Well Done FOUNDATION
P.O. Box 10640 Bozeman, Montana 59719 (406) 460-0903

TO: Randy Pancheco, APWS; Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: October 9, 2022

RE: Foster #001 (30-025-07968) Orphan Well Pre-Plugging Methane Monitoring

TECHNICAL MEMORANDUM

The Well Done Foundation, Inc. (WDF) performing contract professional services methane monitoring for A-Plus Well Services, Inc. (APWS) for the State of New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD) under Purchase Order #52100-00000072992 for Orphan Oil & Gas Wells in Lea County, NM.

The site conditions found at Foster #001 by the WDF Measure 1 Field Team on September 20, 2022, at 3:20 P.M. revealed a severely leaking wellhead with high concentrations of methane gas present and leaking by the production valve at the 2-3/8" tubing and from the 4" casing. The WDF Team performed field gas measurements, collected gas samples and performed a 2.2-hour Methane Emissions Flow Monitoring Test using Ventbuster™ Instruments VB100-039 Ultra-Low Flow Meter with GPS for site location verification.

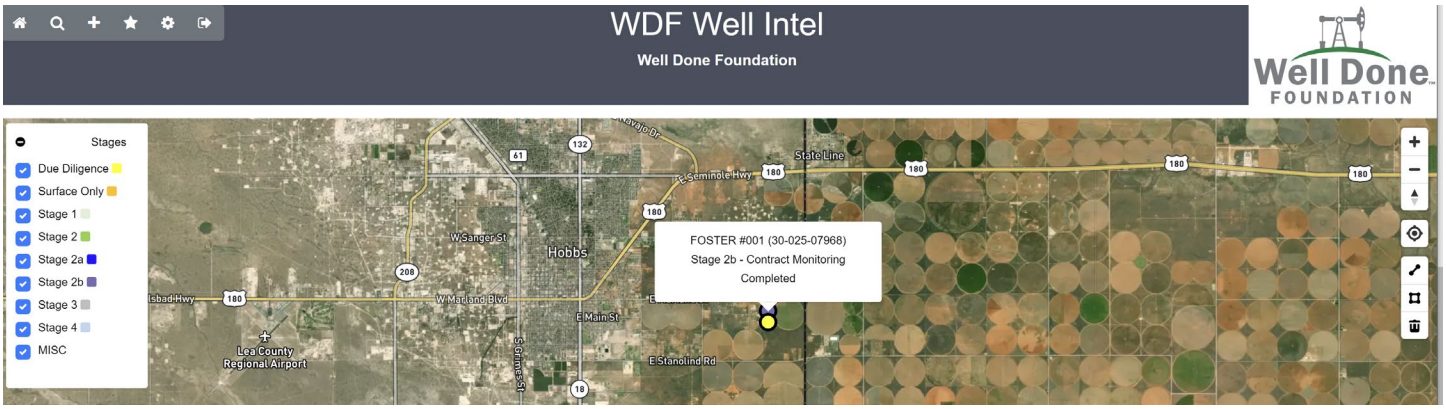


Image 1.1 – Foster #001 (30-025-07968) Orphan Well near the City of Hobbs in Lea County, NM

The findings from the Pre-Plugging Methane Flow Monitoring Test, using Ventbuster™ Instruments VB100-0039 Ultra-Low Flow Meter with GPS, resulted in 339.86 cubic meters per day of total measured wellhead emissions over the 2.2-hour period. A composite gas sample was collected at the wellhead by WDF during the flow test beginning on September 20, 2022, and at the end of the flow test on September 20, 2022, approximately 2.2-hours later. Methane gas concentration levels were measured at 670,960 ppm, pursuant to Test ID 2022058184 performed by Laboratory Services of Hobbs, NM on September 22, 2022, at 3:51 P.M. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **5,263.75 grams per hour (g/hour)**.[1] The peak methane gas emission was recorded at 8:10 P.M. on September 20, 2022 and would indicate that this orphan well has a much higher emission rate potential of **6,396.85 grams per hour (g/hour) or greater**. During the scope of this test, the Foster #001 did not achieve a "Normalized Flow" and the measured methane emission was increasing steadily.

