Notice of Construction (NOC) Worksheet

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Puget Sound Clean Air Agency

Applicant: US Oil & Refining Co.	**NOC Number**: 11547
Project Location: 3001 Marshall Ave, Tacoma, WA 98421	**Registration Number**: 12593
Applicant Name and Phone: Ty Gaub, 253-383-1651	**NAICS:** 324110
Engineer: Ralph Munoz	**Inspector**: Wellington Troncoso

A. DESCRIPTION

For the Order of Approval:

Marine loading of crude oil and ethanol controlled by an existing John Zink Model ZCM-5/5-10-60-X-4/8-4/8 Marine Vapor Combustion Unit (MVCU) with a Vapor Blower Staging Unit (VBSU) and dock safety unit (DSU). The MVCU will also be used to control emissions from the loading of gasoline and gasoline blendstocks as well as an existing fuel oil tank at the dock (TK-35002).

Two new ethanol unloading pumps and associated piping at the refinery rail unloading facility, two new ethanol transfer pumps in the tank farm, converting two existing crude storage tanks to ethanol service (TK-80015 and TK-80020) equipped with Internal Floating Roofs (IFR). This project also includes the installation of three product lines, a ethanol tank to tank transfer line, and a recovered oil line between the main facility and the marine terminal;

This NOC also covers the use of the existing 107 crude railcar offloading stations, 38 of which are capable of offloading ethanol. The crude throughput is 34,775 bbl/day and 12,658,100 bbl/yr (approx. 650 bbl/railcar), and the ethanol thoughput is 3,616,600 bbls/year. Also covered by this NOC are existing crude oil storage tanks (TK-80021, TK-80022, TK-300001 and TK-300002.)

Additional Information:

Facility:

The US Oil & Refining Co. petroleum refinery (USOR) processes approximately 42,000 barrels per day of crude oil into products including liquid butane, gasoline, turbine aviation fuels, diesel fuel, catalytic cracker feedstock, fuel oils, asphalt products, and byproducts such as molten sulfur. The facility receives crude oil via rail and ship and sends out finished products via ship and truck, as well as a pipeline that is dedicated to JBLM military base. The facility is currently allowed to store and receive ethanol by the two existing ethanol rail car unloading stations under NOCs 10029 and 9755 used in blends.

Proposed Equipment/Activities:

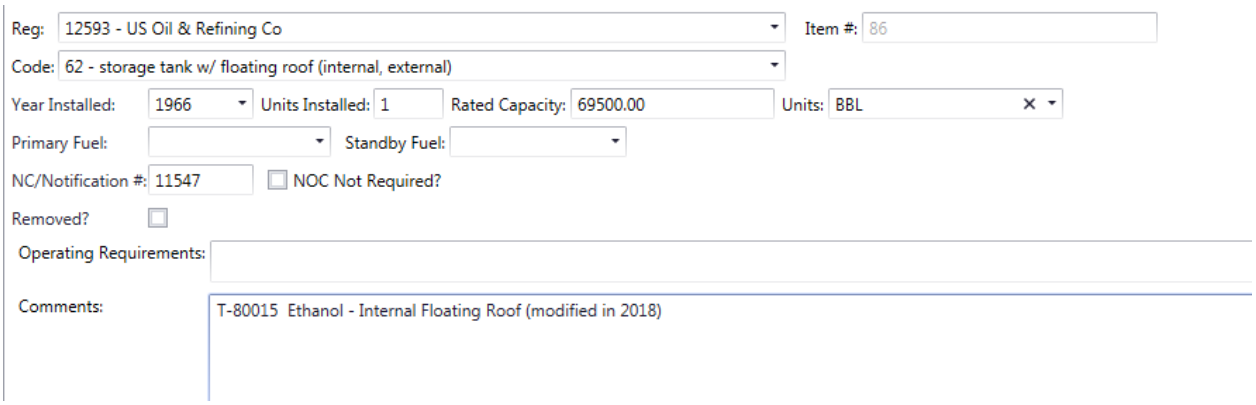
USOR submitted this Notice of Construction (NOC) application to request authorization to modify the refinery to accommodate receiving additional ethanol by rail, transferring and storing of ethanol, and marine terminal loading of ethanol into marine vessels.

The project includes converting two existing external floating roof (EFR) tanks (TK-80015 and TK-80020) currently in crude oil service to ethanol service and installing IFR, the installation of two new ethanol unloading pumps from railcars, two new transfer pumps, and associated piping at the refinery and between the refinery and the marine terminal.

USOR is proposing to increase the amount of ethanol received, stored, and shipped at the facility. As a result of this project, the additional annual throughput of ethanol deliveries at the facility for the project will be 3,616,600 barrels per year for marine loading operations and will be delivered by railcar from the unit train "crude by rail" unloading station. USOR refers to the rail car unloading stations as the "crude by rail unloading station"; however, this unloading station will also be handling increased amounts of ethanol unloading. Throughout this worksheet, the "crude by rail" unloading station refers to the rail unloading station that is capable of unloading both crude oil and is proposed to be capable of unloading ethanol. All 3,616,600 barrels will then be loaded onto marine vessels at USOR's existing Dock #1. The "crude by rail unloading station" currently consists of 107 stations designed for crude oil. In addition, there are currently two ethanol railcar unloading stations capable of handling ethanol, which are located on a separate rail spur. USOR is proposing to convert 36 of the existing crude oil unloading stations to give them the capability to also unload ethanol. This will result in a total of 107 possible crude oil unloading stations and 38 possible ethanol unloading stations (total amount of rai stations unchanged). A new ethanol transfer pump and new fugitive piping components (valves, flanges, connectors, etc.) will be installed to transfer ethanol throughout the facility as mentioned above. The existing MVCU (which was approved under NOC 10620) is being proposed by USOR to capture and control the vapors from loading ethanol into marine vessels.

No changes are being made in this application to the Crude Oil operations; this NOC will continue to cover those operations. (See cancelled and superseded NOC discussion section at the end of this worksheet).

B. DATABASE INFORMATION



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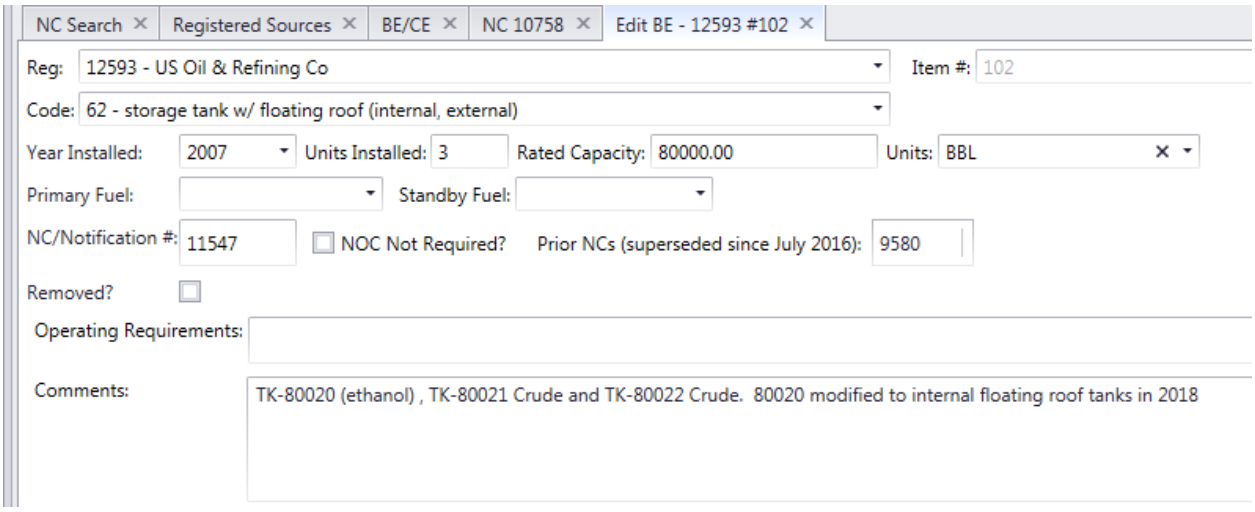

NC Search | Registered Sources | BE/CE | NC 10758 | Edit BE - 12593 #102

Reg: 12593 - US Oil & Refining Co Item #: 102

Code: 62 - storage tank w/ floating roof (internal, external)

Year Installed: 2007 Units Installed: 3 Rated Capacity: 80000.00 Units: BBL

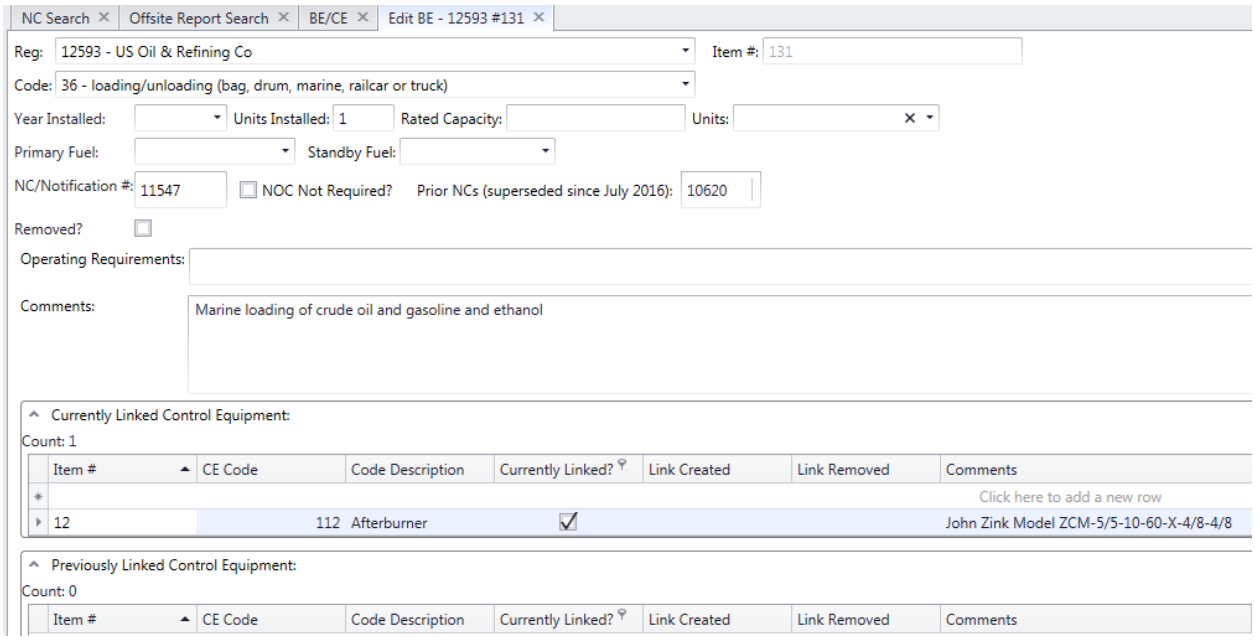
Primary Fuel: Standby Fuel:

NC/Notification #: 11547 NOC Not Required? Prior NCs (superseded since July 2016): 9580

Removed?

Operating Requirements:

Comments: TK-80020 (ethanol) , TK-80021 Crude and TK-80022 Crude. 80020 modified to internal floating roof tanks in 2018


NC Search | Offsite Report Search | BE/CE | Edit BE - 12593 #131

Reg: 12593 - US Oil & Refining Co Item #: 131

Code: 36 - loading/unloading (bag, drum, marine, railcar or truck)

Year Installed: Units Installed: 1 Rated Capacity: Units:

Primary Fuel: Standby Fuel:

NC/Notification #: 11547 NOC Not Required? Prior NCs (superseded since July 2016): 10620

Removed?

Operating Requirements:

Comments: Marine loading of crude oil and gasoline and ethanol

Currently Linked Control Equipment:

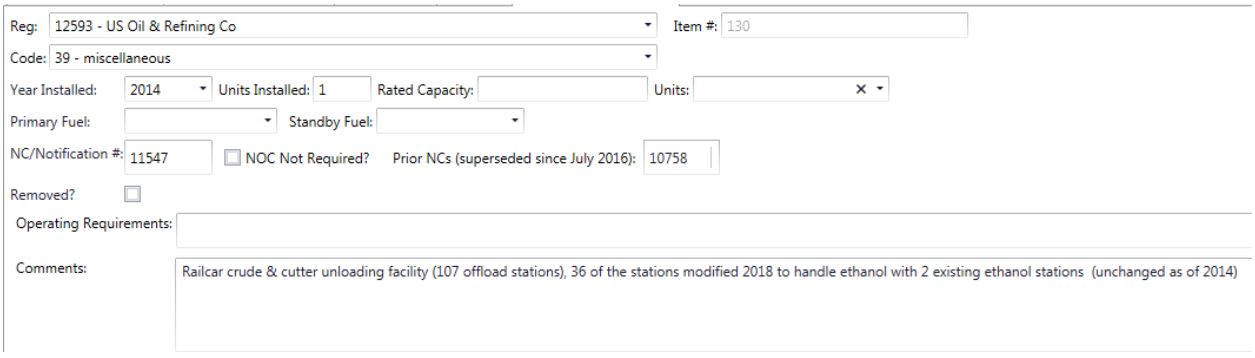
Count: 1

Item #	CE Code	Code Description	Currently Linked?	Link Created	Link Removed	Comments
						Click here to add a new row
12	112	Afterburner	☑			John Zink Model ZCM-5/5-10-60-X-4/8-4/8

Previously Linked Control Equipment:

Count: 0

Item #	CE Code	Code Description	Currently Linked?	Link Created	Link Removed	Comments


Reg: 12593 - US Oil & Refining Co Item #: 130

Code: 39 - miscellaneous

Year Installed: 2014 Units Installed: 1 Rated Capacity: Units:

Primary Fuel: Standby Fuel:

NC/Notification #: 11547 NOC Not Required? Prior NCs (superseded since July 2016): 10758

Removed?

Operating Requirements:

Comments: Railcar crude & cutter unloading facility (107 offload stations), 36 of the stations modified 2018 to handle ethanol with 2 existing ethanol stations (unchanged as of 2014)

New NSPS due to this NOCOA?	**No**
New NESHAP due to this NOCOA?	**No**
New Synthetic Minor due to this NOCOA?	**No**

US Oil is already subject to the requirements of NSPS 40 CFR 60 Subpart GGGa, 40 CFR 60 Subpart A, 40 CFR 60 Subpart QQQ, NSPS 40 CFR subpart Ja and NSPS 40 CFR Kb. Some parts of this application are affected units under these subparts, but they are not new subparts to the facility. The facility is subject to other federal rules that are not related to this NOC application. See discussion in federal rule application section for further details on all these federal standards and how they are all impacted by this NOC action.

C. NOC FEES AND ANNUAL REGISTRATION FEES

NOC Fees:

Fees have been assessed in accordance with the fee schedule in Regulation I, Section 6.04. All fees must be paid prior to issuance of the final Order of Approval.

Fee Description	Cost	Amount Received (Date)
Filing Fee	$ 1,150	
Equipment (2 storage tanks, new associated fugitive components, marine loading changes, Crude by rail unloading facility changes) $600 x 5	$3,000	
NSPS Kb, GGGa, QQQ, NESHAP CC, Y - $1,000 x 5	$5,000	
SEPA (DNS)	$0	
Public Notice – $700 (not including the publication fees)	$700	
Publication Fees – Unknown at this time	TBD when published	
Filing received		$ 1,150 (2/2/18)
Additional fee received		$8,700 (7/27/18)
Publication Fees		TBD when published
Total		

Sent invoice to Megan 7/23/18 for $8,700
Case Hinkins emailed me 7/23/18 with a copy of the check they mailed in certified mail.
Payment received 7/27/18, receipt #99657 $8,700

Registration Fees:
Registration fees are assessed to the facility on an annual basis. Fees are assessed in accordance with Regulation I, Section 7.07.

