



REGION 5

CHICAGO, IL 60604

MEMORANDUM

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Exxon Mobil Corporation, Baytown, Texas

FROM: Constantinos Loukeris, Environmental Engineer
AECAB (MI/WI)

THRU: Sarah Marshall, Section Supervisor
AECAB (MI/WI)

TO: File

BASIC INFORMATION

Facility Name: Exxon Mobil Corporation (XOM)

Facility Location: 5000 Bayway Drive, Baytown, Texas 77520

Date of Inspection: May 6, 2024 – May 10, 2024

EPA Inspector(s):

1. Constantinos Loukeris, Environmental Engineer
2. James Haynes, Physical Scientist
3. Sophia Ong, Physical Scientist
4. Benjamin Rosenthal, Physical Scientist
5. Sydney Knodl, Physical Scientist
6. Colleen McCarthy, Life Scientist

Other Attendees:

1. Kara Moore, Exxon, Environmental Advisor
2. Barbara Kellum, Exxon, Multimedia Supervisor
3. Adeniyi Adetayo, Exxon, Environmental
4. Kristin Henningson, Environmental Advisor
5. Joshua Kinnnger, Exxon, Air Section Supervisor
6. MaryCarmen Perales, Exxon, Wastewater Contact
7. Madison Kettler, Exxon, Environmental Advisor
8. Ty Hastriter, Exxon, GO&S Sustainability Advisor

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9. Colt Schmidtke, Exxon, Counsel
10. Clinton Elliott, TRC, Senior Project Manager
11. George Rizzo, Exxon, Counsel
12. Stephen Codolato, Exxon, State Advisor
13. Amanda Wolsiefer, Exxon, Environmental Advisor
14. Cole Billeaux, Exxon, Environmental Advisor
15. Abraham Valdes, Exxon
16. Bo Anderson, Exxon, Unit Supervisor
17. Kayla Thorsteinson, Exxon, Sulfur Complex Engineer
18. Davina Peterson, Exxon, Chemical Plant
19. Chris Laskoskie, Exxon, CLEU#2
20. Lillian Sandeval, Exxon, Chem Plant Utilities Contract Engineer
21. Jim Kitchens, Exxon, DCU Operator
22. Sadir Shah, Exxon, Technician
23. Tom McClurg, Exxon, Dock Operator
24. Tim Bales, Exxon
25. Rodney Putt, Exxon, ECC Shift Team Leader
26. Juan Rodriguez, HPC Field Supervisor
27. Anthony Ardoin, HPC Utility Technician
28. John Dadurian, HPC Supervisor
29. Peter McKenzie, HPC, Camera Technician
30. John Godbee, Exxon, Supervisor
31. Ignacio Cruz Sanchez, Exxon, Process Technician
32. Lee Trader, Exxon, Shift Team leader
33. Molcom Goudeaux, Exxon Business Team Lead
34. Carl Cramer, Exxon, Shift Team Lead Fuels
35. Jack Dunn, Exxon, Process Mechanical Coordinator

Contact Email Address: kara.moore@exxonmobil.com

Purpose of Inspection: Inspect the benzene waste operations and volatile organic compounds (VOC) emissions from wastewater systems

Facility Type: Petroleum Refinery, Chemical Plant, and Olefins Plant

Regulations Central to Inspection: Refinery wastewater subject to the Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems, at 40 C.F.R. Part 60, Subpart QQQ (Subpart QQQ), and the National Emissions Standards for Hazardous Air Pollutants for Benzene Waste Operations, at 40 C.F.R. Part 61, Subpart FF (Subpart FF or BWON)

Arrival Time: May 6, 2024, 2:30 pm

Departure Time: May 10, 2024, 12:39 pm

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Inspection Type:

- ☒ Unannounced Inspection
- ☐ Announced Inspection

OPENING CONFERENCE

- ☒ Presented Credentials
- ☒ Stated authority and purpose of inspection
- ☐ Provided Small Business Resource Information Sheet
- ☒ Small Business Resource Information Sheet not provided. Reason: Not a Small Business
- ☒ Provided CBI warning to facility

The following information was obtained verbally from Exxon personnel unless otherwise noted.

Process Description:

The Baytown Refinery began operations in 1920 and became an Exxon Corporation refinery in 1972. The Baytown Refinery includes a refinery, chemical plant, and an olefins plant.

XOM has split the refinery (BTRF), chemical plant (BTCP), and olefins units (BOP) into three sources for purposes of compliance with Subpart FF. The refinery has chosen the 6 Megagram per year (6 MG) option, while the chemical plant and the olefins unit each have chosen the 2 Megagram per year (2 MG) option. XOM indicated that BTRF, BOP, and BTCP operate under different Title V permits and different organizational structure, except that shared environmental services, and thus each part of the Baytown complex can have a separate Subpart FF compliance strategy and total annual benzene report. In addition, controlled wastewater streams and controlled slop oil streams from the BOP and the BTCP are managed at the BTRF.

