

Construction Permit Source Analysis & Technical Review

Company	Equistar Chemicals, LP	Permit Numbers	174650 and N312
City	Channelview	Project Number	366657
County	Harris	Regulated Entity Number	RN100542281
Project Type	Initial	Customer Reference Number	CN600124705
Project Reviewer	Devin Pedraza	Received Date	November 17, 2023
Site Name	Channelview Complex		

Project Overview

Equistar Chemicals, LP. (Equistar) submitted an initial air permit application to authorize the construction and operation of the Ethylene Derivatives Unit (EDU) at their Channelview Complex which is an existing chemical manufacturing complex located in Channelview, Harris County, Texas. The Channelview Site is broken up into two operating areas, and each area operates under a unique TCEQ Regulated Entity Number (RN) and Customer Number (CN):

- North Plant operated by Equistar Chemicals, L.P. (RN100542281, CN600124705), and
- South Plant operated by Lyondell Chemical Company (RN100633650, CN600344402).

For the purpose of federal regulatory applicability, the North and South Plants are contiguous and under common control and considered as one site under LyondellBasell. The combined Channelview Site is an existing major source of volatile organic compounds (VOC), sulfur dioxide (SO₂), carbon monoxide (CO), both nitrogen dioxide (NO₂) and nitrogen oxides (NO_x), and particulate matter (PM).

The proposed EDU will use ethylene to make longer chain olefins and by-product gasolines.

The proposed EDU will receive feed from co-located ethylene operating units and/or pipeline. The EDU will contain heaters, various process vessels, process analyzers, a cooling tower, and numerous equipment components in various forms of liquid and gas service. Products will be exported via hard-pipe to onsite and/or offsite dispositions.

Planned Maintenance, Startup, and Shutdown (MSS) activities for the EDU facility will be authorized with this permit and are included in the application.

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Emission Summary

Air Contaminant	Current Allowable Emission Rates (tpy)	Proposed Allowable Emission Rates (tpy)	Change in Allowable Emission Rates (tpy)	Project Changes at Major Sources (Baseline Actual to Allowable)*
VOC**	0.00	19.01	19.01	19.01***
PM	0.00	3.28	3.28	3.28
PM ₁₀	0.00	2.01	2.01	2.01
PM _{2.5}	0.00	2.01	2.01	2.01
NO _x	0.00	3.63	3.63	3.63
CO	0.00	6.92	6.92	6.92
SO ₂	0.00	0.05	0.05	0.05

*Since this is a new facility, a baseline of 0 TPY is used for all contaminants.

** HAPs are included in VOC total.

***The project increase for VOC is greater than 5 tpy; therefore, netting is triggered. Nonattainment permitting applicability for this project was accepted without netting.

Compliance History Evaluation - 30 TAC Chapter 60 Rules

A compliance history report was reviewed on:	February 23, 2026
Site rating & classification:	12.22 / Satisfactory
Company rating & classification:	7.72 / Satisfactory
Has the permit changed on the basis of the compliance history or rating?	No
Did the Regional Office have any comments? If so, explain.	No

Public Notice Information

Requirement	Date
Legislator letters mailed	11/28/2023
Date 1 st notice published	12/20/2023
Publication Name: Pasadena Citizen	
Pollutants: hazardous air pollutants, carbon monoxide, nitrogen oxides, organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less and sulfur dioxide	
Date 1 st notice Alternate Language published	12/20/2023
Publication Name (Alternate Language): La Voz	
1 st public notice tearsheet(s) received	12/28/2023
1 st public notice affidavit(s) received	12/28/2023
1 st public notice certification of sign posting/application availability received	01/29/2024
SB709 Notification mailed*	02/16/2024 & 02/21/2025

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Date 2 nd notice published	03/19/2025
Publication Name: Pasadena Citizen	
Pollutants: hazardous air pollutants, carbon monoxide, nitrogen oxides, organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less and sulfur dioxide	
Date 2 nd notice published (Alternate Language)	03/19/2025
Publication Name (Alternate Language): La Voz	
2 nd public notice tearsheet(s) received	04/01/2025
2 nd public notice affidavit(s) received	04/01/2025
2 nd public notice certification of sign posting/application availability received	04/21/2025

**A SB709 re-notice was mailed on 02/21/2025 as more than 90 days have passed since the initial notification was mailed.

Public Interest

Number of comments received	59
Number of meeting requests received	2
Number of hearing requests received	0
Date meeting held	08/19/2025
Date response to comments filed with OCC	02/12/2026
Date of SOAH hearing	N/A

Federal Rules Applicability

Requirement	
Subject to NSPS?	Yes
Subparts A, IIII, & VVa	
Subject to NESHAP?	No
Subject to NESHAP (MACT) for source categories?	Yes
Subparts A, F, G, H, YY, & ZZZZ	

Nonattainment review applicability:

The site is located in Harris County, which is classified as Severe Nonattainment for Ozone (2008 standard).