This NOC does not seek to change the registration from Petroleum Refineries

Facility Fees and Applicable Regulations		Charges
Facility Fee for Operating Permit Sources. Reg I, 7.07(b)(1)(i)	**$**	**57,200.00**
NAICS 324110 -- Petroleum Refineries		

D. STATE ENVIRONMENTAL POLICY ACT (SEPA) REVIEW

State Environmental Policy Act (SEPA) review was conducted in accordance with Regulation I, Article 2. The SEPA review is undertaken to identify and help government decision-makers, applicants, and the public to understand how a project will affect the environment. A review under SEPA is required for projects that are not categorically exempt in WAC 197-11-800 through WAC 197-11-890. A new source review action which requires a NOC application submittal to the Agency is not categorically exempt.

A new SEPA determination is not required because the potential impacts from this project were reviewed under SEPA by City of Tacoma and an MDNS was issued by Shirley Shultz on 03/15/18. A copy of this MDNS is included below and is being relied upon for this project.


Ex A.1 MDNS.pdf

From the MDNS, the air section has the following mitigation measures:

> **Air:**
> 4. Watering of exposed soil during construction to suppress dust will ensure that no impacts to ambient air quality will result from the project.
>
> 5. All components of ethanol service are subject to Leak Detection and Repair rules, with consistent monitoring and inspection. In addition, the facility operates with operating permits from the Puget Sound Clean Air Agency (PSCAA), the authority for air emissions. The proposal will require a Notice of Construction permit from PSCAA to allow for modifications to the dock equipment, the Marine Vapor Combustion Unit, and the storage tank conversion. Compliance with PSCAA regulations will avoid and/or mitigate any impacts to air quality as a result of the proposal.

The rest of the mitigation measures found in the MDNS were related to traffic and public safety measures.

Conditions regarding the updated LDAR with ethanol service parts will be placed into this NOC and verified by PSCAA during inspection.

This NOC will also carry over the MDNS condition that PSCAA issued for NOC 10620:

> Pursuant to the State Environmental Policy Act, WAC 197-11-350 and WAC 197-11-660, and Puget Sound Clean Air Agency Regulation I, Sections 2.07 and 2.12, the Puget Sound Clean Air Agency issued an MDNS for Order of Approval 10620 based on the following condition: The total inbound and outbound volume of crude oil transferred over the marine loading facility shall not exceed 14,400,000 bbl during any calendar year. The owner and/or operator shall record the volume of all crude oil transferred over the marine loading facility and report the total for each calendar year to the Agency no later than March 1 of the subsequent year.

A sentence was added to the end of this condition to indicate that this does not apply to the Ethanol project "This condition does not apply to Ethanol transfer, storage, or loading."

E. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) REVIEW

Best Available Control Technology (BACT)

New stationary sources of air pollution are required to use BACT to control all pollutants not previously emitted, or those for which emissions would increase as a result of the new source or modification. BACT is defined in WAC 173-400-030 as, "an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under Chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant."

An emissions standard or emissions limitation means "a requirement established under the Federal Clean Air Act or Chapter 70.94 RCW which limits the quantity, rate, or concentration of emissions of air contaminants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction and any design, equipment, work practice, or operational standard adopted under the Federal Clean Air Act or Chapter 70.94 RCW."

Best Available Control Technology for Toxics (tBACT)

New or modified sources are required to use tBACT for emissions control for TAP. tBACT is defined in WAC 173-460-020 as, "the term defined in WAC 173-400-030, as applied to TAP."

Equipment and Processes Subject to BACT/tBACT Review

This permit application has the following emission points that need to be evaluated for BACT/tBACT:

-Two existing crude oil external floating roof tanks modified to ethanol internal floating roof tanks. (TK-80015 and TK-80020).
-Fugitive Emissions leaks from new components
-Three new ethanol product pipelines from the refinery to the marine terminal.
-A new ethanol tank to tank transfer line between Tk #10010, Tk #80015, and Tk #80020. -Additionally, a new recovered oil line between Tk #901 and the refinery is proposed to eliminate the need for a vacuum truck to transfer TK-901
-Marine Loading operations for Ethanol
-Converting 36 crude oil railcar unloading stations for ethanol unloading capabilities, for a total of 38. The facility has 2 existing railcar unloading stations capable of unloading ethanol. The modifications under this section are for the railcar unloading station itself, and not the actual railcars.

Similar PSCAA Permits requiring BACT:

NOC Number	Project	BACT/tBACT
9176 (12/6/2005)	Marine gasoline loading rack rated at 2500 bbl/hr.	**Marine Vapor Combustion Unit (MVCU)** BACT in this case is a vapor combustion unit for loading >6,636,000 gal/yr (158,000 bbl/yr).
10620 (12/2/2013)	Marine loading of crude oil controlled by a John Zink Model ZCM-5/5-10-60-X-4/8-4/8 Marine Vapor Combustion Unit (MVCU) with a Vapor Blower Staging Unit (VBSU) and dock safety unit (DSU). The MVCU will also be used to control emissions from the loading of gasoline and gasoline blendstocks as well as an existing fuel oil tank at the dock (TK-35002).	**MVCU:** BACT for the MVCU is ≥99.0% destruction efficiency, as determined by the procedures in Subpart Y, Sections 63.565(d)(6)-(8) as specified in the recommended approval conditions. **Fugitive Emissions:** BACT for fugitive emissions is compliance with the provisions of US Oil's enhanced LDAR program which includes a 500 ppm leak threshold for the valves, initial repair attempts within 5 days, and additional QA for the monitoring, as specified in the recommended approval conditions. It also includes the Subpart Y standards for ship-to-shore compatibility in §63.562(b)(1)(ii) and vapor-tightness of marine vessels in §63.562(b)(1)(iii), as determined by the testing and monitoring procedures in §63.563(a)(2)-(4), 63.564(c), 63.565(b) and (c), and the recordkeeping requirements in §63.567(h) and (i),
10554 (2/28/2014)	Marine loading of crude oil (and gasoline) controlled by a John Zink Model ZCM-3/3-9-50-	**MVCU:** BACT for the MVCU is ≥99.0% destruction

	2/8-2/8 Marine Vapor Combustion Unit (MVCU) with a Vapor Blower Staging Unit (VBSU) and dock safety unit (DSU). This project also includes two 25000 bbl internal floating roof crude oil storage tanks (T-164, T-165) and two 78000 bbl internal floating roof crude oil tanks (T-206 and T-207), and modifications to the railcar unloading facility.	efficiency, as determined by the procedures in Subpart Y, Sections 63.565(d)(6)-(8) as specified in the recommended approval conditions. **Storage Tanks:** BACT for storage tanks has historically been compliance with NSPS Subpart Kb and Section 3.02 of Regulation II. -rim-mounted secondary seals, boots (or equivalent) for adjustable roof legs -controls for slotted guidepoles -10-year minimum inspection frequencies - a 30% LEL limit for the air above the IFR - control device for degassing the tank. **Fugitive Emissions:** BACT for fugitive emissions is compliance with the Subpart Y standards for ship-to-shore compatibility in §63.562(b)(1)(ii) and vapor-tightness of marine vessels in §63.562(b)(1)(iii) as determined by the testing and monitoring procedures in §63.563(a)(2), (a)(3), and (a)(4)(iv), and (c), §63.564(c), and (d), and §63.565(b); and the recordkeeping requirements in §63.567(h) and (k).
11265 (2/7/2018)	Modification of 4 storage tanks (T-208H, T-209H, T-210H, T-211H) to enable storage of gasoline, isooctane, denatured ethanol, and natural gasoline. The project includes marine loading of natural gasoline (151,500,000 gal/yr).	**MVCU:** BACT for VOC from marine loading of natural gasoline is the same as specified in the recent permit issued to Targa Sound Terminal (NOC No. 10620) and includes a Marine Vapor Combustion Unit with ≥99.0% destruction efficiency for VOC. BACT for SO2 and H2S from marine loading is the Part 80, Subpart O sulfur limit of 330 ppm, as documented by the product transfer documents (bill of lading or certificate of analysis) in accordance with 40 CFR 80.1611. BACT for VOC from equipment leaks is compliance with the gasoline leak detection and repair program under 40 CFR 63.11089, even when storing natural

		gasoline, isooctane, and denatured ethanol. BACT for TAC includes a limit on the benzene content of ≤1.3% by weight. **Storage tanks:** BACT for VOC and organic TAC emissions from storage of natural gasoline, gasoline, denatured ethanol, and isooctane includes compliance with NSPS Subpart Kb, boots for the roof legs, seals for any slotted guidepoles, floating roof mounted secondary seals, a 30% VOC limit for the space above the float (inspected semiannually), a 10 year maximum seal gap inspection frequency for Section 3.02, and emission controls for tank degassing.

Other Regulatory Agencies BACT:

Storage Tanks:
South coast AQMD recent storage tank BACT – but this was for fixed roof tanks:

6. COMMENTS APP. NO.: 353730

The applicant is planning to install 18 organic liquid storage tanks at this facility. All 18 organic liquid storage tanks will be vented to the thermal oxidizer included in application number 353767. The assumed overall efficiency of the thermal oxidizer is 95% VOC control. A temperature of not less than 1400 degrees Fahrenheit will be maintained in the thermal oxidizer when the equipment it serves is in operation, and no liquid wastes will be burned in the thermal oxidizer.

Bay Area AQMD BACT :
Bay Area AQMD Reg. 8, Rule 5 (see http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/reg-08/rg0805.pdf?la=en) applies to existing storage vessels. For products with a true vapor pressure ≥11 psia, Section 301 requires a pressure tank or an approved emission control system and Section 306 requires ≥95% control relative to a fixed roof tank without an approved emission control system. For other products, Section 301 requires a floating roof and Section 305 requires a metallic shoe seal that meets Section 321 and a secondary seal that meets Section 322 and deck fittings that meet Section 320.
The BAAQMD BACT guidance for new or modified internal floating roof organic liquid storage tanks is either a vapor recovery system with an overall efficiency ≥98% or an internal floating roof that complies

with this rule and is equipped with a zero gap secondary seal, controls for any slotted guidepole, and vapor seal boots on the roof legs.

Source:	***Storage Tank - Internal Floating Roof, Organic Liquids***	Revision:	*2*
		Document #:	*167.4.1*
Class:	All	Date:	*03/03/95*

Determination

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice	TYPICAL TECHNOLOGY
POC	1. *Vapor recovery system w/ an overall system efficiency ≥98%*[a,T] 2. *BAAQMD Approved roof w/ liquid mounted primary seal and zero gap secondary seal, all meeting design criteria of Reg. 8, Rule 5. Also, no ungasketed roof penetrations, no slotted pipe guide pole unless equipped with float and wiper seals, and no adjustable roof legs unless fitted w/ vapor seal boots or equivalent*[a,T]	1. *Thermal Incinerator; or Carbon Adsorber; or Refrigerated Condenser; or BAAQMD approved equivalent*[a,T] 2. *BAAQMD Approved Roof and Seal Design*[a,T]
NOx	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
SO_2	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
CO	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
PM_{10}	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
NPOC	1. *Vapor recovery system w/ an overall system efficiency ≥98%*[a,T] 2. *Same as for POC above*	1. *Carbon Adsorber; or Refrigerated Condenser; or BAAQMD approved equivalent*[a,T] 2. *BAAQMD Approved Roof and Seal Design*[a,T]

The California Air Resource Board's BACT Clearinghouse shows a couple internal floating roof gasoline storage tanks recently permitted by the San Diego APCD with both mechanical shoe primary seals and secondary seals (https://www.arb.ca.gov/bact/bactnew/query.php).

NSPS Kb is a federal standard that applies to organic liquid storage tanks, which gives options on how to comply:

§60.112b Standard for volatile organic compounds (VOC).

(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…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.

** * **

(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 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 (§60.18) of the General Provisions.

(4) A system equivalent to those described in paragraphs (a)(1), (a)(2), or (a)(3) of this section as provided in §60.114b of this subpart.

Marine Loading

The Bay Area AQMD BACT guideline specifies a vapor recovery and control system with a destruction efficiency ≥98.5% for all marine loading (http://www.baaqmd.gov/pmt/bactworkbook/default.htm, as updated 10/28/91). Such controls are required by BAAQMD Reg. 8, Rule 44 rule for existing marine loading terminals with loading events of more than 1000 bbls (http://www.baaqmd.gov/dst/regulations/rg0844.pdf).

Source:	***Liquid Transfer & Handling - Marine Loading***	Revision:	*1*
		Document #:	*107.1*
Class:	***All***	Date:	*10/28/91*

Determination

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice	TYPICAL TECHNOLOGY
POC	1. *n/d* 2. *Vapor recovery and control system: compressor, condenser, and thermal incinerator w/ a destruction efficiency ≥98.5%* [b]	1. *n/d* 2. *BAAQMD Approved Design and Operation* [b]
NOx	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
SO_2	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
CO	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
PM_{10}	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
NPOC	1. *n/d* 2. *Vapor recovery system w/ an overall system efficiency ≥95%* [b]	1. *n/d* 2. *Vapor Balance; or Refrigerated Condenser; or Carbon Adsorber; or BAAQMD Approved Equivalent* [b]

The South Coast AQMD BACT guideline specifies a vapor collection system vented to an incinerator (http://www.aqmd.gov/bact/PartD7-9-2004Update.pdf, as updated 10/20/00). Such controls are also required by SCAQMD Rule 1142 (http://www.aqmd.gov/rules/reg/reg11/r1142.pdf).

The EPA adopted a MACT standard for existing marine tank vessel loading operations under 40 CFR Part 63, Subpart Y (http://www.gpoaccess.gov/cfr/retrieve.html ,9/19/95). It requires controls as follows for major sources of HAPs:

> (2) *MACT standards for existing sources with emissions of 10 or 25 tons.* The owner or operator of an existing source with emissions of 10 or 25 tons, except offshore loading terminals and the VMT source, shall reduce captured HAP emissions from marine tank vessel loading operations by 97 weight-percent, as determined using methods in §63.565 (d) and (l).
>
> (3) *MACT standards for new sources.* The owner or operator of a new source with emissions less than 10 and 25 tons or a new source with emissions of 10 or 25 tons, except offshore loading terminals and the VMT source, shall reduce HAP emissions from marine tank vessel loading operations by 98 weight-percent, as determined using methods in §63.565 (d) and (l).

It also includes the standards for ship-to-shore compatibility in §63.562(b)(1)(ii) and vapor-tightness of marine vessels in §63.562(b)(1)(iii), as determined by the testing and monitoring procedures in §63.563(a)(2)-(4), 63.564(c), 63.565(b) and (c), and the recordkeeping requirements in §63.567(h) and (i).

> ***"40 CFR §63.562 Standards.***
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> ** * **
>
> *(b) MACT standards, except for the VMT source--(1)(i) Vapor collection system of the terminal. The owner or operator of a new source with emissions less than 10 and 25 tons and an existing or new source with emissions of 10 or 25 tons shall equip each terminal with a vapor collection system that is designed to collect HAP vapors displaced from marine tank vessels during marine tank vessel loading operations and to prevent HAP vapors collected at one loading berth from passing through another loading berth to the atmosphere, except for those commodities exempted under §63.560(d).*
>
> > *(b)(1)(ii) Ship-to-shore compatibility. The owner or operator of a new source with emissions less than 10 and 25 tons and an existing or new source with emissions of 10 or 25 tons shall limit marine tank vessel loading operations to those vessels that are equipped with vapor collection equipment that is compatible with the terminal's vapor collection system, except for those commodities exempted under §63.560(d).*
> >
> > *(b)(1)(iii) Vapor tightness of marine vessels. The owner or operator of a new source with emissions less than 10 and 25 tons and an existing or new source with emissions of 10 or 25 tons shall limit marine tank vessel loading operations to those vessels that are vapor tight and to those vessels that are connected to the vapor collection system, except for those commodities exempted under §63.560(d)."*

Fugitive VOC emission leaks

Origin	Process Source	BACT Determination
SJVAPCD	Natural Gas Processing Plant – Valves, Connectors, and Compressors and Pump Seals (subject to Rule 4403)	Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of • 100 ppmv above background (for Valves and Connectors) and • 500 ppmv (for Compressor and Pump Seals) when measured per EPA Method 21 from the potential source, and an Inspection and Maintenance Program pursuant to District Rule 4409. Or Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 5,000 ppmv above background when measured EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4409.

