Permit Amendment
Source Analysis & Technical Review

Company	**Motiva Enterprises LLC**	Permit Number	**16989 & PSDTX794M1**
City	**Port Arthur**	Project Number	**359251**
County	**Jefferson**	Regulated Entity Number	**RN100217389**
Project Type	**Amendment**	Customer Reference Number	**CN600124051**
Project Reviewer	**James Brackin**	Received Date	**June 21, 2023**
Site Name	**Port Arthur Chemicals**		

Project Overview

On June 21, 2023, Motiva Enterprises LLC (Motiva) submitted an Amendment application for their Light Olefins Unit (LOU) at their Port Author Chemical (PAC) facility. This application seeks to authorize an increase in the MSS emissions allowed during startup of the LOU. Long-term (tpy) emission increases for VOC, NO_X, and CO are only being proposed in this project. There are no proposed short term emission increases. Startup emissions during startup are routed to the LOU Flare for control (EPN MSSLOUFLARE). An increase in emissions of flare combustion products (CO and NO_X) and VOC have been included with this amendment.

Planned maintenance, Startup, and Shutdown activities are authorized through this permit. MSS emissions are being updated in this project.

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)*
PM	91.60	91.60	0.00	N/A
PM_{10}	91.15	91.15	0.00	N/A
$PM_{2.5}$	89.89	89.89	0.00	N/A
VOC	511.88	590.76	78.88	85.39
NO_X	885.55	890.86	5.31	10.29
CO	970.59	981.17	10.58	12.03
SO_2	197.90	197.90	0.00	N/A

*This site is a major PSD source. The increases for VOC exceed the 40 tpy PSD major modification threshold and therefore PSD review is required.

Compliance History Evaluation - 30 TAC Chapter 60 Rules

A compliance history report was reviewed on:	February 28, 2024
Site rating & classification:	N/A
Company rating & classification:	10.18 / 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	07/10/2023
Date 1st notice published	07/22/2023
Publication Name: ***The News – Port Arthur***	
Pollutants: carbon monoxide, hazardous air pollutants, 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 1st notice Alternate Language published	07/20/2023
Publication Name (Alternate Language): ***El Perico***	
1st public notice tearsheet(s) received	07/27/2023
1st public notice affidavit(s) received	07/27/2023
1st public notice certification of sign posting/application availability received	09/07/2023
SB709 Notification mailed	01/24/2024
Date 2nd notice published	04/13/2024
Publication Name: ***The News – Port Arthur***	
Pollutants: carbon monoxide, hazardous air pollutants, 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 2nd notice published (Alternate Language)	04/11/2024
Publication Name (Alternate Language): ***El Perico***	
2nd public notice tearsheet(s) received	04/18/2024
2nd public notice affidavit(s) received	04/18/2024
2nd public notice certification of sign posting/application availability received	05/15/2024

Public Interest

Number of comments received	0
Number of meeting requests received	0
Number of hearing requests received	0
ate meeting held	N/A
Date response to comments filed with OCC	N/A
Date of SOAH hearing	N/A

Federal Rules Applicability

Requirement	
Subject to NSPS?	**Yes**
Subparts	**A, Ka, Kb, & VV**
Subject to NESHAP?	**Yes**
Subparts	**A, J, V, Y, & FF**
Subject to NESHAP (MACT) for source categories?	**Yes**
Subparts	**A, G, WW, & YY**

Nonattainment review applicability:
This site is located in Jefferson County and is classified as in Attainment for all pollutants. Therefore, Nonattainment review is not applicable.

PSD review applicability:
The site is an existing named stationary major source. This project aligns retrospectively with project 135696 issued in 2008. Although a formal federal review was not conducted, the outcome would still necessitate a federal review. Project increases include VOC (83.39 tpy), NO_x (10.29 tpy), CO (12.03 tpy); VOC increases exceed the 40 tpy PSD major modification threshold. PSD review is applicable for VOC only. There are no CO2e increases associated with the project. Therefore, GHG review is not applicable.

	NO_x (tpy)	CO (tpy)	**VOC (tpy)**
Project increase	10.29	12.03	**85.39**
PSD threshold	40	100	**40**

Title V Applicability - 30 TAC Chapter 122 Rules

Requirement

Title V applicability:
The site operates under Title V Permit No. O1317.

Periodic Monitoring (PM) applicability:
PM is applicable because the site is a major source. The following PM requirements are for the facilities that are affected by this project:

LOU Flare (EPN MSSLOUFLARE)

- Continuous monitoring of flowrate (including waste gas, purge gas, supplemental gas, and sweep gas) and net heating value of the flare vent gas.
- Flared gas actual exit velocity, vent gas net heating value, and flared gas combustion zone net heating value shall be determined in accordance with 40 CFR §63.670(k), §63.670(l), and §63.670(m) on a 15-minute block average and recorded at least once every 15 minutes.
- Pilot flame to be monitored with a thermocouple, infrared monitor, or ultraviolet monitor.
- Monitoring of assist air/steam used with the flare.
- Hourly mass emission rates shall be determined and recorded.