The project increase of 3.63 tpy for NO_x is below the 5 tpy netting threshold; therefore, Nonattainment review is not applicable for NO_x.

The VOC project increase is greater than the 5 tpy significant emission rate. Therefore, an applicability threshold test (netting analysis) is required. However, Equistar had foregone calculating the net emissions increase and states that Nonattainment review is applicable for VOC.

Equistar has opted to apply LAER for VOC with this project and accept Nonattainment applicability. The VOC emission increase will also be offset with reduction credits at a ratio of 1.30 to 1.

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PSD review applicability:

The site is an existing major named source with respect to PSD. The proposed increases associated with this project are below major source modification trigger levels; therefore, PSD review is not applicable.

Contaminant	Project Increase (tpy)	PSD Threshold (tpy)	PSD Review Triggered?
CO	6.92	100	No
NO _x	3.63	40	No
VOC	19.01	40	No
SO ₂	0.05	40	No
PM	3.27	25	No
PM ₁₀	2.01	15	No
PM _{2.5}	2.01	10	No

Title V Applicability - 30 TAC Chapter 122 Rules

Requirement

Title V applicability:

This site is subject to the Title V program because it is a major source and operates under Title V Permit No. O1426.

Periodic Monitoring (PM) applicability:

The following monitoring requirements will be established in NSR Permit No. 174650:

- Daily EDU production rates.
- Ultra Low Sulfur Diesel (ULSD) sampling every 6 months.
- The heaters must be equipped with a totalizing fuel meter to measure fuel usage and records are kept monthly.
- The emergency engine must use a non-resettable hour meter to demonstrate compliance with the permit restriction on hours of operation.
- 28LAER monitoring for fugitive components in VOC service.
- Throughput and service records must be kept for all product storage vessels.
- The cooling tower water must be periodically monitored for strippable VOC and TDS in accordance with Permit 1768.
- Recordkeeping and calculations are required for planned MSS activities.

Compliance Assurance Monitoring (CAM) applicability:

This project is located at a site subject to 30 TAC Chapter 122 requirements. CAM applies to the plant flare system (EPN 38E01) as it is required to be compliance with the emission limitation and the pre-control device potential to emit (PTE) is greater than or equal to the amount in tons per year required for a site to be classified as a major source.

CAM is addressed by requiring continuous flow monitor and composition monitoring to record the flare vent stream flow and composition to the flare. The capture system is required to be inspected annually in accordance with 40 CFR Part 60, Appendix A, Test Method 21 and the bypass monitored. These requirements are outlined in the Special Conditions of NSR Permit No. 1768. CAM requirements are satisfied.

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Process Description

The EDU uses ethylene to make longer chain olefins and by-product gasolines. The ethylene is initially catalytically converted to butene and then the butene is reacted with additional ethylene to form propylene and other by-products. The catalyst and solvent are off-loaded from tank trucks into small pressure-controlled storage tanks (D-7310, D7311, and D-7316). The ethylene is reacted in presence of the catalyst to form butene. Caustic is added to stop the reaction before the butene stream is sent to a separate section. The spent caustic stream is sent to a flash drum before being sent to pressure-controlled storage tank (D-7383). The butene stream is separated into butene, light gasoline and heavy gasoline streams. The gasolines are sent to separate individual storage tanks that are normally operated with a constant level (D-7384 and D-7386 respectively). The gasolines are sent off-site through pipeline or replace existing external supplied feed streams in co-located process units. The butene can be sent to replace existing external supplied feed streams in co-located process unit or be further reacted with ethylene to produce propylene. The butene is treated to remove water and heated to being reacted with ethylene in the R-7360 reactors.

The propylene product will be sent to separation and any residual ethylene or butene is recycled back into the process. The product propylene will be exported from the facility via existing pipeline. Process equipment vents will be routed to high pressure vent recovery system. Any potential venting from the storage tanks will be routed primarily to existing low-pressure vapor recovery system or secondarily to existing flare (EPN 38E01). The R-7360 reactors will periodically be cleared, and coke build-up removed from the catalyst. The reactors will be primarily cleared to the high-pressure vent recovery before decoking. Water removed from the process will be recycled for use in existing co-located process unit. Stormwater and any maintenance water will be collected and sent to existing wastewater storage (EPNs 38E010 and 38E011) and treatment unit (EPN MECUWWTP).