At XOM, stormwater is fully integrated into the BTRF, partially integrated for the BOP, and segregated for the BTCP. At the BTRF's wastewater treatment plant, XOM stated that Subpart FF and Subpart QQQ do not apply.

XOM indicated that generally Method 21 monitoring is performed using a flame ionization detector, and Method 21 breakthrough monitoring at carbon canisters is performed with a benzene-select photoionization detector. XOM reported that Method 21 monitoring is conducted by Clean Harbors, which recently acquired HydroChem PSC, and visual inspections are conducted by XOM operators.

Staff Interviews: EPA requested interviews from XOM to better understand how wastewater is managed or treated across the refinery, chemical plant, and olefins unit. XOM provided the following individuals:

- A. May 7, 2024 at 12:30 pm: Kayla Thorsteinson, Exxon, Sulfur Complex Engineer

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The olefins plant, chemical plant, and the refinery all send wastewater streams to the stripper feed tanks, 1032 and 1033. Each of these tanks has an external floating roof (EFR) and an oil skimming system. Typically, any oil skimmed is sent over once a week but no less frequent than once per month to the refinery's slop system. XOM uses two benzene steam strippers, T071 and T081, that vent vapors to the sulfur recovery unit and wastewater effluent continues to the east sewer line. Both strippers are designed with an identical capacity of 50,000 barrels per day. The effluent wastewater from each of the strippers is about 100-120 degrees Fahrenheit.

For the sour water system, XOM operates two trains, each with two feed drums that route material to one of the stripper feed tanks, 1026 and 2000, then to another feed drum and finally onto one of three strippers, T051, T061, or T853. T051 and T061 are identical in capacity, and T853 has a smaller capacity. XOM uses the sour water exemption in Subpart FF for the wastewater streams that meet the qualifications.

B. May 7, 2024 at 1 pm: Davina Peterson, Exxon, Chemical Plant

EPA asked Ms. Peterson a few questions regarding the flow and location of wastewater generated from specific equipment at XOM's chemical plant. Ms. Peterson stated that she is not familiar with any wastewater or oil movements, where the wastewater or oil is generated within the chemical plant, or how wastewater or oil is sent from specific equipment to other parts of the refinery.

C. May 8, 2024 at 1:15 pm: Lillian Sandeval, Exxon, Chemical Plant, Utilities, Contract Engineer

XOM operates a benzene steam stripper, T150, that routes vapors to a flare through D-152 and sends effluent wastewater to the west sewer trunk. If T150 is down, the wastewater stream is not immediately sent over to the refinery. XOM operations manages which and when wastewater streams are sent over. Some wastewater streams are continuous and feed tanks, 1032 and 1033. XOM's chemical plant also sends over slop oil through tanks, 905 and 907, which are slop oil tanks used by the refinery, olefins plant, and chemicals unit.

TOUR INFORMATION

EPA Toured the Facility: Yes

Data Collected and Observations:

1. Wash Slab: XOM indicated that the wash slab area is subject to Subpart QQQ. EPA observed that two ground level drains (Drains 1 and 2) had oily water pooled over them. In addition, EPA was unable to walk to the frac tank without water boots in this area since the walkway to the frac tank had an oily water level of 2-3 inches for at least a 25-foot length by 10 feet wide distance. The wastewater from the frac tank was discharged to an uncovered manhole. XOM indicated that the stream is not subject to Subpart QQQ at the manhole.

2. EPA requested that XOM show EPA inspectors how operators conduct visual inspections for Subpart FF in the CLEU #2 unit by walking the inspectors through XOM's visual inspection route. XOM personnel were in possession of the document used by operations for identifying the route to be used in conducting visual inspections. After observing approximately 7 pieces of equipment subject to Subpart FF visual inspections, XOM personnel stated that EPA inspectors had seen everything subject to Subpart FF in this unit. However, in response to EPA's onsite document request, the visual inspection document provided by XOM identified an additional 5 pieces of equipment that XOM operators did not show EPA inspectors during the visual inspection of CLEU #2. EPA inspectors advised XOM that for the remaining portion of the inspection, EPA expected XOM to provide complete and accurate information.
3. During the Method 21 monitoring at lift station, LS076, Ms. Madison Kettler, XOM's leak detection and repair coordinator, asked Clean Harbors what an instrument flameout was after EPA detected a flameout in the field.
4. Some of XOM personnel, including Mr. Adetayo, provided feedback to the FLIR optical gas imaging noting differences; however, the XOM personnel were not certified to use the FLIR camera.
5. All Subpart FF or other NESHAP lines from the docks are routed to Tank 38.
6. XOM indicated that several floating roof tanks subject to Subpart FF, including monitoring for breakthrough on the carbon canister by the docks, required a fresh breathing air apparatus ("fresh air"). XOM does not have a specific written procedure or policy requiring fresh air on the floating roof tanks or any signage at the stairwell of the tank for operators who are going up to the platform on top of the tank. Two EPA inspectors (Colleen McCarthy and Constantinos Loukeris) were provided fresh air by XOM to monitor the following tanks from the platform at the top of the tank's stairwell: TK 1001, TK 905, TK 907, TK 1071, TK 1499, and TK 2000.
7. XOM operates a vacuum truck unloading station at the ECC unit, which receives waste and wastewater from the BTRF, BOP and BTCP. The vacuum trucks unload to Pit 1, which XOM operates as an uncontrolled waste management unit for purposes of Subpart FF compliance. On May 10, 2024, EPA observed a vacuum truck with carbon canisters that was unloading waste to Pit 1. XOM personnel had previously stated that the vacuum trucks with carbon canisters are used for waste or wastewater streams requiring control under Subpart FF.
8. During the tank cleaning of Tank 1032, XOM utilized an air mover to pull solids into vacuum boxes. These solids are sent off-site for removal, and the empty vacuum boxes return to XOM. EPA observed detectable emissions on several vacuum boxes collecting solids from Tank 1032. Additionally, the discharge from the air mover was connected to ductwork that vented to the atmosphere from the top of the platform at Tank 1032 while it was in operation.