Compliance Assurance Monitoring (CAM) applicability:
The project is located at a site subject to 30 TAC § 122 requirements. CAM applies to the plant flare systems (EPNs AUFLARE-1 and LOUFLARE) and is addressed by requiring continuous flow and composition monitoring. The capture system is required by monthly visual, audible, and/or olfactory inspection to verify leak free, and annual inspection in accordance with 40 CFR Part 60, Appendix A, Test Method 21. Bypass is prohibited or monitored. CAM requirements are satisfied.

Process Description
The Light Olefins Unit (LOU) and Cyclohexane Unit (CU) are the primary processes that are authorized under NSR Permit No. 16989 at Motiva's PAC facility. A summary of PAC operations is provided below.

Light Olefins Unit (LOU) - The LOU is designed to crack a variety of hydrocarbon mixtures including ethane, propane, butane, and naphtha. The primary product of the LOU is ethylene. The major byproducts are: fuel gas, propylene, mixed C4s, aromatic distillate, pyrolysis gasoline, pyrolysis fuel oil, and hydrogen.

The LOU has eight cracking furnaces that crack feed stocks and one furnace that cracks recycled ethane and propane. Downstream from the furnaces, the LOU separates and purifies the products and the byproducts. The vapors from the cracking furnaces are collected in a primary fractionator column. The primary fractionator overhead is sent to the multistage compression system where the vapor is compressed and is then sent to a series of fractionating columns including a demethanizer, deethanizer, depropanizer, and debutanizer. The fractionator column bottom stream, pyrolysis fuel oil, is sent to on-site storage. Hydrogen-rich gas from the demethanizer is routed to fuel gas for onsite processes or separated for use in the cyclohexane process. The deethanizer system fractionates ethylene and ethane. Ethylene product is sent off site by pipeline. Ethane is recycled to the ethane cracking furnace, exported as product, or routed to fuel gas. Bottoms from the deethanizer are fed to the depropanizer system to fractionate propylene and propane. Propane separated from the propylene is recycled as feed back to the LOU cracking furnaces. Propylene product is sent off site or to the Polymer Grade Propylene (PGP) Processing Area authorized under NSR Permit No. 140051 for further separation. PGP product is sold and distributed via pipeline. The depropanizer bottoms are fed to the debutanizer, producing a C4 fraction overhead, which is sent to pressurized storage. Bottoms from the debutanizer combined with distillate from the primary fractionation system are sent to the gasoline hydrogenation unit (GHU). The resultant product stream is sent off site.

Cyclohexane Unit (CU) - Benzene and hydrogen are the feed stocks for the CU. Benzene and hydrogen are mixed, vaporized, and routed through a series of reactors, where the benzene and hydrogen are converted to cyclohexane by catalytic hydrogenation. The cyclohexane product stream is first routed to onsite storage, then is pumped to off-site storage, and finally is loaded out at the Huntsman Port Neches Dock.

Project Scope
This NSR Permit No. 16989 amendment application is being submitted to correct and authorize an increase in the long-term MSS emissions allowed during startup of the Light Olefins Unit (LOU). There is no increase proposed to the short-term LOU startup emission rates. Startup emissions for the LOU are routed to the LOU Flare for control (EPN MSSLOULFARE). An increase in emissions of flare combustion products (CO and NO_x) and VOC for EPN MSSLOUFLARE has been proposed with this amendment. SO_2 emissions associated with combustion of supplemental natural gas are not increasing with this project and are included in the emission cap for this permit.

Currently the LOU Flare is authorized for startup emissions to occur 73 hours per year. With this amendment, the Lou Flare will be authorized startup emission to occur 720 hours per year (30 days per year).

Emission rates of VOC proposed in this application are based on actual emissions data collected during a startup in April and May of 2022. The average flow rate to the flare and duration of the startup event may vary, but the annual emission rates will not be exceeded.

Flare (EPN MSSLOUFLARE)
MSS Emissions were initially permitted for NSR Permit No. 16989 in TCEQ Project No. 135696. The increase in MSS emissions from the LOU Flare is associated with a correction to previous representations. Impacts for MSS emissions associated with this flare were retrospectively evaluated.

Motiva considers start-up emissions from the flares to include all emissions associated with inventorying and restarting the process after a unit shutdown for any reason. This includes all flare emissions that occur while bringing the unit back online up to the point that the unit is producing a final product that meets specification.

