SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **TANK STORAGE**

BACT Category: Minor Source BACT

BACT Determination Number	373	**BACT Determination Date:**	06/26/2025

Equipment Information

Permit Number: 27812

Equipment Description: BULK TERMINAL STORAGE TANK

Unit Size/Rating Capacity: ≥ 20,000 GALLON CAPACITY

Equipment Location: SFPP, LP
2901 BRADSHAW RD, SACRAMENTO, CA 95827

BACT Determination Information

District Contact: Matt Baldwin **Phone No.:** (279) 207-1119 **Email:** mbaldwin@airquality.org

ROCs	Standard	98% Control
	Technology Description	Floating Roof Tank w/ Primary Liquid-mounted seal and secondary seal (see comments)
	Basis	Achieved in Practice
NOx	Standard	No Standard
	Technology Description	
	Basis	
SOx	Standard	No Standard
	Technology Description	
	Basis	
PM10	Standard	No Standard
	Technology Description	
	Basis	
PM2.5	Standard	No Standard
	Technology Description	
	Basis	
CO	Standard	No Standard
	Technology Description	
	Basis	

LEAD	Standard	No Standard
	Technology Description	
	Basis	
Comments:	1. Internal floating roof tank: Primary Seal - Liquid mounted multiple wipers with drip curtain and weight, or Liquid mounted mechanical shoe. Secondary wiper seal. Gasketed floating roof components that meet NSPS Subpart Kc or SCAQMD Rule 1178 2. External floating roof tank: Same as internal floating roof but must establish equivalent level of control on a case-by-case basis. 3. Fixed Roof Tank: Closed vent vapor recovery system capable of achieving 98% control	

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777 12th Street, Ste. 300 SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.:	373
DATE:	5/19/2025
ENGINEER:	Matt Baldwin

Category/General Equip Description:	Organic Liquid - Storage
BACT Category:	Minor Source BACT / Non-major modification at a Major Source.
Equipment Specific Description:	Bulk Terminal Storage Tank
Equipment Size/Rating:	Tank Capacity ≥ 20,000 gallons
Previous BACT Det. No.:	Equipment Specific (A/C 23896)

This Best Available Control Technology (BACT) determination category was determined under the project for A/C 27812 (SFPP, LP). The applicant proposed to convert an existing fixed-roof storage tank for diesel fuel to an internal floating roof tank for transmix.

Transmix is a mixture of refined products that forms when transported in pipelines. This mixture is typically a combination of gasoline, diesel, and/or jet fuel. Transmix is stored at the bulk terminal until it can be loaded into tanker trucks and sent to a processing plant. The applicant proposed to allow organic liquids with a true vapor pressure of less than 11 psia to be stored in the tank, therefore, this evaluation will include not only transmix fuel mixtures, but organic liquids with a true vapor pressure of less than 11 psia.

Bulk terminals are defined as an organic liquid distribution facility which receives organic liquid from the refinery by means other than truck (District Rule 447, Section 203). For the purposes of this determination, the bulk terminal must receive, store, and distribute gasoline. Gasoline bulk terminals receive fuel by pipeline, railcar, or marine barge. Gasoline is stored in fixed or floating roof aboveground storage tanks. The gasoline is then distributed to a loading rack that transfers gasoline and other fuels to cargo tank trucks for distribution to gasoline dispensing facilities and other intermediate or end users. Fuels distributed by the loading rack primarily include gasoline and diesel. Additives such as detergents and ethanol may be blended at the loading rack depending on customer specifications.

This BACT determination will update an equipment specific BACT determination for an organic liquid storage tank used for storing liquids at a bulk terminal facility.

BACT / T-BACT ANALYSIS

A. ACHIEVED IN PRACTICE (Rule 202, §205.1a):

The following control technologies are currently employed as BACT/T-BACT for an internal floating roof tank by the following agencies and air pollution control and air quality management districts:

US EPA

BACT
Source: EPA RACT/BACT/LAER Clearinghouse

Petroleum Liquid Storage in Floating Roof Tanks (Process Type 42.006)	
VOC	Internal floating roof with a mechanical shoe primary seal and a rim-mounted secondary seal. Tanks must be painted white or unpainted aluminum, utilize submerged fill, and designed to be drain-dry. [TX-0963, BACT-PSD]
NOx	N/A – No BACT determinations found
SOx	N/A – No BACT determinations found
PM10	N/A – No BACT determinations found
PM2.5	N/A – No BACT determinations found
CO	N/A – No BACT determinations found

T-BACT
There are no T-BACT standards published in the clearinghouse for this category, but the NESHAP standards (see 40 CFR, Part 63 standards below) represent Maximum Achievable Control Technology (MACT) or Generally Available Control Technology (GACT) for HAPs and can therefore be considered T-BACT.

RULE REQUIREMENTS:

40 CFR Part 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

This new source performance standard (NSPS) is applicable to large storage vessels, which store volatile organic liquids across a variety of industries, such as petroleum refineries, chemical plants and portions of the oil and gas industry.