[1] Methane Calculation: 554 grams CH4 per cubic meter (554 x 339.86 = 184,883.84 g/day total /24 = 7,845.10 g/hour x 0.670960 (methane concentration) = **5,263.75 g/hour CH4**). **Methane, gas** weighs 0.000554 *gram per cubic centimeter* or 0.554 *kilogram per cubic meter*, i.e. density of *methane, gas* is equal to 0.554 kg/m^3; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In Imperial or US customary measurement system, the density is equal to 0.0346 *pound per cubic foot* [lb/ft^3], or 0.0003202 *ounce per cubic inch* [oz/inch^3] .

This orphan well clearly exceeds the >1 g/hour federal program reporting requirements for methane emissions reductions as described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58)[2].

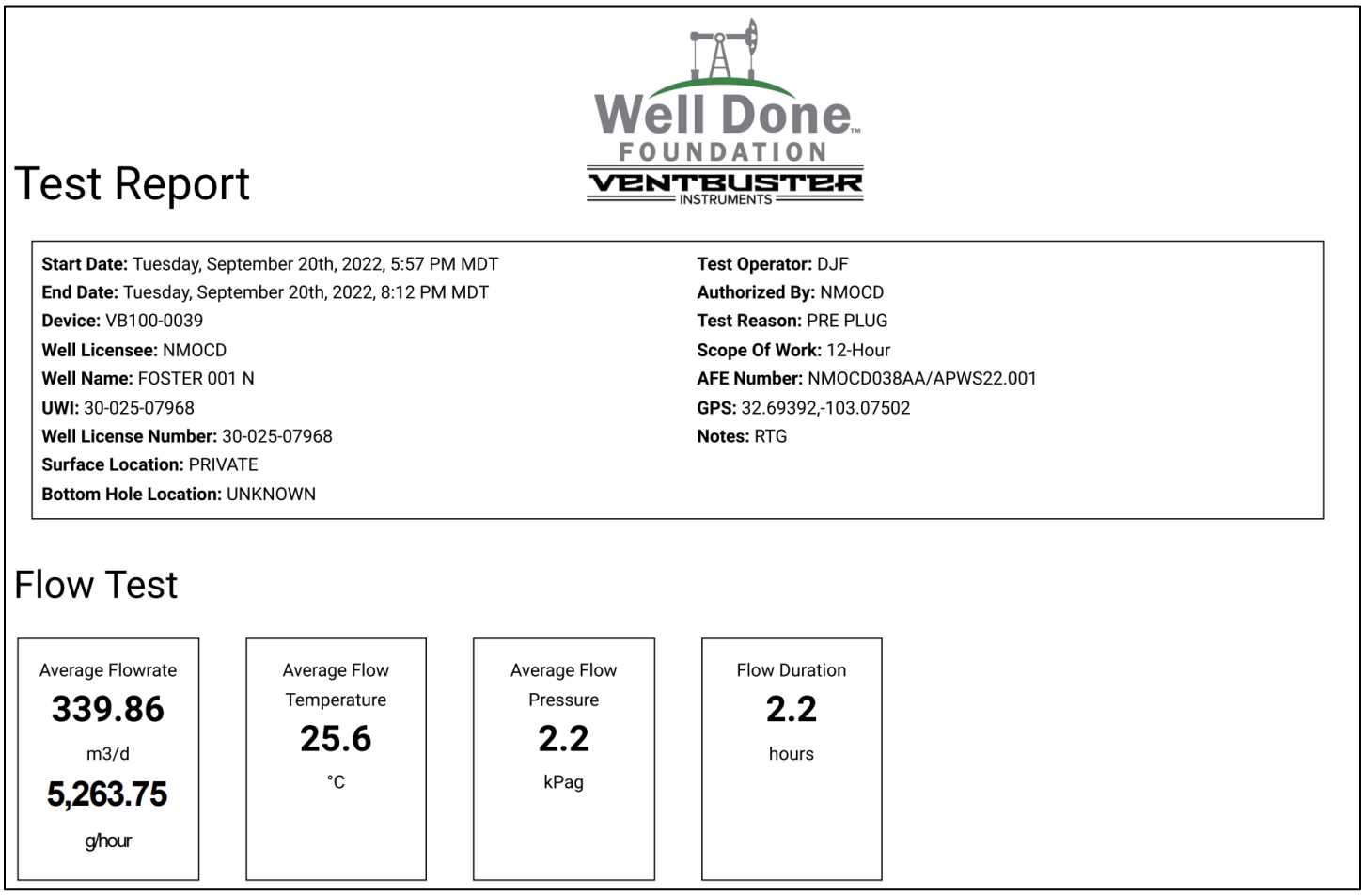