Photos and/or Videos: were taken during the inspection and are listed in Appendix A.

EPA imaged hydrocarbon emissions using a FLIR® optical gas imaging camera, Models GF-320 and GFx-320. In addition, this FLIR® camera was also used to take digital pictures and videos. See Appendix A for a summary of the videos and pictures taken.

Field Measurements: were taken during this inspection and are listed in Appendix B.

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EPA conducted Method 21 monitoring and testing using Thermo Scientific's Toxic Vapor Analyzers, Model 2020, equipped with a flame ionization detector. See Appendix B for the summary of the monitoring and testing. EPA also collected six summa canisters that are being analyzed per Method TO-15. The results of the summa canisters are pending.

Summa Canister Location Summary:

1. LS204
2. LS239
3. LS265
4. LS204
5. ECC P3 Hatch
6. 3053 TWD Pump# 91B

CLOSING CONFERENCE

- ☒ Provided U.S. EPA point of contact to the facility

Requested documents:

1. Wastewater flow diagrams, including a description or color-coding indicating compliance points for Benzene Waste NESHAP (BWON) and NSPS Subpart QQQ
2. Total Annual Benzene Reports – most recent 5 years, including supporting calculations and/or sampling
3. Quarterly BWON Reports – most recent 5 years
4. Visual Inspection records for BWON – most recent 5 years
5. Detectable Emission Testing Results for BWON and NSPS Subpart QQQ (Method 21)– most recent 5 years
6. Repair Records for detectable emissions and visual inspection deficiencies, including information required by 40 C.F.R. § 61.356(h)
7. Database of Detectable Emission testing and visual inspection results, including calibration and repair records
8. Engineering Design Documentation for each waste management unit and treatment process required by 40 C.F.R. § 61.356(d)
9. Carbon Canister Design Evaluations for Each Carbon System (BWON and NSPS Subpart QQQ)
10. Carbon Canister Breakthrough Monitoring results for Each System (BWON and NSPS Subpart QQQ) – most recent 5 years
11. Individual Drain Systems (IDS) for BWON and NSPS Subpart QQQ – identification of all components and respective compliance strategy
12. Semi-Annual NSPS Subpart QQQ Reports – most recent 5 years
13. Database and/or records of NSPS Subpart QQQ visual inspection results – most recent 5 years
14. Parametric Monitoring Data for Treatment Processes – most recent 5 years
15. Process units and/or IDS grandfathered under NSPS Subpart QQQ
16. Floating Roof Tanks Complying with NSPS Kb (For either BWON or QQQ) - Most recent API 653 and primary seal/secondary seal inspection report

17. End of Line Sampling Results for past 2 years
18. BWON Manual
19. NSPS QQQ Manual
20. Exxon's Corporate Policy for BWON and QQQ
21. Vacuum Truck Log – past 5 years: Include destination of each vacuum truck, operated with a control device or counted against the BWON compliance option for the respective site
22. When did Exxon begin operation of the temporary system regarding Lift Station 243. Provide MOC and/or other documentation as to demonstrating compliance under BWON and QQQ
23. List of all the BWON (e.g. NESHAP tagged in the field) sampling points, description, which line item in the TAB each location correlates to, location and most recent 5 years of sampling results. (including separator 13,14, 15, and 17)
24. MOC or other documentation of why access was not allowed to conduct visual inspection in the DCU on May 9, 2024
25. Status of document request from EPA email on May 6, 2024.
26. CBT training for the environmental stewards. I think we wanted to see if there is any wastewater info within the training modules
27. Blank QQQ form for CDU
28. Crosswalk of sample data points (from the process flow diagrams) and how that corresponds to the TAB
29. HU9 (subject to QQQ) sewer diagram noting drains and all access points

