Technical Support Document
For
Draft Air Emission Permit No. 16300010-104

This technical support document (TSD) is intended for all parties interested in the draft permit and to meet the requirements that have been set forth by the federal and state regulations (40 CFR § 70.7(a)(5) and Minn. R. 7007.0850, subp. 1). The purpose of this document is to provide the legal and factual justification for each applicable requirement or policy decision considered in the preliminary determination to issue the draft permit.

1. General information

1.1 Applicant and stationary source location:

Table 1. Applicant and source address

Applicant/Address	**Stationary source/Address** (SIC Code: 5171 - Petroleum Bulk Stations and Terminals)
Circle K Terminal Group 54 21st St Newport, Minnesota 55055-1002	Circle K Terminal Group Newport 54 21st St Newport, MN 55055-1002
Contact: Jeff Watne Phone: 651-495-5019	

1.2 Facility description

Circle K Terminal Group Newport is a bulk transfer and storage terminal for petroleum products (gasoline). The facility consists of three ethanol storage tanks, seven gasoline storage tanks, and a transfer station with two loading racks. The main pollutants from the facility are Hazardous Air Pollutants (HAP) and Volatile Organic Compounds (VOC) emitted from product loading, storage tank standing and working losses, tank roof landing events, fugitive emissions from valves, pumps, and flanges, and tanker purging. Vapor Recovery Unit (VRU) is the primary VOC control device for the gasoline truck loading racks with a Vapor Combustion Unit (VCU) as a backup control.

1.3 Description of the activities allowed by this permit action

This permit action is a Major Amendment under Minn. R. 7007.1500 that authorizes construction of butane blending and injection equipment at the truck loading rack at the facility. The project includes receipt of butane by transport truck, storage in two new pressurized butane vessels, and transfer to a butane injection skid for blending into existing gasoline product lines on an as-needed basis (e.g., seasonal operations). The maximum throughput of gasoline, distillate products, or ethanol blends at the loading rack will not increase.

The project triggers the “collection of equipment at a bulk gasoline terminal affected facility” under 40 CFR part 60, subpart XXa; therefore, the permittee submitted this application as a major permit amendment under Minn. R. 7007.1500. The MPCA has a combined operating and construction permitting program under Minn. R. ch. 7007. Under that authority, this permit action authorizes construction of butane blending and injection equipment at the truck loading rack, including two pressurized butane storage vessels, to support butane blending at the loading rack.

The pressurized vessels are designed to operate as a closed system without normal operating vents to atmosphere, and routine product transfer occurs through hard-piped closed connections. Under normal operation, this configuration does not create routine working or breathing loss pathways associated with atmospheric storage tanks. Pressure relief devices are safety equipment intended to operate only during emergencies or upset conditions, and maintenance depressurization and degassing is non-routine and

occurs when the vessels are out of service. Based on the design and operating basis provided by the permittee, the vessels are not treated as emission units in this permitting action.

1.4 Description of notifications and applications included in this action

Table 2. Notifications and applications included in this action

Date received	Application/notification type and description
10/27/2025 with supplemental information received on 04/27/2026.	Major Amendment

1.5 Facility emissions:

Table 3. Title I emissions summary

Pollutant	Unlimited potential emissions from the modification (tpy)	Limited potential emissions from the modification (tpy)	NSR/112(g) threshold for new major source (tpy)	NSR/112(g) review required? (yes/no)
PM	0	0	100	No
PM_{10}	0	0	100	No
$PM_{2.5}$	0	0	100	No
NO_X	0	0	100	No
SO_2	0	0	100	No
CO	0	0	100	No
Ozone (VOC)	0.64	95	100	No
Lead	0	0	0.6	No
CO_2e*	0	0	75,000	No
Total HAPs	0.01	0.01	25	No

*Carbon dioxide equivalents as defined in Minn. R. 7007.0100.

** Emissions affected from the modification (FUGI 1) are covered by a VOC pre-cap emission limit of 95.0 tpy.

Table 4. Total facility potential to emit summary

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	CO_2e (tpy)	VOC (tpy)	Single HAP** (tpy)	All HAPs (tpy)
Total Facility Limited Potential Emissions	0.30	0.30	0.30	0.34	10.4	23.8	6,377.5	95.0	3.85	4.96
Total Facility Actual Emissions (2025)	0.01	0.02	0.02	0.02	0.27	0.06	*	45.5	*	

* Not reported in MN emission inventory.

**Highest single HAP is Hexane.

Table 5. Facility classification

Classification	Major	Synthetic minor/area	Minor/area
PSD		X	
Part 70 Permit Program		X	
Part 63 NESHAP			X

1.6 Changes to permit

The MPCA has a combined operating and construction permitting program under Minnesota Rules Chapter 7007, and under Minn. R. 7007.0800, the MPCA has authority to include additional requirements in an operating permit. The following changes to the permit are made through this permit action:

- The permit has been updated to reflect current MPCA templates and standard citation formatting;
- Subject item details have been updated based on the equipment that was actually installed;
- Misclassification of TREA 1 as a flare in previous permits has been corrected; as a result, TREAs 5 (Vapor Combustion Unit) has been incorporated in this permit action. Because this TREA already exists at the facility, this permit does not include construction authorization or notification requirements for such unit;
- The permit clarifies the compliance option used for TREA 5 under NESHAP BBBBBB, see section 3.4 for details;
- Some requirements have been reordered or moved to help with clarity, see section 3.3 for details;
- Tank loss calculation methodology has been updated, see section 3.4 for details; and
- The insignificant activities for the facility have been updated to reflect the current activities on site as well as to reflect changes to these rules since the last permit was issued.

2. Regulatory and/or statutory basis

2.1 New source review (NSR)

The facility is a petroleum storage and transfer unit with total storage capacity exceeding 300,000 barrels and is therefore one of the 28 listed source categories under NSR (40 CFR § 52.21(b)(1)(i)(a)); as a result, the facility is subject to the 100 tpy major source threshold for VOC, including fugitives. The permit carries forward federal limits such that the facility remains a minor source for purposes of NSR and Prevention of Significant Deterioration (PSD). This permit action authorizes a modification that does not trigger NSR, as documented in Table 3 of this TSD.

2.2 Part 70 permit program

The permit carries forward limits on the facility such that it is a Synthetic minor source under the Part 70 program.

2.3 New source performance standards (NSPS)

The Permittee has stated that New Source Performance Standards apply to the operations at this facility.

40 CFR pt. 60, subp. XX – NSPS for Bulk Gasoline Terminals: The loading rack EQUI 8 is subject to Subpart XX because it is part of the bulk gasoline terminal loading rack affected facility and the facility commenced construction or modification after December 17, 1980 and on or before June 10, 2022 (40 CFR § 60.500(a) - (b)).

40 CFR pt. 60, subp. XXa – NSPS for Bulk Gasoline Terminals: FUGI 1 is subject to this NSPS because it is part of the "collection of equipment at a bulk gasoline terminal affected facility" for which construction or modification commenced after June 10, 2022 (40 CFR § 60.500a(a)(2) and (b)).

40 CFR pt. 60, subp. IIII – NSPS for Stationary Compression Ignition Internal Combustion Engines (CI ICE) applies to EQUI 6 per 40 CFR § 60.4200(a)(2)(i), and 40 CFR § 60.4205(b), as described in Table 6.

40 CFR pt. 60, subp. JJJJ – NSPS for Stationary Spark Ignition Internal Combustion Engines applies to EQUI 55 per 40 CFR § 60.4230(a)(4)(iv), as described in Table 6.

40 CFR pt. 60, subp. Kb – NSPS for Volatile Organic Liquid Storage Vessels: this NSPS does not apply to the pressurized butane vessels because pressure vessels designed to operate in excess of 204.9 kPa (29.7 psia) and without emissions to the atmosphere are exempt (40 CFR § 60.110b(d)(2)).

40 CFR pt. 60, subp. Kc – NSPS for Volatile Organic Liquid Storage Vessels: this NSPS does not apply to the pressurized butane vessels because pressure vessels designed to operate in excess of 204.9 kPa (29.7 psia) and without emissions to the atmosphere are exempt (40 CFR § 60.110c(b)(2)). Storage vessels located at bulk gasoline plants are also excluded from Subpart Kc (40 CFR § 60.110c(b)(5)).

2.4 National emission standards for hazardous air pollutants (NESHAP)

The facility is an area source under 40 CFR pt. 63 based on the HAP PTE results; therefore, no major source NESHAPs apply. The 40 CFR § 63.2 citation included with the VOC pre-cap emission limit is carried forward from the prior permit structure for consistency.

40 CFR pt. 63, subp. BBBBBB – NESHAP for Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities: This subpart applies to the facility because it meets the definition of an area source bulk gasoline terminal that is not subject to the control requirements of 40 CFR pt. 63, subp. R or 40 CFR pt. 63, subp. CC (40 CFR § 63.11081(a)(1)). The emission sources covered by this NESHAP include gasoline storage tanks, gasoline loading racks, vapor collection-equipped gasoline cargo tanks, and equipment components in vapor or liquid gasoline service, as specified in Tables 1 through 4 (40 CFR § 63.11082(a)). Based on the permit record, the facility is a large bulk gasoline terminal (≥ 250,000 gallons/day), and the loading rack requirements in Table 2 to NESHAP BBBBBB apply, including vapor collection and control requirements for loading racks. The facility operates under a state permit; however, enforcement of 40 CFR pt. 63, subp. BBBBBB remains with EPA because delegation for this subpart has not been granted to the MPCA.

40 CFR pt. 63, subp. ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE): The emergency generators EQUIs 6 and 55 are subject to Subpart ZZZZ because they are new stationary RICE located at an area source for which construction commenced on or after June 12, 2006 (40 CFR § 63.6590(a)(2)(iii)). Under 40 CFR § 63.6590(c)(1), each unit meets the requirements of Subpart ZZZZ by complying with the applicable NSPS: EQUI 6 by complying with 40 CFR pt. 60, subp. IIII and EQUI 55 by complying with 40 CFR pt. 60, subp. JJJJ; no further requirements apply under Subpart ZZZZ for those engines.

40 CFR pt. 63, subp. R – NESHAP for Gasoline Distribution Facilities: this NESHAP does not apply because the facility is not a major source of HAPs and subp. R excludes bulk gasoline terminals that have documented the facility is not a major source (or is not within a contiguous area and under common control with a major source) as defined in 40 CFR § 63.420(a)(2).

40 CFR pt. 63, subp. CC – NESHAP From Petroleum Refineries: this NESHAP does not apply because it applies to petroleum refining process units located at a plant site that is a major source (40 CFR § 63.640(a)(1)).

The Permittee has stated that no other NESHAP apply to the operations at this facility at the time of permit issuance.

2.5 Regulatory overview

Table 6. Regulatory overview of units affected by the modification/permit amendment

Subject item*	Applicable regulations	Rationale

Subject item*	Applicable regulations	Rationale
COMG 1 - Storage Tanks	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. The permit carries forward the storage tank throughput and tank landing recordkeeping and tank loss calculation methodology from the Major Amendment Permit No. 16300010-002. These records support calculation of storage tank standing, working, and landing losses as required by the permit. The resulting tank loss values are used as inputs to the total facility monthly emissions calculation; see COMG 4 for the facility-wide VOC pre-cap compliance rationale.
COMG 2 - Equipment Subject to 40 CFR pt. 63, subp. BBBBBB	40 CFR pt. 63, subp. BBBBBB and Minn. R. 7011.7180(B).	NESHAP for Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities. This facility distributes liquid petroleum products through a distribution bulk terminal. Applicability is based on the following criteria: • The facility is an area source of HAPs; • The facility is an existing affected facility; • The facility is defined as a bulk gasoline terminal that is not subject to the control requirements of 40 CFR pt. 63, subp. R or subp. CC; and • The facility has a gasoline throughput of greater than 250,000 gallons/day.
COMG 4 - Total Facility VOC Limits	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Limits taken to avoid major source and major modification classification under PSD for all noncombustion emissions of VOC. It is a 12-month rolling limit due to substantial and unpredictable variations in operation. The permit carries forward the facility-wide VOC pre-cap of 95.0 tpy (12-month rolling sum). This pre-cap was established under the Major Amendment Permit No. 16300010-002, replacing the prior 67.2 tpy VOC limit for EU 001, and it was restructured to account for internal floating roof landing emissions that were not included in the original emission calculations (see TSD of permit 16300010-002 for details).
EQUI 4 - VRU CEMS	40 CFR pt. 63, subp. BBBBBB and Minn. R. 7011.7180(B).	Requirement to use a CEMS to measure VOC emissions to comply with NESHAP BBBBBB.
EQUI 6 - Diesel emergency generator	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Limits on hours of operation to reduce VOC emissions to avoid major source classification under PSD, Part 70 program, and major source NESHAP definition.
	40 CFR pt. 60, subp. IIII, Minn. R. 7011.2305.	NSPS for Stationary Compression Ignition Internal Combustion Engines. Applicability criteria include: • emergency engine (not a fire pump); • commenced construction date after July 11, 2005; • manufacture date after April 1, 2006; • engine output > 7 Hp; and • displacement less than 30 liters per cylinder.
	40 CFR pt. 63, subp. ZZZZ, Minn. R. 7011.8150.	NESHAP for Stationary Reciprocating Internal Combustion Engines. EQUI 6 is a new affected source subject to 40 CFR pt. 63, subp. ZZZZ. Under 40 CFR § 63.6590(c) the engine complies with the requirements 40 CFR pt. 63, subp. ZZZZ by complying with the requirements of 40 CFR pt. 60, subp. IIII and no further requirements apply under 40 CFR pt. 63, subp. ZZZZ.

Subject item*	Applicable regulations	Rationale
	Minn. R. 7011.2300.	Standards of Performance for Stationary Internal Combustion Engines. Fuel limited to Natural gas and Diesel only, by design. Sulfur content of fuel limited to 0.0015 percent by weight.
EQUI 8 - Loading Rack	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Venting emission requirements to a Vapor Recovery Unit (TREA 2) or a Vapor Combustion Unit (TREA 5) as part of requirements to limit VOC PTE to avoid major source classification under PSD, Part 70 program and major source NESHAP definition.
	40 CFR pt. 60, subp. XX & Minn. R. 7011.1550.	NSPS for Bulk Gasoline Terminals. This facility is a bulk gasoline terminal which delivers liquid petroleum product into gasoline tank trucks via loading racks. Applicability is based on the following criteria: • The facility is defined as a bulk gasoline terminal. • The facility has a gasoline throughput of greater than 75,700 liters/day (19,998 gallons/day); and • The construction of the VCUs commenced after December 17, 1980 but before June 10, 2022.
EQUI 55 - Emergency IC Generator	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Limits on hours of operation to reduce VOC emissions to avoid major source classification under PSD, Part 70 program, and major source NESHAP definition.
	40 CFR pt. 60, subp. JJJJ, and Minn. R. 7011.7385	NSPS for Stationary Spark Ignition Internal Combustion Engines. Applicability criteria include: • Engines manufactured on or after January 1, 2009 and constructed after June 12, 2006; • Certified engines; and • Emergency, natural gas engine between 25 HP and 130 HP.
	40 CFR pt. 63, subp. ZZZZ, and Minn. R. 7011.8150	NESHAP for Stationary Reciprocating Internal Combustion Engines. EQUI 210 is a new affected source subject to 40 CFR pt. 63, subp. ZZZZ. Under 40 CFR § 63.6590(c) the engine complies with the requirements 40 CFR pt. 63, subp. ZZZZ by complying with the requirements of 40 CFR pt. 60, subp. JJJJ and no further requirements apply under 40 CFR pt. 63, subp. ZZZZ.
	Minn. R. 7011.2300	Standards of Performance for Stationary Internal Combustion Engines. Fuel limited to Natural Gas only, by design. Sulfur content of fuel limited to 0.0015 percent by weight.
FUGI 1 - Valves, Flanges, and Seals	40 CFR pt. 60, subp. XXa	NSPS for Bulk Gasoline Terminals that Commenced Construction, Modification, or Reconstruction After June 10, 2022. Applicability criteria include: • Facility includes a "collection of equipment at a bulk gasoline terminal affected facility" (40 CFR § 60.500a(a)(2)); and • Facility starts construction, modification, or reconstruction is commenced after June 10, 2022.

Subject item*	Applicable regulations	Rationale
	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Requirement to calculate and record VOC fugitives emissions to avoid major source classification under PSD, Part 70 program, and major source NESHAP definition.
FUGI 2 - Tanker Purging	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Requirement to calculate and record VOC fugitives emissions to avoid major source classification under PSD, Part 70 program, and major source NESHAP definition.
TREA 2 - Vapor Recovery Unit (VRU)	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Control efficiency and other operating parameter requirements to reduce VOC emissions to avoid major source classification under PSD, Pt 70 program and major area NESHAP. Permit specifies that replacement of the control equipment must meet the TREA 2 requirements.
TREA 5 - Vapor Combustion Unit (VCU)	Title I Condition: Avoid major source under 40 CFR § 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR § 63.2, To avoid major source under 40 CFR § 70.2 & Minn. R. 7007.0200.	PSD, Part 70, and NESHAP. Installation of continuous emission monitor system (CEMS) and other operating parameter requirements to reduce VOC emissions to avoid major source classification under PSD, Pt 70 program and major area NESHAP. Limits reflect that the units have total enclosures. Permit specifies that replacement flare must meet the TREA 5 requirements.

*Location of the requirement in the permit (e.g., EQUI 1, STRU 2, etc.).

3. Technical information

3.1 Calculations of potential to emit (PTE) and emissions increase analysis

Attachment 1 to this TSD summarizes the facility-wide PTE and includes the supporting calculations prepared by the Permittee and reviewed by the MPCA, including the Title I net emissions increase analysis demonstrating that the modification does not trigger NSR.

PTE from gasoline tank truck loading (EQUI 8) was calculated using AP-42 Chapter 5.2 (Transportation and Marketing of Petroleum Liquids), local average ambience conditions and annual loading throughput. A vapor collection efficiency of 98.7 percent was applied to estimate uncaptured emissions as 1.3 percent of uncontrolled loading losses because the tanker trucks must pass the NSPS-level annual leak test per AP-42 Section 5.2.

Emissions from aboveground storage tanks (EQUIs 9 through 18 and the storage tanks classified as insignificant activities) were calculated using AP-42 Chapter 7.1. The calculations include standing and working losses using tank-specific inputs such as tank type, dimensions and construction details, stored liquid properties, annual throughput, and local meteorological data. Landing and cleaning losses were estimated for selected internal floating roof tanks using an event-based approach with conservative assumptions consistent with historical terminal operation and typical API maintenance schedules.

Emissions from valves, flanges, pump seals, and other piping components (FUGI 1) were calculated using the Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017). Component counts were based on the equipment inventory, and emission factors selected by service type (light liquid or gas). Emissions were calculated assuming 8,760 hours per year of operation. Emissions from tanker purging (FUGI 2) were calculated using the AP-42 Chapter 5.2 loading loss equation, assuming one 8,500-gallon tanker purge per month. Saturation factor, vapor pressure, and vapor molecular weight inputs were selected to represent conservative gasoline vapor properties.

HAPs: Emissions from evaporative sources (tanks and fugitives) were calculated by applying speciation weight fractions to VOC emissions for each applicable source, consistent with API Manual of Petroleum Measurement Standards, Chapter 19.4.

TREA 5: Criteria pollutant and Greenhouse Gas (GHG) emissions were calculated assuming the full annual gasoline loading throughput could be routed to the VCU under worst-case conditions. The annual mass of captured vapors was estimated using loading loss factor, vapor capture efficiency, and a conservative heating value. For NO_X, CO, and PM, the Permittee applied manufacturer emission and annual gasoline loading throughput. Pilot emissions were estimated using AP-42 methodology and 8,760 hours per year.

PTE from the engines (EQUIs 6 and 55) were calculated assuming 500 hours of operation per year, consistent with the EPA Seitz memorandum (Calculating Potential to Emit for Emergency Generators). PTE are based on equipment capacity, manufacturer data, and published AP-42 emission factors. GHG emission factors and global warming potentials (GWP) used in the calculations were taken from 40 CFR pt. 98 Table C-1, Table C-2, and Equation A-1.

3.2 Tank loss calculation methodology update

This permit action replaces the prior fixed-factor equation language for monthly tank emission calculations with a methodology-based requirement to use AP-42, Chapter 7.1 to estimate standing losses, working losses, and floating roof landing losses. AP-42, Chapter 7.1 is the current EPA reference methodology for storage tank emissions. It provides a consistent, parameter-based framework that accounts for tank design and operating conditions. To avoid ambiguity over which revision applies, the permit specifies use of “the version in effect at the time the calculation is performed.” The permit continues to require that calculations reflect actual operations when a tank is taken out of service. The Permittee must document out-of-service status and calculate emissions consistent with the tank operating status for the month.

Because landing losses are event-based, the permit clarifies that roof landing events must be recorded consistently with actual operation. Roof landings should not be recorded for periods when the tank is not operated. The permit continues to require monthly calculations, retention of calculation outputs, and supporting records for all inputs.

3.3 Relocation of CEMS Requirements

In previous permits, the Continuous Emission Monitoring System (CEMs) requirements associated with the vapor recovery unit (VRU) were placed under TREA 2 primarily for organizational convenience, since the VRU is the control system required under 40 CFR part 63, subpart BBBBBB.

However, the monitoring obligations apply to the monitoring system installed in the vapor processing system exhaust, and the CEMS-specific requirements (installation, operation and maintenance, calibration, and performance evaluation) are most accurately assigned to the monitoring equipment rather than the control equipment. Therefore, this permit reassigns the CEMS requirements from TREA 2 to VRU CEMS (EQUI 4). As part of this organizational update, the permit citations were also revised to anchor the CEMS requirements to the applicable NESHAP general monitoring provisions in 40 CFR pt. 63 and retain part 60

appendices only where they function as procedural performance references. This change is administrative in nature and clarifies where the monitoring obligations reside for auditing purposes.

3.4 VCU compliance approach

The facility uses the VRU as the primary control device for gasoline loading vapors, with a vapor combustion unit (VCU) as a backup control. TREA 5 is a John Zink vapor combustor (model ZFT-2-6-35-X-2/6). Under 40 CFR pt. 63, subp. BBBBBB, VCUs are addressed within the thermal oxidation system control framework; however, a VCU is not a conventional thermal oxidizer designed to ensure destruction through controlled residence time, mixing, and combustion air at a tightly maintained combustion chamber temperature. Therefore, TREA 5 is not equipped with a combustion chamber temperature monitoring device that continuously indicates and records temperature; instead, when vapors are routed to TREA 5, continuous compliance is demonstrated using combustion operational indicators (flame presence and visible emissions), consistent with the applicable NESHAP BBBBBB compliance option for periods when the device is controlling loading vapors.

3.5 Performance testing history

Table 7 shows the performance tests for TREA 2 and EQUI 8 for VOCs and TOC conducted since the first state permit in 2001, Air Permit No. 16300010-001.

Table 7. Performance Tests for Thermal Oxidizers

Subject Item	Parameter	Stack Test Start Date	Limit Msr	Tested Result	Tested Units	Status
TREA 2	VOCs	9/5/2013	35	0.32	milligrams per liter	Compliant
TREA 2	TOC	8/29/2018	35	0.45	milligrams per liter	Compliant
EQUI 8	VOCs	8/16/2023	35	1.05	milligrams per liter	Compliant

3.6 Monitoring

In accordance with the Clean Air Act, it is the responsibility of the owner or operator of a facility to have sufficient knowledge of the facility to certify that the facility is in compliance with all applicable requirements.

In evaluating the monitoring included in the permit, the MPCA considered the following:

- The likelihood of the facility violating the applicable requirements.
- Whether add-on controls are necessary to meet the emission limits.
- The variability of emissions over time.
- The type of monitoring, process, maintenance, or control equipment data already available for the emission unit.
- The technical and economic feasibility of possible periodic monitoring methods.
- The kind of monitoring found on similar units elsewhere.

The table below summarizes the monitoring requirements associated with this amendment.

Table 8. Monitoring

Subject item*	Requirement (rule basis)	What is the monitoring	Why is this monitoring adequate?
COMG 1 - Storage Tanks	Monthly inputs to comply with COMG 4 VOC limit. [Avoid PSD, avoid major source NESHAP, avoid major source Part 70]	Monthly gasoline throughput records and monthly tank landing records, including revising the calculation approach as needed when tanks are taken out of service.	The throughput and landing records provide monthly inputs used in the facility-wide monthly emissions calculation and rolling-sum compliance demonstration under COMG 4.

Subject item*	Requirement (rule basis)	What is the monitoring	Why is this monitoring adequate?
COMG 2 - Equipment Subject to 40 CFR pt. 63, subp. BBBBBB	Prior to May 8, 2027: Total Organic Compounds (TOC) <= 80 mg/L of gasoline loaded. [NESHAP BBBBBB]	Performance testing, operating parameter monitoring, and associated recordkeeping.	Monitoring required by 40 CFR pt. 63, subp. BBBBBB is adequate to demonstrate compliance with the requirements of the standard because this standard was promulgated after November 15, 1990, and post-November 15, 1990, NSPS and NESHAPs contain adequate monitoring requirements.
	On or after May 8, 2027: TOC <= 19,200 ppm 3-hr rolling average when using a VRU (TREA 2). TOC <= 35 mg/L of gasoline loaded when using a VCU. (TREA 5). [NESHAP BBBBBB]	Performance testing, operating parameter monitoring, and associated recordkeeping.	
COMG 4 Total Facility VOC Limits	VOC <= 95.0 tpy (12-month rolling sum). [Avoid PSD, avoid major source NESHAP, avoid major source Part 70]	Monthly calculations of VOC emissions, and monthly records of total facility 12-month rolling sum VOC emissions.	Records can be generated on a monthly basis using operating records for gasoline loading throughput, storage tank throughput and roof landings, fugitive component inventories, tanker purging events, and engine operating hours. These records are used with the permit-specified calculation methods to determine monthly VOC emissions and the 12-month rolling sum under COMG 4. Because terminal operations can vary substantially from month to month a 12-month rolling sum avoids misleading short-term spikes or dips. For these reasons, 12-month rolling limits are reasonable for this Facility.
EQUI 6 - Diesel emergency generator	Operating hours and recordkeeping to comply with COMG 4 VOC limit. [Avoid PSD, avoid major source under NESHAP, avoid major source under Part 70]	Daily records of hours of operation, monthly VOC calculations, and records.	The Permittee is able to use daily records of hours to calculate monthly and 12-month rolling sum to show compliance with the VOC limit at COMG 4. Because this engine is not likely to operate uniformly throughout the year, with some months having very limited operations, a 12-month rolling sum is adequate to ensure the facility remains below PSD and Part 70 thresholds.

Subject item*	Requirement (rule basis)	What is the monitoring	Why is this monitoring adequate?
	SO_x <= 15.0 ppm. NMHC+NO_X <= 6.6 g/kW-hr. PM <= 0.20 g/kW-hr. CO <= 3.5 g/kW-hr. Opacity <= 50% during the peaks. Opacity <= 15% during the lugging mode. Opacity <= 20% during the acceleration mode. [NSPS IIII]	Fuel Supplier Certification for each shipment of diesel fuel. Non-resettable hour meter, and recordkeeping. Purchase certified engine and: 1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions; 2) Change only those emission-related settings that are permitted by the manufacturer; and 3) Meet the requirements of 40 CFR parts 1039, 1042, and/or 1068 as they apply.	Monitoring required by the NSPS is adequate to demonstrate compliance with the requirements because this standard was promulgated after November 15, 1990, and post-November 15, 1990, NSPS and NESHAPs contain adequate monitoring requirements.
	Opacity <= 20%. SO_2 <= 0.0015 lb/MMBtu heat input. [Minn. R. 7011.2300]	Monthly recordkeeping of amount of fuel type and usage.	This unit uses diesel only; therefore, the likelihood of violating either of the limits is very small. The Permittee can demonstrate that the unit will continue to operate such that emissions are well below the emission limits by only burning natural gas. Design based PTE, using AP-42, is 0.0015 lb/MMBtu of SO_2 compared to the rule limit.
EQUI 55 (Emergency Generator)	Operating hours and recordkeeping to comply with COMG 4 VOC limit. [Avoid PSD, avoid major source under NESHAP, avoid major source under Part 70]	Daily records of hours of operation, monthly VOC calculations, and records.	The Permittee is able to use daily records of hours to calculate monthly and 12-month rolling sum to show compliance with the VOC limit at COMG 4. Because this engine is not likely to operate uniformly throughout the year, with some months having very limited operations, a 12-month rolling sum is adequate to ensure the facility remains below PSD and Part 70 thresholds.
	HC+NO_x <= 10 grams/hph. CO <= 387 grams/hph. [NSPS JJJJ]	Purchase of a certified engine, operation according to the manufacturer's emissions-related instructions, and records of maintenance.	Monitoring required by the NSPS is adequate to demonstrate compliance with the requirements because this standard was promulgated after November 15, 1990, and post-November 15, 1990, NSPS and NESHAPs contain adequate monitoring requirements.

Subject item*	Requirement (rule basis)	What is the monitoring	Why is this monitoring adequate?
	Opacity <= 20% SO_2 <= 0.0015 lb/MMBtu heat input. [Minn. R. 7011.2300]	Monthly recordkeeping of amount of fuel type and usage.	This unit uses pipeline natural gas only; therefore, the likelihood of violating either of the limits is very small. The Permittee can demonstrate that the unit will continue to operate such that emissions are well below the emission limits by only burning natural gas. Design based PTE, using AP-42, is 0.0006 lb/MMBtu of SO_2 compared to the rule limit.
FUGIs 1 and 2	Monthly inputs to comply with COMG 4 VOC limit. [Avoid PSD, avoid major source under NESHAP, avoid major source under Part 70]	Monthly calculations and recordkeeping of VOC fugitive emissions.	Monthly emissions calculation provides a record of fugitive VOC emissions to support the Title I avoidance compliance demonstration under COMG 4.
TREA 2 - Vapor Recovery Unit (VRU)	The COMG 2 TOC limit is monitored by the VRU exhaust organic concentration CEMS (EQUI 4). [Avoid PSD, avoid major source under NESHAP, avoid major source under Part 70]	CEMS, recordkeeping, operation and maintenance, and corrective actions.	The organic concentration CEMS in the VRU exhaust provides continuous and real-time measurements of VOC concentration. This monitoring is required by NESHAP BBBBBB and it is adequate to demonstrate compliance with the requirements of the standard because this standard was promulgated after November 15, 1990, and post-November 15, 1990, NSPS and NESHAPs contain adequate monitoring requirements.
TREA 5 – Vapor Combustion Unit (VCU)	VOC >= 96.7 % control efficiency. [Avoid PSD, avoid major source under NESHAP, avoid major source under Part 70]	Daily and periodic inspections, daily flame presence inspection, recordkeeping, operation and maintenance, and corrective actions.	Proper operation of the control equipment is adequate to show continuous compliance with the limit. The presence of a VCU pilot flame is monitored using a device to detect the presence of a flame. The monitor is checked daily to ensure that the VCU is operating as designed.

*Location of the requirement in the permit (e.g., EQUI 1, STRU 2, etc.).

3.7 Insignificant activities

Circle K Terminal Group Newport has several existing operations which are classified as insignificant activities under the MPCA's permitting rules. These are listed in Appendix A to the permit.

The permit is required to include periodic monitoring for all emissions units, including insignificant activities, per EPA guidance. The insignificant activities at this Facility are only subject to general applicable requirements. Using the criteria outlined earlier in this TSD, the following table documents the justification of why no additional periodic monitoring is necessary for the insignificant activities affected by this modification. See Attachment 1 of this TSD for PTE information for the insignificant activities.

Table 9. Insignificant activities

Insignificant activity	General applicable emission limit	Discussion
Nonhazardous air pollutant VOC storage tanks with total capacity not more than 10,000 gallons meeting certain vapor pressure requirements.	PM, variable depending on airflow. Opacity <= 20%. (Minn. R. 7011.0715)	One 775-gallon diesel storage tank is listed as an insignificant activity (IA) under Minn. R. 7007.1300, subp. 3(C)(2) (nonhazardous VOC storage tank ≤10,000 gallons). Emissions from this tank are expected to be minimal, and no additional periodic monitoring is required. Minn. R. 7011.1505 does not apply because the storage vessel standards (including submerged fill provisions) apply to tanks >2,000 gallons.
Individual units with potential emissions less than 2000 lb/year of certain pollutants.	Permanent submerged fill pipe added to the storage vessel. (Minn. R. 7011.1505 subp. 3(B))	The Permittee operates two tanks (Horizontal Fixed Roof Tank and vertical fixed-roof diesel storage tank); VOC PTE for the biggest tank is 0.51 lb/hr, which supports IA under Minn. R. 7007.1300, subp. 3(F). PM emissions and opacity are not anticipated from this storage activity, and stack testing for PM and opacity is not feasible.
	PM, variable depending on airflow. Opacity <= 20%. (Minn. R. 7011.0715)	Fuel dispensing and loading activities qualify as an IA under Minn. R. 7007.1300, subp. 3(F) because VOC PTE is 10.6 lb/yr (0.005 tpy) based on AP-42 Chapter 5.2 and 600,000 gal/yr throughput; PM emissions and opacity are not anticipated from this activity, and stack testing for passive loading losses is not feasible.
	Requirement to take reasonable measures to prevent PM from becoming airborne. (Minn. R. 7011.0150)	The facility has paved entrance. According to EPA's published emissions factors for paved roads (Section 13.2.2), emissions from such roads are expected to be less than 1 TPY for particulates. Therefore, it is highly unlikely that PM will become airborne.

3.8 Permit organization and standard language

This permit meets the MPCA Tempo Guidance for ordering and grouping of requirements as well as the use of permit appendices.

When amending or reissuing an air permit, MPCA staff evaluate standard permit language in the permit. If the standard language has been changed in the Tempo database since the last permit was issued, staff need to decide how to proceed for each revised condition. For this permit action, all standard language was updated in the permit.

3.9 Comments received

This section will be completed after the referenced review periods. This permit action is a major amendment to a state permit. Therefore, no EPA review is needed.

Public Notice Period: [start date] – [end date]

4. Permit fee assessment

Attachment 3 to this TSD contains the MPCA's assessment of Application and Additional Points used to determine the permit application fee for this permit action as required by Minn. R. 7002.0019. This permit action includes additional points for reviewing the applicable federal standards NSPS Subp. XXa.

5. Conclusion

Based on the information provided by Circle K Terminal Group Newport the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 16300010-104 and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff members on permit team: Alfredo Rincon-Gonzalez (permit engineer)
Hannah Braatz (peer reviewer)
Ryan Maisano (peer reviewer)
Marc Severin (peer reviewer)
Joey Handtmann (data coordinator)
Beckie Olson (permit writing assistant)
Ryan Decker (administrative support)

Tempo Activities: IND2025002

Attachments:
1. PTE summary and emissions increase calculation spreadsheets
2. Subject item inventory and requirements report
3. Points calculator

Circle K Terminal Group Newport
Permit Number 16300010-104
Technical Support Document

Attachment 1
Calculations spreadsheet

Circle K Terminal Group Newport

Tempo SI ID number:	EQUI 6			EQUI 8			EQUI 9			EQUI 10			EQUI 11		
Pollutant Name	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY
CO	6.81	29.81	1.70	0	0	0	0	0	0	0	0	0	0	0	0
NOx	1.24	5.42	0.31	0	0	0	0	0	0	0	0	0	0	0	0
PM	0.16	0.70	3.98E-02	0	0	0	0	0	0	0	0	0	0	0	0
PM-10	0.16	0.70	3.98E-02	0	0	0	0	0	0	0	0	0	0	0	0
PM-2.5	0.16	0.70	3.98E-02	0	0	0	0	0	0	0	0	0	0	0	0
SO2	1.49E-01	6.52E-01	3.72E-02	0	0	0	0	0	0	0	0	0	0	0	0
VOC	0.15	0.64		14.56	63.77		0.49	2.14		1.29	5.64		0.01	0.05	
CO2	84.14	368.54	21.04	0	0	0	0	0	0	0	0	0	0	0	0
CH4	3.39E-03	1.49E-02	8.48E-04	0	0	0	0	0	0	0	0	0	0	0	0
N2O	6.79E-04	2.97E-03	1.70E-04	0	0	0	0	0	0	0	0	0	0	0	0
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
1,1- dichloroethene	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
1,2-Dibromoethane (Ethylene dibromide); EDB	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
1,3-Butadiene	2.01E-05	8.79E-05	5.02E-06	0	0	0	0	0	0	0	0	0	0	0	0
1,3-Dichloropropene	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
1,4-Dichlorobenzene (para-)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Methylnaphthalene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Methylchrysene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7,12-Dimethylbenz[a]anthracene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acenaphthene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acenaphthylene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acetaldehyde	3.94E-04	1.72E-03	9.84E-05	0	0	0	0	0	0	0	0	0	0	0	0
Acrolein	4.75E-05	2.08E-04	1.19E-05	0	0	0	0	0	0	0	0	0	0	0	0
Anthracene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benzo(a)anthracene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benzo(ghi)perylene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benzo(b)fluoranthene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benzo(k)fluoranthene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benzo[a]pyrene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benzene	4.79E-04	2.10E-03	1.20E-04	5.27E-02	2.31E-01	2.31E-01	0	0	0	0	0	0	0	0	0
Beryllium Compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biphenyl	0.00E+00	0.00E+00	0.00E+00	6.01E-08	2.63E-07	2.63E-07	0	0	0	0	0	0	0	0	0
Cadmium compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon tetrachloride	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Chlorobenzene (Monochlorobenzene)	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Chloroform	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Chromium compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrysene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cobalt compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyclohexane	0.00E+00	0.00E+00	0.00E+00	0.01	0.04	0.04	0	0	0	0	0	0	0	0	0
Dichloromethane (Methylene chloride)	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Dibenz[a,h]anthracene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	4.42E-03	1.94E-02	1.94E-02	0	0	0	0	0	0	0	0	0
Fluoranthene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluorene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Formaldehyde	6.05E-04	2.65E-03	1.51E-04	0	0	0	0	0	0	0	0	0	0	0	0
Hexane (n)	0.00E+00	0.00E+00	0.00E+00	5.44E-02	2.38E-01	2.38E-01	0	0	0	0	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Methanol	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Naphthalene	4.35E-05	1.91E-04	1.09E-05	2.70E-05	1.18E-04	1.18E-04	0	0	0	0	0	0	0	0	0
Nickel compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phenanthrene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phenol	0	0	0	3.92E-06	1.72E-05	1.72E-05	0	0	0	0	0	0	0	0	0
Polycyclic organic matter (POM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pyrene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Styrene	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Toluene	2.10E-04	9.19E-04	5.25E-05	6.51E-02	2.85E-01	2.85E-01	0	0	0	0	0	0	0	0	0
Trimethylbenzene (1,2,4)	0.00E+00	0.00E+00	0.00E+00	1.31E-04	5.73E-04	5.73E-04	0	0	0	0	0	0	0	0	0
Vinyl Chloride (chloroethene)	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0
Xylenes, Total	1.46E-04	6.40E-04	3.66E-05	1.73E-02	7.57E-02	7.57E-02	0	0	0	0	0	0	0	0	0
Total HAPs	1.94E-03	8.52E-03	4.86E-04	2.02E-01	8.86E-01	8.86E-01	0	0	0	0	0	0	0	0	0

EQUI 12			EQUI 13			EQUI 14			EQUI 15			EQUI 16		
lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.32	1.42		0.46	2.02		1.36	5.96		1.36	5.96		0.46	2.02	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.61E-03	7.04E-03	7.04E-03	2.04E-03	8.95E-03	8.95E-03	2.04E-03	8.95E-03	8.95E-03	2.04E-03	8.95E-03	8.95E-03	2.04E-03	8.95E-03	8.95E-03
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.61E-06	1.14E-05	1.14E-05	1.74E-06	7.63E-06	7.63E-06	1.74E-06	7.63E-06	7.63E-06	1.74E-06	7.63E-06	7.63E-06	1.74E-06	7.63E-06	7.63E-06
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.46E-04	1.08E-03	1.08E-03	3.14E-04	1.38E-03	1.38E-03	3.14E-04	1.38E-03	1.38E-03	3.14E-04	1.38E-03	1.38E-03	3.14E-04	1.38E-03	1.38E-03
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.25E-04	2.30E-03	2.30E-03	4.37E-04	1.91E-03	1.91E-03	4.37E-04	1.91E-03	1.91E-03	4.37E-04	1.91E-03	1.91E-03	4.37E-04	1.91E-03	1.91E-03
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.47E-03	6.42E-03	6.42E-03	1.96E-03	8.61E-03	8.61E-03	1.96E-03	8.61E-03	8.61E-03	1.96E-03	8.61E-03	8.61E-03	1.96E-03	8.61E-03	8.61E-03
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.16E-04	5.10E-04	5.10E-04	7.83E-05	3.43E-04	3.43E-04	7.83E-05	3.43E-04	3.43E-04	7.83E-05	3.43E-04	3.43E-04	7.83E-05	3.43E-04	3.43E-04
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.45E-05	6.33E-05	6.33E-05	9.72E-06	4.26E-05	4.26E-05	9.72E-06	4.26E-05	4.26E-05	9.72E-06	4.26E-05	4.26E-05	9.72E-06	4.26E-05	4.26E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.39E-03	1.49E-02	1.49E-02	3.50E-03	1.53E-02	1.53E-02	3.50E-03	1.53E-02	1.53E-02	3.50E-03	1.53E-02	1.53E-02	3.50E-03	1.53E-02	1.53E-02
6.54E-04	2.87E-03	2.87E-03	4.38E-04	1.92E-03	1.92E-03	4.38E-04	1.92E-03	1.92E-03	4.38E-04	1.92E-03	1.92E-03	4.38E-04	1.92E-03	1.92E-03
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.30E-03	1.01E-02	1.01E-02	1.87E-03	8.20E-03	8.20E-03	1.87E-03	8.20E-03	8.20E-03	1.87E-03	8.20E-03	8.20E-03	1.87E-03	8.20E-03	8.20E-03
1.03E-02	4.52E-02	4.52E-02	1.07E-02	4.67E-02	4.67E-02	1.07E-02	4.67E-02	4.67E-02	1.07E-02	4.67E-02	4.67E-02	1.07E-02	4.67E-02	4.67E-02