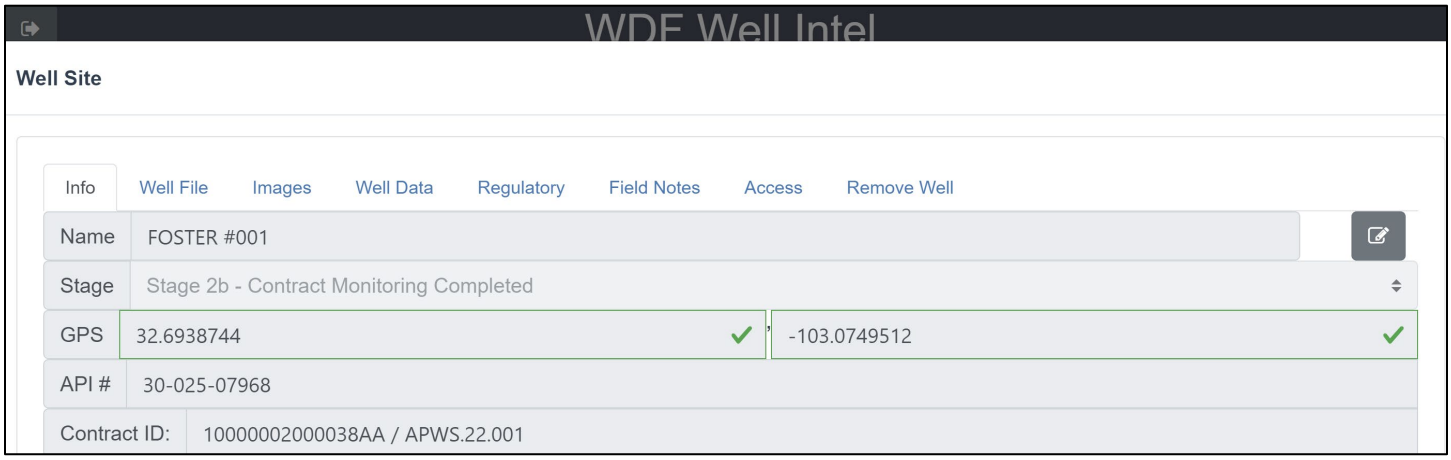


Image 2.1 – Foster #001 (30-025-07968) Methane Monitoring Dashboard

BACKGROUND

The Foster #001 (30-025-07968) Orphan Well is located in the City of Hobbs in Lea County, NM at Latitude 32.6938744, Longitude -103.0749512 was measured and monitored by the WDF Measure 1 Field Team on 9/20/2022 following a Safety Briefing. Per the WDF protocol, the well was photographed from four (4) compass point aspects and closeups capturing the wellhead, field gas analysis results and gas sampling and uploaded to the WDF Well Intel™ IoT site. A Field Gas Analysis was conducted to detect Methane and H2s gas presence and concentration levels using a Honeywell BW Quattro Multi Gas Meter, serial number: QA121-012211.

