



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Jim Griswold, NMOCD  
 FROM: Curtis Shuck, Chairman  
 DATE: July 23, 2023  
 RE: Artesia Metex #042 (30-015-02138) 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 Artesia Metex #042 by the WDF Measure 1 Field Team on May 27, 2023, revealed a cement filled casing to within 24'-7" of the surface. The WDF Measure 1 Team took site photographs, performed field gas measurements and collected a gas sample for immediate laboratory analysis.

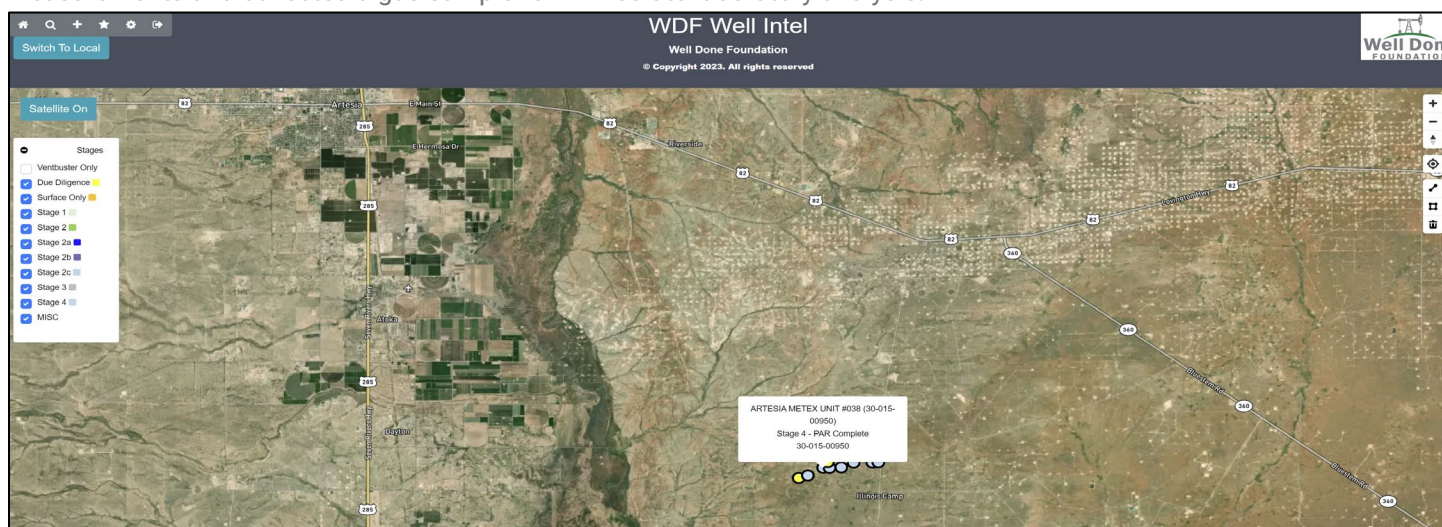


Image 1.1 – Artesia Metex #042 (30-015-02138) Orphan Well in Eddy County, NM

The Pre-Plugging Methane Flow Calculations were conducted by the Well Done Foundation and Well Done New Mexico LLC and monitored using Ventbuster™ Instruments VB100-16 Series Ultra-Low Flow Meter with GPS on February 27, 2023. The Methane Concentration was measured at 0.00 ppm and Methane Flow was measured at 0.00 cfd. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **0.00 grams per hour (g/hour)**.<sup>1</sup>

The State of New Mexico used the methane flow data collected by WDF to prioritize the Artesia Metex #042 orphan well plugging under the IJA Program and began mobilizing a contractor to location. A-Plus P&A Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the Artesia Metex #042 location on May 27, 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.**

<sup>1</sup> Methane Calculation: 717 grams CH<sub>4</sub> per cubic meter (717 x 1.22 m<sup>3</sup>/day = 874.74 g/day total /24 = 36.45 g/hour x 0.000000 (methane concentration) = **0.00 g/hour CH<sub>4</sub>**). **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/m<sup>3</sup>; 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/ft<sup>3</sup>].