EQUI 17			EQUI 18			EQUI 55			FUGI 1			FUGI 2		
lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY
0	0	0	0	0	0	0.48	2.09	0.12	0	0	0	0	0	0
0	0	0	0	0	0	4.82	21.10	1.20	0	0	0	0	0	0
0	0	0	0	0	0	0.79	3.47	1.98E-01	0	0	0	0	0	0
0	0	0	0	0	0	0.79	3.47	1.98E-01	0	0	0	0	0	0
0	0	0	0	0	0	0.79	3.47	1.98E-01	0	0	0	0	0	0
0	0	0	0	0	0	2.55E-03	1.12E-02	6.37E-04	0	0	0	0	0	0
0.46	2.02		0.46	2.02		0.13	0.56		0.15	0.64		0.09	0.42	
0	0	0	0	0	0	476.63	2087.64	119.16	0	0	0	0	0	0
0	0	0	0	0	0	9.55E-03	4.18E-02	2.39E-03	0	0	0	0	0	0
0	0	0	0	0	0	9.55E-04	4.18E-03	2.39E-04	0	0	0	0	0	0
0	0	0	0	0	0	1.10E-04	4.80E-04	2.74E-05	0	0	0	0	0	0
0	0	0	0	0	0	1.10E-04	4.80E-04	2.74E-05	0	0	0	0	0	0
0	0	0	0	0	0	4.90E-05	2.14E-04	1.22E-05	0	0	0	0	0	0
0	0	0	0	0	0	9.23E-05	4.04E-04	2.31E-05	0	0	0	0	0	0
0	0	0	0	0	0	2.87E-03	1.26E-02	7.18E-04	0	0	0	0	0	0
0	0	0	0	0	0	5.63E-05	2.47E-04	1.41E-05	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	1.21E-02	5.30E-02	3.02E-03	0	0	0	0	0	0
0	0	0	0	0	0	1.14E-02	4.99E-02	2.85E-03	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
2.04E-03	8.95E-03	8.95E-03	2.04E-03	8.95E-03	8.95E-03	6.85E-03	3.00E-02	1.71E-03	5.32E-04	2.33E-03	2.33E-03	3.43E-04	1.50E-03	1.50E-03
0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0
1.74E-06	7.63E-06	7.63E-06	1.74E-06	7.63E-06	7.63E-06	0.00E+00	0.00E+00	0.00E+00	6.07E-10	2.66E-09	2.66E-09	3.92E-10	1.71E-09	1.71E-09
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	7.67E-05	0.000336	1.92E-05	0	0	0	0	0	0
0	0	0	0	0	0	5.59E-05	0.000245	1.4E-05	0	0	0	0	0	0
0	0	0	0	0	0	5.94E-05	0.00026	1.48E-05	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.14E-04	1.38E-03	1.38E-03	3.14E-04	1.38E-03	1.38E-03	0.00E+00	0.00E+00	0.00E+00	8.27E-05	3.62E-04	3.62E-04	5.34E-05	2.34E-04	2.34E-04
0	0	0	0	0	0	0.000179	0.000782	4.46E-05	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.37E-04	1.91E-03	1.91E-03	4.37E-04	1.91E-03	1.91E-03	0.000107	0.000471	2.69E-05	4.46E-05	0.000195	0.000195	2.88E-05	0.000126	0.000126
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0.088827	0.38906	0.022207	0	0	0	0	0	0
1.96E-03	8.61E-03	8.61E-03	1.96E-03	8.61E-03	8.61E-03	0	0	0	0.000549	0.002407	0.002407	0.000355	0.001553	0.001553
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0.013259	0.058074	0.003315	0	0	0	0	0	0
7.83E-05	3.43E-04	3.43E-04	7.83E-05	3.43E-04	3.43E-04	4.21E-04	1.84E-03	1.05E-04	2.73E-07	1.2E-06	1.2E-06	1.76E-07	7.71E-07	7.71E-07
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.72E-06	4.26E-05	4.26E-05	9.72E-06	4.26E-05	4.26E-05	0	0	0	3.96E-08	1.73E-07	1.73E-07	2.56E-08	1.12E-07	1.12E-07
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	5.16E-05	0.000226	1.29E-05	0	0	0	0	0	0
3.50E-03	1.53E-02	1.53E-02	3.50E-03	1.53E-02	1.53E-02	0.002418	0.01059	0.000604	0.000657	0.002878	0.002878	0.000424	0.001858	0.001858
4.38E-04	1.92E-03	1.92E-03	4.38E-04	1.92E-03	1.92E-03	0	0	0	1.32E-06	5.79E-06	5.79E-06	8.53E-07	3.74E-06	3.74E-06
0	0	0	0	0	0	3.11E-05	0.000136	7.78E-06	0	0	0	0	0	0
1.87E-03	8.20E-03	8.20E-03	1.87E-03	8.20E-03	8.20E-03	8.45E-04	3.70E-03	2.11E-04	1.74E-04	7.64E-04	7.64E-04	1.13E-04	4.93E-04	4.93E-04
1.07E-02	4.67E-02	4.67E-02	1.07E-02	4.67E-02	4.67E-02	1.40E-01	6.13E-01	3.50E-02	2.04E-03	8.94E-03	8.94E-03	1.32E-03	5.77E-03	5.77E-03

TREA 1			COMG 4 -VOC Limit			Fuel Oil Dispensing (IA)			DA Tank (IA)			Diesel Tank (IA)			Paved Roads (IA)			Total facility with IAs			Total facility W/O IAs		
lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY	lb/hr	un-restricted TPY	limited TPY
5.02	21.97	21.97				0	0	0	0	0	0	0	0	0				12.30	53.87	23.79	12.30	53.87	23.79
2.03	8.90	8.90				0	0	0	0	0	0	0	0	0				8.09	35.42	10.41	8.09	35.42	10.41
2.17E-02	9.52E-02	9.52E-02				0	0	0	0	0	0	0	0	0	8.54E-02	3.74E-01	3.74E-01	0.97	4.26	0.33	0.97	4.26	0.33
2.17E-02	9.52E-02	9.52E-02				0	0	0	0	0	0	0	0	0	1.44E-02	6.29E-02	6.29E-02	0.97	4.26	0.33	0.97	4.26	0.33
2.17E-02	9.52E-02	9.52E-02				0	0	0	0	0	0	0	0	0	1.44E-03	6.29E-03	6.29E-03	0.97	4.26	0.33	0.97	4.26	0.33
5.67E-03	2.48E-02	2.48E-02				0	0	0	0	0	0	0	0	0				0.16	0.69	0.06	0.16	0.69	0.06
1.31	5.75				95.00	1.21E-03	0.01	0.01	0.39	1.19E-03	1.19E-03	0.51	0.01	0.01				23.97	101.04	95.01	23.07	101.03	95.00
1412.27	6,185.74	6,185.74				0	0	0	0	0	0	0	0	0				1973.04	8641.92	6325.93	1973.04	8641.92	6325.93
2.11E-02	9.26E-02	9.26E-02				0	0	0	0	0	0	0	0	0				3.41E-02	1.49E-01	9.59E-02	3.41E-02	1.49E-01	9.59E-02
4.32E-03	1.89E-02	1.89E-02				0	0	0	0	0	0	0	0	0				5.96E-03	2.61E-02	1.93E-02	5.96E-03	2.61E-02	1.93E-02
0	0	0				0	0	0	0	0	0	0	0	0				1.10E-04	4.80E-04	2.74E-05	1.10E-04	4.80E-04	2.74E-05
0	0	0				0	0	0	0	0	0	0	0	0				1.10E-04	4.80E-04	2.74E-05	1.10E-04	4.80E-04	2.74E-05
0	0	0				0	0	0	0	0	0	0	0	0				4.90E-05	2.14E-04	1.22E-05	4.90E-05	2.14E-04	1.22E-05
0	0	0				0	0	0	0	0	0	0	0	0				9.23E-05	4.04E-04	2.31E-05	9.23E-05	4.04E-04	2.31E-05
0	0	0				0	0	0	0	0	0	0	0	0				2.89E-03	1.27E-02	7.23E-04	2.89E-03	1.27E-02	7.23E-04
0	0	0				0	0	0	0	0	0	0	0	0				5.63E-05	2.47E-04	1.41E-05	5.63E-05	2.47E-04	1.41E-05
5.40E-04	2.37E-03	2.37E-03				0	0	0	0	0	0	0	0	0				5.40E-04	2.37E-03	2.37E-03	5.40E-04	2.37E-03	2.37E-03
1.08E-05	4.73E-05	4.73E-05				0	0	0	0	0	0	0	0	0				1.08E-05	4.73E-05	4.73E-05	1.08E-05	4.73E-05	4.73E-05
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
7.20E-06	3.15E-05	3.15E-05				0	0	0	0	0	0	0	0	0				7.20E-06	3.15E-05	3.15E-05	7.20E-06	3.15E-05	3.15E-05
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
0	0	0				0	0	0	0	0	0	0	0	0				1.25E-02	5.47E-02	3.12E-03	1.25E-02	5.47E-02	3.12E-03
0	0	0				0	0	0	0	0	0	0	0	0				1.14E-02	5.01E-02	2.86E-03	1.14E-02	5.01E-02	2.86E-03
1.08E-06	4.73E-06	4.73E-06				0	0	0	0	0	0	0	0	0				1.08E-06	4.73E-06	4.73E-06	1.08E-06	4.73E-06	4.73E-06
9.00E-05	3.94E-04	3.94E-04				0	0	0	0	0	0	0	0	0				9.00E-05	3.94E-04	3.94E-04	9.00E-05	3.94E-04	3.94E-04
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
5.40E-07	2.37E-06	2.37E-06				0	0	0	0	0	0	0	0	0				5.40E-07	2.37E-06	2.37E-06	5.40E-07	2.37E-06	2.37E-06
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
5.40E-07	2.37E-06	2.37E-06				0	0	0	0	0	0	0	0	0				5.40E-07	2.37E-06	2.37E-06	5.40E-07	2.37E-06	2.37E-06
9.45E-04	4.14E-03	4.14E-03				0	0	0	0	0	0	0	0	0				7.57E-02	3.32E-01	3.01E-01	7.57E-02	3.32E-01	3.01E-01
5.40E-06	2.37E-05	2.37E-05				0	0	0	0	0	0	0	0	0				5.40E-06	2.37E-05	2.37E-05	5.40E-06	2.37E-05	2.37E-05
0	0	0				0	0	0	0	0	0	0	0	0				1.31E-05	5.75E-05	5.75E-05	1.31E-05	5.75E-05	5.75E-05
4.95E-04	2.17E-03	2.17E-03				0	0	0	0	0	0	0	0	0				4.95E-04	2.17E-03	2.17E-03	4.95E-04	2.17E-03	2.17E-03
0	0	0				0	0	0	0	0	0	0	0	0				7.67E-05	3.36E-04	1.92E-05	7.67E-05	3.36E-04	1.92E-05
0	0	0				0	0	0	0	0	0	0	0	0				5.59E-05	2.45E-04	1.40E-05	5.59E-05	2.45E-04	1.40E-05
0	0	0				0	0	0	0	0	0	0	0	0				5.94E-05	2.60E-04	1.48E-05	5.94E-05	2.60E-04	1.48E-05
6.30E-04	2.76E-03	2.76E-03				0	0	0	0	0	0	0	0	0				6.30E-04	2.76E-03	2.76E-03	6.30E-04	2.76E-03	2.76E-03
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
3.78E-05	1.66E-04	1.66E-04				0	0	0	0	0	0	0	0	0				3.78E-05	1.66E-04	1.66E-04	3.78E-05	1.66E-04	1.66E-04
0	0	0				0	0	0	0	0	0	0	0	0				1.05E-02	4.58E-02	4.58E-02	1.05E-02	4.58E-02	4.58E-02
0	0	0				0	0	0	0	0	0	0	0	0				1.79E-04	7.82E-04	4.46E-05	1.79E-04	7.82E-04	4.46E-05
5.40E-07	2.37E-06	2.37E-06				0	0	0	0	0	0	0	0	0				5.40E-07	2.37E-06	2.37E-06	5.40E-07	2.37E-06	2.37E-06
0	0	0				0	0	0	0	0	0	0	0	0				7.75E-03	3.39E-02	3.35E-02	7.75E-03	3.39E-02	3.35E-02
1.35E-06	5.91E-06	5.91E-06				0	0	0	0	0	0	0	0	0				1.35E-06	5.91E-06	5.91E-06	1.35E-06	5.91E-06	5.91E-06
1.26E-06	5.52E-06	5.52E-06				0	0	0	0	0	0	0	0	0				1.26E-06	5.52E-06	5.52E-06	1.26E-06	5.52E-06	5.52E-06
3.38E-02	1.48E-01	1.48E-01				0	0	0	0	0	0	0	0	0				1.23E-01	5.40E-01	1.70E-01	1.23E-01	5.40E-01	1.70E-01
8.10E-01	3.55E+00	3.55E+00				0	0	0	0	0	0	0	0	0				0.88	3.85	3.85	0.88	3.85	3.85
8.10E-07	3.55E-06	3.55E-06				0	0	0	0	0	0	0	0	0				8.10E-07	3.55E-06	3.55E-06	8.10E-07	3.55E-06	3.55E-06
1.71E-04	7.49E-04	7.49E-04				0	0	0	0	0	0	0	0	0				1.71E-04	7.49E-04	7.49E-04	1.71E-04	7.49E-04	7.49E-04
1.17E-04	5.12E-04	5.12E-04				0	0	0	0	0	0	0	0	0				1.17E-04	5.12E-04	5.12E-04	1.17E-04	5.12E-04	5.12E-04
0	0	0				0	0	0	0	0	0	0	0	0				1.33E-02	5.81E-02	3.31E-03	1.33E-02	5.81E-02	3.31E-03
2.75E-04	1.20E-03	1.20E-03				1.45E-05	6.36E-05	6.36E-05	8.60E-03	2.22E-05	2.22E-05	8.43E-03	7.05E-05	7.05E-05				1.84E-02	6.08E-03	4.16E-03	1.35E-03	5.92E-03	4.01E-03
9.45E-04	4.14E-03	4.14E-03				0	0	0	0	0	0	0	0	0				9.45E-04	4.14E-03	4.14E-03	9.45E-04	4.14E-03	4.14E-03
7.65E-06	3.35E-05	3.35E-05				0	0	0	0	0	0	0	0	0				7.65E-06	3.35E-05	3.35E-05	7.65E-06	3.35E-05	3.35E-05
0	0	0				0	0	0	0	0	0	0	0	0				7.68E-05	3.36E-04	3.36E-04	7.68E-05	3.36E-04	3.36E-04
3.14E-04	1.38E-03	1.38E-03				0	0	0	0	0	0	0	0	0				3.14E-04	1.38E-03	1.38E-03	3.14E-04	1.38E-03	1.38E-03
2.25E-06	9.86E-06	9.86E-06				0	0	0	0	0	0	0	0	0				2.25E-06	9.86E-06	9.86E-06	2.25E-06	9.86E-06	9.86E-06
1.08E-05	4.73E-05	4.73E-05				0	0	0	0	0	0	0	0	0				1.08E-05	4.73E-05	4.73E-05	1.08E-05	4.73E-05	4.73E-05
0	0	0				0	0	0	0	0	0	0	0	0				5.16E-05	2.26E-04	1.29E-05	5.16E-05	2.26E-04	1.29E-05
1.53E-03	6.70E-03	6.70E-03				0	0	0	0	0	0	0	0	0				9.47E-02	4.15E-01	4.04E-01	9.47E-02	4.15E-01	4.04E-01
0	0	0				0	0	0	0	0	0	0	0	0				3.42E-03	1.50E-02	1.50E-02	3.42E-03	1.50E-02	1.50E-02
0	0	0				0	0	0	0	0	0	0	0	0				3.11E-05	1.36E-04	7.78E-06	3.11E-05	1.36E-04	7.78E-06
0	0	0				0	0	0	0	0	0	0	0	0				3.21E-02	1.41E-01	1.36E-01	3.21E-02	1.41E-01	1.36E-01
0.85	3.72	3.72				0	0	0	8.60E-03	2.22E-05	2.22E-05	8.43E-03	7.05E-05	7.05E-05				1.29	5.57	4.98	1.27	5.57	4.98

Table. Title I emissions summary

Pollutant	Unlimited potential emissions from the modification (tpy)	Limited potential emissions from the modification (tpy)	NSR/112(g) threshold for new major source (tpy)	NSR/112(g) review required?
PM			100	No
PM_{10}			100	No
$PM_{2.5}$			100	No
NO_X			100	No
SO_2			100	No
CO			100	No
VOC	0.64	95	100	No
Lead			0.6	No
CO_2e*			75,000	No
Total HAPs	0.01	0.01	N/A	No

*Carbon dioxide equivalents as defined in Minn. R. 7007.0100.

**The facility has a VOC pre-cap emission limit of 95.0 tpy.

*** the only emission that are affected from the modification are FUGI 1

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 1: Facility-wide Emissions Summary

			Emissions[1] (ton/yr)										
Permit ID	**Facility ID**	**Product**	**VOC**	**SO2**	**NOx**	**CO**	**PM**	**PM-10**	**PM-2.5**	**CH4**	**N20**	**CO2**	**Total HAP**
EQUI 6	Natural Gas Emergency Generator	Natural Gas	3.64E-02	3.72E-02	3.09E-01	1.70E+00	3.98E-02	3.98E-02	3.98E-02	8.48E-04	1.70E-04	2.10E+01	8.52E-03
EQUI 8	Loading Rack 1 - Gasoline	Gasoline	63.77	-	-	-	-	-	-	-	-	-	0.89
EQUI 9	Tank 103	Ethanol	2.14	-	-	-	-	-	-	-	-	-	-
EQUI 10	Tank 104	Ethanol	5.64	-	-	-	-	-	-	-	-	-	-
EQUI 11	Tank 105	Ethanol	0.05	-	-	-	-	-	-	-	-	-	-
EQUI 12	Tank 106	Gasoline	1.42	-	-	-	-	-	-	-	-	-	0.05
EQUI 13	Tank 107	Gasoline	2.02	-	-	-	-	-	-	-	-	-	0.05
EQUI 14	Tank 108	Gasoline	5.96	-	-	-	-	-	-	-	-	-	0.05
EQUI 15	Tank 109	Gasoline	5.96	-	-	-	-	-	-	-	-	-	0.05
EQUI 16	Tank 110	Gasoline	2.02	-	-	-	-	-	-	-	-	-	0.05
EQUI 17	Tank 111	Gasoline	2.02	-	-	-	-	-	-	-	-	-	0.05
EQUI 18	Tank 112	Gasoline	2.02	-	-	-	-	-	-	-	-	-	0.05
EQUI 55	Reciprocating IC Engine	Diesel	3.21E-02	0.00	1.20	0.12	0.20	0.20	0.20	0.00	2.39E-04	119.16	5.51E-01
FUGI 1	Valves, Flanges, Seals	Gasoline	0.64	-	-	-	-	-	-	-	-	-	0.01
FUGI 2	Tanker Purging	Gasoline	0.42	-	-	-	-	-	-	-	-	-	0.01
TREA 1	Flaring	Gasoline	6	0.02	8.90	21.97	0.10	0.10	0.10	0.09	0.02	6,186	0
TREA 2	Vapor Recovery System - Condensers, Hoods, & Other Enclosures	Gasoline	-	-	-	-	-	-	-	-	-	-	-
IA	DA Tank	Additive	1.70E-05	-	-	-	-	-	-	-	-	-	4.43E-05
IA	Diesel Tank	Diesel	1.30E-05	-	-	-	-	-	-	-	-	-	7.05E-05
IA	Fuel Oil Dispensing	Diesel	5.28E-03	-	-	-	-	-	-	-	-	-	6.36E-05
Total Facility			**99.90**	**0.06**	**10.41**	**23.79**	**0.33**	**0.33**	**0.33**	**0.10**	**0.02**	**6,326**	**1.79**
Total Facility w/o IA [2]			**99.90**	**0.06**	**10.41**	**23.79**	**0.33**	**0.33**	**0.33**	**0.10**	**0.02**	**6,326**	**1.79**

Notes:
(1) Refer to Tables 2 through 9 for supporting information.
(2)According to Minn 7007.0150 Subpart 4, emissions caused by insignificant activities do not need to be included in the facility PTE unless requested by MPCA or if including the emissions could cause the permittee to exceed permitting thresholds.

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 2: VOC Emissions from Loading Rack - Gasoline Loading (EQUI 8)

Uncontrolled Emissions

VOC Loading Loss emission factor is calculated as follows (based on AP-42 section 5.2.2.1.1, June 2008):

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

where: L_L = Loading Loss (lb/1000 gal)
S = Saturation factor (see Table 5.2-1)
P = True Vapor Pressure of Liquid Loaded (psia)
M = Molecular Weight of Vapors (lb/lb-mole)
T = Temperature of Bulk Liquid Loaded, deg. R (deg. F + 460)

Loading Loss[3]	0.140	lb/1000 gal

S	1	Submerged loading: dedicated vapor balance service [4]
P	4.8708	Gasoline vapor pressure at average temp.
M	66.00	AP-42, Table 7.1-2
Ave. Temp deg. F	46.30	
T, deg. R	505.97	
L_L	7.92	(lb VOC/1000 gallon)

Uncontrolled Emissions

Emission Source	Annual Throughput[1] (1000/gal)	Loading Loss (lb/1000 gal)	Total Uncontrolled VOC Emissions (tons)	Capture Efficiency [2]	Uncaptured Emissions (ton VOC/yr)
Gasoline loading	525,000	7.92	2,078.09	98.7%	27.015

Controlled Emissions - VRU

Emission Source	Emission Loss (lb/1000 gal)[3]	Total Controlled VOC Emissions (tons/year)
Gasoline loading	0.140	36.75

Summary

Total Emissions from Gasoline Loading (ton VOC/yr)	Total Emissions from Gasoline Loading (lb/day)
63.7651	349

Notes:
(1) Proposed limited throughput to remain a minor source of emissions.
(2) Not all of the displaced vapors reach the control device, because of leakage from both the tank truck and collection system. The collection efficiency should be assumed to be 98.7 percent for tanker trucks passing the NSPS-level annual leak test per AP-42 Section 5.2 - *Transportation And Marketing Of Petroleum Liquids.*
(3) The terminal operates with the VRU (TREA 2) as the main control equipment and the VCU (TREA 1) as backup control equipment. For PTE calculations, the emission factor for the VCU is used since it results in higher emissions.
(4) Retail stations in the Twin Cities metro area are required to have vapor balancing. Due to the terminal's proximity to these areas, a saturation factor of 1 is used.

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 3: Facility-Wide Storage Tank Volatile Organic Compound Emissions Summary

							VOC								
Permit ID	Facility ID	Product	Tank Type	Tank Capacity (1000 gal)	Annual Tank throughput (bbl/yr)	Annual Tank throughput (gal/yr)	Turnovers	Standing Loss[1] (lb/yr)	Working Loss[1] (lb/yr)	Total Uncontrolled Loss (lb/yr)	Standing Loss[1] (ton/yr)	Working Loss[1] (ton/yr)	Landing Loss[2] (tpy)	Cleaning Loss[3] (tpy)	Total Uncontrolled Loss (ton/yr)
EQUI 9	Tank 103	Ethanol	IFRT	500	416,667	17,500,000	35.00	12.74	80.92	93.66	0.01	0.04	1.54E-03	2.09	2.14
EQUI 10	Tank 104	Ethanol	VFRT	500	416,667	17,500,000	39.17	1,718	9,570	11,288.23	0.86	4.79	-	-	5.64
EQUI 11	Tank 105	Ethanol	IFRT	500	416,667	17,500,000	35.00	12.74	80.92	93.66	0.01	0.04	-	-	0.05
EQUI 12	Tank 106	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	2,617	228.45	2,845.64	1.31	0.11	-	-	1.42
EQUI 13	Tank 107	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	3,883	152.34	4,035.31	1.94	0.08	-	-	2.02
EQUI 14	Tank 108	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	3,883	152.34	4,035.31	1.94	0.08	0.68	3.26	5.96
EQUI 15	Tank 109	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	3,883	152.34	4,035.31	1.94	0.08	0.68	3.26	5.96
EQUI 16	Tank 110	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	3,883	152.34	4,035.31	1.94	0.08	-	-	2.02
EQUI 17	Tank 111	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	3,883	152.34	4,035.31	1.94	0.08	-	-	2.02
EQUI 18	Tank 112	Gasoline RVP 13	IFRT	493	75,000,000	3,150,000,000	6,387	3,883	152.34	4,035.31	1.94	0.08	-	-	2.02
Insignificant Activites															
IA	DA Tank	Gas Additive	HFRT	-	-	-	-	0.03	-	0.03	1.70E-05	0.00E+00	-	-	1.70E-05
IA	Diesel Tank	Diesel	VFRT	-	-	-	-	0.03	-	0.03	1.30E-05	0.00E+00	-	-	1.30E-05
Total	Total							27,658	10,875	38,533	13.83	5.44	1.37	8.62	29.25

(1) Tank standing and withdrawal emissions calculated using AP-42 Chapter 7 formulas.
(2) Assumed one ethnaol tank landing and two gasoline tank landings per year.
(3) Assumed one ethanol tank cleaning and two gasoline tank cleanings per year.

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 4: Piping Component Fugitive Volatile Organic Compound Emission Calculations (FUGI 1)

Component	Count[1]	Service	Emission Factor[2] (kg/hr/source)	Emission Factor (lb/hr/source)	Emissions[3] (lb)	Emissions (ton)
Valves	419	Light Liquid	4.30E-05	9.47E-05	348	0.17
Valves	28	Gas	1.30E-05	2.86E-05	7	0.00
Flanges	1,511	Light Liquid	8.00E-06	1.76E-05	233	0.12
Flanges	110	Gas	4.20E-05	9.25E-05	89	0.04
Other Equipment	-	Light Liquid	1.30E-04	2.86E-04	-	0.00
Other Equipment	-	Gas	1.20E-04	2.64E-04	-	0.00
Pump Seals	23	Light Liquid	5.40E-04	1.19E-03	240	0.12
Pump Seals	2	Gas	6.50E-05	1.43E-04	3	0.00
			Total	0.002	919	**0.46**

Butane New Components

Component	Count[1]	Service	Emission Factor[2] (kg/hr/source)	Emission Factor (lb/hr/source)	Emissions[3] (lb)	Emissions (ton)
Valves	205	Light Liquid	4.30E-05	9.47E-05	170	0.09
Valves		Gas	1.30E-05	2.86E-05	-	0.00
Flanges	885	Light Liquid	8.00E-06	1.76E-05	137	0.07
Flanges	12	Gas	4.20E-05	9.25E-05	10	0.00
Other Equipment		Light Liquid	1.30E-04	2.86E-04	-	0.00
Other Equipment		Gas	1.20E-04	2.64E-04	-	0.00
Pump Seals	5	Light Liquid	5.40E-04	1.19E-03	52	0.03
Pump Seals		Gas	6.50E-05	1.43E-04	-	0.00
			Total	0.002	369	**0.18**

Total Valves	652
Total Flanges	2,518
Total pump seals	30

Notes:
(1) Everything is assumed to be in light liquid or gas service to be conservative.
(2) Table 2-3. Marketing Terminal Average Emission Factors from Protocol for Equipment Leak Emission Estimates, USEPA Office of Air Quality Planning and Standards, November 1995 (EPA-453/R-95-017).
(3) Assumes 8,760 hours of operation per year.

Supporting HAP Calculation Information

Product	Benzene	Biphenyl	Cyclohexane	Ethylbenzene	Hexane (n)	Naphthalene	Phenol	Toluene	Ethylbenzene	Xylene (m)
Distillate	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	0.00%	0.00%	0.00%
Gasoline	0.36%	0.00%	0.06%	0.03%	0.37%	0.00%	0.00%	0.45%	0.00%	0.12%
Ethanol	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Distillate Vapor Weight Fraction Calculations

	Benzene	Biphenyl	Cyclohexane	Ethylbenzene	Hexane (n)	Naphthalene	Phenol	Toluene	Ethylbenzene	Xylene (m)
January	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.7261%	0.0000%	0.0000%	0.0000%	0.0000%
February	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.8030%	0.0000%	0.0000%	0.0000%	0.0000%
March	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.9729%	0.0000%	0.0000%	0.0000%	0.0000%
April	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.2084%	0.0000%	0.0000%	0.0000%	0.0000%
May	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.4087%	0.0000%	0.0000%	0.0000%	0.0000%
June	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.5846%	0.0000%	0.0000%	0.0000%	0.0000%
July	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.6669%	0.0000%	0.0000%	0.0000%	0.0000%
August	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.6221%	0.0000%	0.0000%	0.0000%	0.0000%
September	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.4564%	0.0000%	0.0000%	0.0000%	0.0000%
October	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	1.2251%	0.0000%	0.0000%	0.0000%	0.0000%
November	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.9834%	0.0000%	0.0000%	0.0000%	0.0000%
December	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.7955%	0.0000%	0.0000%	0.0000%	0.0000%
Annual Average	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**1.20%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Gasoline Vapor Weight Fraction Calculations

	Benzene	Biphenyl	Cyclohexane	Ethylbenzene	Hexane (n)	Naphthalene	Phenol	Toluene	Ethylbenzene	Xylene (m)
January	0.2540%	0.0000%	0.0405%	0.0158%	0.2809%	0.0001%	0.00%	0.2743%	0.0016%	0.0609%
February	0.2726%	0.0000%	0.0433%	0.0178%	0.2975%	0.0001%	0.00%	0.3014%	0.0014%	0.0691%
March	0.3122%	0.0000%	0.0491%	0.0227%	0.3324%	0.0001%	0.00%	0.3618%	0.0011%	0.0881%
April	0.3649%	0.0000%	0.0568%	0.0299%	0.3774%	0.0002%	0.00%	0.4467%	0.0008%	0.1167%
May	0.4082%	0.0000%	0.0630%	0.0365%	0.4134%	0.0002%	0.00%	0.5204%	0.0006%	0.1430%
June	0.4453%	0.0000%	0.0683%	0.0427%	0.4437%	0.0003%	0.00%	0.5865%	0.0005%	0.1676%
July	0.4624%	0.0000%	0.0707%	0.0457%	0.4575%	0.0003%	0.00%	0.6179%	0.0005%	0.1797%
August	0.4531%	0.0000%	0.0694%	0.0440%	0.4500%	0.0003%	0.00%	0.6007%	0.0005%	0.1731%
September	0.4182%	0.0000%	0.0644%	0.0381%	0.4217%	0.0003%	0.00%	0.5381%	0.0006%	0.1495%
October	0.3684%	0.0000%	0.0573%	0.0304%	0.3804%	0.0002%	0.00%	0.4526%	0.0008%	0.1187%
November	0.3145%	0.0000%	0.0494%	0.0230%	0.3344%	0.0001%	0.00%	0.3653%	0.0011%	0.0893%
December	0.2707%	0.0000%	0.0430%	0.0176%	0.2959%	0.0001%	0.00%	0.2987%	0.0014%	0.0683%
Annual Average	**0.36%**	**0.00%**	**0.06%**	**0.03%**	**0.37%**	**0.00%**	**0.00%**	**0.45%**	**0.00%**	**0.12%**

Ethanol Vapor Weight Fraction Calculations (i.e. 10% gasoline speciation)

	Benzene	Biphenyl	Cyclohexane	Ethylbenzene	Hexane (n)	Naphthalene	Phenol	Toluene	Ethylbenzene	Xylene (m)
January	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
February	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
March	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
April	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
May	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
June	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
July	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
August	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
September	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
October	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
November	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
December	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Annual Average	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 5: Hazardous Air Pollutant Emissions

Permit ID	Facility ID	Product	Total Controlled Loss (lb VOC/yr)	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-dichloroethene	1,2-Dibromoethane (Ethylene dibromide); EDB	1,3-Butadiene	1,3-Dichloropropene	1,4-Dichlorobenzene (para-)	2-Methylnaphthalene	5-Methylchrysene	7,12-Dimethylbenz[a]anthracene	Acenaphthene	Acenaphthylene
				HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP
EQUI 6	Natural Gas Emergency Generator	Natural Gas	72.71	0.00	0.00	0.00E+00	0.00E+00	0.18	0.00E+00	-	-	-	-	-	-
EQUI 8	Loading Rack 1 - Gasoline	Gasoline	127,530.30	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 9	Tank 103	Ethanol	4,279.18	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 10	Tank 104	Ethanol	11,288.23	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 11	Tank 105	Ethanol	93.66	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 12	Tank 106	Gasoline	2,845.64	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 13	Tank 107	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 14	Tank 108	Gasoline	11,927.14	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 15	Tank 109	Gasoline	11,921.93	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 16	Tank 110	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 17	Tank 111	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 18	Tank 112	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 55	Reciprocating IC Engine	Diesel	64.13	0.00	0.00	0.00	0.00	25.17	0.00	-	-	-	-	-	-
FUGI 1	Valves, Flanges, Seals	Gasoline	1,287.72	-	-	-	-	-	-	-	-	-	-	-	-
FUGI 2	Tanker Purging	Gasoline	831.08	-	-	-	-	-	-	-	-	-	-	-	-
TREA 1	Flaring	Gasoline	11,507.98	-	-	-	-	-	-	2.37E-03	4.73E-05	3.55E-06	3.15E-05	3.55E-06	3.55E-06
TREA 2	Vapor Recovery System - Condensers, Hoods, & Other Enclosures	Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	DA Tank	Additive	0.03	-	-	-	-	-	-	-	-	-	-	-	-
IA	Diesel Tank	Diesel	0.03	-	-	-	-	-	-	-	-	-	-	-	-
IA	Fuel Oil Dispensing	Diesel	10.56	-	-	-	-	-	-	-	-	-	-	-	-
Totals (lb)			199,801.54	0.00	0.00	0.00	0.00	25.34	0.00	2.37E-03	4.73E-05	3.55E-06	3.15E-05	3.55E-06	3.55E-06
Totals (ton)			99.90	1.37E-08	1.37E-08	6.12E-09	1.15E-08	1.27E-02	1.23E-07	1.18E-06	2.37E-08	1.77E-09	1.58E-08	1.77E-09	1.77E-09

Notes:
(1) Calculated per API Manual of Petroleum Measurement Standards Chapter 19.4 - Recommended Practice for Speciation of Evaporative Losses, Second Edition, September 2005.
(2) This row only totals "HAPS" as defined by EPA (see those chemicals listed as "HAP" in row 7).

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 5: Hazardous Air Pollutant Emissions

Permit ID	Facility ID	Product	Total Controlled Loss (lb VOC/yr)	Acetaldehyde	Acrolein	Anthracene	Arsenic compounds	Benzo(a)anthracene	Benzo(ghi)perylene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo[a]pyrene	Benzene	Beryllium Compounds	Biphenyl	Cadmium compounds	Carbon tetrachloride
				HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP
EQUI 6	Natural Gas Emergency Generator	Natural Gas	72.71	3.45	0.42	-	-	-	-	-	-	-	4.19	-	-	-	0.00E+00
EQUI 8	Loading Rack 1 - Gasoline	Gasoline	127,530.30	-	-	-	-	-	-	-	-	-	461.72	-	5.26E-04	-	-
EQUI 9	Tank 103	Ethanol	4,279.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 10	Tank 104	Ethanol	11,288.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 11	Tank 105	Ethanol	93.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 12	Tank 106	Gasoline	2,845.64	-	-	-	-	-	-	-	-	-	14.08	-	0.02	-	-
EQUI 13	Tank 107	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	17.90	-	0.02	-	-
EQUI 14	Tank 108	Gasoline	11,927.14	-	-	-	-	-	-	-	-	-	17.90	-	0.02	-	-
EQUI 15	Tank 109	Gasoline	11,921.93	-	-	-	-	-	-	-	-	-	17.90	-	0.02	-	-
EQUI 16	Tank 110	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	17.90	-	0.02	-	-
EQUI 17	Tank 111	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	17.90	-	0.02	-	-
EQUI 18	Tank 112	Gasoline	4,035.31	-	-	-	-	-	-	-	-	-	17.90	-	0.02	-	-
EQUI 55	Reciprocating IC Engine	Diesel	64.13	105.90	99.83	-	-	-	-	-	-	-	59.97	-	-	-	0.00
FUGI 1	Valves, Flanges, Seals	Gasoline	1,287.72	-	-	-	-	-	-	-	-	-	4.66	-	0.00	-	-
FUGI 2	Tanker Purging	Gasoline	831.08	-	-	-	-	-	-	-	-	-	3.01	-	0.00	-	-
TREA 1	Flaring	Gasoline	11,507.98	-	-	4.73E-06	3.94E-04	3.55E-06	2.37E-06	3.55E-06	3.55E-06	2.37E-06	4.14E-03	2.37E-05	-	2.17E-03	-
TREA 2	Vapor Recovery System - Condensers, Hoods, & Other Enclosures	Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	DA Tank	Additive	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	Diesel Tank	Diesel	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	Fuel Oil Dispensing	Diesel	10.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals (lb)			199,801.54	109.35	100.24	4.73E-06	3.94E-04	3.55E-06	2.37E-06	3.55E-06	3.55E-06	2.37E-06	655.03	2.37E-05	0.11	2.17E-03	0.00
Totals (ton)			99.90	5.47E-02	5.01E-02	2.37E-09	1.97E-07	1.77E-09	1.18E-09	1.77E-09	1.77E-09	1.18E-09	3.28E-01	1.18E-08	5.75E-05	1.08E-06	1.68E-07

Notes:
(1) Calculated per API Manual of Petroleum Measurement Standards Chapter 19.4 - Recommended Practice for
(2) This row only totals "HAPS" as defined by EPA (see those chemicals listed as "HAP" in row 7).

