,531	677,531	677,531	677,531	677,531	677,531	677,531
Days-In-Service	Input "0" for OOS	t_{IS}	days	= User specified		31	28	31	30	31	30	31	31
Shell Clingage Factor		C_S	bbl / 1000 ft^2	{Table 7.1-10}		0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	F_F	lb-mole/yr	= [(N_{F1} * K_{F1}) + (N_{F2} * K_{F2}) + … + (N_{Fnf} * K_{Fnf})] {Eqn. 2-6}		231.2	229.4	231.2	225.6	200.5	185.4	174.2	166.5
Daily Total Solar Insolation Factor		I	Btu / ft^2 day			552	794	1,117	1,452	1,736	1,922	1,881	1,663
Product Factor	Eqn. 2-3	K_C		= 0.4 {crude oils} = 1.0 {all other org. liquids}		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	K_D	lb-mole / ft-month	= 0.0 {IFR Tank with welded deck and all EFR Tanks} = 0.14 * t_{IS} / t_{yr} {bolted deck}		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	M_V	lb/lb-mole	= VOL data of tank contents {partial speciation} M_V = Σ (M_{Vi} * ($P_{VA,Tla}$-/$P_{VA,Tla}$)) M_L = 1 / Σ (Z_{Li} / M_L) {full speciation, Eqn. 1-22}		62.0	62.0	62.0	62.0	62.0	62.0	62.0	62.0
Liquid Molecular Weight		M_L	lb/lb-mole			92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
Liquid Density at 60 °F		W_L	lb/gal	= VOL data of tank contents {partial speciation} = Σ (M_{L-i} * Z_{Li}) {full speciation, Eqn. 1-22}		5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		T_{AN}	°F			18.50	20.30	29.80	38.80	48.40	56.90	61.60	60.20
Average Daily Maximum Ambient Temperature		T_{AX}	°F			33.70	36.90	49.00	60.30	70.60	78.90	82.60	80.80
Daily Average Ambient Temperature		T_{AA}	°F	= (T_{AX} + T_{AN}) / 2 {Eqn. 1-27}		26.10	28.60	39.40	49.55	59.50	67.90	72.10	70.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	T_{LA}	°F	= (0.44 * T_{AA}) + (0.56 * T_B) + (0.0079 * α_{Tot} * I) {Eqn. 1-26}		26.85	29.68	40.91	51.51	61.84	70.49	74.64	72.74
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	T_B	degrees F	= specified by user {heated tanks only} = T_{AA} + 6 * α_{Tot} - 1 {Eqn. 1-28}		26.12	28.62	39.42	49.57	59.52	67.92	72.12	70.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	$P_{VA,Tla}$	psia	*{full speciation profiles, Eqn. 1-22}:* Sum of partial true vapor pressures components. *{partial/no speciation profiles}:* Vapor pressures at T (°F) based on P_{VA} values in VOLs tab at ΔT (°F) increments by interpolating between the P_{VA} values at the next highest/lowest T. $P_{VA,T}$ = (T - T_{Low}) / (T_{High} - T_{Low}) * ($P_{VA,T,High}$ - $P_{VA,T,Low}$) + $P_{VA,T,Low}$		3.5872	3.8085	4.7996	5.9147	7.1915	8.4206	9.0657	8.7664
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	$P_{VA,Tb}$	psia			3.5316	3.7244	4.6572	5.6964	6.8870	8.0390	8.6695	8.4248
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	P_f		= ($P_{VA,Tb}$ / P_A) / (1 + (1 - $P_{VA,Tb}$ / P_A)$^{0.5}$)^2 {Eqn. 2-3}		0.0719	0.0765	0.0998	0.1286	0.1659	0.2078	0.2339	0.2235
Average Ambient Wind Speed	Monthly Average	v	mph	= 0 {Domed EFR and all IFR tanks, Eqn. 2-3 Note 3}		10.6	10.5	10.6	10.3	8.9	8.0	7.3	6.8
Rim Seal Loss		L_R	lb/month	= (K_{Ra} + K_{Rb} * v^n) * D * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn. 2-2}		122.78	116.97	170.45	207.18	243.46	269.61	290.45	261.74
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	L_{WD}	lb/month	= 0.943 * (Q / (42 gal/bbl)) * C_S * W_L / D * (1 + (N_{Col} * F_C / D)) {Eqn. 2-4}		1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91
Deck Fitting Loss		L_F	lb/month	= F_F * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn 2-5}		87.55	83.43	121.55	147.82	175.18	196.35	214.56	195.96
Deck Seam Loss		L_D	lb/month	= 0 {welded IFR and all EFR tanks} = K_D * S_D * D^2 * P_f * M_V * K_C {Eqn. 2-9}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**L_T**	**lb/month**	**= L_R + L_{WD} + L_F + L_D {Eqn. 2-1}**		**212.24**	**202.31**	**293.91**	**356.90**	**420.54**	**467.86**	**506.93**	**459.61**

Parameter Title	Notes	Calculatio 9 Sep	10 Oct	11 Nov	12 Dec
Service		**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		677,531	677,531	677,531	677,531
Days-In-Service	Input "0" for OOS	30	31	30	31
Shell Clingage Factor		0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	175.8	192.0	216.5	225.6
Daily Total Solar Insolation Factor		1,333	959	581	446
Product Factor	Eqn. 2-3	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	62.0	62.0	62.0	62.0
Liquid Molecular Weight		92.0	92.0	92.0	92.0
Liquid Density at 60 °F		5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		53.50	42.30	34.10	24.40
Average Daily Maximum Ambient Temperature		74.30	62.50	50.40	38.60
Daily Average Ambient Temperature		63.90	52.40	42.25	31.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	65.70	53.70	43.04	32.11
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	63.92	52.42	42.27	31.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	7.7208	6.1687	5.0088	4.0077
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	7.4728	6.0192	4.9322	3.9585
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	0.1864	0.1382	0.1071	0.0821
Average Ambient Wind Speed	Monthly Average	7.4	8.4	9.8	10.3
Rim Seal Loss		226.53	193.04	165.32	136.79
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	1.91	1.91	1.91	1.91
Deck Fitting Loss		166.95	139.72	118.17	97.59
Deck Seam Loss		0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**395.39**	**334.67**	**285.39**	**236.29**

Floating Roof Tank Emissions

Based on AP-42, November 2006, Section 7.1.3.2.

Tool Last Updated: 12/14/15 *Click Here to Go Back to Cover Page*

Reporting Year	*2017*

Tank Reference Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Tank ID	Enter only Tank ID in this tab.			4004S2
Tank Name		TK_{name}		Gasoline EFR Scenario 2
Actual Location		Loc_{Act}		Newell, West Virginia
Location for Calculation Purposes		Loc_{Calc}		Pittsburgh, Pennsylvania
Tank Roof Type		TK_{roof}		EFR - Pontoon
Normal Capacity		Cap	gal	1,260,000
Diameter		D	ft	67.0
Shell Height or Length		H_S	ft	48.0
External Shell Color		SC_{ext}		White
External Shell Paint Condition		PC_{Shell}		Good
Roof Color/Shade		RC		White
Roof Paint Condition		PC_{Roof}		Good
Tank Shell Solar Absorbance		α_{Shell}		0.17
Tank Roof Paint Solar Absorbance		α_{Roof}		0.17
Total Tank Paint Solar Absorbance	= (α_{Shell} + α_{Roof}) / 2 {Note A, Table 7.1-6}	α_{Tot}		0.17
Ideal Gas Constant,		R	psia ft^3 / lbmole °R	10.731
Ambient Pressure		P_A	psia	14.109
Rim-Seal System		$TK_{RimSeal}$		Mechanical-shoe/Rim-mounted
Tank Fittings		$TK_{Fittings}$		Detail

Floating Roof Parameters

Parameter Title	Notes	Parameter Symbol	Units	Value
Heated Tank?		HT		No
Liquid Bulk Temperature	Heated Tanks Only	T_B	Degrees F	--
Number of fixed roof support columns		N_{Col}		0
Effective Column Diameter	1.1 for 9" by 7" built-up column 0.7 for 8" diameter pipe column 1.0 for unknown pipe column	F_C	(col perimeter/π) ft	1.0
Internal Shell Condition		SC_{int}		Light Rust
Tank Construction		TK_{Const}		Welded
Deck Type		TK_{Deck}		--
Total Length of Deck Seams		L_{Seam}	ft	--
Area of deck	= π * D^2 / 4 {Eqn. 2-9}	A_{deck}	ft^2	3,525.7
Deck Seam Length Factor	= L_{Seam} / A_{deck} {Eqn. 2-9} = 0.20 ft/ft^2 {5' wide sheet} = 0.17 ft/ft^2 {6' wide sheet} = 0.14 ft/ft^2 {7' wide sheet} = 0.33 ft/ft^2 {5' x 7.5' panels} = 0.28 ft/ft^2 {5' 12' panels} = 0.20 ft/ft^2 {most common type}	S_D	ft/ft^2	--
Deck Construction (IFR w/Bolted Decks Only)	Not applicable if L_{Seam} specified.	$TK_{DeckConst}$		--
Zero wind speed rim seal loss factor	AP-42 Table 7.1-8	K_{RA}	lb-mole/ft-yr	0.6
Wind speed dependent rim seal loss factor	AP-42 Table 7.1-8	K_{RB}	lb-mole/$(mph)^n$-ft-yr	0.4
Fitting Wind Speed Correction Factor	= 0.7 {EFR Tanks Only} = 0.0 {IFR and Domed EFR Tanks Only} {Eqn. 2-7}	K_V		0.7
Seal related wind speed exponent		n		1.0
Days per Year	For leap years, days = 366	t_{yr}	days/yr	365

Emission Summary

Annual Throughput, gal	**32,850,000**	**Annual Turnovers**	**26.07**
Annual Emissions, tons	**2.12**		

Month	Normal Operation Loss, lbs	Emissions, tpy
Jan	218.03	0.109
Feb	208.11	0.104
Mar	299.71	0.150
Apr	362.70	0.181
May	426.34	0.213
Jun	473.66	0.237
Jul	512.72	0.256
Aug	465.41	0.233
Sep	401.19	0.201
Oct	340.47	0.170
Nov	291.19	0.146
Dec	242.09	0.1210

Note: The emission summary table is pulled into the Tank Emissions tab using cell references A31:B42. The emission summary must remain at this cell reference to function properly.