Project Scope

Equistar is proposing to expand their current operations at their Channelview Site to authorize the new Ethylene Derivatives Unit (EDU). The EDU is being constructed to minimize process emissions. The unit has been designed to implement low carbon fuels, utilize process controls and procedures to retain material in process and route any process equipment vents to vent recovery systems. The design utilizes recovering material into existing systems and utilizing existing control devices to eliminate the combustion emissions that would result from pilot fuel and fuel to maintain minimum firing from new control devices built for the unit. The design includes utilizing an electric heater and a second heater designed to primarily fire low-VOC (H₂) fuel gas. The heaters are designed to reduce carbon-based emissions and combustion products through the use of an electric heater and low-VOC (hydrogen) fuel in a combustion heater. Additionally, the facility is being designed to utilize vent recovery systems to minimize emissions being sent to add-on controls. The process emission will primarily vent to a high-pressure vent recovery system that will recycle material to existing olefins process unit and secondarily vent to a low-pressure gas recovery system that will also recycle material to existing process unit. The EDU will utilize 28LAER monitoring to minimize potential for equipment leak fugitive emissions. This Initial permit application proposes authorization for the following units:

Heaters

Equistar is proposing the authorization of two new heaters designed to reduce carbon-based emission and combustion products. Heater F-7361 (FIN EF7361) will be an electric heater with a firing rate of 6.82 MMBtu/hr and will have no emissions associated with it (and is therefore not included on the MAERT). The Reactor Feed Heater (EPN EF7360) will operate at a firing rate of 20 MMBtu/hr and is designed to primarily fire low-VOC hydrogen (H₂) fuel gas but will also have the capability to fire natural gas. These heaters will not operate as control devices. The Reactor Feed Heater (EPN EF7360) will be authorized to fire either 100% natural gas or 100% H₂-rich fuel for 8,760 hours a year. Emissions are based on the firing rate and highest emission factor (in lb emission/MMBtu) between low-VOC hydrogen fuel gas and natural gas. NO_x, VOC, CO, SO₂, and PM emission factors are based on AP-42.

Emergency Engine (EPN EF2GEN1)

Equistar is proposing to authorize one new EPA Tier 4 600 horsepower emergency engine. This engine will fire ultra-low sulfur diesel fuel and will not operate for more than 100 hours per rolling 12-months. Emissions are based on the horsepower of the engine, expected hours of operation, and the emission factors in lb emissions/hr-hr. NO_x, CO, VOC, and PM emission factors are based on EPA Tier 4 Factors for nonroad compression-ignition engines. The SO₂ emission factor is based on fuel consumption (0.00001777 lb diesel/hp-hr) and Ultra Low Sulfur Diesel (ULSD) sulfur concentration (15 ppmw), per TCEQ BACT Tier I guidance for emergency diesel engines.

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Pressurized Storage Tanks

The EDU will utilize 6 pressure-controlled storage tanks to minimize emissions. The pressure of these tanks will be maintained to prevent any standing losses from occurring due to diurnal temperature changes throughout the day. The tanks will be designed such that the pressure controller will minimize losses during filling and any subsequent working loss emissions will be routed to site low pressure vapor recovery system and/or the OP1 flare (EPN 38E01). Pressurized tanks and their service are summarized below:

Tank ID	Service
D-7310	Hexane 1016
D-7311	Hexane 11
D-7316	Hexane 1016
D-7384	Gasoline
D-7383	Spent Caustic
D-7386	Heavy Oil

Cooling Tower (EPN 38E11)

Equistar has proposed the addition of one new cooling tower cell that will be added to the existing OP1 cooling tower authorized under NSR Permit Nos. 1768, PSDTX1272, and N142M1. The OP1 cooling tower operates at a recirculation rate of 38,500 gal/min with a maximum total dissolved (TDS) concentration of 3,000 parts per million (ppm). The tower will operate with 16 cells, and the flow to cooling tower cells is intended to be uniformly distributed. Equistar does not anticipate operating at a flow rate less than the design maximum. The new cell will be a non-contact design and will be sampled 30 TAC Chapter 115 Subchapter H requirements. Additionally, the site will repair leaks as soon as possible, but before next schedule shutdown or shutdown triggered by 0.08 ppm cooling water concentration. The emissions that will be authorized on the MAERT represent the emissions from this permit only and are not a combined total across permits.