Origin	Process Source	BACT Determination
TCEQ	Equipment Fugitive Leaks	Uncontrolled VOC emissions < 10 tpy - None 10 tpy < uncontrolled VOC emissions < 25 tpy - 28M leak detection and repair program with 75% credit for 28M Uncontrolled VOC emissions > 25 tpy - 28VHP leak detection and repair program with 97% credit for valves, 85% for pumps and compressors VOC vp < 0.002 psia - No inspection required Approved odorous compounds: NH3, C12, H2S, etc. - Audio/Visual/Olfactory (AVO) inspection twice per shift with Appropriate credit for AVO program

Analysis:

Denatured Ethanol has the following composition (taken from the SDS information submitted by USOR in application)

Section 3. Composition, information on ingredients

HARZARDOUS COMPONENTS/CAS#	%VOLUME	EXPOSURE LIMIT GUIDELINE	
		OSHA PEL	ACGIH TLV
Ethanol / 64-17-5	95 – 98	1000 ppm	1000 ppm
Gasoline / 86290-81-5	2 – 5	300 ppm	500 ppm-STEL
Gasoline, Natural / 8006-61-9	2 – 5	300 ppm	500 ppm-STEL
Xylene / 1330-20-7	2 – 5	100 ppm	100 ppm
Toluene / 108-88-3	2 – 5	200 ppm	100 ppm

Therefore, tBACT will be evaluated for xylene, toluene, and gasoline.

Storage Tanks
For the Tank modifications described above, they are being physically modified from external floating roof tanks, to internal floating roof tanks and changing service from crude oil to ethanol.

BACT for storage tanks with the Agency (as shown above in similar permits) has historically been compliance with NSPS Subpart Kb, the Bay Area AQMD BACT guidance. In addition to these two standards, the Agency has also required other, more recent, federal standards, including Subpart C of 40 CFR Part 65 and Subpart WW of 40 CFR Part 63 such as rim-mounted secondary seals, boots (or equivalent) for adjustable roof legs, controls for slotted guidepoles, 10-year minimum inspection frequencies, a 30% LEL limit for the air above the IFR, and a control device for degassing the tank. An example of the requirements the Agency has placed in other, similar permits for tank modifications is shown below.

Tanks TK-80015 and 80020 are subject to 40 CFR Part 60, Subparts Kb and A.

The adjustable roof legs on this tank shall be fitted with vapor seal boots or equivalent.

The slotted guidepole on this tank shall be equipped with a pole float with either a pole sleeve or a pole wiper. If a pole sleeve isn't employed, the seal of the pole float shall be higher than the pole wiper. The top of the guidepole shall be equipped with a gasketed cap which shall be closed at all times except when gauging or taking liquid samples.

The secondary seal on this tank shall extend from the roof to the tank shell and shall not be attached to the primary seal.

The entire circumference of each primary and secondary seal on this tank shall be inspected for compliance with the requirements of Section 3.02 of Regulation II. If a new primary or secondary seal is installed, or if a primary or secondary seal is repaired, both seals shall be inspected at the time of the seal installation or repair. Flexible wiper seals shall be inspected when the outer edge of the seal is curved upward.

The concentration of organic vapor in the vapor space above the internal floating roof on this tank shall not exceed 30% of its lower explosive limit (LEL).

The emissions from degassing of this storage tank shall be vented to a control device.

Regulation II, Section 3.02 applies only to tanks above 40,000 gallons and that hold organic liquids with a true vapor pressure above 1.5 psi. Ethanol is not above this threshold and will not be subject to the primary and secondary seal requirements from Regulation II, Section 3.02.

Fugitive emissions leaks

The valves, connectors, pressure relief valves, and new piping sources will be sources of fugitive VOC/TAP emissions, which can be controlled through the use of the leak detection and repair plan. This is typical for other source types of fugitive pump and pipe emissions that the agency has permitted (see above). This is also supported by the other agency BACT section above which requires the use of LDARs for fugitive emission leaks. US Oil's LDAR requirements are already outlined in their existing, issued AOP.

NSPS subpart GGGa is more stringent than the AOP LDAR, therefore permit conditions will be added as outlined below that explain what fugitive parts of the project are subject to NSPS Subpart GGGa. Specifically;

The group of all the equipment within a process unit (if any) that includes the railcar offloading facility (Crude by Rail Unloading facility) is an affected facility under 40 CFR Part 60, Subparts

GGGa and A. At a minimum, all equipment installed under this order at the Crude by Rail Unloading facility shall comply with Subpart GGGa.

The owner and/or operator shall include the following components in the facility LDAR plan:

i) Piping equipment on the 6-in ethanol tank to tank line

ii) Piping equipment on the 3-in recovered oil line.

The crude by rail unloading station components are the only components subject to GGGa. The rest of the project components are subject to the LDAR requirements listed in the Air Operating Permit (AOP) & Consent Decree.

Marine Vessel loading with ethanol:

As shown above, the permits we have issued for marine loading have typically been for non-ethanol fuels (such as crude oil and gasoline). The most recent permit issued was for Targa Sound Terminal 11265, which required the use of a vapor combustion unit on marine loading of natural gasoline with ≥99.0% destruction efficiency for VOCs. This is more stringent that the requirements in MACT Subpart Y (≥98% destruction) and the BAAQMD BACT guidance (≥98.5% destruction). Loading will be conducted with the same MVCU currently installed at US Oil which will meet this requirement. The capture efficiency of the unit will be verified with the required monitoring of the leak detection and repair plan.

Recommendations:

Summary BACT/tBACT determination

Pollutant	Available Method That Meets BACT
Total VOCs /TBACT	-Two existing crude oil external floating roof tanks modified to ethanol internal floating roof tanks. (TK-80015 and TK-80020). These tanks will be subject to NSPS Subpart Kb and the additional requirements outlined above regarding guide poles. -Fugitive Emissions leaks from new components *Crude by Rail Unloading facility, which is used for ethanol unloading, is an affected facility under 40 CFR Part 60, Subparts GGGa and A. At a minimum, all equipment installed under this order at the Crude by Rail Unloading*

Pollutant	Available Method That Meets BACT
	facility that is being used for ethanol unloading shall comply with Subpart GGGa. *The owner and/or operator shall include the following components in the facility LDAR plan:* *i) Piping equipment on the 6-in ethanol tank to tank line* *ii) Piping equipment on the 3-in recovered oil line.* -Marine Loading operations for Ethanol shall be controlled with a MVCU capable of meeting 99.0% control efficiency for VOC.

F. EMISSION ESTIMATES

Emissions are calculated using established emission factors published either in United States Environmental Protection Agency (USEPA) AP-42, other technical resources, or conservatively set at the maximum allowable by an applicable regulation or the facility's AOP. Below is a table of the project potential to emit (PTE) provided by the applicant in lbs/yr (first table) and tons/yr (second table):

Total Project potential to emit: (in lbs/yr and tons/yr)

Activity	Pollutants (lb/yr)									
	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	Pb	SO_2	H_2SO_4	HAP	TAP
Locomotive Switching	91.48	88.74	258.57	3,514.81	881.11	0.12	3.09	-	-	-
Locomotive Idling	3.67	3.56	129.29	71.08	10.58	3.02E-03	0.01	-	-	-
Locomotive Idling + Switching	95.15	92.30	387.86	3,585.89	891.69	0.12	3.10	-	-	-
VCU[1]	4.49	4.49	1,811.18	59.04	49.60	2.95E-04	0.35	-	19.98	16.58
Tanks	-	-	7.65	-	-	-	-	-	7.14	3.30
Component Fugitives	-	-	6,789.08	-	-	-	-	-	74.96	77.25
Total	**99.64**	**96.78**	**8,995.77**	**3,644.93**	**941.29**	**0.12**	**3.45**	**0**	**102.08**	**97.12**

1 Project VCU emissions calculated as net emissions

Project Potential Emissions

Activity	Pollutants (tpy)									
	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	Pb	SO_2	H_2SO_4	HAP	TAP
Locomotive Switching	0.05	0.04	0.13	1.76	0.44	5.96E-05	1.54E-03	-	-	-
Locomotive Idling	1.83E-03	1.78E-03	0.06	0.04	0.01	1.51E-06	5.59E-06	-	-	-
Locomotive Idling + Switching	0.05	0.05	0.19	1.79	0.45	6.11E-05	1.55E-03	-	-	-
VCU[1]	2.24E-03	2.24E-03	0.91	0.03	0.02	1.48E-07	1.77E-04	-	0.01	0.01
Tanks	-	-	3.82E-03	-	-	-	-	-	3.57E-03	1.65E-03
Component Fugitives	-	-	3.39	-	-	-	-	-	0.04	0.04
Total	**0.05**	**0.05**	**4.50**	**1.82**	**0.47**	**6.13E-05**	**1.73E-03**	**0**	**0.05**	**0.05**

The applicant provided the following spreadsheet for emission calculations, which were verified by the Agency for accuracy. Some of the tank emission calculations were spot checked as explained below.

PSCAA_USOR Ethanol and Renew E

TANK ESP IFR v3.xlsx

Emissions from each activity are explained below in detail. All speciation was done using the worst case scenario weight % from the following SDS information for Ethanol:

MSDS_Fuel_Alcohol_ ITEC_Refining.pdf

Denatured Fuel Ethanol Chemical Properties[1]:

Chemical Properties	Value	Units
Specific Gravity	0.79	
Density	6.59	lb/gal

VOC Speciation:

Organic Compound	HAP/TAP	CAS	Density (lb/gal)	Gasoline Composition[2] (wt%)	Denatured Fuel Ethanol Composition (vl%)	Mass of Compound (lb)	Denatured Fuel Ethanol Composition (wt%)
Ethanol	-	64-17-5	6.58		96.500	6.35	96.378
Gasoline	-	86290-81-5	6.17		3.500	0.22	
Benzene	HAP/TAP	71-43-2	7.38	0.95		0.00	0.031
Ethylbenzene	HAP/TAP	100-41-4	7.23	2.08		0.00	0.068
Toluene	HAP/TAP	108-88-3	7.26	9.76		0.02	0.320
Xylene (mixed isomers)	HAP/TAP	1330-20-7	7.24	14.55		0.03	0.477
Cyclohexane	TAP	110-82-7	6.50	0.89		0.00	0.029
n-Hexane	HAP/TAP	110-54-3	5.47	4.94		0.01	0.162
Naphthalene	HAP/TAP	91-20-3	9.51	0.06		0.00	0.002
1,2,4-Trimethylbenzene	-	95-63-6	7.31	2.99		0.01	0.098
Isooctane (2,2,4-Trimethylpentane)	HAP	540-84-1	5.76	0.00		0.00	9.83E-05

[1] Speciation data from ITEC Refining and Marketing Company Ltd. MSDS for Denatured Fuel Ethanol issued 12/29/2008

Storage tanks:

Storage tank emissions took into account monthly throughput, number of turnovers, and ambient temperatures. Speciation data for ethanol was assumed using the SDS information linked in this document above.

USOR calculated post-project ethanol storage tank emissions using TankESP version 3.0.43. The calculations and equations used by these programs are in AP-42 Chapter 7 and the tank emissions were verified by the agency to determine if the correct methods were used:

7.1.3.2.1 Normal Operation

Total losses from floating roof tanks may be written as:

$$L_T = L_R + L_{WD} + L_F + L_D \quad (2\text{-}1)$$

where:

L_T = total loss, lb/yr
L_R = rim seal loss, lb/yr; see Equation 2-2
L_{WD} = withdrawal loss, lb/yr; see Equation 2-4
L_F = deck fitting loss, lb/yr; see Equation 2-5
L_D = deck seam loss (internal floating roof tanks only), lb/yr; see Equation 2-9

Loss factors may be estimated for deck fitting configurations that are not listed in Table 1-12, at the zero miles-per-hour wind speed condition (IFRTs and CFRTs), from the following equation:

$$K_{fai} = 0.27(A_{fi})^{0.86}$$

Where:

K_{fai} = zero-wind-speed loss factor for a particular type of deck fitting, in pound-moles per year.
A_{fi} = liquid surface area within a particular type of deck fitting, in square inches. The liquid surface area is the area inside the deck fitting well or leg sleeve, less any area occupied by an obstruction in the deck fitting well or leg sleeve (such as a fixed-roof support column, unslotted guidepole, guidepole float, or deck support leg).

A spot check on Rim Seal Losses for tank 80015 was conducted to ensure accuracy:
The Rim Seal loss calculated by US Oil for this tank at start date 43831.0 was roughly 3.1 lbs/month.

Rim Seal Loss - Rim seal loss from floating roof tanks can be estimated using the following equation:

$$L_R = (K_{Ra} + K_{Rb} v^n) D P^* M_V K_C \quad (2\text{-}2)$$

where:

L_R = rim seal loss, lb/yr
K_{Ra} = zero wind speed rim seal loss factor, lb-mole/ft·yr; see Table 7.1-8
K_{Rb} = wind speed dependent rim seal loss factor, lb-mole/(mph)^{n}ft·yr; see Table 7.1-8
v = average ambient wind speed at tank site, mph; see Note 1
n = seal-related wind speed exponent, dimensionless; see Table 7.1-8
P^* = vapor pressure function, dimensionless; see Note 2

$$P^* = \frac{\frac{P_{VA}}{P_A}}{\left[1+\left(1-\frac{P_{VA}}{P_A}\right)^{0.5}\right]^2} \quad (2\text{-}3)$$

where:

P_{VA} = vapor pressure at daily average liquid surface temperature, psia;

See Notes 1 and 2 to Equation 1-21 and Note 3 below

P_A = atmospheric pressure, psia

D = tank diameter, ft
M_V = average vapor molecular weight, lb/lb-mole; see Note 1 to Equation 1-21,
K_C = product factor;
$K_C = 0.4$ for crude oils;
$K_C = 1$ for all other organic liquids.

Using equation 2-2 outlined above, the following factors were taken from AP-42 Table 7.1-8 for K_{RA} and K_{RB} For a liquid mounted seal, Rim mounted secondary (corresponding to tank 80015)

Tank Construction And Rim-Seal System	Average-Fitting Seals		
	K_{Ra} (lb-mole/ft-yr)	K_{Rb} [lb-mole/(mph)^n-ft-yr]	n (dimensionless)
Welded Tanks			
Mechanical-shoe seal			
Primary only[b]	5.8	0.3	2.1
Shoe-mounted secondary	1.6	0.3	1.6
Rim-mounted secondary	0.6	0.4	1.0
Liquid-mounted seal			
Primary only	1.6	0.3	1.5
Weather shield	0.7	0.3	1.2
Rim-mounted secondary	0.3	0.6	0.3

$K_{RA} = 0.3$
$K_{RB} = 0.6$

According to note 1, on page 7.1-23 of AP-42 Chapter 7, the v^n value goes to zero for internal floating roof tanks and domed external floating roof tanks since the "average ambient wind speeds" (v) goes to zero.

Vapor Pressure Function was found used Equation 2-3 as noted above, which is a function of vapor pressure at the average daily liquid surface temperature and the atmospheric pressure (both in the spreadsheet)

Vapor Pressure Function (P*) = 0.022119743

-The Vapor Molecular weight Mv, was found to be 46 lbs/lb-mole based on ethanol.

-The tank diameter is 120 feet (D)

-Product factor, K_c was 1.0 for all other volatile organic liquids since this is not crude oil.

These values were placed in Equation 2-2 outlined above and verified to be 36.629 lbs/year for rim seal losses, or 3.0524 lbs/month which is equivalent to the rounded version presented in the spreadsheet above from US Oil of 3.1 lbs/month.

Fugitive emissions from new components:
New equipment located in the Crude by Rail Unloading Facility (which is used for ethanol as well as crude oil as described above) is subject to 40 Code of Federal Regulations (CFR) 60 Subpart GGGa. Fugitive emissions are estimated based on a combination of actual average component leak rates for equipment in light liquid service (measured through the facility's leak detection and repair [LDAR] program), leak definitions specified in 40 CFR 60 Subpart GGGa (Subpart VVa leak standards) which is considered BACT for this Project (see Section 4.0, below), and USEPA AP-42 *Screening Value Correlations*.2 The ethanol tank to tank transfer line and recovered oil line are outside the Crude by Rail Unloading Facility and subject to 40 CFR 63 Subpart CC.