The flare is subject to 40 CFR 63 Subpart YY and flare boilerplate is being updated in this project. A continuous flow monitor and composition analyzer are installed on the LOU Flare. Monitoring is used to maintain waste gas above the minimum heating value. The pilot flame is continuously monitored.

Changes to Special Conditions with approval of this project:

Current	Proposed	Description of Change
11	11	Removed §60.18 flare requirements for the two LOU Flares (EPNs LOUFLARE and LOUFLARE-2) as they are no longer applicable. Added flare conditions for the two LOU Flares regarding compliance with the new MACT standards (40 CFR §63.670). Revised condition to state that only the AUFLARE-1 needs to meet requirements of 40 CFR §60.18 as it does not serve the Ethylene unit.
---	53	Added special condition to state that the LOU flare (EPN LOUFLARE) is limited to operating 30 days (720 hours) per year.
Attachment C		Corrected misspelling of “MSSLOUFLARE.”

Changes to MAERT:

EPN	Description of Change
MSSLOUFLARE	Increased VOC, NO_x, and CO emissions associated with increase in startup emissions.

In addition to revising the emissions of the LOU Flare, Footnote (8) was revised to state that the LOU Startup emissions may occur for 720 hours annually (previously stated 73 hours annually). Footnote (10) was also added to the MAERT in order to clarify that SO_2 emissions associated with sulfur in the assist gas for EPN MSSLOUFLARE is included in the permit cap.

Best Available Control Technology

Source Name	EPN	Best Available Control Technology Description
Flare	MSSLOUFLARE	The LOU Flare is equipped with a continuous flow monitor, composition analyzer, and pilot flame monitor. The LOU Flare meets the applicable requirements of 40 CFR §63.670 (Applicable to 40 CFR 63 Subpart YY). The LOU Flare meets a minimum destruction efficiency of 98% for VOCs. 99% is not being claimed for any flared compounds. 0.138 lb/MMBtu and 0.2755 lb/MMBtu emission factors are utilized for NO_x and CO respectively (from TCEQ's Guidance for Flares and Vapor Oxidizers, Table 4 ([October 2000]). Fuel gas is used at the flare and contains no more than 5.0 grains total sulfur per 100 dry standard cubic feet. Tier 1 BACT is satisfied.

Impacts Evaluation

Was modeling conducted?	**Yes**	Type of Modeling:	**AERMOD**
Is the site within 3,000 feet of any school?			**No**
Additional site/land use information: The site lies between two major neighborhoods. Lincoln Middle School resides 3,100 feet Southeast. Southwest of the property is primarily undeveloped land.			

On January 8, 2024, The TCEQ Air Dispersion Modeling Team (ADMT) conducted an Air Quality Analysis Audit (ADMT project number 8883, WCC Content ID 6877888) and determined that the air quality analysis is acceptable for all review types and pollutants. Although this project has increases for VOC over the major source threshold (40 tpy), a protocol was not provided per the Appendix Q of the TCEQ Modeling Guidelines:

"For a Prevention of Significant Deterioration (PSD) application, if a project will emit 100 tons per year (tpy) or more of volatile organic compounds (VOCs) or nitrogen oxides (NO_x) emissions, an ozone impact analysis to demonstrate predicted compliance with the 8-hour ozone standard is required."

This amendment proposes an increase of less than 100 tpy (+90.45 tpy < 100 tpy) in VOCs, and therefore an ozone impact analysis was not required.

Minor National Ambient Air Quality (NAAQS) Analysis

The applicant conducted modeling for applicable NAAQS pollutants (NO_x). The modeled GLCmax of NO_x was under the de minimis levels and no further review is necessary. Only annual CO emissions were increased with this project. CO only has NAAQS standards for the 1-hr and 8-hr averaging times; therefore, no NAAQS analysis was performed for CO.

State Health Effects Analysis

State Health Effects analyses were performed using the Modeling Effects Review Applicability (MERA, APDG 5874) to demonstrate compliance with state guidelines for net ground-level concentrations of the non-criteria pollutants. The analysis was conducted for 14 constituents: ethylene, propylene, propane, isobutane, isobutylene, 1,3-Butadiene, n-butane, n-pentane, benzene, toluene, ethylbenzene, p-xylene, m-xylene, o-xylene. Only annual impacts were evaluated for all pollutants as there are no short-term emission increases in this project. All pollutants had a modeled GLCmax that was less than 10% of the Short-Term Effects Screening Level (STESL). Step 3 has been satisfied for all Health Effect pollutants.

Based on the modeling, the air quality analysis 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 the environment as a result of exposure to the emissions from the facilities authorized by this project.

James Brackin	May 22, 2024	Chirag Patel	May 31, 2024
Project Reviewer James Brackin	Date	Team Leader Chirag Patel	Date