For average and maximum VOC emissions, cooling tower emissions are based on the recirculation rate of the tower and a corresponding leak rate emission factor of 0.7 lb VOC/MMgal. Cooling tower emissions are based on EPA AP-42 Chapter 5 and the Reisman-Frisbie method for estimating PM emissions. Site historical total suspended particles data (TSPD) was used to estimate PM emissions for cooling tower. The cooling water from this unit to the tower will be returned through the main cooling tower header with the current HRVOC sampling. Cooling tower water will be monitored monthly with an air stripping system meeting the requirements of the TCEQ Sampling Procedures Manual, Appendix P or an approved equivalent sampling method. Cooling water will be sampled at least once per week for TDS and once per week for conductivity as outlined in NSR Permit Nos. 1768, PSDTX1272, and N142M1.

Fugitives (EPN FUGETHDRV)

Fugitive emissions from piping and equipment in the EDU associated with this project are accounted for via the number of valves, flanges, and other piping components. The TCEQ 28LAER fugitive emissions monitoring programs will be used to control fugitive emissions from streams that contain greater than 10 percent VOC in the EDU. Emissions have been included for non-traditional components such as hatches, manways and heat exchanger heads that are required to be monitored per the 30 TAC Chapter 115 Subchapter H and reported in the site annual emissions inventory to the TCEQ.

Wastewater Treatment (EPN MECUWWTP)

The EDU is designed to utilize existing wastewater systems to manage stormwater first flush and periodic maintenance water. The Wastewater treatment unit (EPN MECUWWTP) is currently authorized under NSR Permit No. 49120. Emissions generated from the process in this permit are estimated using ToxChem software. The emissions that will be authorized in the MAERT represent the emissions from this permit only and are not a combined total across permits.

The derivatives stream will be mostly water since it either comes from first flush of stormwater or maintenance related clearing/washing. Since it is mostly water, addition of this stream will lower the overall concentration of the organics in the wastewater system as well as change the residence time in the system, so material has less time to vaporize. The ToxChem program models the impact of the multitude of streams going to the wastewater system and identifies the predicted emissions based on the flows and concentrations of the different input streams. When the derivatives stream was added to the wastewater plant model in ToxChem, the result was a decrease in vaporization to

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atmosphere/emissions from the wastewater system.

Wastewater Tanks (EPNs 38E010 and 38E011)

The EDU will be designed to utilize two existing wastewater tanks to manage stormwater. Wastewater Tanks TK38010 and TK38011 (EPNs 38E010 and EPN 38E011) are existing internal floating roof tanks that store wastewater. These tanks are currently authorized under NSR Permit Nos. 1768, PSDTX1272, and N142M1. The emissions that will be authorized in the MAERT represent the potential increase in emissions from this permit only and are not a combined total across permits. Emissions are based on tank size, physical characteristics, and vapor pressure of material stored. Annual storage tank emission calculations are based on EPA AP-42 Chapter 7.1 (dated June 2020). Short term storage tank emissions are based on TCEQ's Technical Guidance Package APDG 6419 (dated February 2020).

Catalyst Decoke Vent (EPN ER7360AB)

This EPN is for the emissions that occur due to reactor clearing, which occurs through several steps. The reactor will be primarily cleared to high pressure vent recovery to comply with LAER. The reactor will be purged with a methane/hydrogen stream until measured VOC concentration is less than 15 percent by weight. Residual emissions will be routed to the low-pressure recovery/flare system. Vent emissions from flare represent for maximum case potential.

When the vent is below a VOC concentration of 10,000 ppm, the reactor will be opened to atmosphere prior to commencing decoking. Decoking events will be limited to 16 events per year.

Analyzer Vents (EPN EETHDRVANL)

Equistar has proposed the authorization of 16 new sampling analyzers. The facility will operate several analyzer systems to maintain the unit and ensure good operation. The sample loop for the analyzer will be routed back to the process to reduce overall emissions. Small puff vents from the analyzer will be released to the atmosphere.

OP1 Flare (EPN 38E01)

The EDU is designed to utilize the existing steam assisted flare that is authorized under NSR Permit Nos. 1768, PSDTX1272, and N142M1. The OP1 flare is equipped with an analyzer and flowmeter to monitor the total flow and composition to the flare as required by NSR Permit Nos. 1768, PSDTX1272, and N142M1. The unit operations will monitor valve position and operating conditions from equipment venting to flare to determine amount of VOC sent to the flare. The emissions that will be authorized in the MAERT represented the emissions from this permit only and are not a combined total across permits. Emissions from SO₂ are authorized in Permit Nos. 1768, PSDTX1272, and N142M1 and as this project will not change pilot fuel rates, SO₂ is not being authorized in this permit.