Concerns: At the closing conference, EPA identified the follow areas of concern:

1. XOM has improperly split up its refinery, olefins, and chemical plant into three total annual benzene reports with separate compliance strategies for Subpart FF. EPA pointed to the regulatory definitions of "petroleum refinery," defined as "a facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives and to "Facility," defined as "all process units and product tanks that generate waste within a stationary source, and all waste management units that are used for waste treatment, storage, or disposal within a stationary source."
2. As one facility under Subpart FF, XOM would not be able to comply with any of the three compliance options in Subpart FF (6 MG, 2 MG, and 1 MG)
3. XOM did not identify all of its points of generation in the annual TAB reports as required by Subpart FF for at least the past 5 years.
4. In its TAB reports, XOM does not account for all benzene emissions in the TAB that have been volatilized to atmosphere based on its sampling locations. See for example, separators 13, 14, 15, 17, and 19.
5. XOM's lift station, LS 265, which supports the benzene loading dock, is not designed or operated to no detectable emissions and also had significant visible defects.
6. Based on the number of visible defects EPA found including an opening to atmosphere in a manhole, XOM's visual inspections are not identifying defects as required by Subpart FF and Subpart QQQ.

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7. XOM is sending vacuum trucks that require control with Subpart FF standards to Pit 1, which is operated as an uncontrolled waste management unit.
8. XOM did not design or operate the barscreen with no detectable emissions as required 0020 under Subpart FF after EPA detected greater than 500 ppm from the door accessing the barscreen area.
9. Based on the number of detectable emissions and design issues with waste management units across the Baytown complex, XOM may not be complying with the 6 MG or 2 MG compliance options in Subpart FF.
10. During the inspection, XOM was operating a temporary sewer line due to extended maintenance being performed at lift station, LS 243. XOM did not evaluate any applicability and compliance with Subpart QQQ for the new individual drain system that had been used for multiple months.

DIGITAL SIGNATURES

Report Author: _____

Section Supervisor: _____

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APPENDICES

1. Appendix A: Digital Image Log and Digital Video Log
2. Appendix B: Field Measurement Data
3. Appendix C: Method 21 Calibration Data
4. Appendix D: Subpart QQQ Observations

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APPENDIX A: DIGITAL IMAGE LOG AND DIGITAL VIDEO LOG

Inspector Name: Constantinos Loukeris **Archival Record Location:** [May 2024 Inspection - Pictures and Videos](#)

Image Number	File Name	Camera	Date	Time	Inspector	Image description	Notes
1	FLIR0037.jpg	C027003	5/7/2024	10:18	McCarthy	Dewatering Pump 186-10 historic leak	-
2	FLIR0038.jpg	C027003	5/7/2024	10:19	McCarthy	Overview of Dewatering Pump 186-10 including drain	-
3	FLIR0039.jpg	C027003	5/7/2024	10:44	McCarthy	Conservation Vent at P-6 and P259-5 pump area	-
4	FLIR0040.jpg	C027003	5/7/2024	10:48	McCarthy	Liquid leak at valve. LDAR Tag NETF 11 0066	-
5	FLIR0041.jpg	C027003	5/7/2024	10:50	McCarthy	Liquid leak at V09028 fill to Tk 1070.	Kosta TVA: 2900ppm
6	FLIR0042.jpg	C027003	5/7/2024	10:52	McCarthy	Back of liquid leak at V09028 fill to Tk 1070.	-
7	FLIR0043.jpg	C027003	5/7/2024	10:52	McCarthy	Back of liquid leak at V09028 fill to Tk 1070.	-
8	FLIR0044.mp4	C027003	5/7/2024	11:23	McCarthy	Hydrocarbon (HC) emissions from open-ended line plug on P194-10. Oil ring observed	-
9	FLIR0045.mp4	C027003	5/7/2024	14:50	Loukeris	Incidental video	-
10	FLIR0046.mp4	C027003	5/7/2024	14:51	Loukeris	HC emissions from east vacuum breaker on Tank 1033	-
11	FLIR0047.mp4	C027003	5/7/2024	14:55	Loukeris	HC emissions from seal and east vacuum breaker on Tank 1033	-
12	FLIR0048.jpg	C027003	5/7/2024	15:21	McCarthy	Flange on vacuum box	Haynes has box number. Haynes TVA: 1600 confirmed by HPC at bottom of flange along gasket
13	FLIR0049.jpg	C027003	5/7/2024	15:30	McCarthy	Drain clogged at slop pump PS258 P-5	-
14	FLIR0050.jpg	C027003	5/7/2024	16:37	McCarthy	Wash Slab near drain 1	-
15	FLIR0051.jpg	C027003	5/7/2024	16:38	McCarthy	Wash Slab near drain 2	-
16	FLIR0052.jpg	C027003	5/7/2024	16:52	McCarthy	Frac Tank at Wash Slab	-