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 5: Hazardous Air Pollutant Emissions

				HAP Emissions[1] (lb/yr)															
				Chlorobenzene (Monochlorobenzene)	Chloroform	Chromium compounds	Chrysene	Cobalt compounds	Cyclohexane	Dichloromethane (Methylene chloride)	Dibenz[a,h]anthracene	Ethylbenzene	Fluoranthene	Fluorene	Formaldehyde	Hexane (n)	Indeno(1,2,3-cd)pyrene	Manganese compounds
Permit ID	**Facility ID**	**Product**	**Total Controlled Loss (lb VOC/yr)**	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP
EQUI 6	Natural Gas Emergency Generator	Natural Gas	72.71	0.00E+00	0.00E+00	-	-	-	-	0.00	-	0.00	-	-	5.30	-	-	-
EQUI 8	Loading Rack 1 - Gasoline	Gasoline	127,530.30	-	-	-	-	-	71.76	-	-	38.71	-	-	-	476.68	-	-
EQUI 9	Tank 103	Ethanol	4,279.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 10	Tank 104	Ethanol	11,288.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 11	Tank 105	Ethanol	93.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 12	Tank 106	Gasoline	2,845.64	-	-	-	-	-	2.15	-	-	4.60	-	-	-	12.85	-	-
EQUI 13	Tank 107	Gasoline	4,035.31	-	-	-	-	-	2.75	-	-	3.83	-	-	-	17.21	-	-
EQUI 14	Tank 108	Gasoline	11,927.14	-	-	-	-	-	2.75	-	-	3.83	-	-	-	17.21	-	-
EQUI 15	Tank 109	Gasoline	11,921.93	-	-	-	-	-	2.75	-	-	3.83	-	-	-	17.21	-	-
EQUI 16	Tank 110	Gasoline	4,035.31	-	-	-	-	-	2.75	-	-	3.83	-	-	-	17.21	-	-
EQUI 17	Tank 111	Gasoline	4,035.31	-	-	-	-	-	2.75	-	-	3.83	-	-	-	17.21	-	-
EQUI 18	Tank 112	Gasoline	4,035.31	-	-	-	-	-	2.75	-	-	3.83	-	-	-	17.21	-	-
EQUI 55	Reciprocating IC Engine	Diesel	64.13	0.00	0.00	-	-	-	-	0.00	-	0.00	-	-	778.12	-	-	-
FUGI 1	Valves, Flanges, Seals	Gasoline	1,287.72	-	-	-	-	-	0.72	-	-	0.39	-	-	-	4.81	-	-
FUGI 2	Tanker Purging	Gasoline	831.08	-	-	-	-	-	0.47	-	-	0.25	-	-	-	3.11	-	-
TREA 1	Flaring	Gasoline	11,507.98	-	-	2.76E-03	3.55E-06	1.66E-04	-	-	2.37E-06	-	5.91E-06	5.52E-06	0.15	3.55	3.55E-06	7.49E-04
TREA 2	Vapor Recovery System - Condensers, Hoods, & Other Enclosures	Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	DA Tank	Additive	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	Diesel Tank	Diesel	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	Fuel Oil Dispensing	Diesel	10.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals (lb)			199,801.54	0.00	0.00	2.76E-03	3.55E-06	1.66E-04	91.62	0.00	2.37E-06	66.91	5.91E-06	5.52E-06	783.57	604.26	3.55E-06	7.49E-04
Totals (ton)			99.90	1.22E-07	1.30E-07	1.38E-06	1.77E-09	8.28E-08	4.58E-02	3.91E-07	1.18E-09	3.35E-02	2.96E-09	2.76E-09	3.92E-01	3.02E-01	1.77E-09	3.75E-07

Notes:
(1) Calculated per API Manual of Petroleum Measurement Standards Chapter 19.4 - Recommended Practice for
(2) This row only totals "HAPS" as defined by EPA (see those chemicals listed as "HAP" in row 7).

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 5: Hazardous Air Pollutant Emissions

Permit ID	Facility ID	Product	Total Controlled Loss (lb VOC/yr)	Mercury	Methanol	Naphthalene	Nickel compounds	Phenanthrene	Phenol	Polycyclic organic matter (POM)	Pyrene	Selenium compounds	Styrene	Toluene	Trimethyl benzene (1,2,4)	Vinyl Chloride (chloroethene)	Xylene (m)	Total HAPs[2]
				HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP
EQUI 6	Natural Gas Emergency Generator	Natural Gas	72.71	-	0.00	3.81E-01	-	-	-	-	-	-	0.00E+00	1.84	-	0.00E+00	1.28	17.04
EQUI 8	Loading Rack 1 - Gasoline	Gasoline	127,530.30	-	-	0.24	-	-	0.03	-	-	-	-	570.09	1.15	-	151.33	1,771.72
EQUI 9	Tank 103	Ethanol	4,279.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 10	Tank 104	Ethanol	11,288.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 11	Tank 105	Ethanol	93.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQUI 12	Tank 106	Gasoline	2,845.64	-	-	1.02	-	-	0.13	-	-	-	-	29.71	5.73	-	20.12	90.40
EQUI 13	Tank 107	Gasoline	4,035.31	-	-	0.69	-	-	0.09	-	-	-	-	30.66	3.84	-	16.40	93.37
EQUI 14	Tank 108	Gasoline	11,927.14	-	-	0.69	-	-	0.09	-	-	-	-	30.66	3.84	-	16.40	93.37
EQUI 15	Tank 109	Gasoline	11,921.93	-	-	0.69	-	-	0.09	-	-	-	-	30.66	3.84	-	16.40	93.37
EQUI 16	Tank 110	Gasoline	4,035.31	-	-	0.69	-	-	0.09	-	-	-	-	30.66	3.84	-	16.40	93.37
EQUI 17	Tank 111	Gasoline	4,035.31	-	-	0.69	-	-	0.09	-	-	-	-	30.66	3.84	-	16.40	93.37
EQUI 18	Tank 112	Gasoline	4,035.31	-	-	0.69	-	-	0.09	-	-	-	-	30.66	3.84	-	16.40	93.37
EQUI 55	Reciprocating IC Engine	Diesel	64.13	-	0.06	3.69	-	-	-	-	-	-	0.00	21.18	-	0.00	7.40	1101.31
FUGI 1	Valves, Flanges, Seals	Gasoline	1,287.72	-	-	2.39E-03	-	-	3.47E-04	-	-	-	-	5.76	0.01	-	1.53	17.89
FUGI 2	Tanker Purging	Gasoline	831.08	-	-	1.54E-03	-	-	2.24E-04	-	-	-	-	3.72	0.01	-	0.99	11.55
TREA 1	Flaring	Gasoline	11,507.98	5.12E-04	-	1.20E-03	4.14E-03	3.35E-05	-	1.38E-03	9.86E-06	4.73E-05	-	0.01	-	-	-	3.72
TREA 2	Vapor Recovery System - Condensers, Hoods, & Other Enclosures	Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA	DA Tank	Additive	0.03	-	-	0.04	-	-	-	-	-	-	-	-	-	-	0.04	0.09
IA	Diesel Tank	Diesel	0.03	-	-	0.14	-	-	-	-	-	-	-	-	-	-	-	0.14
IA	Fuel Oil Dispensing	Diesel	10.56	-	-	0.13	-	-	-	-	-	-	-	-	-	-	-	0.13
Totals (lb)			199,801.54	5.12E-04	0.06	9.75	4.14E-03	3.35E-05	0.67	1.38E-03	9.86E-06	4.73E-05	0.00	816.24	29.92	0.00	281.09	3574.19
Totals (ton)			99.90	2.56E-07	2.90E-05	4.88E-03	2.07E-06	1.68E-08	3.36E-04	6.88E-07	4.93E-09	2.37E-08	1.13E-07	4.08E-01	1.50E-02	6.81E-08	1.41E-01	1.79

Notes:
(1) Calculated per API Manual of Petroleum Measurement Standards Chapter 19.4 - Recommended Practice for
(2) This row only totals "HAPS" as defined by EPA (see those chemicals listed as "HAP" in row 7).

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 6: Flare (TREA 1)

The vapor combustion unit (Flare) is used as a backup control device to combust the vapor recovery system offgas from the loading rack. For purposes of calculating the worst-case combustion emissions, it is assumed that 100% of facility throughput is controlled by the Flare. VOC and HAP emissions are estimated using the control efficiency of the vapor combustion unit and are estimated separately. The total emissions from the vapor combustion unit include both the emissions from the gasoline vapors and the emissions from the pilot light.

Emissions from Gasoline Vapors

		Notes
Annual Loading Rack Throughput (Gasoline) Controlled by the VCU (gallons/yr):	525,000,000	see loading rack calculations
Conversion Factor (liters/gal):	3.785	
Annual VCU Throughput (liters/yr):	1,987,125,000	
Loading Rack Loss (lb/1000 gal):	7.92	**(1)**
Loading Rack Vapors (lbs/yr):	4,102,146	
Gasoline Heat Content (BTU/lb):	20,000	**(2)**
Total Vapor Heat Value (MMBTU/yr):	82,043	

Pollutant	Emission Factor (7) (mg/L)	Emission Factor (3,4,5) (lb/MMBTU)	Emission Factor (3,6) (µg/L)	Emissions (µg/yr)	Emissions (lb/yr)	Emissions (TPY)
SO2		0.0006			49.23	0.02
NOx	4			7,948,500,000,000	17,507.71	8.75
CO	10			19,871,250,000,000	43,769.27	21.88
PM			40	79,485,000,000	175.08	8.75E-02
PM-10			40	79,485,000,000	1.75E+02	8.75E-02
PM-2.5			40	79,485,000,000	175.08	8.75E-02
VOC		0.14			11,486.01	5.74E+00
CH4		0.0022			180.87	0.09
N2O		0.00022			18.09	0.01
CO2		147.44			12,096,818.44	6048.41

Notes:

1) The loading throughput displaces an equivalent amount of vapors in truck (i.e. 1 gallon of gasoline displaces 1 gallon of vapors in a truck).

2) Assumed to be worst case scenario (equivalent to natural gas).

3) Emission Factors from AP-42, Table 13.5-1, Industrial Flare Operations, September 1991.

4) The SO2 emission factors are based on natural gas combustion since there are no emission factors for SO2 in the Industrial Flare Section.

5) 40 CFR 98, Subpart C, Tables C-1 and C-2 values for natural gas.

6) Although the vapor combustion unit is considered to be smokeless, the PM emission factors are based on the soot concentration for a lightly smoking unit.

7) Emission factors are based on a manufacturer guarantee.

Emissions from Pilot Light - for Propane

Maximum Heat Input[(1)]:	0.230	MMBTU/hr (rating of pilot light burner)	
Natural Gas Heat Content:	91.5	MMBTU/1000 gal	AP-42 1.5.3.1

Pollutant	Emission Factor (2,3) (lb/1000 gal)	Emission Factor (1) (lb/MMscf)	Emission Factor (lb/MMBTU)	Emissions (4) (lb/yr)	Emissions (TPY)
SO2	0.02		0.0002	0.44	0.0002
NOx	13		0.1421	286	0.1428
CO	7.5		0.0820	164.79	0.0824
PM	0.7		0.0077	15.38	0.0077
PM-10	0.7		0.0077	15.38	0.0077
PM-2.5	0.7		0.0077	15.38	0.0077
VOC	1		0.0109	21.97	0.0110
CH4	0.2		0.0022	4.39	0.0022
N2O	0.9		0.0098	19.78	0.0099
CO2	12500		136.6120	274,657.35	137.3287

1,4-Dichlorobenzene (para-)		1.20E-03	1.18E-06	2.37E-03	1.18E-06
Arsenic compounds		2.00E-04	1.96E-07	3.94E-04	1.97E-07
Benzene		2.10E-03	2.06E-06	4.14E-03	2.07E-06
Beryllium Compounds		1.20E-05	1.18E-08	2.37E-05	1.18E-08
Cadmium compounds		1.10E-03	1.08E-06	2.17E-03	1.08E-06
Chromium compounds		1.40E-03	1.37E-06	2.76E-03	1.38E-06
Cobalt compounds		8.40E-05	8.24E-08	1.66E-04	8.28E-08
Formaldehyde		7.50E-02	7.35E-05	1.48E-01	7.39E-05
Hexane (n)		1.8	1.76E-03	3.55	1.77E-03
Manganese compounds		3.80E-04	3.73E-07	7.49E-04	3.75E-07
Mercury		2.60E-04	2.55E-07	5.12E-04	2.56E-07
Nickel compounds		2.10E-03	2.06E-06	4.14E-03	2.07E-06
Polycyclic organic matter (POM)		6.98E-04	6.85E-07	1.38E-03	6.88E-07
Selenium compounds		2.40E-05	2.35E-08	4.73E-05	2.37E-08
Toluene		3.40E-03	3.33E-06	6.70E-03	3.35E-06
2-Methylnaphthalene		2.40E-05	2.35E-08	4.73E-05	2.37E-08
5-Methylchrysene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
7,12-Dimethylbenz[a]anthracene		1.60E-05	1.57E-08	3.15E-05	1.58E-08
Acenaphthene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Acenaphthylene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Anthracene		2.40E-06	2.35E-09	4.73E-06	2.37E-09
Benzo(a)anthracene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Benzo(ghi)perylene		1.20E-06	1.18E-09	2.37E-06	1.18E-09
Benzo(b)fluoranthene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Benzo(k)fluoranthene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Benzo[a]pyrene		1.20E-06	1.18E-09	2.37E-06	1.18E-09
Chrysene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Dibenz[a,h]anthracene		1.20E-06	1.18E-09	2.37E-06	1.18E-09
Fluoranthene		3.00E-06	2.94E-09	5.91E-06	2.96E-09
Fluorene		2.80E-06	2.75E-09	5.52E-06	2.76E-09
Indeno(1,2,3-cd)pyrene		1.80E-06	1.76E-09	3.55E-06	1.77E-09
Naphthalene		6.10E-04	5.98E-07	1.20E-03	6.01E-07
Phenanthrene		1.70E-05	1.67E-08	3.35E-05	1.68E-08
Pyrene		5.00E-06	4.90E-09	9.86E-06	4.93E-09
Total POM		6.98E-04	6.85E-07	1.38E-03	6.88E-07
Total HAP		1.89	1.85E-03	3.72	1.86E-03

Notes:

1) Maximum heat input value from John Zink data.
2) AP-42, Liquefied Petroleum Gas Combustion, Tables 1.5-1; Commercial Boiler (between 0.3 and 10 MMBTU/hr) July 2008.
3) The SO2 factor assumes a sulfur content of 0.2 gr/100 cu.ft. of gas vapor.
4) The emissions are calculated assuming continuous operation, 8760 hr/yr.
5) HAP emission factors are from AP-42 Chapter 1.4. Gasoline was used a a surogate for propane. A value of 1020 BTU/scf was used to convert the emission factors to lb/MMBtu.

Example Calculations:
Emission Factor (lb/MMBTU) = Emission Factor (lb/1000 gal) ÷ Propane Heat Content (MMBTU/1000 gal)
Emissions (lb/yr) = Emission Factor (lb/MMBTU) x Maximum Heat Input (MMBTU/hr) x 8760 hr/yr

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 7: Tanker Purging (FUGI 2)

The tanker trailers will be purged of VOC before being brought into a building for maintenance.

VOC Loading Loss emission factor for gasoline. Based on AP 42 section 5.2.

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

where:

L_L = Loading Loss (lb/1000 gal)
S = Saturation factor (see Table 5.2-1)
P = True Vapor Pressure of Liquid Loaded (psia)
M = Molecular Weight of Vapors (lb/lb-mole)
T = Temperature of Bulk Liquid Loaded, deg. R (deg. F + 460)

S:	1.00	
P:	5.34	psia
M:	62	lb/lb-mol
Average T:	46.3	F
L_L:	8.1479	lb/1000 gal
Assume one 8500 gal tanker purged per month:	102000	gal/yr
Total Emissions:	831	lbs/yr
	0.42	**tons/yr**

Notes:
Gasoling loading factor is used for flare emissions calculation.

8500	gallons/trailer tank
1	trailers/month

Engines

EQUI ID	EQUI 6
Heat Input (MMBTU/hr)	0.51306
Unlimited Hours (hr/yr)	8760
Limited Hours (hr/yr)	500
Firing Type	Diesel

Pollutant	AP-42 Emission Factor (lb/MMBtu)	Other Emission Factor (lb/MMBtu)	Control Efficiency (%)	Unrestricted Emission Rate (lb/hr)	Controlled Emission Rate (lb/hr)	Unrestricted Emissions (tpy)	Limited Emissions (tpy)
Particulate Matter	3.10E-01			1.59E-01	1.59E-01	6.97E-01	3.98E-02
PM < 10 micron	3.10E-01			1.59E-01	1.59E-01	6.97E-01	3.98E-02
PM < 2.5 micron	3.10E-01			1.59E-01	1.59E-01	6.97E-01	3.98E-02
Nitrogen Oxides	4.41E+00	2.41E+00		1.24E+00	1.24E+00	5.42E+00	3.09E-01
Carbon Monoxide	9.50E-01	1.33E+01		6.81E+00	6.81E+00	2.98E+01	1.70E+00
Sulfur Dioxide	2.90E-01			1.49E-01	1.49E-01	6.52E-01	3.72E-02
Volatile Organic Compounds	3.60E-01	2.83E-01		1.45E-01	1.45E-01	6.37E-01	3.64E-02
HAPs - Total	3.87E-03			1.99E-03	1.99E-03	8.70E-03	4.97E-04
Carbon Dioxide	1.64E+02			8.41E+01	8.41E+01	3.69E+02	2.10E+01
Methane	6.61E-03			3.39E-03	3.39E-03	1.49E-02	8.48E-04
Nitrous Oxide	1.32E-03			6.79E-04	6.79E-04	2.97E-03	1.70E-04
Carbon Dioxide Equivalent	1.65E+02			8.44E+01	8.44E+01	3.70E+02	2.11E+01
1,1,2,2-Tetrachloroethane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloroethane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dibromoethane (Ethylene dibromide); EDB	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloropropane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	3.91E-05			2.01E-05	2.01E-05	8.79E-05	5.02E-06
1,3-Dichloropropene	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,2,4-trimethylpentane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	7.67E-04			3.94E-04	3.94E-04	1.72E-03	9.84E-05
Acrolein	9.25E-05			4.75E-05	4.75E-05	2.08E-04	1.19E-05
Benzene	9.33E-04			4.79E-04	4.79E-04	2.10E-03	1.20E-04
Benzo(e)pyrene	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biphenyl	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon tetrachloride	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chlorobenzene (Monochlorobenzene)	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroform	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichloromethane (Methylene chloride)	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	1.18E-03			6.05E-04	6.05E-04	2.65E-03	1.51E-04
Hexane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methanol	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	8.48E-05			4.35E-05	4.35E-05	1.91E-04	1.09E-05
Phenol	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Polycyclic organic matter	1.68E-04			8.62E-05	8.62E-05	3.78E-04	2.15E-05
Styrene	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	4.09E-04			2.10E-04	2.10E-04	9.19E-04	5.25E-05
Vinyl chloride (chloroethene)	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes, Total	2.85E-04			1.46E-04	1.46E-04	6.40E-04	3.66E-05

Other Emission Factor and/or Control Efficiency Factor Notes:

Engines

EQUI ID	EQUI 55
Heat Input (BTU/hr)	4.333
Unlimited Hours (hr/yr)	8760
Limited Hours (hr/yr)	500
Firing Type	4SRB 90-105% Load

Pollutant	Emission Factor (lb/MMSCF)	Other Emission Factor (lb/MMBtu)	Control Efficiency (%)	Unrestricted Emission Rate (lb/hr)	Controlled Emission Rate (lb/hr)	Unrestricted Emissions (tpy)	Limited Emissions (tpy)
Particulate Matter	1.94E-02	1.83E-01		7.91E-01	7.91E-01	3.47E+00	1.98E-01
PM < 10 micron	1.94E-02	1.83E-01		7.91E-01	7.91E-01	3.47E+00	1.98E-01
PM < 2.5 micron	1.94E-02	1.83E-01		7.91E-01	7.91E-01	3.47E+00	1.98E-01
Nitrogen Oxides	2.21E+00	1.11E+00		4.82E+00	4.82E+00	2.11E+01	1.20E+00
Carbon Monoxide	3.72E+00	1.10E-01		4.78E-01	4.78E-01	2.09E+00	1.19E-01
Sulfur Dioxide	5.88E-04			2.55E-03	2.55E-03	1.12E-02	6.37E-04
Volatile Organic Compounds	2.96E-02			1.28E-01	1.28E-01	5.62E-01	3.21E-02
HAPs - Total	3.25E-02			1.41E-01	1.41E-01	6.16E-01	3.52E-02
Carbon Dioxide	1.10E+02			4.77E+02	4.77E+02	2.09E+03	1.19E+02
Methane	2.20E-03			9.55E-03	9.55E-03	4.18E-02	2.39E-03
Nitrous Oxide	2.20E-04			9.55E-04	9.55E-04	4.18E-03	2.39E-04
Carbon Dioxide Equivalent	1.10E+02			4.77E+02	4.77E+02	2.09E+03	1.19E+02
1,1,2,2-Tetrachloroethane	2.53E-05			1.10E-04	1.10E-04	4.80E-04	2.74E-05
1,1,2-Trichloroethane	2.53E-05			1.10E-04	1.10E-04	4.80E-04	2.74E-05
1,1-Dichloroethane	1.13E-05			4.90E-05	4.90E-05	2.14E-04	1.22E-05
1,2-Dibromoethane (Ethylene dibromide); EDB	2.13E-05			9.23E-05	9.23E-05	4.04E-04	2.31E-05
1,2-Dichloropropane	1.30E-05			5.63E-05	5.63E-05	2.47E-04	1.41E-05
1,3-Butadiene	6.63E-04			2.87E-03	2.87E-03	1.26E-02	7.18E-04
1,3-Dichloropropene	1.30E-05			5.63E-05	5.63E-05	2.47E-04	1.41E-05
2,2,4-trimethylpentane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	2.79E-03			1.21E-02	1.21E-02	5.30E-02	3.02E-03
Acrolein	2.63E-03			1.14E-02	1.14E-02	4.99E-02	2.85E-03
Benzene	1.58E-03			6.85E-03	6.85E-03	3.00E-02	1.71E-03
Benzo(e)pyrene	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biphenyl	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon tetrachloride	1.77E-05			7.67E-05	7.67E-05	3.36E-04	1.92E-05
Chlorobenzene (Monochlorobenzene)	1.29E-05			5.59E-05	5.59E-05	2.45E-04	1.40E-05
Chloroform	1.37E-05			5.94E-05	5.94E-05	2.60E-04	1.48E-05
Dichloromethane (Methylene chloride)	4.12E-05			1.79E-04	1.79E-04	7.82E-04	4.46E-05
Ethylbenzene	2.48E-05			1.07E-04	1.07E-04	4.71E-04	2.69E-05
Formaldehyde	2.05E-02			8.88E-02	8.88E-02	3.89E-01	2.22E-02
Hexane	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methanol	3.06E-03			1.33E-02	1.33E-02	5.81E-02	3.31E-03
Naphthalene	9.71E-05			4.21E-04	4.21E-04	1.84E-03	1.05E-04
Phenol	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00
Polycyclic organic matter	2.38E-04			1.03E-03	1.03E-03	4.52E-03	2.58E-04
Styrene	1.19E-05			5.16E-05	5.16E-05	2.26E-04	1.29E-05
Toluene	5.58E-04			2.42E-03	2.42E-03	1.06E-02	6.04E-04
Vinyl chloride (chloroethene)	7.18E-06			3.11E-05	3.11E-05	1.36E-04	7.78E-06
Xylenes, Total	1.95E-04			8.45E-04	8.45E-04	3.70E-03	2.11E-04

Other Emission Factor and/or Control Efficiency Factor Notes:

NOx, CO, HC, and filterable PM emission factors are provided by the engine manufacturer, Caterpillar model C15 400 ekW at 60 Hz operation.

Emission Factors	2SLB 90-105% Load	2SLB <90% Load	4SLB 90-105% Load	4SLB <90% Load	4SRB 90-105% Load	4SRB <90% Load	Gasoline	Diesel
Particulate Matter	4.83E-02	4.83E-02	9.99E-03	9.99E-03	1.94E-02	1.94E-02	1.00E-01	3.10E-01
PM < 10 micron	4.83E-02	4.83E-02	9.99E-03	9.99E-03	1.94E-02	1.94E-02	1.00E-01	3.10E-01
PM < 2.5 micron	4.83E-02	4.83E-02	9.99E-03	9.99E-03	1.94E-02	1.94E-02	1.00E-01	3.10E-01
Nitrogen Oxides	3.17E+00	1.94E+00	4.08E+00	8.47E-01	2.21E+00	2.27E+00	1.63E+00	4.41E+00
Carbon Monoxide	3.86E-01	3.53E-01	3.17E-01	5.57E-01	3.72E+00	3.51E+00	9.90E-01	9.50E-01
Sulfur Dioxide	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04	8.40E-02	2.90E-01
Volatile Organic Compounds	1.20E-01	1.20E-01	1.18E-01	1.18E-01	2.96E-02	2.96E-02	3.03E+00	3.60E-01
Carbon Dioxide	1.10E+02	1.10E+02	1.10E+02	1.10E+02	1.10E+02	1.10E+02	1.54E+02	1.64E+02
Methane	2.20E-03	2.20E-03	2.20E-03	2.20E-03	2.20E-03	2.20E-03	6.61E-03	6.61E-03
Nitrous Oxide	2.20E-04	2.20E-04	2.20E-04	2.20E-04	2.20E-04	2.20E-04	1.32E-03	1.32E-03
1,1,2,2-Tetrachloroethane	6.63E-05	6.63E-05	4.00E-05	4.00E-05	2.53E-05	2.53E-05		
1,1,2-Trichloroethane	5.27E-05	5.27E-05	3.18E-05	3.18E-05	2.53E-05	2.53E-05		
1,1-Dichloroethane	3.91E-05	3.91E-05			1.13E-05	1.13E-05		
1,2-Dibromoethane (Ethylene dibromide); EDB	7.34E-05	7.34E-05	4.43E-05	4.43E-05	2.13E-05	2.13E-05		
1,2-Dichloropropane	4.46E-05	4.46E-05			1.30E-05	1.30E-05		
1,3-Butadiene	8.20E-04	8.20E-04	2.67E-04	2.67E-04	6.63E-04	6.63E-04		3.91E-05
1,3-Dichloropropene	4.38E-05	4.38E-05	2.64E-05	2.64E-05	1.30E-05	1.30E-05		
2,2,4-trimethylpentane	8.46E-04	8.46E-04	2.50E-04	2.50E-04				
Acetaldehyde	7.76E-03	7.76E-03	8.36E-03	8.36E-03	2.79E-03	2.79E-03		7.67E-04
Acrolein	7.78E-03	7.78E-03	5.14E-03	5.14E-03	2.63E-03	2.63E-03		9.25E-05
Benzene	1.94E-03	1.94E-03	4.40E-04	4.40E-04	1.58E-03	1.58E-03		9.33E-04
Benzo(e)pyrene	2.34E-08	2.34E-08						
Biphenyl	3.95E-06	3.95E-06	2.12E-04	3.91E-05				
Carbon tetrachloride	6.07E-05	6.07E-05	3.67E-05	3.67E-05	1.77E-05	1.77E-05		
Chlorobenzene (Monochlorobenzene)	4.44E-05	4.44E-05	3.04E-05	3.04E-05	1.29E-05	1.29E-05		
Chloroform	4.71E-05	4.71E-05	2.85E-05	2.85E-05	1.37E-05	1.37E-05		
Dichloromethane (Methylene chloride)	1.47E-04	1.47E-04	2.00E-05	2.00E-05	4.12E-05	4.12E-05		
Ethylbenzene	1.08E-04	1.08E-04	3.97E-05	3.97E-05	2.48E-05	2.48E-05		
Formaldehyde	5.52E-02	5.52E-02	5.28E-02	5.28E-02	2.05E-02	2.05E-02		1.18E-03
Hexane	4.45E-04	4.45E-04	1.11E-03	1.11E-03				
Methanol	2.48E-03	2.48E-03	2.50E-03	2.50E-03	3.06E-03	3.06E-03		
Naphthalene	9.63E-05	9.63E-05	7.44E-05	7.44E-05	9.71E-05	9.71E-05		8.48E-05
Phenol	4.21E-05	4.21E-05	2.40E-05	2.40E-05				
Polycyclic organic matter	2.64E-04	2.64E-04	1.62E-04	1.62E-04	2.38E-04	2.38E-04		1.68E-04
Styrene	5.48E-05	5.48E-05	2.36E-05	2.36E-05	1.19E-05	1.19E-05		
Toluene	9.63E-04	9.63E-04	4.08E-04	4.08E-04	5.58E-04	5.58E-04		4.09E-04
Vinyl chloride (chloroethene)	2.47E-05	2.47E-05	1.49E-05	1.49E-05	7.18E-06	7.18E-06		
Xylenes, Total	2.68E-04	2.68E-04	1.84E-04	1.84E-04	1.95E-04	1.95E-04		2.85E-04

Notes:

Diesel and Gasoline VOC emission factors (AP-42 Chapter 3.3) include all of the components of TOC (Table 3.3-1)

HAP emission factors include PAH as part of POM. Pollutants included in POM are not included separately.

Where AP-42 emission factors are "< X", X is used as the emission factor.

POM emission factors include naphthalene.However, since naphthalene is a HAP, it is also listed separately. Total HAPS subtracts the separate naphthalene factor so it is not counted twice in the total.

From Table 3.2-1, 3.2-2, and 3.2-3, the VOC emission factor was used instead of the TOC emission factor

Methane and Nitrous Oxides are from CFR 98, subp. C, Table C-2, converted from kg/MMBtu to lb/MMBtu.

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Loading Rack Throughputs

		Gal/Month												Gal/Year	
Days Per Month		31	28	31	30	31	30	31	31	30	31	30	31	365	
Rack ID	Data	January	February	March	April	May	June	July	August	September	October	November	December	Total	Source of Data
Gasoline	Throughput (Gal/Month)	44,589,041	40,273,973	44,589,041	43,150,685	44,589,041	43,150,685	44,589,041	44,589,041	43,150,685	44,589,041	43,150,685	44,589,041	525,000,000	Maintain 95 tpy VOC limit

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 9				
Location:	Circle K Terminal Newport				
Type of Tank:	Internal Floating Roof Tank				

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	48.00	Tank Volume (bbl):	11,905.00		
Net Throughput (bbl/yr):	416,667	Turnovers Per Year:	35.00		
Maximum Pumping Rate (bbl/hr):	11,905				
Shell Height (ft):	37				
Tank Temperature Profile:	Ambient				

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (α_S):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pan		

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Mechanical Shoe	Secondary Rim Seal:	Rim-mounted	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{vi}	x_i	y_i	Z_{yi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Ethyl Alcohol**	**January**	**16.27**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.1212**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**February**	**22.16**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.1551**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**March**	**34.24**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.2519**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**April**	**49.47**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.4465**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**May**	**61.47**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.6821**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**June**	**71.48**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.9551**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**July**	**76.04**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**1.1079**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**August**	**73.58**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**1.0232**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**September**	**64.26**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.7504**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**October**	**50.55**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.4643**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**November**	**34.99**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.2593**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**December**	**21.62**	--	--	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.1517**	--	--	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**0.24**	**0.28**	**0.50**	**0.87**	**1.38**	**1.89**	**2.28**	**2.10**	**1.47**	**0.93**	**0.50**	**0.30**	**12.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EPRT, see 'Meteorological Data', otherwise zero.
P^*	Value of Vapor Pressure Function	0.0021	0.0027	0.0045	0.0080	0.0123	0.0173	0.0202	0.0186	0.0135	0.0083	0.0046	0.0027		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.94	481.83	493.91	509.14	521.14	531.15	535.71	533.25	523.93	510.22	494.66	481.29		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	0.1212	0.1551	0.2519	0.4465	0.6821	0.9551	1.1079	1.0232	0.7504	0.4643	0.2593	0.1517		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_D	**Deck Fitting Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	Calculated Using Equation 2-13
P^*	Value of Vapor Pressure Function	0.0021	0.0027	0.0045	0.0080	0.0123	0.0173	0.0202	0.0186	0.0135	0.0083	0.0046	0.0027		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_S	Total Deck Fitting Loss Factor (lbmol/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EPRT, see 'Meteorological Data', otherwise zero.
L_W	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**6.87**	**6.21**	**6.87**	**6.65**	**6.87**	**6.65**	**6.87**	**6.87**	**6.65**	**6.87**	**6.65**	**6.87**	**80.92**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	35,388	31,963	35,388	34,247	35,388	34,247	35,388	35,388	34,247	35,388	34,247	35,388		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59		Density of gasoline
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**7.11**	**6.49**	**7.37**	**7.52**	**8.25**	**8.54**	**9.15**	**8.97**	**8.12**	**7.80**	**7.15**	**7.17**	**93.66**	**Calculated Using Equation 1-1 or 2-1**

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr)	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59		Density of gasoline
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	Monthly rim seal loss calculated above divided by hours per month, per TCEQ APDG 6416
L_D	**Deck Fitting Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Fitting Loss Calculated above divided by hours per month, per TCEQ APDG 6416
L_W	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly deck seam loss calculated above divided by hours per month, per TCEQ APDG 6416
L_T	**Total Losses (lb/hr)**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.32**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.32**	**Calculated Using Equation 2-1**

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 9
Location:	Circle K Terminal Newport
Type of Tank:	Internal Floating Roof Tank

Roof Fitting/Status	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Unga	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gask	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Sock	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 10
Location:	Circle K Terminal Group Newport
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	48.00	Tank Volume (bbl):	11,905		
Net Throughput (bbl/yr):	416,667	Turnovers Per Year:	39.17		
Maximum Pumping Rate (bbl/hr):	11,905				
Shell Height (ft):	37	Maximum Liquid Height (ft):	34	Average Liquid Height (ft): 17.0	Minimum Liquid Height (ft): 1.0
Is Tank Underground (y / n)	No				
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (α_S): 0.25

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.50	
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R): 0.25

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03	Tank Operating Pressure (psig, zero means ambient): 0.00

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (˚F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (˚F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (˚F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_i	x_i	y_i	$Z_{i,i}$	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at TLA (psia)	True vapor pressure at TLN (psia)	True vapor pressure at TLX (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Ethyl Alcohol**	**January**	**16.27**	**12.96**	**19.65**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.1212**	**0.1052**	**0.1398**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**February**	**22.16**	**18.50**	**25.91**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.1551**	**0.1332**	**0.1809**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**March**	**34.32**	**30.00**	**38.63**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.2526**	**0.2132**	**0.2983**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**April**	**49.47**	**44.32**	**54.81**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.4465**	**0.3696**	**0.5408**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**May**	**61.47**	**56.10**	**67.06**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.6821**	**0.5659**	**0.8248**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**June**	**71.48**	**66.08**	**77.12**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.9551**	**0.7981**	**1.1473**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**July**	**76.04**	**70.70**	**81.63**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**1.1079**	**0.9310**	**1.3240**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**August**	**73.58**	**68.55**	**78.84**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**1.0232**	**0.8667**	**1.2121**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**September**	**64.26**	**59.44**	**69.25**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.7504**	**0.6360**	**0.8871**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**October**	**50.55**	**46.44**	**54.76**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.4643**	**0.3997**	**0.5398**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**November**	**34.99**	**31.86**	**38.18**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.2593**	**0.2294**	**0.2933**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
Mixture/Product	**Ethyl Alcohol**	**December**	**21.62**	**18.64**	**24.65**	**1-27**	**8.2470**	**1,670.4**	**232.96**	**0.1517**	**0.1340**	**0.1719**	**46.07**	**46.07**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_S	**Standing Losses (lb)**	**29.23**	**36.69**	**72.62**	**138.63**	**209.87**	**266.06**	**305.34**	**269.17**	**193.97**	**114.63**	**50.49**	**31.25**	**1,717.95**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft3)	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft3)	0.0011	0.0014	0.0022	0.0038	0.0056	0.0077	0.0089	0.0082	0.0061	0.0039	0.0022	0.0014		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0263	0.0299	0.0367	0.0493	0.0567	0.0633	0.0661	0.0602	0.0516	0.0384	0.0259	0.0234		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8836	0.8558	0.7846	0.6733	0.5744	0.4908	0.4538	0.4736	0.5509	0.6647	0.7802	0.8585		Calculated Using Equation 1-21
V_V	**Tank Vapor Space Volume (ft3)**	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93	37,095.93		Calculated Using Equation 1-3
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	20.500	20.500	20.500	20.500	20.500	20.500	20.500	20.500	20.500	20.500	20.500	20.500		Calculated Using Equation 1-16
H_L	Tank Shell Height (ft)	37.000	37.000	37.000	37.000	37.000	37.000	37.000	37.000	37.000	37.000	37.000	37.000		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500		Calculated Using 1-17
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft3)**	**0.0011**	**0.0014**	**0.0022**	**0.0038**	**0.0056**	**0.0077**	**0.0089**	**0.0082**	**0.0061**	**0.0039**	**0.0022**	**0.0014**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1212	0.1551	0.2526	0.4465	0.6821	0.9551	1.1079	1.0232	0.7504	0.4643	0.2593	0.1517		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.97	481.88	493.99	509.24	521.25	531.27	535.84	533.36	524.01	510.27	494.69	481.32		Calculated Using Equation 1-27
H_V/D	Shell Heigh to Diameter Ratio (ft/ft)	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77		Shell Height Divided by Diameter
ΔT_A	Daily Average Ambient Temperature Range (°R)	14.50	14.90	16.00	18.80	18.70	18.10	17.40	17.30	18.20	16.90	13.50	13.30		Calculated Using Equation 1-11
R	Ideal Gas Constant R (psia-ft3)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	476.36	482.47	494.86	510.40	522.60	532.73	537.35	534.67	525.01	510.91	495.08	481.62		Calculated Using Equation 1-32
K_E	**Vapor Space Expansion Factor**	**0.0263**	**0.0299**	**0.0367**	**0.0493**	**0.0567**	**0.0633**	**0.0661**	**0.0602**	**0.0516**	**0.0384**	**0.0259**	**0.0234**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.39	14.83	17.25	20.98	21.92	22.08	21.85	20.59	19.61	16.65	12.66	12.02		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.03	0.05	0.09	0.17	0.26	0.35	0.39	0.35	0.25	0.14	0.06	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.12	0.16	0.25	0.45	0.68	0.96	1.11	1.02	0.75	0.46	0.26	0.15		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.11	0.13	0.21	0.37	0.57	0.80	0.93	0.87	0.64	0.40	0.23	0.13		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.14	0.18	0.30	0.54	0.82	1.15	1.32	1.21	0.89	0.54	0.29	0.17		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.97	481.88	493.99	509.24	521.25	531.27	535.84	533.36	524.01	510.27	494.69	481.32		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	472.63	478.17	489.67	503.99	515.77	525.75	530.37	528.22	519.11	506.11	491.53	478.31		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	479.32	485.58	498.30	514.48	526.73	536.79	541.30	538.51	528.92	514.43	497.85	484.32		Calculated Using Figure 7-1.17
K_S	**Vented Vapor Saturation Factor**	**0.8836**	**0.8558**	**0.7846**	**0.6733**	**0.5744**	**0.4908**	**0.4538**	**0.4736**	**0.5509**	**0.6647**	**0.7802**	**0.8585**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1212	0.1551	0.2526	0.4465	0.6821	0.9551	1.1079	1.0232	0.7504	0.4643	0.2593	0.1517		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000	20.5000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**202.43**	**231.00**	**406.10**	**673.43**	**1,038.21**	**1,380.05**	**1,640.05**	**1,522.24**	**1,100.22**	**722.81**	**403.14**	**250.61**	**9,570.28**	**Calculated Using Equation 1-35**
Q_i	Throughput (gal/month)	1,486,301	1,342,466	1,486,301	1,438,356	1,486,301	1,438,356	1,486,301	1,486,301	1,438,356	1,486,301	1,438,356	1,486,301		User-specified monthly throughput
K_N	Turnover Factor	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325	0.9325		Per notes to Equation 1-35
N	Monthly Turnovers	3.33	3.00	3.33	3.22	3.33	3.22	3.33	3.33	3.22	3.33	3.22	3.33		Calculated Using Equation 1-36
ΣH_{Qi}	Monthly Sum of Increases in Liquid Level (ft/month)	109.79	99.16	109.79	106.25	109.79	106.25	109.79	109.79	106.25	109.79	106.25	109.79		Calculated Using Equation 1-37
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
-	Condition for KB High Breather Vent Settings	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		Calculated using equation 1-40
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equation 1-41
L_T	**Total Losses (lb/month)**	**231.66**	**267.69**	**478.72**	**812.06**	**1,248.08**	**1,646.10**	**1,945.39**	**1,791.42**	**1,294.18**	**837.45**	**453.63**	**281.85**	**11,288.23**	**Calculated Using Equation 1-1 or 2-1**

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WMAX}	**Maximum Hourly Emissions (lb/hr)**	**73.09**	**92.38**	**146.76**	**251.62**	**375.51**	**515.87**	**593.34**	**550.50**	**410.92**	**261.09**	**150.40**	**90.47**	**593.34**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.12	0.16	0.25	0.45	0.68	0.96	1.11	1.02	0.75	0.46	0.26	0.15		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-gal/lbmol-°R)	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.97	481.88	493.99	509.24	521.25	531.27	535.84	533.36	524.01	510.27	494.69	481.32		See "Monthly Total Emissions Report" above
F_{MAX}	Maximum Filling Rate for Tank (gal/hr)	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00	500,010.00		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**73.09**	**92.38**	**146.76**	**251.62**	**375.51**	**515.87**	**593.34**	**550.50**	**410.92**	**261.09**	**150.40**	**90.47**	**593.34**	Calculated Using Equation 2-1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Default properties for No. 2 Fuel Oil from AP-42 Chapter 7.1.
(4) Default properties for Naphthalene from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 11
Location:	Circle K Terminal Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	48.00	Tank Volume (bbl):	11,905.00
Net Throughput (bbl/yr):	416,667	Turnovers Per Year:	35.00
Maximum Pumping Rate (bbl/hr):	11,905		
Shell Height (ft):	37		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (α_S):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pan