OP1 Flare NO_x emissions are calculated using an emission factor of 0.068 lb/MMBtu for low BTU steam assisted flares. OP1 Flare CO emissions are calculated using an emission factor of 0.35 lb/MMBtu for high BTU steam assisted flares. High and low BTU emission factors were utilized to obtain the highest amount of emissions for NO_x and CO. This is because the waste steam sent to the flare can vary between high (>1000 BTU/scf) and low BTU content.

The flare will be operated according to those conditions located in NSR 1768 (which include requirements from Consent Decree Case 4:21-cv-03359) and AMOC 157.

Maintenance, Start-up, and Shutdown (EPN ENMSSROUT)

The EDU project includes the installation of additional process equipment, which will consist of various vessels. During MSS clearing operations of the new vessels associated with the process equipment, VOC process gases will be initially routed back to the high-pressure vent recovery. Residual VOC will then be cleared to the flare system until organics concentration is below 10,000 ppm.

Emission from maintenance and shutdown activities were estimated based on engineering knowledge of process conditions for temperature, pressure and concentration at shutdown and equipment dimensions. During start-up, the high-pressure vent gas recovery may not be available. During start-up periods, process vents will be routed to the flare until operations are able to direct vents to the vent gas recovery system or operate without needing to vent individual process equipment.

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Best Available Control Technology and Lowest Achievable Emission Rate

All proposed new or modified sources in this application are required to meet LAER for VOC and state minor NSR BACT for other criteria pollutants. The applicant's LAER control proposals were evaluated by comparing the proposed emission rates to entries in the EPA's RACT/BACT/LAER Clearinghouse (RBLCL), and applicable NSPS and NESHAPs requirements.

Source Name	EPN	Pollutant	BACT/LAER Description
OP1 Cooling Tower	38E11	PM/PM ₁₀ /PM _{2.5}	The cooling tower is equipped with drift eliminators that achieve <0.001% drift.
		VOC	The EPA RACT/BACT/LAER clearinghouse and recently issued TCEQ permits identified LAER for cooling towers as monthly monitoring per Appendix P or approved equivalent with an action level of 0.08 ppm. Thus, the cooling tower design and operation will meet LAER requirements.
Unit Fugitives	FUGETHDRV	VOC	Leaks from piping components are minimized through use of the TCEQ 28LAER LDAR program, additional requirements for non-traditional component types under the 30 TAC Chapter 115 Subchapter H and, daily AVO monitoring of <10 wt% VOC streams meet LAER control requirements for VOC emissions per review of EPA RACT/BACT/LAER clearinghouse results and recently issued TCEQ non-attainment permit applications. LAER is met for fugitive VOC emissions.
TK38010	38E010	VOC	As the existing storage wastewater storage tank TK38010 and TK38011 are part of the wastewater system, LAER was evaluated against wastewater systems.
TK38011	38E011		These are internal floating roof tanks that store material with a true vapor pressure less than 11.0 psia and have a capacity greater than 100,000 gallons. Uninsulated exterior surfaces are painted white, and the tanks are equipped with a mechanical shoe primary seal. Tank TK38010 is equipped with a rim-mounted secondary seal. These tanks are evaluated as part of the wastewater treatment systems to achieve LAER. LAER is met for the wastewater storage tanks' VOC emissions.
Wastewater	MECUWWTP	VOC	The EDU is designed to utilize existing wastewater systems to manage stormwater first flush and periodic maintenance water. Process wastewater will be collected via covered sumps and hard-piped to the existing wastewater tanks (EPN TK38010 and TK38E011) and then piped to the existing wastewater treatment facility (under NSR Permit No. 49120) at the site that will treat the VOCs contained in the wastewater to remove greater than 90%. Per review of EPA RACT/BACT/LAER clearinghouse results and recently issued TCEQ non-attainment permit applications, this represents LAER for wastewater collection and treatment. LAER is met for the wastewater systems' VOC emissions.