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Fugitive emissions for the two lines are based on a combination of actual average component leak rates for equipment in light liquid service (measured through the facility's LDAR program) and RTI International's *Emissions Estimation Protocol for Petroleum Refineries.*

Date: 4/18/2018 Date: 4/20/2018

Project: Ethanol Component Count Multipliers

Railcar Unloading Stations	36
Station Sets	18
Railcar Track Sets	2
Transfer Pumps	2
Safety Factor[1]	1.05

[1] 5% Safety Factor applied to all equipment counts except pumps.

Project: Assumptions

Railcar volume (bbl)	650
Railcars/train	107
Ethanol Railcar Offloads/yr	5,564
Oil to ground/railcar (ml)	10
Oil from Stormwater Evaporation (%)	10

Project: Recovered Oil Line - Fugitive Emissions Estimate (excluding tank fugitives)

				Potential to Emit Project Fugitive Components (LDAR Average & Petroleum Refinery Average Leak Rates)			
Equipment Type	Component Count for Recovered Oil Line	Total Component Counts	Operating Hours[1]	Leak Rate[2] (lb/hr/component)	VOC[3] (lb/hr)	VOC[3] (lb/yr)	VOC[3] (tpy)
Valves	1	2	8,760	9.30E-05	1.40E-04	1.22	6.11E-04
Pumps	1	2	8,760	1.22E-03	1.83E-03	16.02	8.01E-03
Other[4]	0	0	8,760	3.00E-04	0	0	0
Connectors	3	4	8,760	5.51E-04	2.07E-03	18.11	9.05E-03
Flanges	3	5	8,760	5.51E-04	2.48E-03	21.73	0.01
Open-ended line	0	0	8,760	3.75E-03	0	0	0
				Total	**6.51E-03**	**57.07**	**0.03**

[1] PTE and actual emissions estimates based upon continuous operations (i.e., 8,760 operating hours per year)

[2] Average LDAR Leak Rates from Facility LDAR Program as provided by Case Hinkins' email from 01
Assume Relief Valve leak rate for Other. Leak rates for Flanges and Open-Ended Lines based on *Emissions Estimation Protocol for Petroleum Refineries (April 2015)* as no facility specific leak rates were available.

[3] Assume all TOC is VOC.

[4] The "other" equipment type was developed from instruments, loading arms, pressure relief devices, stuffing boxes, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters, and polished rods. This "other" equipment type should be applied to any equipment other than connectors, flanges, open-ended lines, pumps, or valves.

Project: Ethanol Railcar Unloading to Tankage - Fugitive Emissions Estimate (excluding tank fugitives)

							Potential to Emit Project Fugitive Components (NSPS Subpart GGGa Leak Rates)				Actual Emissions Project Fugitive Components (LDAR Average Leak Rates & NSPS Subpart GGGa Leak Rates)			
Equipment Type	Count Per Crude Railcar Unloading Station (From Railcar to 12-inch Gravity Line)	Component Count Per Gravity Line to Pump and Tankage (From 12-inch Gravity Line to Tankage)	Component Count For Pump Transfer Station (DWGs HP316, HP346, and GA325)	Total Component Counts	NSPS Subpart GGGa Leak Definition (ppmv)	Operating Hours[1]	TOC EPA AP-42 Screening Value Correlations[2] (lb/hr/component)	VOC[3] (lb/hr)	VOC[3] (lb/yr)	VOC[3] (tpy)	LDAR/GGGa Leak Rate[4] (lb/hr/component)	VOC[3] (lb/hr)	VOC[3] (lb/yr)	VOC[3] (tpy)
Valves	2	4	42	128	500	8,760	5.21E-04	0.07	584	0.29	9.30E-05	0.01	104	0.05
Pumps	0	1	3	5	2,000	8,760	1.14E-02	0.06	516	0.26	1.22E-03	6.28E-03	55.0	0.03
Other[5]	3	2	5	117	500	8,760	1.17E-03	0.14	1,197	0.60	3.00E-04	0.04	308	0.15
Connectors	5	10	35	247	500	8,760	3.25E-04	0.08	702	0.35	3.25E-04	0.08	702	0.35
Flanges	9	28	114	519	500	8,760	8.02E-04	0.42	3,646	1.82	8.02E-04	0.42	3,646	1.82
Open-ended line	0	0	0	0	500	8,760	3.85E-04	0	0	0	3.85E-04	0	0	0
							Total	**0.76**	**6,646**	**3.32**	**Total**	**0.55**	**4,816**	**2.41**

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Project: Ethanol Tank to Tank Transfer Line - Fugitive Emissions Estimate (excluding tank fugitives)				Potential to Emit Project Fugitive Components (LDAR Average & Petroleum Refinery Average Leak Rates)			
Equipment Type	Component Count for Ethanol Tank to Tank Transfer Line	Total Component Counts	Operating Hours[1]	Leak Rate[2] (lb/hr/ component)	VOC[3] (lb/hr)	VOC[3] (lb/yr)	VOC[3] (tpy)
Valves	1	2	8,760	9.30E-05	1.86E-04	1.63	8.15E-04
Pumps	1	2	8,760	1.22E-03	2.44E-03	21.4	0.01
Other[5]	0	0	8,760	3.00E-04	0	0	0
Connectors	3	5	8,760	5.51E-04	2.76E-03	24.1	0.01
Flanges	3	6	8,760	5.51E-04	3.31E-03	29.0	0.01
Open-ended line	0	0	8,760	3.75E-03	0	0	0
				Total	**8.69E-03**	**76**	**0.04**

[1] PTE and actual emissions estimates based upon continuous operations (i.e., 8,760 operating hours per year)

2 Average LDAR Leak Rates from Facility LDAR Program as provided by Case Hinkins' email from 01/29/2018 (Valves, Pumps, Other).
Assume Relief Valve leak rate for Other. Leak rates for Flanges and Open-Ended Lines based on *Emissions Estimation Protocol for Petroleum Refineries (April 2015)* as no facility specific leak rates were available.

[3] Assume all TOC is VOC.

[4] The "other" equipment type was developed from instruments, loading arms, pressure relief devices, stuffing boxes, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters, and polished rods. This "other" equipment type should be applied to any equipment other than connectors, flanges, open-ended lines, pumps, or valves.

[5] The "other" equipment type was developed from instruments, loading arms, pressure relief devices, stuffing boxes, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters, and polished rods. This "other" equipment type should be applied to any equipment other than connectors, flanges, open-ended lines, pumps, or valves.

Project: Oil Phase Calculations

Equipment Type	Potential Offloads/Year	Oil Volume (gal)	Estimated Emissions (lb):
Ethanol Cars	5,564	14.7	**9.7**
		Estimated Emissions (lb):	**9.7**

	Potential to Emit Project Fugitive Components (NSPS Subpart GGGa Leak Rates)			Actual Emissions Project Fugitive Components (LDAR Average Leak Rates & NSPS Subpart GGGa Leak Rates)		
Post-Project: Total Fugitive Emission Estimate (excluding tank fugitives)	VOC (lb/hr)	VOC (lb/yr)	VOC (tpy)	VOC (lb/hr)	VOC (lb/yr)	VOC (tpy)
Recovered Oil Line	6.51E-03	57.07	0.03	6.51E-03	57.07	0.03
Ethanol Railcar Unloading to Tankage	0.76	6,646.24	3.32	0.55	4,815.92	2.41
Ethanol Tank to Tank Line	8.69E-03	76.09	0.04	8.69E-03	76.09	0.04
Ethanol Oily Water Collection System	1.11E-03	9.69	4.84E-03	1.11E-03	9.69	4.84E-03
Total	**0.78**	**6,789.08**	**3.39**	**0.57**	**4,958.77**	**2.48**

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US Oil submitted the above information in an Excel spreadsheet which was verified by the Agency for accuracy.

MVCU Combustion:

MVCU combustion emission factors are derived from USEPA AP-42, USEPA1; API/WSPA5; Wien, S., England, G.C., and Chang, O.M.C.6; and based on design operating conditions. The MVCU meets destruction efficiency standards as confirmed by a source test on November 4, 2014. Due to the increase in ethanol loading and unloading operations, the MVCU will have a slight increase in emissions from this project. The emissions are estimated below:

Parameter	Value	Units	Source
Project Pilot + Enrichment Gas (Natural Gas)	0	lb/year	
Project Pilot + Enrichment Gas (Natural Gas) + Ethanol Loading	28,624	lb/year	
Specific gravity of natural gas:	0.6	SG	From Cascade NG MSDS
Heating value of natural gas:	1,020	btu/scf	From AP-42 Table 1.4-1
Density of air:	0.0808	lb/scf	Perry's Chemical Engineering Handbook
Net volume increase of all vapors burned in the dock VCU:	0.6	mmscf/year	VCU vapors burned
Project HHV of vapors increase burned in the dock VCU:	602	mmbtu/year	VCU gasses burned
Project mass of vapors increase in the dock VCU:	28,624	lb/year	VCU gasses burned

	Emission Factor			VCU	
Criteria Pollutants	($lb/10^6$ scf)	(lb/MMBtu)	Source	(lbs/yr)	(tpy)
NO_X	100	0.0980	AP-42 Table 1.4-1	59.04	0.03
CO	84	0.0824	AP-42 Table 1.4-1	49.60	0.02
SO_2	0.6	0.0006	AP-42 Table 1.4-2	0.35	1.77E-04
PM	7.6	0.0075	AP-42 Table 1.4-2	4.49	2.24E-03
VOC	5.5	0.00539	AP-42 Table 1.4-2	0.32	1.59E-04
Pb	0.0005	4.90E-07	AP-42 Table 1.4-2	2.95E-04	1.48E-07

Note:

Per AP-42 Table 1.4-1 (c), SO_2 emission factor is based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content of natural gas is 2,000 $gr/10^6$ scf.

Per AP-42 Table 1.4-1 (c), all PM is assumed to be less than 1.0 micrometer in diameter; therefore, the emission factor for PM can be used to estimate PM_{10} or $PM_{2.5}$.

Marine Loading:

Emission factors for product loading are calculated using the equations and methodology of USEPA AP-42, Transportation and Marketing of Petroleum Liquids, July 2008. Loading losses were calculated using equation 1 in AP -42 Chapter 5:

AP42 Loading Equation 1

$L_L = 12.46 * S * P * M / T$

Where

L_L = loading loss in pounds per 1,000 gal loaded
S = Saturation factor per AP-42, Table 5.2-1
P = True vapor pressure of liquid loaded (psia)
M = molecular weight of vapors from liquid loaded (lb/lbmol)
T = temperature of bulk liquid loaded (Rankin)

The factors used in this equation are outlined below:

Constants:

Material Loaded	S	P	M	T (F)	T (R)	L_L (lb/1000 gal)	EF (lb/10^6 scf)
Ethanol[4]	0.2	0.9	46	54.91	514.91	0.20	

The MVCU runs on two pilot burners that use 1.0 scfm natural gas, and also around 752 scfm per year of enrichment natural gas is added to the unit for complete combustion. The 752 scfm of enrichment gas is the maximum design capacity of the MVCU and therefore; is the worst case value for these emission calculations. Natural gas emission factors are taken from AP-42 Section 1.4 – Natural Gas Combustion Table 1.4-2 (5.5 lbs/Mscf)

Ethanol loading emissions (titled "VOC Not Combusted"), taking into account the 95% collection efficiency (reported and verified by the MVCU manufacturer's performance guarantee) and the 99% destruction efficiency (will be verified with performance testing) was estimated to be 1,810.86 pounds per year:

Post-Project Emissions

Loaded/Vented Product	Emission Factor (lb/mgal)	Total Volume Loaded (bbl)[1]	Total Volume Loaded (mgal)	VOC Total Mass Loaded (lbs)	Fraction Uncontrolled[3]	Uncontrolled Loading Volume (mgal)	Controlled Loading Volume (mgal)	Fraction Not Combusted[4]	VOC Not Combusted (lbs)	VOC Not Combusted (tpy)
Ethanol	0.200	3,616,600	151,897	30,435	0.05	7,595	144,302	0.01	1,810.86	0.91
VCU Fuel	**(lb/10^6 scf)**	**(scfm)**	**(10^6scf)**	**(lbs)**	-	**(10^6scf)**	**(10^6scf)**	-	**(lbs)**	**(tpy)**
Pilot Gas[2]	5.50	2.00	1.05	5.78	0.00	0	1.05	0.01	0.06	2.89E-05
Enrichment Gas	5.50	752	0	0	0.00	0	0	0.01	0	0
								Total VOC	**1,810.92**	**0.91**

[2] 2 pilot burners at 1.0 scfm natural gas continuously

[3] Fraction uncontrolled is inverse ratio of collection efficiency (i.e., 95% following construction of Marine Terminal Vapor Control System)

[4] Fraction not combusted is inverse ratio of combustion efficiency (i.e., 99% following contruction of VCU)

Reporting Source Status:

US Oil reports emissions on an annual basis for pollutants above the thresholds listed below. US Oil is a reporting source and this application does not change that status.

Section 7.09(a)

Emission Reporting. An emission report shall be required from each owner or operator of an operating permit source, listing those air contaminants emitted during the previous calendar year that equal or exceed the following (tons/year):

Carbon monoxide (CO) emissions 25
Facility combined total of all toxic air contaminant (TAC) emissions 6
Any single toxic air contaminant (TAC) emissions (excluding lead, but including lead compounds) 2
Nitrogen oxide (NOx) emissions 25
Particulate matter (PM10) emissions 25
Particulate matter (PM2.5) emissions 25
Sulfur oxide (SOx) emissions 25
Volatile organic compounds (VOC) emissions 25
Lead 0.5

G. OPERATING PERMIT or PSD

The Title V Air Operating Permit (AOP) program applicability for the entire source has been reviewed.

The facility is a Title V air operating permit source and conditions of this Order will be incorporated into the AOP during the next AOP renewal. The changes allowed by this NOCOA are considered to be off-permit changes. The changes being made here are additions to what is currently in the AOP, and no condition of the permit would be violated with these modifications.

Emission increases associated with this project were reviewed for Prevention of Significant Deterioration (PSD) Program applicability. The facility is an existing PSD major source and the increase in emissions from this permitting action is below PSD thresholds.

H. AMBIENT TOXICS IMPACT ANALYSIS

The estimated potential toxic air pollutant (TAP) emissions were assessed assuming operating at 100% rated capacity and 8,760 hour per year for each new or modified emission unit (*or based on limit in permit*). The table below includes estimated potential emissions of all TAP and compares those to the Small Quantity Emission Rates (SQER) in WAC 173-460-150.

