



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: July 24, 2023

RE: Cato San Andres (CSAU) #118 (30-005-20077) Orphan Well Post-Plugging Methane Monitoring

TECHNICAL MEMORANDUM

Well Done New Mexico LLC and the Well Done Foundation, Inc. (WDF) performing contract professional services methane monitoring for the State of New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD) under Purchase Order #52100-00000073985 for Orphan Oil & Gas Wells in Chaves County, NM.

The site conditions found at the Cato San Andres Unit (CSAU) #118 by the WDF Measure 1 Field Team on June 29, 2023, revealed a cement filled casing, cut off 3' below the surface with a welded monument cap. The WDF Measure 1 Team took site photographs, performed field gas measurements and collected a gas sample for immediate laboratory analysis.

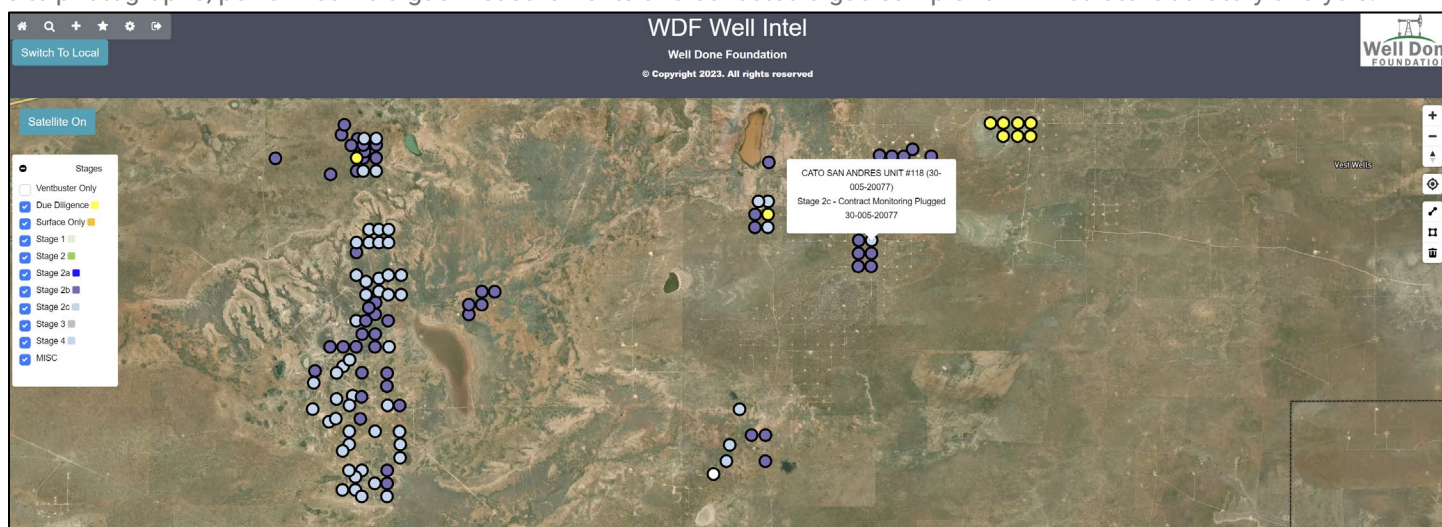


Image 1.1 – CSAU #118 (30-005-20077) Orphan Well in Chaves County, NM

The Pre-Plugging Methane Flow Calculations were conducted by the Well Done Foundation and Well Done New Mexico LLC and monitored using Ventbuster™ Instruments VB100-40 Series Ultra-Low Flow Meter with GPS on January 20, 2023. The Methane Concentration was measured at 3,350 ppm and Methane Flow was measured at 0.14 cfd. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **0.00 grams per hour (g/hour)**.¹

The State of New Mexico used the methane flow data collected by WDF to prioritize the CSAU #118 orphan well plugging under the IIJA Program and began mobilizing a contractor to location. Drake Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the CSAU #118 location on June 29, 2023, to perform post-plugging orphan well methane testing and sampling on behalf of the State of New Mexico. **WDF post plugging field gas tests revealed 0.00% of methane or H₂s gasses. The post plugging collected gas samples, analyzed by Laboratory Services, Inc. confirmed 0.00 ppm or methane gas and 0.00 ppm of H₂s gas. THEREFORE, the total Methane Gas Emissions Reduction is: 0.00 g/hour.**