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<p>Pressurized Storage Tanks FINs: D-7310, D-7311, D-7316, D-7384, D-7383, D-7386</p>	<p>38E01</p>	<p>VOC</p>	<p>Storage tanks D-7310, D-7311, D-7316, D-7384, D-7383, and D-7386 are pressure-controlled tanks, and the pressure will be maintained to prevent any standing losses from occurring from diurnal temperature changes throughout the day. The tanks will be designed such that the pressure controller will minimize losses during filling and any subsequent working loss emissions will be routed to site low pressure vapor recovery system and/or flare (EPN 38E01).</p> <p>The combined design of pressure-controlled tanks, cooling of material prior to storage and destruction of residual emissions by flare will meet control requirements of LAER for the pressurized storage tanks' VOC emissions.</p>
<p>Reactor Feed Heater</p>	<p>EF7360</p>	<p>NO_x</p>	<p>This heater is less than 40 MMBtu/hr (20.04 MMBtu/hr) and will utilize either H₂ rich fuel gas or pipeline natural gas. Burner manufacturer provided emission rate for H₂ rich fuel is 0.04 lb/MMBtu. The emission rate when firing natural gas is 0.01 lb/MMBtu and is based on AP-42 guidance.</p>
		<p>CO</p>	<p>This heater will meet 50 ppmv @ 3% O₂ rolling 12-month average when firing natural gas. No CO expected when burning H₂ rich fuel.</p> <p>During routine MSS events, the heater will meet 400 ppmv @ 3% O₂ on an hourly average. This is justified because the annual average limit is 50 ppmv @ 3% O₂ and routine MSS events will be limited to 4 hours.</p>
		<p>SO₂</p>	<p>This heater will fire low-sulfur natural gas or H₂ rich fuel, which contains no sulfur.</p> <p>The SO₂ emission rate is based on firing natural gas. The emission factor of 0.6 lb/MMscf (firing 0.2 grains sulfur per 100 dscf natural gas and the assumption of complete (100%) conversion of sulfur to SO₂) is based on AP-42.</p>
		<p>PM/PM₁₀/PM_{2.5}</p>	<p>Site will follow best combustion practices. Heater is also capable of burning H₂ rich fuel gas stream to minimize VOC emissions from fuel. The PM emission rate is based on firing natural gas. An emission factor of 7.6 lbs/MMscf (0.007451 lbs/MMBtu) from AP-42 was used to calculate PM/PM₁₀/PM_{2.5} emissions.</p>
		<p>VOC</p>	<p>Two heaters will be utilized in the EDU unit. The heaters will not be used as control devices. VOC emissions occur due to the combustion of fuel.</p> <p>Heater F-7361 (FIN EF7361) will be 6.82 MMBtu/hr and be electric and operate with no emissions, therefore no EPN is being added for this unit.</p> <p>Heater F-7360 (EPN EF7360) will be 20 MMBtu/hr and primarily fire low-VOC (H₂) fuel but will also have the capability to fire natural gas.</p> <p>The EPA RACT/BACT/LAER database and recently issued TCEQ non-attainment permits indicated following proper heater design and good combustion practices to control VOC emissions from process heaters. The facility will utilize proper design, good combustion practices and utilization of a low VOC fuel to comply</p>

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Catalyst Decoke Vent	ER7360AB	CO	Site will minimize amount of CO entrained in vent gas. CO can be generated through the decoke process when removing coke from reactor.
		PM	The reactor will be operated to minimize formation of coke. Additionally, internal heater tubing contains screens that will knock-out particulate from stack vent.
		VOC	<p>A search of the EPA RACT/BACT/LAER database did not indicate VOC control requirements for decoking process. The EPA RACT/BACT/LAER database identified removal efficiency of 99.9% for continuous process vents. Although, the decoking is a periodic activity and not a routine process vent, the clearing procedure and design will meet the LAER requirement for a continuous process vent.</p> <p>To clear the reactor prior to decoke, 99.33% or greater of the vent stream will be recovered, 0.59% will be routed to the flare and 0.09% remaining when the equipment is opened prior to commencing decoke. Search of the RACT/BACT/LAER and recently issued permits indicated that the above mentioned specifications meet LAER.</p>
OP1 Flare	38E01	NO _x	Emission Factor = 0.068 lb/MMBtu for low Btu steam-assisted flare
		CO	Emission Factor = 0.35 lb/MMBtu for high Btu steam-assisted flare
		VOC	<p>The facility operates an existing steam assisted flare to maintain net heating value in the flame zone.</p> <p>This unit was designed to focus on recovering process emissions rather than solely utilizing destructive control methodology. The high-pressure vents are routed to high pressure vent recovery so the material can be utilized in the olefins process. A flare gas recovery system is operated with the flare to reduce VOC emissions emitted to atmosphere. Thus, the design lowers most of routine process emissions before routing to the control device.</p> <p>For the VOC that is not recycled into the process, operation of the flare in accordance with the work practice standards of 40 CFR Part 63, Subpart YY – maintaining the combustion zone net heating value, flare tip velocity requirements, visible emissions requirements, and continuously lit pilot flame requirements. LAER for the flare's VOC emissions are met.</p>
Analyzer Vents	EETHDRVANL	VOC	<p>The facility will operate several analyzer systems to maintain the unit and ensure good operation. The sample loop for the analyzer will be routed back to the process. Small puff vents from the analyzer will be released to the atmosphere.</p> <p>Search of the RACT/BACT/LAER and recently issued permits indicated that routing the analyzer sample loop back to process or control meets LAER for the analyzer vents VOC emission.</p>