Tank Size	Vapor Pressure	Requirement
≥ 75 m^3 and < 151 m^3 (≥ 19,815 gal. and < 39,890 gal.)	≥ 27.6 kPa < 76.6 kPa (≥ 4 psia < 11.1 psia)	Internal or external floating roof tank or fixed-roof tank with closed vent system and control device that meets 40 CFR § 60.112b (95% control).
≥ 151 m^3 ≥ 39,890 gal.	≥ 5.2 kPa < 76.6 kPa (≥ 0.75 psia < 11.1 psia)	
≥ 75 m^3 ≥ 19,815 gal.	≥ 76.6 kPa (≥ 11.1 psia)	Fixed-roof tank with closed vent system and control device that meets 40 CFR § 60.112b (95% control).

US EPA (continued)

Floating Roof Requirements		
Category	**Internal Floating Roof (IFR)**	**External Floating Roof (EFR)**
Lower Seal (Primary)	Require one of the following: 1. Liquid mounted foam- or liquid- filled seal, or 2. Two seals mounted one above the other (lower seal may be vapor-mounted), or 3. Mechanical shoe seal	Require one of the following: 1. Mechanical shoe seal, or 2. Liquid-mounted seal
Upper Seal (Secondary)	Required if option 2 is selected	Required for all EFRs

NSPS Subpart Kb also requires numerous deck fittings on the floating roof to be equipped with a gasketed cover or lid that is kept in the closed position at all times (i.e., no visible gap), except when the device (deck fitting) is in actual use, to prevent VOC emissions from escaping through the deck fittings.

NSPS Subpart Kb also includes two primary alternative means of compliance. Owners or operators may either comply with the consolidated air rule provisions for storage vessels in 40 CFR 65, Subpart C, or comply with National Emission Standards for Hazardous Air Pollutants 40 CFR 63, Subpart WW. The substantive control requirements in these rules are the same as in NSPS Subpart Kb although they may have slight differences in the details of the fitting and inspection requirements.

40 CFR Part 60 Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After October 4, 2023.

NSPS Subpart Kc is an update to NSPS Subpart Kb. The EPA updated vapor pressure applicability thresholds for controls under NSPS subpart Kc. The EPA also updated standards for volatile organic liquid (VOL) storage vessels subject to control requirements. Under NSPS subpart Kc EPA updated the standard of performance reflecting the application of best system of emission reduction (BSER) for VOL storage vessels subject to control requirements and used to store liquids with maximum true vapor pressures below 11.1 psia (76.6 kPa) is an IFR. The updated standards are projected to increase the average control efficiency of IFR storage vessels to 98%. As an alternative compliance to the proposed IFR design standard, EPA is proposing to permit either the use of an EFR or the use of a closed vent system and a control device that meet an equivalent standard of control.

NSPS Subpart Kc was finalized on October 14, 2024 (89 FR 83319).

The table below shows the updated vapor pressure and technology standards.

US EPA (continued)

Tank Size	Vapor Pressure	Requirement
≥ 75.7 m^3 and < 151 m^3 (≥ 20,000 gal. and < 40,000 gal.)	≥ 10.3 kPa < 76.6 kPa (≥ 1.5 psia < 11.1 psia)	Internal floating roof tank or fixed-roof tank with closed vent system and control device that meets 40 CFR § 60.112c (98% control). Any proposed external floating roof tank must be able to demonstrate equivalency to
≥ 151 m^3 ≥ 40,000 gal.	≥ 3.4 kPa < 76.6 kPa (≥ 0.5 psia < 11.1 psia)	
≥ 75.7 m^3 ≥ 40,000 gal.	≥ 76.6 kPa (≥ 11.1 psia)	Fixed-roof tank with closed vent system and control device that meets 40 CFR § 60.112c (98% control).

The EPA identified[1] the following potential tank configurations:

- IFR-Kb. NSPS subpart Kb for internal floating roofs considering controls for guidepoles as provided in the Storage Tank Emission Reduction Partnership Program (STERPP) as provided in 65 FR 19891 (April 13, 2000).
- IFR-1. NSPS subpart Kb but primary seal must either be liquid-mounted or mechanical shoe seal and must have rim-mounted secondary seal and gauge-hatch/sampling port using a gasketed cover with weighted mechanical actuation.
- IFR-2. Option IFR-1 with fixed roof legs or a cable suspended roof (cannot have adjustable roof legs that penetrate through the floating roof).
- IFR-3. Option IFR-2 with welded seems and best guidepole fittings.

Tanks that meet the IFR-3 configuration are projected to provide an average control efficiency of 98%, compared to 95% control for NESHAP Subpart Kb. Floating roof components in use for tanks that meet the IFR-3 configuration are as follows:

Floating Roof Component	Requirement	Floating Roof Type
Access Hatch & Gauge Float	Cover that is gasketed and bolted	EFR, IFR
Gauge Hatch / Sample well	Gasketed cover	EFR, IFR
Roof Leg	Gasket or cover with VOC impermeable sock	EFR, IFR
Rim Vent	Gasketed, no visible gaps when roof is floating	EFR, IFR
Vacuum Breaker	Gasketed, no visible gaps when roof is floating	EFR, IFR
Roof Drain	Slotted membrane fabric cover	EFR, IFR
Unslotted Guidepole	Gasketed cover	EFR, IFR
Slotted Guidepole	Gasketed cover, a pole wiper, and a pole float with (1) a wiper or seal, (2) that is extended into the stored liquid, or (3), that is extended into the stored liquid and a Flexible Enclosure System	EFR, IFR

[1] Control Options for Storage Vessels: Memorandum from RTI-International to EPA/OAQPS, EPA Docket No. EPA-HQ-OAR-2023-0358, August 11, 2023.