[2] These April 11, 2022 Guidelines were developed to meet the federal program reporting requirements for methane emissions reductions as described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58).



mage 3.1 – WDF Well Intel™ Orphan Well Project Management IoT

The WDF Measure 1 Field Team collected Gas Sample #1 using a 1 Liter Tedlar/TO-Plus Gas Sampling Bag from the 2-3/8" production tubing which was flowing gas past the valve and at the 4" casing port at the beginning of the Flow Test at approximately 5:30 P.M MDT on 9.20.2022 as the well was being prepared for the Flow Measurement. Gas Sample #2 was collected in the same 1 Liter Tedlar Bag on 9.20.2022 before the Flow Test was concluded 8:12 P.M. MDT.

WDF rigged up the Ventbuster™ Instruments VB100-039 Continuous Ultra-Low Flow Meter with GPS for testing site confirmation for a minimum 2-Hour Methane Emission Test and began Test ID: 28ef69e5, verifying a cellular signal, cloud link and GPS coordinates. WDF collected Gas Sample #2 in the same Tedlar/TO Plus Gas Sample Bag prior to the VB Test being concluded later in the evening on 9.20.2022 to ensure the Methane Emission Flow was normalized. The collected Gas Sample was secured and placed in a storage cooler for transport to Laboratory Services, Inc. in Hobbs, NM.

WDF remained on location for the duration of the test on 9.20.2022 (approximately 2.2 hours) to closely monitor the Pre-Plugging Methane Emission Flow Test, destroy the flow test emissions through thermal oxidization and rig the VB100-039 down and secure the wellhead as best as possible. A "Green Ribbon" was placed at the Wellhead indicating that WDF had concluded the Pre-Plugging Methane Flow testing.

TECHNICAL FINDINGS

Foster #001 (30-025-07968):

- **Total C1 through C6 Gas Concentration: 817,210 ppm**
- **Total Measured Wellhead Gas Emissions: 339.86 m3/day**
- **Methane Gas Concentration: 670,960 ppm**
- **Calculated Average Wellhead Methane Gas Emissions: 5,263.75 g/hour**
- **Peak Methane Flow Measured at: 6,396.85 g/hour**