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MSS Vessel Cleaning	ENMSSROUT	VOC	<p>The EDU project includes the installation of additional process equipment, which will consist of various vessels. During MSS clearing operations of the new vessels associated with the process equipment, VOC process gases will be initially routed back to the high-pressure vent recovery. Residual VOC will then be cleared to the flare system until organics concentration is below 10,000 ppm.</p> <p>Emission from maintenance and shutdown activities were estimated based on engineering knowledge of process conditions for temperature, pressure and concentration at shutdown and equipment dimensions. During start-up the high-pressure vent gas recovery may not be available.</p> <p>During start-up periods, process vents will be routed to the flare until operations is able to direct vents to the vent gas recovery system or operate without needing to vent individual process equipment.</p> <p>The RACT/BACT/LAER database and recent issued permits were consistent with clearing equipment vapor space to flare control before opening equipment at less than 10,000 ppm. LAER is met for the MSS vessel cleaning VOC emissions.</p>
Emergency Engine	EF2GEN1	NO _x	<p>Diesel powered emergency engine. Meets the requirements of 40 CFR Part 60, Subpart IIII. Fires ultra-low sulfur diesel (no more than 15 ppm sulfur by weight) and is limited to 100 hours/year of non-emergency operation. Equipped with a non-resettable runtime meter.</p> <p>SO₂ emissions are minimized through the use of ultra-low sulfur diesel (ULSD) as fuel, which contains no more than 15 ppmw total sulfur.</p>
		PM	
		SO ₂	
		CO	
		VOC	<p>Emergency diesel engine is subject to NSPS Subpart IIII emissions standards for non-road diesel engines. The engine will be limited to 100 hours on a rolling 12-month basis of non-emergency operation for the purposes of testing and maintenance (specific permissible non-emergency situations are defined at 40 CFR § 63.6640(f)) and must be equipped with a non-resettable runtime meter (or "hour meter").</p> <p>The engines must meet the Tier 4 emission standards at 40 CFR § 1039.101 for VOC, NO_x, CO and particulate as follows (emission limits are in units of g/hp-hr).</p> <p>The emergency engine proposed with the Derivatives unit will meet Tier 4 Final emission standards, operate less than 100 hours for non-emergency and use ultra-low sulfur diesel fuel.</p> <p>Search of the RACT/BACT/LAER and recently issued permits indicated that the above mentioned specifications meet LAER for the emergency engines VOC emissions.</p>

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Impacts Evaluation

Was modeling conducted?	Yes	Type of Modeling:	AERMOD
Is the site within 3,000 feet of any school?			Yes
Additional site/land use information: North of the property line is a combination of industrial and rural land. East of the property line is primarily rural land that includes the San Jacinto River and Bear Lake. South of the property line is primarily residential with Crenshaw Elementary School located within 3,000 of the property line. West of the property line is a combination of industrial and residential with Harvey Brown Elementary School located within 3,000 feet from the property line.			

Summary of Modeling Results

On October 25, 2024, The TCEQ Air Dispersion Modeling Team (ADMT) conducted an Air Quality Analysis (AQA) Audit (ADMT project number 9455, WCC Content ID 7360750) and determined that the air quality analysis is acceptable for all review types and pollutants.

Minor National Ambient Air Quality Standards (NAAQS) Analysis and State Property Line (SPL) Analysis

The applicant conducted modeling for sitewide emissions for applicable NAAQS pollutants (SO₂, PM₁₀ and PM_{2.5}, NO₂ and CO). The modeled Maximum Ground Level Concentration (GLC_{MAX}) of SO₂, PM₁₀ and PM_{2.5}, NO₂ and CO for each respective averaging times are under the de minimis levels (see Tables 1 and 2 in ADMT AQA Audit) and no further review is necessary.