US EPA (continued)

Floating Roof Component	Requirement	Floating Roof Type
Fixed Roof Support Column and Well	Sliding cover that is gasketed or with flexible fabric sleeves	IFR
Ladder Well	Gasketed cover	IFR

The technologies of this NSPS are based on applicable standards for floating roofs listed in the Consolidated Federal Air Rule for storage vessels at 40 CFR Part 65 subpart C, the NESHAP for storage vessels located at 40 CFR Part 63 Subpart WW, and SCAQMD Rule 463 and Rule 1178, and therefore, are considered as achieved in practice.

40 CFR Part 63 Subpart BBBBBB – National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities.

This NESHAP establishes national emission limitations and management practices for VOCs emitted from area source gasoline line distribution bulk terminals, bulk plants, and pipeline facilities. VOCs are being controlled as a surrogate for HAPs found in gasoline.

Tank Size	Vapor Pressure	Requirement
< 75 m^3 (19,815 gal.), or < 151 m^3 (39,890 gal.) and throughput < 480 gal/day.	≥ 27.6 kPa (≥ 4 psia)	Fixed roof that is mounted to the storage tank in a stationary manner and maintain all openings in a closed position at all times when not in use.
≥ 75 m^3 and < 151 m^3 (≥ 19,815 gal. and < 39,890 gal.)	≥ 27.6 kPa (≥ 4 psia)	Internal or external floating roof tank or fixed-roof tank that meets 40 CFR § 60.112b, or Fixed-roof tank with closed vent system and control device that reduces HAP or TOC by 95%.

Gasoline storage tanks subject to, and complying with, the control requirements of 40 CFR 60, subpart Kb, are considered compliant with this regulation.

California Air Resources Board (CARB)

BACT
Source: CARB BACT Determination Tool & BACT Guidelines Tool

The Air Resource Board is required to maintain a technology clearinghouse that identifies BACT. Their BACT Determination Tool includes one published BACT determination for Tank – Storage.

Agency	Description	Date	District ID
South Coast	Tank – Storage	10/1/99	353730

The above determination is for the liquid transfer and handling of non-vehicle fuel and is thus outside the scope and not applicable to this BACT determination.

The BACT Guidelines Tool compiles guidelines from various agencies. In addition to the agencies identified in the SMAQMD BACT Guidance Document and discussed below, the following guidelines were identified:

California Air Resources Board (continued)

Agency	District ID	Date	Title
Santa Barbara	1.3.2	6/14/2017	External Floating Roof Tanks in Oil and Gas Service
Santa Barbara	1.3.2	6/14/2017	Internal Floating Roof Tanks in Oil and Gas Service

The above guidelines are for internal and external floating roof tanks used in the oil and gas service industry. The oil and gas industry primarily produces, stores, transports, and processes crude oil and gas products and their intermediate products prior to transfer to bulk fuel terminals.

As noted before a bulk terminal stores and distributes refined fuels and receives these fuels by method other than truck (i.e. pipeline or rail). Santa Barbara County does not have any bulk terminals.[2]

Although these determinations have similar requirements to NSPS Subpart Kb, these guidelines are outside the scope of this determination, and thus, not applicable.

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

Sacramento Metropolitan AQMD

BACT
Source: BACT Determination for Authority to Construct 23896
(Last revised 12/16/2013)

Conversion of exempt fixed-roof tank to internal floating roof tank (Tank 111)	
VOC	Compliance with 40 CFR 60 Subpart Kb and SMAQMD Rule 446.
NOx	No Standard
SOx	No Standard
PM10	No Standard
PM2.5	No Standard
CO	No Standard

T-BACT
The toxics at issue with this technology are VOCs. The control of VOCs through meeting the BACT standard will also control toxic air contaminants found in the VOCs. Therefore, the BACT VOC controls are also the T-BACT controls.

[2] California Energy Commission – Oil Refineries and Terminals, July 2, 2019,

Sacramento Metropolitan AQMD (continued)

RULE REQUIREMENTS

Rule 446 – Storage of Petroleum Products (Amended 11/16/1993)

Tank Size	Vapor Pressure	Requirement
≥ 150,000 liters (≥ 40,000 gal.)	≥ 1.5 psia (≥ 10.3 kPa)	1. Pressure Tank 2. Floating roof tank (external) with primary and secondary seal (A) 3. Internal floating roof. (A) 4. Vapor recovery system with an efficiency of at least 95%.

(A) A floating roof shall not be used if the organic liquid stored has a true vapor pressure of 11 psia (75.9 kPa) or greater under actual storage conditions as determined by the methods specified in Section 502.4.