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Mechanical Shoe	Secondary Rim Seal:	Rim-mounted	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	Values for Minneapolis-St. Paul, MN.
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VX}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	x_i	y_i	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	Ethyl Alcohol	January	16.27	--	--	1-27	8.2470	1,670.4	232.96	0.1212	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	February	22.16	--	--	1-27	8.2470	1,670.4	232.96	0.1551	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	March	34.24	--	--	1-27	8.2470	1,670.4	232.96	0.2519	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	April	49.47	--	--	1-27	8.2470	1,670.4	232.96	0.4465	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	May	61.47	--	--	1-27	8.2470	1,670.4	232.96	0.6821	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	June	71.48	--	--	1-27	8.2470	1,670.4	232.96	0.9551	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	July	76.04	--	--	1-27	8.2470	1,670.4	232.96	1.1079	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	August	73.58	--	--	1-27	8.2470	1,670.4	232.96	1.0232	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	September	64.26	--	--	1-27	8.2470	1,670.4	232.96	0.7504	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	October	50.55	--	--	1-27	8.2470	1,670.4	232.96	0.4643	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	November	34.99	--	--	1-27	8.2470	1,670.4	232.96	0.2593	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)
Mixture/Product	Ethyl Alcohol	December	21.62	--	--	1-27	8.2470	1,670.4	232.96	0.1517	--	--	46.07	46.07	100.00%	100.00%	100.00%	100.00%	(3)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**0.24**	**0.28**	**0.50**	**0.87**	**1.38**	**1.89**	**2.28**	**2.10**	**1.47**	**0.93**	**0.50**	**0.30**	**12.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P^*	Value of Vapor Pressure Function	0.0021	0.0027	0.0045	0.0080	0.0123	0.0173	0.0202	0.0186	0.0135	0.0083	0.0046	0.0027		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.94	481.83	493.91	509.14	521.14	531.15	535.71	533.25	523.93	510.22	494.66	481.29		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	0.1212	0.1551	0.2519	0.4465	0.6821	0.9551	1.1079	1.0232	0.7504	0.4643	0.2593	0.1517		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_D	**Deck Fitting Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	Calculated Using Equation 2-13
P^*	Value of Vapor Pressure Function	0.0021	0.0027	0.0045	0.0080	0.0123	0.0173	0.0202	0.0186	0.0135	0.0083	0.0046	0.0027		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07	46.07		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_W	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**6.87**	**6.21**	**6.87**	**6.65**	**6.87**	**6.65**	**6.87**	**6.87**	**6.65**	**6.87**	**6.65**	**6.87**	**80.92**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	35,388	31,963	35,388	34,247	35,388	34,247	35,388	35,388	34,247	35,388	34,247	35,388		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59		Density of gasoline
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**7.11**	**6.49**	**7.37**	**7.52**	**8.25**	**8.54**	**9.15**	**8.97**	**8.12**	**7.80**	**7.15**	**7.17**	**93.66**	**Calculated Using Equation 1-1 or 2-1**

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{Max}	Maximum Throughput (bbl/hr)	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905	11,905		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59	6.59		Density of gasoline
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_F	**Deck Fitting Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.32**	**2.31**	**2.31**	**2.31**	**2.31**	**2.31**	**2.32**	**Calculated Using Equation 2-1**

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 11
Location:	Circle K Terminal Newport
Type of Tank:	Internal Floating Roof Tank

	Deck Fitting Loss Factors Per Table 7.1-12 (1)			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Ungas	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gaske	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Sock	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 12
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	67.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	41		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}													
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	P_{LN}: True vapor pressure at T_{LN} (psia)	P_{VN}: True vapor pressure at T_{LN} (psia)	P_{LX}: True vapor pressure at T_{LX} (psia)	M_L: Liquid Molecular Weight (lb/lbmol)	M_V: Vapor Molecular Weight (lb/lbmol)	Z_L: Liquid Wt. Percent of Components Within Liquid	x_i: Liquid Mole % of Components (40-4)	y_i: Vapor Mole % of Components (40-5)	Z_{vi}: Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.29**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**2.8500**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0057	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.19**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2446**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0069	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.29**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.1930**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.53**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.6922**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0154	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.54**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.1512**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0231	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0250	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.56**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.5828**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0303	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.44%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0274	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0338	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.12**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**9.3055**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0341	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0048	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0306	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0386	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0097	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.65**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.9091**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0320	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0288	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0360	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.31**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.5270**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0228	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0272	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.58**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.8092**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.01**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2557**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.64**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2061**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 12
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_{Di}	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**11.79**	**12.32**	**18.38**	**25.95**	**36.47**	**46.35**	**54.68**	**50.86**	**37.99**	**27.53**	**18.11**	**13.46**	**353.89**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0868	0.1267	0.1723	0.2263	0.2583	0.2403	0.1854	0.1301	0.0884	0.0636		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.96	481.86	493.96	509.20	521.21	531.23	535.79	533.32	523.98	510.25	494.68	481.31		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8500	3.2446	4.1930	5.6922	7.1512	8.5828	9.3055	8.9091	7.5270	5.8092	4.2557	3.2061		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**75.39**	**78.81**	**117.55**	**165.97**	**233.26**	**296.45**	**349.70**	**325.27**	**242.96**	**176.08**	**115.79**	**86.08**	**2,263.30**	Calculated Using Equation 2-13
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0868	0.1267	0.1723	0.2263	0.2583	0.2403	0.1854	0.1301	0.0884	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	257.10	257.10	257.10	257.10	257.10	257.10	257.10	257.10	257.10	257.10	257.10	257.10		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_D	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**19.40**	**17.52**	**19.40**	**18.78**	**19.40**	**18.78**	**19.40**	**19.40**	**18.78**	**19.40**	**18.78**	**19.40**	**228.45**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_t	Throughput (bbl/month)	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_s	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**106.58**	**108.66**	**155.34**	**210.70**	**289.13**	**361.57**	**423.78**	**395.53**	**299.72**	**223.01**	**152.67**	**118.94**	**2,845.64**	**Calculated Using Equation 1-1 or 2-1**
L_{TA}	Benzene Losses (lb/month)	0.53	0.53	0.74	1.00	1.41	1.83	2.18	2.01	1.48	1.06	0.72	0.58	14.08	Calculated using Equations 40-1 through 40-9
L_{TB}	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{TC}	Cyclohexane Losses (lb/month)	0.08	0.08	0.11	0.15	0.22	0.28	0.33	0.31	0.23	0.16	0.11	0.09	2.15	Calculated using Equations 40-1 through 40-9
L_{TE}	Ethylbenzene Losses (lb/month)	0.33	0.30	0.34	0.36	0.41	0.45	0.50	0.48	0.41	0.37	0.33	0.33	4.60	Calculated using Equations 40-1 through 40-9
L_{TH}	Hexane (n) Losses (lb/month)	0.44	0.45	0.65	0.91	1.31	1.71	2.04	1.89	1.37	0.97	0.64	0.49	12.85	Calculated using Equations 40-1 through 40-9
L_{TN}	Naphthalene Losses (lb/month)	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02	Calculated using Equations 40-1 through 40-9
L_{TP}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13	Calculated using Equations 40-1 through 40-9
L_{TT}	Toluene Losses (lb/month)	1.64	1.54	1.89	2.21	2.80	3.36	3.89	3.66	2.86	2.32	1.84	1.70	29.71	Calculated using Equations 40-1 through 40-9
L_{TX}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.49	0.44	0.49	0.47	0.49	0.47	0.49	0.49	0.47	0.49	0.47	0.49	5.73	Calculated using Equations 40-1 through 40-9
L_{TX}	Xylene (m) Losses (lb/month)	1.45	1.33	1.52	1.58	1.78	1.93	2.12	2.05	1.77	1.64	1.47	1.47	20.12	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr)	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See 'Tank Identification and Physical Characteristics' table above
C_s	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00	67.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.02**	**0.02**	**0.04**	**0.05**	**0.06**	**0.07**	**0.07**	**0.07**	**0.05**	**0.04**	**0.03**	**0.02**	**0.07**	Monthly Rim Seal Loss calculated above divided by hours per month, see TCEQ Air Permit Reviewer Guide (APDG) 6419
L_F	**Deck Fitting Loss (lb/hr)**	**0.10**	**0.12**	**0.16**	**0.23**	**0.31**	**0.41**	**0.47**	**0.44**	**0.34**	**0.24**	**0.16**	**0.12**	**0.47**	Monthly Deck Fitting Loss calculated above divided by hours per month, see TCEQ APDG 6419
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, see TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**1.62**	**1.64**	**1.68**	**1.77**	**1.86**	**1.98**	**2.05**	**2.01**	**1.89**	**1.78**	**1.69**	**1.64**	**2.05**	**Calculated Using Equation 2-1**
L_{TA}	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.03	Calculated using Equations 40-1 through 40-9
L_{TB}	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{TC}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{TE}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{TH}	Hexane (n) Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{TN}	Naphthalene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TP}	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{TT}	Toluene Losses (lb/hr)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	Calculated using Equations 40-1 through 40-9
L_{TX}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	Calculated using Equations 40-1 through 40-9
L_{TX}	Xylene (m) Losses (lb/hr)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[3]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	5
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Deck lag, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	19

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 13
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	40		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS): 0.25
Internal Shell Condition:	Light Rust			

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R): 0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	x_i	y_i	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.33**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**2.8524**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0058	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.24**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**3.2486**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0070	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.37**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**4.2003**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.65**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**5.7046**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0155	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.67**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**7.1684**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0232	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0251	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number: EQUI 13
Location: Circle K Terminal Group Newport
Type of Tank: Internal Floating Roof Tank

Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.70**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.6043**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0304	--	--	78.11	78.11	1.61%	1.89%	0.35%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0275	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0340	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.27**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**9.3293**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0342	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0049	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0307	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0388	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0098	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.78**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.9289**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0321	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0289	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0361	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.41**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.5402**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0229	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0273	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.64**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.8162**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0025	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.05**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2590**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0016	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2081**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**17.61**	**18.42**	**27.49**	**38.84**	**54.62**	**69.46**	**81.96**	**76.18**	**56.84**	**41.16**	**27.05**	**20.10**	**529.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.00	481.91	494.04	509.32	521.34	531.37	535.94	533.45	524.08	510.31	494.72	481.34		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8524	3.2486	4.2003	5.7046	7.1684	8.6043	9.3293	8.9289	7.5402	5.8162	4.2590	3.2081		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**111.47**	**116.59**	**174.01**	**245.86**	**345.75**	**439.66**	**518.84**	**482.24**	**359.82**	**260.51**	**171.21**	**127.25**	**3,353.23**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_D	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**12.94**	**11.69**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**152.34**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**142.02**	**146.69**	**214.44**	**297.22**	**413.31**	**521.64**	**613.74**	**571.36**	**429.19**	**314.61**	**210.78**	**160.30**	**4,035.31**	**Calculated Using Equation 1-1 or 2-1**
L_{Ti}	Benzene Losses (lb/month)	0.54	0.56	0.84	1.24	1.84	2.47	2.99	2.74	1.94	1.32	0.82	0.61	17.90	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.08	0.09	0.13	0.19	0.28	0.38	0.46	0.42	0.30	0.20	0.13	0.09	2.75	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.23	0.21	0.25	0.29	0.35	0.42	0.48	0.45	0.36	0.30	0.25	0.23	3.83	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	0.49	0.52	0.80	1.20	1.78	2.38	2.88	2.64	1.88	1.28	0.79	0.57	17.21	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.69	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	1.29	1.25	1.66	2.17	3.02	3.89	4.65	4.29	3.15	2.30	1.63	1.37	30.66	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.33	0.29	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.84	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.01	0.94	1.11	1.24	1.51	1.76	2.01	1.90	1.53	1.29	1.08	1.03	16.40	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.03**	**0.04**	**0.05**	**0.07**	**0.10**	**0.11**	**0.10**	**0.08**	**0.06**	**0.04**	**0.03**	**0.11**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419
L_F	**Deck Fitting Loss (lb/hr)**	**0.15**	**0.17**	**0.23**	**0.34**	**0.46**	**0.61**	**0.70**	**0.65**	**0.50**	**0.35**	**0.24**	**0.17**	**0.70**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**1.18**	**1.20**	**1.27**	**1.40**	**1.54**	**1.71**	**1.81**	**1.75**	**1.58**	**1.41**	**1.28**	**1.20**	**1.81**	**Calculated Using Equation 2-1**
L_{Ti}	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/hr)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	Calculated using Equations 40-1 through 40-9

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 13
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

	Deck Fitting Loss Factors Per Table 7.1-12 [(1)]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	7
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	32
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Unga	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gask	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Sock	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 14
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	40		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

I			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_i	x_i	y_i	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.33**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**2.8524**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0058	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.24**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.3486**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0070	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.37**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2003**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.65**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.7046**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0155	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.1684**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0232	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0251	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.70**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.6043**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0304	--	--	78.11	78.11	1.61%	1.89%	0.35%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0275	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0340	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.27**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**9.3293**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0342	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0049	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0307	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0388	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0098	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.78**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.9289**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0321	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0289	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0361	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 14
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.41**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.5402**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0229	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0273	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000	--	--	120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.64**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.8162**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0025	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000	--	--	120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.05**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2590**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0016	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000	--	--	120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2081**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000	--	--	120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**17.61**	**18.42**	**27.49**	**38.84**	**54.62**	**69.46**	**81.96**	**76.18**	**56.84**	**41.16**	**27.05**	**20.10**	**529.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.00	481.91	494.04	509.32	521.34	531.37	535.94	533.45	524.08	510.31	494.72	481.34		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8524	3.2486	4.2003	5.7046	7.1684	8.6043	9.3293	8.9289	7.5402	5.8162	4.2590	3.2081		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_F	**Deck Fitting Loss (lb/month)**	**111.47**	**116.59**	**174.01**	**245.86**	**345.75**	**439.66**	**518.84**	**482.24**	**359.82**	**260.51**	**171.21**	**127.25**	**3,353.23**	Calculated Using Equation 2-13
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_S	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**12.94**	**11.69**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**152.34**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**142.02**	**146.69**	**214.44**	**297.22**	**413.31**	**521.64**	**613.74**	**571.36**	**429.19**	**314.61**	**210.78**	**160.30**	**4,035.31**	**Calculated Using Equation 1-1 or 2-1**
L_{T1}	Benzene Losses (lb/month)	0.54	0.56	0.84	1.24	1.84	2.47	2.99	2.74	1.94	1.32	0.82	0.61	17.90	Calculated using Equations 40-1 through 40-9
L_{T2}	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{T3}	Cyclohexane Losses (lb/month)	0.08	0.09	0.13	0.19	0.28	0.38	0.46	0.42	0.30	0.20	0.13	0.09	2.75	Calculated using Equations 40-1 through 40-9
L_{T4}	Ethylbenzene Losses (lb/month)	0.23	0.21	0.25	0.29	0.35	0.42	0.48	0.45	0.36	0.30	0.25	0.23	3.83	Calculated using Equations 40-1 through 40-9
L_{T5}	Hexane (n) Losses (lb/month)	0.49	0.52	0.80	1.20	1.78	2.38	2.88	2.64	1.88	1.28	0.79	0.57	17.21	Calculated using Equations 40-1 through 40-9
L_{T6}	Naphthalene Losses (lb/month)	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.69	Calculated using Equations 40-1 through 40-9
L_{T7}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	Calculated using Equations 40-1 through 40-9
L_{T8}	Toluene Losses (lb/month)	1.29	1.25	1.66	2.17	3.02	3.89	4.65	4.29	3.15	2.30	1.63	1.37	30.66	Calculated using Equations 40-1 through 40-9
L_{T9}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.33	0.29	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.84	Calculated using Equations 40-1 through 40-9
L_{T10}	Xylene (m) Losses (lb/month)	1.01	0.94	1.11	1.24	1.51	1.76	2.01	1.90	1.53	1.29	1.08	1.03	16.40	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{Max}	Maximum Throughput (Bbl/hr)	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.03**	**0.04**	**0.05**	**0.07**	**0.10**	**0.11**	**0.10**	**0.08**	**0.06**	**0.04**	**0.03**	**0.11**	Monthly Rim Seal Loss Calculated above Divided by Hours per Month, per
L_F	**Deck Fitting Loss (lb/hr)**	**0.15**	**0.17**	**0.23**	**0.34**	**0.46**	**0.61**	**0.70**	**0.65**	**0.50**	**0.35**	**0.24**	**0.17**	**0.70**	Monthly Deck Fitting Loss Calculated above Divided by Hours per Month, per TCEQ APDG 6418
L_S	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Deck Seam Loss calculated above divided by Hours per Month, per TCEQ APDG 6418
L_T	**Total Losses (lb/hr)**	**1.18**	**1.20**	**1.27**	**1.40**	**1.54**	**1.71**	**1.81**	**1.75**	**1.58**	**1.41**	**1.28**	**1.20**	**1.81**	**Calculated Using Equation 2-1**
L_{T1}	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{T2}	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{T3}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{T4}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{T5}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{T6}	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{T7}	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{T8}	Toluene Losses (lb/hr)	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
L_{T9}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	Calculated using Equations 40-1 through 40-9
L_{T10}	Xylene (m) Losses (lb/hr)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	Calculated using Equations 40-1 through 40-9

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 14
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

	Deck Fitting Loss Factors Per Table 7.1-12 (3)			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	7
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.5	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	32
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Ungask	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gasket	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Sock	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

(3) Motor gasoline with RVP specified and distillation slope of 3.

(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 15
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	40		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	x_i	y_i	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.33**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**2.8524**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0058	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.24**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**3.2486**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0070	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.37**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**4.2003**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.65**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**5.7046**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0155	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.67**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**7.1684**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0232	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0251	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.70**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**8.6043**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0304	--	--	78.11	78.11	1.61%	1.89%	0.35%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0275	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0340	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.27**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**9.3293**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0342	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0049	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0307	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0388	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0098	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.78**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**8.9289**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0321	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0289	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0361	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.41**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**7.5402**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0229	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0273	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.64**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**5.8162**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0025	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.05**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**4.2590**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0016	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.67**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**3.2081**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**17.61**	**18.42**	**27.49**	**38.84**	**54.62**	**69.46**	**81.96**	**76.18**	**56.84**	**41.16**	**27.05**	**20.10**	**529.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.00	481.91	494.04	509.32	521.34	531.37	535.94	533.45	524.08	510.31	494.72	481.34		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8524	3.2486	4.2003	5.7046	7.1684	8.6043	9.3293	8.9289	7.5402	5.8162	4.2590	3.2081		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**111.47**	**116.59**	**174.01**	**245.86**	**345.75**	**439.66**	**518.84**	**482.24**	**359.82**	**260.51**	**171.21**	**127.25**	**3,353.23**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_D	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**12.94**	**11.69**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**152.34**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**142.02**	**146.69**	**214.44**	**297.22**	**413.31**	**521.64**	**613.74**	**571.36**	**429.19**	**314.61**	**210.78**	**160.30**	**4,035.31**	**Calculated Using Equation 1-1 or 2-1**
L_{Ti}	Benzene Losses (lb/month)	0.54	0.56	0.84	1.24	1.84	2.47	2.99	2.74	1.94	1.32	0.82	0.61	17.90	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.08	0.09	0.13	0.19	0.28	0.38	0.46	0.42	0.30	0.20	0.13	0.09	2.75	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.23	0.21	0.25	0.29	0.35	0.42	0.48	0.45	0.36	0.30	0.25	0.23	3.83	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	0.49	0.52	0.80	1.20	1.78	2.38	2.88	2.64	1.88	1.28	0.79	0.57	17.21	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.69	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	1.29	1.25	1.66	2.17	3.02	3.89	4.65	4.29	3.15	2.30	1.63	1.37	30.66	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.33	0.29	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.84	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.01	0.94	1.11	1.24	1.51	1.76	2.01	1.90	1.53	1.29	1.08	1.03	16.40	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr)	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.03**	**0.04**	**0.05**	**0.07**	**0.10**	**0.11**	**0.10**	**0.08**	**0.06**	**0.04**	**0.03**	**0.11**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419
L_F	**Deck Fitting Loss (lb/hr)**	**0.15**	**0.17**	**0.23**	**0.34**	**0.46**	**0.61**	**0.70**	**0.65**	**0.50**	**0.35**	**0.24**	**0.17**	**0.70**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**1.18**	**1.20**	**1.27**	**1.40**	**1.54**	**1.71**	**1.81**	**1.75**	**1.58**	**1.41**	**1.28**	**1.20**	**1.81**	**Calculated Using Equation 2-1**
L_{Ti}	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/hr)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	Calculated using Equations 40-1 through 40-9

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 15
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	7
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	32
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Ungasketed	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gasketed	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Sock	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQU 16
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	40		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded						
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting		

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_L	x_i	y_i	Z_{Li}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.33**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**2.8524**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0058	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.24**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2486**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0070	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.37**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2003**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.65**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.7046**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0155	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.1684**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0232	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0251	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.70**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.6043**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0304	--	--	78.11	78.11	1.61%	1.89%	0.35%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0275	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0340	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.27**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**9.3293**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0342	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0049	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0307	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0388	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0098	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.78**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.9289**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0321	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0289	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0361	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.41**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.5402**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0229	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0273	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.64**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.8162**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0025	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.05**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2590**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0016	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2081**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQU 16
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_M	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**17.61**	**18.42**	**27.49**	**38.84**	**54.62**	**69.46**	**81.96**	**76.18**	**56.84**	**41.16**	**27.05**	**20.10**	**529.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
T_R	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.00	481.91	494.04	509.32	521.34	531.37	535.94	533.45	524.08	510.31	494.72	481.34		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8524	3.2486	4.2003	5.7046	7.1684	8.6043	9.3293	8.9289	7.5402	5.8162	4.2590	3.2081		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_d	**Deck Fitting Losses (lb/month)**	**111.47**	**116.59**	**174.01**	**245.86**	**345.75**	**439.66**	**518.84**	**482.24**	**359.82**	**260.51**	**171.21**	**127.25**	**3,353.23**	Calculated Using Equation 2-13
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_S	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**12.94**	**11.69**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**152.34**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**142.02**	**146.69**	**214.44**	**297.22**	**413.31**	**521.64**	**613.74**	**571.36**	**429.19**	**314.61**	**210.78**	**160.30**	**4,035.31**	**Calculated Using Equation 1-1 or 2-1**
L_B	Benzene Losses (lb/month)	0.54	0.56	0.84	1.24	1.84	2.47	2.99	2.74	1.94	1.32	0.82	0.61	17.90	Calculated using Equations 40-1 through 40-9
L_{BI}	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{CH}	Cyclohexane Losses (lb/month)	0.08	0.09	0.13	0.19	0.28	0.38	0.46	0.42	0.30	0.20	0.13	0.09	2.75	Calculated using Equations 40-1 through 40-9
L_{EB}	Ethylbenzene Losses (lb/month)	0.23	0.21	0.25	0.29	0.35	0.42	0.48	0.45	0.36	0.30	0.25	0.23	3.83	Calculated using Equations 40-1 through 40-9
L_H	Hexane (n) Losses (lb/month)	0.49	0.52	0.80	1.20	1.78	2.38	2.88	2.64	1.88	1.28	0.79	0.57	17.21	Calculated using Equations 40-1 through 40-9
L_N	Naphthalene Losses (lb/month)	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.69	Calculated using Equations 40-1 through 40-9
L_{PH}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	Calculated using Equations 40-1 through 40-9
L_T	Toluene Losses (lb/month)	1.29	1.25	1.66	2.17	3.02	3.89	4.65	4.29	3.15	2.30	1.63	1.37	30.66	Calculated using Equations 40-1 through 40-9
L_{TM}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.33	0.29	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.84	Calculated using Equations 40-1 through 40-9
L_X	Xylene (m) Losses (lb/month)	1.01	0.94	1.11	1.24	1.51	1.76	2.01	1.90	1.53	1.29	1.08	1.03	16.40	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr)	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.03**	**0.04**	**0.05**	**0.07**	**0.10**	**0.11**	**0.10**	**0.08**	**0.06**	**0.04**	**0.03**	**0.11**	Monthly rim seal loss calculated above divided by hours per month; TCEQ Air Permit Reviewer Guide (APDG) 6419
L_d	**Deck Fitting Loss (lb/hr)**	**0.15**	**0.17**	**0.23**	**0.34**	**0.46**	**0.61**	**0.70**	**0.65**	**0.50**	**0.35**	**0.24**	**0.17**	**0.70**	Monthly deck fitting loss calculated above divided by hours per month; per TCEQ APDG 6419
L_S	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly deck seam loss calculated above divided by hours per month; per TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**1.18**	**1.20**	**1.27**	**1.40**	**1.54**	**1.71**	**1.81**	**1.75**	**1.58**	**1.41**	**1.28**	**1.20**	**1.81**	**Calculated Using Equation 2-1**
L_B	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{BI}	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{CH}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{EB}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_H	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_N	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{PH}	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_T	Toluene Losses (lb/hr)	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
L_{TM}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	Calculated using Equations 40-1 through 40-9
L_X	Xylene (m) Losses (lb/hr)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[3]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	7
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	32
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Ung	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gas	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Soc	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

(3) Motor gasoline with RVP specified and distillation slope of 3.

(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 17
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	40		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (α_S):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

I			T_{LX}	T_{LN}	T_{LX}					P_{VX}	P_{VN}	P_{VX}	M_L	M_V	Z_c	x_i	y_i	Z_{ci}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LX} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.33**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**2.8524**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0058	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.24**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2486**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0070	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.37**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2003**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.65**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.7046**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0155	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.1684**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0232	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0251	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.70**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.6043**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0304	--	--	78.11	78.11	1.61%	1.89%	0.35%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0275	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0340	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.27**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**9.3293**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0342	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0049	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0307	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0388	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0098	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.78**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**8.9289**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0321	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0289	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0361	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.41**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**7.5402**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0229	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0273	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.64**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**5.8162**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0025	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.05**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**4.2590**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0016	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 17
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.67**	--	--	**1-27**	**11.6439**	**5,043.6**	--	**3.2081**	--	--	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**17.61**	**18.42**	**27.49**	**38.84**	**54.62**	**69.46**	**81.96**	**76.18**	**56.84**	**41.16**	**27.05**	**20.10**	**529.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see 'Meteorological Data', otherwise zero.
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.00	481.91	494.04	509.32	521.34	531.37	535.94	533.45	524.08	510.31	494.72	481.34		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8524	3.2486	4.2003	5.7046	7.1684	8.6043	9.3293	8.9289	7.5402	5.8162	4.2590	3.2081		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**111.47**	**116.59**	**174.01**	**245.86**	**345.75**	**439.66**	**518.84**	**482.24**	**359.82**	**260.51**	**171.21**	**127.25**	**3,353.23**	Calculated Using Equation 2-13
P^*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see 'Meteorological Data', otherwise zero.
L_W	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**12.94**	**11.69**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**152.34**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**142.02**	**146.69**	**214.44**	**297.22**	**413.31**	**521.64**	**613.74**	**571.36**	**429.19**	**314.61**	**210.78**	**160.30**	**4,035.31**	**Calculated Using Equation 1-1 or 2-1**
L_D	Benzene Losses (lb/month)	0.54	0.56	0.84	1.24	1.84	2.47	2.99	2.74	1.94	1.32	0.82	0.61	17.90	Calculated using Equations 40-1 through 40-9
L_S	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_X	Cyclohexane Losses (lb/month)	0.08	0.09	0.13	0.19	0.28	0.38	0.46	0.42	0.30	0.20	0.13	0.09	2.75	Calculated using Equations 40-1 through 40-9
L_E	Ethylbenzene Losses (lb/month)	0.23	0.21	0.25	0.29	0.35	0.42	0.48	0.45	0.36	0.30	0.25	0.23	3.83	Calculated using Equations 40-1 through 40-9
L_H	Hexane (n) Losses (lb/month)	0.49	0.52	0.80	1.20	1.78	2.38	2.88	2.64	1.88	1.28	0.79	0.57	17.21	Calculated using Equations 40-1 through 40-9
L_N	Naphthalene Losses (lb/month)	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.69	Calculated using Equations 40-1 through 40-9
L_P	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	Calculated using Equations 40-1 through 40-9
L_T	Toluene Losses (lb/month)	1.29	1.25	1.66	2.17	3.02	3.89	4.65	4.29	3.15	2.30	1.63	1.37	30.66	Calculated using Equations 40-1 through 40-9
L_{TM}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.33	0.29	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.84	Calculated using Equations 40-1 through 40-9
L_O	Xylene (m) Losses (lb/month)	1.01	0.94	1.11	1.24	1.51	1.76	2.01	1.90	1.53	1.29	1.08	1.03	16.40	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	TCEQAir Permit Reviewer Guide (APDG) 6419 Equation 5 scaled to 1 hr
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr)	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.03**	**0.04**	**0.05**	**0.07**	**0.10**	**0.11**	**0.10**	**0.08**	**0.06**	**0.04**	**0.03**	**0.11**	Monthly Rim Seal Loss Calculated above divided by hours per month, per TCEQ APDG 6419
L_F	**Deck Fitting Loss (lb/hr)**	**0.15**	**0.17**	**0.23**	**0.34**	**0.46**	**0.61**	**0.70**	**0.65**	**0.50**	**0.35**	**0.24**	**0.17**	**0.70**	Monthly Deck Fitting Loss Calculated above divided by hours per month, per TCEQ APDG 6419
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss Calculated above divided by hours per month, per TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**1.18**	**1.20**	**1.27**	**1.40**	**1.54**	**1.71**	**1.81**	**1.75**	**1.58**	**1.41**	**1.28**	**1.20**	**1.81**	**Calculated Using Equation 2-1**
L_D	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_S	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_X	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_E	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_H	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_N	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_P	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_T	Toluene Losses (lb/hr)	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	Calculated using Equations 40-1 through 40-9
L_O	Xylene (m) Losses (lb/hr)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[3]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	7
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	32
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Ung	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gas	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Soc	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 18
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	11,742.00
Net Throughput (bbl/yr):	75,000,000	Turnovers Per Year:	6,387.33
Maximum Pumping Rate (bbl/hr):	11,742		
Shell Height (ft):	40		
Tank Temperature Profile:	Ambient		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25
Internal Shell Condition:	Light Rust				

Floating Roof Characteristics

Construction:	Bolted, Continuous Sheet, 5 Ft Wide	Type:	Aluminum Skin & Pontoon

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (α_R):	0.25

Tank Construction and Rim-Seal System

Construction:	Welded				
Primary Rim Seal:	Liquid-Mounted	Secondary Rim Seal:	None	Seal Fit:	Average-Fitting

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	x_i	y_i	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Motor Gasoline RVP 13.0**	**January**	**16.33**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**2.8524**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0058	--	--	78.11	78.11	1.61%	1.89%	0.20%	0.25%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(4)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0009	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(4)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(4)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0058	--	--	86.18	86.18	1.00%	1.07%	0.20%	0.28%	(4)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(4)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(4)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0053	--	--	92.14	92.14	7.21%	7.20%	0.18%	0.27%	(4)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(4)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0010	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.06%	(4)
Mixture/Product	**Motor Gasoline RVP 13.0**	**February**	**22.24**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**3.2486**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0070	--	--	78.11	78.11	1.61%	1.89%	0.22%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0070	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0066	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**March**	**34.37**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**4.2003**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0104	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0015	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0100	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0102	--	--	92.14	92.14	7.21%	7.20%	0.24%	0.36%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**April**	**49.65**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**5.7046**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0165	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.36%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0024	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0155	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0171	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0039	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**May**	**61.67**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**7.1684**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0232	--	--	78.11	78.11	1.61%	1.89%	0.32%	0.41%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0033	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0015	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0213	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.41%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0251	--	--	92.14	92.14	7.21%	7.20%	0.35%	0.52%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0060	--	--	106.17	106.17	7.21%	6.25%	0.08%	0.14%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**June**	**71.70**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**8.6043**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0304	--	--	78.11	78.11	1.61%	1.89%	0.35%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0043	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0021	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0275	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.44%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0340	--	--	92.14	92.14	7.21%	7.20%	0.39%	0.59%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0084	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**July**	**76.27**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**9.3293**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0342	--	--	78.11	78.11	1.61%	1.89%	0.37%	0.46%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0049	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0025	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.05%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0307	--	--	86.18	86.18	1.00%	1.07%	0.33%	0.46%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0388	--	--	92.14	92.14	7.21%	7.20%	0.42%	0.62%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0098	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.18%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**August**	**73.78**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**8.9289**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0321	--	--	78.11	78.11	1.61%	1.89%	0.36%	0.45%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0046	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.07%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0023	--	--	106.17	106.17	1.61%	1.39%	0.03%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0289	--	--	86.18	86.18	1.00%	1.07%	0.32%	0.45%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0361	--	--	92.14	92.14	7.21%	7.20%	0.40%	0.60%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0090	--	--	106.17	106.17	7.21%	6.25%	0.10%	0.17%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**September**	**64.41**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**7.5402**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0250	--	--	78.11	78.11	1.61%	1.89%	0.33%	0.42%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0036	--	--	84.16	84.16	0.24%	0.26%	0.05%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0017	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.04%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0229	--	--	86.18	86.18	1.00%	1.07%	0.30%	0.42%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0273	--	--	92.14	92.14	7.21%	7.20%	0.36%	0.54%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0066	--	--	106.17	106.17	7.21%	6.25%	0.09%	0.15%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**October**	**50.64**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**5.8162**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0170	--	--	78.11	78.11	1.61%	1.89%	0.29%	0.37%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0025	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.06%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0010	--	--	106.17	106.17	1.61%	1.39%	0.02%	0.03%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0159	--	--	86.18	86.18	1.00%	1.07%	0.27%	0.38%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0177	--	--	92.14	92.14	7.21%	7.20%	0.30%	0.45%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0040	--	--	106.17	106.17	7.21%	6.25%	0.07%	0.12%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**November**	**35.05**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**4.2590**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0106	--	--	78.11	78.11	1.61%	1.89%	0.25%	0.31%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0016	--	--	84.16	84.16	0.24%	0.26%	0.04%	0.05%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0006	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0102	--	--	86.18	86.18	1.00%	1.07%	0.24%	0.33%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0105	--	--	92.14	92.14	7.21%	7.20%	0.25%	0.37%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0022	--	--	106.17	106.17	7.21%	6.25%	0.05%	0.09%	(5)
Mixture/Product	**Motor Gasoline RVP 13.0**	**December**	**21.67**	**--**	**--**	**1-27**	**11.6439**	**5,043.6**	**--**	**3.2081**	**--**	**--**	**92.00**	**62.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Benzene					1-28 & 40-3	6.9060	1,211.0	220.79	0.0069	--	--	78.11	78.11	1.61%	1.89%	0.21%	0.27%	(4)
	Biphenyl					1-28 & 40-3	7.2400	1,998.0	202.73	0.0000	--	--	154.21	154.21	0.01%	0.01%	0.00%	0.00%	(5)
	Cyclohexane					1-28 & 40-3	6.8450	1,203.5	222.86	0.0010	--	--	84.16	84.16	0.24%	0.26%	0.03%	0.04%	(5)
	Ethylbenzene					1-28 & 40-3	6.9500	1,419.3	212.61	0.0003	--	--	106.17	106.17	1.61%	1.39%	0.01%	0.02%	(5)
	Hexane (n)					1-28 & 40-3	6.8780	1,171.5	224.37	0.0068	--	--	86.18	86.18	1.00%	1.07%	0.21%	0.30%	(5)
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	--	--	128.17	128.17	0.44%	0.32%	0.00%	0.00%	(5)
	Phenol					1-28 & 40-3	7.1200	1,509.7	174.20	0.0000	--	--	94.11	94.11	0.06%	0.05%	0.00%	0.00%	(5)
	Toluene					1-28 & 40-3	7.0170	1,377.6	222.64	0.0064	--	--	92.14	92.14	7.21%	7.20%	0.20%	0.30%	(5)
	Trimethylbenzene (1,2,4)					1-28 & 40-3	7.0440	1,573.3	208.56	0.0000			120.19	120.19	2.50%	1.91%	0.00%	0.00%	(5)
	Xylene (m)					1-28 & 40-3	7.0090	1,462.3	215.11	0.0013	--	--	106.17	106.17	7.21%	6.25%	0.04%	0.07%	(5)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant
L_R	**Rim Seal Losses (lb/month)**	**17.61**	**18.42**	**27.49**	**38.84**	**54.62**	**69.46**	**81.96**	**76.18**	**56.84**	**41.16**	**27.05**	**20.10**	**529.74**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
n	Seal-related Wind Speed Exponent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Factor from Table 7.1-8 based on seal type specified above
v	Monthly Average Wind Speed (mph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		If EFRT, see "Meteorological Data", otherwise zero.
P*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.00	481.91	494.04	509.32	521.34	531.37	535.94	533.45	524.08	510.31	494.72	481.34		Calculated Using Equation 1-31
P_{VA}	Vapor Pressure at TLA (psia)	2.8524	3.2486	4.2003	5.7046	7.1684	8.6043	9.3293	8.9289	7.5402	5.8162	4.2590	3.2081		See "Stored Liquid Characteristics" table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See "Tank Identification and Physical Characteristics" table above
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See "Stored Liquid Characteristics" table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Constant, per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**111.47**	**116.59**	**174.01**	**245.86**	**345.75**	**439.66**	**518.84**	**482.24**	**359.82**	**260.51**	**171.21**	**127.25**	**3,353.23**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0557	0.0645	0.0870	0.1270	0.1729	0.2272	0.2594	0.2411	0.1859	0.1303	0.0885	0.0636		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00		See "Stored Liquid Characteristics" table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80	379.80		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		If EFRT, see "Meteorological Data", otherwise zero.
L_D	**Deck Seam Losses (lb/month)**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**Calculated Using Equation 2-18**
L_{WD}	**Withdrawal Losses (lb/month)**	**12.94**	**11.69**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**12.94**	**12.52**	**12.94**	**12.52**	**12.94**	**152.34**	Calculated using Equation 2-19
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q	Throughput (bbl/month)	151,663	136,986	151,663	146,771	151,663	146,771	151,663	151,663	146,771	151,663	146,771	151,663		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Product-specific factor from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See "Stored Liquid Characteristics" table above
L_T	**Total Losses (lb/month)**	**142.02**	**146.69**	**214.44**	**297.22**	**413.31**	**521.64**	**613.74**	**571.36**	**429.19**	**314.61**	**210.78**	**160.30**	**4,035.31**	**Calculated Using Equation 1-1 or 2-1**
L_{Ti}	Benzene Losses (lb/month)	0.54	0.56	0.84	1.24	1.84	2.47	2.99	2.74	1.94	1.32	0.82	0.61	17.90	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.08	0.09	0.13	0.19	0.28	0.38	0.46	0.42	0.30	0.20	0.13	0.09	2.75	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.23	0.21	0.25	0.29	0.35	0.42	0.48	0.45	0.36	0.30	0.25	0.23	3.83	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	0.49	0.52	0.80	1.20	1.78	2.38	2.88	2.64	1.88	1.28	0.79	0.57	17.21	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.69	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	1.29	1.25	1.66	2.17	3.02	3.89	4.65	4.29	3.15	2.30	1.63	1.37	30.66	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.33	0.29	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.84	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.01	0.94	1.11	1.24	1.51	1.76	2.01	1.90	1.53	1.29	1.08	1.03	16.40	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{WD}	**Withdrawal Loss (lb/hr)**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
N_C	Number of Columns (dimensionless)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		Number of each type of fixed roof support columns for tank.
F_C	Effective Column Diameter (ft)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10		Default from Note 4 to Equation 2-19
Q_{MAX}	Maximum Throughput (bbl/hr)	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742	11,742		See "Tank Identification and Physical Characteristics" table above
C_S	Shell Clingage Factor (bbl/1,000 ft3)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		Density of gasoline
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See "Stored Liquid Characteristics" table above
L_R	**Rim Seal Loss (lb/hr)**	**0.02**	**0.03**	**0.04**	**0.05**	**0.07**	**0.10**	**0.11**	**0.10**	**0.08**	**0.06**	**0.04**	**0.03**	**0.11**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_F	**Deck Fitting Loss (lb/hr)**	**0.15**	**0.17**	**0.23**	**0.34**	**0.46**	**0.61**	**0.70**	**0.65**	**0.50**	**0.35**	**0.24**	**0.17**	**0.70**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419
L_T	**Total Losses (lb/hr)**	**1.18**	**1.20**	**1.27**	**1.40**	**1.54**	**1.71**	**1.81**	**1.75**	**1.58**	**1.41**	**1.28**	**1.20**	**1.81**	**Calculated Using Equation 2-1**
L_{Ti}	Benzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/hr)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	Calculated using Equations 40-1 through 40-9

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Identification

Tank Number:	EQUI 18
Location:	Circle K Terminal Group Newport
Type of Tank:	Internal Floating Roof Tank