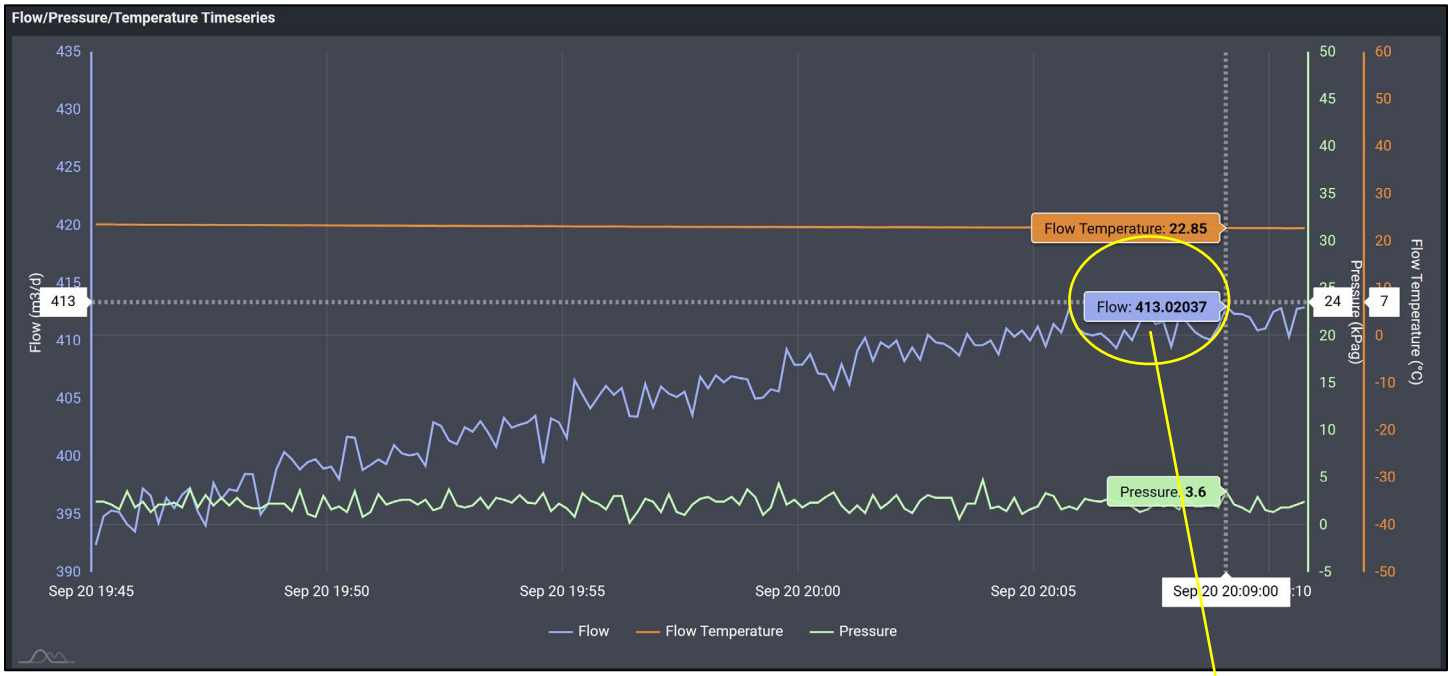


Image 4.1 – Foster #001 (30-025-07968) Methane Peak Flow of 413.03 m3/day is equal to 6,396.85 g/hour.