South Coast AQMD

BACT

Source: SCAQMD LAER/BACT Determinations (Part B)
(Date: 02/19/2019)

Storage Tank – External Floating Roof, Application Nos. 535483, 535485, 544857 & 544859	
VOC	Storage tanks are equipped with geodesic dome cover, double-deck floating roof, category A metallic shoe primary seal, category A rim-mounted secondary seal and guide pole gasketed sliding cover with wiper unslotted.
NOx	No Standard
SOx	No Standard
PM10	No Standard
PM2.5	No Standard
CO	No Standard

Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities (Part D)

Storage Tanks - Liquid

Subcategory/ Rating/Size (A)	VOC	NOx	SOx	CO	PM10
External Floating Roof, VP ≤ 11 psia	Category “A” Tank Seals and Compliance with Rule 463 (A)	N/A	N/A	N/A	N/A
Internal Floating Roof	Category “A” Tank Seals and Compliance with Rule 463 (A)	N/A	N/A	N/A	N/A

(A) Category "A" seals are seals approved by the [SCAQMD] Executive Officer as most effective in the control of VOCs and are deemed Best Available Control Technology (BACT) according to the criteria set forth in [SCAQMD Rule 463] Attachment A - "Floating Roof Tank Seal Categories." [SCAQMD Rule 463(b)(12)(A)]

South Coast AQMD (continued)

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS

Reg. IV, Rule 463 – Organic Liquid Storage (Amended 05/05/2023)

This rule applies to any above-ground stationary tank with a Potential for VOC Emissions of 6 tons per year or greater or with a capacity of 75,000 liters (19,815 gallons) or greater used for storage of organic liquids.

Tank Size	Vapor Pressure	Requirement
≥ 75 m^3 and < 151 m^3 (≥ 19,815 gal. and < 39,630 gal.)	≥ 77.5 mmHg (≥ 1.5 psia)	1. Pressure Tank 2. External floating roof tank with primary and secondary seal (A) 3. Internal floating roof tank with single liquid mounted seal or a primary and secondary seal. (A) 4. Fixed-roof tank with closed vent system and 5. Fixed-roof tank with closed vent system and control device that reduces HAP or TOC by 95%.
≥ 151 m^3 ≥ 39,630 gal.	≥ 25.8 mmHg (≥ 0.5 psia)	

(A) A fixed roof tank with an internal floating-type cover or a tank with an external floating roof cover shall not be used for storing organic liquids having a true vapor pressure of 11 psia (569 mm Hg) or greater under actual storage conditions.

This rule also applies to aboveground gasoline storage tanks with a capacity of between 950 liters (251 gallons) and 75,000 listers (19,815 gallons), but those requirements are outside the scope of this determination.

Reg. IV, Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities (Amended 09/01/2023)

This rule applies to organic liquid storage tanks located at any petroleum facility that emits over 20 tons per year of VOC which meet the following criteria:

- Aboveground storage tanks with a capacity of 75,000 liters (19,815 gallons) or greater used for storage of organic liquids.
- Storage tanks with a Potential for VOC Emissions of 6 tons per year or greater and

In addition to complying with Rule 463, above, tanks subject to Rule 1178 must have a primary liquid-mounted or mechanical shoe seal and meet the following:

Floating Roof Component	Requirement	Floating Roof Type
Access Hatch & Gauge Float	Cover that is gasketed and bolted	EFR, Domed EFR, IFR
Gauge Hatch / Sample well	Gasketed cover	EFR, Domed EFR, IFR
Roof Leg	Gasket or cover with VOC impermeable sock	EFR, Domed EFR, IFR
Rim Vent	Gasketed, no visible gaps when roof is floating	EFR, Domed EFR, IFR

South Coast AQMD (continued)

Floating Roof Component	Requirement	Floating Roof Type
Vacuum Breaker	Gasketed, no visible gaps when roof is floating	EFR, Domed EFR, IFR
Roof Drain	Slotted membrane fabric cover	EFR, Domed EFR, IFR
Unslotted Guidepole	Gasketed cover	EFR, Domed EFR, IFR
Slotted Guidepole	Gasketed cover, a pole wiper, and a pole float with (1) a wiper or seal, (2) that is extended into the stored liquid, or (3), that is extended into the stored liquid and a Flexible Enclosure System	EFR, Domed EFR, IFR
Fixed Roof Support Column and Well	Sliding cover that is gasketed or with flexible fabric sleeves	IFR
Ladder Well	Gasketed cover	IFR

This rule also applies to aboveground gasoline storage tanks with a capacity of between 950 liters (251 gallons) and 75,000 listers (19,815 gallons), but those requirements are outside the scope of this determination.

San Joaquin Valley APCD

BACT
Source: SJVAPCD BACT Guideline 7.3.3
(Last revised 09/01/2021)

Floating Roof Organic Liquid Storage or Processing Tank	
VOC	Internal Floating Roof Tank meeting requirements of District Rule 4623, or External Domed Floating Roof Tank meeting requirements of District Rule 4623
NOx	No Standard
SOx	No Standard
PM10	No Standard
PM2.5	No Standard
CO	No Standard

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

Rule 4623 – Storage of Organic Liquids
(Amended 05/19/2005)

This rule applies to any tank with a capacity of 1,100 gallons or greater in which any organic liquid is placed, held, or stored.