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						Hazardous Waste Satellite Accumulation with no accumulation start date near D-8 in CLEU.	-
17	FLIR0053.jpg	C027003	5/8/2024	10:19	McCarthy		
18	FLIR0054.jpg	C027003	5/8/2024	15:10	McCarthy	Lift Station 076 hatch	-
19	FLIR0055.jpg	C027003	5/8/2024	15:15	McCarthy	Lift Station 076 hatch	No gasket. Retrofitted plate. Kosta TVA 400 then flameout on hinge
20	FLIR0056.jpg	C027003	5/8/2024	15:19	McCarthy	Lift Station 076. Cracks and gaps.	-
21	FLIR0057.jpg	C027003	5/8/2024	15:32	McCarthy	Lift Station 076. Cracks and gaps.	-
22	FLIR0058.jpg	C027003	5/8/2024	15:55	McCarthy	4 Spot 1 Dock overview of catch basin	-
23	FLIR0059.mp4	C027003	5/8/2024	16:36	McCarthy	HC emissions from unbolted cover on Lift Station 239	-
24	FLIR0060.mp4	C027003	5/8/2024	16:40	McCarthy	HC emissions from visible crack in sealant on Lift Station 265	-
25	FLIR0061.mp4	C027003	5/8/2024	16:52	McCarthy	HC emissions from pump cover observed with gaps on Lift Station 265	-
26	FLIR0062.jpg	C027003	5/8/2024	16:55	McCarthy	Overview of Lift Stations 265 and 239	-
27	FLIR0063.jpg	C027003	5/8/2024	16:59	McCarthy	Visible gap in sealant/caulk on Lift Station 265	Area of Video 24
28	FLIR0064.jpg	C027003	5/8/2024	16:59	McCarthy	Overview of Lift Station 265	-
29	FLIR0065.jpg	C027003	5/8/2024	17:00	McCarthy	Side of Lift Station 265	-
30	FLIR0066.jpg	C027003	5/8/2024	17:00	McCarthy	Rusted piping on Lift Station 239	-
31	FLIR0067.jpg	C027003	5/8/2024	17:01	McCarthy	Unbolted cover and debris on Lift Station 239	-
32	FLIR0068.jpg	C027003	5/8/2024	17:01	McCarthy	Lift station 239	-
33	FLIR0069.jpg	C027003	5/9/2024	9:45	McCarthy	Solid drain behind P610A	DCU
34	FLIR0070.jpg	C027003	5/9/2024	9:52	McCarthy	Manhole cover near E-617	-
35	FLIR0071.jpg	C027003	5/9/2024	10:09	McCarthy	Dry drain at P-619A	-
36	FLIR0072.jpg	C027003	5/9/2024	10:13	McCarthy	Incidental photo	-
37	FLIR0073.jpg	C027003	5/9/2024	10:15	McCarthy	Manhole cover in DCU	-
38	FLIR0074.jpg	C027003	5/9/2024	10:16	McCarthy	DHX3P18 dry drain	-
39	FLIR0075.jpg	C027003	5/9/2024	10:17	McCarthy	MH3P27 Manhole cover	-
40	FLIR0076.jpg	C027003	5/9/2024	10:23	McCarthy	MHCB3P25 Manhole cover missing caulking	-

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41	FLIR0077.jpg	C027003	5/9/2024	10:24	McCarthy	MHCB3P17 Catch basin	-
42	FLIR0078.jpg	C027003	5/9/2024	10:25	McCarthy	MHCB316 Catch basin	-
43	FLIR0079.jpg	C027003	5/9/2024	10:26	McCarthy	Manhole in DCU	-
44	FLIR0080.jpg	C027003	5/9/2024	10:28	McCarthy	MHCB3N05 Manhole cover with sand	-
45	FLIR0081.jpg	C027003	5/9/2024	10:38	McCarthy	Manhole cover rusted and covered in liquid.	-
46	FLIR0082.mp4	C027003	5/9/2024	10:44	McCarthy	HPC monitoring manhole cover	near tank 601
47	FLIR0083.jpg	C027003	5/9/2024	10:47	McCarthy	Manhole cover open with cone in center	near tank 601
48	FLIR0084.jpg	C027003	5/9/2024	10:47	McCarthy	Manhole cover open with cone in center	near tank 601
49	FLIR0085.jpg	C027003	5/9/2024	11:52	McCarthy	MH7 Manhole cover	SCU
50	FLIR0086.mp4	C027003	5/9/2024	11:53	McCarthy	MH7 Manhole cover opened to check for water seal. HC emissions	-
51	FLIR0087.mp4	C027003	5/9/2024	11:58	McCarthy	MH1 Manhole cover opened to check for water seal. HC emissions	-
52	FLIR0088.mp4	C027003	5/9/2024	14:41	Loukeris	HC emissions at preseparator 14	-
52	FLIR0089.mp4	C027003	5/9/2024	14:44	Loukeris	HC emissions at preseparator 13	-
53	FLIR0090.jpg	C027003	5/9/2024	14:51	McCarthy	NESHAP FF sample point between pumps 2 and 3 at preseparators 13 and 14	-
54	FLIR0091.mp4	C027003	5/9/2024	14:52	McCarthy	HC emissions from NESHAP FF sample point at preseparators	EPA 15,000ppm; HPC 18,000ppm
55	FLIR0092.mp4	C027003	5/9/2024	14:55	McCarthy	HC emissions from sump cover between pumps 3 and 4 at preseparators 13 and 14	-
56	FLIR0093.jpg	C027003	5/9/2024	14:56	McCarthy	Sump cover between pumps 3 and 4 at preseparators 13 and 14	EPA 20,000ppm; HPC 20,000ppm
57	FLIR0094.jpg	C027003	5/9/2024	14:57	McCarthy	Unbolted sump covers with holes and no seal at preseparators	-
58	FLIR0095.jpg	C027003	5/9/2024	15:02	McCarthy	Gap in preseparator 13	EPA 7500ppm, HPC 7500ppm