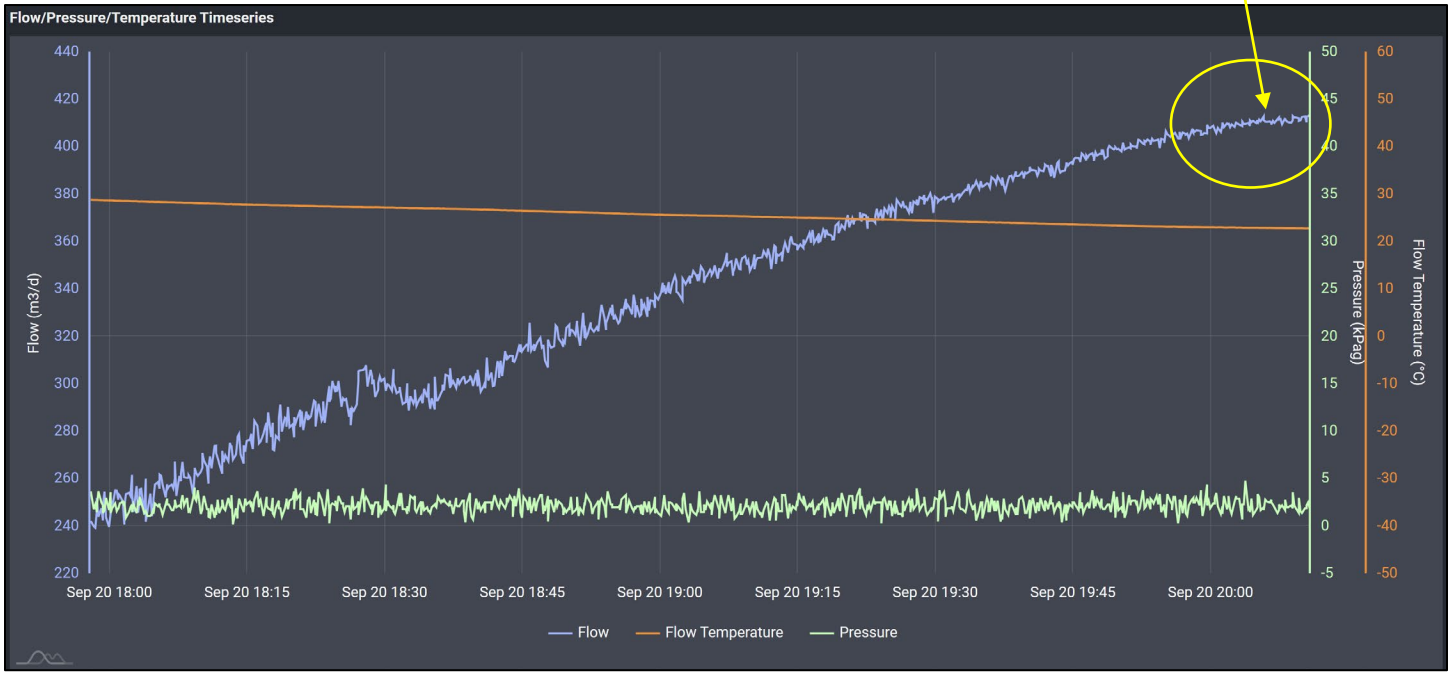


Image 4.2 – Foster #001 (30-025-07968) Methane Flow/Pressure/Temperature Timeseries & Peak Flow with Methane Flow Average of 5,263.75 g/hour.

CONCLUSIONS

- The Foster #001 (30-025-07968 is currently emitting Methane at the average rate of 5,263.75 g/hour, which is well above the Federal minimum threshold for reporting described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58) which is >1g/hour.

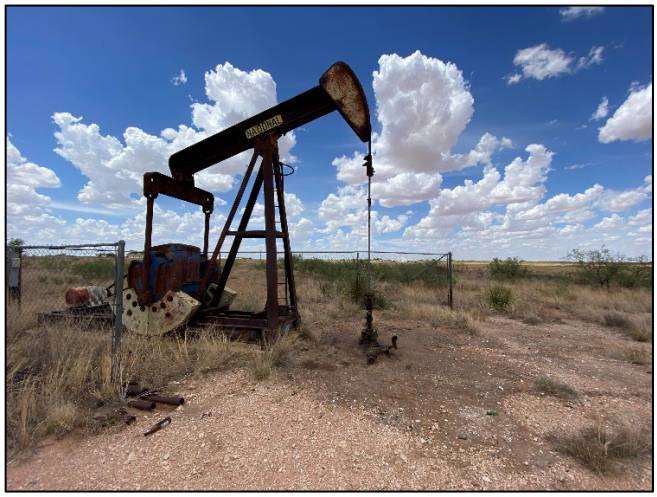
- WDF did capture a Methane Flow Peak at 413.55 m3/day recorded at 8:10 P.M on September 20, 2022, which is equal to 6,396.85 g/hour and indicates a much higher potential for Methane Emissions that exceed the Federal minimum threshold, therefore plugging of this well however should be a priority in the NMOCD schedule.