Calculations						1	2	3	4	5	6	7	8
Parameter Title	**Notes**	**Parameter Symbol**	**Units**	**Reference or Equation**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Service						**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil					Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):			= User specified		Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):			= User specified		Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type				= User specified		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		Q	gal/month	= User specified		2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500	2,737,500
Days-In-Service	Input "0" for OOS	t_{IS}	days	= User specified		31	28	31	30	31	30	31	31
Shell Clingage Factor		C_S	bbl / 1000 ft^2	{Table 7.1-10}		0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	F_F	lb-mole/yr	= [(N_{F1} * K_{F1}) + (N_{F2} * K_{F2}) + … + (N_{Fnf} * K_{Fnf})] {Eqn. 2-6}		231.2	229.4	231.2	225.6	200.5	185.4	174.2	166.5
Daily Total Solar Insolation Factor		I	Btu / ft^2 day			552	794	1,117	1,452	1,736	1,922	1,881	1,663
Product Factor	Eqn. 2-3	K_C		= 0.4 {crude oils} = 1.0 {all other org. liquids}		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	K_D	lb-mole / ft-month	= 0.0 {IFR Tank with welded deck and all EFR Tanks} = 0.14 * t_{IS} / t_{yr} {bolted deck}		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	M_V	lb/lb-mole	= VOL data of tank contents {partial speciation} M_V = Σ (M_{Vi} * ($P_{VA,Tla}$-/$P_{VA,Tla}$)) M_L = 1 / Σ (Z_{Li} / M_L) {full speciation, Eqn. 1-22}		62.0	62.0	62.0	62.0	62.0	62.0	62.0	62.0
Liquid Molecular Weight		M_L	lb/lb-mole			92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
Liquid Density at 60 °F		W_L	lb/gal	= VOL data of tank contents {partial speciation} = Σ (M_{L-i} * Z_{Li}) {full speciation, Eqn. 1-22}		5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		T_{AN}	°F			18.50	20.30	29.80	38.80	48.40	56.90	61.60	60.20
Average Daily Maximum Ambient Temperature		T_{AX}	°F			33.70	36.90	49.00	60.30	70.60	78.90	82.60	80.80
Daily Average Ambient Temperature		T_{AA}	°F	= (T_{AX} + T_{AN}) / 2 {Eqn. 1-27}		26.10	28.60	39.40	49.55	59.50	67.90	72.10	70.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	T_{LA}	°F	= (0.44 * T_{AA}) + (0.56 * T_B) + (0.0079 * α_{Tot} * I) {Eqn. 1-26}		26.85	29.68	40.91	51.51	61.84	70.49	74.64	72.74
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	T_B	degrees F	= specified by user {heated tanks only} = T_{AA} + 6 * α_{Tot} - 1 {Eqn. 1-28}		26.12	28.62	39.42	49.57	59.52	67.92	72.12	70.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	$P_{VA,Tla}$	psia	*{full speciation profiles, Eqn. 1-22}:* Sum of partial true vapor pressures components. *{partial/no speciation profiles}:* Vapor pressures at T (°F) based on P_{VA} values in VOLs tab at ΔT (°F) increments by interpolating between the P_{VA} values at the next highest/lowest T. $P_{VA,T}$ = (T - T_{Low}) / (T_{High} - T_{Low}) * ($P_{VA,T,High}$ - $P_{VA,T,Low}$) + $P_{VA,T,Low}$		3.5872	3.8085	4.7996	5.9147	7.1915	8.4206	9.0657	8.7664
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	$P_{VA,Tb}$	psia			3.5316	3.7244	4.6572	5.6964	6.8870	8.0390	8.6695	8.4248
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	P_f		= ($P_{VA,Tb}$ / P_A) / (1 + (1 - $P_{VA,Tb}$ / P_A)$^{0.5}$)^2 {Eqn. 2-3}		0.0719	0.0765	0.0998	0.1286	0.1659	0.2078	0.2339	0.2235
Average Ambient Wind Speed	Monthly Average	v	mph	= 0 {Domed EFR and all IFR tanks, Eqn. 2-3 Note 3}		10.6	10.5	10.6	10.3	8.9	8.0	7.3	6.8
Rim Seal Loss		L_R	lb/month	= (K_{Ra} + K_{Rb} * v^n) * D * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn. 2-2}		122.78	116.97	170.45	207.18	243.46	269.61	290.45	261.74
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	L_{WD}	lb/month	= 0.943 * (Q / (42 gal/bbl)) * C_S * W_L / D * (1 + (N_{Col} * F_C / D)) {Eqn. 2-4}		7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71
Deck Fitting Loss		L_F	lb/month	= F_F * P_f * M_V * K_C * t_{IS} / t_{yr} {Eqn 2-5}		87.55	83.43	121.55	147.82	175.18	196.35	214.56	195.96
Deck Seam Loss		L_D	lb/month	= 0 {welded IFR and all EFR tanks} = K_D * S_D * D^2 * P_f * M_V * K_C {Eqn. 2-9}		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**L_T**	**lb/month**	**= L_R + L_{WD} + L_F + L_D {Eqn. 2-1}**		**218.03**	**208.11**	**299.71**	**362.70**	**426.34**	**473.66**	**512.72**	**465.41**

Parameter Title	Notes	Calculatio 9 Sep	10 Oct	11 Nov	12 Dec
Service		**Main Service**	**Main Service**	**Main Service**	**Main Service**
Type of Substance	Select Organic Liquid, Petroleum Distillate, or Crude Oil	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate	Petroleum Distillate
Contents of Tank	Select from list (add new compounds in 'VOLs' tab):	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)	Gasoline (RVP 13)
Speciation Profile	Select from list (add new in 'Speciation Input' tab):	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal	Gasoline - Normal
Speciation Profile Type		Partial Speciation	Partial Speciation	Partial Speciation	Partial Speciation
Monthly Throughput		2,737,500	2,737,500	2,737,500	2,737,500
Days-In-Service	Input "0" for OOS	30	31	30	31
Shell Clingage Factor		0.0015	0.0015	0.0015	0.0015
Total Deck Fitting Loss Factor	Eqn. 2-6	175.8	192.0	216.5	225.6
Daily Total Solar Insolation Factor		1,333	959	581	446
Product Factor	Eqn. 2-3	1.0	1.0	1.0	1.0
Deck Seam Loss per Unit Seam Length Factor	Converted K_D into monthly emissions by scaling by the time in service for the month.	0.000	0.000	0.000	0.000
Vapor Molecular Weight	When using full speciation profiles, calculated as the weighted average of the M of each component.	62.0	62.0	62.0	62.0
Liquid Molecular Weight		92.0	92.0	92.0	92.0
Liquid Density at 60 °F		5.60	5.60	5.60	5.60
Average Daily Minimum Ambient Temperature		53.50	42.30	34.10	24.40
Average Daily Maximum Ambient Temperature		74.30	62.50	50.40	38.60
Daily Average Ambient Temperature		63.90	52.40	42.25	31.50
Daily Average Liquid Surf. Temperature	Constant 0.0079 has units of (°R-ft^2-day/btu).	65.70	53.70	43.04	32.11
Liquid Bulk Temperature	If T_B is unknown, see AP-42 7.1-23 Note 3. Not included here as T_B is always calculated.	63.92	52.42	42.27	31.52
Vapor Pressure at Daily Av. Liquid Surf. Temp.	Used for speciated emissions and most vapor pressures. $P_{VA,Tla}$ uses T_{LA}.	7.7208	6.1687	5.0088	4.0077
Vapor Pressure at Daily Av. Liquid Bulk Temp.	Used for vapor space expansion factor. $P_{VA,Tb}$ uses T_B.	7.4728	6.0192	4.9322	3.9585
Vapor Pressure Function	Use T_B for calculating P_{VA} per Eqn. 2-3 Note 3.	0.1864	0.1382	0.1071	0.0821
Average Ambient Wind Speed	Monthly Average	7.4	8.4	9.8	10.3
Rim Seal Loss		226.53	193.04	165.32	136.79
Withdrawal Loss	Constant 0.943 has units of (1,000 ft^3 gal / bbl^2)	7.71	7.71	7.71	7.71
Deck Fitting Loss		166.95	139.72	118.17	97.59
Deck Seam Loss		0.00	0.00	0.00	0.00
Total Emission from Normal Operation		**401.19**	**340.47**	**291.19**	**242.09**

ATTACHMENT O – MONITORING RECORDKEEPING REPORTING

Attachment O - Monitoring, Recordkeeping, Reporting, and Testing

Source	Monitoring	Recordkeeping	Reporting	Testing
External Floating Roof Tanks TK-4004 TK-4005 TK-4006 TK-4071	The permittee will comply with the applicable inspection requirements of 40 CFR 60.113b.	The permittee will keep monthly records of throughput. The permittee will estimate monthly and annual emissions for criteria pollutants. The permittee sill comply with the applicable recordkeeping requirements of 40 CFR 60 Subpart Kb.	The permittee will comply with the applicable reporting requirements of 40 CFR 60.115b.	NA
Internal Floating Roof Tanks TK-4070	The permittee will comply with the applicable inspection requirements of 40 CFR 60.113b.	The permittee will keep monthly records of throughput. The permittee will estimate monthly and annual emissions for criteria pollutants. The permittee sill comply with the applicable recordkeeping requirements of 40 CFR 60 Subpart Kb.	The permittee will comply with the applicable reporting requirements of 40 CFR 60.115b.	NA
Fixed Roof Tank TK-4072	NA	The permittee will keep monthly records of throughput. The permittee will estimate monthly and annual emissions for criteria pollutants.	NA	NA

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Ergon-West Virginia Inc. (EWVI) has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction and Modification Permit for a petroleum refinery located on 9995 Ohio River Blvd. in Newell, Hancock County, West Virginia. The latitude and longitude coordinates are:
40.60613, -80.63357.