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59	FLIR0096.jpg	C027003	5/9/2024	15:07	McCarthy	Gap and missing concrete at preseparator 13	-
60	FLIR0097.jpg	C027003	5/9/2024	15:18	McCarthy	Preseparator 15	-
61	FLIR0098.jpg	C027003	5/9/2024	15:19	McCarthy	Preseparator 15	-
62	FLIR0099.jpg	C027003	5/9/2024	15:19	McCarthy	Preseparator 15	-
63	FLIR0100.jpg	C027003	5/9/2024	15:20	McCarthy	Preseparator 15	-
64	FLIR0101.mp4	C027003	5/9/2024	15:22	McCarthy	Incidental video	-
65	FLIR0102.jpg	C027003	5/9/2024	15:22	McCarthy	Preseparator 15. Liquid leak.	-
66	FLIR0103.mp4	C027003	5/9/2024	15:23	McCarthy	HC emissions at preseparator 15	-
67	FLIR0104.mp4	C027003	5/9/2024	15:26	Loukeris	HC emissions at Temporary Lift Station Assembly	EPA 1,100 ppm
68	FLIR0105.mp4	C027003	5/9/2024	15:42	McCarthy	HC emissions at hole in Pit 1 oil sump.	EPA 15,000 ppm
69	FLIR0106.jpg	C027003	5/9/2024	15:44	McCarthy	Open inlet to Pit 1	-
70	FLIR0107.jpg	C027003	5/9/2024	15:46	McCarthy	Holes throughout Pit 1	-
71	FLIR0108.jpg	C027003	5/9/2024	15:51	McCarthy	Incidental photo	-
72	FLIR0109.mp4	C027003	5/9/2024	15:51	McCarthy	HC emissions from cracked concrete on corner of Pit 1	EPA 2400 ppm, HPC 2700ppm
73	FLIR0110.mp4	C027003	5/9/2024	16:13	McCarthy	HC emissions from inlet of Pit 1 while active vacuum truck unloading	-
74	FLIR0111.mp4	C027003	5/9/2024	16:14	McCarthy	HC emissions from inlet of Pit 1 while active vacuum truck unloading	-
75	FLIR0112.jpg	C027003	5/9/2024	16:26	McCarthy	Labeled piping to tanks from Slab 112	-
76	FLIR0113.jpg	C027003	5/10/2024	9:04	McCarthy	Tank 1001 roof	-
77	FLIR0114.jpg	C027003	5/10/2024	9:22	Loukeris	Incidental photo	-
78	FLIR0115.mp4	C027003	5/10/2024	9:23	Loukeris	HC emissions from seal on Tank 907	-
79	FLIR0116.mp4	C027003	5/10/2024	10:32	McCarthy	HC emissions from Tank 1499	-
80	FLIR0117.mp4	C027003	5/10/2024	11:26	Loukeris	HC emissions from Tank 2000	-
81	FLIR0160.jpg	C027001	5/7/2024	16:00		Roll off boxes at Wash Lab	-
82	FLIR0161.mp4	C027001	5/8/2024	10:18	Haynes	Digital video at connector leak	-
83	FLIR0162.jpg	C027001	5/8/2024	9:19	Haynes	Photo of connector leak in CLEU 2	-
84	FLIR0163.jpg	C027001	5/8/2024	9:43	Haynes	Photo of LV204, D-22 sour water to sour water unit	-
85	FLIR0165.jpg	C027001	5/8/2024	14:54	Haynes	Photo of crack in cement around drain line at Dock 1	-
86	FLIR0166.jpg	C027001	5/8/2024	15:56	Haynes	Photo at LS204	-
87	FLIR0167.mp4	C027001	5/8/2024	16:58	Haynes	HC emissions at hole in LS204	EPA 15,000ppm

