REGION 8
DENVER, CO 80202

EOG Resources - Various Well Pads and Facilities
Partial Compliance Evaluation (PCE)
On-Site Clean Air Act (CAA) Inspections

Inspection Date(s): February 6-7, 2024

Inspection Report Date: March 8, 2024

EPA Representatives: [redacted] US EPA Region 8, Clean Air Act Inspector
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Tribal Representatives: [redacted] MHA Energy
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Company Representatives: None

Inspection Report Prepared By: [redacted], US EPA Region 8
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Inspection Report Reviewed By: [redacted] anager, Enforcement and Compliance Assurance Division, Air and Toxics Enforcement Branc[redacted]

Applicable Rules: 40 C.F.R Part 49, Subpart K: Federal Implementation Plan for Oil and Natural Gas Well Production Facilities; Fort Berthold Indian Reservation (Mandan, Hidatsa and Arikara Nation), North Dakota (Fort Berthold FIP)

40 C.F.R Part 60, Subpart OOOOa: Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 (NSPS OOOOa)

Other Rules Investigated: 40 C.F.R Part 60, Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS JJJJ)

40 CFR Part 49 Subpart C - Federal Implementation Plan for Managing Air Emissions From True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector (OGFIP)

40 C.F.R Part 63, Subpart HH National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities (MACT HH)

Compliance Assistance
None

Enforcement History
EOG Resources, Inc. (EOG) was issued an administrative complaint and consent agreement for constructing major stationary sources located in Fort Berthold Reservation without first obtaining a PSD permit (Court Docket Number CAA-08-2011-0023) in 2012.

Areas of Concern

1. The EPA detected hydrocarbon emissions from the storage tanks at well pads co-located with the following wells:
   - Liberty LR 14-1109H
   - Clarks Creek 08 SESE 1 Pad, latitude: 47.90753, latitude: -102.72965 (Note: pad sign shows Clarks Creek 08 SESE 2)
   - Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad

2. The EPA detected hydrocarbon emissions from an unlit flare co-located with the following wells or compressor sites:
   - Van Hook 15 NENW
   - Parshall 33 SWSE 1

3. The EPA detected visible emissions from operating utility flares co-located with the following wells:
   - Van Hook 35 SESE Pad

4. The EPA has concerns that the following facilities may have exceeded 100 tpy at one point since the facilities began operation:
   - Mandaree 10 NENW Pad and Mandaree 10 (both facilities may be co-located, EPA noted 3 engines, one dehydration unit, 4 wells, 8 tanks and 2 control devices onsite).
   - Mandaree 10 NWNW Pad: On March 7, 2024, EOG provided information that Mandaree 10 NWNW had cumulative VOC emissions greater than 100 tpy, shown below. VOC would be 105.47 tpy according to information provided by EOG. Additionally, EOG provided information about the dehydration unit operating at Mandaree 10 NWNW where the dehydration unit showed benzene in excess of 0.9 Mg/yr. EPA has concerns that this unit shall comply with the major source requirements of MACT HH.

Category	VOC	NOx	CO	SO2	PM10	PM2.5	Total HAPs[2]
Part 2 Registration[3]	42.05	3.59	9.91	0.06	0.16	0.16	1.07
Cat G3516 LE	4.20	18.25	18.25	0.02	0.610	0.610	4.20[4]
Glycol Dehy Unit	59.22						13.34[5]

   - Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad (both facilities listed as same latitude and longitude on two separate registrations, combined emissions exceed 100 tpy for VOC's)
   - Liberty 23 NENW and Liberty LR 56-2320H (both facilities listed as same latitude and longitude on registration, combined emissions exceed 100 tpy for VOC's)
   - Clarks Creek 08 SESE: EOG provided PTE from a Part 2 Registration submitted December 12, 2019 that shows, among other criteria pollutants, 93.54 tpy of VOC and 8.09 tpy of HAP, shown below. During the onsite inspection, EPA inspectors observed a Moser Engine Service Generator onsite that EOG confirmed was a PSI Heavy Duty Engine, D146L also shown in a screenshot below. EOG confirmed that a generator was onsite since August 8, 2018, and two generators (D146L and D219L) located onsite between 1/7/2020 and 3/14/2020. The D146L generator has 402 hp and the D219L has 684 hp. EOG did not account for second or third engines being onsite for greater than 12 months in the Part 2 Registration. Based on the duration these engines may have been required to notify EPA of their operation as a

registration. These two engines may add to the VOC PTE to be greater than 100 tpy.