The applicant estimates the increased potential to discharge for the following Regulated Air Pollutants will be:

Pollutant	Emissions in tpy (tons per year)
CO	0.43
NOX	0.09
PM	0.01
PM10	0.01
PM2.5	0.01
SO_2	1.23
VOC	7.76
Total HAP	0.79
Benzene	0.09
Toluene	0.67
Ethylbenzene	0.13
Xylene	0.67
Hexane	0.10
2,2,4-Trimethylpentane	0.21

Startup of operation is planned to begin on or about the day of DATE. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.
Dated this the **(Day)** day of **(Month)**, **(Year)**.

By: Ergon-West Virginia Inc. (EWVI)
Neil Stanton
Vice-President, Refining
9995 Ohio River Blvd.
Newell, West Virginia 26050

ATTACHMENT S – TITLE V REVISION INFORMATION FORM

Attachment S

Title V Permit Revision Information

1. New Applicable Requirements Summary

Mark all applicable requirements associated with the changes involved with this permit revision:

☐ SIP	☐ FIP
☒ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☒ Section 111 NSPS (Subpart 40 CFR 60 Subpart Kb)	☐ Section 112(d) MACT standards (Subpart(s)_____)
☐ 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) (1)
☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)

(1) If this box is checked, please include **Compliance Assurance Monitoring (CAM) Form(s)** for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why **Compliance Assurance Monitoring** is not applicable:

2. Non Applicability Determinations

List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.

40 CFR 63 Subpart CC and 40 CFR 63 Subpart UUU. These NESHAP standards apply to major HAP source facilities. The Newell Refinery is an area HAP source; as such, these NESHAP standards do not apply.

☒ **Permit Shield Requested** *(not applicable to Minor Modifications)*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

3. Suggested Title V Draft Permit Language

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision? ☐ Yes ☒ No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

It will be necessary to add the following emissions units: TK-4070 (gasoline tank), TK-4071 (ethanol tank), and TK-4072 (feedstock tank). It will be necessary to update the permit conditions for modified tanks TK-4004, TK-4005, and TK-4006. See attached suggested permit language.

4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
R13-2334AA	06/05/2017	
	/ /	
	/ /	

5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	/ /	
	/ /	
	/ /	

6. Change in Potential Emissions

Pollutant	Change in Potential Emissions (+ or -), TPY
CO	0.43
NOx	0.09
PM/PM10/PM2.5	0.01
SO2	1.23
VOC	7.76
Total HAPs	0.79

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

7. **Certification For Use Of Minor Modification Procedures** ***(Required Only for Minor Modification Requests)***	
Note:	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed): Neil Stanton *(Please use blue ink)* Date: 4 / 30 / 18 *(Please use blue ink)*

Named (typed): *Neil Stanton* Title: *Vice President - Refining*

Note: Please check if the following included (if applicable):

☐	Compliance Assurance Monitoring Form(s)
☒	Suggested Title V Draft Permit Language

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT T – APPLICATION FEE

ATTACHMENT U – SUGGESTED TITLE V LANGUAGE

ATTACHMENT U – TITLE V PERMIT SUGGESTED LANGUAGE

Suggested language is provided for section 7.0 of the Title V permit for the current storage tank project.

EWVI is also requesting a few Title V permit language cleanup items:

- The emissions unit table in Section 1.0 of the permit shows TK-4012 and TK-4012 equipped with mechanical shoe type seals. The tanks are actually equipped with vapor mounted double-seal systems. We request the emissions unit table be updated to reflect the vapor mounted seal design.

- Title V permit Condition 5.1.9 contains a table of emissions limits. EWVI notes that the SO2 emissions limit for the MLDOX contains a typographical error. The SO2 limitation should have been listed as 1.64 TPY and 0.16 TPM from a previous permit modification.

- Title V permit Condition 5.1.10 contains a table of throughput limits. The last row of the table contains an operational limitation on non-pilot hours of operation of the Main/Sour Gas Flare. EWVI submitted a Class II Administrative permit application to revise the permit language related to the main and sour gas flares. As a part of this application, EWVI requested the hourly limit on non-pilot operation be removed. The subsequent permit R13-2334Z was issued by WVDEP on 11/30/2016 incorporating the revised permit language related to the flares; however, the non-pilot hour limit in the table was inadvertently overlooked and should have been removed. The R13 permit was later incorporated in the facility's Title V permit as modified on 6/5/2017. The hour limitation on the flare was again inadvertently overlooked in the Condition 5.1.10 table. At this time, EWVI requests the non-pilot hour limitation on the flare be removed.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
00P-01	FWPUMP1	Diesel Firewater Pump at River Dock	2006	350 hp	N/A
00P-02	FWPUMP2	Diesel Firewater Pump at Boiler House	1993	350 hp	N/A
		Tanks			
4000	TK-4000	External floating roof; crude oil; mechanical shoe	1992	2,310,000 gallons	N/A
4001	TK-4001	External floating roof; crude oil; mechanical shoe	1973	2,310,000 gallons	N/A
4002	TK-4002	External floating roof; heavy products or kerosene; mechanical shoe	1970	2,310,000 gallons	N/A
4003	TK-4003	External floating roof; heavy products or kerosene; mechanical shoe	1970	2,310,000 gallons	N/A
4004	TK-4004	External floating roof; gasoline; mechanical shoe	1971/2018	1,260,000 gallons	N/A
4005	TK-4005	External floating roof; gasoline; mechanical shoe	1971/2018	1,260,000 gallons	N/A
4006	TK-4006	External floating roof; gasoline; mechanical shoe	1971/2018	1,260,000 gallons	N/A
4007	TK-4007	Fixed roof; heavy products	1971	2,310,000 gallons	N/A
4008	TK-4008	Fixed roof; heavy products	1970	1,260,000 gallons	N/A
4009	TK-4009	Fixed roof; heavy products or kerosene	1971	1,260,000 gallons	N/A
4010	TK-4010	Fixed roof; heavy products	1970	1,260,000 gallons	N/A
4011	TK-4011	Fixed roof; heavy products or kerosene	1971	1,239,568 gallons	N/A
4012	TK-4012	Internal floating roof; gasoline; Vapor-mounted	1971	630,000 gallons	N/A
4013	TK-4013	Internal floating roof; gasoline; Vapor-mounted	1971	630,000 gallons	N/A
4014	TK-4014	External floating roof; gasoline; mechanical shoe	1971/2013	315,000 gallons	N/A
4015	TK-4015	External floating roof; gasoline; mechanical shoe	1971/2013	315,000 gallons	N/A
4016	TK-4016	External floating roof; gasoline; mechanical shoe	1971	315,000 gallons	N/A
4017	TK-4017	Fixed roof; heavy products	1971	840,000 gallons	N/A
4018	TK-4018	Fixed roof; heavy products	1971/2000	704,970 gallons	N/A
4019	TK-4019	Fixed roof; heavy products	1971	704,970 gallons	N/A
4020	TK-4020	Fixed roof; heavy products	1971	840,000 gallons	N/A
4021	TK-4021	Fixed roof; heavy products	1971	840,000 gallons	N/A
4022	TK-4022	Fixed roof; heavy products	1971	571,200 gallons	N/A
4023	TK-4023	Fixed roof; heavy products	1971	571,200 gallons	N/A
4024	TK-4024	Fixed roof; heavy products	1970	840,000 gallons	N/A
4025	TK-4025	Fixed roof; heavy products	1970	840,000 gallons	N/A
4026	TK-4026	Fixed roof; heavy products	1970	840,000 gallons	N/A

Deleted: 050

Deleted: 050

Deleted: 050

Deleted: mechanical shoe

Deleted: mechanical shoe

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
4070	TK-4070	Internal floating roof; ethanol	2018	630,000	N/A
4071	TK-4071	External floating roof; gasoline; mechanical shoe	2018	1,260,000	N/A
4072	TK-4072	Fixed roof; feedstock tank	2018	1,260,000	N/A

5.1.9. Emissions shall not exceed those listed below. Annual emission limits are based on a 12-month rolling basis.

	Emission Point ID									
	F1 (pilot light)		F2 (pilot light)		TLOAD & OXIDIZER		MLD & MLDOX		NH3OX	
	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY
CO	0.007	0.074	0.013	0.129	~~0.21~~	~~2.12~~	0.27	~~2.67~~	0.80	7.96
NOx	0.009	0.088	0.015	0.153	0.04	~~0.39~~	0.05	~~0.49~~	0.05	0.5
PM2.5	0.001	0.007	0.001	0.012	0.01	0.04	0.01	0.05	0.02	0.22
PM10					0.01	0.04	0.01	0.05	0.02	0.22
PM					0.01	0.04	0.01	0.05	0.02	0.22
SO2					~~0.13~~	~~1.26~~	~~0.17~~	~~1.67~~	0.01	0.02
VOC	0.001	0.005	0.001	0.008	~~1.82~~	~~18.17~~	~~1.22~~	~~12.24~~	0.10	1.00
Total HAP					~~0.32~~	~~3.22~~	~~0.13~~	~~1.30~~		
Benzene					0.03	~~0.32~~	0.01	~~0.08~~		

Deleted: 0.20
Deleted: 1.98
Deleted: 2.63
Deleted: 0.36
Deleted: 0.48
Deleted: 0.02
Deleted: 1.16
Deleted: 0.08
Deleted: 0.72
Deleted: 1.57
Deleted: 15.77
Deleted: 1.09
Deleted: 10.86
Deleted: 0.27
Deleted: 2.68
Deleted: 0.11
Deleted: 1.05
Deleted: 0.26
Deleted: 0.05

5.1.10. The permittee shall not exceed the annual limits in the table below that correspond to the emission limits established in requirement 5.1.9. Annual quantities are based on a 12-month rolling basis.