San Joaquin Valley APCD (continued)

Tank Capacity (Gallons)	True Vapor Pressure (TVP of Organic Liquid)		
	0.5 psia to < 1.5 psia	1.5 psia to < 11 psia	≥ 11 psia
(Group A) 1,100 to 19,800	Pressure-vacuum relief valve, or internal floating roof, or external floating roof, or vapor recovery system	Pressure-vacuum relief valve, or internal floating roof, or external floating roof, or vapor recovery system	Pressure vessel or vapor recovery system
(Group B) >19,800 to 39,600	Pressure-vacuum relief valve, or internal floating roof, or external floating roof, or vapor recovery system	Internal floating roof, or external floating roof, or vapor recovery system	Pressure Vessel
(Group C) > 39,600	Internal floating roof, or external floating roof, or vapor recovery system	Internal floating roof, or external floating roof, or vapor recovery system	Pressure Vessel

Internal and external floating roof tanks must be equipped with a primary and secondary seal that meets the requirements of Section 5.3 of this rule.

This rule has separate requirements for crude oil storage tanks used by small producers, but those requirements are outside the scope of this determination.

San Diego County APCD

BACT
Source: NSR Requirements for BACT

There are no BACT standards published in the clearinghouse for this category.

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS

Regulation 4, Rule 61.1 – Receiving and Storing Volatile Organic Compounds at Bulk Plants and Bulk Terminals
(Effective 01/10/1995)

This rule applies to storage tanks with a capacity of greater than or equal to 40,000 gallons located at a bulk plant or bulk terminal.

New tank construction and replacement of rim seals: Except as otherwise provided in Subsection (b)(3)of this rule no person shall store volatile organic compounds in, or transfer such compounds into, any bulk plant or bulk terminal stationary tank which is used primarily to fill mobile transport tanks and which was installed or replaced after November 15, 1979, unless the tank is equipped with best available control technology (BACT) at the time of construction or replacement. No person shall install a rim seal unless the rim seal configuration represents BACT at the time of installation.

San Diego APCD (continued)

This rule has separate requirements for tanks constructed before November 15, 1979. However, those requirements are outside the scope of this determination.

Bay Area AQMD

BACT

Source: BAAQMD BACT/TBACT Workbook Document #167.4.1
(Last revised 03/03/1995)

Storage Tank - Internal Floating Roof, Organic Liquids	
VOC	BAAQMD Approved roof w/ liquid mounted primary seal and zero gap secondary seal, all meeting design criteria of Reg. 8, Rule 5. Also, no ungasketed roof penetrations, no slotted pipe guide pole unless equipped with float and wiper seals, and no adjustable roof legs unless fitted w/ vapor seal boots or equivalent
NOx	No Standard
SOx	No Standard
PM10	No Standard
PM2.5	No Standard
CO	No Standard

T-BACT

The standard listed above for VOC is considered T-BACT.

RULE REQUIREMENTS

Reg 8, Rule 5 – Storage of Organic Liquids (Amended 11/03/2021)

This rule applies to storage tanks with a capacity of 1.0 m^3 (264 gallons) or greater in which any organic liquid is placed, held, or stored.

Tank Capacity	True Vapor Pressure (TVP of Organic Liquid)		
	0.5 psia to < 1.5 psia	**1.5 psia to < 11 psia**	**≥ 11 psia**
≥ 1.0 m^3 to ≤ 37.5 m^3 (≥ 264 gal. to ≤ 9,906 gal.)	Submerged fill pipe	Submerged fill pipe (underground tank or aboveground non-gasoline tank), pressure vacuum valve, internal or external floating roof	Pressure tank or approved emission control system
> 37.5 m^3 to < 75 m^3 (> 9,906 gal. to < 19,803 gal.)	Submerged fill pipe	Submerged fill pipe (underground tank), pressure vacuum valve, internal or external floating roof	Pressure tank or approved emission control system

Bay Area AQMD (continued)

Tank Capacity	True Vapor Pressure (TVP of Organic Liquid)		
	0.5 psia to < 1.5 psia	1.5 psia to < 11 psia	≥ 11 psia
> 75 m^3 to < 150 m^3 (> 19,803 gal. to < 39,626 gal.)	Submerged fill pipe	Internal or external floating roof	Pressure tank or approved emission control system
≥ 150 m^3 (≥ 39,626 gal.)	Internal or external floating roof	Internal or external floating roof	Pressure tank or approved emission control system

Summary of Achieved in Practice Control Technologies

The following control technologies have been identified and are ranked based on stringency:

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
Pollutant	**Standard**
VOC (A)	1. Internal Floating Roof with a liquid-mounted or mechanical shoe primary seal and rim-mounted secondary seal, and compliance with NSPS Subpart Kc (98% Control) [EPA] 1. Category "A" Tank Seals(A) and Compliance with Rules 463 and 1178 [SCAQMD] 2. Category "A" Tank Seals(A) and Compliance with Rule 463 [SCAQMD] 3. Internal Floating Roof Tank meeting requirements of District Rule 4623 [SJVAPCD] 4. Internal floating roof with a mechanical shoe primary seal and a rim-mounted secondary seal. Tanks must be painted white or unpainted aluminum, utilize submerged fill, and designed to be drain-dry. [EPA] 5. Approved roof w/ liquid mounted primary seal and zero gap secondary seal, all meeting design criteria of Reg. 8, Rule 5. Also, no ungasketed roof penetrations, no slotted pipe guide pole unless equipped with float and wiper seals, and no adjustable roof legs unless fitted w/ vapor seal boots or equivalent. [BAAQMD] 6. Compliance with 40 CFR 60 Subpart Kb and SMAQMD Rule 446. [SMAQMD] (95% control efficiency).
NOx	No standard
SOx	No standard
PM10	No standard
PM2.5	No standard
CO	No standard
T-BACT (Organic HAP / VHAP)	Same as achieved in practice BACT for VOC.