¹ Methane Calculation: 717 grams CH₄ per cubic meter (717 x 0.00 m³/day = 0.00 g/day total /24 = 0.00 g/hour x 0.00335 (methane concentration) = **0.00 g/hour CH₄**). **Methane, gas** weighs 0.000717 gram per cubic centimeter or 0.717 kilogram per cubic meter, i.e. density of methane, gas is equal to 0.717 kg/m³; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In Imperial or US customary measurement system, the density is equal to 0.044 pound per cubic foot [lb/ft³].



Test Report

Start Date: Fri Jan 20 2023 20:23:02 GMT+0000 (Coordinated Universal Time)
 End Date: Sat Jan 21 2023 17:48:51 GMT+0000 (Coordinated Universal Time)
 Device: VB100-0040
 Well Licensee: 30-005-20077
 Well Name: Cato San Andres 118
 UWI: 30-005-20077
 Well License Number: 30-005-20077
 Surface Location: State of NM
 Bottom Hole Location: Unknown

Test Operator: Sean O. Jacobson
 Authorized By: State of NM
 Test Reason: IJA Pre Plugging
 Scope Of Work: 12 Hour
 AFE Number: 52100-00000073108
 GPS: 33.61436,-103.86118
 Notes: GTG
 Prepared By: Curtis Shuck

Flow / Pressure Test

Flow Duration

21 hrs 24 minutes
 Duration

Average Flowrate

0.1430
 cfd

Average Pressure

0.3724
 psig

Average Flow Temperature

42.5103
 °F

Average CH4 Mass

0.00 g/hr

Methane Calculation: 717 grams CH4 per cubic meter ($717 \text{ g/m}^3 \times 0.0040 \text{ m}^3/\text{day} = 2.87 \text{ g/day total} / 24 = 0.12 \text{ g/hour} \times 0.00335 \text{ (methane concentration)} = 0.00 \text{ g/hour CH4}$). **Methane, gas** weighs 0.000717 gram per cubic centimeter or 0.717 kilogram per cubic meter, i.e. density of methane, gas is equal to 0.717 kg/m³; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In imperial or US customary measurement system, the density is equal to 0.0448 pound per cubic foot [lb/ft³], or 0.0004144 ounce per cubic inch [oz/inch³].

Flow / Pressure / Temperature Timeseries

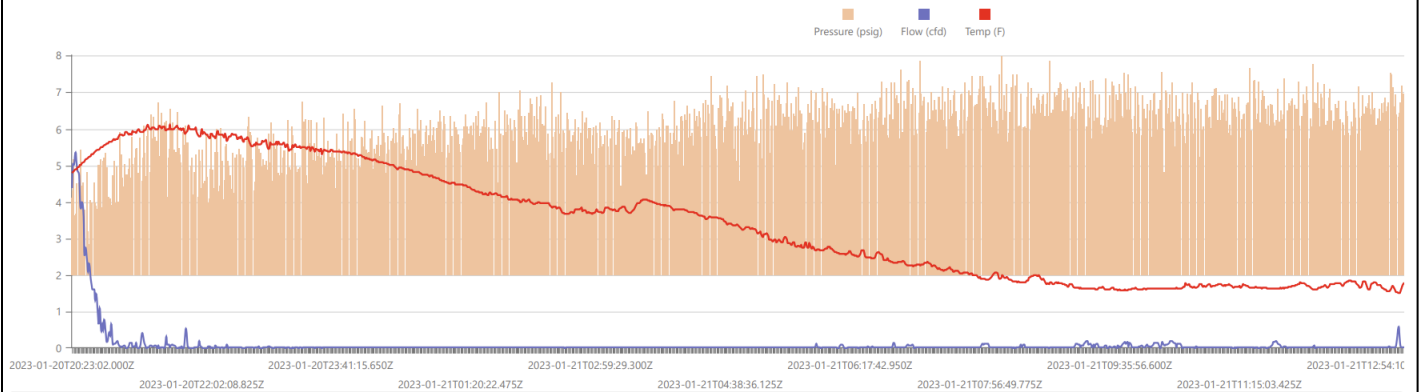


Image 2.1 – CSAU #118 Pre Plugging Test Report

This orphan well did not exceed 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.