Roof Fitting/Status	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_f
Access Hatch, Bolted Cover, Gasketed	1.6	--	--	
Access Hatch, Unbolted Cover, Ungasketed	36.0	5.9	1.2	
Access Hatch, Unbolted Cover, Gasketed	31.0	5.2	1.3	1
Fixed Roof Support Col. Well, Round Pipe, Ungasketed Sliding Cover	31.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Gasketed Sliding Cover	25.0	--	--	
Fixed Roof Support Col. Well, Round Pipe, Flexible Fabric Sleeve Seal	10.0	--	--	7
Fixed Roof Support Col. Well, Built-Up Col., Ungasketed Sliding Cover	51.0	--	--	
Fixed Roof Support Col. Well, Built-Up Col., Gasketed Sliding Cover	33.0	--	--	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31.0	150.0	1.4	
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25.0	2.2	2.1	
Unslotted Guide-Pole Well, Gasketed Sliding Cover	25.0	13.0	2.2	
Unslotted Guide-Pole Well, Gasketed sliding Cover, w. Wiper	14.0	3.7	0.8	
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12.0	0.8	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w/o Float	43.0	270.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Ungask. Sliding Cover, w. Float	31.0	36.0	2.0	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Wiper	41.0	48.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve	11.0	46.0	1.4	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Pole Sleeve,Wiper	8.3	4.4	1.6	
Slotted Guide-Pole/Sample Well, Gask. Sliding Cover, w. Float, Wiper	21.0	7.9	1.8	
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11.0	9.9	0.9	
Slotted guidepole/sample well, Flexible Enclosure	21.0	7.9	1.8	
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14.0	5.4	1.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17.0	0.4	
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	--	--	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.5	0.0	1.0	
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Ungask.	2.3	--	--	
Sample Pipe or Well, Slit Fabric Seal 10% Open	12.0	--	--	1
Vacuum Breaker, Weighted Mech. Actuation, Ungask.	7.8	0.0	4.0	
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.9	
Roof Drain (3 in. Diameter), Open	1.5	0.2	1.7	
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.1	1.1	
Stub Drain (1-in. Diameter),	1.2	--	--	
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	--	--	32
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2.0	0.4	0.9	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Gasketed	1.3	0.1	0.7	
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.1	0.7	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Ungasketed	0.8	0.5	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Gasketed	0.5	0.1	0.1	
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable, Sock	0.5	0.2	0.1	
Deck Leg or hanger (no opening through deck), Fixed	--	--	--	
Rim Vent, Weighted Mechanical Actuation, Ungasketed	0.7	1.8	1.0	
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.7	0.1	1.0	
Ladder well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder well, Sliding Cover, Gasketed	56.0	--	--	
Ladder-guidepole combination well, Sliding Cover, Ungasketed	98.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, ungasketed sliding cover	65.0	--	--	
Ladder-guidepole combination well, Ladder sleeve, gasketed sliding cover	60.0	--	--	

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).
(3) Motor gasoline with RVP specified and distillation slope of 3.
(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
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LANDING EVENT DETAILS			Notes
---	**Tank Number**	**Tank 108**	
---	Event Type	Floating Roof Landed and Subsequent Refill after Cleaning	

TANK INFORMATION			Notes
H_d	Floating Roof Height Above Tank Bottom (ft)	5.00	Landing event property specified by user.
---	Original Heel Type	Standing Liquid Only In or Near Sump (Partial Liquid Heel)	Landing event property specified by user.
---	Volume of Partial Liquid Heel (bbl)	50.0	Conservatively assumed
H_{Le}	Original Average Heel Height of Liquid (in)	0.0	Conservatively assumed
---	Tank Type	IFRT	Physical property of tank
D	Tank Diameter (ft)	100.00	Physical property of tank
---	External Shell Color/Shade	White	Physical property of tank
---	Shell Paint Condition	Average	Physical property of tank
α_S	Shell surface solar absorptance, dimensionless	0.25	Factors from Table 7.1-6 based on shell color/shade and condition
---	Tank Shell Construction	Welded	Physical property of tank
---	Tank Shell Internal Condition	Light Rust	Physical property of tank
---	Insulation Installed on Tank?	No Insulation	Physical property of tank

METEOROLOGICAL DATA FOR LANDING EVENT:			Notes
---	Month of Landing	July	Conservatively assumed July as worst-case month
T_{AA}	Ambient Daily Average Temperature (˚F)	73.20	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (˚F)	64.50	
T_{AX}	Ambient Daily Maximum Temperature (˚F)	81.90	
v	Monthly Average Wind Speed (mph)	8.50	
P_A	Atmospheric Pressure (psia)	14.30	
I	Monthly Solar Insolation (Btu/ft^2-d)	1,970.0	

LIQUID SURFACE TEMPERATURE			Notes
T_{LA}	Average liquid surface temperature (°R)	532.87	Assumed equal to T_{AA} per note in Equation 3-6
ΔT_V	Average Daily Vapor Temperature Range (°R)	22.03	Eq. 1-7
T_{LN}	Minimum liquid surface temperature (°R)	527.36	Figure 7.1-17
T_{LX}	Maximum liquid surface temperature (°R)	538.38	Figure 7.1-17

STORED LIQUID CHARACTERISTICS

i		P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	**Stored Product or Component in Mixture**	**True vapor pressure at T_{LA} (psia)**	**True vapor pressure at T_{LN} (psia)**	**True vapor pressure at T_{LX} (psia)**	**Liquid Molecular Weight (lb/lbmol)**	**Vapor Molecular Weight (lb/lbmol)**	**Liquid Wt. Percent of Components Within Liquid**	**Vapor Weight Percent Eq. 40-6**	**Footnote Identifying Source of Chemical Properties**
Mixture/Product	**Motor Gasoline RVP 13**	**5.9421**	**5.3542**	**6.5804**	**92.00**	**65.00**	**100.000%**	**100.000%**	**(2)**
	Benzene	0.0054	0.0047	0.0062	120.19	120.19	0.424%	0.169%	(3)
	Biphenyl	0.0000	0.0000	0.0000	78.11	78.11	0.100%	0.000%	(3)
	Cyclohexane	0.0000	0.0000	0.0000	276.33	276.33	0.000%	0.000%	(3)
	Ethylbenzene	0.0002	0.0001	0.0002	154.21	154.21	0.180%	0.007%	(3)
	Hexane (n)	0.0329	0.0287	0.0376	108.14	108.14	1.450%	0.922%	(3)
	Naphthalene	0.0000	0.0000	0.0000	120.19	120.19	0.124%	0.000%	(3)
	Phenol	0.0000	0.0000	0.0000	106.17	106.17	0.509%	0.001%	(3)
	Toluene	0.0005	0.0004	0.0006	128.17	128.17	0.137%	0.016%	(3)
	Trimethylbenzene (1,2,4)	0.0245	0.0199	0.0301	128.17	128.17	100.137%	0.813%	(3)
	Xylene (m)	0.0019	0.0016	0.0022	86.18	86.18	1.236%	0.042%	(3)

STANDING IDLE LOSSES		Pre-Liquid Flush	Post-Liquid Flush	Notes
L_{SL}	**Total Standing Idle Losses During Roof Landing, Time period Pre/Post-Liquid Flush (lb per Landing Episode)**	**968.65**	**--**	**Minimum of standing idle losses and limit on standing idle losses as calculated below**
Limit on Standing Idle Losses for FRT with Full Liquid Heel				
$L_{SL\ max}$	**Limit on Standing Idle Loss for Tanks with a Full Liquid Heel (lb per Landing Episode)**	**11,760.00**	**--**	50 bbl x 42 gal/bbl x 5.6 lb/gal = 11,760 lb
---	Volume of Partial Liquid Heel (bbl)	50.00	--	See Tank Information table above
W_L	Average Organic Liquid Density (lb/gal)	5.60	--	Default liquid density for gasoline
Standing Idle Losses for EFRT with Liquid Heel				
$L_{SL\ Wind}$	**Standing Idle Losses During Roof Landing (lb per Landing Episode)**	**968.65**	**--**	Eq. 3-7
n_d	Number of Days with Standing Idle Losses	5.00	--	Assumed 1 days standing idle
K_E	Vapor Space Expansion Factor (dimensionless)	0.19	--	Eq. 1-5
P_{VA}	True vapor pressure at average liquid surface temperature (psia)	5.9421	--	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume for Fixed Roof Tanks (ft^3)	39,269.91	--	Eq. 3-22
D	Tank Diameter (ft)	100.00	--	See Tank Information table above
H_{VO}	Vapor Space Outage, calculated based on roof leg and liquid heel heights (ft)	5.00	--	Eq. 1-16
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)	10.731	--	Equation constant
ΔT_V	Vapor Temperature Range (°R)	22.03	--	Eq. 1-7
ΔP_V	Average Daily Vapor Pressure Range (psia)	1.23	--	Eq. 1-9
K_S	Vented Vapor Space Saturation Factor (dimensionless)	0.39	--	Eq. 1-21
M_V	Stock Vapor Molecular Weight (lb/lbmol)	65.00	--	Specified

FILLING LOSSES FOR FRT		"Arrival" Losses	"Generated" Losses	Notes
L_{FL}	**Floating Roof Filling Losses for Component (lb)**	No "Arrival" Losses as the tank was emptied and degassed prior to refilling.	**397.87**	Eq. 3-18
P_{VA}	True vapor pressure at average liquid surface temperature (psia)		5.9421	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume for Fixed Roof Tanks (ft^3)		39,269.91	Eq. 3-22
D	Tank Diameter (ft)		100.00	See Tank Information table above
H_{VO}	Vapor Space Outage, calculated based on roof leg and liquid heel heights (ft)		5.00	Eq. 1-16
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)		10.731	Equation constant
$T_V = T_{AA}$	Vapor Temperature (°R), assumed equal to average ambient temperature for the month		532.87	Notes in Eq. 3-6
M_V	Stock Vapor Molecular Weight (lb/lbmol)		65.00	See Liquid Characteristics table(s) above
S	Filling Saturation Factor (dimensionless)		0.15	Notes in Eq. 3-18
C_{SF}	Filling Saturation Correction Factor for Wind, EFRT with Liquid Heel (dimensionless)		--	Notes in Eq. 3-18

SUMMARY OF TANK LANDING LOSSES			Notes
L_{SL}	Standing Idle Losses per episode (lb)	968.65	Sum of standing losses pre and post-flush
L_{FL}	Filling Losses per episode (lb)	397.87	Sum of arrival and generated filling losses
L_{TL}	**Total Landing Loss per episode (lb)**	**1,366.51**	Sum of standing and filling losses
L_{TLi}	Benzene Loss per episode (lb)	2.30	Calculated using Equations 40-1 through 40-9
L_{TLi}	Biphenyl Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9
L_{TLi}	Cyclohexane Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9
L_{TLi}	Ethylbenzene Loss per episode (lb)	0.09	Calculated using Equations 40-1 through 40-9
L_{TLi}	Hexane (n) Loss per episode (lb)	12.60	Calculated using Equations 40-1 through 40-9
L_{TLi}	Naphthalene Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9
L_{TLi}	Phenol Loss per episode (lb)	0.01	Calculated using Equations 40-1 through 40-9
L_{TLi}	Toluene Loss per episode (lb)	0.22	Calculated using Equations 40-1 through 40-9
L_{TLi}	Trimethylbenzene (1,2,4) Loss per episode (lb)	11.12	Calculated using Equations 40-1 through 40-10
L_{TLi}	Xylene (m) Loss per episode (lb)	0.57	Calculated using Equations 40-1 through 40-9

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Motor gasoline with RVP specified and distillation slope of 3.

(3) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
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LANDING EVENT DETAILS			Notes
---	**Tank Number**	**Tank 109**	
---	Event Type	Floating Roof Landed and Subsequent Refill after Cleaning	

TANK INFORMATION			Notes
H_d	Floating Roof Height Above Tank Bottom (ft)	5.00	Landing event property specified by user.
---	Original Heel Type	Standing Liquid Only In or Near Sump (Partial Liquid Heel)	Landing event property specified by user.
---	Volume of Partial Liquid Heel (bbl)	50.0	Conservatively assumed
H_{Le}	Original Average Heel Height of Liquid (in)	0.0	Conservatively assumed
---	Tank Type	IFRT	Physical property of tank
D	Tank Diameter (ft)	100.00	Physical property of tank
---	External Shell Color/Shade	White	Physical property of tank
---	Shell Paint Condition	Average	Physical property of tank
α_S	Shell surface solar absorptance, dimensionless	0.25	Factors from Table 7.1-6 based on shell color/shade and condition
---	Tank Shell Construction	Welded	Physical property of tank
---	Tank Shell Internal Condition	Light Rust	Physical property of tank
---	Insulation Installed on Tank?	No Insulation	Physical property of tank

METEOROLOGICAL DATA FOR LANDING EVENT:			Notes
---	Month of Landing	July	Conservatively assumed July as worst-case month
T_{AA}	Ambient Daily Average Temperature (°F)	73.20	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (°F)	64.50	
T_{AX}	Ambient Daily Maximum Temperature (°F)	81.90	
v	Monthly Average Wind Speed (mph)	8.50	
P_A	Atmospheric Pressure (psia)	14.26	
I	Monthly Solar Insolation (Btu/ft²-d)	1,930.0	

LIQUID SURFACE TEMPERATURE			Notes
T_{LA}	Average liquid surface temperature (°R)	532.87	Assumed equal to T_{AA} per note in Equation 3-6
ΔT_V	Average Daily Vapor Temperature Range (°R)	21.83	Eq. 1-7
T_{LN}	Minimum liquid surface temperature (°R)	527.41	Figure 7.1-17
T_{LX}	Maximum liquid surface temperature (°R)	538.33	Figure 7.1-17

STORED LIQUID CHARACTERISTICS

i		P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	**Stored Product or Component in Mixture**	**True vapor pressure at T_{LA} (psia)**	**True vapor pressure at T_{LN} (psia)**	**True vapor pressure at T_{LX} (psia)**	**Liquid Molecular Weight (lb/lbmol)**	**Vapor Molecular Weight (lb/lbmol)**	**Liquid Wt. Percent of Components Within Liquid**	**Vapor Weight Percent Eq. 40-6**	**Footnote Identifying Source of Chemical Properties**
Mixture/Product	**Motor Gasoline RVP 13**	**5.9421**	**5.3594**	**6.5743**	**92.00**	**65.00**	**100.000%**	**100.000%**	**(2)**
	Benzene	0.0054	0.0047	0.0062	120.19	120.19	0.424%	0.169%	(3)
	Biphenyl	0.0000	0.0000	0.0000	78.11	78.11	0.100%	0.000%	(3)
	Cyclohexane	0.0000	0.0000	0.0000	276.33	276.33	0.000%	0.000%	(3)
	Ethylbenzene	0.0002	0.0001	0.0002	154.21	154.21	0.180%	0.007%	(3)
	Hexane (n)	0.0329	0.0288	0.0376	108.14	108.14	1.450%	0.922%	(3)
	Naphthalene	0.0000	0.0000	0.0000	120.19	120.19	0.124%	0.000%	(3)
	Phenol	0.0000	0.0000	0.0000	106.17	106.17	0.509%	0.001%	(3)
	Toluene	0.0005	0.0004	0.0006	128.17	128.17	0.137%	0.016%	(3)
	Trimethylbenzene (1,2,4)	0.0245	0.0199	0.0300	128.17	128.17	100.137%	0.813%	(3)
	Xylene (m)	0.0019	0.0016	0.0022	86.18	86.18	1.236%	0.042%	(3)

STANDING IDLE LOSSES		Pre-Liquid Flush	Post-Liquid Flush	Notes
L_{SL}	**Total Standing Idle Losses During Roof Landing, Time period Pre/Post-Liquid Flush (lb per Landing Episode)**	**963.44**	--	**Minimum of standing idle losses and limit on standing idle losses as calculated below**
Limit on Standing Idle Losses for FRT with Full Liquid Heel				
$L_{SL\ max}$	**Limit on Standing Idle Loss for Tanks with a Full Liquid Heel (lb per Landing Episode)**	**11,760.00**	--	50 bbl x 42 gal/bbl x 5.6 lb/gal = 11,760 lb
---	Volume of Partial Liquid Heel (bbl)	50.00	--	See Tank Information table above
W_L	Average Organic Liquid Density (lb/gal)	5.60	--	Default liquid density for gasoline
Standing Idle Losses for EFRT with Liquid Heel				
$L_{SL\ Wind}$	**Standing Idle Losses During Roof Landing (lb per Landing Episode)**	**963.44**	--	Eq. 3-7
n_d	Number of Days with Standing Idle Losses	5.00	--	Assumed 1 days standing idle
K_E	Vapor Space Expansion Factor (dimensionless)	0.19	--	Eq. 1-5
P_{VA}	True vapor pressure at average liquid surface temperature (psia)	5.9421	--	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume for Fixed Roof Tanks (ft^3)	39,269.91	--	Eq. 3-22
D	Tank Diameter (ft)	100.00	--	See Tank Information table above
H_{VO}	Vapor Space Outage, calculated based on roof leg and liquid heel heights (ft)	5.00	--	Eq. 1-16
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)	10.731	--	Equation constant
ΔT_V	Vapor Temperature Range (°R)	21.83	--	Eq. 1-7
ΔP_V	Average Daily Vapor Pressure Range (psia)	1.21	--	Eq. 1-9
K_S	Vented Vapor Space Saturation Factor (dimensionless)	0.39	--	Eq. 1-21
M_V	Stock Vapor Molecular Weight (lb/lbmol)	65.00	--	Specified

FILLING LOSSES FOR FRT		"Arrival" Losses	"Generated" Losses	Notes
L_{FL}	**Floating Roof Filling Losses for Component (lb)**	No "Arrival" Losses as the tank was emptied and degassed prior to refilling.	**397.87**	Eq. 3-18
P_{VA}	True vapor pressure at average liquid surface temperature (psia)		5.9421	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume for Fixed Roof Tanks (ft^3)		39,269.91	Eq. 3-22
D	Tank Diameter (ft)		100.00	See Tank Information table above
H_{VO}	Vapor Space Outage, calculated based on roof leg and liquid heel		5.00	Eq. 1-16
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)		10.731	Equation constant
$T_V = T_{AA}$	Vapor Temperature (°R), assumed equal to average ambient		532.87	Notes in Eq. 3-6
M_V	Stock Vapor Molecular Weight (lb/lbmol)		65.00	See Liquid Characteristics table(s) above
S	Filling Saturation Factor (dimensionless)		0.15	Notes in Eq. 3-18
C_{SF}	Filling Saturation Correction Factor for Wind, EFRT with Liquid Heel (dimensionless)		--	Notes in Eq. 3-18

SUMMARY OF TANK LANDING LOSSES			Notes
L_{SL}	Standing Idle Losses per episode (lb)	963.44	Sum of standing losses pre and post-flush
L_{FL}	Filling Losses per episode (lb)	397.87	Sum of arrival and generated filling losses
L_{TL}	**Total Landing Loss per episode (lb)**	**1,361.31**	Sum of standing and filling losses
L_{TLI}	Benzene Loss per episode (lb)	2.30	Calculated using Equations 40-1 through 40-9
L_{TLI}	Biphenyl Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9
L_{TLI}	Cyclohexane Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9
L_{TLI}	Ethylbenzene Loss per episode (lb)	0.09	Calculated using Equations 40-1 through 40-9
L_{TLI}	Hexane (n) Loss per episode (lb)	12.55	Calculated using Equations 40-1 through 40-9
L_{TLI}	Naphthalene Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9
L_{TLI}	Phenol Loss per episode (lb)	0.01	Calculated using Equations 40-1 through 40-9
L_{TLI}	Toluene Loss per episode (lb)	0.22	Calculated using Equations 40-1 through 40-9
L_{TLI}	Trimethylbenzene (1,2,4) Loss per episode (lb)	11.07	Calculated using Equations 40-1 through 40-10
L_{TLI}	Xylene (m) Loss per episode (lb)	0.57	Calculated using Equations 40-1 through 40-9

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020

(2) Motor gasoline with RVP specified and distillation slope of 3

(3) Default properties for organic HAPs from AP-42 Chapter 7.1

Circle K Terminal Group Newport
Potential-to-emit Calculations
Landing Emissions Calculations

LANDING EVENT DETAILS			Notes
---	**Tank Number**	**Tank 103**	
---	Event Type	Floating Roof Landed and Subsequent Refill after Cleaning	

TANK INFORMATION			Notes
H_d	Floating Roof Height Above Tank Bottom (ft)	5.00	Landing event property specified by user.
---	Original Heel Type	Standing Liquid Only In or Near Sump (Partial Liquid Heel)	Landing event property specified by user.
---	Volume of Partial Liquid Heel (bbl)	50.0	Conservatively assumed
H_{Le}	Original Average Heel Height of Liquid (in)	0.0	Conservatively assumed
---	Tank Type	IFRT	Physical property of tank
D	Tank Diameter (ft)	48.00	Physical property of tank
---	External Shell Color/Shade	White	Physical property of tank
---	Shell Paint Condition	Average	Physical property of tank
α_S	Shell surface solar absorptance, dimensionless	0.25	Factors from Table 7.1-6 based on shell color/shade and condition
---	Tank Shell Construction	Welded	Physical property of tank
---	Tank Shell Internal Condition	Light Rust	Physical property of tank
---	Insulation Installed on Tank?	No Insulation	Physical property of tank

METEOROLOGICAL DATA FOR LANDING EVENT:			Notes
---	Month of Landing	July	Conservatively assumed July as worst-case month
T_{AA}	Ambient Daily Average Temperature (˚F)	73.20	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (˚F)	64.50	
T_{AX}	Ambient Daily Maximum Temperature (˚F)	81.90	
v	Monthly Average Wind Speed (mph)	8.50	
P_A	Atmospheric Pressure (psia)	14.26	
I	Monthly Solar Insolation (Btu/ft^2-d)	1,930.0	

LIQUID SURFACE TEMPERATURE			Notes
T_{LA}	Average liquid surface temperature (°R)	532.87	Assumed equal to T_{AA} per note in Equation 3-6
ΔT_V	Average Daily Vapor Temperature Range (°R)	21.83	Eq. 1-7
T_{LN}	Minimum liquid surface temperature (°R)	527.41	Figure 7.1-17
T_{LX}	Maximum liquid surface temperature (°R)	538.33	Figure 7.1-17

STORED LIQUID CHARACTERISTICS									
i		**P_{VA}**	**P_{VN}**	**P_{VX}**	**M_L**	**M_V**	**Z_{Li}**	**Z_{Vi}**	
Component	**Stored Product or Component in Mixture**	**True vapor pressure at T_{LA} (psia)**	**True vapor pressure at T_{LN} (psia)**	**True vapor pressure at T_{LX} (psia)**	**Liquid Molecular Weight (lb/lbmol)**	**Vapor Molecular Weight (lb/lbmol)**	**Liquid Wt. Percent of Components Within Liquid**	**Vapor Weight Percent Eq. 40-6**	**Footnote Identifying Source of Chemical Properties**
Mixture/Product	**Motor Gasoline RVP 13**	**0.1212**	**--**	**--**	**46.07**	**46.07**	**100.000%**	**100.000%**	**(2)**

STANDING IDLE LOSSES		Pre-Liquid Flush	Post-Liquid Flush	Notes
L_{SL}	**Total Standing Idle Losses During Roof Landing, Time period Pre/Post-Liquid Flush (lb per Landing Episode)**	**1.75**	**--**	**Minimum of standing idle losses and limit on standing idle losses as calculated below**
Limit on Standing Idle Losses for FRT with Full Liquid Heel				
$L_{SL\ max}$	**Limit on Standing Idle Loss for Tanks with a Full Liquid Heel (lb per Landing Episode)**	**11,760.00**	**--**	50 bbl x 42 gal/bbl x 5.6 lb/gal = 11,760 lb
---	Volume of Partial Liquid Heel (bbl)	50.00	--	See Tank Information table above
W_L	Average Organic Liquid Density (lb/gal)	5.60	--	Default liquid density for gasoline
Standing Idle Losses for EFRT with Liquid Heel				
$L_{SL\ Wind}$	**Standing Idle Losses During Roof Landing (lb per Landing Episode)**	**1.75**	**--**	Eq. 3-7
n_d	Number of Days with Standing Idle Losses	5.00	--	Assumed 1 days standing idle
K_E	Vapor Space Expansion Factor (dimensionless)	0.04	--	Eq. 1-5
P_{VA}	True vapor pressure at average liquid surface temperature (psia)	0.1212	--	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume for Fixed Roof Tanks (ft^3)	9,047.79	--	Eq. 3-22
D	Tank Diameter (ft)	48.00	--	See Tank Information table above
H_{VO}	Vapor Space Outage, calculated based on roof leg and liquid heel heights (ft)	5.00	--	Eq. 1-16
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)	10.731	--	Equation constant
ΔT_V	Vapor Temperature Range (°R)	21.83	--	Eq. 1-7
ΔP_V	Average Daily Vapor Pressure Range (psia)	--	--	Eq. 1-9
K_S	Vented Vapor Space Saturation Factor (dimensionless)	0.97	--	Eq. 1-21
M_V	Stock Vapor Molecular Weight (lb/lbmol)	46.07	--	Specified

FILLING LOSSES FOR FRT		"Arrival" Losses	Generated" Losse	Notes
L_{FL}	**Floating Roof Filling Losses for Component (lb)**	No "Arrival" Losses as the tank was emptied and degassed prior to refilling.	**1.33**	Eq. 3-18
P_{VA}	True vapor pressure at average liquid surface temperature (psia)		0.1212	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume for Fixed Roof Tanks (ft^3)		9,047.79	Eq. 3-22
D	Tank Diameter (ft)		48.00	See Tank Information table above
H_{VO}	Vapor Space Outage, calculated based on roof leg and liquid heel heights (ft)		5.00	Eq. 1-16
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)		10.731	Equation constant
$T_V = T_{AA}$	Vapor Temperature (°R), assumed equal to average ambient temperature for the month		532.87	Notes in Eq. 3-6
M_V	Stock Vapor Molecular Weight (lb/lbmol)		46.07	See Liquid Characteristics table(s) above
S	Filling Saturation Factor (dimensionless)		0.15	Notes in Eq. 3-18
C_{SF}	Filling Saturation Correction Factor for Wind, EFRT with Liquid Heel (dimensionless)		--	Notes in Eq. 3-18

SUMMARY OF TANK LANDING LOSSES			Notes
L_{SL}	Standing Idle Losses per episode (lb)	1.75	Sum of standing losses pre and post-flush
L_{FL}	Filling Losses per episode (lb)	1.33	Sum of arrival and generated filling losses
L_{TL}	**Total Landing Loss per episode (lb)**	**3.08**	Sum of standing and filling losses

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Motor gasoline with RVP specified and distillation slope of 3.

(3) Default properties for organic HAPs from AP-42 Chapter 7.1.

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CLEANING EVENT DETAILS			Notes:
---	**Tank Number**	**Tank 009**	

TANK INFORMATION			Notes:
H_d	Floating Roof Height Above Tank Bottom (ft)	5.0	Specified by user for tank cleaning event
---	Tank Type	EFRT	Physical property of tank
D	Tank Diameter (ft)	100.0	Physical property of tank
---	External Shell Color/Shade	White	Physical property of tank
---	Shell Paint Condition	Average	Physical property of tank
α_S	Shell surface solar absorptance, dimensionless	0.25	Factors from Table 7.1-6 based on shell color/shade and condition
---	Tank Shell Construction	Welded	Physical property of tank
---	Tank Shell Internal Condition	Light Rust	Physical property of tank
---	Insulation Installed on Tank?	No Insulation	Physical property of tank

METEOROLOGICAL DATA FOR CLEANING EVENT:			Notes
---	Month of Landing	July	Determined based off date of landing
T_{AA}	Ambient Daily Average Temperature (°F)	73.20	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (°F)	64.50	
T_{AX}	Ambient Daily Maximum Temperature (°F)	81.90	
v	Monthly Average Wind Speed (mph)	8.50	
P_A	Atmospheric Pressure (psia)	14.26	
I	Monthly Solar Insolation (Btu/ft^2-d)	1,930.0	

LIQUID SURFACE TEMPERATURE. VALUES SHOWN ARE FOR INITIAL DATE OF CLEANING EVENT. DAYS IN SUBSEQUENT MONTHS WILL DIFFER DUE TO DIFFERENT METEOROLOGICAL DATA:			
T_{LA}	Average liquid surface temperature (°R)	532.87	Assumed equal to T_{AA} per note in Eq. 3-6
ΔT_V	Average Daily Vapor Temperature Range (°R)	21.83	Eq. 1-7
T_{LN}	Minimum liquid surface temperature (°R)	527.41	Fig. 7.1-17
T_{LX}	Maximum liquid surface temperature (°R)	538.33	Fig. 7.1-17

INITIALLY STORED LIQUID CHARACTERISTICS. VALUES SHOWN ARE FOR INITIAL DATE OF CLEANING EVENT. DAYS IN SUBSEQUENT MONTHS WILL DIFFER DUE TO DIFFERENT METEOROLOGICAL DATA:

i		P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	Footnote Identifying Source of Chemical Properties
Component	Stored Product or Component in Mixture	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid MW (lb/lbmol)	Vapor MW (lb/lbmol)	Liquid Wt. % Specified for Mixture	Vapor Wt. Percent Eq. 40-6	
Mixture/Product	**Motor Gasoline RVP 13**	**5.9421**	**5.3594**	**6.5743**	**92.00**	**65.00**	**100.000%**	**100.000%**	**(2)**
	Benzene	0.0054	0.0047	0.0062	120.19	120.19	0.424%	0.169%	(3)
	Biphenyl	0.0000	0.0000	0.0000	78.11	78.11	0.100%	0.000%	(3)
	Cyclohexane	0.0000	0.0000	0.0000	276.33	276.33	0.000%	0.000%	(3)
	Ethylbenzene	0.0002	0.0001	0.0002	154.21	154.21	0.180%	0.007%	(3)
	Hexane (n)	0.0329	0.0288	0.0376	108.14	108.14	1.450%	0.922%	(3)
	Naphthalene	0.0000	0.0000	0.0000	120.19	120.19	0.124%	0.000%	(3)
	Phenol	0.0000	0.0000	0.0000	106.17	106.17	0.509%	0.001%	(3)
	Toluene	0.0005	0.0004	0.0006	128.17	128.17	0.137%	0.016%	(3)
	Trimethylbenzene (1,2,4)	0.0245	0.0199	0.0300	128.17	128.17	100.137%	0.813%	(3)
	Xylene (m)	0.0019	0.0016	0.0022	86.18	86.18	1.236%	0.042%	(3)

TANK CLEANING LOSSES:						Notes:
--	Day Number of Cleaning Event	1	2	3	4	
VAPOR SPACE PURGE LOSSES:						
L_P	**Vapor Space Purge Emissions (lb per Vapor Space Purge)**	**1,721.45**	**--**	**--**	**--**	**Eq. 4-2**
--	Was There a Vapor Space Purge on This Day?	TRUE	FALSE	FALSE	FALSE	Assumed each day has a vapor space purge.
P_{VA}	True vapor pressure at average liquid surface temperature (psia)	5.9421	--	--	--	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume (ft^3)	50,972.34	--	--	--	Eq. 4-3
D	Tank Diameter (ft)	100.00	--	--	--	See 'Tank Information' table above
H_{VO}	Vapor Space Outage, calculated based on roof leg or shell and liquid heel heights (ft)	6.49	--	--	--	Eq. 4-4 or Eq. 4-9
H_S	Tank Shell Height if VFRT, Shell Length if HFRT, or Floating Roof Height if Floating Roof Tank (ft)	6.50	--	--	--	See 'Tank Information' table above
H_{le}	Effective Height of the Stock Liquid and Sludge for the Given Day (ft)	0.01	--	--	--	Specified by user for calculation each vapor space purge
R	Ideal Gas Constant, (psia-ft^3/lbmol-°R)	10.731	--	--	--	Equation constant
$T_V = T_{AA}$	Vapor Temperature (°R) assumed equal to average ambient temperature for month specified	532.87	--	--	--	Notes in Eq. 4-2
M_V	Stock Vapor Molecular Weight (lb/lbmol)	65.00	--	--	--	See Liquid Characteristics table(s) above
--	Liquid Heel Type at Time of Vapor Space Purge	Full Heel	--	--	--	Specified by user for calculation each vapor space purge
S	Saturation Factor for Floating Roof Tanks	0.5000	--	--	--	Full Liquid Heel = 0.6, Partial Liquid Heel = 0.5, Sludge Only =
C_{SF}	Filling Saturation Correction Factor for Wind, EFRT with Liquid Heel (dimensionless)	1.0000	--	--	--	Eq. 3-21
CONTINUED FORCED VENTILATION EMISSIONS:						
L_{CV}	**Continued Forced Ventilation Emissions (lb per day)**	**2,557.45**	**1,728.01**	**345.60**	**172.80**	**Minimum of emissions calculated using Eq. 4-10 and 4-12 or 4-13**
L_{CV}	**Limit on Continued Forced Ventilation Emissions (lb per day)**	**8,378.00**	**8,378.00**	**8,378.00**	**8,378.00**	**Eq. 4-12 or Eq. 4-13, as applicable.**
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	See 'Tank Information' table above
F_e	The Fraction of the Sludge with Potential to Evaporate (Wt. fraction)	0.20	0.20	0.20	0.20	Default value
H_{le} or d_s	Average Effective Height/Depth of the Stock Liquid and/or Sludge for the Given Day (in)	0.10	0.10	0.10	0.10	See 'Tank Information' table above
W_l	Density of the stock liquid (lb/gal)	7.10	7.10	7.10	7.10	See 'Tank Information' table above
L_{CV}	**Continued Forced Ventilation Emissions (lb per day)**	**2,557.45**	**1,728.01**	**345.60**	**172.80**	**Eq. 4-10**
Q_V	Daily Average Ventilation Rate (ft^3/min)	8,000.00	8,000.00	8,000.00	8,000.00	Assumed fan rating for cleaning event.
n_{CV}	Duration of Continued Forced Ventilation (days)	1.00	1.00	1.00	1.00	Calculation is done for each day so $n_d = 1$
t_V	Hours of Forced Ventilation in Day (hr/day)	24.00	24.00	24.00	24.00	Assumed hours per day for cleaning event
C_V	Average Vapor Concentration by Volume During Continued Forced Ventilation	37.00	25.00	5.00	2.50	Assumed concentration for each day of cleaning event
	Units of Vapor Concentration	%LEL	%LEL	%LEL	%LEL	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	See Meteorological Data Above
CG	Calibration Gas Used	Pentane	Pentane	Pentane	Pentane	Assumed for cleaning event
LEL	Lower Explosive Limit (LEL) of Calibration Gas Used	1.50	1.50	1.50	1.50	Table 7.1-5
RF	Monitor Response Factor	1.00	1.00	1.00	1.00	See 'Tank Cleaning Data Entry'
M_{CG}	Calibration Gas Molecular Weight (lb/lbmol)	16.04	16.04	16.04	16.04	See "Chemical Properties Database"
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	Constant
$T_V = T_{AA}$	Vapor Temperature (°R), assumed equal to average ambient temperature for month specified	532.87	532.87	532.87	532.87	Notes in Eq. 4-2

SUMMARY OF TANK CLEANING LOSSES:			Notes:
L_P	Vapor Space Purge Losses for Cleaning Event (lb)	1,721.45	Sum of all vapor space purge losses
L_{CV}	Continued Forced Ventilation Losses for Cleaning Event (lb)	4,803.87	Sum of all continued forced ventilation losses
L_{TL}	**Total Losses for Cleaning Event (lb)**	**6,525.31**	Sum of all vapor space purge and continued forced ventilation losses
L_{TLI}	Benzene Loss per episode (lb)	11.01	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Biphenyl Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Cyclohexane Loss per episode (lb)	0.01	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Ethylbenzene Loss per episode (lb)	0.45	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Hexane (n) Loss per episode (lb)	60.16	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Naphthalene Loss per episode (lb)	0.01	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Phenol Loss per episode (lb)	0.04	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Toluene Loss per episode (lb)	1.05	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Trimethylbenzene (1,2,4) Loss per episode (lb)	53.08	Calculated using Equations 40-1 through 40-9.
L_{TLI}	Xylene (m) Loss per episode (lb)	2.72	Calculated using Equations 40-1 through 40-9.

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Motor gasoline with RVP specified and distillation slope of 3.

(3) Default properties for organic HAPs from AP-42 Chapter 7.1.