Emissions of toxic air pollutants were calculated and submitted as part of the permit application. Emissions of TAPS were calculated using speciated data from the Ethanol SDS information pasted above in the emission section. They are summarized and presented below. The emission calculations were verified:

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			Tank Fugitive Emissions				Fugitive Emissions - New Components				VCU				Total Emissions[1]				SQER Threshold		Exceed Threshold?[1]
CAS #	Pollutant	HAP/TAP?	lb/hr	lb/24-hr	lb/yr	tpy	lb/hr	lb/24-hr	lb/yr	tpy	lb/hr	lb/24-hr	lb/yr	tpy	lb/hr	lb/24-hr	lb/yr	tpy	Amount	Averaging Period (Units)	(Yes/No)
95-63-6	1,2,4-Trimethylbenzene	--	3.23E-05	7.75E-04	0.28	1.41E-04	3.06E-05	7.35E-04	0.27	1.34E-04	2.02E-04	4.86E-03	1.77	8.87E-04	2.65E-04	6.37E-03	2.32	1.16E-03			--
106-99-0	1,3 Butadiene	HAP/TAP	0	0	0	0	6.39E-09	1.53E-07	5.60E-05	2.80E-08	0	0	0	0	6.39E-09	1.53E-07	5.60E-05	2.80E-08	1.13	lb/Year	NO
540-84-1	2,2, 4-Trimethylpentane	HAP	0	0	0	0	1.21E-05	2.89E-04	0.11	5.28E-05	2.03E-07	4.88E-06	1.78E-03	8.90E-07	1.23E-05	2.94E-04	0.11	5.37E-05	--	--	--
83-32-9	Acenaphthene (POM)	HAP									1.65E-10	3.96E-09	1.45E-06	7.23E-10	1.65E-10	3.96E-09	1.45E-06	7.23E-10	--	--	--
208-96-8	Acenaphthylene (POM)	HAP									4.47E-10	1.07E-08	3.91E-06	1.96E-09	4.47E-10	1.07E-08	3.91E-06	1.96E-09	--	--	--
75-07-0	Acetaldehyde	HAP/TAP									8.25E-07	1.98E-05	7.23E-03	3.61E-06	8.25E-07	1.98E-05	7.23E-03	3.61E-06	71	lb/Year	NO
107-02-8	Acrolein	HAP/TAP									1.17E-06	2.80E-05	0.01	5.12E-06	1.17E-06	2.80E-05	0.01	5.12E-06	0.00789	lb/24-hr	NO
120-12-7	Anthracene (POM)	HAP									3.23E-10	7.75E-09	2.83E-06	1.42E-09	3.23E-10	7.75E-09	2.83E-06	1.42E-09	--	--	--
71-43-2	Benzene	HAP/TAP	2.44E-04	5.85E-03	2.14	1.07E-03	2.15E-05	5.16E-04	0.19	9.42E-05	6.45E-05	1.55E-03	0.56	2.82E-04	3.30E-04	7.92E-03	2.89	1.44E-03	6.62	lb/Year	NO
56-55-3	Benzo(a)anthracene	TAP									1.51E-09	3.63E-08	1.32E-05	6.62E-09	1.51E-09	3.63E-08	1.32E-05	6.62E-09	1.74	lb/Year	NO
50-32-8	Benzo(a)pyrene	TAP									3.92E-09	9.40E-08	3.43E-05	1.72E-08	3.92E-09	9.40E-08	3.43E-05	1.72E-08	0.174	lb/Year	NO
205-99-2	Benzo(b)fluoranthene	TAP									1.86E-09	4.45E-08	1.63E-05	8.13E-09	1.86E-09	4.45E-08	1.63E-05	8.13E-09	1.74	lb/Year	NO
191-24-2	Benzo(g,h,i)perylene (POM)	HAP									8.94E-11	2.14E-09	7.83E-07	3.91E-10	8.94E-11	2.14E-09	7.83E-07	3.91E-10	--	--	--
207-08-9	Benzo(k)fluoranthene	TAP									1.17E-09	2.80E-08	1.02E-05	5.12E-09	1.17E-09	2.80E-08	1.02E-05	5.12E-09	1.74	lb/Year	NO
92-52-4	Biphenyl	HAP	0	0	0	0	1.95E-06	4.69E-05	0.02	8.56E-06	0	0	0	0	1.95E-06	4.69E-05	0.02	8.56E-06	--	--	--
630-08-0	Carbon Monoxide	--									5.66E-03	0.14	49.60	0.02	5.66E-03	0.14	49.60	0.02	50.4	lb/1-hr	NO
218-01-9	Chrysene	HAP/TAP									1.10E-10	2.64E-09	9.64E-07	4.82E-10	1.10E-10	2.64E-09	9.64E-07	4.82E-10	17.4	lb/Year	NO
98-82-8	Cumene	HAP/TAP	0	0	0	0	7.04E-06	1.69E-04	0.06	3.08E-05	0	0	0	0	7.04E-06	1.69E-04	0.06	3.08E-05	52.6	lb/24-hr	NO
110-82-7	Cyclohexane	TAP	2.33E-05	5.59E-04	0.20	1.02E-04	5.21E-05	1.25E-03	0.46	2.28E-04	6.03E-05	1.45E-03	0.53	2.64E-04	1.36E-04	3.26E-03	1.19	5.94E-04	789	lb/24-hr	NO
53-70-3	Dibenzo(a,h)anthracene	TAP									8.25E-11	1.98E-09	7.23E-07	3.61E-10	8.25E-11	1.98E-09	7.23E-07	3.61E-10	0.16	lb/Year	NO
100-41-4	Ethylbenzene	HAP/TAP	2.47E-05	5.92E-04	0.22	1.08E-04	2.61E-05	6.25E-04	0.23	1.14E-04	1.42E-04	3.41E-03	1.24	6.22E-04	1.93E-04	4.62E-03	1.69	8.44E-04	76.8	lb/Year	NO
206-44-0	Fluoranthene (POM)	HAP									1.99E-10	4.78E-09	1.75E-06	8.73E-10	1.99E-10	4.78E-09	1.75E-06	8.73E-10	--	--	--
86-73-7	Fluorene (POM)	HAP									1.86E-10	4.45E-09	1.63E-06	8.13E-10	1.86E-10	4.45E-09	1.63E-06	8.13E-10	--	--	--
50-00-0	Formaldehyde	HAP/TAP									5.09E-06	1.22E-04	0.04	2.23E-05	5.09E-06	1.22E-04	0.04	2.23E-05	32	lb/Year	NO
110-54-3	Hexane	HAP/TAP	1.75E-04	4.20E-03	1.53	7.67E-04	9.06E-05	2.17E-03	0.79	3.97E-04	3.34E-04	8.03E-03	2.93	1.47E-03	6.00E-04	0.01	5.26	2.63E-03	92	lb/24-hr	NO
7783-06-4	Hydrogen Sulfide	HAP/TAP									2.01E-05	4.82E-04	0.18	8.79E-05	2.01E-05	4.82E-04	0.18	8.79E-05	0.263	lb/24-hr	NO
193-39-5	Indeno(1,2,3-cd)pyrene (POM)	HAP/TAP									4.88E-09	1.17E-07	4.28E-05	2.14E-08	4.88E-09	1.17E-07	4.28E-05	2.14E-08	1.74	lb/24-hr	NO
7440-43-9	Lead	TAP									3.37E-08	8.09E-07	2.95E-04	1.48E-07	3.37E-08	8.09E-07	2.95E-04	1.48E-07	16	lb/Year	NO
91-20-3	Naphthalene	HAP/TAP	6.44E-07	1.55E-05	5.64E-03	2.82E-06	9.06E-06	2.17E-04	0.08	3.97E-05	4.10E-06	9.85E-05	0.04	1.80E-05	1.38E-05	3.31E-04	0.12	6.05E-05	5.64	lb/year	NO
10102-44-0	Nitrogen Dioxide	--									6.74E-03	0.16	59.04	0.03	6.74E-03	0.16	59.04	0.03	1.03	lb/1-hr	NO
85-01-8	Phenanathrene (POM)	HAP									1.17E-09	2.80E-08	1.02E-05	5.12E-09	1.17E-09	2.80E-08	1.02E-05	5.12E-09	--	--	--
108-95-2	Phenol	HAP/TAP									2.75E-07	6.60E-06	2.41E-03	1.20E-06	2.75E-07	6.60E-06	2.41E-03	1.20E-06	26.3	lb/24-hr	NO
7723-14-0	Phosphorus	HAP									4.40E-08	1.06E-06	3.85E-04	1.93E-07	4.40E-08	1.06E-06	3.85E-04	1.93E-07	2.63	lb/24-hr	NO
115-07-1	Propylene	TAP									1.03E-05	2.47E-04	0.09	4.52E-05	1.03E-05	2.47E-04	0.09	4.52E-05	394	lb/24-hr	NO
129-00-0	Pyrene (POM)	HAP									3.37E-10	8.08E-09	2.95E-06	1.48E-09	3.37E-10	8.08E-09	2.95E-06	1.48E-09	--	--	--
7556-09-05	Sufur Dioxide	--									4.04E-05	9.71E-04	0.35	1.77E-04	4.04E-05	9.71E-04	0.35	1.77E-04	1.45	lb/1-hr	NO
108-88-3	Toluene	HAP/TAP	1.45E-04	3.48E-03	1.27	6.35E-04	1.17E-04	2.80E-03	1.02	5.11E-04	6.61E-04	0.02	5.79	2.90E-03	9.23E-04	0.02	8.08	4.04E-03	657	lb/24-hr	NO
1330-20-7	mixed xylene	HAP/TAP	1.70E-04	4.09E-03	1.49	7.46E-04	1.30E-04	3.13E-03	1.14	5.71E-04	9.87E-04	0.02	8.65	4.32E-03	1.29E-03	0.03	11.28	5.64E-03	--	--	--
95-47-6	o-xylene	HAP/TAP	1.70E-04	4.09E-03	1.49	7.46E-04	4.34E-05	1.04E-03	0.38	1.90E-04	9.87E-04	0.02	8.65	4.32E-03	1.20E-03	0.03	10.52	5.26E-03	29	lb/24-hr	NO
108-38-3	m-xylene	HAP/TAP	1.70E-04	4.09E-03	1.49	7.46E-04	4.34E-05	1.04E-03	0.38	1.90E-04	9.87E-04	0.02	8.65	4.32E-03	1.20E-03	0.03	10.52	5.26E-03	29	lb/24-hr	NO
106-42-3	p-xylene	HAP/TAP	1.70E-04	4.09E-03	1.49	7.46E-04	4.34E-05	1.04E-03	0.38	1.90E-04	9.87E-04	0.02	8.65	4.32E-03	1.20E-03	0.03	10.52	5.26E-03	29	lb/24-hr	NO
		Total HAP	**1.27E-03**	**0.03**	**11.13**	**5.57E-03**	**5.45E-04**	**0.01**	**4.78**	**2.39E-03**	**5.18E-03**	**0.12**	**45.39**	**0.02**	**7.00E-03**	**0.17**	**61.30**	**0.03**	-	-	-
		Total TAP	**1.29E-03**	**0.03**	**11.34**	**5.67E-03**	**5.84E-04**	**0.01**	**5.11**	**2.56E-03**	**5.25E-03**	**0.13**	**46.01**	**0.02**	**7.13E-03**	**0.17**	**62.45**	**0.03**	-	-	-

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From the information above, none of the Toxic Air Pollutants emitted from this project exceeded the SQER values. Emission calculations were not done using any project netting for TAPs. Detailed emission calculations are outlined below for each process associated with this application (Fugitive emission leaks, MVCU combustion, Ethanol Loading operations and storage tanks).

Fugitive emission leaks:

Project Equipment - Speciatiated Ethanol Fugitive Emissions Estimate (Based on Denatured Fuel Ethanol Speciation Data)				Potential to Emit Project Fugitive Components (NSPS Subpart GGGa Leak Rates)			Actual Emissions Project Fugitive Components (LDAR Average Leak Rates & NSPS Subpart GGGa Leak Rates)		
Chemical	**CAS**	**HAP/TAP**	**Concentration (wt%)[1, 2]**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**
Ethanol	64-17-5	-	96.378	0.74	6488.17	3.24	0.54	4724.15	2.36
Benzene	71-43-2	HAP/TAP	0.031	2.39E-04	2.09	1.05E-03	1.74E-04	1.53	7.63E-04
Ethylbenzene	100-41-4	HAP/TAP	0.068	5.24E-04	4.59	2.29E-03	3.81E-04	3.34	1.67E-03
Toluene	108-88-3	HAP/TAP	0.320	2.46E-03	21.52	0.01	1.79E-03	15.67	7.84E-03
Xylene (mixed isomers)	1330-20-7	HAP/TAP	0.477	3.66E-03	32.08	0.02	2.67E-03	23.36	0.01
Cyclohexane	110-82-7	TAP	0.029	2.24E-04	1.96	9.81E-04	1.63E-04	1.43	7.14E-04
n-Hexane	110-54-3	HAP/TAP	0.162	1.24E-03	10.89	5.45E-03	9.05E-04	7.93	3.97E-03
Naphthalene	91-20-3	HAP/TAP	0.002	1.51E-05	0.13	6.62E-05	1.10E-05	0.10	4.82E-05
1,2,4-Trimethylbenzene	95-63-6	-	0.098	7.53E-04	6.59	3.30E-03	5.48E-04	4.80	2.40E-03
Isooctane (2,2,4-Trimethylpentane)	540-84-1	HAP	9.83E-05	7.55E-07	6.62E-03	3.31E-06	5.50E-07	4.82E-03	2.41E-06
Other VOC	-	-	2.4	0.02	163.97	0.08	0.01	119.39	0.06
			Total VOC	**0.77**	**6732.01**	**3.37**	**0.56**	**4901.70**	**2.45**
			Total HAP	**8.14E-03**	**71.32**	**0.04**	**5.93E-03**	**51.93**	**0.03**
			Total TAP	**8.36E-03**	**73.27**	**0.04**	**6.09E-03**	**53.35**	**0.03**

[1] Speciation data from ITEC Refining and Marketing Company Ltd. MSDS for Denatured Fuel Ethanol issued 12/29/2008

Conversions

3785	mL/gallon
8.34	lb/gallon (water)
0.790	specific gravity of ethanol

TAP Emissions from the fugitive emission leaks were done using NSPS subpart GGGa leak rates and the total speciated amount of TAPS from the SDS information from ITEC refining and marketing company (linked earlier in the emission calculation section).

MVCU Combustion:

Toxics	CAS	HAP/TAP?	Emission Factor (lb/MMBtu)	Emission Factor Source	Emissions (lb/year)
Acenaphthene	83-32-9	HAP	2.40E-09	ICR Protocol Final 2.1.1	1.45E-06
Acenaphthylene	208-96-8	HAP	6.50E-09	ICR Protocol Final 2.1.1	3.91E-06
Acetaldehyde	75-07-0	HAP/TAP	1.20E-05	ICR Protocol Final 2.1.1	7.23E-03
Acrolein	107-02-8	HAP/TAP	1.70E-05	ICR Protocol Final 2.1.1	0.01
Anthracene	120-12-7	HAP	4.70E-09	ICR Protocol Final 2.1.1	2.83E-06
Barium	7440-39-3	-	4.30E-06	ICR Protocol Final 2.1.1	2.59E-03
Benzene	71-43-2	HAP/TAP	2.10E-06	ICR Protocol Final 2.1.1	1.26E-03
Benzo(a)anthracene	56-55-3	TAP	2.20E-08	ICR Protocol Final 2.1.1	1.32E-05
Benzo(a)pyrene	50-32-8	TAP	5.70E-08	ICR Protocol Final 2.1.1	3.43E-05
Benzo(b)fluoranthene	205-99-2	TAP	2.70E-08	ICR Protocol Final 2.1.1	1.63E-05
Benzo(g,h,i)perylene	191-24-2	HAP	1.30E-09	ICR Protocol Final 2.1.1	7.83E-07
Benzo(k)fluoranthene	207-08-9	TAP	1.70E-08	ICR Protocol Final 2.1.1	1.02E-05
Chrysene	218-01-9	HAP/TAP	1.60E-09	ICR Protocol Final 2.1.1	9.64E-07
Cyclopentane	287-92-3	-	1.35E-05	Wien et al., 2003	8.13E-03
Dibenz(a,h)anthracene	53-70-3	TAP	1.20E-09	ICR Protocol Final 2.1.1	7.23E-07
Ethylbenzene	100-41-4	HAP/TAP	1.60E-05	ICR Protocol Final 2.1.1	9.64E-03
Fluoranthene	206-44-0	HAP	2.90E-09	ICR Protocol Final 2.1.1	1.75E-06
Fluorene	86-73-7	HAP	2.70E-09	ICR Protocol Final 2.1.1	1.63E-06
Formaldehyde	50-00-0	HAP/TAP	7.40E-05	ICR Protocol Final 2.1.1	0.04
Hydrogen sulfide	7783-06-4	HAP/TAP	2.92E-04	API/WSPA August, 1998	0.18
Indene	95-13-6	-	1.08E-06	Wien et al., 2003	6.50E-04
Indeno(1,2,3-cd)pyrene	193-39-5	HAP/TAP	7.10E-08	ICR Protocol Final 2.1.1	4.28E-05
Methylcyclohexane	108-87-2	-	8.18E-06	Wien et al., 2003	4.93E-03
Naphthalene	91-20-3	HAP/TAP	6.00E-07	ICR Protocol Final 2.1.1	3.61E-04
Phenanthrene	85-01-8	HAP	1.70E-08	ICR Protocol Final 2.1.1	1.02E-05
Phenol	108-95-2	HAP/TAP	4.00E-06	ICR Protocol Final 2.1.1	2.41E-03
Phosphorus	7723-14-0	HAP	6.40E-07	ICR Protocol Final 2.1.1	3.85E-04
Propylene	115-07-1	TAP	1.50E-04	ICR Protocol Final 2.1.1	0.09
Pyrene	129-00-0	HAP	4.90E-09	ICR Protocol Final 2.1.1	2.95E-06
Thallium	7440-28-0	-	5.78E-06	API/WSPA August, 1998	3.48E-03
Toluene	108-88-3	HAP/TAP	3.30E-06	ICR Protocol Final 2.1.1	1.99E-03
Xylenes (mixed isomers)	1330-20-7	HAP/TAP	2.50E-05	ICR Protocol Final 2.1.1	0.02
m-xylene	108-38-3	HAP/TAP	2.18E-05	Wien et al., 2003	0.01
o-xylene	95-47-6	HAP/TAP	9.35E-06	Wien et al., 2003	5.63E-03
p-xylene	106-42-3	HAP/TAP	2.18E-05	Wien et al., 2003	0.01
				Total	**0.38**
				Total HAP	**0.27**
				Total TAP	**0.36**