(A) Category "A" Primary Tank Seals are either (1) Liquid mounted multiple wipers with drip curtain and weight, or (2) Liquid mounted mechanical shoe. Category "A" secondary seal is a rim-mounted wiper seal.

Summary of Achieved in Practice Control Technologies (continued)

The following control technologies have been identified as the most stringent, achieved in practice control technologies:

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	**Standard**	**Source**
VOC	98% control efficiency through one of the following: <u>Internal floating roof tank</u> Primary Seal - Liquid mounted multiple wipers with drip curtain and weight, or Liquid mounted mechanical shoe. Secondary wiper seal. Gasketed floating roof components that meet NSPS Subpart Kc or SCAQMD Rule 1178	SCAQMD, EPA
VOC	<u>External floating roof tank</u> Same as internal floating roof but must establish equivalent level of control on a case-by-case basis. <u>Fixed roof tank</u> Closed vent vapor recovery system capable of achieving 98% control	SCAQMD, EPA
NOx	No standard	EPA, ARB, SMAQMD, SCAQMD, SJVAPCD, SDPACD, BAAQMD
SOx	No standard	
PM10	No standard	
PM2.5	No standard	
CO	No standard	
T-BACT	Same as BACT for VOC	SMAQMD, SCAQMD

B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (RULE 202, §205.1.b.)

Technologically Feasible Alternatives:
Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be "Achieved in Practice" as per Rule 202, §205.1. a.

Pollutant	Technologically Feasible Alternatives	Source
VOC	Vapor recovery system w/ an overall system efficiency ≥ 98%	BAAQMD
NOx	No other technologically feasible option identified	
SOx	No other technologically feasible option identified	
PM10	No other technologically feasible option identified	
PM2.5	No other technologically feasible option identified	
CO	No other technologically feasible option identified	

The BAAQMD's BACT Document 167.4.1 identified the above add-on control technology as technologically feasible alternative to a floating roof tank with an overall control efficiency of 98% (NSPS Subpart Kc equivalent).

NSPS Subpart Kc is primarily based on SCAQMD Rules 463 and 1178. These rules are based on currently available technology and are expected to provide an equivalent level of control through more effective floating roof components and rim seals or through the utilization of a fixed-roof tank with a closed vent vapor recovery system capable of achieving 98% control. Since the currently achieved in practice standard provides a level of control equivalent to the technologically feasible standard above, a cost effectiveness analysis is not necessary for demonstrating BACT.

C. SELECTION OF BACT:

Based on the review of SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, SBCAPCD, ARB, and EPA BACT Clearinghouses and cost effectiveness determinations, BACT for VOC, NOx, SOx, PM10, PM2.5, and CO will be the following:

BACT #373 for Organic Liquid Storage Tank ≥ 20,000 gallons		
Pollutant	**Standard**	**Source**
VOC	98% control efficiency through one of the following: <u>Internal floating roof tank</u> Primary Seal - Liquid mounted multiple wipers with drip curtain and weight, or Liquid mounted mechanical shoe. Secondary wiper seal. Gasketed floating roof components that meet NSPS Subpart Kc or SCAQMD Rule 1178 <u>External floating roof tank</u> Same as internal floating roof but must establish equivalent level of control on a case-by-case basis. <u>Fixed roof tank</u> Closed vent vapor recovery system capable of achieving 98% control	EPA, SCAQMD, BAAQMD
NOx	No Standard	EPA, ARB, SMAQMD, SCAQMD, SJVAPCD, SDPACD, BAAQMD
SOx	No Standard	
PM10	No Standard	
PM2.5	No Standard	
CO	No Standard	

T-BACT #373 for Organic Liquid Storage Tank ≥ 20,000 gallons		
Pollutant	**Standard**	**Source**
T-BACT (Organic HAP / VHAP)	Same as BACT for VOC	SMAQMD, SCAQMD