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CLEANING EVENT DETAILS			Notes:
---	**Tank Number**	**Tank 108**	

TANK INFORMATION			Notes:
H_d	Floating Roof Height Above Tank Bottom (ft)	5.0	Specified by user for tank cleaning event
---	Tank Type	EFRT	Physical property of tank
D	Tank Diameter (ft)	100.0	Physical property of tank
---	External Shell Color/Shade	White	Physical property of tank
---	Shell Paint Condition	Average	Physical property of tank
α_S	Shell surface solar absorptance, dimensionless	0.25	Factors from Table 7.1-6 based on shell color/shade and condition
---	Tank Shell Construction	Welded	Physical property of tank
---	Tank Shell Internal Condition	Light Rust	Physical property of tank
---	Insulation Installed on Tank?	No Insulation	Physical property of tank

METEOROLOGICAL DATA FOR CLEANING EVENT:			Notes
---	Month of Landing	July	Determined based off date of landing
T_{AA}	Ambient Daily Average Temperature (˚F)	73.20	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (˚F)	64.50	
T_{AX}	Ambient Daily Maximum Temperature (˚F)	81.90	
v	Monthly Average Wind Speed (mph)	8.50	
P_A	Atmospheric Pressure (psia)	14.26	
I	Monthly Solar Insolation (Btu/ft^2-d)	1,930.0	

LIQUID SURFACE TEMPERATURE. VALUES SHOWN ARE FOR INITIAL DATE OF CLEANING EVENT. DAYS IN SUBSEQUENT MONTHS WILL DIFFER DUE TO DIFFERENT METEOROLOGICAL DATA:			
T_{LA}	Average liquid surface temperature (°R)	532.87	Assumed equal to T_{AA} per note in Eq. 3-6
ΔT_V	Average Daily Vapor Temperature Range (°R)	21.83	Eq. 1-7
T_{LN}	Minimum liquid surface temperature (°R)	527.41	Fig. 7.1-17
T_{LX}	Maximum liquid surface temperature (°R)	538.33	Fig. 7.1-17

INITIALLY STORED LIQUID CHARACTERISTICS. VALUES SHOWN ARE FOR INITIAL DATE OF CLEANING EVENT. DAYS IN SUBSEQUENT MONTHS WILL DIFFER DUE TO DIFFERENT METEOROLOGICAL DATA:

i		P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	**Stored Product or Component in Mixture**	**True vapor pressure at T_{LA} (psia)**	**True vapor pressure at T_{LN} (psia)**	**True vapor pressure at T_{LX} (psia)**	**Liquid MW (lb/lbmol)**	**Vapor MW (lb/lbmol)**	**Liquid Wt. % Specified for Mixture**	**Vapor Wt. Percent Eq. 40-6**	**Footnote Identifying Source of Chemical Properties**
Mixture/Product	**Motor Gasoline RVP 13**	**5.9421**	**5.3594**	**6.5743**	**92.00**	**65.00**	**100.000%**	**100.000%**	**(2)**
	Benzene	0.0054	0.0047	0.0062	120.19	120.19	0.424%	0.169%	(3)
	Biphenyl	0.0000	0.0000	0.0000	78.11	78.11	0.100%	0.000%	(3)
	Cyclohexane	0.0000	0.0000	0.0000	276.33	276.33	0.000%	0.000%	(3)
	Ethylbenzene	0.0002	0.0001	0.0002	154.21	154.21	0.180%	0.007%	(3)
	Hexane (n)	0.0329	0.0288	0.0376	108.14	108.14	1.450%	0.922%	(3)
	Naphthalene	0.0000	0.0000	0.0000	120.19	120.19	0.124%	0.000%	(3)
	Phenol	0.0000	0.0000	0.0000	106.17	106.17	0.509%	0.001%	(3)
	Toluene	0.0005	0.0004	0.0006	128.17	128.17	0.137%	0.016%	(3)
	Trimethylbenzene (1,2,4)	0.0245	0.0199	0.0300	128.17	128.17	100.137%	0.813%	(3)
	Xylene (m)	0.0019	0.0016	0.0022	86.18	86.18	1.236%	0.042%	(3)

TANK CLEANING LOSSES:						Notes:
--	Day Number of Cleaning Event	1	2	3	4	
VAPOR SPACE PURGE LOSSES:						
L_P	**Vapor Space Purge Emissions (lb per Vapor Space Purge)**	**1,721.45**	**--**	**--**	**--**	**Eq. 4-2**
--	Was There a Vapor Space Purge on This Day?	TRUE	FALSE	FALSE	FALSE	Assumed each day has a vapor space purge.
P_{VA}	True vapor pressure at average liquid surface temperature (psia)	5.9421	--	--	--	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume (ft^3)	50,972.34	--	--	--	Eq. 4-3
D	Tank Diameter (ft)	100.00	--	--	--	See 'Tank Information' table above
H_{VO}	Vapor Space Outage, calculated based on roof leg or shell and liquid heel heights (ft)	6.49	--	--	--	Eq. 4-4 or Eq. 4-9
H_S	Tank Shell Height if VFRT, Shell Length if HFRT, or Floating Roof Height if Floating Roof Tank (ft)	6.50	--	--	--	See 'Tank Information' table above
H_{le}	Effective Height of the Stock Liquid and Sludge for the Given Day (ft)	0.01	--	--	--	Specified by user for calculation each vapor space purge
R	Ideal Gas Constant, (psia-ft^3/lbmol-°R)	10.731	--	--	--	Equation constant
$T_V = T_{AA}$	Vapor Temperature (°R) assumed equal to average ambient temperature for month specified	532.87	--	--	--	Notes in Eq. 4-2
M_V	Stock Vapor Molecular Weight (lb/lbmol)	65.00	--	--	--	See Liquid Characteristics table(s) above
--	Liquid Heel Type at Time of Vapor Space Purge	Full Heel	--	--	--	Specified by user for calculation each vapor space purge
S	Saturation Factor for Floating Roof Tanks	0.5000	--	--	--	Full Liquid Heel = 0.6, Partial Liquid Heel = 0.5, Sludge Only = 0.5,
C_{sF}	Filling Saturation Correction Factor for Wind, EFRT with Liquid Heel (dimensionless)	1.0000	--	--	--	Eq. 3-21
CONTINUED FORCED VENTILATION EMISSIONS:						
L_{CV}	**Continued Forced Ventilation Emissions (lb per day)**	**2,557.45**	**1,728.01**	**345.60**	**172.80**	**Minimum of emissions calculated using Eq. 4-10 and 4-12 or 4-13**
L_{CV}	**Limit on Continued Forced Ventilation Emissions (lb per day)**	**8,378.00**	**8,378.00**	**8,378.00**	**8,378.00**	**Eq. 4-12 or Eq. 4-13, as applicable.**
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	See 'Tank Information' table above
F_e	The Fraction of the Sludge with Potential to Evaporate (Wt. fraction)	0.20	0.20	0.20	0.20	Default value
H_{le} or d_s	Average Effective Height/Depth of the Stock Liquid and/or Sludge for the Given Day (in)	0.10	0.10	0.10	0.10	See 'Tank Information' table above
W_l	Density of the stock liquid (lb/gal)	7.10	7.10	7.10	7.10	See 'Tank Information' table above
L_{CV}	**Continued Forced Ventilation Emissions (lb per day)**	**2,557.45**	**1,728.01**	**345.60**	**172.80**	**Eq. 4-10**
Q_V	Daily Average Ventilation Rate (ft^3/min)	8,000.00	8,000.00	8,000.00	8,000.00	Assumed fan rating for cleaning event.
n_{CV}	Duration of Continued Forced Ventilation (days)	1.00	1.00	1.00	1.00	Calculation is done for each day so n_d = 1
t_V	Hours of Forced Ventilation in Day (hr/day)	24.00	24.00	24.00	24.00	Assumed hours per day for cleaning event
C_V	Average Vapor Concentration by Volume During Continued Forced Ventilation	37.00	25.00	5.00	2.50	Assumed concentration for each day of cleaning event
	Units of Vapor Concentration	%LEL	%LEL	%LEL	%LEL	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	See Meteorological Data Above
CG	Calibration Gas Used	Pentane	Pentane	Pentane	Pentane	Assumed for cleaning event
LEL	Lower Explosive Limit (LEL) of Calibration Gas Used	1.50	1.50	1.50	1.50	Table 7.1-5
RF	Monitor Response Factor	1.00	1.00	1.00	1.00	See 'Tank Cleaning Data Entry'
M_{CG}	Calibration Gas Molecular Weight (lb/lbmol)	16.04	16.04	16.04	16.04	See "Chemical Properties Database"
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	Constant
$T_V = T_{AA}$	Vapor Temperature (°R), assumed equal to average ambient temperature for month specified	532.87	532.87	532.87	532.87	Notes in Eq. 4-2

SUMMARY OF TANK CLEANING LOSSES:			Notes:
L_P	Vapor Space Purge Losses for Cleaning Event (lb)	1,721.45	Sum of all vapor space purge losses
L_{CV}	Continued Forced Ventilation Losses for Cleaning Event (lb)	4,803.87	Sum of all continued forced ventilation losses
L_{TL}	**Total Losses for Cleaning Event (lb)**	**6,525.31**	Sum of all vapor space purge and continued forced ventilation losses
L_{TLi}	Benzene Loss per episode (lb)	11.01	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Biphenyl Loss per episode (lb)	0.00	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Cyclohexane Loss per episode (lb)	0.01	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Ethylbenzene Loss per episode (lb)	0.45	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Hexane (n) Loss per episode (lb)	60.16	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Naphthalene Loss per episode (lb)	0.01	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Phenol Loss per episode (lb)	0.04	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Toluene Loss per episode (lb)	1.05	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Trimethylbenzene (1,2,4) Loss per episode (lb)	53.08	Calculated using Equations 40-1 through 40-9.
L_{TLi}	Xylene (m) Loss per episode (lb)	2.72	Calculated using Equations 40-1 through 40-9.

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Motor gasoline with RVP specified and distillation slope of 3.

(3) Default properties for organic HAPs from AP-42 Chapter 7.1.

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CLEANING EVENT DETAILS			Notes:
---	**Tank Number**	**Tank 103**	

TANK INFORMATION			Notes:
H_{LI}	Floating Roof Height Above Tank Bottom (ft)	5.0	Specified by user for tank cleaning event
---	Tank Type	EFRT	Physical property of tank
D	Tank Diameter (ft)	48.0	Physical property of tank
---	External Shell Color/Shade	White	Physical property of tank
---	Shell Paint Condition	Average	Physical property of tank
α_S	Shell surface solar absorptance, dimensionless	0.25	Factors from Table 7.1-6 based on shell color/shade and condition
---	Tank Shell Construction	Welded	Physical property of tank
---	Tank Shell Internal Condition	Light Rust	Physical property of tank
---	Insulation Installed on Tank?	No Insulation	Physical property of tank

METEOROLOGICAL DATA FOR CLEANING EVENT:			Notes
---	Month of Landing	July	Determined based off date of landing
T_{AA}	Ambient Daily Average Temperature (°F)	73.20	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (°F)	64.50	
T_{AX}	Ambient Daily Maximum Temperature (°F)	81.90	
v	Monthly Average Wind Speed (mph)	8.50	
P_A	Atmospheric Pressure (psia)	14.26	
I	Monthly Solar Insolation (Btu/ft^2-d)	1,930.0	

LIQUID SURFACE TEMPERATURE. VALUES SHOWN ARE FOR INITIAL DATE OF CLEANING EVENT. DAYS IN SUBSEQUENT MONTHS WILL DIFFER DUE TO DIFFERENT METEOROLOGICAL DATA:			
T_{LA}	Average liquid surface temperature (°R)	532.87	Assumed equal to T_{AA} per note in Eq. 3-6
ΔT_V	Average Daily Vapor Temperature Range (°R)	21.83	Eq. 1-7
T_{LN}	Minimum liquid surface temperature (°R)	527.41	Fig. 7.1-17
T_{LX}	Maximum liquid surface temperature (°R)	538.33	Fig. 7.1-17

INITIALLY STORED LIQUID CHARACTERISTICS. VALUES SHOWN ARE FOR INITIAL DATE OF CLEANING EVENT. DAYS IN SUBSEQUENT MONTHS WILL DIFFER DUE TO DIFFERENT METEOROLOGICAL DATA:

i		P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	**Stored Product or Component in Mixture**	**True vapor pressure at T_{LA} (psia)**	**True vapor pressure at T_{LN} (psia)**	**True vapor pressure at T_{LX} (psia)**	**Liquid MW (lb/lbmol)**	**Vapor MW (lb/lbmol)**	**Liquid Wt. % Specified for Mixture**	**Vapor Wt. Percent Eq. 40-6**	**Footnote Identifying Source of Chemical Properties**
Mixture/Product	**Motor Gasoline RVP 13**	**0.1212**	--	--	**46.07**	**46.07**	**100.000%**	**100.000%**	**(2)**

TANK CLEANING LOSSES:						Notes:
--	Day Number of Cleaning Event	1	2	3	4	
VAPOR SPACE PURGE LOSSES:						
L_P	**Vapor Space Purge Emissions (lb per Vapor Space Purge)**	**5.74**	**--**	**--**	**--**	**Eq. 4-2**
--	Was There a Vapor Space Purge on This Day?	TRUE	FALSE	FALSE	FALSE	Assumed each day has a vapor space purge.
P_{VA}	True vapor pressure at average liquid surface temperature (psia)	0.1212	--	--	--	See Liquid Characteristics table(s) above
V_V	Vapor Space Volume (ft^3)	11,744.03	--	--	--	Eq. 4-3
D	Tank Diameter (ft)	48.00	--	--	--	See 'Tank Information' table above
H_{VO}	Vapor Space Outage, calculated based on roof leg or shell and liquid heel heights (ft)	6.49	--	--	--	Eq. 4-4 or Eq. 4-9
H_S	Tank Shell Height if VFRT, Shell Length if HFRT, or Floating Roof Height if Floating Roof Tank (ft)	6.50	--	--	--	See 'Tank Information' table above
H_{HI}	Effective Height of the Stock Liquid and Sludge for the Given Day (ft)	0.01	--	--	--	Specified by user for calculation each vapor space purge
R	Ideal Gas Constant, (psia-ft^3/lbmol-°R)	10.731	--	--	--	Equation constant
$T_V = T_{AA}$	Vapor Temperature (°R) assumed equal to average ambient temperature for month specified	532.87	--	--	--	Notes in Eq. 4-2
M_V	Stock Vapor Molecular Weight (lb/lbmol)	46.07	--	--	--	See Liquid Characteristics table(s) above
--	Liquid Heel Type at Time of Vapor Space Purge	Full Heel	--	--	--	Specified by user for calculation each vapor space purge
S	Saturation Factor for Floating Roof Tanks	0.5000	--	--	--	Full Liquid Heel = 0.6, Partial Liquid Heel = 0.5, Sludge Only = 0.5, and Drain Dry = 0 per
C_{SF}	Filling Saturation Correction Factor for Wind, EFRT with Liquid Heel (dimensionless)	1.0000	--	--	--	Eq. 3-21
CONTINUED FORCED VENTILATION EMISSIONS:						
L_{CV}	**Continued Forced Ventilation Emissions (lb per day)**	**1,930.29**	**1,728.01**	**345.60**	**172.80**	**Minimum of emissions calculated using Eq. 4-10 and 4-12 or 4-13.**
L_{CV}	**Limit on Continued Forced Ventilation Emissions (lb per day)**	**1,930.29**	**1,930.29**	**1,930.29**	**1,930.29**	**Eq. 4-12 or Eq. 4-13, as applicable.**
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	See 'Tank Information' table above
F_s	The Fraction of the Sludge with Potential to Evaporate (Wt. fraction)	0.20	0.20	0.20	0.20	Default value
H_{HI} or d_L	Average Effective Height/Depth of the Stock Liquid and/or Sludge for the Given Day (in)	0.10	0.10	0.10	0.10	See 'Tank Information' table above
W_L	Density of the stock liquid (lb/gal)	7.10	7.10	7.10	7.10	See 'Tank Information' table above
L_{CV}	**Continued Forced Ventilation Emissions (lb per day)**	**2,557.45**	**1,728.01**	**345.60**	**172.80**	**Eq. 4-10**
Q_V	Daily Average Ventilation Rate (ft^3/min)	8,000.00	8,000.00	8,000.00	8,000.00	Assumed fan rating for cleaning event.
n_{CV}	Duration of Continued Forced Ventilation (days)	1.00	1.00	1.00	1.00	Calculation is done for each day so n_b = 1
t_V	Hours of Forced Ventilation in Day (hr/day)	24.00	24.00	24.00	24.00	Assumed hours per day for cleaning event
C_V	Average Vapor Concentration by Volume During Continued Forced Ventilation	37.00	25.00	5.00	2.50	Assumed concentration for each day of cleaning event
	Units of Vapor Concentration	%LEL	%LEL	%LEL	%LEL	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	See Meteorological Data Above
CG	Calibration Gas Used	Pentane	Pentane	Pentane	Pentane	Assumed for cleaning event
LEL	Lower Explosive Limit (LEL) of Calibration Gas Used	1.50	1.50	1.50	1.50	Table 7.1-5
RF	Monitor Response Factor	1.00	1.00	1.00	1.00	See 'Tank Cleaning Data Entry'
M_{CG}	Calibration Gas Molecular Weight (lb/lbmol)	16.04	16.04	16.04	16.04	See "Chemical Properties Database"
R	Ideal Gas Constant (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	Constant
$T_V = T_{AA}$	Vapor Temperature (°R), assumed equal to average ambient temperature for month specified	532.87	532.87	532.87	532.87	Notes in Eq. 4-2

SUMMARY OF TANK CLEANING LOSSES:			Notes:
L_P	Vapor Space Purge Losses for Cleaning Event (lb)	5.74	Sum of all vapor space purge losses
L_{CV}	Continued Forced Ventilation Losses for Cleaning Event (lb)	4,176.70	Sum of all continued forced ventilation losses
L_{TL}	**Total Losses for Cleaning Event (lb)**	**4,182.44**	Sum of all vapor space purge and continued forced ventilation losses

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020

(2) Motor gasoline with RVP specified and distillation slope of 3.

(3) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-Emit Calculations
Table 8: Fuel Oil Dispensing (IA)

VOC Emissions - Fuel Oil Dispenser

Maximum Throughput 600,000 gal/yr equals 68.49 gal/hr

	Maximum Annual Throughput (gal/hr)	VOC Emission Factor (mg/l)	VOC Emission Factor (lb/1000 gal)	Emission Rate (lbs/hr)	Emission Rate (lbs/day)	Emission Rate (lbs/yr)	Emission Rate (TPY)
Fuel Oil	68.5	na	0.0176	0.001	0.03	10.56	0.005

VOC Loading Loss emission factor for No. 1 Fuel Oil and No. 2 Fuel Oil is calculated as follows (based on AP 42 section 5.2):

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

where: L_L = Loading Loss (lb/1000 gal)
S = Saturation factor (see Table 5.2-1)
P = True Vapor Pressure of Liquid Loaded (psia)
M = Molecular Weight of Vapors (lb/lb-mole)
T = Temperature of Bulk Liquid Loaded, deg. R (deg. F + 460)

	No.1 Fuel Oil	No. 2 Fuel Oil
S	1.00	1.00
P	0.0055	0.0042
M	130	130
Ave. Temp deg. F	46.3	46.3
L_L	0.0176	0.0134

Notes:
Use No. 1 Fuel Oil for Loading Loss factor since it is more conservative.

	Insignificant Activity Criteria		**Does this units qualify as a IA?**
	To qualify as an insignificant activity under		Yes, 7007.1300, subp. 3(F)
	Minn. R. 7007.1300, subp. 3F		
CO	1000	TPY actual emissions	
	5.7	lb/hr	
NOx, SO2, PM, PM10, VOCs	1	TPY actual emissions	
	2.28	lb/hr	
CO2e	10000	TPY	
	1000	TPY actual emissions	

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Insignificant Activity Criteria		Does this unit qualify as a IA?
To qualify as an insignificant activity under		Yes, 7007.1300, subp. 3(F)
Minn. R. 7007.1300, subp. 3F		
CO	1000 TPY actual emissions	
	4000 lb/hr	
NOx, SO2, PM, PM10, VOCs	1 TPY actual emissions	
	2000 lb/hr	
CO2e	1000 TPY	
	1000 TPY actual emissions	

Identification

Tank Number:	DA Tank
Location:	Circle K Terminal Group Newport
Type of Tank:	Horizontal Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	9.00	Tank Volume (bbl):	142
Net Throughput (bbl/yr):	1,721	Turnovers Per Year:	12.15
Maximum Pumping Rate (bbl/hr):	283		
Shell Length (ft):	25		
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25

Fixed Roof Characteristics

Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (αR):	0.25

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03	Tank Operating Pressure (psig, zero means ambient):	0.00

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	
T_{AN}	Ambient Daily Minimum Temperature (°F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (°F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}					P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	x_i	y_i	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at TLA (psia)	True vapor pressure at TLN (psia)	True vapor pressure at TLX (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	Footnote Identifying Source of Chemical Properties
Mixture/Product	**Gas Additive**	**January**	**16.36**	**13.19**	**19.53**	**1-27**	**12.1010**	**8,907.0**	--	**0.0013**	**0.0012**	**0.0015**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	3.40%	4.99%	0.96%	0.95%	(4)
Mixture/Product	**Gas Additive**	**February**	**22.29**	**18.74**	**25.84**	**1-27**	**12.1010**	**8,907.0**	--	**0.0017**	**0.0015**	**0.0019**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	3.40%	4.99%	1.07%	1.05%	(4)
Mixture/Product	**Gas Additive**	**March**	**34.45**	**30.27**	**38.62**	**1-27**	**12.1010**	**8,907.0**	--	**0.0027**	**0.0023**	**0.0031**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	3.40%	4.99%	1.29%	1.27%	(4)
Mixture/Product	**Gas Additive**	**April**	**49.74**	**44.64**	**54.84**	**1-27**	**12.1010**	**8,907.0**	--	**0.0046**	**0.0038**	**0.0055**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0001	128.17	128.17	3.40%	4.99%	1.61%	1.58%	(4)
Mixture/Product	**Gas Additive**	**May**	**61.78**	**56.43**	**67.14**	**1-27**	**12.1010**	**8,907.0**	--	**0.0069**	**0.0058**	**0.0082**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0002	128.17	128.17	3.40%	4.99%	1.87%	1.85%	(4)
Mixture/Product	**Gas Additive**	**June**	**71.82**	**66.40**	**77.23**	**1-27**	**12.1010**	**8,907.0**	--	**0.0095**	**0.0080**	**0.0112**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0002	0.0002	0.0003	128.17	128.17	3.40%	4.99%	2.11%	2.08%	(4)
Mixture/Product	**Gas Additive**	**July**	**76.39**	**71.01**	**81.77**	**1-27**	**12.1010**	**8,907.0**	--	**0.0109**	**0.0093**	**0.0129**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0002	0.0002	0.0003	128.17	128.17	3.40%	4.99%	2.22%	2.19%	(4)
Mixture/Product	**Gas Additive**	**August**	**73.89**	**68.85**	**78.92**	**1-27**	**12.1010**	**8,907.0**	--	**0.0101**	**0.0086**	**0.0118**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0002	0.0002	0.0003	128.17	128.17	3.40%	4.99%	2.16%	2.13%	(4)
Mixture/Product	**Gas Additive**	**September**	**64.49**	**59.75**	**69.23**	**1-27**	**12.1010**	**8,907.0**	--	**0.0075**	**0.0064**	**0.0087**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0002	128.17	128.17	3.40%	4.99%	1.94%	1.91%	(4)
Mixture/Product	**Gas Additive**	**October**	**50.70**	**46.72**	**54.68**	**1-27**	**12.1010**	**8,907.0**	--	**0.0047**	**0.0041**	**0.0054**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0001	128.17	128.17	3.40%	4.99%	1.63%	1.60%	(4)
Mixture/Product	**Gas Additive**	**November**	**35.08**	**32.07**	**38.08**	**1-27**	**12.1010**	**8,907.0**	--	**0.0027**	**0.0024**	**0.0030**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	3.40%	4.99%	1.31%	1.29%	(4)
Mixture/Product	**Gas Additive**	**December**	**21.69**	**18.86**	**24.53**	**1-27**	**12.1010**	**8,907.0**	--	**0.0017**	**0.0015**	**0.0018**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	3.40%	4.99%	1.06%	1.04%	(4)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant

L_S	**Standing Losses (lb)**	**0.02**	**0.02**	**0.05**	**0.09**	**0.15**	**0.19**	**0.22**	**0.19**	**0.13**	**0.07**	**0.03**	**0.02**	**1.19**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft3)	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft3)	0.0000	0.0000	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0000		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0225	0.0253	0.0296	0.0359	0.0370	0.0368	0.0362	0.0338	0.0321	0.0271	0.0201	0.0194		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9997	0.9997	0.9995	0.9991	0.9987	0.9982	0.9980	0.9981	0.9986	0.9991	0.9995	0.9997		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft3)**	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22	795.22		Calculated Using Equation 1-3
D	Tank Diameter (ft)	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00		See 'Tank Identification and Physical Characteristics' table above
L	Tank Shell Length (ft)	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000		Calculated Using Equation 1-16
D_E	Effective Diameter of HFRT (ft)	16.926	16.926	16.926	16.926	16.926	16.926	16.926	16.926	16.926	16.926	16.926	16.926		See 'Tank Identification and Physical Characteristics' table above
H_E	Effective Height of HFRT (ft)	7.069	7.069	7.069	7.069	7.069	7.069	7.069	7.069	7.069	7.069	7.069	7.069		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0000**	**0.0000**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0000**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0013	0.0017	0.0027	0.0046	0.0069	0.0095	0.0109	0.0101	0.0075	0.0047	0.0027	0.0017		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.03	481.96	494.12	509.41	521.45	531.49	536.06	533.56	524.16	510.37	494.75	481.36		Calculated Using Equation 1-28
H_S/D	Shell Heigh to Diameter Ratio (ft/ft)	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42		Shell Height Divided by Diameter
ΔT_A	Daily Average Ambient Temperature Range (°R)	14.50	14.90	16.00	18.80	18.70	18.10	17.40	17.30	18.20	16.90	13.50	13.30		Calculated Using Equation 1-11
R	Ideal Gas Constant R (psia-ft3)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	476.47	482.64	495.12	510.74	523.00	533.17	537.80	535.05	525.30	511.10	495.20	481.71		Calculated Using Equation 1-32
K_E	**Vapor Space Expansion Factor**	**0.0225**	**0.0253**	**0.0296**	**0.0359**	**0.0370**	**0.0368**	**0.0362**	**0.0338**	**0.0321**	**0.0271**	**0.0201**	**0.0194**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.68	14.20	16.69	20.38	21.42	21.66	21.51	20.15	18.97	15.92	12.02	11.35		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.0003	0.0005	0.0008	0.0016	0.0024	0.0033	0.0037	0.0032	0.0023	0.0013	0.0006	0.0004		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0013	0.0017	0.0027	0.0046	0.0069	0.0095	0.0109	0.0101	0.0075	0.0047	0.0027	0.0017		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0012	0.0015	0.0023	0.0038	0.0058	0.0080	0.0093	0.0086	0.0064	0.0041	0.0024	0.0015		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0015	0.0019	0.0031	0.0055	0.0082	0.0112	0.0129	0.0118	0.0087	0.0054	0.0030	0.0018		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.03	481.96	494.12	509.41	521.45	531.49	536.06	533.56	524.16	510.37	494.75	481.36		Calculated Using Equation 1-28
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	472.86	478.41	489.94	504.31	516.10	526.07	530.68	528.52	519.42	506.39	491.74	478.53		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	479.20	485.51	498.29	514.51	526.81	536.90	541.44	538.59	528.90	514.35	497.75	484.20		Calculated Using Figure 7-1.17
K_S	**Vented Vapor Saturation Factor**	**0.9997**	**0.9997**	**0.9995**	**0.9991**	**0.9987**	**0.9982**	**0.9980**	**0.9981**	**0.9986**	**0.9991**	**0.9995**	**0.9997**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0013	0.0017	0.0027	0.0046	0.0069	0.0095	0.0109	0.0101	0.0075	0.0047	0.0027	0.0017		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343	3.5343		Equal to one half of the effective height per notes under Equation 1-15
L_W	**Working Losses (lb/month)**	**0.03**	**0.03**	**0.05**	**0.09**	**0.13**	**0.17**	**0.20**	**0.18**	**0.14**	**0.09**	**0.05**	**0.03**	**1.20**	**Calculated Using Equation 1-35**
Q	Throughput (gal/month)	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50	6,022.50		User-specified monthly throughput
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
N	Monthly Turnovers	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		Calculated Using Equation 1-36
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
-	Condition for K_B High Breather Vent Settings	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equation 1-40
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equation 1-41
L_T	**Total Losses (lb/month)**	**0.05**	**0.06**	**0.10**	**0.18**	**0.27**	**0.36**	**0.42**	**0.37**	**0.27**	**0.17**	**0.09**	**0.05**	**2.39**	**Calculated Using Equation 1-1 or 2-1**
L_{TI}	Naphthalene Losses (lb/month)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.04	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.05**	**0.07**	**0.10**	**0.17**	**0.25**	**0.34**	**0.39**	**0.37**	**0.28**	**0.18**	**0.11**	**0.07**	**0.39**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-gal/lbmol-°R)	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	476.03	481.96	494.12	509.41	521.45	531.49	536.06	533.56	524.16	510.37	494.75	481.36		See "Monthly Total Emissions Report" above
F_{RM}	Maximum Filling Rate for Tank (gal/hr)	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00	11,897.00		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.05**	**0.07**	**0.10**	**0.17**	**0.25**	**0.34**	**0.39**	**0.37**	**0.28**	**0.18**	**0.11**	**0.07**	**0.39**	Calculated Using Equation 2-1
L_{TI}	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

(3) Default properties for No. 2 Fuel Oil from AP-42 Chapter 7.1.

(4) Default properties for organic HAPs from AP-42 Chapter 7.1.

Circle K Terminal Group Newport
Potential-to-emit Calculations
Detailed Storage Tank Emission Calculations - Routine Losses

Insignificant Activity Criteria		Does this unit qualify as a IA?
To qualify as an insignificant activity under		Yes, 7007.1300, subp. 3(F)
Minn. R. 7007.1300, subp. 3F		
CO	1000 TPY actual emissions	
	4000 lb/hr	
NOx, SO2, PM, PM10, VOCs	1 TPY actual emissions	
	2000 lb/hr	
CO2e	1000 TPY	
	1000 TPY actual emissions	

Identification

Tank Number:	Tank Diesel
Location:	Circle K Terminal Group Newport
Type of Tank:	Vertical Fixed Roof Tank

Tank Dimensions, Throughput, and Temperature Profile

Physical Characteristics

Diameter (ft):	11.00	Tank Volume (bbl):	372		
Net Throughput (bbl/yr):	14,286	Turnovers Per Year:	17.96	38.40245776	
Maximum Pumping Rate (bbl/hr):	372				
Shell Height (ft):	25	Maximum Liquid Height (ft):	47	Average Liquid Height (ft): 23.5	Minimum Liquid Height (ft): 0.0
Is Tank Underground (y / n)	No				
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation		

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average	Tank Shell Paint Solar Absorptance (αS):	0.25

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.00		
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	Average	Tank Roof Paint Solar Absorptance (αR):	0.25

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03	Tank Operating Pressure (psig, zero means ambient):	0.00

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (˚F)	22.80	28.50	40.60	56.70	68.30	77.80	81.90	79.80	71.50	57.80	41.00	27.70	54.53	AP-42 Chapter 7.1, Organic Liquid Storage Tanks, June 2020, Table 7.1-7. Values for Minneapolis-St. Paul, MN.
T_{AN}	Ambient Daily Minimum Temperature (˚F)	8.30	13.60	24.60	37.90	49.60	59.70	64.50	62.50	53.30	40.90	27.50	14.40	38.07	
T_{AA}	Ambient Daily Average Temperature (˚F)	15.55	21.05	32.60	47.30	58.95	68.75	73.20	71.15	62.40	49.35	34.25	21.05	46.30	
v	Monthly Average Wind Speed (mph)	9.40	9.40	9.80	10.70	10.30	9.20	8.50	8.30	9.20	9.80	9.60	9.20	9.45	
P_A	Atmospheric Pressure (psia)	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	14.26	
I	Monthly Solar Insolation (Btu/ft2-day)	490.00	752.00	1,116.00	1,476.00	1,712.00	1,856.00	1,930.00	1,655.00	1,265.00	814.00	501.00	389.00	1,163.00	

Stored Liquid Characteristics (See Footnote 1)

i			T_{LA}	T_{LN}	T_{LX}				P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	x_i	y_i	Z_{Vi}	Footnote Identifying Source of Chemical Properties
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Equation Used for Vapor Pressure Calculation	Vapor Pressure Constant A	Vapor Pressure Constant B	Vapor Pressure Constant C (if applicable)	True vapor pressure at TLA (psia)	True vapor pressure at TLN (psia)	True vapor pressure at TLX (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Liquid Mole % of Components (40-4)	Vapor Mole % of Components (40-5)	Vapor Weight Percent Eq. 40-6	
Mixture/Product	**Distillate**	**January**	**16.20**	**12.55**	**19.86**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0013**	**0.0012**	**0.0015**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	2.60%	3.81%	0.74%	0.72%	(4)
Mixture/Product	**Distillate**	**February**	**22.05**	**18.07**	**26.03**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0017**	**0.0014**	**0.0020**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	2.60%	3.81%	0.81%	0.80%	(4)
Mixture/Product	**Distillate**	**March**	**34.09**	**29.53**	**38.65**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0026**	**0.0022**	**0.0031**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	2.60%	3.81%	0.98%	0.97%	(4)
Mixture/Product	**Distillate**	**April**	**49.27**	**43.76**	**54.78**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0045**	**0.0037**	**0.0054**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0000	0.0001	128.17	128.17	2.60%	3.81%	1.22%	1.20%	(4)
Mixture/Product	**Distillate**	**May**	**61.23**	**55.53**	**66.93**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0068**	**0.0056**	**0.0081**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0001	128.17	128.17	2.60%	3.81%	1.42%	1.40%	(4)
Mixture/Product	**Distillate**	**June**	**71.23**	**65.53**	**76.93**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0093**	**0.0078**	**0.0111**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0002	128.17	128.17	2.60%	3.81%	1.60%	1.58%	(4)
Mixture/Product	**Distillate**	**July**	**75.77**	**70.16**	**81.39**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0107**	**0.0090**	**0.0128**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0002	0.0001	0.0002	128.17	128.17	2.60%	3.81%	1.68%	1.66%	(4)
Mixture/Product	**Distillate**	**August**	**73.36**	**68.02**	**78.70**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0100**	**0.0084**	**0.0118**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0002	0.0001	0.0002	128.17	128.17	2.60%	3.81%	1.64%	1.62%	(4)
Mixture/Product	**Distillate**	**September**	**64.09**	**58.91**	**69.27**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0074**	**0.0063**	**0.0088**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0001	0.0001	128.17	128.17	2.60%	3.81%	1.47%	1.45%	(4)
Mixture/Product	**Distillate**	**October**	**50.44**	**45.96**	**54.92**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0001	0.0000	0.0001	128.17	128.17	2.60%	3.81%	1.24%	1.22%	(4)
Mixture/Product	**Distillate**	**November**	**34.92**	**31.48**	**38.36**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0027**	**0.0024**	**0.0031**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	2.60%	3.81%	1.00%	0.98%	(4)
Mixture/Product	**Distillate**	**December**	**21.57**	**18.27**	**24.86**	**1-27**	**12.1010**	**8,907.0**	**--**	**0.0016**	**0.0015**	**0.0019**	**188.00**	**130.00**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**(3)**
	Naphthalene					1-28 & 40-3	7.1460	1,831.6	211.82	0.0000	0.0000	0.0000	128.17	128.17	2.60%	3.81%	0.81%	0.79%	(4)

Monthly Total Emissions Report (See Footnote 1)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
n_D	Number of Days in Month	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00		Constant

L_S	**Standing Losses (lb)**	**0.00**	**0.01**	**0.01**	**0.02**	**0.03**	**0.04**	**0.05**	**0.04**	**0.03**	**0.02**	**0.01**	**0.01**	**0.28**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft3)	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft3)	0.0000	0.0000	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0000		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0265	0.0289	0.0328	0.0392	0.0397	0.0390	0.0380	0.0361	0.0355	0.0310	0.0237	0.0232		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9999	0.9998	0.9997	0.9996	0.9993	0.9991	0.9990	0.9990	0.9993	0.9995	0.9997	0.9998		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft3)**	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23	174.23		Calculated Using Equation 1-3
D	Tank Diameter (ft)	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	23.500	23.500	23.500	23.500	23.500	23.500	23.500	23.500	23.500	23.500	23.500	23.500		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333		Calculated Using 1-17
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft3)**	**0.0000**	**0.0000**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0000**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0013	0.0017	0.0026	0.0045	0.0068	0.0093	0.0107	0.0100	0.0074	0.0047	0.0027	0.0016		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.87	481.72	493.76	508.94	520.90	530.90	535.44	533.03	523.76	510.11	494.59	481.24		Calculated Using Equation 1-27
H_S/D	Shell Heigh to Diameter Ratio (ft/ft)	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27		Shell Height Divided by Diameter
ΔT_A	Daily Average Ambient Temperature Range (°R)	14.50	14.90	16.00	18.80	18.70	18.10	17.40	17.30	18.20	16.90	13.50	13.30		Calculated Using Equation 1-11
R	Ideal Gas Constant R (psia-ft3)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	475.59	481.28	493.11	508.08	519.90	529.81	534.32	532.06	523.02	509.63	494.30	481.01		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	476.16	482.16	494.41	509.80	521.90	531.98	536.57	533.99	524.50	510.58	494.88	481.47		Calculated Using Equation 1-32
K_E	**Vapor Space Expansion Factor**	**0.0265**	**0.0289**	**0.0328**	**0.0392**	**0.0397**	**0.0390**	**0.0380**	**0.0361**	**0.0355**	**0.0310**	**0.0237**	**0.0232**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.61	15.93	18.23	22.03	22.80	22.80	22.45	21.36	20.72	17.92	13.77	13.18		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.87	481.72	493.76	508.94	520.90	530.90	535.44	533.03	523.76	510.11	494.59	481.24		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	472.22	477.74	489.20	503.43	515.20	525.20	529.83	527.69	518.58	505.63	491.15	477.94		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	479.53	485.70	498.32	514.45	526.60	536.60	541.06	538.37	528.94	514.59	498.03	484.53		Calculated Using Figure 7-1.17
K_S	**Vented Vapor Saturation Factor**	**0.9999**	**0.9998**	**0.9997**	**0.9996**	**0.9993**	**0.9991**	**0.9990**	**0.9990**	**0.9993**	**0.9995**	**0.9997**	**0.9998**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0013	0.0017	0.0026	0.0045	0.0068	0.0093	0.0107	0.0100	0.0074	0.0047	0.0027	0.0016		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333	1.8333		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**0.23**	**0.28**	**0.43**	**0.72**	**1.05**	**1.41**	**1.62**	**1.51**	**1.14**	**0.74**	**0.44**	**0.28**	**9.85**	**Calculated Using Equation 1-35**
Q	Throughput (gal/month)	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00		User-specified monthly throughput
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
N	Monthly Turnovers	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50		Calculated Using Equation 1-36
ΣH_{QI}	Monthly Sum of Increases in Liquid Level (ft/month)	70.33	70.33	70.33	70.33	70.33	70.33	70.33	70.33	70.33	70.33	70.33	70.33		Calculated Using Equation 1-37
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
-	Condition for KB High Breather Vent Settings	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equation 1-40
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equation 1-41
L_T	**Total Losses (lb/month)**	**0.23**	**0.29**	**0.44**	**0.74**	**1.08**	**1.46**	**1.67**	**1.55**	**1.17**	**0.76**	**0.45**	**0.28**	**10.12**	**Calculated Using Equation 1-1 or 2-1**
L_{TI}	Naphthalene Losses (lb/month)	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.03	0.02	0.01	0.00	0.00	0.14	Calculated using Equations 40-1 through 40-9

Maximum Hourly Emissions Report (See Footnote 2)

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.07**	**0.09**	**0.14**	**0.22**	**0.33**	**0.44**	**0.51**	**0.47**	**0.36**	**0.23**	**0.14**	**0.09**	**0.51**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-gal/lbmol-°R)	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273	80.273		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	475.87	481.72	493.76	508.94	520.90	530.90	535.44	533.03	523.76	510.11	494.59	481.24		See "Monthly Total Emissions Report" above
F_{RM}	Maximum Filling Rate for Tank (gal/hr)	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00	15,639.00		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.07**	**0.09**	**0.14**	**0.22**	**0.33**	**0.44**	**0.51**	**0.47**	**0.36**	**0.23**	**0.14**	**0.09**	**0.51**	Calculated Using Equation 2-1
L_{TI}	Naphthalene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9

Notes:

(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.

(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

(3) Default properties for No. 2 Fuel Oil from AP-42 Chapter 7.1.

(4) Default properties for Naphthalene from AP-42 Chapter 7.1.

AP-42, Section 13.2.2

$E = k * (s/12)^a * (W/3)^b * [(365-P)/365]$

where:

E = Emission factor (lb/VMT, vehicle miles traveled)
k = Particle size multiplier (lb/VMT) from AP-42, Table 13.2.2-2.
a,b = Empirical constants (a, b) from AP-42, Table 13.2.2-2.
s = Road surface material silt content (%) is from AP-42 Table 13.2.1-2 for the ADT category of <500
W = Mean vehicle weight based on the "fleet" average weight of all vehicles traveling the road.
P = Number of days in a year with at least 0.01 in of precipitation, P = 120 days

Constants on Industrial Roads

Constant	PM	PM_{10}	$PM_{2.5}$
k	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45
P	120	120	120

Unpaved Roads Emissions

Traffic Type	Miles Per Day	Avg. Veh. Weight (W) (Tons)	Avg Silt Content (s) (%)	Vehicle Emission Factor (E) (lb/VMT)			Uncontrolled Emissions (lb/hr)			Dust Control Strategy		Controlled Emissions (lb/hr)		
				PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	Control Method	Control Efficiency (%)	PM	PM_{10}	$PM_{2.5}$
Pickup	1.8	30.0	0.6	1.14	0.19	0.02	0.09	0.01	0.00	none	0.0	0.09	0.01	0.00
Total							***8.54E-02***	***1.44E-02***	***1.44E-03***			***8.54E-02***	***1.44E-02***	***1.44E-03***
							ton/yr					ton/yr		
Pickup							0.37	0.06	0.01	none	0.0	0.37	0.06	0.01
Total							***3.74E-01***	***6.29E-02***	***6.29E-03***			***3.74E-01***	***6.29E-02***	***6.29E-03***

NOTE: Data for traffic miles was supplied by the Permittee

Insignificant Activity Criteria

To qualify as an insignificant activity unde

Minn. R. 7007.1300, subp. 3F

Does this unit qualify as a IA?