TAP Emissions for the MVCU combustion unit are based on burning 602 mmbtu/year of project HHV vapors.
Emission factors were taken from the ICR Protocol Final 2.1.1
https://www3.epa.gov/ttnchie1/efpac/protocol/Emission_Estimation_Protocol_for_Petroleum_Refinerie_052011.pdf
Table 4-3, page 4-13 External Combustion Natural Gas/Refinery Gas (lbs/MMBtu) Column 1

Notice of Construction (NOC) Worksheet

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Ethanol loading operations:

Post-Project Emissions

Loaded/Vented Product	Emission Factor (lb/mgal)	Total Volume Loaded (bbl)[1]	Total Volume Loaded (mgal)	VOC Total Mass Loaded (lbs)	Fraction Uncontrolled[3]	Uncontrolled Loading Volume (mgal)	Controlled Loading Volume (mgal)	Fraction Not Combusted[4]	VOC Not Combusted (lbs)	VOC Not Combusted (tpy)
Ethanol	0.200	3,616,600	151,897	30,435	0.05	7,595	144,302	0.01	1,810.86	0.91
VCU Fuel	**(lb/10^6 scf)**	**(scfm)**	**(10^6scf)**	**(lbs)**	-	**(10^6scf)**	**(10^6scf)**	-	**(lbs)**	**(tpy)**
Pilot Gas[2]	5.50	2.00	1.05	5.78	0.00	0	1.05	0.01	0.06	2.89E-05
Enrichment Gas	5.50	752	0	0	0.00	0	0	0.01	0	0
								Total VOC	**1,810.92**	**0.91**

[1] All recovered crude oil is assumed to be Worst-Case Crude for worst-case emission estimates

[2] 2 pilot burners at 1.0 scfm natural gas continuously

[3] Fraction uncontrolled is inverse ratio of collection efficiency (i.e., 95% following construction of Marine Terminal Vapor Control System)

[4] Fraction not combusted is inverse ratio of combustion efficiency (i.e., 99% following contruction of VCU)

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Toxics Speciation (wt%)

Loaded Product	n-Hexane	2,2,4 TMP	Benzene	Toluene	Xylenes	Ethylbenzene	1,2,4 TMB	Naphthalene	Cyclohexane
CAS	**110-54-3**	**540-84-1**	**71-43-2**	**108-88-3**	**1330-20-7**	**100-41-4**	**95-63-6**	**91-20-3**	**110-82-7**
Ethanol	0.16	9.83E-05	0.03	0.32	0.48	0.07	0.10	1.97E-03	0.03

Post-Project Toxics Vapor Emissions (lb)

Loaded Product	n-Hexane[1]	2,2,4 TMP	Benzene[1]	Toluene[1]	Xylenes[1]	Ethylbenzene[1]	1,2,4 TMB[1]	Naphthalene[1]	Cyclohexane	Total
CAS	**110-54-3**	**540-84-1**	**71-43-2**	**108-88-3**	**1330-20-7**	**100-41-4**	**95-63-6**	**91-20-3**	**110-82-7**	**(lbs)**
Ethanol	2.93	1.78E-03	0.56	5.79	8.63	1.23	1.77	0.04	0.53	21.49
Totals (lbs)	**2.93**	**1.78E-03**	**0.56**	**5.79**	**8.63**	**1.23**	**1.77**	**0.04**	**0.53**	**21.49**
Totals (TPY)	**1.47E-03**	**8.90E-07**	**2.82E-04**	**2.89E-03**	**4.32E-03**	**6.17E-04**	**8.87E-04**	**1.78E-05**	**2.64E-04**	**0.01**

Net Project Toxics Vapor Emissions (lb)

Chemical	CAS	HAP/TAP?	Total (lbs)
Benzene	71-43-2	HAP	0.56
Cyclohexane	110-82-7	HAP/TAP	0.53
Ethylbenzene	100-41-4	HAP/TAP	1.23
n-Hexane	110-54-3	HAP	2.93
Naphthalene	91-20-3	HAP/TAP	0.04
Toluene	108-88-3	HAP/TAP	5.79
1,2,4 Trimethylbenzene	95-63-6	--	1.77
2,2,4 Trimethylpentane	540-84-1	HAP/TAP	1.78E-03
Xylenes	1330-20-7	HAP/TAP	8.63
		Net Project HAP Emissions (lbs)	**19.7**
		Net Project TAP Emissions (lbs)	**16.2**
		Net Project HAP Emissions (TPY)	**0.01**
		Net Project TAP Emissions (TPY)	**0.01**

Emissions of ethanol loading were done using the speciated amount of each TAP in the ethanol and taking the ethanol unloading VOC not combusted and multiplying this value by each toxic speciation (wt%). Emissions were checked and verified for accuracy.

Notice of Construction (NOC) Worksheet

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Storage Tanks:
Tank emissions were calculated using the TankESP program, with the same speciated values as presented in the ethanol SDS. The annual results are summarized below.

Project Emissions:

Pollutant	CAS	HAP/TAP	TK-80015	TK-80020	Total
			24	24	**48**
			1,481,038	2,135,562	**3,616,600**
					lb/year
Total VOC	--	--	3.4	3.7	**7.1**
Total HAP	--	--	3.2	3.5	**6.7**
Total TAP	--	--	1.4	1.8	**3.2**
Benzene	71-43-2	HAP	1.1	1.1	**2.1**
Biphenyl	92-52-4	HAP/TAP	0	0	**0**
1,3-Butadiene	106-99-0	HAP/TAP	0	0	**0**
Cumene (isopropylbenzene)	98-82-8	TAP	0	0	**0**
Cyclohexane	110-82-7	HAP/TAP	0.1	0.1	**0.2**
Ethylbenzene	100-41-4	HAP/TAP	0.1	0.1	**0.2**
n-Hexane	110-54-3	HAP	0.8	0.7	**1.5**
Naphthalene	91-20-3	HAP/TAP	0.0	0.0	**0.01**
Toluene	108-88-3	HAP/TAP	0.6	0.7	**1.3**
1,2,4-Trimethylbenzene	95-63-6	--	0.1	0.2	**0.3**
2,2,4 trimethylpentane	540-84-1	HAP/TAP	0	0	**0**
Mixed Xylenes	1330-20-7	HAP/TAP	0.6	0.9	**1.5**
o-xylene[1]	95-47-6	HAP/TAP	0.6	0.9	**1.5**
p-xylene[1]	106-42-3	HAP/TAP	0.6	0.9	**1.5**
m-xylene[1]	108-38-3	HAP/TAP	0.6	0.9	**1.5**

[1] Conservatively assumed to be 100% mixed xylenes

Key:

	No change in emissions
	Increased emissions
	Decreased emissions

I. APPLICABLE RULES & REGULATIONS

REGULATION I, SECTION 7.09(b): Owner or operators of air contaminant sources subject to Article 7 of this regulation shall develop and implement an operation and maintenance plan to ensure continuous compliance with Regulations I, II, and III. A copy of the plan shall be filed with the Control Officer upon request. The plan shall reflect good industrial practice and shall include, but not be limited to, the following:

(1) Periodic inspection of all equipment and control equipment;
(2) Monitoring and recording of equipment and control equipment performance;
(3) Prompt repair of any defective equipment or control equipment;
(4) Procedures for startup, shut down, and normal operation;

(5) The control measures to be employed to ensure compliance with Section 9.15 of this regulation; and
(6) A record of all actions required by the plan.
The plan shall be reviewed by the source owner or operator at least annually and updated to reflect any changes in good industrial practice.

REGULATION I, SECTION 6.09: Within 30 days of completion of the installation or modification of a stationary source subject to the provisions of Article 6 of this regulation, the owner or operator or applicant shall file a Notice of Completion with the Agency. Each Notice of Completion shall be submitted on a form provided by the Agency, and shall specify the date upon which operation of the stationary source has commenced or will commence.

REGULATION I, SECTION 9.03: (a) It shall be unlawful for any person to cause or allow the emission of any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour, which is:
(1) Darker in shade than that designated as No. 1 (20% density) on the Ringelmann Chart, as published by the United States Bureau of Mines; or
(2) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in Section 9.03(a)(1).
(b) The density or opacity of an air contaminant shall be measured at the point of its emission, except when the point of emission cannot be readily observed, it may be measured at an observable point of the plume nearest the point of emission.
(c) This section shall not apply when the presence of uncombined water is the only reason for the failure of the emission to meet the requirements of this section.

REGULATION I, SECTION 9.09: General Particulate Matter (PM) Standard. It shall be unlawful for any person to cause or allow the emission of particulate matter in excess of the following concentrations:
Equipment Used in a Manufacturing Process: 0.05 gr/dscf

REGULATION I, SECTION 9.11: It shall be unlawful for any person to cause or allow the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

REGULATION I, SECTION 9.13: It shall be unlawful for any person to cause or allow the installation or use of any device or use of any means designed to mask the emission of an air contaminant which causes detriment to health, safety or welfare of any person.

REGULATION I, SECTION 9.15: It shall be unlawful for any person to cause or allow visible emissions of fugitive dust unless reasonable precautions are employed to minimize the emissions. Reasonable precautions include, but are not limited to, the following:
(1) The use of control equipment, enclosures, and wet (or chemical) suppression techniques, as practical, and curtailment during high winds;
(2) Surfacing roadways and parking areas with asphalt, concrete, or gravel;

(3) Treating temporary, low-traffic areas (e.g., construction sites) with water or chemical stabilizers, reducing vehicle speeds, constructing pavement or rip rap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways; or
(4) Covering or wetting truck loads or allowing adequate freeboard to prevent the escape of dust-bearing materials.

REGULATION II, SECTION 2.03 Petroleum Refineries (f) and (g)

(f) It shall be unlawful to install or operate a valve at the end of a pipe or line containing VOC unless the pipe or line is sealed with a second suitable closure. Exceptions to this requirement are the ends of a pipe or line connected to pressure relief valves, aspirator vents or other devices specifically required to be open for safety protection. The sealing device shall be removed only when a sample is being taken or during maintenance operations.

(g) Pressure relief devices that are connected to an operating flare header, vapor recovery device, inaccessible valves, storage tank valves and valves that are not externally regulated are exempt from the monitoring requirements of Section 2.03.

REGULATION II, SECTION 3.02
Revised 12/11/80 (482), 06/13/91 (700), Revised/Renumbered 07/08/99 (885)
(a) This section shall apply to all stationary storage tanks with a capacity of 40,000 gallons (151,400 liters) or greater storing volatile organic compounds with a true vapor pressure of 1.5 pounds per square inch (10.5 kPa) or greater at actual monthly average storage temperatures.
(b) It shall be unlawful for any person to cause or allow such storage unless the storage tank is a pressure tank maintaining working pressures sufficient at all times to prevent organic vapor loss to the atmosphere, or is designed and equipped with one of the following vapor loss control devices:
(1) An external floating roof, consisting of a pontoon-type or double decktype cover that rests on the surface of the liquid contents at all times and is equipped with a closure device between the tank shell and the roof edge. The closure device shall consist of two seals, a primary seal and a rim mounted secondary seal above the primary; or
(2) A fixed roof with an internal floating-type cover that rests on the surface of the liquid contents at all times and is equipped with a closure device. The closure device shall prevent the emission of organic vapors such that the concentration of such vapors in the vapor space above the internal floating roof does not exceed 50% of the lower explosive limit (LEL) measured as propane; or
(3) A fixed roof tank with control equipment that reduces emissions by 95% or greater.
(c) All primary seals or closure devices shall meet the following requirements:
(1) The primary seal shall contain no visible holes, tears, or other openings.
(2) No gap between the tank shell and the primary seal shall exceed 1½ inches (3.8 cm). No continuous gap greater than ⅛ inch (0.32 cm) shall exceed 10% of the circumference of the tank. The cumulative length of all primary seal gaps exceeding ½ inch (1.3 cm) shall not be more than 10% of the circumference; and the cumulative length of all primary seal gaps exceeding ⅛ inch (0.32 cm) shall not be more than 40% of the circumference.
(d) All secondary seals or closure devices shall meet the following requirements:

(1) There shall be no visible holes, tears, or other openings in the secondary seal or seal fabric;
(2) The secondary seal shall be intact and uniformly in place around the circumference of the floating roof between the roof and the tank wall; and
(3) No gap between the tank shell and the secondary seal shall exceed ½ inch (1.3 cm). The cumulative length of all gaps exceeding ⅛ inch (0.32 cm) in width between the secondary seal and the tank wall shall not exceed 5% of the circumference of the tank.

(e) All openings in the external floating roof, except for automatic bleeder vents, rim space vents, and leg sleeves shall be:
(1) Equipped with covers, seals, or lids in the closed position except when the openings are in actual use; and
(2) Equipped with projections into the tank that remains below the liquid surface at all times.

(f) Automatic bleeder vents shall be closed at all times except when the roof is floated off or landed on the roof leg supports.

(g) Rim vents shall be set to open when the roof is being floated off the leg supports or at the manufacturer's recommended setting.

(h) Emergency roof drains shall be provided with slotted membrane fabric covers or equivalent that cover at least 90% of the area of the opening.

(i) Routine inspections shall be performed by the owner or operator as follows:
(1) For external floating roof tanks, conduct a semiannual visual inspection of all seals and closure devices and measure the primary and secondary seal gap annually;
(2) For internal floating roof tanks, visually inspect all seals and measure the concentration of VOC in the vapor space above the internal floating roof semiannually; and
(3) Maintain records of the results of any inspections performed for a period of 2 years after the date on which the record was made.

REGULATION I, SECTION 9.20(a): It shall be unlawful for any person to cause or allow the operation of any features, machines or devices constituting parts of or called for by plans, specifications, or other information submitted pursuant to Article 6 of Regulation I unless such features, machines or devices are maintained in good working order.

2. WASHINGTON STATE ADMINISTRATIVE CODE

WAC 173-400-040(3): Fallout. No person shall cause or allow the emission of particulate matter from any source to be deposited beyond the property under direct control of the owner or operator of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.

WAC 173-400-040(4): Fugitive emissions. The owner or operator of any emissions unit engaging in materials handling, construction, demolition or other operation which is a source of fugitive emission:

(a) If located in an attainment area and not impacting any nonattainment area, shall take reasonable precautions to prevent the release of air contaminants from the operation.

WAC173-400-111(7): Construction limitations.

(a) Approval to construct or modify a stationary source becomes invalid if construction is not commenced within eighteen months after receipt of the approval, if construction is discontinued for a period of eighteen months or more, or if construction is not completed within a reasonable time. The permitting authority may extend the eighteen-month period upon a satisfactory showing by the permittee that an extension is justified.