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).

METHANE GAS EMISSIONS REDUCTION CSAU #118 (30-005-20077)

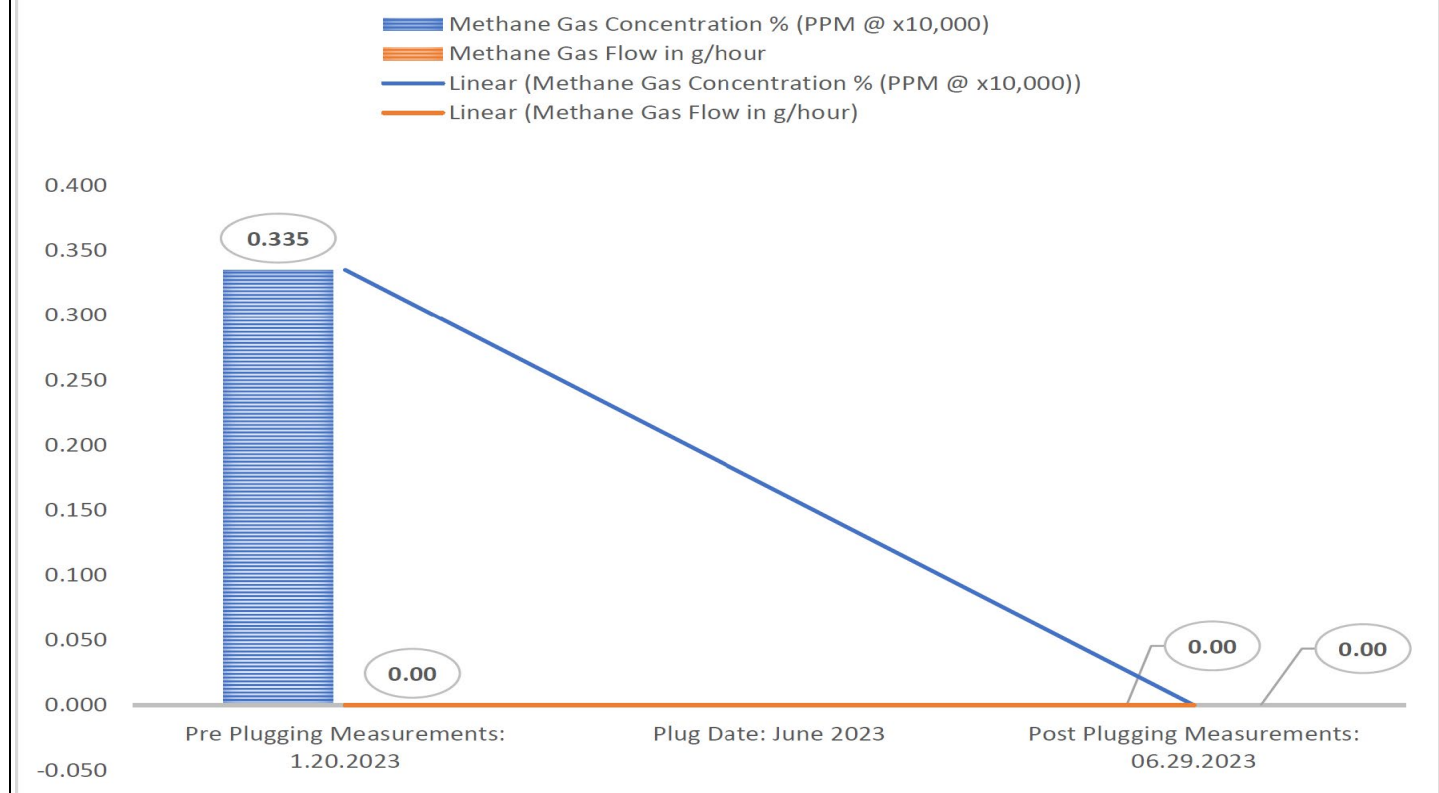


Image 3.1 – CSAU #118 (30-005-20077) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