Emission Point	Equipment Description	NO_x		CO		VOC		SO_2		$PM_{10/2.5}$		Formaldehyde		H_2S		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
FUG-1	Fugitive Equipment Leaks	--	--	--	--	4.00	17.50	--	--	--	--	--	--	--	--	0.38	1.68
FL-1	Pad 1 Oil Tanks to Flare	--	--	--	--	0.13	0.57	--	--	--	--	--	--	--	--	0.01	0.03
FL-1	Pad 1 Produced Water Tanks to Flare	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	0.00	0.00
FL-1	Pad 1 Tank Flare Combustion Emissions	0.02	0.08	0.09	0.42	--	--	--	--	--	--	--	--	--	--	--	--
FL-1	Pad 2 Oil Tanks to Flare	--	--	--	--	7.15	31.30	--	--	--	--	--	--	--	--	0.57	2.49
FL-1	Pad 2 Produced Water Tanks to Flare	--	--	--	--	0.03	0.14	--	--	--	--	--	--	--	--	0.00	0.01
FL-1	Pad 2 Tank Flare Combustion Emissions	0.02	0.08	0.09	0.42	--	--	--	--	--	--	--	--	--	--	--	--
L-1	Uncaptured Oil Loading Emissions to Atmosphere	--	--	--	--	2.06	7.46	--	--	--	--	--	--	--	--	0.11	0.40
L-2	Water Loading Emissions to Atmosphere	--	--	--	--	0.00	0.01	--	--	--	--	--	--	--	--	0.00	0.00
FL-2	HP Emergency Flare	0.86	3.78	4.70	20.59	6.26	27.40	--	--	--	--	--	--	--	--	0.39	1.73
ENG-1	1340 hp Caterpillar G3516B LE	2.95	12.94	5.91	25.88	2.07	9.06	0.01	0.02	0.18	0.80	0.40	1.75	--	--	0.40	1.75
HTR-1	0.5 MMBtu/hr Heater Treater	0.07	0.32	0.06	0.27	0.00	0.02	0.00	0.00	0.01	0.02	--	--	--	--	--	--
HTR-2	0.5 MMBtu/hr Heater Treater	0.07	0.32	0.06	0.27	0.00	0.02	0.00	0.00	0.01	0.02	--	--	--	--		
HTR-3	1 MMBtu/hr Group Treater	0.14	0.63	0.12	0.53	0.01	0.03	0.00	0.00	0.01	0.05	--	--	--	--		
HTR-4	1 MMBtu/hr Line Heater	0.14	0.63	0.12	0.53	0.01	0.03	0.00	0.00	0.01	0.05	--	--	--	--	--	--
TOTALS		4.29	18.77	11.16	48.89	21.71	93.54	0.01	0.04	0.22	0.95	0.40	1.75	0	0	1.86	8.09

CLARKS CREEK 08 SESE

GENERATOR #	GENREATOR MANUFACTURER	ENGINE MANUFACTURER	ENGINE YEAR	ENGINE SIZE	ENGINE SERIAL #	INSTALL DATE	REMOVAL DATE
14-20-007P	MOSER ENGINE SERVICE	PSI HEAVY DUTY	5/7/2019	D146L	EZZOG902248	8/2/2023	CURRENT
14-20-001P	MOSER ENGINE SERVICE	PSI HEAVY DUTY	11/7/2019	D146L	EZZOG902478	3/14/2020	8/2/2023
22L-19-093P	MOSER ENGINE SERVICE	PSI HEAVY DUTY	8/6/2019	D219L	EZYOF903674	1/7/2020	3/14/2020
14-19-044P	MOSER ENGINE SERVICE	NG ENGINE	NO NAMEPLATE	D146L	NO NAMEPLATE	1/7/2020	3/14/2020
14-15-022	MOSER ENGINE SERVICE	PSI HEAVY DUTY	10/27/2014	D146L	NO NAMEPLATE	11/13/2019	1/7/2020
500298	NOV	PSI HEAVY DUTY	3/11/2015	D219L	EEYOF401000	10/4/2019	11/13/2019
11-14-090	MOSER ENGINE SERVICE	PSI HEAVY DUTY	5/13/2014	D111L	EEIOH403525	8/8/2018	10/4/2019