FIELD NOTES

#	Date	Note
1	2022-07-30	ces: On location. Found gas leaking at tubing head packing at a high rate. National pump jack on location with concrete base. One 210 barrel stock tank one 160 barrel saltwater tank one fiberglass trader/separator one steel heater treater and one steel separator. Tank battery does not have containment. Surface staying at tank battery approximately 10' x 10' surface standing at
2	2022-07-30	ces: Access off of E. Moreland Rd. OK through a lot gate. Side is flat was plenty of room to move thank batteries do not appear to be leaking.
3	2022-07-30	ces: Gas test tubing head show high levels of H2 S4 134+ ppm. Methane level is high, over limit. Exercise caution!
4	2022-07-30	ces: IMPORTANT - Field gas test was conducted in the mixing zone. Actual gas concentrations will be higher within the wellbore! Well is under pressure!
5	2022-07-30	ces: Stock tank has approximately 4+ feet of material.
6	2022-09-20	ces: WDF Measure 1 team arrived on location at Foster #001 North at approximately 5:15 P.M. WDF performed JHA prior to beginning work to address elevated levels of H2S gas and the planned flaring operations. Began rigging up the VB100-0039 for testing at the 4" casing that is pressured up and leaking by the 2-3/8" tubing packing at the wellhead. Position the WDF Mobile Flare to destroy emission gas from the flow testing and improve site safety. Collected gas sample for Lab analysis. Start IIJA Pre-Plugging Methane Flow Test at 5:57 P.M. WDF Team closely monitoring the methane flow and performance of the Mobile Flare Unit. Turn on Light Plant at approximately 7:45 as darkness sets in. Conclude Methane Flow Test at 8:12 P.M. Rig down VB100-039 and rig down Mobile Flare. Secure well location and wellhead however, as the Methane Flow test Results conclude from this interval, the flow steadily increased and pressure at the 2-3/8" packing never subsided. Clean up and roll off location at 9:05 P.M. - WILDCAT OUT!

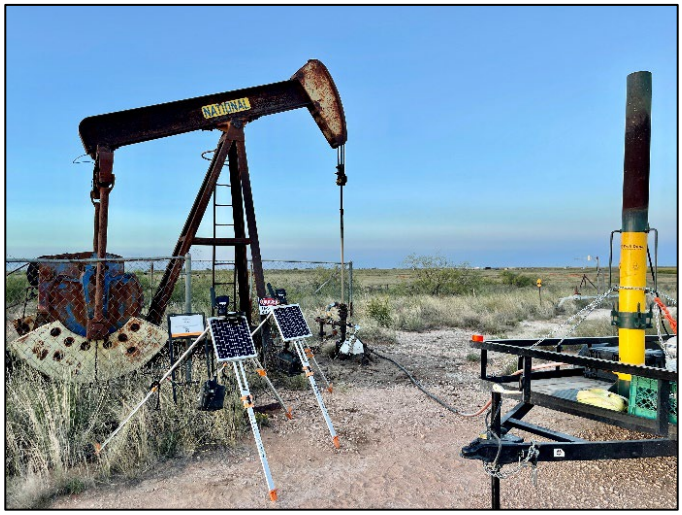
Image 5.1 – Foster #001 (30-025-07968) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT

Appendix A – Site Photos for Foster #001 (30-025-07968)



1) Foster #001 (30-025-07968) – North Facing

2) Foster #001 (30-025-07968) – Wellhead - East Facing



3) Foster #001 (30-025-07968) – Methane Flow Monitoring Rig Up

4) Foster #001 (30-025-07968) – Monitoring the Monitoring!

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

QUESTIONS

Action 172247

QUESTIONS

Operator:	OGRID:
ROBINSON OIL INC P.O. Box 1829 Eunice, NM 88231	37636
	Action Number: 172247
	Action Type: [UF-OMA] Pre-Plug Methane Monitoring (UF-OMA-MMA)

QUESTIONS

Prerequisites	
[OGRID] Well Operator	**[37636] ROBINSON OIL INC**
[API] Well Name and Number	**[30-025-07968] FOSTER #001**
Well Status	**Reclamation Fund Approved**

Monitoring Event Information	
Reason For Filing	**Pre-Plug Methane Monitoring**
Date of monitoring	09/20/2022

Monitoring Event Details	
Flow rate in cubic meters per day (m^3/day)	339.86
Test duration in hours (hr)	2.2
Average flow temperature in degrees Celsius (°C)	25.6
Average gauge flow pressure in kilopascals (kPag)	2.2
Methane concentration in part per million (ppm)	670,960
Methane emission rate in grams per hour (g/hr)	5,263.75
Testing Method	Steady State Chamber (ACR)

Monitoring Contractor	
Name of monitoring contractor	Well Done Foundation, Inc.