Throughput Limits		
Location	Product	Quantity (Mgal/year)
Marine Loading	Gasoline	~~40387~~
	Light Crude Oil (including oil with a vapor pressure up to 11.0 psia)	306600
	Diesel	37065
	Kerosene	46000
	Lube Oil/ Heavy Products	30660
Truck Loading	Diesel	134904
	Gasoline	~~96966~~
	No. 6 Fuel Oil	13650
	Kerosene	15330
	Lube Oil/ Heavy Products	136920
~~Operational Limits~~		
~~Location~~	~~Product~~	~~Quantity~~
~~Main/Sour Gas Flare [F1]~~	~~Non-Pilot emissions~~	~~250 hours~~

Gasoline 62,031 MGal/yr

Gasoline 134,904 MGal/yr

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7.0 Tank Requirements

7.1. Limitations and Standards

7.1.1. Storage tanks are limited to the raw material/ product type and throughput provided in the table below:

Tank ID No.	Raw Material/Product Type (gallons/year)
4000, 4001, 4060, 4061, and 4072	crude oil (802,264,890)
4062 and 4063	light crude oil w/vapor pressure up to 11.0 psia (306,600,000)
4004, 4005, 4006, 4012, 4013, 4014, 4015, 4016, 4050, 4052, 4053, 4070, and 4071	gasoline or ethanol (318,034,433)
4002, 4003, 4009, 4011, 4054, 4055, 4056, and 4057	heavy products or kerosene (406,459,760)
4007, 4008, 4010, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 4027, 4028, 4029, 4030, 4031, 4032, 4033, 4034, 4035, 4036, 4037, 4038, 4039, 4040, 4041, 4042, 4043, 4044, 4045, 4046, 4047, 4048, 4051, 4103, and 4104	heavy products (550,817,989)

[45CSR13 - Permit R13-2334 - 7.1.1.]

Deleted: 282,320,300

7.1.2. Combined emissions from the tanks listed in section 7.1.1 shall not exceed the following:

Pollutant	Emission Rate	
	TPM	TPY
Total VOC	5.79	57.85
Benzene	0.08	0.81
Total HAP	0.65	6.54

[45CSR13 - Permit R13-2334 - 7.1.2.]

Deleted: 5.39

Deleted: 53.87

7.1.3. Fixed roof **Tanks 4012 and 4013** shall be equipped with internal floating roofs to minimize emissions of VOC's.
[45CSR13 - Permit R13-2334 - 7.1.3.]

7.1.4. The following slotted guidepole requirements apply to **Tanks 4001, 4002, 4003, 4004, 4005, 4006, 4014, 4015, and 4016**:

Deleted: 4000

a. Each and every slotted guidepole that passes through the floating roof shall be equipped with one of the following: a pole float system; an alternate control technology that has an emission factor less than or equal to the emission factor for a pole float system; a pole sleeve system; an internal sleeve emission control system; a solid guidepole system; a flexible enclosure system; or

b. In the alternative, the Permittee may elect to cover an external floating roof tank with a fixed roof mounted on the tank above the external floating roof, or remove the tank from the service storing

liquids subject to NSPS Ka or Kb, modify the permit for that tank, and represent to the West Virginia Division of Air Quality that the tank will not be used to store certain petroleum liquids or volatile organic liquids.

c. For systems that use a sliding cover, the sliding cover shall be in place over the slotted-guidepole opening in the floating roof at all times, except, when the sliding cover must be removed for access. If the control technology used includes a guidepole float, the float shall be floating within the guidepole at all times except when it must be removed for access to the stored liquid or when the tank is empty.

d. The permittee shall visually inspect the deck fitting for the slotted guidepole at least once every ten (10) years and each time the vessel is emptied and degassed. If the slotted guidepole deck fitting or control device has defects, or if a gap that is more than 0.32 centimeters (1/8 inch) exists between any gasket required for control of the slotted guidepole deck fitting and any surface that it is intended to seal, such items shall be repaired before filling or refilling the storage vessel with regulated material.

e. Tanks taken out of hydrocarbon service, for any reason, do not have to have any controls in place during the time they are taken out of service. Tanks taken out of service must have in place, prior to being put back into service, all controls necessary to remain below the emission limits set forth by the current version of permit R13-2334.

[45CSR13 - Permit R13-2334 - 7.1.4. and 7.1.5.]

7.1.5. The following 40 CFR 60 Subpart K requirements apply to **Tanks 4036, 4037, 4038, and 4039:**

Deleted: 4001, 4035,
Deleted: , and 4041

The owner or operator of any storage vessel to which 40 CFR Part 60 Subpart K applies shall store petroleum liquids as follows: if the true vapor pressure of the petroleum liquid, as stored, is equal to or greater than 78 mm Hg (1.5 psia) but not greater than 570 mm Hg (11.1 psia), the storage vessel shall be equipped with a floating roof, a vapor recovery system, or their equivalents.

[40 CFR § 60.112(a)(1) and 45CSR§16-2.1.; 45CSR13 - Permit R13-2334 - 7.1.6.]

7.1.6. The following 40 CFR 60 Subpart Ka requirements apply to **Tanks 4035, 4040, 4042, 4043, 4044, 4045, and 4046**:

Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Ka:4035, 4040, 4042, 4043, 4044, 4045, and 4046:

The owner or operator of each storage vessel to which 40 CFR Part 60 Subpart Ka applies which contains a petroleum liquid which, as stored, has a true vapor pressure equal to or greater than 10.3 kPa (1.5 psia) but not greater than 76.6 kPa (11.1 psia) shall equip the storage vessel with one of the following:

(1) An external floating roof, consisting of a pontoon-type or double-deck-type cover that rests on the surface of the liquid contents and is equipped with a closure device between the tank wall and the roof edge. Except as provided in 40 CFR § 60.112a (a)(1)(ii)(D), 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 roof is to be floating on the liquid at all times (i.e., off the roof leg supports) except during initial fill and when the tank is completely emptied and subsequently refilled. The process of emptying and refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

(i) The primary seal is to be either a metallic shoe seal, a liquid-mounted seal, or a vapor-mounted seal. Each seal is to meet the following requirements:

(A) The accumulated area of gaps between the tank wall and the metallic shoe seal or the liquid-mounted seal shall not exceed 212 cm2 per meter of tank diameter (10.0 in2 per ft of tank diameter) and the width of any portion of any gap shall not exceed 3.81 cm (1½ in).

(B) The accumulated area of gaps between the tank wall and the vapor-mounted seal shall not exceed 21.2 cm2 per meter of tank diameter (1.0 in2 per ft of tank diameter) and the width of any portion of any gap shall not exceed 1.27 cm (½ in).

(C) One end of the metallic shoe is to extend into the stored liquid and the other end is to extend a minimum vertical distance of 61 cm (24 in) above the stored liquid surface.

(D) There are to be no holes, tears, or other openings in the shoe, seal fabric, or seal envelope.

(ii) The secondary seal is to meet the following requirements:

(A) 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 § 60.112a (a)(1)(ii)(B).

(B) The accumulated area of gaps between the tank wall and the secondary seal used in combination with a metallic shoe or liquid-mounted primary seal shall not exceed 21.2 cm2 per meter of tank diameter (1.0 in2 per ft. of tank diameter) and the width of any portion of any gap shall not exceed 1.27 cm (½ in.). There shall be no gaps between the tank wall and the secondary seal used in combination with a vapor-mounted primary seal.

(C) There are to be no holes, tears or other openings in the seal or seal fabric.

(D) The owner or operator is exempted from the requirements for secondary seals and the secondary seal gap criteria when performing gap measurements or inspections of the primary seal.

(iii) Each opening in the roof except for automatic bleeder vents and rim space vents is to provide a projection below the liquid surface. Each opening in the roof except for automatic bleeder vents, rim space vents and leg sleeves is to be equipped with a cover, seal 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 or as described in 40 CFR § 60.112a (a)(1)(iv). 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.

(iv) 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.

(2) A fixed roof with an internal floating type cover equipped with a continuous closure device between the tank wall and the cover edge. The cover is to be floating at all times, (i.e., off the leg supports) except during initial fill and when the tank is completely emptied and subsequently refilled. The process of emptying and refilling when the cover is resting on the leg supports shall be continuous and shall be

accomplished as rapidly as possible. Each opening in the cover except for automatic bleeder vents and the rim space vents is to provide a projection below the liquid surface. Each opening in the cover except for automatic bleeder vents, rim space vents, stub drains and leg sleeves is to be equipped with a cover, seal, 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. Automatic bleeder vents are to be closed at all times when the cover is floating except when the cover is being floated off or is being landed on the leg supports. Rim vents are to be set to open only when the cover is being floated off the leg supports or at the manufacturer's recommended setting.

(3) A vapor recovery system which collects all VOC vapors and gases discharged from the storage vessel, and a vapor return or disposal system which is designed to process such VOC vapors and gases so as to reduce their emission to the atmosphere by at least 95 percent by weight.

(4) A system equivalent to those described in 40 CFR § 60.112a (a)(1), (a)(2), or (a)(3) as provided in 40 CFR § 60.114a.

[40 CFR § 60.112a (a) and 45CSR16]

7.1.7. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071**:

Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Kb: 4034, 4047, 4048, 4051, 4054, 4055, 4056, 4057.

Deleted: 4001,

Deleted: 4014, 4015, 4018,

Deleted: 4052, 4053,

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a. The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 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 m^3 but less than 151 m^3 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:

1. A fixed roof in combination with an internal floating roof meeting the following specifications:

i. 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.

ii. 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:

A. 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.

B. 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.

C. 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.

iii. 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.

iv. 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.

v. 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.

vi. 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.

vii. 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.

viii. 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.

ix. Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

2. An external floating roof. An external floating roof means a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof. Each external floating roof must meet the following specifications:

i. 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.

A. 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.

B. 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).

ii. 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.

iii. 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.

3. A closed vent system and control device meeting the following specifications:

i. The closed vent system shall be designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background and visual inspections, as determined in 40 CFR part 60, subpart VV, § 60.485(b).

ii. The control device shall be designed and operated to reduce inlet VOC emissions by 95 percent or greater. If a flare is used as the control device, it shall meet the specifications described in the general control device requirements (40 CFR § 60.18) of the General Provisions.