5. The EPA noted equipment onsite at Clarks Creek 08 SESE that was not included in the Part 2 Registration and EOG informed EPA in a submittal provided February 22, 2024 that two emission sources (Caterpillar Engine and a dehydration unit) were added at Mandaree 10 NWNW without registration forms submitted.

See Table 1 below for more details regarding inspected locations and Tables 2 and 3 for inspection observation details for all pads. A log of images and videos captured during the inspections is provided in Appendix A.

General Inspection Information

Unannounced well pad inspections were conducted jointly by U.S. EPA and Fort Berthold Indian Reservation (FBIR) Tribal inspectors on February 6-7, 2023, at multiple EOG facilities located on the FBIR.

The EPA evaluated each EOG well site listed in Table 1 using audio, visual, and olfactory (AVO) inspection methods including the use of an optical gas imaging (OGI) camera and EPA Reference Method 22. At each facility, inspectors scanned the crude and/or water storage tanks, closed vent system and flares onsite for any detectable emissions. Specifically, inspectors scanned storage tank covers and closed vent systems for hydrocarbon emissions to determine compliance with the Clean Air Act, including the Fort Berthold FIP, NSPS OOOOa, NSPS JJJJ, OGFIP, and Part 71 Title V Operating Permits.

Each well pad inspection followed the approach below:

1. Record the entry sign of the well pad when available. Survey the entire well pad with OGI camera. Record the number and type of site process equipment such as well heads, tanks, engines, dehydration units and emission control devices.
2. Record AVO indications of emissions from the storage tanks, closed vent system to the control devices and control devices.
3. Using the OGI camera, survey each process in infrared modes (auto, manual, and/or high-

sensitivity modes). Record any uncontrolled emissions with the OGI camera and describe the frequency and magnitude of emissions in the field notebook.

4. Observe control devices (enclosed combustor or utility flare) for visible emissions. If there is visible emissions present, conduct Method 22 and record the observations.
5. If there are operators present onsite, share any Areas of Concern.

Table 1 lists general inspection and facility details for each inspected facility. The well pad information located in the Table 1 is from the North Dakota Industrial Commission (NDIC) well index located online at https://www.dmr.nd.gov/oilgas/.

Date	Arrival Time	Departure Time	Pad Name	API	NDIC #	Latitude	Longitude
2/6/2024	12:52	13:12	Van Hook 36 SESW	33-061-03640, 33-061-03639	30968, 30969	47.935571	-102.271516
2/6/2024	9:00	9:45	Van Hook 15 NENW Pad	33-061-03641, 33-061-03642, 33-061-03643, 33-061-03644, 33-061-01361	30978, 30979, 30980, 30981, 19018	47.9914778	-102.3153667
2/6/2024	11:15	11:30	Parshall 35 SWSE Pad	33-061-03255, 33-061-03256, 33-061-00930, 33-061-03246, 33-061-03247, 33-061-03248	29126, 29127, 17828, 29103, 29104, 29105	47.935387	-102.155519
2/6/2024	11:40	12:10	Parshall 33 SWSE 1	33-061-03286, 33-061-03287, 33-061-03288, 33-061-00871, 33-061-03348, 33-061-03347, 33-061-03346	29298, 29299, 29300, 17621, 29637, 29636, 29635	47.9350639	-102.1988111
2/6/2024	13:21	13:52	LIBERTY LR 43-1109H	33-061-04028, 33-061-04029, 33-061-02281	33432, 33433, 23958	47.91229218	-102.2884416
2/7/2024	11:35	11:52	Mandaree 10 NENW Pad (Not operating during inspection, no API's included in this inspection report) and Mandaree 10 NWNW	33-053-03082, 33-053-09879, 33-053-09880	18464, 38965, 38966	47.745876	-102.70059