TECHNICAL FINDINGS

CSAU #118 (30-005-20077):

- **Total C1 through C6 Gas Concentration: 15,862 ppm**
- **Total Measured Wellhead Gas Emissions: <0.00 m3/day**
- **Methane Gas Concentration: 3,350 ppm**
- **Calculated Average Wellhead Methane Gas Emissions: 0.00 g/hour**
- **Post Plugging Methane Gas Concentration: 0.00 ppm**
- **Post Plugging Methane Flow: 0.00 g/hour**

CONCLUSIONS

- The CSAU #118 (30-005-20077) was emitting Methane gas pre-plugging at the average rate of 0.00 g/hour, which was below 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.
- Post Plugging, the CSAU #118 (30-005-20077) presented 0.00 ppm of Methane gas emissions from field gas tests and laboratory analysis of WDF collected gas samples.

FIELD NOTES

#	Date	Note
1	2023-06-29	ces: On location with WDF Measure 1 to perform post plugging methane testing. We had a Thunderstorm that flooded the well location after the collection of the gas sample and before we could take photos. Non detect on any methane. Placed green ribbon at the wellsite. WILDCAT OUT!
2	2023-01-21	Arrived 10:52am January 21st, 2023. Rigged down ventbuster.
3	2023-01-20	Arrived January 20th, 2023. Conducted field gas analysis then collected gas sample. Decided to double rig. Rigged up ventbuster #40 (2") and ventbuster #24 (1") for flow testing.

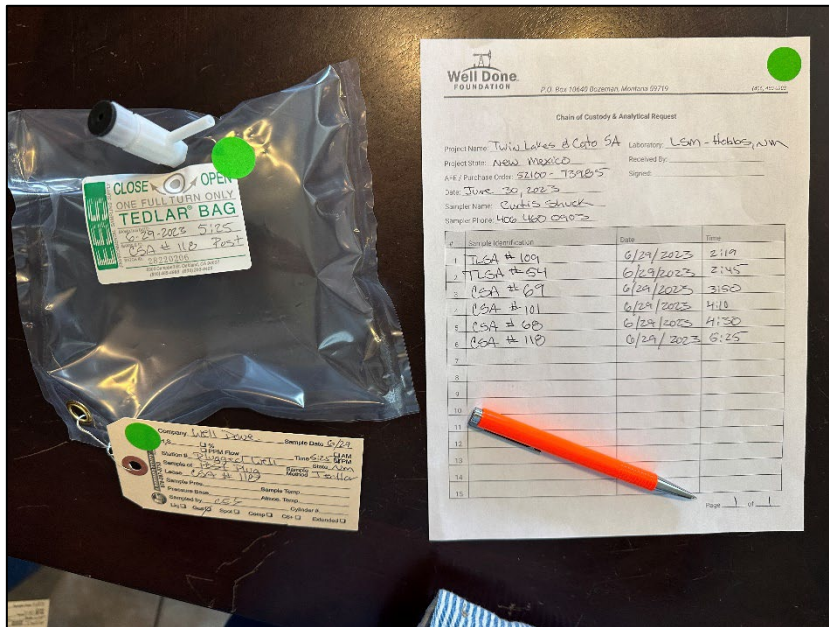
Image 4.1 – CSAU #118 (30-005-20077) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT



1) CSAU #118 - Sample



2) CSAU #118 - Ribbon



3) CSAU #118 - Sample Chain of Custody



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575.397.3713 2609 W Marland Hobbs NM 88240