APPROVED BY: *Brian F Krebs* **DATE:** 06-26-2025

Appendix A

Review of BACT Determinations Published by EPA

RBLC #	Permit Date	Process Code	Equipment	Pollutant	Standard	Case-By-Case Basis
TX-0936	03/29/2022	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Internal floating roof tanks with mechanical shoe primary seal, painted white. External floating roof tank painted white with primary mechanical shoe seal and a secondary rim-mounted seal.	BACT-PSD, NSPS, MACT
TX-0930	10/19/2021	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Internal floating roof with a mechanical shoe primary seal and a rim-mounted secondary seal. Tanks must be painted white or unpainted aluminum, utilize submerged fill, and designed to be drain-dry.	BACT-PSD, NSPS, MACT
IL-0131	11/20/2020	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	The storage tank will be equipped with an external welded floating roof with rim seals and fittings on the deck of floating roof that are designed meet applicable requirements for floating roof tanks in the NSPS Subpart Kb. A sloped, drain floor. An exterior shell that is painted white.	BACT-PSD, NSPS, SIP, OPERATING PERMIT
LA-0383	09/03/2020	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Internal floating roofs	BACT-PSD
TX-0873	02/04/2020	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	IFR and EFR tanks are equipped with welded decks as well as a mechanical shoe and rim-mounted secondary seal systems. Submerge filled equipped. Drain dry and store material with less than 11.0 psia	BACT-PSD, NSPS
TX-0872	10/31/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Equipped with welded decks and permanent submerged fill pipes. Designed with a mechanical shoe seal system and drain dry sump. Seal visual inspections required via 40 CFR §60.113b	BACT-PSD, NSPS

RBLC #	Permit Date	Process Code	Equipment	Pollutant	Standard	Case-By-Case Basis
TX-0862	09/27/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	IFR, constructed with welded decks, primary and secondary seals, and drain-dry bottoms	BACT-PSD, NSPS
OK-0181	09/11/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Equipped with IFR, primary mechanical shoe seal, and drain-dry design.	BACT-PSD, NSPS
TX-0861	08/29/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	IFR, Painted White, Submerged Fill, Drain-Dry Design, Mechanical Primary Seal	BACT-PSD, NSPS
IN-0318	06/11/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Tanks shall have an internal floating roof. Tanks shall use a white shell. Tanks shall use submerged filling. Tanks shall use good maintenance practices as described in the permit.	BACT-PSD, NSPS, NESHAP
LA-0344	05/29/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Internal floating roof (IFR)	BACT-PSD, NSPS, NESHAP
LA-0380	05/21/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Internal floating roof (IFR)	BACT-PSD, NSPS, NESHAP
TX-0855	03/13/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	Internal floating roof storage tanks equipped with a primary and secondary seal, painted white, and has drain dry floor design	BACT-PSD, NSPS, MACT
TX-0852	01/02/2019	42.006	Petroleum Liquid Storage in Floating Roof Tanks	VOC	IFR equipped with a primary and secondary seal, painted white, and has drain dry floor design. Vapors are routed to a vapor combustion unit (A)	BACT-PSD, NSPS, MACT

(A) The listed BACT determination implies that vapors above the floating roof are routed to a vapor combustion unit for additional control. However, referenced Permit Numbers 145717 and PSDTX1516 only require that vapors be routed to a vapor combustion unit when being emptied or degassed for maintenance, which is outside the scope of this determination.

Appendix B

Review of BACT Determinations Published by Air Districts

2. NEW SOURCE REVIEW COMPLIANCE:

RULE 202:

Section 301 - BACT
The proposed VOC net emission increase from Tank 111 A/C 23896 trigger the VOC BACT limit of this section. Therefore, BACT is required. The following sources were evaluated to determine the applicable BACT:

Source	BACT – Achieved in practice
South Coast AQMD	Tank Seals and compliance with the applicable rule
San Joaquin Valley APCD	Primary metal shoe seal with secondary wiper or equal
Bay Area AQMD	Approved roof with seals
US EPA BACT/LAER learinghouse	NSPS and NESHAP compliance

Chevron Sacramento Terminal is proposing to install and operate Tank 111, A/C 23896, in compliance with 40 CFR 60 Subpart Kb and Sacramento AQMD Rule 446 which includes the installation of the required seals and roof design specified in the BACT table above. Therefore, BACT requirements are satisfied.

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.3.3*

Last Update: 9/1/2021

Floating Roof Organic Liquid Storage or Processing Tank

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Internal Floating Roof Tank meeting requirements of District Rule 4623 or External Domed Floating Roof Tank meeting requirements of District Rule 4623		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

Part B, Section 1 - SCAQMD BACT Determination

Source Type: **Major/LAER**

Application No.: **535483, 535485, 544857 & 544859**

Equipment Category: **Storage Tank**

Equipment Subcategory: **External Floating Roof**

Date: **February 1, 2019**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Custom	B. MODEL: Custom
C. DESCRIPTION: Domed external floating roof, welded shell, Nos. 15, 2625, 2640 & 2643	
D. FUNCTION: Phillips 66 Company is a refinery which owns and operates external floating roof storage tanks for crude oil, gas oil, mixed naphtha and wastewater	
E. SIZE/DIMENSIONS/CAPACITY: A/N 535483: 117' Dia. x 40' H., 79,000 BBL (3,318,000 Gal.) Mixed Naphtha A/N 535485: 165' Dia. x 48' H., 165,252 BBL (6,940,584 Gal.) Gas Oil A/N 544857: 260' Dia. x 65' H., 615,000 BBL (25,830,000 Gal.) Crude Oil A/N 544859: 44' Dia. x 51' H., 14,000 BBL (588,000 Gal.) Wastewater	
COMBUSTION SOURCES	
F. MAXIMUM HEAT INPUT: N/A	
G. BURNER INFORMATION	