2/6/2024	14:35	3:04	Liberty 14 NWSE 14 1 Pad (possibly Liberty LR18-14H)	033-061-04652, 033-061-04653, 033-061-04654, 033-061-04655	37252, 37253, 37254, 37255	47.895717	-102.28845
2/7/2024	10:40	11:07	Clarks Creek 08 SESE	33-053-07918, 33-053-07919, 33-053-03535, 33-053-03320	33278, 33279, 20602, 19790	47.907531	-102.72965
2/6/2024	15:12	15:31	Liberty LR 56-2320H AND Liberty 23 NENW	33-061-04894, 33-061-04895, 33-061-03556, 33-061-03555	38324, 38325, 30594, 30593	47.88912092	-102.2908038
2/6/2024	15:54	16:16	FERTILE LCS Compressor Station	NA	NA	47.8705	-102.2159
2/6/2024	10:30	11:05	PARSHALL LCS (1, 2 3 & 4)	NA	NA	47.9628	-102.1744
2/7/2024	9:07	9:22	Fertile 7 SESE 2 Pad	33-061-03983, 33-061-03985, 33-061-03984	33019, 33021, 33020	47.906848	-102.23982
2/6/2024	12:24	12:45	Van Hook 35 SESE Pad	33-061-03724, 33-061-03858	31399, 32119	47.935902	-102.281728
2/6/2024	9:58	10:20	Van Hook 14 SESE Pad	33-061-03628, 33-061-03629, 33-061-03646, 33-061-03645, 33-061-01517	30950, 30951, 30989, 30988, 19662	47.978934	-102.280141
2/7/2024	9:35	9:49	Liberty 13 NESE 1 Pad	33-061-04154, 33-061-04009, 33-061-04010	34271, 33373, 33374	47.897591	-102.258476
2/6/2024	14:00	14:30	Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad	33-061-04043, 33-061-04160	33511, 34361	47.9065444	-102.27985

Observations and Regulatory Applicability

Fort Berthold FIP, NSPS OOOOa, NSPS JJJJ, OGFIP, and Part 71 Title V Operating Permit regulations which are potentially relevant to the Areas of Concern observed during inspections are summarized in this section.

Tables 2 and 3 at the end of this report summarize inspection observations and findings. Table 2 includes well head counts and storage tank observations. Table 3 includes details of control devices and related observations. See Appendix A for a log of images and videos taken during the inspections.

Fort Berthold FIP Applicability

Based on drilling information reported to the NDIC well index by EOG, the facilities listed in Table 1 were completed after the August 12, 2007, applicability date (per 40 C.F.R. § 49.4161) and are producing from the Bakken Pool (per 40 C.F.R. § 49.4163(a)(1)) and are thus subject to the Fort Berthold FIP.

Closed Vent System Equipment Requirements [§ 49.4165(b)]

Per § 49.4165(b)(1), "Each closed-vent system must route all produced natural gas and natural gas emissions from production and storage operations to the natural gas sales pipeline or the control devices…" The EPA, using an OGI camera, detected natural gas emissions from production and storage tanks at three out of 14 oil and natural gas production facilities evaluated. See Area of Concern #1 above.

Utility Flare Requirements [§ 49.4165(c)]

Per § 49.4165(c)(6)(vi), "The owner or operators must ensure that each enclosed combustor and utility flare is maintained in a leak-free condition." The EPA, using an OGI camera, detected emissions from an unlit flare at two out of 14 oil and natural gas production facilities. See Area of Concern #2 above.

Per § 49.4165(c)(6)(vii), "The owner or operator must ensure that each enclosed combustor and utility flare is operated with no visible smoke emissions." Per 49.4166(g)(3) and EPA Reference Method 22, the EPA noted smoke emissions at one out of 14 oil and natural gas production facilities evaluated. See Area of Concern #3 above.