Yes, 7007.1300, subp. 3(F)

CO	1000	TPY actual emissions
	4000	lb/hr
NOx, SO2, PM, PM10, VOCs	1	TPY actual emissions
	2000	lb/hr
CO2e	1000	TPY
	1000	TPY actual emissions

Attachment 2 – Subject item inventory and facility requirements

SI List

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Category	SI Type	Subject Item ID	Delta Designation	Description	
Activity	Insignificant Air Emissions Activity	ACTV 1	Null	All IAs	
Agency Interest	Conventional Site	AISI 1686	Null	Null	
Component Group	Air Component Group	COMG 1	GP001	Storage Tanks	
		COMG 2	GP002	40 CFR pt. 63, subp. BBBBBB Requirements - Enforcement Not Delegated to MPCA	
		COMG 4	Null	Total Facility VOC Limits	
Equipment	Aboveground Storage Tank	EQUI 9	TK001	Tank 103 Ethanol	
		EQUI 10	TK002	Tank 104 Ethanol	
		EQUI 11	TK003	Tank 105 Ethanol	
		EQUI 12	TK004	Tank 106 Gasoline	
		EQUI 13	TK005	Tank 107 Gasoline	
		EQUI 14	TK006	Tank 108 Gasoline	
		EQUI 15	TK007	Tank 109 Gasoline	
		EQUI 16	TK008	Tank 110 Gasoline	
		EQUI 17	TK009	Tank 111 Gasoline	
		EQUI 18	TK010	Tank 112 Gasoline	
	Continuous Emission Monitor	EQUI 4	MR002	VRU CEMS	
	Data Acquisition System	EQUI 1	DA001	Pilot Flame UV Light Signal	
		EQUI 2	DA002	VRU DAS	
	Loading-Unloading Equipment	EQUI 8	EU001	Loading Rack	
	Parametric Monitor	EQUI 3	MR001	Temperature reading monitor	
	Reciprocating IC Engine	EQUI 6	EU004	Diesel emergency generator	
		EQUI 55	Null	Reciprocating IC Engine	
Fugitive	Equipment Leaks	FUGI 1	Null	Valves, Flanges, Seals	
	Material Handling/Transfer/Storage	FUGI 2	Null	Tanker Purging	
Structure	Stack/Vent	STRU 2	SV003	VRU	
		STRU 3	SV005	Emergency Diesel Generator	
		STRU 4	SV001	Loading Rack 1 - gasoline	
		STRU 6	Null	Natural Gas Emergency Generator	
Total Facility	Air Quality Total Facility	TFAC 1	16300010	Circle K Terminal Group	
Treatment	047-Vapor Recyc Sys-Condensers, Hoods, ..	TREA 2	CE002	Vapor Recovery Unit (VRU)	
	131-Thermal Oxidizer	TREA 5	Null	Vapor Combustion Unit	

Insignificant Activities

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Category	SI Type	Status Description	Sub Attribute Description	
Activity	Insignificant Air Emissions Activity	Active / Existing	Minn. R. 7007.1300, subp. 3(C)(2)	
			Minn. R. 7007.1300, subp. 3(F)	

Emission Units 2

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Type	Subject Item ID	Delta Designation	Description	Manufacturer	Model	Max Design Capacity	Max Design Capacity Units	Material	Engine Use	Firing Method	Engine Displacement	Engine Displacement Units	Construction Start Date	Operation Start Date	Modification Date	
Reciprocating IC Engine	EQUI 6	EU004	Diesel emergency generator	Caterpiller	C15 S/N C5E03760	619	horsepower/each	Electrical Energy	Emergency/blacks..	CI	5,985	total cubic centimeters	5/28/2013	5/28/2013	Null	
	EQUI 55	Null	Reciprocating IC Engine	GENERAC	QT036	503	cubic feet/hours	Natural Gas	Emergency/blacks..	SI-4SLB	0.6	liters per cylinder	12/1/2009	12/1/2009	Null	

Emission Units 3

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Type	Subject Item ID	Delta Designation	Description	Manufacturer	Model	Max Design Capacity	Max Design Capacity Units	Material	Construction Start Date	Operation Start Date	Modification Date	
Loading-Unloading Equipment	EQUI 8	EU001	Loading Rack	Emco-Wheaton	NA	2,400	gallons/minutes	Fuel	10/15/2008	10/15/2008	Null	

Component Groups

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item ID	Delta Designation	Description	Group Member ID	
COMG 1	GP001	Storage Tanks	EQUI 9	
			EQUI 10	
			EQUI 11	
			EQUI 12	
			EQUI 13	
			EQUI 14	
			EQUI 15	
			EQUI 16	
			EQUI 17	
			EQUI 18	
COMG 2	GP002	40 CFR pt. 63, subp. BBBBBB Requirements - Enforcement Not Delegated to MPCA	EQUI 3	
			EQUI 4	
			EQUI 8	
			EQUI 12	
			EQUI 13	
			EQUI 14	
			EQUI 15	
			EQUI 16	
			EQUI 17	
			EQUI 18	
COMG 4	Null	Total Facility VOC Limits	EQUI 6	
			EQUI 9	
			EQUI 10	
			EQUI 11	
			EQUI 12	
			EQUI 13	
			EQUI 14	
			EQUI 15	
			EQUI 16	
			EQUI 17	
			EQUI 18	
			EQUI 55	

PTE by SI

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Category	SI Type	Subject Item ID	Delta Designation	Description	Pollutant	Potential (lbs/hr)	Unrestricted Potential (tons/yr)	Potential Limited (tons/yr)	Actual Emissions (tons/yr)
Component Group	Air Compone..	COMG 4	Null	Total Facility VOC Limits	Volatile Organic Compounds			95	
Equipment	Aboveground Storage Tank	EQUI 9	TK001	Tank 103 Ethanol	Volatile Organic Compounds	0.488	2.14	0	
		EQUI 10	TK002	Tank 104 Ethanol	Volatile Organic Compounds	1.289	5.644	0	
		EQUI 11	TK003	Tank 105 Ethanol	Volatile Organic Compounds	0.0107	0.0468	0	
		EQUI 12	TK004	Tank 106 Gasoline	1,2,4-Trimethylbenzene	0.0006541	0.002865	0.002865	
					Benzene	0.00161	0.00704	0.00704	
					Biphenyl	2.61e-06	1.143e-05	1.143e-05	
					Ethylbenzene	0.000525	0.0023	0.0023	
					HAPs - Total	0.0103	0.0452	0.0452	
					Hexane	0.001467	0.006424	0.006424	
					Naphthalene	0.000116	0.00051	0.00051	
					Phenol	1.45e-05	6.33e-05	6.33e-05	
					Toluene	0.00339	0.0149	0.0149	
					Volatile Organic Compounds	0.325	1.42	0	
					Xylenes, Total	0.0023	0.0101	0.0101	
		EQUI 13	TK005	Tank 107 Gasoline	1,2,4-Trimethylbenzene	0.000438	0.001918	0.001918	
					Benzene	0.00204	0.00895	0.00895	
					Biphenyl	1.74e-06	7.63e-06	7.63e-06	
					Ethylbenzene	0.000437	0.00191	0.00191	
					HAPs - Total	0.0107	0.0467	0.0467	
					Hexane	0.001965	0.008606	0.008606	
					Naphthalene	7.83e-05	0.000343	0.000343	
					Phenol	9.724e-06	4.259e-05	4.259e-05	
					Toluene	0.0035	0.0153	0.0153	
					Volatile Organic Compounds	0.461	2.02	0	
					Xylenes, Total	0.00187	0.0082	0.0082	
		EQUI 14	TK006	Tank 108 Gasoline	1,2,4-Trimethylbenzene	0.000438	0.001918	0.001918	
					Benzene	0.00204	0.00895	0.00895	
					Biphenyl	1.74e-06	7.63e-06	7.63e-06	
					Ethylbenzene	0.000437	0.00191	0.00191	
					HAPs - Total	0.0107	0.0467	0.0467	
					Hexane	0.001965	0.008606	0.008606	
					Naphthalene	7.83e-05	0.000343	0.000343	
					Phenol	9.724e-06	4.259e-05	4.259e-05	
					Toluene	0.0035	0.0153	0.0153	
					Volatile Organic Compounds	1.362	5.964	0	
					Xylenes, Total	0.00187	0.0082	0.0082	
		EQUI 15	TK007	Tank 109 Gasoline	1,2,4-Trimethylbenzene	0.000438	0.001918	0.001918	
					Benzene	0.00204	0.00895	0.00895	
					Biphenyl	1.74e-06	7.63e-06	7.63e-06	
					Ethylbenzene	0.000437	0.00191	0.00191	
					HAPs - Total	0.0107	0.0467	0.0467	
					Hexane	0.001965	0.008606	0.008606	
					Naphthalene	7.83e-05	0.000343	0.000343	
					Phenol	9.724e-06	4.259e-05	4.259e-05	
					Toluene	0.0035	0.0153	0.0153	
					Volatile Organic Compounds	1.36	5.96	0	
					Xylenes, Total	0.00187	0.0082	0.0082	
		EQUI 16	TK008	Tank 110 Gasoline	1,2,4-Trimethylbenzene	0.000438	0.001918	0.001918	
					Benzene	0.00204	0.00895	0.00895	
					Biphenyl	1.74e-06	7.63e-06	7.63e-06	
					Ethylbenzene	0.000437	0.00191	0.00191	
					HAPs - Total	0.0107	0.0467	0.0467	
					Naphthalene	7.83e-05	0.000343	0.000343	
					Phenol	9.724e-06	4.259e-05	4.259e-05	
					Toluene	0.0035	0.0153	0.0153	
					Volatile Organic Compounds	0.461	2.02	0	
					Xylenes, Total	0.00187	0.0082	0.0082	
		EQUI 17	TK009	Tank 111 Gasoline	1,2,4-Trimethylbenzene	0.000438	0.001918	0.001918	
					Benzene	0.00204	0.00895	0.00895	
					Biphenyl	1.74e-06	7.63e-06	7.63e-06	
					Ethylbenzene	0.000437	0.00191	0.00191	
					HAPs - Total	0.0107	0.0467	0.0467	
					Hexane	0.001965	0.008606	0.008606	
					Naphthalene	7.83e-05	0.000343	0.000343	
					Phenol	9.724e-06	4.259e-05	4.259e-05	
					Toluene	0.0035	0.0153	0.0153	
					Volatile Organic Compounds	0.461	2.02	0	
					Xylenes, Total	0.00187	0.0082	0.0082	
		EQUI 18	TK010	Tank 112 Gasoline	1,2,4-Trimethylbenzene	0.000438	0.001918	0.001918	
					Benzene	0.00204	0.00895	0.00895	
					Biphenyl	1.74e-06	7.63e-06	7.63e-06	
					Ethylbenzene	0.000437	0.00191	0.00191	
					HAPs - Total	0.0107	0.0467	0.0467	
					Hexane	0.001965	0.008606	0.008606	
					Naphthalene	7.83e-05	0.000343	0.000343	

PTE by SI

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Category	SI Type	Subject Item ID	Delta Designation	Description	Pollutant	Potential (lbs/hr)	Unrestricted Potential (tons/yr)	Potential Limited (tons/yr)	Actual Emissions (tons/yr)
Equipment	Aboveground Storage Tank	EQUI 18	TK010	Tank 112 Gasoline	Phenol	9.724e-06	4.259e-05	4.259e-05	
					Toluene	0.0035	0.0153	0.0153	
					Volatile Organic Compounds	0.461	2.02	0	
					Xylenes, Total	0.00187	0.0082	0.0082	
	Loading-Unloading Equipment	EQUI 8	EU001	Loading Rack	1,2,4-Trimethylbenzene	0.0001309	0.0005733	0.0005733	
					Benzene	0.05271	0.2309	0.2309	
					Biphenyl	6.01e-08	2.63e-07	2.63e-07	
					Ethylbenzene	0.00442	0.0194	0.0194	
					HAPs - Total	0.202	0.886	0.886	
					Hexane	0.05442	0.2383	0.2383	
					Naphthalene	2.7e-05	0.000118	0.000118	
					Phenol	3.92e-06	1.72e-05	1.72e-05	
					Toluene	0.0651	0.285	0.285	
					Volatile Organic Compounds	14.558	63.765	0	
					Xylenes, Total	0.0173	0.0757	0.0757	
	Reciprocating IC Engine	EQUI 6	EU004	Diesel emergency generator	1,3-Butadiene	2.01e-05	8.79e-05	5.02e-06	
					Acetaldehyde	0.000394	0.00172	9.84e-05	
					Acrolein	4.75e-05	0.000208	1.19e-05	
					Benzene	0.000479	0.0021	0.00012	
					Carbon Dioxide	84.1	369	21	
					Carbon Monoxide	6.806	29.81	1.701	
					Formaldehyde	0.000605	0.00265	0.000151	
					HAPs - Total	0.00194	0.00852	0.000486	
					Methane	0.00339	0.0149	0.000848	
					Naphthalene	4.98e-05	0.000218	1.25e-05	
					Nitrogen Oxides	1.238	5.421	0.309	
					Nitrous Oxide	0.000679	0.00297	0.00017	
					Particulate Matter	0.159	0.697	0.0398	
					PM < 2.5 micron	0.159	0.697	0.0398	
					PM < 10 micron	0.159	0.697	0.0398	
					Sulfur Dioxide	0.149	0.652	0.0372	
					Toluene	0.000286	0.00125	7.16e-05	
					Volatile Organic Compounds	0.145	0.637	0	
					Xylenes, Total	0.0001	0.000438	2.5e-05	
		EQUI 55	Null	Reciprocating IC Engine	1,1-Dichloroethane	0.00011	0.00048	2.74e-05	
					1,1,2-Trichloroethane	4.9e-05	0.000214	1.22e-05	
					1,1,2,2-Tetrachloroethane	0.00011	0.00048	2.74e-05	
					1,2-Dibromoethane (Ethylene dibromide); EDB	9.23e-05	0.000404	2.31e-05	
					1,3-Butadiene	0.00287	0.0126	0.000718	
					1,3-Dichloropropene	5.63e-05	0.000247	1.41e-05	
					Acetaldehyde	0.0121	0.053	0.00302	
					Acrolein	0.000401	0.00176	0.0001	
					Benzene	0.00685	0.03	0.00171	
					Carbon Dioxide	477	2,090	119	
					Carbon Monoxide	0.478	2.09	0.119	
					Carbon tetrachloride	7.67e-05	0.000336	1.92e-05	
					Chlorobenzene (Monochlorobenzene)	5.59e-05	0.000245	1.4e-05	
					Chloroform	5.94e-05	0.00026	1.48e-05	
					Dichloromethane (Methylene chloride)	0.000179	0.000782	4.46e-05	
					Ethylbenzene	0.000107	0.000471	2.69e-05	
					Formaldehyde	0.0888	0.389	0.0222	
					HAPs - Total	0.14	0.613	0.035	
					Methane	0.00955	0.0418	0.00239	
					Methanol	0.0133	0.0581	0.00331	
					Naphthalene	0.000367	0.00161	9.19e-05	
					Nitrogen Oxides	4.817	21.099	1.204	
					Nitrous Oxide	0.000955	0.00418	0.000239	
					Particulate Matter	0.791	3.47	0.198	
					PM < 2.5 micron	0.791	3.47	0.198	
					PM < 10 micron	0.791	3.47	0.198	
					Styrene	5.16e-05	0.000226	1.29e-05	
					Sulfur Dioxide	0.00255	0.0112	0.000637	
					Toluene	0.00242	0.0106	0.000604	
					Vinyl chloride (chloroethene)	3.11e-05	0.000136	7.78e-06	
					Volatile Organic Compounds	0.128	0.562	0	
					Xylenes, Total	0.000845	0.0037	0.000211	
Fugitive	Equipment Leaks	FUGI 1	Null	Valves, Flanges, Seals	1,2,4-Trimethylbenzene	1.322e-06	5.788e-06	5.788e-06	
					Benzene	0.000532	0.00233	0.00233	
					Biphenyl	6.07e-10	2.66e-09	2.66e-09	
					Ethylbenzene	4.46e-05	0.000195	0.000195	
					HAPs - Total	0.00204	0.00894	0.00894	
					Hexane	0.0005494	0.002407	0.002407	
					Naphthalene	2.73e-07	1.2e-06	1.2e-06	
					Phenol	3.96e-08	1.73e-07	1.73e-07	
					Toluene	0.000567	0.00288	0.00288	
					Volatile Organic Compounds	0.147	0.644	0	

PTE by SI

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Category	SI Type	Subject Item ID	Delta Designation	Description	Pollutant	Potential (lbs/hr)	Unrestricted Potential (tons/yr)	Potential Limited (tons/yr)	Actual Emissions (tons/yr)
Fugitive	Equipment Leaks	FUGI 1	Null	Valves, Flanges, Seals	Xylenes, Total	0.000174	0.000764	0.000764	
	Material Handling/ Transfer/ Storage	FUGI 2	Null	Tanker Purging	1,2,4-Trimethylbenzene	8.529e-07	3.736e-06	3.736e-06	
					Benzene	0.000343	0.0015	0.0015	
					Biphenyl	3.92e-10	1.71e-09	1.71e-09	
					Ethylbenzene	2.88e-05	0.000126	0.000126	
					HAPs - Total	0.00132	0.00577	0.00577	
					Hexane	0.0003546	0.001553	0.001553	
					Naphthalene	1.76e-07	7.71e-07	7.71e-07	
					Phenol	2.56e-08	1.12e-07	1.12e-07	
					Toluene	0.000424	0.00186	0.00186	
					Volatile Organic Compounds	0.0949	0.416	0	
					Xylenes, Total	0.000113	0.000493	0.000493	
Treatment	131-Thermal Oxidizer	TREA 5	Null	Vapor Combustion Unit	1,4-Dichlorobenzene (para-)	0.00054	0.002365	0.002365	
					2-Methylnaphthalene	1.08e-05	4.731e-05	4.731e-05	
					5-Methylchrysene	8.1e-07	3.548e-06	3.548e-06	
					7,12-Dimethylbenz[a]anthracene	7.2e-06	3.154e-05	3.154e-05	
					Acenaphthene	8.1e-07	3.548e-06	3.548e-06	
					Acenaphthylene	8.1e-07	3.548e-06	3.548e-06	
					Anthracene	1.08e-06	4.731e-06	4.731e-06	
					Arsenic compounds	9e-05	0.0003942	0.0003942	
					Benzene	0.000945	0.004139	0.004139	
					Benzo(a)anthracene	8.1e-07	3.548e-06	3.548e-06	
					Benzo(b)fluoranthene	8.1e-07	3.548e-06	3.548e-06	
					Benzo(ghi)perylene	5.4e-07	2.365e-06	2.365e-06	
					Benzo(k)fluoranthene	8.1e-07	3.548e-06	3.548e-06	
					Benzo[a]pyrene	5.4e-07	2.365e-06	2.365e-06	
					Beryllium	5.4e-06	2.365e-05	2.365e-05	
					Cadmium compounds	0.000495	0.002168	0.002168	
					Carbon Dioxide	1,412.269	6,185.738	6,185.738	
					Carbon Monoxide	5.015	21.967	21.967	
					Chromium compounds	0.00063	0.002759	0.002759	
					Chrysene	8.1e-07	3.548e-06	3.548e-06	
					Cobalt compounds	3.78e-05	0.0001656	0.0001656	
					Dibenz[a,h]anthracene	5.4e-07	2.365e-06	2.365e-06	
					Fluoranthene	1.35e-06	5.913e-06	5.913e-06	
					Fluorene	1.26e-06	5.519e-06	5.519e-06	
					Formaldehyde	0.03375	0.1478	0.1478	
					HAPs - Total	0.8496	3.721	3.721	
					Hexane	0.81	3.548	3.548	
					Indeno(1,2,3-cd)pyrene	8.1e-07	3.548e-06	3.548e-06	
					Manganese compounds	0.000171	0.000749	0.000749	
					Mercury	0.000117	0.0005125	0.0005125	
					Methane	0.02115	0.09263	0.09263	
					Naphthalene	0.0002745	0.001202	0.001202	
					Nickel compounds	0.000945	0.004139	0.004139	
					Nitrogen Oxides	2.031	8.897	8.897	
					Nitrous Oxide	0.004322	0.01893	0.01893	
					Particulate Matter	0.02174	0.09523	0.09523	
					Phenanthrene	7.65e-06	3.351e-05	3.351e-05	
					PM < 2.5 micron	0.02174	0.09523	0.09523	
					PM < 10 micron	0.02174	0.09523	0.09523	
					Polycyclic organic matter	0.0003142	0.001376	0.001376	
					Pyrene	2.25e-06	9.855e-06	9.855e-06	
					Selenium compounds	1.08e-05	4.731e-05	4.731e-05	
					Sulfur Dioxide	0.00567	0.02483	0.02483	
					Toluene	0.00153	0.006702	0.006702	

Relationships

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

SI Category	SI Type	Subject Item ID	Delta Designation	Description	Relationship	Related SI ID	% Flow	Related SI Type	Related Delta Designation	Relationship Start Date	Relationship End Date	
Equipment	Data Acquisition System	EQUI 1	DA001	Pilot Flame UV Light Signal	receives from	EQUI 3	Null	Parametric Monitor	MR001	2/6/2012	Null	
		EQUI 2	DA002	VRU DAS	receives from	EQUI 4	Null	Continuous Emission Monitor	MR002	2/16/2012	Null	
	Loading-Unloading Equipment	EQUI 8	EU001	Loading Rack	is controlled in parallel by	TREA 2	100	047-Vapor Recyc Sys-Condensers, Hoods, Oth..	CE002	2/16/2012	Null	
						TREA 5	0	131-Thermal Oxidizer	Null	5/6/2026	Null	
					is monitored by	EQUI 3	100	Parametric Monitor	MR001	2/16/2012	Null	
						EQUI 4	100	Continuous Emission Monitor	MR002	2/16/2012	Null	
					sends to	EQUI 2	100	Data Acquisition System	DA002	2/16/2012	Null	
						STRU 2	50	Stack/Vent	SV003	2/16/2012	Null	
						STRU 4	50	Stack/Vent	SV001	12/11/2001	Null	
	Reciprocating IC Engine	EQUI 6	EU004	Diesel emergency generator	sends to	STRU 3	100	Stack/Vent	SV005	5/28/2013	Null	
		EQUI 55	Null	Reciprocating IC Engine	sends to	STRU 6	100	Stack/Vent	Null	12/1/2009	Null	

Aboveground Storage Tanks

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item ID	Delta Designation	Description	Capacity (gal)	Construction Type	Column Diameter (ft)	Number of Columns	Deck Type	Interior Diameter (ft)	Interior Height (ft)	Max True Vapor Pressure (psia)	Construction Type	Seal Type	Support Type	Construction or Installation Start Date	
EQUI 9	TK001	Tank 103 Ethanol	500000	Internal Floating Roof	1	1	Welded	48	37	0.75	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1959	
EQUI 10	TK002	Tank 104 Ethanol	500000	Fixed Roof	Null	Null	Null	48	37	0.75	Fixed Roof	Null	Null	1/1/1959	
EQUI 11	TK003	Tank 105 Ethanol	500000	Internal Floating Roof	1	1	Welded	48	37	1	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1959	
EQUI 12	TK004	Tank 106 Gasoline	1081000	Internal Floating Roof	1	5	Welded	67	41	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1963	
EQUI 13	TK005	Tank 107 Gasoline	2350000	Internal Floating Roof	1	7	Welded	100	40	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1959	
EQUI 14	TK006	Tank 108 Gasoline	2350000	Internal Floating Roof	1	7	Welded	100	40	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1959	
EQUI 15	TK007	Tank 109 Gasoline	2350000	Internal Floating Roof	1	7	Welded	100	40	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1959	
EQUI 16	TK008	Tank 110 Gasoline	2350000	Internal Floating Roof	1	7	Welded	100	40	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1964	
EQUI 17	TK009	Tank 111 Gasoline	2350000	Internal Floating Roof	1	7	Welded	100	40	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1964	
EQUI 18	TK010	Tank 112 Gasoline	2350000	Internal Floating Roof	1	7	Welded	100	40	8.8	Internal Floating Roof	Resilient; liquid mounted primary only	Column, construction type not specified	1/1/1964	

CEMs

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item ID	Delta Designation	Description	Manufacturer	Model	Serial Number	Parameter	Primary or Backup?	Bypass Capability?	Install Date (CEMs/COMs)	Certification Date	Certification Basis	Span (ppm)	System Full Scale Value (ppm)	
EQUI 4	MR002	VRU CEMS	Jordan Technologies	JSGD11R	111022	Volatile Organic Compounds	Primary	No	2/16/2012	8/3/2013	40 CFR Pt 60	4,500	5,000	

PMs

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item ID	Delta Designation	Description	Manufacturer	Model	Serial Number	Parameter Monitored	Bypass Capability? (parametric)	Install Date (parametric)	
EQUI 3	MR001	Temperature reading monitor	Yokogawa	SN	S5N205195	Temperature	No	11/1/2001	

DAS

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item ID	Delta Designation	Description	Manufacturer	Model	Serial Number	Primary or Backup? (DASs)	Install Date (DASs)	
EQUI 1	DA001	Pilot Flame UV Light Signal	Yikagawa	CX106-1-2 Style S4	S5H108847	Primary	12/11/2001	
EQUI 2	DA002	VRU DAS	Wonderware Intouch SCADA	Custom	Custom	Primary	2/16/2012	

FUGI

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item Type	Subject Item ID	Delta Designation	Description	Install Year	Pollutants Emitted	
Equipment Leaks	FUGI 1	Null	Valves, Flanges, Seals	2008	HAPs - Total	
					Volatile Organic Compounds	
Material Handling/ Transfer/ Storage	FUGI 2	Null	Tanker Purging	2008	HAPs - Total	
					Volatile Organic Compounds	

Stack/Vents

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item ID	Delta Designation	Description	Stack Height (feet)	Stack Diameter (feet)	Stack Length (feet)	Stack Width (feet)	Stack Flow Rate (cubic ft/min)	Discharge Temperature (°F)	Flow Rate/Temp Information Source	Discharge Direction	
STRU 2	SV003	VRU	13.7	0.5	Null	Null	354	90	Manufacturer	Horizontally	
STRU 3	SV005	Emergency Diesel Generator	9.2	0.67	Null	Null	3,658.6	908	Manufacturer	Upwards with no cap on stack/vent	
STRU 4	SV001	Loading Rack 1 - gasoline	40	0.5	Null	Null	120	70	Estimate	Upwards with no cap on stack/vent	
STRU 6	Null	Natural Gas Emergency Generator	3.42	Null	3.42	2.75	300	1,075	Manufacturer	Horizontally	

Direct Flame Afterburners

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item Type	Subject Item ID	Delta Designation	Description	Manufacturer (Model #)	Installation Start Date	Pollutants Controlled	Capture Efficiency (%)	Destruction/ Collect Efficiency (%)	Efficiency Basis	Other Basis Explanation	TO Burner Capacity (MMBTU/hr)	Inlet Temp/Outlet Temp (°F)	TO Min Combustion Temperature (°F)	TO Residence Time (secs)	
131-Thermal Oxidizer	TREA 5	Null	Vapor Combustion Unit	John Zink (ZFT-2-6-35-X-2/6)	12/11/2001	HAPs - Organic	98.7	96.4	Test data	Null	0.01	Null	429	1	
						Volatile Organic Compounds	98.7	96.4	Test data	Null	0.01	Null	429	1	

Condensers

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item Type	Subject Item ID	Delta Designation	Description	Manufacturer (Model #)	Installation Start Date	Pollutants Controlled	Capture Efficiency (%)	Destruction/ Collect Efficiency (%)	Subject to CAM?	Large or Other PSEU?	Efficiency Basis	Other Basis Explanation	Vapor Min/Max Temperature (°F)	Vapor Min/Max Condenser Pressure Drop (in. of w.c.)	Vapor Min/Max Filter Pressure Drop (in. of w.c.)	
047-Vapor Recyc Sys-Condensers, Hoods, Othr E..	TREA 2	CE002	Vapor Recovery Unit (VRU)	Jordan Technologies (JT-7051-1000D)	2/16/2012	Volatile Organic Compounds	100	99.89	No	Null	Test data	Null	50/110	Null	0.100000000000..	

Wet Seperators

AI ID (Name): 1686 (Circle K Terminal Group Newport)
Activity: IND20250002

Subject Item Type	Subject Item ID	Delta Designation	Description	Manufacturer (Model #)	Installation Start Date	Pollutants Controlled	Capture Efficiency (%)	Destruction/ Collect Efficiency (%)	Subject to CAM?	Large or Other PSEU?	Efficiency Basis	Other Basis Explanation	Wet Cyclone Max Pressure Drop (in. of w.c.)	Wet Cyclone Min Pressure Drop (in. of w.c.)	Wet Cyclone Min Water Pressure (psi)	
047-Vapor Recyc Sys-Condensers, Hoods, Othr Enclos	TREA 2	CE002	Vapor Recovery Unit (VRU)	Jordan Technologies (JT-7051-1000D)	2/16/2012	Volatile Organic Compounds	100	99.89	No	Null	Test data	Null	Null	Null	Null	

SI Id	Sequence	Requirement
TFAC 1	1240	Permit Appendices: This permit contains appendices as listed in the permit Table of Contents. The Permittee shall comply with all requirements contained in Appendices: Appendix A - Insignificant Activities; Appendix B - 40 CFR Part 60, Subpart A - General Provisions; Appendix C - 40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines; Appendix D - 40 CFR Part 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines; Appendix E - 40 CFR pt. 60, subp. XX - Standards of Performance for Bulk Gasoline Terminals That Commenced Construction, Modification, or Reconstruction After December 17, 1980, and On or Before June 10, 2022; Appendix F - 40 CFR pt. 60, subp. XXa - Standards of Performance for Bulk Gasoline Terminals that Commenced Construction, Modification, or Reconstruction After June 10, 2022; Appendix G - 40 CFR Part 63, Subpart A - General Provisions; and Appendix H - 40 CFR Part 63, Subpart BBBBBB - National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities. [Minn. R. 7007.0800, subp. 2(A) & (B)]
TFAC 1	7400	The Permittee must comply with Minn. Stat. 116.385. The Permittee may not use trichloroethylene at its permitted facility including in any manufacturing, processing, or cleaning processes, except as described in Minn. Stat. 116.385, subd. 2(b) and 4. This is a state-only requirement and is not enforceable by the U.S. Environmental Protection Agency (EPA) Administrator and citizens under the Clean Air Act. [Minn. R. 7007.0100, subp. 7(X), Minn. Stat. 116.385]
TFAC 1	7420	PERMIT SHIELD: Subject to the limitations in Minn. R. 7007.1800, compliance with the conditions of this permit shall be deemed compliance with the specific provision of the applicable requirement identified in the permit as the basis of each condition. Subject to the limitations of Minn. R. 7007.1800 and 7017.0100, subp. 2, notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements. This permit shall not alter or affect the liability of the Permittee for any violation of applicable requirements prior to or at the time of permit issuance. [Minn. R. 7007.1800(A)(2)]
TFAC 1	7450	The Permittee must comply with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0090. Compliance must be demonstrated upon written request by the MPCA. [Minn. R. 7007.0800, subp. 2(A) & (B), Minn. R. 7009.0020-7009.0090, Minn. Stat. 116.07, subd. 4a(a)]
TFAC 1	7540	Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted. [Minn. R. 7011.0020]
TFAC 1	7550	The Permittee must at all times properly operate and maintain the facilities and systems of treatment and control and the appurtenances related to them that are installed or used by the Permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. [Minn. R. 7007.0800, subp. 16(J)]
TFAC 1	7560	Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and control practices and shall include a preventative maintenance program for the equipment and practices, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment and practices to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment and practices, and the records kept to demonstrate plan implementation. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 16(J)]
TFAC 1	7570	Operation Changes: In any shutdown, breakdown, or deviation the Permittee must immediately or as soon as possible considering plant and personnel safety take all practical steps to modify operations to reduce the emission of any regulated air pollutant. No emissions units that have an unreasonable shutdown or breakdown frequency of process or control equipment are permitted to operate. [Minn. R. 7019.1000, subp. 4]

SI Id	Sequence	Requirement
TFAC 1	7580	Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150. [Minn. R. 7011.0150]
TFAC 1	7590	Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the U.S. Environmental Protection Agency (EPA) Administrator and citizens under the Clean Air Act. [Minn. R. 7030.0010-7030.0080]
TFAC 1	7600	Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A). [Minn. R. 7007.0800, subp. 9(A)]
TFAC 1	7610	The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16. [Minn. R. 7007.0800, subp. 16]
TFAC 1	7620	Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in this permit. [Minn. R. ch. 7017]
TFAC 1	7630	Performance Test Notifications and Submittals: Performance Test Notification and Plan: due 30 days before each Performance Test Performance Test Pre-test Meeting: due seven days before each Performance Test Performance Test Report: due 45 days after each Performance Test The Notification, Test Plan, and Test Report must be submitted in a format specified by the commissioner. [Minn. R. 7017.2017, Minn. R. 7017.2030, subps. 1-4, Minn. R. 7017.2035, subps. 1-2]
TFAC 1	7640	Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as stated in the MPCA's follow up compliance letter granting preliminary approval. Preliminary approval is based on formal review of a subsequent performance test on the same unit as specified by Minn. R. 7017.2025, subp. 3. The limit is final upon issuance of a permit amendment incorporating the change. [Minn. R. 7017.2025, subp. 3]
TFAC 1	7650	Monitoring Equipment Calibration - The Permittee shall either: 1. Calibrate or replace required monitoring equipment every 12 months; or 2. Calibrate at the frequency stated in the manufacturer's specifications. For each monitor, the Permittee shall maintain a record of all calibrations, including the date conducted, and any corrective action that resulted. The Permittee shall include the calibration frequencies, procedures, and manufacturer's specifications (if applicable) in the Operations and Maintenance Plan. Any requirements applying to continuous emission monitors are listed separately in this permit. [Minn. R. 7007.0800, subp. 4(D)]
TFAC 1	7660	Operation of Monitoring Equipment: Unless noted elsewhere in this permit, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system. [Minn. R. 7007.0800, subp. 4(D)]
TFAC 1	7670	Recordkeeping: Retain all records at the stationary source, unless otherwise specified within this permit, for five (5) years from the date of monitoring, sample, measurement, or report. Records which must be retained at this location include all calibration and maintenance records, all original recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A). [Minn. R. 7007.0800, subp. 5(C)]
TFAC 1	7680	Recordkeeping: Maintain records describing any insignificant modifications (as required by Minn. R. 7007.1250, subp. 3) or changes contravening permit terms (as required by Minn. R. 7007.1350, subp. 2), including records of the emissions resulting from those changes. [Minn. R. 7007.0800, subp. 5(B)]
TFAC 1	7690	If the Permittee determines that no permit amendment or notification is required prior to making a change, the Permittee must retain records of all calculations required under Minn. R. 7007.1200. For non-expiring permits, these records shall be kept for a period of five years from the date that the change was made. The records shall be kept at the stationary source for the current calendar year of operation and may be kept at the stationary source or office of the stationary source for all other years. The records may be maintained in either electronic or paper format. [Minn. R. 7007.1200, subp. 4]

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TFAC 1	7770	Shutdown Notifications: Notify the commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the Permittee does not have advance knowledge of the shutdown, the Permittee must notify the commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in items A, B, and C of Minn. R. 7019.1000, subp. 3. At the time of notification, the owner or operator must inform the commissioner of the cause of the shutdown and the estimated duration. The owner or operator must notify the commissioner when the shutdown is over. [Minn. R. 7019.1000, subp. 3]
TFAC 1	7780	Breakdown Notifications: Notify the commissioner within 24 hours of a breakdown of more than one hour of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in items A, B, and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the Permittee must inform the commissioner of the cause of the breakdown and the estimated duration. The Permittee must notify the commissioner when the breakdown is over. [Minn. R. 7019.1000, subp. 2]
TFAC 1	7790	Notification of Deviations Endangering Human Health or the Environment: Immediately after discovery of the deviation or immediately after when the deviation reasonably should have been discovered, notify the commissioner either orally or by e-mail, or telephone the state duty officer at 800-422-0798 or 651-649-5451, of any deviation from permit conditions that could endanger human health or the environment. [Minn. R. 7019.1000, subp. 1]
TFAC 1	7800	Notification of Deviations Endangering Human Health or the Environment Report: Within two working days of discovery, notify the commissioner in writing of any deviation from permit conditions that could endanger human health or the environment. Include the following information in this written description: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation. [Minn. R. 7019.1000, subp. 1]
TFAC 1	7810	The Permittee must submit a semiannual deviations report : Due semiannually, by the 30th of January and July. The first semiannual report submitted by the Permittee must cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. Submit this on form DRF-2 (Deviation Reporting Form). If no deviations have occurred, submit the signed report certifying that there were no deviations. [Minn. R. 7007.0800, subp. 6(B)(2)]
TFAC 1	7830	Application for Permit Amendment: If a permit amendment is needed, submit an application in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500. Submittal dates vary, depending on the type of amendment needed. Upon adoption of a new or amended federal applicable requirement, and if there are three or more years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150 - 7007.1500]
TFAC 1	7840	Extension Requests: The Permittee may apply for an Administrative Amendment to extend a deadline in a permit by no more than 120 days, provided the proposed deadline extension meets the requirements of Minn. R. 7007.1400, subp. 1(H). Performance testing deadlines from the General Provisions of 40 CFR pt. 60 and pt. 63 are examples of deadlines for which the MPCA does not have authority to grant extensions and therefore do not meet the requirements of Minn. R. 7007.1400, subp. 1(H). [Minn. R. 7007.1400, subp. 1(H)]
TFAC 1	7860	The Permittee must submit a compliance certification : Due annually, by the 31st of January (for the previous calendar year). Submit this on form CR-04 (Annual Compliance Certification Report). This report covers all deviations experienced during the calendar year. If no deviations have occurred, submit the signed report certifying that there were no deviations. [Minn. R. 7007.0800, subp. 6(D)]

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TFAC 1	7870	Within 15 days of a request from the Commissioner, the Permittee must provide a complete summary of all performance tests required at the facility including the subject item, pollutant, most recent test date (if applicable), and the date of the next test in an approved format. [Minn. R. 7007.0800, subp. 16(L)]
TFAC 1	7900	Emission Inventory Report: due on or before April 1 of each calendar year following permit issuance. Submit in a format specified by the Commissioner. [Minn. R. 7019.3000-7019.3100]
TFAC 1	7910	Emission Fees: due 30 days after receipt of an MPCA bill. [Minn. R. 7002.0005-7002.0085]
COMG 1	1	Monthly Recordkeeping - Gasoline Throughput: By the 15th day of each month the Permittee must calculate, record, and maintain the gasoline throughput (all grades) during the previous calendar month as follows: 1. EQUI 12 (Tank 106) throughput; 2. EQUI 13, EQUI 14, EQUI 15, EQUI 16, EQUI 17, and EQUI 18 (Tank 107 - Tank 112) total throughput. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
COMG 1	2	Monthly Recordkeeping - Tank Landings: by the 15th day of each month the Permittee must calculate, record, and maintain the following: 1. The combined total tank landings for EQUI 13, EQUI 14, EQUI 15, EQUI 16, EQUI 17, and EQUI 18 during the previous calendar month; 2. The total tank landings for EQUI 12 during the previous calendar month. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
COMG 1	3	Standing Losses Calculations: By the 15th day of each month, the Permittee must calculate, record, and maintain the total tank standing losses for the previous calendar month using the methodology prescribed in U.S. EPA AP-42, Chapter 7.1, the version in effect at the time the calculation is performed (including any referenced equations, procedures, and required inputs). The Permittee must retain the calculation output and supporting documentation for all inputs used (e.g., tank ID, stored liquid, tank dimensions, roof type, meteorological data/temperatures, vapor pressure/true vapor pressure assumptions, fitting configuration as applicable). For any tank taken out of service during the month, the Permittee must document the out-of-service status (including dates) and must calculate working losses consistent with AP-42, Chapter 7.1 for the tank's actual operating status during the month. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
COMG 1	4	Working Losses Calculations: By the 15th day of each month, the Permittee must calculate, record, and maintain the total tank working losses for the previous calendar month using the methodology prescribed in U.S. EPA AP-42, Chapter 7.1, the version in effect at the time the calculation is performed. The Permittee must document monthly throughput for each tank (or for each stored liquid/tank as applicable) and shall retain the calculation output and supporting records for all inputs used. For any tank taken out of service during the month, the Permittee must document the out-of-service status (including dates) and must calculate working losses consistent with AP-42, Chapter 7.1 for the tank's actual operating status during the month. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]

SI Id	Sequence	Requirement
COMG 1	5	Tank Landing Emission Calculations: By the 15th day of each month, the Permittee must calculate, record, and maintain the total floating roof landing losses for the previous calendar month using the methodology prescribed in U.S. EPA AP-42, Chapter 7.1, the version in effect at the time the calculation is performed. The Permittee must record the number of roof landings for each applicable tank for the previous month and retain calculation output and supporting documentation for all inputs used. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
COMG 2	1	Prior to May 8, 2027, the Permittee must limit Total Organic Compounds <= 80 milligrams per liter of gasoline loaded into gasoline cargo tanks at the loading rack. [40 CFR 63.11083(d)(3), 40 CFR pt. 63, subp. BBBBBB(Table 2)(item 1)(b), Minn. R. 7011.7180, B]
COMG 2	2	On or after May 8, 2027, the Permittee must limit Total Organic Compounds <= 35 milligrams per liter of liquid product loaded into gasoline cargo tanks at the loading rack when vapors are routed to the VCU (thermal oxidation system). [40 CFR 63.11083(d)(3), 40 CFR pt. 63, subp. BBBBBB(Table 3)(item 1)(a), Minn. R. 7011.7180(B)]
COMG 2	3	On or after May 8, 2027 the Permittee must limit Total Organic Compounds <= 19,200 parts per million 3-hour rolling average by volume as propane considering all periods when vapors are routed to the vapor recovery system is capable of processing gasoline vapors, including periods when liquid product is being loaded, during carbon bed regeneration, and when preparing the beds for reuse. [40 CFR 63.11083(d)(3), 40 CFR pt. 63, subp. BBBBBB(Table 3)(item 3)(a), Minn. R. 7011.7180(B)]
COMG 2	4	The Permittee must comply with all applicable requirements of 40 CFR pt. 63, subp. BBBBBB as follows: 40 CFR 63.11080; 40 CFR 63.11081(a)(1); 40 CFR 63.11081(b); 40 CFR 63.11081(f)-(j); 40 CFR 63.11082; 40 CFR 63.11083; 40 CFR 63.11085; 40 CFR 63.11087(e)-(g); 40 CFR 63.11088; 40 CFR 63.11089(b)(3); 40 CFR 63.11089(c)-(f); 40 CFR 63.11092(a); 40 CFR 63.11092(b)(1)(i); 40 CFR 63.11092(b)(1)(iii)-(iv); 40 CFR 63.11092(b)(3)-(b)(5); 40 CFR 63.11092(c)-(d); 40 CFR 63.11092(e)(1)-(e)(2); 40 CFR 63.11092(e)(4);