4. A system equivalent to those described in paragraphs a.1., a.2., or a.3. above as provided in 40 CFR § 60.114b.

b. The owner or operator of each storage vessel with a design capacity greater than or equal to 75 m^3 which contains a VOL that, as stored, has a maximum true vapor pressure greater than or equal to 76.6 kPa shall equip each storage vessel with one of the following:

1. A closed vent system and control device as specified in 40 CFR § 60.112b(a)(3).

2. A system equivalent to that described in paragraph b.1. above as provided in 40 CFR § 60.114b.

[40 CFR § 60.112b(a) and (b) and 45CSR§16-2.1.; 45CSR13 - Permit R13-2334 - 7.1.7.]

7.2. Monitoring Requirements

7.2.1. Compliance with Section 7.1.4. may be determined by visual inspection by the Director or a duly authorized representative of the Director.
[45CSR13 - Permit R13-2334 - 7.2.1.]

7.2.2. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071:**
Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Kb: 4034, 4047, 4048, 4051, 4054, 4055, 4056, 4057.

Deleted: 4001,
Deleted: 4014, 4015, 4018,
Deleted: 4052, 4053,
Deleted: and

The owner or operator of each storage vessel as specified in 40 CFR § 60.112b(a) shall meet the requirements of paragraph a., b., or c. 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.

a. After installing the control equipment required to meet 40 CFR § 60.112b(a)(1) (permanently affixed roof and internal floating roof), each owner or operator shall:

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 in 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 § 60.112b(a)(1)(ii)(B) :

i. Visually inspect the vessel as specified in paragraph a.4. of this section at least every 5 years; or

ii. Visually inspect the vessel as specified in paragraph a.2. of this section.

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 paragraphs a.2. and a.3.ii. of this section and at intervals no greater than 5 years in the case of vessels specified in paragraph a.3.i. of this section.

5. Notify the Administrator in writing at least 30 days prior to the filling or refilling of each storage vessel for which an inspection is required by paragraphs a.1. and a.4. of this section to afford the Administrator the opportunity to have an observer present. If the inspection required by paragraph a.4. of this section is not planned and the owner or operator could not have known about the inspection 30 days in advance or 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.

b. After installing the control equipment required to meet 40 CFR § 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 paragraphs b.1.i. and b.1.ii. of this section.

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 paragraph b.2.ii. of this section 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 paragraph b.4. of this section.

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).

5. Notify the Administrator 30 days in advance of any gap measurements required by paragraph b.1. of this section 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.

ii. For all the inspections required by paragraph b.6. of this section, 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 paragraph b.6. of this section 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.

c. The owner or operator of each source that is equipped with a closed vent system and control device as required in § 60.112b (a)(3) or (b)(2) (other than a flare) is exempt from § 60.8 of the General Provisions and shall meet the following requirements.

1. Submit for approval by the Administrator as an attachment to the notification required by § 60.7(a)(1) or, if the facility is exempt from § 60.7(a)(1), as an attachment to the notification required by § 60.7(a)(2), an operating plan containing the information listed below.

i. Documentation demonstrating that the control device will achieve the required control efficiency during maximum loading conditions. This documentation is to include a description of the gas stream which enters the control device, including flow and VOC content under varying liquid level conditions (dynamic and static) and manufacturer's design specifications for the control device. If the control device or the closed vent capture system receives vapors, gases, or liquids other than fuels from sources that are not designated sources under 40 CFR Part 60 subpart K, the efficiency demonstration is to include consideration of all vapors, gases, and liquids received by the closed vent capture system and control device. If an enclosed combustion device with a minimum residence time of 0.75 seconds and a minimum temperature of 816 °C is used to meet the 95 percent requirement, documentation that those conditions will exist is sufficient to meet the requirements of this paragraph.

ii. A description of the parameter or parameters to be monitored to ensure that the control device will be operated in conformance with its design and an explanation of the criteria used for selection of that parameter

2. Operate the closed vent system and control device and monitor the parameters of the closed vent system and control device in accordance with the operating plan submitted to the Administrator in accordance with paragraph c.1. of this section, unless the plan was modified by the Administrator during the review process. In this case, the modified plan applies.

d. The owner or operator of each source that is equipped with a closed vent system and a flare to meet the requirements in § 60.112b (a)(3) or (b)(2) shall meet the requirements as specified in the general control device requirements, § 60.18 (e) and (f).

[40 CFR § 60.113b and 45CSR§16-2.1.; 45CSR13 - Permit R13-2334 - 7.2.2., 7.2.3.]

7.2.3. The following 40 CFR 60 Subpart Ka requirements apply to **Tanks 4035, 4040, 4042, 4043, 4044, 4045, and 4046**:

Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Ka:4035, 4040, 4042, 4043, 4044, 4045, and 4046:

a. Except as provided in 40 CFR §60.8(b) compliance with the standard prescribed in 40 CFR §60.112a shall be determined as follows or in accordance with an equivalent procedure as provided in 40 CFR §60.114a.

1. The owner or operator of each storage vessel to which this subpart applies which has an external floating roof shall meet the following requirements:

i. Determine the gap areas and maximum gap widths between the primary seal and the tank wall and between the secondary seal and the tank wall according to the following frequency:

A. For primary seals, gap measurements shall be performed within 60 days of the initial fill with petroleum liquid and at least once every five years thereafter. All primary seal inspections or gap measurements which require the removal or dislodging of the

secondary seal shall be accomplished as rapidly as possible and the secondary seal shall be replaced as soon as possible.

B. For secondary seals, gap measurements shall be performed within 60 days of the initial fill with petroleum liquid and at least once every year thereafter.

C. If any storage vessel is out of service for a period of one year or more, subsequent refilling with petroleum liquid shall be considered initial fill for the purposes of paragraphs 40 CFR §§ 60.113a(a)(1)(i)(A) and (a)(1)(i)(B).

D. Keep records of each gap measurement at the plant for a period of at least 2 years following the date of measurement. Each record shall identify the vessel on which the measurement was performed and shall contain the date of the seal gap measurement, the raw data obtained in the measurement process required by 40 CFR §60.113a(a)(1)(ii) and the calculation required by 40 CFR 60.113a(a)(1)(iii).

E. If either the seal gap calculated in accord with 40 CFR §60.113a (a)(1)(iii) or the measured maximum seal gap exceeds the limitations specified by 40 CFR §60.112a of this subpart, a report shall be furnished to the Administrator within 60 days of the date of measurements. The report shall identify the vessel and list each reason why the vessel did not meet the specifications of 40 CFR §60.112a. The report shall also describe the actions necessary to bring the storage vessel into compliance with the specifications of 40 CFR §60.112a.

ii. Determine gap widths in the primary and secondary seals individually by the following procedures:

A. Measure seal gaps, if any, at one or more floating roof levels when the roof is floating off the roof leg supports.

B. Measure seal gaps around the entire circumference of the tank in each place where a 1/8"diameter uniform probe passes freely (without forcing or binding against seal) between the seal and the tank wall and measure the circumferential distance of each such location.

C. The total surface area of each gap described in 40 CFR §60.113a (a)(1)(ii)(B) shall be determined by using probes of various widths to accurately measure the actual distance from the tank wall to the seal and multiplying each such width by its respective circumferential distance.

iii. Add the gap surface area of each gap location for the primary seal and the secondary seal individually. Divide the sum for each seal by the nominal diameter of the tank and compare each ratio to the appropriate ratio in the standard in 40 CFR §60.112a(a)(1)(i) and §60.112a(a)(1)(ii).

iv. Provide the Administrator 30 days prior notice of the gap measurement to afford the Administrator the opportunity to have an observer present.

2. The owner or operator of each storage vessel to which this subpart applies which has a vapor recovery and return or disposal system shall provide the following information to the Administrator on or before the date on which construction of the storage vessel commences:

   i. Emission data, if available, for a similar vapor recovery and return or disposal system used on the same type of storage vessel, which can be used to determine the efficiency of the system. A complete description of the emission measurement method used must be included.

   ii. The manufacturer's design specifications and estimated emission reduction capability of the system.

   iii. The operation and maintenance plan for the system.

   iv. Any other information which will be useful to the Administrator in evaluating the effectiveness of the system in reducing VOC emissions.

   [40 CFR § 60.113a and 45CSR16]

7.3. Testing Requirements

7.3.1. None.

7.4. Recordkeeping Requirements

7.4.1. To determine compliance with the throughput limits set forth in Section 7.1.1. and the VOC emission limit set forth in Section 7.1.2., the permittee shall keep monthly records of throughput of each raw material/product for each tank. These records shall be kept individually, i.e. per tank. AP-42 emission factors for organic liquid storage tanks (Supp. D, Chapter 7.1), may be used to estimate yearly emissions.
[45CSR13 - Permit R13-2334 - 7.3.1.]

7.4.2. To determine compliance with the short-term and annual HAP emission limits set forth in Sections 7.1.2., the permittee shall estimate the emissions using a material balances calculation utilizing the vapor weight of HAPs present in petroleum liquids processed and transported at the facility. The following equation shall be to determine monthly and yearly emissions.

HAP Emissions (tpm or tpy) = [(Individual HAP %) x (Actual VOC emissions, obtained from section 7.4.1. (tpm or tpy))/100

Compliance with the yearly limit shall be based on a 12-month rolling total in accordance with Section 2.1.4.
[45CSR13 - Permit R13-2334 - 7.3.2.; 45CSR§30-5.1.c.]

7.4.3. The following 40 CFR 60 Subpart K requirements apply to **Tanks 4036, 4037, 4038, 4039, and 4041:**

Except as provided in 40 CFR § 60.113(d), the owner or operator subject to 40 CFR Part 60 subpart K shall maintain a record of the petroleum liquid stored, the period of storage, and the maximum true vapor pressure of that liquid during the respective storage period.
[40 CFR § 60.112(a) and 45CSR§16-2.1.; 45CSR13 - Permit R13-2334 - 7.3.3.]