NSPS OOOOa Applicability

Based on well production information reported by EOG in NSPS OOOOa reports, data submitted to the NDIC and the date of construction, reconstruction, or modification of the storage vessels, the EPA believes that storage vessels, reciprocating compressors and associated emissions control equipment at all identified in Table 1 are subject to requirements for storage vessel affected facilities in NSPS OOOOa.

Closed Vent System Equipment Requirements [§ 60.5411a(c)]

Per § 60.5411a(c)(1), owners and operators must "Design the closed vent system to route all gases, vapors, and fumes emitted from the material in the storage vessel to a control device that meets the requirements specified in § 60.5412(c) and (d), or to a process." The EPA, using an OGI camera, observed emissions from the closed vent system at the Liberty LR 43-1109H, Clarks Creek 08 SESE, Liberty 11 SESE/ Liberty 11 NWSE facility. See Area of Concern #1 above.

Control Device Requirements [§§ 60.5412a(d) and 60.5413a(e)]

Per § 60.5412a(d)(1)(ii), owners and operators must, for each combustion control device, "install and operate a continuous burning pilot flame." The EPA observed unlit pilot flames at the Van Hook 15 NENW and Parshall 33 SWSE 1 facilities. See Area of Concern #2 above.

Per § 60.5412a(d)(1)(iii), owners and operators must, "Operate the combustion control device with no visible emissions, except for periods not to exceed a total of 1 minute during any 15-minute period." The EPA observed black smoke continuously for more than one minute (per Method 22) at the Van Hook 35 SESE Pad facility. See Area of Concern #3 above.

NSPS JJJJ Applicability

A stationary internal combustion engine (ICE) means any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a nonroad engine as defined at 40 CFR 1068.30 (excluding paragraph (2)(ii) of that definition), and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition. Stationary ICE include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines.

The Moser engines located at Clarks Creek 08 SESE were manufactured after the trigger dates of NSPS JJJJ at § 60.4230(a)(4), have continually been located at the facility for greater than 12 months (ie, not a mobile source engine) and therefore should comply with the requirements for stationary ICE.

40 CFR Part 49 Subpart C - Federal Implementation Plan for Managing Air Emissions From True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector

As specified in 49.160(c)(1)(iv), "Minor sources complying with §§ 49.101 through 49.105 for the oil and natural gas production and natural gas processing segments of the oil and natural gas sector, as defined in § 49.102, must submit, at least 30 days prior to beginning construction, the Part 1 Registration Form containing the information in paragraph (c)(2) of this section. The Part 2 Registration Form, including emissions information, must be submitted within 60 days after the startup of production as defined in § 49.152(d). The source must determine the potential for emissions within 30 days after startup of production.

The combination of the Part 1 and Part 2 Registration Forms submittals satisfies the requirements in paragraph (c)(2) of this section. These forms are submitted to the EPA instead of the application form required in paragraph (c)(1)(iii) of this section. The forms are available at: https://www.epa.gov/tribal-air/tribal-minor-new-source-review or from the EPA Regional Offices."

EPA noted equipment onsite at Clarks Creek 08 SESE that was not included in the Part 2 Registration and EOG informed EPA in a submittal provided February 22, 2024 that two emission sources (Caterpillar Engine and a dehydration unit) were added at Mandaree 10 NWNW without registration forms submitted.

MACT HH Applicability

EOG provided information about the dehydration unit that operated at Mandaree 10 NWNW showing benzene PTE greater than 0.90 Mg/yr. Benzene PTE was calculated by EOG to be 7.899 tpy. The dehydration unit operated April 26, 2023 through January 4, 2024. Therefore, EOG should have complied with the major source requirements of MACT HH at 40 C.F.R. 63.764(c). The EPA does not have records of startup notifications according to 40 C.F.R. 63.775 or startup notifications under the General Provisions of Part 63.

Part 71 Title V Applicability

Per § 71.3(a), any major source is subject to the permitting requirements under Part 71. Based on well production information reported by EOG in facility registrations, NSPS OOOOa reports, data submitted to the NDIC and facility throughputs, the EPA believes that the facilities identified in Area of Concern #4 may be or have had emissions greater than 100 tpy and therefore may be or have been subject to Part 71 Title V. As specified in 40 C.F.R. 71.7(b), "no part 71 source may operate after the time that it is required to submit a timely and complete application under this part."