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88	FLIR0168.jpg	C027001	5/8/2024	16:01	Haynes	Photo at LS203	-
89	FLIR0169.jpg	C027001	5/8/2024	16:02	Haynes	Photo of vapor line on pressure side of PVRV at LS204	-
90	FLIR0170.jpg	C027001	5/8/2024	16:03	Haynes	Photo of PVRV at LS204	-
91	FLIR0171.jpg	C027001	5/9/2024	9:11	Haynes	Photo of leaking bolt at vacuum box V250496 from T1032	EPA 760ppm, HPC 1668ppm
92	FLIR0172.jpg	C027001	5/9/2024	9:32	Haynes	Photo of air mover used to fill vacuum box	-
93	FLIR0173.jpg	C027001	5/9/2024	9:32	Haynes	Photo of vapor discharge line from air mover used to fill vacuum box	-
94	FLIR0174.mp4	C027001	5/9/2024	14:48	Haynes	Incidental Video	-
95	FLIR0175.jpg	C027001	5/9/2024	14:51	Haynes	Photo of separator 17 lid for HCU	EPA 30,000ppm, HPC 30,000ppm
96	FLIR0176.mp4	C027001	5/9/2024	16:25	Haynes	HC emissions from HC sink in lab	EPA 10,000ppm
97	FLIR0177.mp4	C027001	5/9/2024	16:33	Haynes	HC emissions from acid station in lab	-
98	FLIR0178.jpg	C027001	5/9/2024	15:56	Haynes	Incidental Photo	-
99	FLIR0179.mp4	C027002	5/9/2024	16:56	Haynes	HC emissions from sump lid behind lab	EPA 5,000ppm, HPC 5,000ppm

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APPENDIX B: FIELD MEASUREMENT DATA

Date	Area	Component	EPA Reading (ppm)	XOM Reading (ppm)	Notes
5/7/2024	Near Tank 1032/1033	Container (V250596) – Bottom of gasket	1,600	1,600	-
5/7/2024	-	Tag: NETF 11 0066	-	-	Visible liquid (not actively dripping)
5/7/2024	-	Tag: OM1-4571 (V09028)	2,900	6,392	Visible liquid
5/7/2024	Gasoline Water Draws	Open-ended closure device on valve behind pump 194-P10	14,000	37,908	Oily ring on plug
5/7/2024	Wash Slab	Rolloff Container (RT-251825)	760	580	Not sealed, contains sludge/oily waste
5/7/2024	Wash Slab	Rolloff Container (RT-251205)	205	-	Tear in tarp cover, exchanger sludge
5/8/2024	CLEU#2	Flare Knock Out Drum – Sample Line	-	-	Stain and liquid droplet on bottom of line
5/8/2024	LS239	Access Hatch	9,000	>500	Not bolted
5/8/2024	LS 265	North side of cover	3,400	>500	-
5/8/2024	LS 265	East side of cover	750	>500	-
5/8/2024	LS 265	South side of cover	3,600	>500	1.5 foot of detectable emission interface
5/8/2024	LS 265	Manhole on top of cover	2,900	>500	-
5/8/2024	LS 265	South side of cover (Different location than above)	1,600	>500	-

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5/8/2024	LS 265	West side of cover	2,800	>500	1.5 foot of detectable emission interface
5/8/2024	CLEU#2	Tag # 975.1	1,000	1,044	XOM indicated component is on delay of repair
5/8/2024	LEFU	Drain under Flare #3 Knockout, D-016	47	-	-
5/8/2024	LS097	Hatch	1,700	>500	Hinge to hatch had missing caulk
5/8/2024	LS097	Drain west of hatch	635	>500	-
5/8/2024	LS204	Sump	15,100	13,000	Hole in sump corner
5/8/2024	LS204	Hatch (1 side) -	6,000	2,156	Hole in caulk
5/8/2024	LS204	Hatch (other side)	4,000	3,572	Hole in caulk
5/8/2024	LS076	Hatch	>10,000 (flameout)	Flameout	At hinge
5/8/2024	LS076	Elevated concrete hatch	350	-	Visible cracks in the concrete surrounding the square opening
5/8/2024	Dock	4-spot pit	275 1 inch from water level	-	Wastewater level in pit, open to atmosphere
5/9/2024	LS204	Cover	15,000	>500	Hole in cover
5/9/2024	LS204	Hatch	6,000	>500	Gap
5/9/2024	FCCU3	Sump 19	550	-	Latch
5/9/2024	FCCU3	P-17, vacuum Breaker	3,400	1,900	-
5/9/2024	FCCU3	P-17, manhole	1,100	2,403	Hole in caulk around manhole adjacent to pump