SI Id	Sequence	Requirement
		40 CFR 63.11092(f)(1); 40 CFR 63.11092(g)(1); 40 CFR 63.11092(h)-(i); 40 CFR 63.11093; 40 CFR 63.11094(a)-(g)(1); 40 CFR 63.11094(g)(3); 40 CFR 63.11094(h)-(o); 40 CFR 63.11095(a)-(c)(2); 40 CFR 63.11095(d)(1)-(d)(2); 40 CFR 63.11095(d)(4)-(d)(9); 40 CFR 63.11095(e); 40 CFR 63.11098; 40 CFR 63.11099(a)-(c); 40 CFR 63.11100; 40 CFR pt. 63, subp. BBBBBB Table 1; 40 CFR pt. 63, subp. BBBBBB Table 2, item 1; 40 CFR pt. 63, subp. BBBBBB Table 3, items 1 & 3; and 40 CFR pt. 63, subp. BBBBBB Table 4. A copy of 40 CFR pt. 63, subp. BBBBBB is included in Appendix H. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 63, subp. BBBBBB, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.7180(B)]
COMG 2	27820	The Permittee must comply with all applicable requirements of 40 CFR pt. 63, subp. A as follows: 40 CFR 63.1(a); 40 CFR 63.1(b)(1); 40 CFR 63.1(c)(1)-(c)(2); 40 CFR 63.1(c)(5); 40 CFR 63.1(e); 40 CFR 63.2; 40 CFR 63.3;
		40 CFR 63.4; 40 CFR 63.5(b); 40 CFR 63.5(d)-(f); 40 CFR 63.6(a); 40 CFR 63.6(b)(7); 40 CFR 63.6(c)(1)-(c)(2); 40 CFR 63.6(c)(5); 40 CFR 63.6(e)(1); 40 CFR 63.6(e)(3); 40 CFR 63.6(i)(1); 40 CFR 63.6(i)(3)-(i)(4); 40 CFR 63.6(i)(6); 40 CFR 63.6(i)(8); 40 CFR 63.6(i)(9); 40 CFR 63.6(i)(11); 40 CFR 63.6(j); 40 CFR 63.7(a)(2); 40 CFR 63.7(a)(2)(ix); 40 CFR 63.7(a)(3); 40 CFR 63.7(a)(4);

SI Id	Sequence	Requirement
		40 CFR 63.7(b)-(h); 40 CFR 63.7(h); 40 CFR 63.8(b)-(g); 40 CFR 63.9(b)(1); 40 CFR 63.9(c); 40 CFR 63.9(e); 40 CFR 63.9(g)-(j); 40 CFR 63.10(a)(5)-(a)(7); 40 CFR 63.10(b); 40 CFR 63.10(c); 40 CFR 63.10(d)(1); 40 CFR 63.10(d)(2); 40 CFR 63.10(d)(5); 40 CFR 63.10(e)-(f); 40 CFR 63.11; 40 CFR 63.12; 40 CFR 63.13; 40 CFR 63.14; and 40 CFR 63.15(a). A copy of 40 CFR pt. 63, subp. A is included in Appendix G. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 63, subp. A, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.0050, subp. 1(B), Minn. R. 7017.1010 & 7017.2015, subp. 3, Minn. R. 7019.0100]
COMG 2	27821	Performance test reports shall be submitted according to 40 CFR 63.13. Beginning on November 4, 2024, within 60 days after completing each performance test required by 40 CFR pt. 63, subp. BBBBBB, the Permittee shall submit the results of the performance test following the procedures specified in 40 CFR 63.9(k). The performance test report shall include the applicable operating parameter limit(s) established during the performance test, as applicable. If the monitoring alternative in 40 CFR 63.11092(h) is used, the report shall identify each loading rack subject to this subpart and include the highest instantaneous pressure monitored during the performance test or performance evaluation for each identified loading rack. Test data collected using methods supported by EPA's Electronic Reporting Tool (ERT) at the time of the test shall be submitted in an ERT-generated format (or an electronic file consistent with the ERT XML schema). Test data collected using methods not supported by ERT at the time of the test shall be included as an attachment in the ERT package or an alternate electronic file. [40 CFR 63.11092(h), 40 CFR 63.11095(a), 40 CFR 63.7(g)(2)(iv), 40 CFR 63.9(k), Minn. R.
COMG 2	27822	Prior to May 8, 2027, the Permittee shall submit a semiannual compliance report to the Administrator including the applicable information specified in 40 CFR 63.11095(c)(1)(i) through (iv). At the time the semiannual compliance report is submitted, the Permittee shall submit an excess emissions report if required, consistent with 40 CFR 63.11095(c)(2)(i) through (v). [40 CFR 63.11095(c)(1), 40 CFR 63.11095(c)(2), Minn. R. 7011.7180(B)]
COMG 2	27824	On or after May 8, 2027, the Permittee shall submit semiannual reports with the applicable information in 40 CFR 63.11095(d)(1) through (9) following the procedures in 40 CFR 63.11095(e). Beginning on May 8, 2027, or once the report template for this subpart has been available on the CEDRI website for one year (whichever date is later), the Permittee shall submit all subsequent semiannual compliance reports using the appropriate electronic report template on the CEDRI website for this subpart and following the procedures specified in 40 CFR 63.9(k). The Permittee shall submit required electronic reports to EPA via CEDRI (accessed through EPA's CDX) by the applicable deadline. If the Permittee claims EPA system outage or force majeure as the reason for failure to timely comply with an electronic reporting requirement, the Permittee shall submit the written report to the Administrator at the appropriate address listed in 40 CFR 63.13 and email a copy to the MPCA as directed in Section 2 of this permit for other compliance submittals. [40 CFR 63.11095(d), 40 CFR 63.11095(e), 40 CFR

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COMG 4	4330	The Permittee must limit emissions of Volatile Organic Compounds <= 95.0 tons per year 12-month rolling sum to be calculated by the 15th day of each month for the previous 12-month period as described later in this permit. All VOC-emitting equipment at the Facility is subject to this limit except for the insignificant activities . If the Permittee replaces any existing VOC-emitting equipment, adds new VOC-emitting equipment, or modifies the existing equipment, such equipment is subject to this permit limit as well as all of the requirements COMG 1 and COMG 4. Prior to making such a change, the Permittee must apply for and obtain the appropriate permit amendment, as applicable. The Permittee is not required to complete VOC calculations described in Minn. R. 7007.1200, subp. 2. A permit amendment will still be needed regardless of the emissions increase if the change will be subject to a new applicable requirement or requires revisions to the limits or monitoring and recordkeeping in this permit. [Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2]
COMG 4	4340	Volatile Organic Compounds: Monthly Recordkeeping -- VOC Emissions. By the 15th of the month, the Permittee must calculate and record the following: 1) The facility VOC emissions for the previous month using the formulas specified in this permit; and 2) The total facility 12-month rolling sum VOC emissions for the previous 12-month period by summing the monthly VOC emissions data for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
COMG 4	4350	Volatile Organic Compounds: Volatile Organic Compounds: Monthly Calculation -- VOC Emissions. The Permittee must calculate VOC emissions using the following equations: TFE = (LR1 + TS + TW + TL + FE + TP + EG + NGE)/2000 where: TFE = total terminal facility monthly VOC emissions, tons LR1 = loading rack 1 emissions calculated under EQUI 8, lb/month TS = storage tank standing losses calculated under COMG 1, lb/month TW = storage tank working losses calculated under COMG 1, lb/month TL = tank roof landing emissions calculated under COMG 1, lb/month FE = fugitive emissions calculated under FUGI 1, lb/month TP = tanker purging emissions calculated under FUGI 2, lb/month EG = emergency generator emissions calculated under EQUI 6, lb/month NGE = natural gas emergency generator emissions calculated under EQUI 55, lb/month. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 4	2200	Relative Accuracy Test Audit (RATA) Results Summary: due 30 days after end of each calendar quarter in which a RATA was conducted. [Minn. R. 7017.1180, subp. 3]
EQUI 4	2220	Cylinder Gas Audit (CGA) Results Summary: due 30 days after end of each calendar quarter in which a CGA was conducted. [Minn. R. 7017.1180, subp. 1]
EQUI 4	2230	Additional monitoring requirements may apply. The Permittee is responsible for meeting all applicable requirements. [Minn. R. 7007.0800, subp. 4(A)]
EQUI 4	2231	Volatile Organic Compounds: Emissions Monitoring: The owner or operator must use a CEMS to measure emissions from EQUI 8 when controlled by TREA 2. [40 CFR pt. 63, subp. BBBBBB, Minn. R. 7017.1010, subp 1]
EQUI 4	2232	CEMS Applicability: EQUI 4 is required to comply with 40 CFR Part 63, Subpart BBBBBB. The CEMS must be installed, operated, and maintained in accordance with 40 CFR 63.11092(b) and the general monitoring requirements in 40 CFR 63.8, as applicable. Performance specifications and QA/QC procedures shall follow 40 CFR Part 60, Appendix B and Appendix F, as applicable. [40 CFR 63.11092(b), 40 CFR 63.8, 40 CFR pt. 60, App. B, 40 CFR pt. 60, App. F, Minn. R. 7011.7180, B]

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EQUI 4	2260	Certification Test Plan due 30 days before Certification Test. Certification Test Pretest Meeting due seven days before Certification Test. Certification Test Report due 45 days after Certification Test. Notify the commissioner prior to making any planned change or if unforeseen, within two working days, when a monitor must be recertified as outlined in Minn. R. 7017.1050, subp. 2. Test plans and reports must be submitted in a format specified by the commissioner. [40 CFR 63.8(e)(2), 40 CFR 63.8(e)(5), Minn. R. 7017.1060, subp. 1-3, Minn. R. 7017.1080]
EQUI 4	2270	Continuous Operation: CEMS must be operated and data recorded during all periods of emission unit operation when controlled by TREA 2 including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A CEMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment. [Minn. R. 7017.1010, subp. 1(A), Minn. R. 7017.1090]
EQUI 4	2280	QA Plan: Develop and implement a written quality assurance plan that covers each CEMS. The plan must be on site and available for inspection within 30 days after monitor certification. The plan must contain all of the information required by 40 CFR Part 60, Appendix F, Section 3. The plan must include the manufacturer's spare parts list for each CEMS and require that those parts be kept at the facility unless the Commissioner gives written approval to exclude specific spare parts from the list. [40 CFR 63.8(d), 40 CFR pt. 60, Appendix F, 3, Minn. R. 7017.1010, subp. 1(C), Minn. R. 7017.1170, subp. 2]
EQUI 4	2290	CEMS QA/QC: The Permittee is subject to the performance specifications listed in 40 CFR pt. 60, Appendix B and shall operate, calibrate, and maintain each CEMS according to the QA/QC procedures in 40 CFR pt. 60, Appendix F as amended and maintain a written QA/QC program available in a form suitable for inspection. [40 CFR 63.8, 40 CFR pt. 60, Appendix F, Minn. R. 7017.1010, subp. 1(A)]
EQUI 4	2300	CEMS Daily Calibration Drift Test: Check the zero (low level value between 0 and 20 percent of span value) and span (50 to 100 percent of span value) calibration drifts at least once daily. The zero and span must, at a minimum, be adjusted whenever the drift exceeds two times the limit specified in 40 CFR pt. 60, Appendix B. 40 CFR pt. 60, Appendix F, Section 4.3.1 must be used to determine out-of-control periods for CEMS. [40 CFR 63.8, 40 CFR pt. 60, Appendix F, 4.1, Minn. R. 7017.1010, subp. 1(A), Minn. R. 7017.1170, subp. 3]
EQUI 4	2320	CEMS Monitor Design: Each CEMS shall be designed to complete a minimum of one cycle of sampling, analyzing, and data recording in each 15-minute period. [40 CFR 63.8(c)(4)(ii), Minn. R. 7017.1010, subp. 1(A)]
EQUI 4	2360	CEMS Certification/Recertification Test: due 90 days after the first excess emissions report required for the CEMS or any change which invalidates the monitor's certification status as outlined in Minn. R. 7017.1050, subp. 2. [40 CFR 63.8(e), Minn. R. 7017.1010, subp. 1(A)]
EQUI 4	2460	The Permittee must conduct a cylinder gas audit: Due by the end of each three of four calendar quarters but no more than three quarters in succession. A CGA is not required during any calendar quarter in which a RATA was performed. [40 CFR pt. 60, Appendix F, 5.1.2, Minn. R. 7017.1010, subp. 1(C)]
EQUI 4	2470	The Permittee must conduct a relative accuracy test audit: Due one of each four calendar quarters. [40 CFR pt. 60, Appendix F, 5.1.1, Minn. R. 7017.1010, subp. 1(C)]
EQUI 6	3520	The Permittee must limit emissions of NMHC+NOx <= 6.4 grams per kilowatt-hour as described in 40 CFR pt. 1039, Appendix I. [40 CFR 60.4202(a)(2), 40 CFR 60.4205(b), Minn. R. 7011.2305]
EQUI 6	3535	The Permittee must limit emissions of Particulate Matter <= 0.20 grams per kilowatt-hour as described in 40 CFR pt. 1039, Appendix I. [40 CFR 60.4202(a)(2), 40 CFR 60.4205(b), Minn. R. 7011.2305]
EQUI 6	3540	The Permittee must limit emissions of Carbon Monoxide <= 3.5 grams per kilowatt-hour as described in 40 CFR pt. 1039, Appendix I. [40 CFR 60.4202(a)(2), 40 CFR 60.4205(b), Minn. R. 7011.2305]
EQUI 6	3550	The Permittee must limit emissions of Opacity <= 20 percent opacity during the acceleration mode. [40 CFR 60.4202(a)(2), 40 CFR 60.4205(b), Minn. R. 7011.2305]
EQUI 6	3560	The Permittee must limit emissions of Opacity <= 15 percent opacity during the lugging mode. [40 CFR 60.4202(a)(2), 40 CFR 60.4205(b), Minn. R. 7011.2305]
EQUI 6	3565	The Permittee must limit emissions of Opacity <= 50 percent opacity during the peaks in either the acceleration or lugging modes. [40 CFR 60.4202(a)(2), 40 CFR 60.4205(b), Minn. R. 7011.2305]

SI Id	Sequence	Requirement
EQUI 6	3840	Hours: Daily Recordkeeping. On each day of operation, the Permittee must calculate, record, and maintain a record of the total hours of operation. This must be based on hours of operation logs or hour meter readings. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 6	3850	Hours: Monthly Recordkeeping. By the 15th of the month, the Permittee must calculate and record the following: 1) The total hours of operation for the previous calendar month using the daily records; and 2) The 12-month rolling sum hours of operation for the previous 12-month period by summing the monthly hours of operation for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5]
EQUI 6	19530	The Permittee must limit Sulfur Content of Fuel <= 15.0 parts per million and either a minimum cetane index of 40 or a maximum aromatic content of 35 percent by volume, as required by 40 CFR 1090.305. [40 CFR 60.4207(b), Minn. R. 7011.2305]
EQUI 6	28030	Opacity <= 20 percent opacity once operating temperatures have been attained. [Minn. R. 7011.2300, subp. 1]
EQUI 6	28040	Sulfur Dioxide <= 0.0015 pounds per million Btu heat input. The potential to emit from the unit is 0.0015 lb/MMBtu due to equipment design and allowable fuels. [Minn. R. 7011.2300, subp. 2(B)]
EQUI 6	28050	Fuel type: Diesel fuel oil and diesel fuel oil blends only, by design. [Minn. R. 7005.0100, subp. 35a]
EQUI 6	28060	Hours of Operation: The Permittee shall maintain documentation on site that the unit is an emergency generator by design that qualifies under the U.S. EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators" dated September 6, 1995, that allows calculation of potential emissions based on 500 operating hours per year. [Minn. R. 7007.0800, subps. 4-5]
EQUI 6	28070	The Permittee shall keep records of fuel type and usage on a monthly basis. [Minn. R. 7007.0800, subp. 5]
EQUI 6	28080	Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of diesel fuel oil, certifying that the sulfur content does not exceed 0.0015 percent by weight. [Minn. R. 7007.0800, subps. 4-5]
EQUI 6	28160	EQUI 6 is a new affected source as defined under 40 CFR pt. 63, subp. ZZZZ, and the facility is an area source as defined at 40 CFR 63.2. The Permittee shall meet the requirements of 40 CFR pt. 63, subp. ZZZZ by meeting the requirements of 40 CFR pt. 60, subp. IIII. No further requirements of 40 CFR pt. 63, subp. ZZZZ apply to EQUI 6. [40 CFR 63.6590(c), Minn. R. 7011.8150]
EQUI 6	28161	Volatile Organic Compounds: Monthly Recordkeeping. By the 15th of the month, the Permittee must calculate and record the following using the formulas specified in this permit: 1) The VOC emissions for the previous month using the formulas specified in this permit; and 2) The 12-month rolling sum of VOC emissions for the previous 12-month period by summing the monthly emissions data for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 6	28162	Volatile Organic Compounds: Monthly calculations: By the 15th day of each month the Permittee must calculate, record, and maintain the emergency generator VOC emissions for the previous month using the following equation: EG = 2.83E-01 lb/MMBtu * 0.51306 MMBtu/hr * MH where: 2.83E-01 = VOC diesel emission factor at the time of the permit amendment (lb/MMBtu); 0.513064 = Heat Input of EQUI 6 (MMBTU/hr); and MH = hours of operation for EQUI 6 recorded during the previous month. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]

SI Id	Sequence	Requirement
EQUI 6	35680	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. IIII as follows: 40 CFR 60.4200(a)(2)(i); 40 CFR 60.4202(a)(2); 40 CFR 60.4205(b); 40 CFR 60.4206; 40 CFR 60.4207(b); 40 CFR 60.4208(a); 40 CFR 60.4209(a); 40 CFR 60.4211(a); 40 CFR 60.4211(c); 40 CFR 60.4211(f)(1); 40 CFR 60.4211(f)(2)(i); 40 CFR 60.4211(f)(3); 40 CFR 60.4214(b); 40 CFR 60.4218; 40 CFR 60.4219; and 40 CFR pt. 60, subp. IIII, Table 8. A copy of 40 CFR pt. 60, subp. IIII is included in Appendix C. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. IIII, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.2305]
EQUI 6	35700	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. A as follows: 40 CFR 60.1(a)-(c); 40 CFR 60.2; 40 CFR 60.3; 40 CFR 60.4; 40 CFR 60.5(a)-(b); 40 CFR 60.6(a)-(b); 40 CFR 60.7(a)(1); 40 CFR 60.7(a)(3); 40 CFR 60.7(a)(4); 40 CFR 60.7(b); 40 CFR 60.9; 40 CFR 60.11(d); 40 CFR 60.12; 40 CFR 60.14(a); 40 CFR 60.14(b);

SI Id	Sequence	Requirement
		40 CFR 60.14(c); 40 CFR 60.14(f); 40 CFR 60.14(g); 40 CFR 60.14(h); 40 CFR 60.14(l); 40 CFR 60.15(a)-(g) 40 CFR 60.17; 40 CFR 60.18(g)-(i); 40 CFR 60.19(a)-(e); 40 CFR 60.19(f)(1); 40 CFR 60.19(f)(2); 40 CFR 60.19(f)(3); and 40 CFR 60.19(f)(4). A copy of 40 CFR pt. 60, subp. A is included in Appendix B. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. A, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.0050, subp. 1(A), Minn. R. 7017.1010 & 7017.2015, subp. 2, Minn. R. 7019.0100]
EQUI 8	1	During operation of the loading rack the Permittee must vent emissions from EQUI 8 to control equipment meeting the requirements of TREA 2 (VRU) or TREA 5 (VCU) whenever EQUI 8 operates. [Minn. R. 7011.0075, subp. 1, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 8	2	EQUI 8 must be equipped with a vapor collection system designed to collect the total organic compounds vapors displaced from tank trucks during product loading. [40 CFR 60.502(a) and (d), Minn. R. 7011.1550]
EQUI 8	3	Total Organic Compounds <= 35 milligrams per liter of gasoline loaded due to the loading of liquid product into gasoline tank trucks. [40 CFR 60.502(b), Minn. R. 7011.1550]
EQUI 8	4	Recordkeeping - Gasoline Loading: By the 15th day of each month the Permittee must calculate and record the gallons of gasoline loaded during the previous calendar month. Gasoline includes gasoline/ethanol blends and E-85. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 8	5	Loading Emissions Calculations: By the 15 day of each month the Permittee must calculate and record the VOC loading emissions from the previous month using the following equation: LR = ((0.987 *gal_TREA 2 * a) + (0.987 *gal_TREA 5 * b) + (0.013 * (gal_TREA 5 + gal_TREA 2)*c) + (d * c))/1000 where: LR = Loading Rack monthly emissions, lbs/month gal_TREA 2= gallons of gasoline loaded the previous month, TREA 2 in service gal_TREA 5= gallons of gasoline loaded the previous month, TREA 5 in service a = VRU controlled emission factor in lb/mgal (currently 0.083 lb/mgal (based on 10 mg/liter manufacturer guarantee), or as revised based on performance testing) b = VCU controlled emission factor in lb/mgal (currently 0.14 lb/mgal on performance testing) c = uncontrolled emission factor (7.92 lb/mgal) d = gallons of gasoline loaded, TREA 5 and TREA 2 out of service. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]

SI Id	Sequence	Requirement
EQUI 8	6	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. XX as follows: 40 CFR 60.500(a); 40 CFR 60.500(b); 40 CFR 60.501; 40 CFR 60.502(a)-(j); 40 CFR 60.503(a)-(f); and 40 CFR 60.505. A copy of 40 CFR pt. 60, subp. XX is included in Appendix E. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. XX, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-1500, Minn. R. 7011.1550]
EQUI 8	20080	Volatile Organic Compounds: The Permittee shall conduct a performance test due before 09/05/2028 and every 60 months thereafter to measure emissions. The first test is due by the date specified above and all subsequent tests shall be completed every 60 months thereafter by the due date (month and day) and as described below. The performance test shall be conducted at worst-case conditions defined at Minn. R. 7017.2005, subp. 8 or at the operating conditions described at Minn. R. 7017.2025, subp. 2, using EPA Reference Methods 25A, or other method approved by MPCA in the performance test plan approval. Testing conducted during the 60 days prior to the performance test due date will not reset the test due date for future testing as required by this permit or within a follow up compliance letter. Testing conducted more than 60 days prior to the performance test due date satisfies this test due date requirement but will reset future performance test due dates based on the performance test date. [Minn. R. 7017.2020, subp. 1, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]

SI Id	Sequence	Requirement
EQUI 8	35700	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. A as follows: 40 CFR 60.1(a)-(c); 40 CFR 60.2; 40 CFR 60.3; 40 CFR 60.4; 40 CFR 60.7(a)(1); 40 CFR 60.7(a)(3)-(a)(7); 40 CFR 60.7(b)-(d); 40 CFR 60.8(a); 40 CFR 60.8(b); 40 CFR 60.8(g); 40 CFR 60.8(h); 40 CFR 60.8(i); 40 CFR 60.12; 40 CFR 60.15(a)-(g); 40 CFR 60.17; 40 CFR 60.18(b)-(f); 40 CFR 60.19(a)-(e); 40 CFR 60.19(f)(1); 40 CFR 60.19(f)(2); 40 CFR 60.19(f)(3); and 40 CFR 60.19(f)(4). A copy of 40 CFR pt. 60, subp. A is included in Appendix B. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. A, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.0050, subp. 1(A), Minn. R. 7017.1010 & 7017.2015, subp. 2, Minn. R. 7019.0100]
EQUI 55	3520	Opacity <= 20 percent opacity once operating temperatures have been attained. [Minn. R. 7011.2300, subp. 1]
EQUI 55	3535	Sulfur Dioxide <= 0.0015 pounds per million Btu heat input. The potential to emit from the unit is 0.0015 lb/MMBtu due to equipment design and allowable fuels. [Minn. R. 7011.2300, subp. 2(B)]
EQUI 55	3540	The Permittee must limit HC+NOx <= 10.0 grams per horsepower-hour. [40 CFR 60.4233(e), 40 CFR 63.6590(c), 40 CFR pt. 60, subp. JJJJ(Table 1), Minn. R. 7011.2310, Minn. R. 7011.8150]
EQUI 55	3550	The Permittee must limit Carbon Monoxide <= 387 grams per horsepower-hour. [40 CFR 60.4233(e), 40 CFR 63.6590(c), 40 CFR pt. 60, subp. JJJJ(Table 1), Minn. R. 7011.2310, Minn. R. 7011.8150]
EQUI 55	3560	Fuel type: Natural gas only, by design. [Minn. R. 7005.0100, subp. 35a]
EQUI 55	3565	Hours of Operation: The Permittee shall maintain documentation on site that the unit is an emergency generator by design that qualifies under the U.S. EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators" dated September 6, 1995, that allows calculation of potential emissions based on 500 operating hours per year. [Minn. R. 7007.0800, subps. 4-5]
EQUI 55	3840	Hours: Daily Recordkeeping. On each day of operation, the Permittee must calculate, record, and maintain a record of the total hours of operation. This must be based on hours of operation logs or our meter readings. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 55	3850	Hours: Monthly Recordkeeping. By the 15th of the month, the Permittee must calculate and record the following: 1) The total hours of operation for the previous calendar month using the daily records; and 2) The 12-month rolling sum hours of operation for the previous 12-month period by summing the monthly hours of operation for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5]
EQUI 55	3870	The Permittee shall keep records of fuel type and usage on a monthly basis. [Minn. R. 7007.0800, subp. 5]

SI Id	Sequence	Requirement
EQUI 55	3881	Volatile Organic Compounds: Monthly Recordkeeping. By the 15th of the month, the Permittee must calculate and maintain the following: 1) The VOC emissions for the previous month using the formulas specified in this permit; and 2) The 12-month rolling sum of VOC emissions for the previous 12-month period by summing the monthly emissions data for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 55	3882	Volatile Organic Compounds: Monthly calculations - Volatile Organic Compounds. The Permittee must calculate VOC emissions using the following equation: VOC Emissions (lb/month) = 3.60E-01 lb/MMscf *4.33 Btu/hr * *NGH where: NGH = Hours of operation for EQUI 55 recorded during the previous month (hr/months); 3.60E-01 = VOC natural gas emission factor at the time of the permit amendment (lb/MMscf); and 4.33 = Heat Input of EQUI 55 (BTU/hr). [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
EQUI 55	3890	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. JJJJ as follows: 40 CFR 60.4230(a)(4)(iv); 40 CFR 60.4230(a)(6); 40 CFR 60.4233(d); as it pertains to stationary SI ICE meeting the criteria in the first sentence of this item; 40 CFR 60.4234; 40 CFR 60.4237(c); 40 CFR 60.4243(a)(1); 40 CFR 60.4243(b)(1); 40 CFR 60.4243(d)(1); 40 CFR 60.4243(d)(2); 40 CFR 60.4243(d)(2)(i); 40 CFR 60.4243(d)(3); 40 CFR 60.4243(e); 40 CFR 60.4245(a)(1)-(a)(3); 40 CFR 60.4245(b); 40 CFR 60.4245(g)-(j); 40 CFR 60.4246; 40 CFR 60.4248; and 40 CFR pt. 60, subp JJJJ Table 1. A copy of 40 CFR pt. 60, subp. JJJJ is included in Appendix D. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR 63.6590(c), 40 CFR pt. 60, subp. JJJJ, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.2310, Minn. R. 7011.8150]
EQUI 55	19530	EQUI 55 is a new affected source as defined under 40 CFR pt. 63, subp. ZZZZ, and the facility is an area source as defined at 40 CFR 63.2. The Permittee shall meet the requirements of 40 CFR pt. 63, subp. ZZZZ by meeting the requirements of 40 CFR pt. 60, subp. JJJJ. No further requirements of 40 CFR pt. 63, subp. ZZZZ apply to EQUI 55. [40 CFR 63.6590(c), Minn. R. 7011.8150]

SI Id	Sequence	Requirement
EQUI 55	35700	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. A as follows: 40 CFR 60.1(a)-(c); 40 CFR 60.2; 40 CFR 60.3; 40 CFR 60.4; 40 CFR 60.5(a)-(b); 40 CFR 60.6(a)-(b); 40 CFR 60.7(a)(1); 40 CFR 60.7(a)(3); 40 CFR 60.7(a)(4); 40 CFR 60.7(b); 40 CFR 60.9; 40 CFR 60.11(d); 40 CFR 60.12; 40 CFR 60.14(a); 40 CFR 60.14(b);
		40 CFR 60.14(c); 40 CFR 60.14(f); 40 CFR 60.14(g); 40 CFR 60.14(h); 40 CFR 60.14(l); 40 CFR 60.15(a)-(g) 40 CFR 60.17; 40 CFR 60.18(g)-(i); 40 CFR 60.19(a)-(e); 40 CFR 60.19(f)(1); 40 CFR 60.19(f)(2); 40 CFR 60.19(f)(3); and 40 CFR 60.19(f)(4). A copy of 40 CFR pt. 60, subp. A is included in Appendix B. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. A, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.0050, subp. 1(A), Minn. R. 7017.1010 & 7017.2015, subp. 2, Minn. R. 7019.0100]

SI Id	Sequence	Requirement
FUGI 1	1	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. XXa as follows: 40 CFR 60.500a(a)(2); 40 CFR 60.500a(b); 40 CFR 60.500a(c); 40 CFR 60.500a(e)(1)-(e)(2); 40 CFR 60.501a; 40 CFR 60.502a(j); 40 CFR 60.502a(k); 40 CFR 60.503a(e); 40 CFR 60.505a(a)(6); 40 CFR 60.505a(a)(9); 40 CFR 60.505a(c)(1); 40 CFR 60.505a(c)(6)-(c)(7); and 40 CFR 60.505a(d)-(g). A copy of 40 CFR pt. 60, subp. XXa is included in Appendix F. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. XXa, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500]
FUGI 1	2	The Permittee must keep an updated record of the FUGI 1 inventory. The inventory must state the number of valves, flanges, and pump seals. As of April 15, 2026 there were 652 valves, 2518 flanges, and 30 pump seals. [Minn. R. 7007.0800, subp. 2, Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(1)(i) and Minn. R 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
FUGI 1	3	Volatile Organic Compounds: Monthly Recordkeeping -- VOC Emissions. By the 15th of each month, the Permittee must calculate and record the following: 1) The FUGI 1 VOC emissions for the previous month using the formulas specified in this permit; and 2) The total FUGI 1 12-month rolling sum VOC emissions for the previous 12-month period by summing the monthly VOC emissions data for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
FUGI 1	4	Fugitive Emissions Calculations: By the 15th day of each month, the Permittee must calculate, record, and maintain fugitive VOC emissions from the previous month using the following equation: FE = T*U + V*W + X*Y where FE = fugitive emissions, lb/month; T = total valve count; U = valve emission factor; V = total flange count; W = flange emission factor; X = total pump seal count; and Y = pump seal emission factor. [Minn. R. 7007.0800, subp. 2, Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(1)(i) and Minn. R 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]

SI Id	Sequence	Requirement
FUGI 1	35700	The Permittee must comply with all applicable requirements of 40 CFR pt. 60, subp. A as follows: 40 CFR 60.2; 40 CFR 60.3; 40 CFR 60.4; 40 CFR 60.8(b); 40 CFR 60.11(f); 40 CFR 60.14(a)-(l); and 40 CFR 60.15(a)-(g); A copy of 40 CFR pt. 60, subp. A is included in Appendix B. If the standard changes or upon adoption of a new or amended federal applicable requirement, and if there are more than three years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [40 CFR pt. 60, subp. A, Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150-7007.1500, Minn. R. 7011.0050, subp. 1(A), Minn. R. 7017.1010 & 7017.2015, subp. 2, Minn. R. 7019.0100]
FUGI 1	35701	Submit a Semiannual Report with the applicable information in 40 CFR 60.505a(c)(1)-(c)(7) to the Administrator. The first semiannual report will cover the date starting with the date the source first becomes an affected facility subject to 40 CFR pt. 60, subp. XXa and ending with the last day of the month five months later. For example, if the source becomes an affected facility on April 15, the first semiannual report would cover the period from April 15 to September 30. The first semiannual report must be submitted on or before the last day of the month two months after the last date covered by the semiannual report. In this example, the first semiannual report would be due November 30. Subsequent semiannual reports will cover subsequent 6 calendar month periods with each report due on or before the last day of the month two months after the last date covered by the semiannual report. [40 CFR 60.505a(c), 40 CFR 60.505a(d)]
FUGI 2	1	Volatile Organic Compounds: Monthly Recordkeeping -- VOC Emissions. By the 15th of each month, the Permittee must calculate and record the following: 1) The FUGI 2 VOC emissions for the previous month using the formulas specified in this permit; and 2) The total FUGI 2 12-month rolling sum VOC emissions for the previous 12-month period by summing the monthly VOC emissions data for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
FUGI 2	2	Recordkeeping - Tanker Purging: By the 15th day of each month the Permittee must calculate, record, and maintain the fugitive VOC emissions from the previous month using the following equation: TP = Z*AA*8500 where TP = tanker purging emissions, lb/month; Z = purging emission factor; and AA = total number of 8500 gallon tanker purged during the previous month. [Minn. R. 7007.0800, subp. 2, Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
TREA 2	1	The Permittee must install, operate, and maintain a CEMS (EQUI 4) in the VRU exhaust air stream to continuously measure and record organic concentration, as required by NESHAP BBBBBB. The CEMS must be in service and properly maintained whenever the VRU is capable of processing gasoline vapors, including during gasoline loading operations. [40 CFR 63.11092, Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]

SI Id	Sequence	Requirement
TREA 2	3	The Permittee must vent emissions from EQUI 8 to TREA 2 or TREA 5 whenever EQUI 8 operates and operate and maintain TREA 2 at all times that any emissions are vented to TREA 2. The Permittee must document periods of non-operation of the control equipment TREA 2 or TREA 1 whenever EQUI 8 is operating. [40 CFR 63.11092, Minn. R. 7007.0800, subp. 2(A), Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
TREA 2	4	If the Permittee replaces TREA 2, the replacement control must meet or exceed the control efficiency requirements of TREA 2 as well as comply with all other requirements of TREA 2. Prior to making such a change, the Permittee shall apply for and obtain the appropriate permit amendment, as applicable. If no amendment is needed for the replacement, the Permittee shall submit an electronic notice to the Agency using Form CR-05. The notice must be received by the Agency seven working days prior to the commencement/start of replacement. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 2(A)]
TREA 2	5	The Permittee must operate and maintain the Vapor Recovery System in accordance with the Operation and Maintenance (O & M) Plan. The Permittee must keep copies of the O & M Plan available onsite for use by staff and MPCA staff. [Minn. R. 7007.0800, subp. 14]
TREA 2	6	Annual Inspection: At least once per calendar year, or more frequently as required by the manufacturing specifications, the Permittee must conduct an inspection of the operating systems of the control device. The Permittee must record the inspection and any action resulting from the inspection. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 2(A), Minn. R. 7007.0800, subp. 5]
TREA 2	7	Corrective Actions: If any of the Vapor Recovery System components are found during the inspections to need repair, the Permittee must take corrective action as soon as possible. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the Vapor Recovery System. The Permittee must keep a record of the type and date of any corrective action taken. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 2(A), Minn. R. 7007.0800, subp. 5]
TREA 5	1	The Permittee must vent emissions from EQUI 8 to TREA 5 or TREA 2 whenever EQUI 8 operates, and operate and maintain TREA 5 at all times that any emissions are vented to TREA 5. The Permittee must document periods of non-operation of the control equipment TREA 5 whenever EQUI 8 is operating. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
TREA 5	2	If the Permittee replaces TREA 5, the replacement control must meet or exceed the control efficiency requirements of TREA 5 as well as comply with all other requirements of TREA 5. Prior to making such a change, the Permittee must apply for and obtain the appropriate permit amendment, as applicable. If no amendment is needed for the replacement, the Permittee must submit an electronic notice to the Agency using Form CR-05. The notice must be received by the Agency seven working days prior to the commencement/start of replacement. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
TREA 5	3	The Permittee must operate and maintain control equipment such that it achieves a control efficiency for Volatile Organic Compounds >= 98.7 percent control efficiency. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major modification under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200]
TREA 5	4	Compliance for TREA 5 (VCU): At all times that vapors are routed to TREA 5, the Permittee must comply with the current thermal oxidation system requirements applicable under 40 CFR pt. 63, subp. BBBBBB. [40 CFR 63.11092(e)(2)(ii), Minn. R. 7011.7180, B]
TREA 5	5	The VCU must be operated with a flame or pilot flame (or an electronically controlled automatic igniter system) present at all times. [Minn. R. 7007.0800, subp. 14, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000]
TREA 5	6	The Permittee must operate and maintain the flare in accordance with the Operations and Maintenance (O & M) Plan. The Permittee must keep copies of the O & M Plan available onsite for use by staff and MPCA staff. [Minn. R. 7007.0800, subp. 14]

SI Id	Sequence	Requirement
TREA 5	7	Daily Monitoring: The Permittee must physically verify the operation of the device used to monitor for flame presence at least once each operating day to verify that it is working and recording properly. The Permittee must maintain a written record of the daily verifications. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000]
TREA 5	8	Recordkeeping: The Permittee must record the date, times and duration of all periods during which: 1. the flame or all the pilot flames are absent; 3. whether or not emissions were being vented to the VCU during periods of flame absence; and 4. whether or not emissions were being vented to the VCU during periods of visible emissions. If periods of flame absence or visible emissions are recorded when emissions are being vented to the VCU, the emissions during that time must be considered uncontrolled until flame presence and/or no visible emission conditions are restored. The period of time for which there is no flame or there are visible emissions are considered deviations as defined by Minn. R. 7007.0100, subp. 8a and must be reported. [Minn. R. 7007.0800, subps. 4-5]
TREA 5	9	Recordkeeping of Flame Presence: The Permittee must maintain records of flame presence and other supporting information. The Permittee must maintain written records of the monitoring. [Minn. R. 7007.0800, subp. 5]
TREA 5	10	The Permittee must install, maintain, and operate a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself that continuously indicates and records the presence of a flame. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000]
TREA 5	11	The Permittee must calibrate or replace the thermocouple or other equivalent monitoring device at least once every 12 months, or calibrate at the frequency stated in the manufacturer's specifications, and must maintain a written record of the calibration and any action resulting from the calibration. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subps. 4-5]
TREA 5	12	Annual Inspection: At least once per calendar year, the Permittee must conduct an inspection of the operating systems of the control device. The Permittee must keep a record of the inspection and any action resulting from the inspection. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subps. 4-5]
TREA 5	13	Corrective Actions: If any of the flare components are found during the inspections to need repair, or the presence of flame is not detected, the Permittee must take corrective action as soon as possible. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the Flare. The Permittee must keep a record of the type and date of any corrective action taken. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 2(A), Minn. R. 7007.0800, subp. 5]

Circle K Terminal Group Newport
Permit Number 16300010-104
Technical Support Document

Attachment 3
Compliance Assurance Monitoring (CAM) Plan

Points Calculator

1) AI ID No.: 1686
2) Facility Name: Circle K Terminal Group Newport
3) Small business? y/n? no
4) Air Project Tracking **Numbers (including all rolled) :** 7902
5) Date of each Application Received: 10/27/2025
6) Final Permit No. 16300010-104
7) Permit Staff Alfredo Rincon-Gonzalez

Total Points 35

Application Type	Air Project Tracking No.	Tempo Activity ID	Qty.	*Points*	Total Points	Total Additionl Cost	Details
Administrative Amendment				*1*	0	$ -	
Minor Amendment				*4*	0	$ -	
Applicability Request				*10*	0	$ -	
Moderate Amendment				*15*	0	$ -	
Major Amendment	7902	IND20250002	1	*25*	25	$ 7,125.00	
Individual State Permit (not reissuance)				*50*	0	$ -	
Individual Part 70 Permit (not reissuance)				*75*	0	$ -	
Additional Points							
Modeling Review				*15*	0	$ -	
BACT Review				*15*	0	$ -	
LAER Review				*15*	0	$ -	
CAA section 110(a)(2)(D)(i)(I) Review (i.e., Transport Rule/CAIR/CSAPR)				*10*	0	$ -	
Part 75 CEM analysis				*10*	0	$ -	
NSPS Review	7902	IND20250002	1	*10*	10	$ 2,850.00	subp. XXa
NESHAP Review				*10*	0	$ -	
Case-by-case MACT Review				*20*	0	$ -	
Netting				*10*	0	$ -	
Limits to remain below threshold				*10*	0	$ -	
Plantwide Applicability Limit (PAL)				*20*	0	$ -	
AERA review				*15*	0	$ -	
Variance request under 7000.7000				*35*	0	$ -	
Confidentiality request under 7000.1300				*2*	0	$ -	
EAW review					0		
Part 4410.4300, subparts 18, item A; and 29				*15*	0	$ -	
Part 4410.4300, subparts 8, items A & B; 10, items A to C; 16, items A & D; 17, items A to C & E to G; and 18, items B & C				*35*	0	$ -	
Part 4410.4300, subparts 4; 5 items A & B; 13; 15; 16, items B & C; and 17 item D				*70*	0	$ -	
			Add'l Points		10		

NOTES:

(DQ Points)