Table 2: Inspection Details: Storage Tank Observations				
Well Name	**Number of Storage Tanks**	**AVO (Audio, visual, olfactory) Observations**	**Emissions Description**	**Media File Name**
Van Hook 36 SESW	10	None	None	
Van Hook 15 NENW Pad	14	None	None	
Parshall 35 SWSE Pad	8	None	None	
Parshall 33 SWSE 1	18	Yes, UBHC odor likely from unlit flare.	None	
LIBERTY LR 43-1109H	10	Yes, UBHC odors.	Thief hatch leaks on 4 oil tanks and 1 PW. Probe on one oil tank venting. Leak on one PW tank vacuum breaker.	TH leaks on tank 8368, 8373, 8372, 8371 oil tanks and 1789 oil tank: MOV_3470, MOV_3471, MOV_3472, MOV_3474, MOV_3475. Vac breaker on tank 1790: MOV_3473 Yellow probe tank leak 8369: MOV_3469
Mandaree 10 NENW Pad and Mandaree 10 NWNW	8	None	None	
Liberty 14 NWSE 14 1 Pad (possibly Liberty LR18-14H)	8	None		
Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)	14	None	Following tank leaks seen on FLIR as tank emissions; large/significant	Prod Oil MOV_3497. PW emissions MOV_3494
Liberty LR 56-2320H AND Liberty 23 NENW	10	None		
FERTILE LCS Compressor Station	2	None		
PARSHALL LCS (1, 2 3 & 4)	2	None		
Fertile 7 SESE 2 Pad	6	None	None	None
Van Hook 35 SESE Pad	10	None	None	None

Van Hook 14 SESE Pad	14	None	None	None
Liberty 13 NESE 1 Pad	10	None	None	None
Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad	14		Thief hatch leaks	MOV_3479, MOV_3480, MOV_3481

Table 3: Inspection Details: Control Devices and AVO/OGI Observations

Well Name	Number of Control Device	Control Device Type	Visible Pilot Flame (Y/N)	Active Flaring (Y/N)	Method 22 Observations	Emission Description	Media File Name	Slope to K/O Drum	Notes
Van Hook 36 SESW	1	Zeeco, MJAG 3T-20	Y	Y	None	UBHC/propane smell, minor.	None	Downward	
Van Hook 15 NENW Pad	2	Zeeco, MJAG430 and MJNG-3D-20 (or MJAG-3T-20, difficult to read)	Yes, No	Yes, No	None	One unlit flare	MOV_3449, MOV_3450	Downward	MJNG-3D-20 (or MJAG-3T-20, difficult to read) was not on, flare venting emissions/UBHC, no pilot. Audio: flare recieving gas noise. 11 PSI noted to flare. Control panel shows Pilot Failure (DC_3451 and DC_3452).
Parshall 35 SWSE Pad	1	Zeeco, MJAG 3T-20, manufactured 2014.	Yes	Yes	None	None	None	Downward	
Parshall 33 SWSE 1	1	Zeeco MJAG-3T-20	No	Flare Unlit	None	One unlit flare, control panel photo DC_3460	MOV_3459	Upward, Improper	AVO odors of UBHC upstream