C6+ Gas Analysis Report

17471G	CSA #118 Post Plug	CSA #118 Post Plug	
Sample Point Code	Sample Point Name	Sample Point Location	
Laboratory Services	2023071262	Tedlar Bag	CES - Spot
Source Laboratory	Lab File No	Container Identity	Sampler
USA	USA	USA	New Mexico
District	Area Name	Field Name	Facility Name
Jun 29, 2023 17:25	Jun 29, 2023 17:25	Jul 6, 2023 12:27	Jul 6, 2023
Date Sampled	Date Effective	Date Received	Date Reported
System Administrator			
Ambient Temp (°F)	Flow Rate (Mcf)	Analyst	Press PSI @ Temp °F Source Conditions
Well Done Foundation		NG	
Operator		Lab Source Description	

Component	Normalized Mol %	Un-Normalized Mol %	GPM
H2S (H2S)	0.0000	0	
Nitrogen (N2)	99.4570	99.457	
CO2 (CO2)	0.0370	0.037	
Methane (C1)	0.0000	0	
Ethane (C2)	0.0000	0	0.0000
Propane (C3)	0.0000	0	0.0000
I-Butane (IC4)	0.0000	0	0.0000
N-Butane (NC4)	0.0000	0	0.0000
I-Pentane (IC5)	0.0000	0	0.0000
N-Pentane (NC5)	0.0000	0	0.0000
Hexanes Plus (C6+)	0.5060	0.506	0.2200
TOTAL	100.0000	100.0000	0.2200

Method(s): Gas C6+ - GPA 2261, Extended Gas - GPA 2286, Calculations - GPA 2172

Analyzer Information	
Device Type:	Device Make:
Device Model:	Last Cal Date:

Gross Heating Values (Real, BTU/ft³)			
14.696 PSI @ 60.00 Å°F		14.73 PSI @ 60.00 Å°F	
Dry	Saturated	Dry	Saturated
26.1	26.5	26.2	26.6
Calculated Total Sample Properties			
GPA2145-16 *Calculated at Contract Conditions			
Relative Density Real		Relative Density Ideal	
0.9787		0.9788	
Molecular Weight			
28.3491			
C6+ Group Properties			
Assumed Composition			
C6 - 60.000%	C7 - 30.000%	C8 - 10.000%	
Field H2S			
0 PPM			

PROTREND STATUS:

Passed By Validator on Jul 11, 2023

DATA SOURCE:

Imported

PASSED BY VALIDATOR REASON:

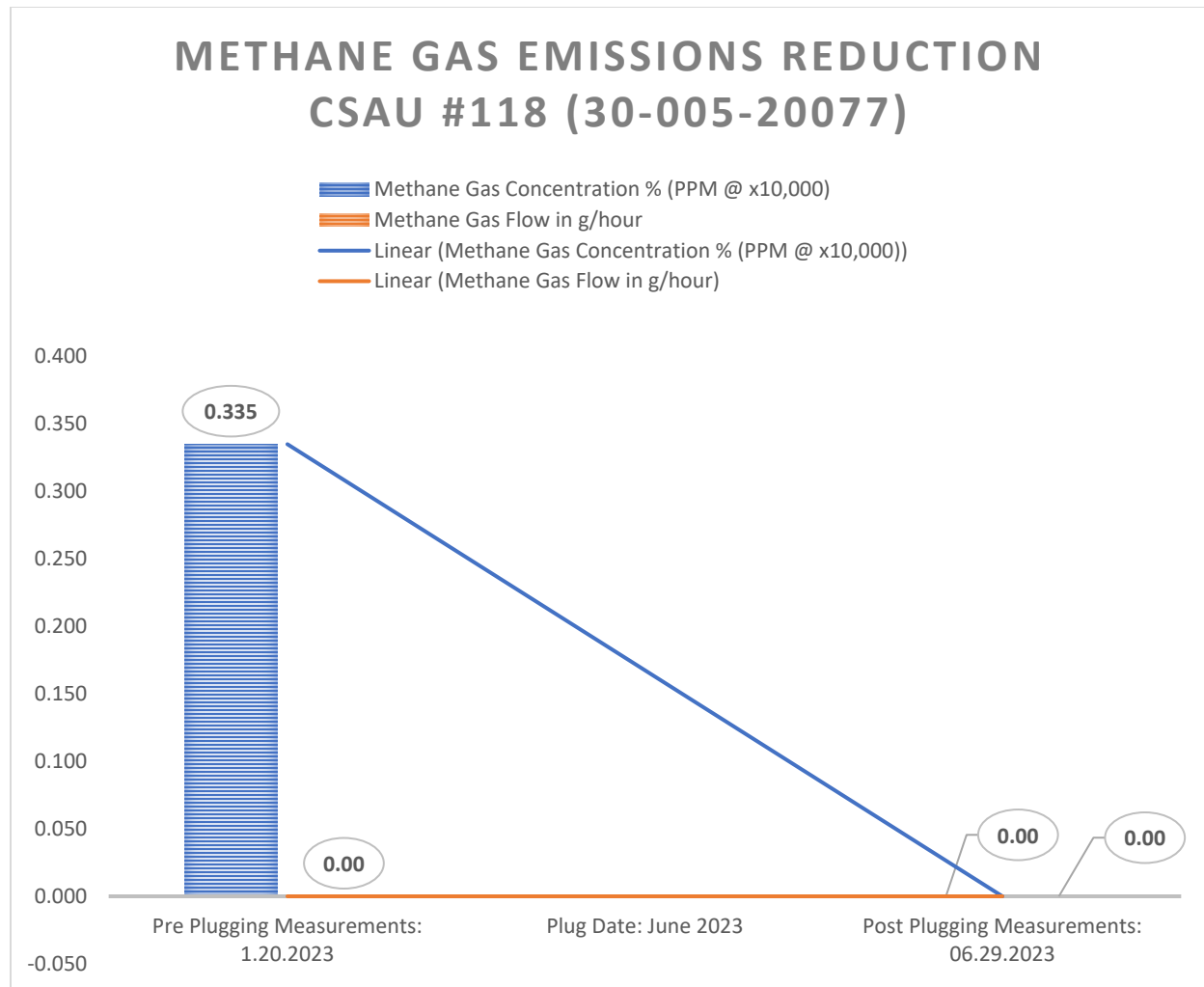
First sample taken @ this point, composition looks reasonable

VALIDATOR:

Rush

VALIDATOR COMMENTS:

OK



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

DEFINITIONS

Action 243520

DEFINITIONS

Operator: CANO PETRO OF NEW MEXICO, INC. 801 Cherry Street Fort Worth, TX 76102	OGRID: 248802
	Action Number: 243520
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

DEFINITIONS

The Orphan Well Mitigation Activity (OMA) forms are a subset of the OCD's forms exclusively designed for activities related to State of New Mexico's contracted plugging and reclamation activities. Specifically, these forms are used for orphan wells or associated facilities which are in a "Reclamation Fund Approved" status. This status represents wells or facilities where the OCD has acquired a hearing order allowing the OCD to perform plugging or reclamation on wells and associated facilities that no longer have a viable operator to perform the necessary work. These forms are not to be utilized for any other purpose.

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QUESTIONS

Action 243520

QUESTIONS

Operator: CANO PETRO OF NEW MEXICO, INC. 801 Cherry Street Fort Worth, TX 76102	OGRID: 248802
	Action Number: 243520
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

QUESTIONS

Prerequisites	
[OGRID] Well Operator	[248802] CANO PETRO OF NEW MEXICO, INC.
[API] Well Name and Number	[30-005-20077] CATO SAN ANDRES UNIT #118
Well Status	Plugged (not released)

Monitoring Event Information

Please answer all the questions in this group.

Reason For Filing	Post-Plug Methane Monitoring
Date of monitoring	06/29/2023
Latitude	33.6143723
Longitude	-103.8612595

Monitoring Event Details

Please answer all the questions in this group.

Flow rate in cubic meters per day (m³/day)	0.00
Test duration in hours (hr)	1.0
Average flow temperature in degrees Celsius (°C)	28.2
Average gauge flow pressure in kilopascals (kPag)	0.0
Methane concentration in part per million (ppm)	0
Methane emission rate in grams per hour (g/hr)	0.00
Testing Method	Other

Monitoring Contractor

Please answer all the questions in this group.

Name of monitoring contractor	Well Done New Mexico LLC
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