3. FEDERAL

NSPS

40 CFR 60 Subpart Kb (*Standards of Performance for Volatile Organic Liquid Storage Vessels [Including Petroleum Liquid Storage Vessels])*

This subpart applies to each storage vessel with a capacity greater than or equal to 75 cubic meters that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. Subpart Kb does not apply to storage vessels with a capacity greater than or equal to 151 cubic meters storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals. The Project proposes modifications to Tk-80015 and Tk-80020, which occur after July 23, 1984. The storage capacities of Tk-80015 and Tk-80020 are 9,857 and 14,213 cubic meters, respectively, and denatured ethanol has a maximum true vapor pressure greater than 3.5 kilopascals. Tk-80020 is currently subject to Subpart Kb requirements. Tk-80015 and Tk-80020 will be subject to Subpart Kb requirements after the proposed modification.

40 CFR 60 Subparts J -*Standards of Performance for Petroleum Refineries*) and Ja (*Standards of Performance for Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After May 14, 2007*)

These subparts do not apply to the US Oil Project. The gas being burned in the MVCU combustor is exempt from the definition of fuel gas as stated in 40 CFR 60.101a(d):

Fuel gas means any gas which is generated at a petroleum refinery and which is combusted. Fuel gas includes natural gas when the natural gas is combined and combusted in any proportion with a gas generated at a refinery. Fuel gas does not include gases generated by catalytic cracking unit catalyst regenerators, coke calciners (used to make premium grade coke) and fluid coking burners, but does include gases from flexicoking unit gasifiers and other gasifiers. Fuel gas does not include vapors that are collected and combusted in a thermal oxidizer or flare installed to control emissions from wastewater treatment units other than those processing sour water, marine tank vessel loading operations or asphalt processing units (i.e., asphalt blowing stills).

Ethanol is not being produced, nor are ethanol vapors being combusted at the facility as a fuel gas or as part of the fuel gas production in the refinery. Therefore; the project specific ethanol does not qualify as a fuel gas for these subparts and is not applicable.

40 CFR Part 60, Subpart GGGa (*Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006*)

This subpart is applicable and applies to "each valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other connector in VOC service" within the crude by rail unloading Facility that was modified after November 7, 2006. Fugitive emissions are estimated based upon a combination of actual average component leak rates measured through the facility's LDAR program and leak rates specified in Subpart GGGa.

40 CFR Part 60, Subpart QQQ (*Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems*)

§60.690 Applicability and designation of affected facility.

(a)(1) The provisions of this subpart apply to affected facilities located in petroleum refineries for which construction, modification, or reconstruction is commenced after May 4, 1987.

(2) An individual drain system is a separate affected facility.

(3) An oil-water separator is a separate affected facility.

(4) An aggregate facility is a separate affected facility.

(b) Notwithstanding the provisions of 40 CFR 60.14(e)(2), the construction or installation of a new individual drain system shall constitute a modification to an affected facility described in §60.690(a)(4). For purposes of this paragraph, a new individual drain system shall be limited to all process drains and the first common junction box.

This subpart applies to the above affected facilities located in petroleum refinery that were modified after May 4, 1987. The construction of the new individual drain system associated with the two new ethanol transfer pumps constitutes a modification. The new drain system will be subject to this subpart. Each individual drain system is a separate affected facility as outlined in (2) above. Individual drain system is defined as:

Individual drain system means all process drains connected to the first common downstream junction box. The term includes all such drains and common junction box, together with their associated sewer lines and other junction boxes, down to the receiving oil-water separator.

The drains systems for the ethanol transfer pumps are subject to the requirements of §60.692-2.

40 CFR Part 60, Subpart XX Standards of Performance for Bulk Gasoline Terminals

This subpart outlines the following

(a) The affected facility to which the provisions of this subpart apply is the total of all the loading racks at a bulk gasoline terminal which deliver liquid product into gasoline tank trucks.

(b) Each facility under paragraph (a) of this section, the construction or modification of which is commenced after December 17, 1980, is subject to the provisions of this subpart.

This project is not considered a bulk gasoline terminal since it will employ ethanol, and will not use the loading docks to deliver liquid products into gasoline tank trucks.

This subpart is not applicable.

NESHAP

40 CFR 63 Subpart CC (*National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries*).

The storage tanks are currently subject to the requirements of 40 CFR 63 Subpart CC. This NESHAP reflects the application of the maximum achievable control technology (MACT) for process vents, storage vessels, marine tank vessel loading operations, gasoline rack operations, equipment leaks, and wastewater treatment systems located at a petroleum refinery. VOC and HAP emissions from the Project storage tanks will be controlled as currently required by the Subpart CC standard. Subpart CC contains equipment leak standards. These standards are applicable to the additional components (e.g., as valves, connectors, and pumps) installed as part of the Project. Subpart CC only requires that the provisions of 40 CFR 60 Subpart GGGa are met, if applicable, per 40 CFR 63.640(p)(2). 40 CFR 60 Subpart GGGa is applicable to the project components located at the crude by rail unloading facility. Therefore, the Subpart CC standards are applicable for the project components located outside the crude by rail unloading facility.

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 is not applicable to this project as the crude by rail unloading facility, marine loading area, and storage tank areas are not included in the affected sources listed in Subpart UUU.

40 CFR 63 Subpart Y (*National Emission Standards for Marine Tank Vessel Loading Operations*)

The MACT provisions of this subpart apply to existing or new sources with emissions of 10 or 25 tons, as defined in 63.561, and are applicable to new sources with emissions less than 10 and 25 tons, as defined in 63.561.

US Oil is an existing major source with HAP emissions greater than 10 and 25 tons. However; this project does not have emissions above these values by itself. This project does also not have more than "10 M Barrels or 200M Barrels, as defined in 63.561". This subpart defined affected source as:

Affected source means a source with emissions of 10 or 25 tons, a new source with emissions less than 10 and 25 tons, a new major source offshore loading terminal, a source with throughput of 10

M barrels or 200 M barrels, or the VMT source, that is subject to the emissions standards in §63.562.

US oil is an affected source for marine tank loading vessel operations. §63.560(a)(2), §63.560(a)(4) §153.282 Monitoring/Testing §63.565(l) Recordkeeping §63.567(j)(4) are the applicable parts of this rule that US Oil would be required to follow.

However; in 40 CFR 63.560(d)(3)(3) The provisions of this subpart pertaining to the MACT standards in §63.562(b)(2), (3), and (4) do not apply to marine tank vessel loading operations that are contiguous with refinery operations at sources subject to and complying with subpart CC, National Emissions Standards for Organic Hazardous Air Pollutants from Petroleum Refineries, except to the extent that any such provisions of this subpart are made applicable by subpart CC. Refineries subject to 40 CFR 63 MACT CC and that fall below the loading thresholds outlined above in "affected source" are exempt from the standards of 40 CFR 63 subpart Y.

The US Oil AOP, will be updated at renewal to state that the following requirements are subject to the Marine Loading Racks (including all requirements of this Subpart)

[40 CFR 63.565(l)]
[40 CFR 63.651(a)]
[40 CFR 63.642(k)]
[40 CFR 63.642(i)]
[40 CFR 63.4(a)(1)]
[WAC 173-400-075]
[PSCAA Reg. III: 2.02]
[40 CFR 63.567(j)(4)]

40 CFR Part 61, Subpart FF (Benzene Waste Operations NESHAP)

This project will not change the status of the facility under this subpart. The ethanol loading and storage operation do not have streams of wastewater containing benzene in sufficient quantities that would warrant this subpart being applicable. From the SDS information sheet submitted with the application, benzene is not listed in substantial quantities that would cause US Oil to pass the thresholds of this rule.

J. PUBLIC NOTICE

This project meets the criteria for mandatory public notice under WAC 173-400-171(3)(n) of this section states *Any application or other action for which the permitting authority determines that there is significant public interest.* The agency believes there is a significant public interest in this project based on interest from both residents in the area and others who have participated in other projects related to petroleum and will be going to public notice as outlined in WAC 173-400-171.

A notice of application was posted on the Agency's website for 15 days starting on 2/15/18. No requests or responses were received during this time.

Public notice will start on August 16, 2018 and will be published in the Tacoma News Tribune and the Daily Journal of Commerce. A request was received to hold a public hearing for this permit action; therefore, the posting will include a date, location, and time for the public hearing as well.

The public hearing is being held at the Bates technical college at 1101 S. Yakima Ave in Tacoma, WA on September 18, 2018 at 6:30pm. Written comments will be accepted by the Agency until September 21, 2018.

This draft worksheet will be updated if any comments are received during this timeframe.

K. RECOMMENDED APPROVAL CONDITIONS

Standard Conditions:

1. Approval is hereby granted as provided in Article 6 of Regulation I of the Puget Sound Clean Air Agency to the applicant to install or establish the equipment, device or process described hereon at the installation address in accordance with the plans and specifications on file in the Engineering Division of the Puget Sound Clean Air Agency.

2. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.

Specific Conditions:

3. Tanks T-80015 and T-80020 shall follow the requirements of 40 CFR Part 60, Subparts Kb and Subpart A.

4. The adjustable roof legs on storage tanks T-80015 and T-80020 shall be fitted with vapor seal boots or equivalent.

5. The slotted guidepoles on storage tanks T-80015 and T-80020 shall be equipped with a pole float with either a pole sleeve or a pole wiper. If a pole sleeve isn't employed, the seal of the pole float shall be higher than the pole wiper. The top of the guidepole shall be equipped with a gasketed cap which shall be closed at all times except when gauging or taking liquid samples.

6. The secondary seals on storage tanks T-80015 and T-80020 shall extend from the roof to the tank shell and shall not be attached to the primary seal.

7. The concentration of organic vapor in the vapor space above the internal floating roofs on storage tanks T-80015 and T-80020 shall not exceed 30% of its lower explosive limit (LEL).

8. The emissions from a planned out of service maintenance events that result in degassing of storage tanks T-80015 and T-80020 shall be vented to a control device.

9. The individual drain systems and existing aggregate facilities, as defined in §60.691, for the railcar unloading facility covered under this order shall follow the requirements of 40 CFR Part 60, Subparts QQQ and A.

10. The junction box for individual drain systems, as defined in §60.691, shall be equipped with a P/V valve to prevent the flow of organic vapors from the junction box vent pipe to the atmosphere during normal operation.

11. The group of all the equipment within a process unit (if any) that includes the railcar offloading facility (Crude by Rail Unloading facility) is an affected facility under 40 CFR Part 60, Subparts GGGa and A. At a minimum, all equipment installed under this order at the crude by rail unloading facility that is used for ethanol shall comply with Subpart GGGa.

12. The following components shall meet the requirements of 40 CFR 63 Subpart CC and the owner and/or operator shall include the following components in the facility wide LDAR plan:
    iii) Piping equipment on ethanol tank to tank transfer lines.
    iv) Piping equipment on recovered oil line transfer lines.

13. The Marine Vapor Combustion Unit (MVCU) shall be used for all marine loading of crude oil, gasoline, ethanol and gasoline blendstocks. The following conditions 14-19 shall not apply to the loading of products with true vapor pressure <1.5 psia, except for Ethanol.

14. The destruction efficiency of the MVCU shall be at least 99.0%, as determined by the procedures in 40 CFR 63.565(d)(1)-(4) and (6)-(8), except as follows:

    i) EPA Method 25A may be used to determine the VOC concentration;

    ii) EPA Method 19 may be used to determine the exhaust flowrate; and

    iii) All testing shall be performed during the last 50% of loading of a tank or compartment.

15. The owner and/or operator shall conduct a performance test for determining compliance with Condition 14 of this Order within 120 days of the MVCU receiving ethanol vapors under this order. The owner and/or operator does not need to submit a test plan before conducting the performance test; however, the notification and test report requirements of Regulation 1, Section 3.07 shall be followed.

16. The owner and/or operator shall maintain the loading cycle average MVCU combustion chamber temperature at or above the average temperature established during the performance test. US Oil shall continuously monitor and record the MVCU combustion chamber temperature during each loading cycle and also keep a record of the loading cycle average. The continuous temperature monitoring device shall meet the requirements in 40 CFR 63.564(e)(4).

17. For control of fugitive emissions from the vapor collection system components, the owner and/or operator shall comply with the requirements of 40 CFR Part 63, Subpart CC and Section 2.03 of PSCAA Regulation II, except as follows:

i) The leak threshold for valves shall be 500 ppm;

ii) Daily calibration drift assessments indicating a negative drift of 10% or more shall require re-monitoring any valve that had a leak rate in excess of 100 ppm during that monitoring day.

18. The owner and/or operator shall limit marine loading to those vessels meeting the requirements for ship-to-shore compatibility in 40 CFR 63.562(b)(1)(ii) and (iii), as determined by the procedures in §63.563(a)(2)-(a)(4), §63.564(c), and §63.565(b) and (c). The owner and/or operator shall document compliance in accordance with the recordkeeping requirements in §63.567(h), (i)(1)-(3) and (i)(5)-(8).

19. Marine loading of crude oil shall not exceed 5,000,000 bbl during any consecutive 12-month period. Marine loading of ethanol shall not exceed 3,616,600 bbl during any consecutive 12-month period. The owner and/or operator shall record the monthly and 12-month rolling total volume of crude oil and ethanol loaded within 30 days of the end of each month.

Additional Requirements for Crude oil Storage tanks TK-80021, TK-80022, TK-300001 and TK-300002, Conditions 20 through 23.

20. These tanks are subject to 40 CFR Part 60, Subpart Kb. Their water draw systems are subject to 40 CFR Part 60, Subpart QQQ.

21. Each cover on access hatches and gauge float wells shall be designed to be bolted or fastened when closed.

22. Each opening for a slotted guidepole shall be equipped with a pole wiper and either a pole float or a pole sleeve. The wiper or seal of the pole float (if used) shall be at or above the height of the pole wiper.

23. Each junction box shall be equipped with a system to prevent the flow of organic vapors from the junction box vent pipe to the atmosphere during normal operation.

24. Pursuant to the State Environmental Policy Act, WAC 197-11-350 and WAC 197-11-660, and Puget Sound Clean Air Agency Regulation I, Sections 2.07 and 2.12, the Puget Sound Clean Air Agency issued an MDNS for Order of Approval 10620 based on the following condition: The total inbound and outbound volume of crude oil transferred over the marine loading facility shall not exceed 14,400,000 bbl during any calendar year. The owner and/or operator shall record the volume of all crude oil transferred over the marine loading facility and report the total for each calendar year to the Agency no later than March 1 of the subsequent year. This condition does not apply to Ethanol transfer, storage, or loading.

25. All records required by this Order of Approval shall be kept onsite for up to five years, up-to-date, and be made readily available to Agency personnel upon request at all times.

26. This Order of Approval No. 11547, issued to allow the storage, transfer and loading of ethanol, cancels and supersedes Orders of Approval No. 10620 (12/2/2013), No. 10758(7/9/2014), and No. 9580 (3/16/2007).

L. EXISTING NOC EVALUATION

This NOC will cancel and supersede older NOCs that are currently covering equipment being modified under this NOC. An evaluation of these NOCs is presented below:

NOC 10620 – this NOC currently only allows marine loading of crude oil, gasoline, and gasoline blendstock. This NOC does exempt loading of products with a true vapor pressure less than 1.5 psia from the rest of Permit Conditions 4 through 10. Ethanol has a true vapor pressure of 0.9 psia according to the SDS information submitted with this application; however, permit condition 3 does not currently allow loading of ethanol so this NOC must be cancelled and superseded to allow ethanol loading.

The vapor pressure exemption language comes from 40 CFR 63 Subpart Y:

[79 FR 372, Jan. 3, 2014]

Subpart Y—National Emission Standards for Marine Tank Vessel Loading Operations

SOURCE: 61 FR 48399, Sept. 19, 1995, unless otherwise noted.

§ 63.560 Applicability and designation of affected source.

(a) *Maximum achievable control technology (MACT) standards.* (1) The provisions of this subpart pertaining to the MACT standards in § 63.562(b) and (d) of this subpart are applicable to existing and new sources with emissions of 10 or 25 tons, as that term is defined in § 63.561, except as specified in paragraph (d) of this section, and are applicable to new sources with emissions less than 10 and 25 tons, as that term is defined in § 63.561, except as specified in paragraph (d) of this section.