7.4.4. The following 40 CFR 60 Subpart Ka requirements apply to **Tanks 4035, 4040, 4042, 4043, 4044, 4045, and 4046:**

a. Except as provided in 40 CFR §§ 60.115a (d), the owner or operator subject to 40 CFR Part 60 Subpart Ka shall maintain a record of the petroleum liquid stored, the period of storage, and the maximum true vapor pressure of that liquid during the respective storage period.

b. Available data on the typical Reid vapor pressure and the maximum expected storage temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API Bulletin 2517, unless the Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

c. The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa (2.0 psia) or whose physical properties preclude determination by the recommended method is to be determined from available data and recorded if the estimated true vapor pressure is greater than 6.9 kPa (1.0 psia).

[40 CFR §§ 60.115a(a) through (c) and 45CSR16]

7.4.5. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4052, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071**:

Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Kb:4034, 4047, 4048, 4051, 4054, 4055, 4056, 4057.

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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 40 CFR § 60.115b (a), (b), or (c) 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, except for the record required by 40 CFR § 60.115b (c) (1), for at least 2 years. The record required by 40 CFR § 60.115b (c)(1) will be kept for the life of the control equipment.

a. After installing control equipment in accordance with 40 CFR § 60.112b (a) (1) (fixed roof and internal 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)(1) and 40 CFR § 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)(2), (a)(3), and (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 annual visual 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.

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 40 CFR § 60.113b (a)(3) and list each repair made.

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 40 CFR § 60.113b (b)(2), (b)(3), and (b)(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:

   i. The date of measurement.

   ii. The raw data obtained in the measurement.

   iii. The calculations described in 40 CFR §§ 60.113b (b)(2) and (b)(3).

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:

   i. The date of measurement.

   ii. The raw data obtained in the measurement.

   iii. The calculations described in 40 CFR §§ 60.113b (b)(2) and (b)(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.

c. After installing control equipment in accordance with 40 CFR §§ 60.112b (a)(3) or (b)(1) (closed vent system and control device other than a flare), the owner or operator shall keep the following records.

1. A copy of the operating plan.

2. A record of the measured values of the parameters monitored in accordance with 40 CFR§ 60.113b(c)(2).

d. d. After installing a closed vent system and flare to comply with 40 CFR § 60.112b, the owner or operator shall meet the following requirements.

1. A report containing the measurements required by 40 CFR §§ 60.18 (f)(1), (2), (3), (4), (5), and (6) shall be furnished to the Administrator as required by 40 C.F.R. § 60.8 of the General Provisions. This report shall be submitted within 6 months of the initial start-up date.

2. Records shall be kept of all periods of operation during which the flare pilot flame is absent.

3. Semiannual reports of all periods recorded under 40 CFR § 60.115b (d)(2) in which the pilot flame was absent shall be furnished to the Administrator.

[40 CFR § 60.115b, 45CSR§16-2.1; 45CSR13: Permit R13-2334, 7.3.4.]

7.4.6. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071**:

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a. The owner or operator shall keep copies of all records required by 40 CFR Part 60 Subpart Kb, except for the record required by paragraph (b) of this section, for at least 2 years. The record required by paragraph (b) of this section will be kept for the life of the source.

b. The owner or operator of each storage vessel as specified in 40 CFR § 60.110b (a) shall keep readily accessible records showing the dimension and an analysis showing the capacity of the storage vessel.

c. Except as provided in paragraphs (f) and (g) of this section, 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 greater than or equal to 3.5 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 greater than or equal to 15.0 kPa 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.

d. Except as provided in paragraph (g) of this section, 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.

e. Available data on the storage temperature may be used to determine the maximum true vapor pressure as determined below.

    1. For vessels operated above or below ambient temperatures, the maximum true vapor pressure is calculated based upon the highest expected calendar-month average of the storage temperature. For vessels operated at ambient temperatures, the maximum true vapor pressure is calculated based upon the maximum local monthly average ambient temperature as reported by the National Weather Service.

    2. For crude oil or refined petroleum products the vapor pressure may be obtained by the following:

        i. Available data on the Reid vapor pressure and the maximum expected storage temperature based on the highest expected calendar-month average temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API Bulletin 2517 (incorporated by reference -- see § 60.17), unless the Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

        ii. The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa or with physical properties that preclude determination by the recommended method is to be determined from available data and recorded if the estimated maximum true vapor pressure is greater than 3.5 kPa.

f. The owner or operator of each vessel storing a waste mixture of indeterminate or variable composition shall be subject to the following requirements.

    1. Prior to the initial filling of the vessel, the highest maximum true vapor pressure for the range of anticipated liquid compositions to be stored will be determined using the methods described in paragraph (e) of this section.

    2. For vessels in which the vapor pressure of the anticipated liquid composition is above the cutoff for monitoring but below the cutoff for controls as defined in 40 CFR §60.112b(a), an initial

physical test of the vapor pressure is required; and a physical test at least once every 6 months thereafter is required as determined by the following methods:

i. ASTM D2879-83, 96, or 97 (incorporated by reference -- see 40 CFR § 60.17); or

ii. ASTM D323-82 or 94 (incorporated by reference -- see 40 CFR § 60.17); or

iii. As measured by an appropriate method as approved by the Administrator.

g. The owner or operator of each vessel equipped with a closed vent system and control device meeting the specification of 40 CFR § 60.112b or with emissions reductions equipment as specified in 40 CFR § 65.42(b)(4), (b)(5), (b)(6), or (c) is exempt from the requirements of paragraphs (c) and (d) of this section. [**40 CFR § 60.116b, 45CSR§16-2.1, 45CSR13: Permit R13-2334, 7.3.5.]**

7.5. Reporting Requirements

7.5.1. None.

7.6. Compliance Plan

7.6.1. None.

ATTACHMENT V – SUGGESTED R13 LANGUAGE

ATTACHMENT V – R13 PERMIT SUGGESTED LANGUAGE

Suggested language is provided for section 7.0 of the R13 permit for the current storage tank project.

EWVI is also requesting a few R13 permit language cleanup items:

- The emissions unit table in Section 1.0 of the permit shows TK-4012 and TK-4012 equipped with mechanical shoe type seals. The tanks are actually equipped with vapor mounted double-seal systems. We request the emissions unit table be updated to reflect the vapor mounted seal design.

- R13-2334 Condition 5.1.9 contains a table of emissions limits. EWVI notes that the SO2 emissions limit for the MLDOX contains a typographical error. The SO2 limitation should have been listed as 1.64 TPY and 0.16 TPM from a previous permit modification.

- R13-2334 Condition 5.1.10 contains a table of throughput limits. The last row of the table contains an operational limitation on non-pilot hours of operation of the Main/Sour Gas Flare. EWVI submitted a Class II Administrative permit application to revise the permit language related to the main and sour gas flares. As a part of this application, EWVI requested the hourly limit on non-pilot flare operation be removed. The subsequent permit R13-2334Z was issued by WVDEP on 11/30/2016 incorporating the revised permit language related to the flares; however, the non-pilot hour limit in the table was inadvertently overlooked and should have been removed. At this time, EWVI requests the non-pilot hour limitation on the flare be removed.

00B-02	EQLEAKS	Equipment Leak Fugitives	NA	NA	n/a
00D-01	Dehy Htr	Dehydration Heater	1991	0.59 MMBtu/hr	n/a
00D-02	Still	Glycol Dehydration Still	1991	N/A	n/a
EPN 01	H-901	DHT Heater	2005	27.5 MMBtu/hr	n/a
EPN 03	H-1101	Hydrogen Plant Heater	2005	38.8 MMBtu/hr	n/a
00A-04	MLDOX	Barge Loading Thermal Oxidizer	2012	59.0 MMBtu/hr 98% min efficiency	n/a

Tanks

Emission Unit ID	Emission Point ID	Emission Unit Description	Contents	Designation	Year Installed	Design / Permitted Capacity	Control Device
4000	TK-4000	External floating roof; mechanical shoe	crude oil	Kb	1992/ 2012	2,310,000 gallons	n/a
4001	TK-4001	External floating roof; mechanical shoe	crude oil	Kb	1973/ 2012	2,310,000 gallons	n/a
4002	TK-4002	External floating roof; mechanical shoe	heavy/ kerosene		1970	2,310,000 gallons	n/a
4003	TK-4003	External floating roof; mechanical shoe	heavy / kerosene		1970	2,310,000 gallons	n/a
4004	TK-4004	External floating roof; mechanical shoe	gasoline	Kb	1971/ 2018	1,260,000 gallons	n/a
4005	TK-4005	External floating roof; mechanical shoe	gasoline	Kb	1971 2018	1,260,000 gallons	n/a
4006	TK-4006	External floating roof; mechanical shoe	gasoline	Kb	1971/ 2018	1,260,000 gallons	n/a
4007	TK-4007	Fixed roof	heavy		1971	2,310,000 gallons	n/a
4008	TK-4008	Fixed roof	heavy		1970	1,260,000 gallons	n/a

Emission Unit ID	Emission Point ID	Emission Unit Description	Contents	Designation	Year Installed	Design / Permitted Capacity	Control Device
4009	TK-4009	Fixed roof	heavy / kerosene		1971	1,260,000 gallons	n/a
4010	TK-4010	Fixed roof	heavy		1970	1,260,000 gallons	n/a
4011	TK-4011	Fixed roof	heavy / kerosene		1971	1,239,568 gallons	n/a
4012	TK-4012	Internal floating roof; ~~shoe~~ Vapor-mounted	gasoline		1971	630,000 gallons	n/a
4013	TK-4013	Internal floating roof; ~~shoe~~ Vapor-mounted	gasoline		1971	630,000 gallons	n/a
4014	TK-4014	External floating roof; mechanical shoe	gasoline		1971/ 2013	315,000 gallons	n/a
4015	TK-4015	External floating roof; mechanical shoe	gasoline		1971/ 2013	315,000 gallons	n/a
4016	TK-4016	External floating roof; mechanical shoe	gasoline		1971	315,000 gallons	n/a
4017	TK-4017	Fixed roof	heavy		1971	840,000 gallons	n/a
4018	TK-4018	Fixed roof	heavy		1971	704,970 gallons	n/a
4019	TK-4019	Fixed roof	heavy		1971	704,970 gallons	n/a
4020	TK-4020	Fixed roof	heavy		1971	840,000 gallons	n/a
4021	TK-4021	Fixed roof	heavy		1971	840,000 gallons	n/a
4022	TK-4022	Fixed roof	heavy		1971	571,200 gallons	n/a
4023	TK-4023	Fixed roof	heavy		1971	571,200 gallons	n/a
4024	TK-4024	Fixed roof	heavy		1970	840,000 gallons	n/a
4025	TK-4025	Fixed roof	heavy		1970	840,000 gallons	n/a
4026	TK-4026	Fixed roof	heavy		1970	840,000 gallons	n/a

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Emissions Unit ID	Emissions Point ID	Emission Unit Description	Contents	Designation	Year Installed	Design/ Permitted Capacity	Control Device
4070	TK-4070	Internal Floating Roof, mechanical shoe	Ethanol	Kb	2018	630,000 gal	n/a
4071	TK-4071	External floating roof; mechanical shoe	Gasoline	Kb	2018	1,260,000 gal	n/a
4072	TK-4072	Fixed Roof	Feedstock		2018	1,260,000 gal	n/a

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5.1.9. Emissions shall not exceed those listed below. Annual emission limits are based on a 12-month rolling basis.