						shows pilot failure light on.		Slope	of flare. Pilot light out on FLIR, control panel also alarm shows Pilot Failure. Photo DC_3460.
LIBERTY LR 43-1109H	2	1, LP Steffes Air assist. 1 HP Steffes	Y	Y	None	None			Temps for thermocouple on control panel above 1400F for both flares
Mandaree 10 NENW Pad and Mandaree 10 NWNW	2	1, LP Steffes Air assist. 1 HP Steffes	No	No	None	None			
Liberty 14 NWSE 14 1 Pad (possibly Liberty LR18-14H)	2	1 HP Steffes, 1 LP Air assist Steffes.	Yes, Yes	Y	None	Flares on, no emission concerns	DC_3482	NA	Low temp alarm on flare control panel. One panel was 1356F, low alarm panel shows negative (-) 153F but flare pilot is burning/flare on.
Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)	3	2 Steffes, 1 Air Assist HP, 1 Zeeco HEIC-1-TS-S	Y	Y	None			Downward	
Liberty LR 56-2320H AND Liberty 23 NENW	2	1 HP Steffes, 1 LP Air assist Steffes.	Y	Y	None			Downward	Air assist flares noted as operating greater than 1000F on control panel
FERTILE LCS Compressor Station	2	Air assist	Y, N	Y	None	Large air assist (likely Flare Industries similar to Parshall LCS), unlit. UBHC from large air assist.	MOV_3486, MOV_3488		

						Other flare, smaller Cimarron flare, operating and flaring (truck loading during onsite inspection). Manual mode used for second OGI video			
PARSHALL LCS (1, 2 3 & 4)	2	Air assist	Y	No	None				Air assist flares, one was Flare Industries, #10-0246
Fertile 7 SESE 2 Pad	2	1 HP Steffes, 1 LP Air assist Steffes.	Y	Y	None	None	DC_3490	Downward	No pilot detected on control panel but heat signature detected with FLIR. Pilot alarm on LP flare.
Van Hook 35 SESE Pad	1	Zeeco, MTAG-3T-20, manufactured 2013.	Y	Y	Yes	Failed Method 22.	IMG_0023, IMG_0024	Downward	5-15% opacity for >70 seconds.
Van Hook 14 SESE Pad	2	Zeeco, likely HP-LP	Yes, Yes	Yes, Yes	None	UBHC on one but pilot on	MOV_3455	Downward	
Liberty 13 NESE 1 Pad	2	1 HP Steffes, 1 LP Air assist Steffes.	Y	No	None	None		Downward	
Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad	3	1 HP Steffes, 1 LP Air assist Steffes, 1 Zeeco	Yes, Yes, Yes	Y, Y, Y	None	None		Downward	Both Steffes noted with thermocouple temps each between 1250-1350F.

APPENDIX A: Photograph and Video Log

File Name Prefix	File Number	Description	Site Name
IMG	14	Entry Sign Photo	Van Hook 15 NENW Pad
IMG	16	Entry Sign Photo	Van Hook 14 SESE Pad
IMG	17	Entry Sign Photo	PARSHALL LCS (1, 2 3 & 4)
IMG	18	Entry Sign Photo	Parshall 35 SWSE Pad
IMG	19	Entry Sign Photo	Parshall 35 SWSE Pad
IMG	20	Entry Sign Photo	Parshall 33 SWSE 1
IMG	22	Entry Sign Photo	Van Hook 35 SESE Pad
IMG	23	Failed Method 22	Van Hook 35 SESE Pad
IMG	24	Failed Method 22	Van Hook 35 SESE Pad
IMG	25	Entry Sign Photo	Van Hook 36 SESW
IMG	26	Entry Sign Photo	LIBERTY LR 43-1109H
IMG	27	Entry Sign Photo	Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad
IMG	28	Entry Sign Photo	Liberty 14 NWSE 14 1 Pad (possibly Liberty LR18-14H)
IMG	31	Entry Sign Photo	Liberty LR 56-2320H AND Liberty 23 NENW
IMG	32	Entry Sign Photo	FERTILE LCS Compressor Station
IMG	35	Entry Sign Photo	Fertile 7 SESE 2 Pad
IMG	36	Entry Sign Photo	Liberty 13 NESE 1 Pad
IMG	37	Entry Sign Photo	Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)
IMG	38	Entry Sign Photo	Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)
DC/MOV	3447	Site Overview	Van Hook 15 NENW Pad
DC/MOV	3448	Site Overview	Van Hook 15 NENW Pad
DC/MOV	3449	Unlit flare	Van Hook 15 NENW Pad
DC/MOV	3450	Unlit flare	Van Hook 15 NENW Pad
DC/MOV	3451	Flare control panel	Van Hook 15 NENW Pad
DC/MOV	3452	Flare control panel	Van Hook 15 NENW Pad
DC/MOV	3453	Site Overview	Van Hook 15 NENW Pad
DC/MOV	3454	Site Overview	Van Hook 14 SESE Pad
DC/MOV	3455	UBHC on one but pilot on	Van Hook 14 SESE Pad
DC/MOV	3456	Site Overview	PARSHALL LCS (1, 2 3 & 4)
DC/MOV	3457	Site Overview	Parshall 33 SWSE 1
DC/MOV	3458	Pumpjack leak fixed while EPA was onsite	Parshall 33 SWSE 1