(2) Existing sources with emissions less than 10 and 25 tons are not subject

(2) Sources with throughput less than 10 M barrels and 200 M barrels, as that term is defined in § 63.561, are not subject to the emissions standards in § 63.562(c) and (d).

(c) *General Provisions applicability.* Owners or operators of affected sources, as that term is defined in § 63.561, of this subpart must comply with the requirements of subpart A of this part in accordance with the provisions for applicability of subpart A to this subpart in Table 1 of this section.

(d) *Exemptions from MACT and RACT standards.* (1) This subpart does not apply to emissions resulting from marine tank vessel loading operations, as that term is defined in § 63.561, of commodities with vapor pressures less than 10.3 kilopascals (kPa) (1.5 pounds per square inch, absolute) (psia) at standard conditions, 20 °C and 760 millimeters Hg (mm Hg).

(2) The provisions of this subpart pertaining to the MACT standards in § 63.562(b)(2), (3) and (4) and to the RACT standards in § 63.562(c)(3) and (4)

10620gsp.docx

NOC 10758 – this NOC was evaluated for the increase in number of railcar offloading stations allowed from 60 to 107. The emission calculations done under this permit were done mostly for Bakken Crude oil with the following composition:

Chemical	TAC/HAP?	Revised Speciation	
		(wt. % liquid)	(wt. % vapor)
1,3-Butadiene	TAC/HAP	0.0000981%	0.001%
2,2,4-Trimethylpentane	HAP	0.01%	0.004%
Benzene	TAC/HAP	0.22%	0.153%
Biphenyl	HAP	0.03%	0.003%
Cumene	TAC/HAP	0.03%	0.004%
Cyclohexane	TAC	0.39%	0.378%
Ethylbenzene	TAC/HAP	0.10%	0.016%
n-Hexane	TAC/HAP	1.91%	2.029%
Naphthalene	TAC/HAP	0.04%	0.003%
Toluene	TAC/HAP	0.47%	0.129%
Mixed Xylenes	HAP	0.61%	0.094%
o-Xylene	TAC/HAP	0.17%	0.025%
m-Xylene	TAC/HAP	0.36%	0.056%
p-Xylene	TAC/HAP	0.08%	0.013%
Other VOC			96.71%


10758gsp.docx

It would appear that this evaluation was a conservative estimate for 107 railcar offloads, since ethanol has less speciated TAPs/HAPs than what was evaluated in this worksheet. (see SDS from ethanol below). Emissions were calculated from the ethanol loading in this NOC worksheet and are much less than what was evaluated in 10758. This NOC will be cancelled and superseded in order to allow the railcar unloading of ethanol.

MSDS_Fuel_Alcohol_ ITEC_Refining.pdf

NOC 10449 –

This NOC covers Refinery fuel gas mixing vessel (V-20) replacement and facilities for offloading crude oil and cutterstock from railcars. This NOC does not need to be cancelled since it only covers the facilities for offloading crude oil, not the railcars themselves.

NOC 9580 –

Three crude oil Storage Tanks rated at 80,000 bbl (TK-80020, TK-80021, TK-80022) and two crude oil Storage Tanks rated at 300,000 bbl (TK-300001, TK-300002).

This NOC will be cancelled and superseded to allow the storage of Ethanol in TK-80020 instead of just Crude Oil. The other tanks will remain unchanged and the conditions from this NOC will be carried over that cover the other tanks. (These tanks are not considered modified under this NOC - TK-80021, TK-80022, TK-300001, TK-300002)

M. CORRESPONDENCE AND SUPPORTING DOCUMENTS

Initial completeness review:

US Oil Completeness 11547

Ralph Munoz

Sent: Thu 3/1/2018 1:18 PM
To: Case S. Hinkins
Cc: 'Dustin Pittman'; Carole Cenci; Ty J. Gaub

Good morning Case,

I've done my initial completeness review for the next generation fuels project at US oil and have found the application to be incomplete.

1) The application mentions that "additional miscellaneous equipment upgrades may result in a decrease in some fugitive emissions." The project summary describes a decrease in fugitive emissions from vacuum truck traffic to and from US oil's dock location. Is this the "miscellaneous equipment upgrade" that the application was referring to in the introduction? If not, please describe all changes being made that would result in a decrease in fugitive emissions. Please include in this description how these changes are relevant to this project and also if they were used for netting purposes in the emission calculations. Please give as much detail as possible about these miscellaneous equipment upgrades.

2) Please specifically identify which parts of the "Confidential application" are you claiming to be confidential so that I can have our attorney review. The cover letter says "parts of Appendix B – Emission Calculations" but emission calculations are in Appendix C. If it is the emission calculation section, please specifically identify which parts are confidential. (Our Confidential Information rule is found in Reg 1, Section 3.19) Please note from this rule, emission calculations cannot be confidential. Please specifically identify which section US Oil believes is confidential if it is not the emission calculation section.

3) The emission calculations conducted for tank emissions and product loading **Crude Oil VOC Speciation and Physical properties** do not seem to use "worst-case" as suggested in the application. For example: Benzene wt% in Alaska North Slope is 0.33%, yet a value of 0.14 wt% was used as a "worst case crude". You will need to either update these worst case values to their true worst case values or explain why the lower values were used. Averages are not typically allowed as they do not represent worst case.

4) Emission calculation "Project Emission Summary" seems to evaluate emissions based on a "Net Project Potential Emissions". Netting of criteria emissions is not allowed under our NOC process. Pre-project emissions are considered zero for the pieces of equipment being replaced. TAP emission netting is a little different. Under WAC 173-460-080 First Tier Review, an ASIL analysis can be satisfied by meeting the SQER values (173-460-080(2)). Section (3) of this rule goes on to discuss netting and reduction in emissions from existing emission units. US Oil will need to specifically identify how it intends to comply with each part of this rule. If netting of TAPs is still an option US Oil wants to take, please note that public notice (WAC 173-460-071) is required.

   Emission calculations should be updated for both criteria pollutants and HAP/TAC emission summaries to exclude netting for criteria pollutants, and if netting is not chosen as part of WAC 173-460-080, TAP emissions must be updated to exclude netting.

5) The application included some suggested language for the NOC project description. It asks to be modified to "107 railcar offloading stations, 36 of which will also be capable of offloading ethanol." The emission calculations for the railcar unloading station includes a "safety factor" of 1.05. Does this safety factor increase the amount of railcar unloading stations from 107 to 112? Since 112 is the evaluated amount, would this need to go on the Order of approval as "Up to 112 railcar offloading stations." Also, can US oil explain what the "rainfall (in) – 36" was used for in the calculations?

6) Please supply the MSDS Sheet for Denatured Fuel Ethanol from ITEC Refining and Marketing 2008.

7) The top down best available control technology (BACT) review provided with the application is lacking sufficient information. Section 4.0 of the application states that a thorough BACT study was done; however, the RBLC is not an exhaustive list of BACT information. There are specific Agency websites that contain very detailed information regarding their BACT determinations or what they currently consider BACT in their region as well as a review of other similar types of facilities permitted elsewhere. As an example, most of the California agencies have websites that you can use to develop a top down BACT analysis (San Joaquin Valley - http://www.valleyair.org/busind/pto/bact/bactLoader.htm , Bay Area - http://www.baaqmd.gov/permits/permitting-manuals/bact-tbact-workbook, etc). Texas and CARB also have BACT determination index's on their websites for review. Not all of these sites will have ethanol storage and loading operations, but a similar process can be used and compared for US oils project If available. In addition, the local Washington Clean Air Agencies may have made BACT determinations that you should review and include in your assessment.

8) Additionally with regards to BACT, the application inaccurately uses the De Minimis values for NSR review in Table 3.2 to determine what needs to be evaluated for BACT. PSCAA does not have similar NSR exemption levels in its program. PSCAA Regulation 1, Section 6.01 identifies the parts of the WAC that are in effect in our jurisdiction. If a regulation is not listed in this list, it is not part of the regulations applicable to sources in our jurisdiction. The specific citation for NSR is:

WAC 173-400-110	New source review (NSR) for sources and portable sources. (effective 12/29/12) (1)(c)(i), (1)(d) and (1)(e)

Section (5) which includes the NSR exemption levels, was not adopted from WAC 173-400-110. Please update the BACT to include all pollutants for which an emission increase occurs as a result of this project unless PSCAA specifically exempts those projects under Regulation 1 Section 6.03(c).

9) Section 5.2 discusses the applicability of controls for new sources of toxic air pollutants. The application inaccurately uses the de minimis values from WAC 173-460-150. PSCAA did not adopt the de minimis values in its program, as can be seen in Regulation 1, section 6.01:

WAC 173-460-150	Table of ASIL, SQER and de minimis emission values. – excluding references to de minimis emission values (effective 6/20/09)

Please update the emission calculation tables and use only the SQER/ASIL's for determining if a toxic pollutant should be modeled. As mentioned above in (4), project netting is only allowed for projects that meet WAC 173-460-080. Post project emission increases should be compared to the SQER's to determine if modelling is required if US oil decides not to use netting for TAPs.

10) Any toxic for which an emission increase occurred should be evaluated for tBACT (See WAC 173-460-040) tBACT was not discussed in the BACT section of the application. (Section 4.0). Please include a tBACT discussion that addresses toxic emissions as well as VOC. It is possible and acceptable that VOC BACT also be tBACT, but it should be addressed.

11) Please identify any changes made in design from the SEPA EIS to the PSCAA permit application. If there were no changes made in design, please indicate this.

12) The application and SEPA discusses "next generation" fuels, but only seeks to add ethanol tanks and throughput limits for ethanol. Will other next generation fuels be used by US Oil? Renewable Diesel (Hydrotreated renewal diesel), Renewable jet fuel, renewable aviation fuel. Is US Oil making the determination that these next generation fuels would be exempt from permitting under Reg 1 Section 6.03(c)?

13) NSPS Ja – Can you explain in a bit more detail your interpretation of the definition of "fuel gas" not including ethanol?

> *Fuel gas* means any gas which is generated at a petroleum refinery and which is combusted. *Fuel gas* includes natural gas when the natural gas is combined and combusted in any proportion with a gas generated at a refinery. *Fuel gas* does not include gases generated by catalytic cracking unit catalyst regenerators, coke calciners (used to make premium grade coke) and fluid coking burners, but does include gases from flexicoking unit gasifiers and other gasifiers. *Fuel gas* does not include vapors that are collected and combusted in a thermal oxidizer or flare installed to control emissions from wastewater treatment units other than those processing sour water, marine tank vessel loading operations or asphalt processing units (*i.e.,* asphalt blowing stills).

14) Subpart UUU – the application states that the project is not subject to UUU, but does not explain the justification. IT appears that the 63.1562 describes what parts of an Oil Refinery are subject to this standard. Please explain why the gas streams from this project are not subject to UUU.

15) Please evaluate and discuss the applicability of NSPS Kb to the Ethanol Storage tanks?

Just as a side note, The application included a minor modification to the AOP. If you look at WAC 173-401-725 (Permit Modifications):

> (i) Minor permit modification procedures shall be used for those permit modifications that:
> (A) Do not violate any applicable requirement;
> (B) Do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;
> (C) Do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary

US Oil's response to initial completeness:

Cover Letter and Response to Complet

Track Changes_USOR Ethal

RE: Worksheet

Case S. Hinkins <case.hinkins@usor.com>
Sent: Wed 7/11/2018 3:33 PM
To: Ralph Munoz
Cc: Dustin Pittman; Ty J. Gaub
Message noc9755.pdf (406 KB) noc10029.pdf (362 KB)

Let me know if I missed anything we discussed that might warrant more discussion.

1) NOC 10449 –

This NOC covers Refinery fuel gas mixing vessel (V-20) replacement and facilities for offloading crude oil and cutterstock from railcars. This NOC does not need to be cancelled since it only covers the facilities for offloading crude oil, not the railcars themselves.[RM1]

Does this need to be modified at all? Do you know what NOC covers the two existing ethanol cars by chance?
NOC 10449 is specific to offloading crude oil and cutterstock from railcars. Therefore it does not need to be modified based on the application. Current NOCs 9755 and 10029, see attached, represent the NOCs for ethanol storage tanks. However, there is not a specific NOC that covers the two existing ethanol car unloading stations. Given ethanol offloading emissions are zero, it is plausible the ethanol cars were left out of the NOCs completely back in 2008 and 2009 during the permitting of Tk # 10010 (NOC 10029)

2) Process description is going to say - This NOC also covers the use of 107 crude railcar offloading stations, **38** of which will also be allowed to offload ethanol. The crude throughput is 34,775 bbl/day and 12,658,100 bbl/yr (approx. 650 bbl/railcar). The ethanol thoughput is 3,616,600 bbls/year. As well as crude oil storage tanks (TK-80021, TK-80022, TK-300001 and TK-300002.)

Bold and underlined to make sure its actually 38 that can move ethanol. Maybe make sure10449 doesn't cover the 2 existing railcars that can load ethanol?
The NOC statement looks correct except for the last sentence. The crude oil storage tanks are outside the scope of this project and do not need to be included in the NOC language.

3) Do you know how much ethanol is currently permitted to be stored in the NOCs we talked about on the phone (NOC 10029 and 9755 are the two I found for ethanol)
NOCs 9755 and 10029, see attached, represent the NOCs for ethanol storage tanks. There is no permit limit on ethanol throughput listed in either of the NOCs.

4) In the Marine Vapor Loading calculation sheet, we had a few additional questions about some of the foot notes if you can help answer:

a. Was marine diesel oil (MDO) used as a surrogate for the Marine loading emissions of ethanol in this spreadsheet on Page 16?
Correct, MDO was used as the fuel source for the marine loading emissions.
b. Page 16 of the Emission Calc document (attached), Note 3 -There is an assumption for SO2 to convert to H2SO4 at 2.6%. Can you provide information on how this was determined?
i. Unless my math is off, 2.6% of 36.2 lb/Mgal (SO2 value) is not 1.4 lb/Mgal. I get 0.94 H2SO4 lb/Mgal. The equation takes into account the conversion of SO_2 to H_2SO_4. The conversion ratios the H_2SO_4 molar mas (98 g/mol) by sulfur dioxide molar mass (64 g/mol). This corresponds to : 1.4 lb H_2SO_4/Mgal fuel = 36.2 lb SO_2/Mgal*0.026*98/64

Finally, can you submit to me the original excel spreadsheet that contains these emission calculations? No need to submit the confidential ones in excel format for now.
Per our phone call and follow up email you sent me today (7/11/2018) I would like to take a day to put some thought into this request.

Thanks Case

Ralph Munoz
Puget Sound Clean Air Agency
1904 Third Ave. #105
Seattle, WA 98101

From: Ralph Munoz <RalphM@pscleanair.org>
Sent: Friday, June 15, 2018 9:28 AM
To: Case.Hinkins@usor.com
Cc: Dustin Pittman <Dustin.Pittman@erm.com>; ty.gaub@usor.com
Subject: RE: US Oil Completeness 11547

Case I apologize this has taken me this long to respond to the email.

6) **Please supply the MSDS Sheet for Denatured Fuel Ethanol from ITEC Refining and Marketing 2008.**

Response: The MSDS is included in this submittal in Appendix G.

Did I miss this submittal somehow? I don't think I ever got the MSDS for the ethanol.

Also can you please send me the updated calculation spreadsheet (Appendix C), the updated tank ESP outputs (Appendix D) that may have been updated as a result of your resubmittal.

If you can't email them directly due to the size, you can put them on an FTP site.

I am working through the permit worksheet and will let you know if I need anything else as I work through it. As for a timeline, If you can give me a couple weeks to get this worked on – then to get it Carole for her review, that would be great.

Thank you!

Ralph Munoz
Puget Sound Clean Air Agency
1904 Third Ave. #105
Seattle, WA 98101
(206) -689-4021
Schedule – 6:30am – 3:00pm (M-F)
pscleanair.org
Puget Sound Clean Air Agency

N. REVIEWS

Reviews	Name	Date
Engineer	Ralph Munoz	7/27/18
Inspector	Wellington Troncoso	
Second Review:	Carole Cenci	7/27/18
Applicant Name:	Case Hinkins	8/9/18

Case Hinkins and Dustin Pittman reviewed the draft worksheet on 8/8/18.