	Emission Point ID									
	F1 (pilot light)		F2 (pilot light)		TLOAD & OXIDIZER		MLD & MLDOX		NH3OX	
	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY	TPM	TPY
CO	0.007	0.074	0.013	0.129	0.21	2.12	0.27	2.67	0.80	7.96
NOx	0.009	0.088	0.015	0.153	0.04	0.39	0.05	0.49	0.05	0.5
PM2.5	0.001	0.007	0.001	0.012	0.01	0.04	0.01	0.05	0.02	0.22
PM10					0.01	0.04	0.01	0.05	0.02	0.22
PM					0.01	0.04	0.01	0.05	0.02	0.22
SO2					0.13	1.26	0.19	1.85	0.01	0.02
VOC	0.001	0.005	0.001	0.008	1.82	18.17	1.22	12.24	0.10	1.00
Total HAP					0.32	3.22	0.13	1.30		
Benzene					0.03	0.32	0.01	0.08		

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5.1.10. The permittee shall not exceed the annual limits in the table below that correspond to the emission limits established in requirement 5.1.9. Annual quantities are based on a 12-month rolling basis.

Throughput Limits		
Location	Product	Quantity (Mgal/year)
Marine Loading	Gasoline	~~40387~~
	Light Crude Oil (including oil with a vapor pressure up to 11.0 psia)	306600
	Diesel	37065
	Kerosene	46000
	Lube Oil/ Heavy Products	30660
Truck Loading	Diesel	134904
	Gasoline	~~96960~~
	No. 6 Fuel Oil	13650
	Kerosene	15330
	Lube Oil/ Heavy Products	136920
~~Operational Limits~~		
~~Location~~	~~Product~~	~~Quantity~~
~~Main/Sour Gas Flare [F1]~~	~~Non-Pilot emissions~~	~~250 hours~~

Gasoline 62,031 MGal/yr

Gasoline 134,904 MGal/yr

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7.0 Tank Requirements

7.1. Limitations and Standards

7.1.1. Storage tanks are limited to the raw material/ product type and throughput provided in the table below:

Tank ID No.	Raw Material/Product Type (gallons/year)
4000, 4001, 4060, 4061, and 4072	crude oil (802,264,890)
4062 and 4063	light crude oil w/vapor pressure up to 11.0 psia (306,600,000)
4004, 4005, 4006, 4012, 4013, 4014, 4015, 4016, 4050, 4052, 4053, 4070, and 4071	gasoline or ethanol (318,034,433)
4002, 4003, 4009, 4011, 4054, 4055, 4056, and 4057	heavy products or kerosene (406,459,760)
4007, 4008, 4010, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 4027, 4028, 4029, 4030, 4031, 4032, 4033, 4034, 4035, 4036, 4037, 4038, 4039, 4040, 4041, 4042, 4043, 4044, 4045, 4046, 4047, 4048, 4051, 4103, and 4104	heavy products (550,817,989)

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7.1.2. Combined emissions from the tanks listed in section 7.1.1 shall not exceed the following:

Pollutant	Emission Rate	
	TPM	TPY
Total VOC	5.79	57.85
Benzene	0.08	0.81
Total HAP	0.65	6.54

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7.1.3. Fixed roof **Tanks 4012 and 4013** shall be equipped with internal floating roofs to minimize emissions of VOC's.

7.1.4. The following requirements apply to **Tanks 4004, 4005, 4006, 4014, 4015, and 4016**:

a. Each and every slotted guidepole that passes through the floating roof shall be equipped with one of the following: a pole float system; an alternate control technology that has an emission factor less than or equal to the emission factor for a pole float system; a pole sleeve system; an internal sleeve emission control system; a solid guidepole system; a flexible enclosure system; or

b. In the alternative, the Permittee may elect to:
1. Cover an external floating roof tank with a fixed roof mounted on the tank above the external floating roof, or
2. Remove the tank from the service storing liquids subject to NSPS Ka or Kb, modify the permit for that tank, and represent to the West Virginia Division of Air Quality that the tank will not be used to store certain petroleum liquids or volatile organic liquids.

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c. For systems that use a sliding cover, the sliding cover shall be in place over the slotted-guidepole opening in the floating roof at all times, except, when the sliding cover must be removed for access. If the control technology used includes a guidepole float, the float shall be floating within the guidepole at all times except when it must be removed for access to the stored liquid or when the tank is empty.

d. The permittee shall visually inspect the deck fitting for the slotted guidepole at least once every ten (10) years and each time the vessel is emptied and degassed. If the slotted guidepole deck fitting or control device has defects, or if a gap that is more than 0.32 centimeters (1/8 inch) exists between any gasket required for control of the slotted guidepole deck fitting and any surface that it is intended to seal, such items shall be repaired before filling or refilling the storage vessel with regulated material.

e. Tanks taken out of hydrocarbon service, for any reason, do not have to have any controls in place during the time they are taken out of service. Tanks taken out of service must have in place, prior to being put back into service, all controls necessary to remain below the emission limits set forth by the current version of permit R13-2334.

7.1.5. The following requirements apply to **Tanks 4001, 4002, and 4003**:

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a. Each and every slotted guidepole that passes through the floating roof shall be equipped with one of the following: a pole float system; an alternate control technology that has an emission factor less than or equal to the emission factor for a pole float system; a pole sleeve system; an internal sleeve emission control system; a solid guidepole system; a flexible enclosure system; or

b. In the alternative, the Permittee may elect to:
1. Cover an external floating roof tank with a fixed roof mounted on the tank above the external floating roof, or
2. Remove the tank from the service storing liquids subject to NSPS Ka or Kb, modify the permit for that tank, and represent to the West Virginia Division of Air Quality that the tank will not be used to store certain petroleum liquids or volatile organic liquids.

c. For systems that use a sliding cover, the sliding cover shall be in place over the slotted-guidepole opening in the floating roof at all times, except, when the sliding cover must be removed for access. If the control technology used includes a guidepole float, the float shall be floating within the guidepole at all times except when it must be removed for access to the stored liquid or when the tank is empty.

d. The permittee shall visually inspect the deck fitting for the slotted guidepole at least once every ten (10) years and each time the vessel is emptied and degassed. If the slotted guidepole deck fitting or control device has defects, or if a gap that is more than 0.32 centimeters (1/8 inch) exists between any gasket required for control of the slotted guidepole deck fitting and any surface that it is intended to seal, such items shall be repaired before filling or refilling the storage vessel with regulated material.

e. Tanks taken out of hydrocarbon service, for any reason, do not have to have any controls in place during the time they are taken out of service. Tanks taken out of service must have in place, prior to being put back into service, all controls necessary to remain below the emission limits set forth by the current version of permit R13-2334.

7.1.6. The following 40 CFR 60 Subpart K requirements apply to **Tanks 4036, 4037, 4038, and 4039**:

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The owner or operator of any storage vessel to which 40 CFR Part 60 Subpart K applies shall store petroleum liquids as follows: if the true vapor pressure of the petroleum liquid, as stored, is equal to or greater than 78 mm

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Hg (1.5 psia) but not greater than 570 mm Hg (11.1 psia), the storage vessel shall be equipped with a floating roof, a vapor recovery system, or their equivalents.

7.1.7. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071.**

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Deleted: 4014, 4015, 4018,

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Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Kb: 4034, 4047, 4048, 4051, 4054, 4055, 4056, and 4057.

a. The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 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 m^3 but less than 151 m^3 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:

1. A fixed roof in combination with an internal floating roof meeting the following specifications:

i. 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.

ii. 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:

A. 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.

B. 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.

C. 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.

iii. 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.

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iv. 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.

v. 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.

vi. 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.

vii. 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.

viii. 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.

ix. Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

2. An external floating roof. An external floating roof means a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof. Each external floating roof must meet the following specifications:

i. 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.

A. 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.

B. 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).

ii. 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

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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.

iii. 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.

3. A closed vent system and control device meeting the following specifications:

i. The closed vent system shall be designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background and visual inspections, as determined in 40 CFR part 60, subpart VV, § 60.485(b).

ii. The control device shall be designed and operated to reduce inlet VOC emissions by 95 percent or greater. If a flare is used as the control device, it shall meet the specifications described in the general control device requirements (40 CFR § 60.18) of the General Provisions.

4. A system equivalent to those described in paragraphs a.1., a.2., or a.3. above as provided in 40 CFR § 60.114b.

b. The owner or operator of each storage vessel with a design capacity greater than or equal to 75 m^3 which contains a VOL that, as stored, has a maximum true vapor pressure greater than or equal to 76.6 kPa shall equip each storage vessel with one of the following:

1. A closed vent system and control device as specified in 40 CFR § 60.112b(a)(3).

2. A system equivalent to that described in paragraph b.1. above as provided in 40 CFR § 60.114b.

[40 CFR § 60.112b(a) and (b) and 45CSR§16-2.1]

7.2. Monitoring Requirements

7.2.1. Compliance with Section 7.1.4. and 7.1.5 may be determined by visual inspection by the Director or a duly authorized representative of the Director.