DC/MOV	3459	Unlit flare	Parshall 33 SWSE 1
DC/MOV	3460	Control panel showing pilot failure light on	Parshall 33 SWSE 1
DC/MOV	3461	Significant emissions from hotizontal separator T-12	Parshall 33 SWSE 1
DC/MOV	3462	On other side of separator, leak detected on FLIR but could not pinpoint exact location	Parshall 33 SWSE 1
DC/MOV	3463	Staining on ground behind heater treater	Van Hook 35 SESE Pad
DC/MOV	3464	Staining on ground behind heater treater	Van Hook 35 SESE Pad
DC/MOV	3465	Staining on ground behind heater treater	Van Hook 35 SESE Pad
DC/MOV	3466	Site Overview	Van Hook 36 SESW
DC/MOV	3467	Site Overview	Van Hook 36 SESW
DC/MOV	3468	Site Overview	LIBERTY LR 43-1109H
DC/MOV	3469	Yellow probe leak tank 8369	LIBERTY LR 43-1109H
DC/MOV	3470	TH leak on tank 8368	LIBERTY LR 43-1109H
DC/MOV	3471	TH leak on tank 8373	LIBERTY LR 43-1109H
DC/MOV	3472	TH leak on tank 8372	LIBERTY LR 43-1109H
DC/MOV	3473	Vac breaker leak on tank 1790	LIBERTY LR 43-1109H
DC/MOV	3474	TH leak on tank 8371	LIBERTY LR 43-1109H
DC/MOV	3475	TH leak on tank 1789	LIBERTY LR 43-1109H
DC/MOV	3476	FLIR video taken showing liquids in tanks	LIBERTY LR 43-1109H
DC/MOV	3477	South heater treater emissions on FLIR from insulation by burner/exhaust	LIBERTY LR 43-1109H
DC/MOV	3478	Site Overview	Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad
DC/MOV	3479	Thief hatch leaks	Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad
DC/MOV	3480	Thief hatch leaks	Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad
DC/MOV	3481	Thief hatch leaks	Liberty 11 SESE 1 Pad and Liberty 11 NWSE 1 Pad
DC/MOV	3482	Flare video	Liberty 14 NWSE 14 1 Pad (possibly Liberty LR18-14H)
DC/MOV	3483	Site Overview	Liberty 14 NWSE 14 1 Pad (possibly Liberty LR18-14H)
DC/MOV	3484	Site Overview	Liberty LR 56-2320H AND Liberty 23 NENW
DC/MOV	3485	Site Overview	FERTILE LCS Compressor Station
DC/MOV	3486	Unlit flare	FERTILE LCS Compressor Station
DC/MOV	3488	Unlit flare	FERTILE LCS Compressor Station
DC/MOV	3489	Site Overview	Fertile 7 SESE 2 Pad
DC/MOV	3490	Control panel showing pilot failure light on	Fertile 7 SESE 2 Pad
DC/MOV	3492	Site Overview	Liberty 13 NESE 1 Pad

DC/MOV	3493	Site Overview	Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)
DC/MOV	3494	Following tank leaks seen on FLIR as tank emissions; large/significant: PW tank emissions	Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)
DC/MOV	3496	1 VRU disconnected from tanks	Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)
DC/MOV	3497	Following tank leaks seen on FLIR as tank emissions; large/significant: PO tank emissions	Clarks Creek 08 SESE 2 Pad (sign says SESE 1 pad)
DC/MOV	3498	Entry Sign Photo	Mandaree 10 NENW Pad and Mandaree 10 NWNW