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5/9/2024	FCCU3	P-17, manhole	22,000	11,982	Different hole in caulk around manhole adjacent to pump
5/9/2024	FCCU3	P-17, kick hatch	720	270	
5/9/2024	Lab	Post 4	10,100		Hydrocarbon 4
5/9/2024	Lab	Distillation Post	90,100	-	-
5/9/2024	Lab	Manual	2,700	-	-
5/9/2024	Lab	Ash Post	7,700	-	-
5/9/2024	Lab	Acid Post	19,000	-	-
5/9/2024	Lab	Sump	5,000	6,200	Lid
5/9/2024	ECC	Between P2 and P3	15,000	18,000	Separator 13/14
5/9/2024	ECC	Between P3 and P4	20,000	20,000	Separator 13/14
5/9/2024	ECC	Separator 13	7,500	7,500	Gap/opening to atmosphere
5/9/2024	ECC	Separator 15	1,700	1,500	Gap/opening to atmosphere
5/9/2024	ECC	Separator 14	3,000	>500	Gap/opening to atmosphere
5/9/2024	ECC	Pit 1	15,000	-	Hole in sump cover on slab
5/9/2024	ECC	Pit 1	8,500	-	Grated opening hole
5/9/2024	ECC	Pit 1	2,400	2,700	Crack in concrete
5/9/2024	ECC	Pit 1	1,400	-	Side Wall
5/9/2024	ECC	Pit 1, fill hose (N)	1,100	-	-
5/9/2024	ECC	Pit 1, fill hose (S)	1,050	-	-
5/9/2024	Hydrocracker	Separator 17 Cover	30,000	30,000	-
5/10/2024	ECC	Door to Barscreen House # 14	1,700	1,850	-
5/10/2024	BTCP	12167	11,000	8,000	Suction line from 3053 TWD Pump# 91B

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APPENDIX C: METHOD 21 CALIBRATION DATA

Cylinder Information:

Zero Air: Green Light Safety
Lot# 269794
Expiration Date: 09/2025

500 ppm Methane: Green Light Safety
Lot# 304-402311271-1
Expiration Date: 12/23/2025

2,000 ppm Methane: Gasco
Lot# 304-402415357-1
Expiration Date: 04/20/2026

10,000 ppm Methane: Green Light Safety
Lot# 304-402244727-1
Expiration Date: 10/04/2025

Daily Calibration:

May 7, 2025, 8:25 am	B39303	B39302	-
500 ppm	476		-
2,000 ppm	1,931	1,990	-
10,000 ppm	9,844	10,100	-
May 8, 2025, 9:05 am	B39303	B39302	-
500 ppm	477	513	-
2,000 ppm	1,908	2,020	-
10,000 ppm	10,100	10,300	-
May 9, 2025, 8:55 am	B39303	B39302	E04884
500 ppm	502	497	505
2,000 ppm	1,942	2,012	1,997
10,000 ppm	9,932	10,000	10,000
May 9, 2025, 6:40 pm	Bump Check	For B39303	
500 ppm	570	-	-
2,000 ppm	2,200	-	-
10,000 ppm	11,300	-	-
May 10, 2025, 8:00 am	B39303	E04884	-
500 ppm	499	504	-
2,000 ppm	1,975	1,987	-
10,000 ppm	9,804	10,400	-

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APPENDIX D: SUBPART QQQ OBSERVATIONS

Date	Unit	Component	Observation
5/9/2024	DCU	619 A	No water seal
5/9/2024	DCU	618A	Oily water
5/9/2024	DCU	Drain by IP008 circuit breaker	No water seal
5/9/2024	DCU	Manhole (MH 3P27)	Over half covered in black tarry material
5/9/2024	DCU	Manhole (MHCB 3P25)	Missing caulk
5/9/2024	DCU	SC962	Solidified material in drain
5/9/2024	DCU	SC 961	No water seal
5/9/2024	DCU	Manhole left of E617	Partially covered by rocks
5/9/2024	DCU	Manhole right of E617	Partially covered by rocks
5/9/2024	DCU	Manhole located at north side of unit, east of deluge	Debris covering good portion of manhole
5/9/2024	DCU	Southwest of manhole (MHCB 3P17)	Tarry material covering manhole
5/9/2024	DCU	Manhole (MHCB 3P16)	Missing caulk
5/9/2024	DCU	Manhole (MHCB 3P15)	Missing caulk
5/9/2024	DCU	Manhole (MHCB 3P05)	Debris covering good portion of manhole
5/9/2024	DCU	Manhole by 644B	Partially under water
5/9/2024	DCU	Manhole by crane/outer road	Cone in manhole sample opening, open to atmosphere (250 ppm)
5/9/2024	SCU-2	OWS 2	No water seal
5/9/2024	SCU-2	OWS 10	No water seal (10 inches)