7.2.2. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071:**
Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Kb: 4034, 4047, 4048, 4051, 4054, 4055, 4056, and 4057.

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The owner or operator of each storage vessel as specified in 40 CFR § 60.112b(a) shall meet the requirements of paragraph a., b., or c. 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.

a. After installing the control equipment required to meet 40 CFR § 60.112b(a)(1) (permanently affixed roof and internal floating roof), each owner or operator shall:

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 in 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 § 60.112b(a)(1)(ii)(B) :

i. Visually inspect the vessel as specified in paragraph a.4. of this section at least every 5 years; or

ii. Visually inspect the vessel as specified in paragraph a.2. of this section.

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 paragraphs a.2. and a.3.ii. of this section and at intervals no greater than 5 years in the case of vessels specified in paragraph a.3.i. of this section.

5. Notify the Administrator in writing at least 30 days prior to the filling or refilling of each storage vessel for which an inspection is required by paragraphs a.1. and a.4. of this section to afford the Administrator the opportunity to have an observer present. If the inspection required by paragraph a.4. of this section is not planned and the owner or operator could not

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have known about the inspection 30 days in advance or 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.

b. After installing the control equipment required to meet 40 CFR § 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 paragraphs b.1.i. and b.1.ii. of this section.

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 paragraph b.2.ii. of this section 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 paragraph b.4. of this section.

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).

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5. Notify the Administrator 30 days in advance of any gap measurements required by paragraph b.1. of this section 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.

ii. For all the inspections required by paragraph b.6. of this section, 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 paragraph b.6. of this section 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.

c. The owner or operator of each source that is equipped with a closed vent system and control device as required in § 60.112b (a)(3) or (b)(2) (other than a flare) is exempt from § 60.8 of the General Provisions and shall meet the following requirements.

1. Submit for approval by the Administrator as an attachment to the notification required by § 60.7(a)(1) or, if the facility is exempt from § 60.7(a)(1), as an attachment to the notification required by § 60.7(a)(2), an operating plan containing the information listed below.

i. Documentation demonstrating that the control device will achieve the required control efficiency during maximum loading conditions. This documentation is to include a description of the gas stream which enters the control device, including flow and VOC content under varying liquid level conditions (dynamic and static) and manufacturer's design specifications for the control device. If the control device or the closed vent capture system receives vapors, gases, or liquids other than fuels from sources that are not designated sources under 40 CFR Part 60 subpart K, the efficiency demonstration is to include consideration of all vapors, gases, and liquids received by the closed vent capture system and control device. If an enclosed combustion device with a minimum residence time of 0.75 seconds and a minimum temperature of 816 ºC is used to meet the 95 percent requirement, documentation that those conditions will exist is sufficient to meet the requirements of this paragraph.

ii. A description of the parameter or parameters to be monitored to ensure that the control device will be operated in conformance with its design and an explanation of the criteria used for selection of that parameter

2. Operate the closed vent system and control device and monitor the parameters of the closed vent system and control device in accordance with the operating plan submitted to the Administrator in accordance with paragraph c.1. of this section, unless the plan was modified by the Administrator during the review process. In this case, the modified plan applies.

d. The owner or operator of each source that is equipped with a closed vent system and a flare to meet the requirements in § 60.112b (a)(3) or (b)(2) shall meet the requirements as specified in the general control device requirements, § 60.18 (e) and (f).

[40 CFR § 60.113b and 45CSR§16-2.1]

7.3. Recordkeeping Requirements

7.3.1. To determine compliance with the throughput limits set forth in Section 7.1.1. and the VOC emission limit set forth in Section 7.1.2., the permittee shall keep monthly records of throughput of each raw material/product for each tank. These records shall be kept individually, i.e. per tank. AP-42 emission factors for organic liquid storage tanks (Supp. D, Chapter 7.1), may be used to estimate yearly emissions.

7.3.2. To determine compliance with the short-term and annual HAP emission limits set forth in Sections 7.1.2., the permittee shall estimate the emissions using a material balances calculation utilizing the vapor weight of HAPs present in petroleum liquids processed and transported at the facility. The following equation shall be to determine monthly and yearly emissions.

HAP Emissions (tpm or tpy) = [(Individual HAP %) x (Actual VOC emissions, obtained from section 7.4.1. (tpm or tpy))/100

Compliance with the yearly limit shall be based on a 12-month rolling total in accordance with Section 2.1.4.

7.3.3. The following 40 CFR 60 Subpart K requirements apply to **Tanks 4036, 4037, 4038, and 4039:**

Except as provided in 40 CFR § 60.113(d), the owner or operator subject to 40 CFR Part 60 subpart K shall maintain a record of the petroleum liquid stored, the period of storage, and the maximum true vapor pressure of that liquid during the respective storage period.
[40 CFR § 60.112(a) and 45CSR§16-2.1]

7.3.4. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071**:
Based on storage of heavy products, the following tanks are not subject to either the floating roof requirements or the closed vent system and control requirements of 40 CFR 60 Subpart Kb: 4034, 4047, 4048, 4051, 4054, 4055, 4056, 4057.

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 40 CFR § 60.115b (a), (b), or (c) 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, except for the record required by 40 CFR § 60.115b (c) (1), for at least 2 years. The record required by 40 CFR § 60.115b (c)(1) will be kept for the life of the control equipment.

a. After installing control equipment in accordance with 40 CFR § 60.112b (a) (1) (fixed roof and internal floating roof), the owner or operator shall meet the following requirements.

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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 40 CFR § 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)(2), (a)(3), and (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 annual visual 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.

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 40 CFR § 60.113b (a)(3) and list each repair made.

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 40 CFR § 60.113b (b)(2), (b)(3), and (b)(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:

i. The date of measurement.

ii. The raw data obtained in the measurement.

iii. The calculations described in 40 CFR §§ 60.113b (b)(2) and (b)(3).

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:

i. The date of measurement.

ii. The raw data obtained in the measurement.

iii. The calculations described in 40 CFR §§ 60.113b (b)(2) and (b)(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.

c. After installing control equipment in accordance with 40 CFR §§ 60.112b (a)(3) or (b)(1) (closed vent system and control device other than a flare), the owner or operator shall keep the following records.

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1. A copy of the operating plan.

2. A record of the measured values of the parameters monitored in accordance with 40 CFR§ 60.113b(c)(2).

d. d. After installing a closed vent system and flare to comply with 40 CFR § 60.112b, the owner or operator shall meet the following requirements.

1. A report containing the measurements required by 40 CFR §§ 60.18 (f)(1), (2), (3), (4), (5), and (6) shall be furnished to the Administrator as required by 40 C.F.R. § 60.8 of the General Provisions. This report shall be submitted within 6 months of the initial start-up date.

2. Records shall be kept of all periods of operation during which the flare pilot flame is absent.

3. Semiannual reports of all periods recorded under 40 CFR § 60.115b (d)(2) in which the pilot flame was absent shall be furnished to the Administrator.

[40 CFR § 60.115b, 45CSR§16-2.1]

7.3.5. The following 40 CFR 60 Subpart Kb requirements apply to **Tanks 4000, 4004, 4005, 4006, 4034, 4047, 4048, 4050, 4051, 4054, 4055, 4056, 4057, 4060, 4061, 4062, 4063, 4070, and 4071**:

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a. The owner or operator shall keep copies of all records required by 40 CFR Part 60 Subpart Kb, except for the record required by paragraph (b) of this section, for at least 2 years. The record required by paragraph (b) of this section will be kept for the life of the source.

b. The owner or operator of each storage vessel as specified in 40 CFR § 60.110b (a) shall keep readily accessible records showing the dimension and an analysis showing the capacity of the storage vessel.

c. Except as provided in paragraphs (f) and (g) of this section, 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 greater than or equal to 3.5 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 greater than or equal to 15.0 kPa 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.

d. Except as provided in paragraph (g) of this section, 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.

e. Available data on the storage temperature may be used to determine the maximum true vapor pressure as determined below.

1. For vessels operated above or below ambient temperatures, the maximum true vapor pressure is calculated based upon the highest expected calendar-month average of the storage temperature. For vessels operated at ambient temperatures, the maximum true vapor pressure is calculated based upon the maximum local monthly average ambient temperature as reported by the National Weather Service.

2. For crude oil or refined petroleum products the vapor pressure may be obtained by the following:

i. Available data on the Reid vapor pressure and the maximum expected storage temperature based on the highest expected calendar-month average temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API

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Bulletin 2517 (incorporated by reference -- see § 60.17), unless the Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

ii. The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa or with physical properties that preclude determination by the recommended method is to be determined from available data and recorded if the estimated maximum true vapor pressure is greater than 3.5 kPa.

f. The owner or operator of each vessel storing a waste mixture of indeterminate or variable composition shall be subject to the following requirements.

1. Prior to the initial filling of the vessel, the highest maximum true vapor pressure for the range of anticipated liquid compositions to be stored will be determined using the methods described in paragraph (e) of this section.

2. For vessels in which the vapor pressure of the anticipated liquid composition is above the cutoff for monitoring but below the cutoff for controls as defined in 40 CFR §60.112b(a), an initial physical test of the vapor pressure is required; and a physical test at least once every 6 months thereafter is required as determined by the following methods:

i. ASTM D2879-83, 96, or 97 (incorporated by reference -- see 40 CFR § 60.17); or

ii. ASTM D323-82 or 94 (incorporated by reference -- see 40 CFR § 60.17); or

iii. As measured by an appropriate method as approved by the Administrator.

g. The owner or operator of each vessel equipped with a closed vent system and control device meeting the specification of 40 CFR § 60.112b or with emissions reductions equipment as specified in 40 CFR § 65.42(b)(4), (b)(5), (b)(6), or (c) is exempt from the requirements of paragraphs (c) and (d) of this section. **[40 CFR § 60.116b, 45CSR§16-2.1]**

7.4. Reporting Requirements

7.5.1. None.

7.5. Compliance Plan

7.6.1. None.