State Health Effects Review

A State Health Effects analysis was performed using the TCEQ Air Permits Modeling and Effects Review Applicability (MERA) Guide APDG 5874 to determine compliance guidelines for net ground level concentrations for 54 health effects pollutants: ethylene, propylene, propane, n-butane, isobutane, 1-butene, cis-2-butene, trans-2-butene, isobutene, 1-pentene, cyclopentane, cis-2-pentene, trans-2-pentene, 2-methyl-1-butene, 3-methyl-1-butene, 2-methyl-2-butene, 1-hexene, cis-2-hexene, trans-2-hexene, cis-3-hexene, trans-3-hexene, isopentane, 2-methyl-1-pentene, 3-methyl-1-pentene, 4-methyl-1-pentene, 2-methyl-2-pentene, 3-methyl-cis-2-pentene, 3-methyl-trans-2-pentene, 4-methyl-cis-2-pentene, 4-methyl-trans-2-pentene, 2,3-dimethyl-2-butene, n-hexane, 1-octene, 1,2,3,4-tetrahydronaphthalene, acetylene, benzene, 1,3-butadiene, cyclohexene, cyclopentadiene, cyclopentene, dicyclopentadiene, heptane, indane, indene, methyl-cyclo-pentane, m-xylene, n-decane, n-heptane, n-nonane, n-octane, n-pentane, pentene, styrene, and toluene.

2-methyl-2-pentene (CAS No. 625-27-4) and 3-methyl-trans-2-pentene (CAS No. 616-12-6) did not have an existing Effects Screening Level (ESL); therefore, the applicant reached out to the TCEQ Toxicology division to have one generated. Both contaminants respectively were the designated a short-term ESL of 1700 µg/m³ and a long-term ESL of 170 µg/m³.

Step 0

Of these air contaminants, propylene and propane are considered simple asphyxiants and are therefore exempt from the MERA analysis.

Step 2

To meet the requirements of Step 2, a pollutant must have an annual ESL that is greater than 10 percent of the short-term ESL and meet one of the three requirements listed below:

- 2 µg/m³ ≤ 1-hour ESL < 500 µg/m³ and Emission Rate Increase ≤ 0.04 lb/hr; or
- 500 µg/m³ ≤ 1-hour ESL < 3,500 µg/m³ and Emission Rate Increase ≤ 0.1 lb/hr; or
- 3,500 µg/m³ ≤ 1-hour ESL and Emission Rate Increase ≤ 0.4 lb/hr.

Of the remaining pollutants, 32 pollutants met the above requirements and fell out at step 2: n-butane; isobutane; isobutene; 1-pentene; Cyclopentane; 2-methyl-1-butene; 3-methyl-1-butene; cis-2-hexene; cis-3-hexene; trans-3-hexene; Isopentane; 3-methyl-1-pentene; 4-methyl-1-pentene; 3-methyl-cis-2-pentene; 4-methyl-cis-2-pentene; 4-methyl-trans-2-pentene; 2,3-dimethyl-2-butene; 1,2,3,4-Tetrahydronaphthalene; Acetylene; Cyclohexene; Cyclopentadiene; Cyclopentene; Dicyclopentadiene; Heptene; Indane; Indene; Methyl-cyclo-pentane; N-Decane; N-Heptane; N-Pentane; Styrene; and Toluene.

Step 3

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The remaining 20 pollutants were modeled using AERMOD to determine a GLC_{MAX} . The determined GLC_{MAX} for all pollutants are below 10% of the respective ESLs, thus satisfying Step 3 of the MERA: Ethylene; 1-butene; cis-2-butene; trans-2-butene; cis-2-pentene; trans-2-pentene; 2-methyl-2-butene; 1-hexene; trans-2-hexene; 2-methyl-1-pentene; 2-methyl-2-pentene; 3-methyl-trans-2-pentene; n-hexane; 1-octene; Benzene; 1,3-butadiene; m-xylene; n-nonane; n-octane; and pentene.

Based on this modeling, the air quality analysis (AQA) is acceptable for all review types and pollutants. The health effects review is completed. No adverse health effects are expected to occur among the public health, welfare, or environment as a result of exposure to the emissions from the facilities authorized by this project.



February 23, 2026

Project Reviewer
Devin Pedraza



February 23, 2026

Team Leader
James Brackin

Date