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
N/A		**Number of burners**

H. PRIMARY FUEL: N/A	. OTHER FUEL: N/A
I. OPERATING SCHEDULE: Hours 24 Days 7 Weeks 52	
J. EQUIPMENT COST:	
K. EQUIPMENT INFORMATION COMMENTS: Storage tanks are equipped with geodesic dome cover, double- deck floating roof, category A metallic shoe primary seal, category A rim-mounted secondary seal and guide	

2. COMPANY INFORMATION

A. COMPANY: Phillips 66 Company	B. FAC ID: 171109
C. ADDRESS: 1520 E. Sepulveda Blvd. CITY: Carson STATE: CA ZIP: 90745	D. NAICS CODE: 324110
E. CONTACT PERSON: Marshall Waller	F. TITLE: Env. Engineer
G. PHONE NO.: (310) 522-8039	H. EMAIL:

3. PERMIT INFORMATION

A. AGENCY: SCAQMD	B. APPLICATION TYPE: NEW CONSTRUCTION
C. SCAQMD ENGINEER: Thomas Truppi	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 8/30/13 P/O NO.: G17750, G17751, G51127 & G51128	PO ISSUANCE DATE: 3/15/2018
E. START-UP DATE: 4/4/2016	
F. OPERATIONAL TIME: 2+ years	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx	SOx	CO	PM OR PM_{10}	INORGANIC
BACT Limit						
Averaging Time						
Correction						

B. OTHER BACT REQUIREMENTS:

C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology

D. EMISSION INFORMATION COMMENTS:

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Custom B. MODEL: Custom

C. DESCRIPTION: Use of Geodesic Dome Cover, Floating Roof Pontoon (Double Deck), Primary Seal with Category A Metallic Shoe, Secondary Seal with Category A wiper type, and Guidepole with gasketed sliding cover with wiper unslotted.

D. SIZE/DIMENSIONS/CAPACITY: N/A

. CONTROL EQUIPMENT PERMIT INFORMATION:

APPLICATION NO. same PC ISSUANCE DATE: same
PO NO.:same PO ISSUANCE DATE: same

A. REQUIRED CONTROL EFFICIENCIES: .

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	___%	___%	___%
NOx	___%	___%	___%
SOx	___%	___%	___%
CO	___%	___%	___%
PM	___%	___%	___%
PM_{10}	___%	___%	___%
INORGANIC	___%	___%	___%

B. CONTROL TECHNOLOGY COMMENTS

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Maintenance, Inspection and Recordkeeping

B. DATE(S) OF SOURCE TEST: An appropriate size parameter such as rated product throughput, usable volume, and/or one more characteristic dimensions.

C. COLLECTION EFFICIENCY METHOD: N/A

D. COLLECTION EFFICIENCY PARAMETERS: N/A

E. SOURCE TEST/PERFORMANCE DATA:N/A

F. TEST OPERATING PARAMETERS AND CONDITIONS: N/A

G. TEST METHODS (SPECIFY AGENCY): N/A

H. MONITORING AND TESTING REQUIREMENTS: Monitoring monthly throughput permitted limit. This requirement is included for information only; it is not related to the dome cover BACT requirement.

I. DEMONSTRATION OF COMPLIANCE COMMENTS: **Enter comments for additional information for Demonstration of Compliance.**

7. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT: 248919	B. CCAT: Click here to enter text.	C. APPLICATION TYPE CODE: 60
D. RECLAIM FAC? YES ☒ NO ☐	E. TITLE V FAC: YES ☒ NO ☐	F. SOURCE TEST ID(S): N/A
G. SCAQMD SOURCE SPECIFIC RULES: Click here to enter text.		
H. HEALTH RISK FOR PERMIT UNIT		

H1. MICR: Click here to enter text.	H2. MICR DATE: Click here to enter a date.	H3. CANCER BURDEN: Click here to enter text.	H4. CB DATE: Click here to enter a date.
H5: HIA: Click here to enter text.	H6. HIA DATE: Click here to enter a date.	H7. HIC: Click here to enter text.	H8. HIC DATE: Click here to enter a date.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

10-20-2000 Rev. 0

Equipment or Process: Storage Tanks - Liquid

Criteria Pollutants

Subcategory/ Rating/Size	VOC	NOx	SOx	CO	PM10	Inorganic
Asphalt					Cool Gases to < 120 °F and Vent to a Fiberglass or Steel Wool Filter. (07-11-97)	
External Floating Roof, VP ≤ 11 psia	Category A Tank Seals and Compliance with Rule 463 (10-20-2000)					
Fixed Roof	Vapor Recovery System with an Overall System Efficiency of ≥ 95% (7-11-97)					
Fuming Sulfuric Acid					Scrubber Followed by Fiber Mist Filter; or Water Spray Followed by Fiber Mist Filter (1988)	
Grease or Tallow					Maintain Temperatures ≥ 140 °F (1988)	
Internal Floating Roof	Category A Tank Seals and Compliance with Rule 463 (10-20-2000)					
Sulfuric Acid			Caustic Scrubber and Mist Eliminator (1988)			
Underground, > 250 gallons	≥ 95% Removal Efficiency for VOC (1990)					

* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline

Source Category

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

Determination

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

References

a. BAAQMD
T. TBACT