### Test Report

<b>Start Date:</b> Mon Feb 27 2023 22:19:43 GMT+0000 (Coordinated Universal Time)	<b>Test Operator:</b> Sean O. Jacobson
<b>End Date:</b> Tue Feb 28 2023 17:07:45 GMT+0000 (Coordinated Universal Time)	<b>Authorized By:</b> State of NM
<b>Device:</b> VB100-0016	<b>Test Reason:</b> IJA Pre Plugging
<b>Well Licensee:</b> 30-015-02138	<b>Scope Of Work:</b> 12 Hour
<b>Well Name:</b> Artesia Metex 042	<b>AFE Number:</b> 52100-0000072986
<b>UWI:</b> 30-015-02138	<b>GPS:</b> 32.72094,-104.21571
<b>Well License Number:</b> 30-015-02138	<b>Notes:</b> GTG
<b>Surface Location:</b> State of NM	<b>Prepared By:</b> Curtis Shuck
<b>Bottom Hole Location:</b> Unknown	

### Flow / Pressure Test

<b>Flow Duration</b> 18 hrs 47 minutes <small>Duration</small>	<b>Average Flowrate</b> 43.0546 <small>cfid</small>	<b>Average Pressure</b> 0.2726 <small>psig</small>	<b>Average Flow Temperature</b> 56.9378 <small>*F</small>	<b>Average CH4 Mass</b> 0.00 g/hr
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**Methane Calculation:** 717 grams CH4 per cubic meter (717 g/m<sup>3</sup> x 1.2192 m<sup>3</sup>/day = 874.17 g/day total /24 = 36.42 g/hour x 0 (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/m<sup>3</sup>; 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/ft<sup>3</sup>], or 0.0004144 ounce per cubic inch [oz/inch<sup>3</sup>].

### Flow / Pressure / Temperature Timeseries

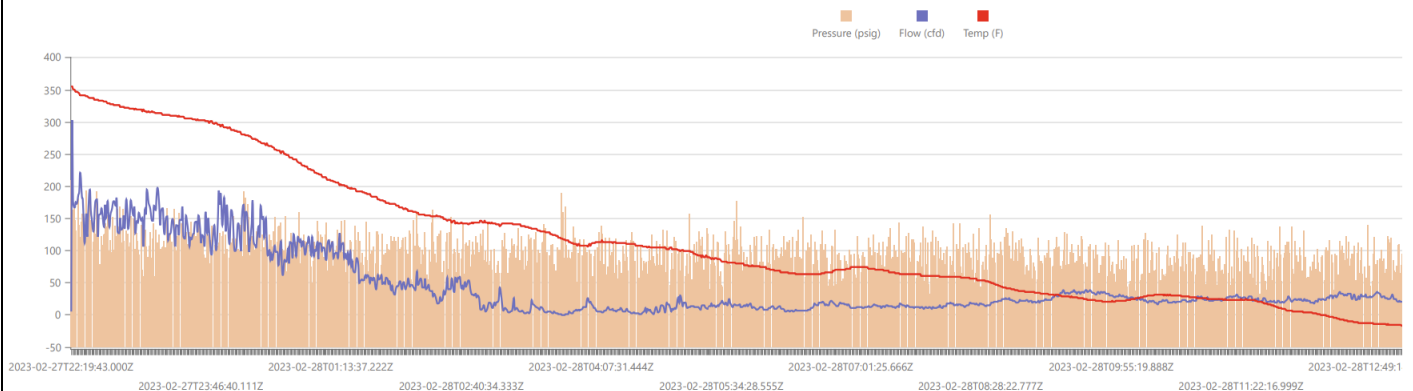


Image 2.1 – Artesia Metex #038 Pre Plugging Test Report

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)<sup>2</sup>.

<sup>2</sup> 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).

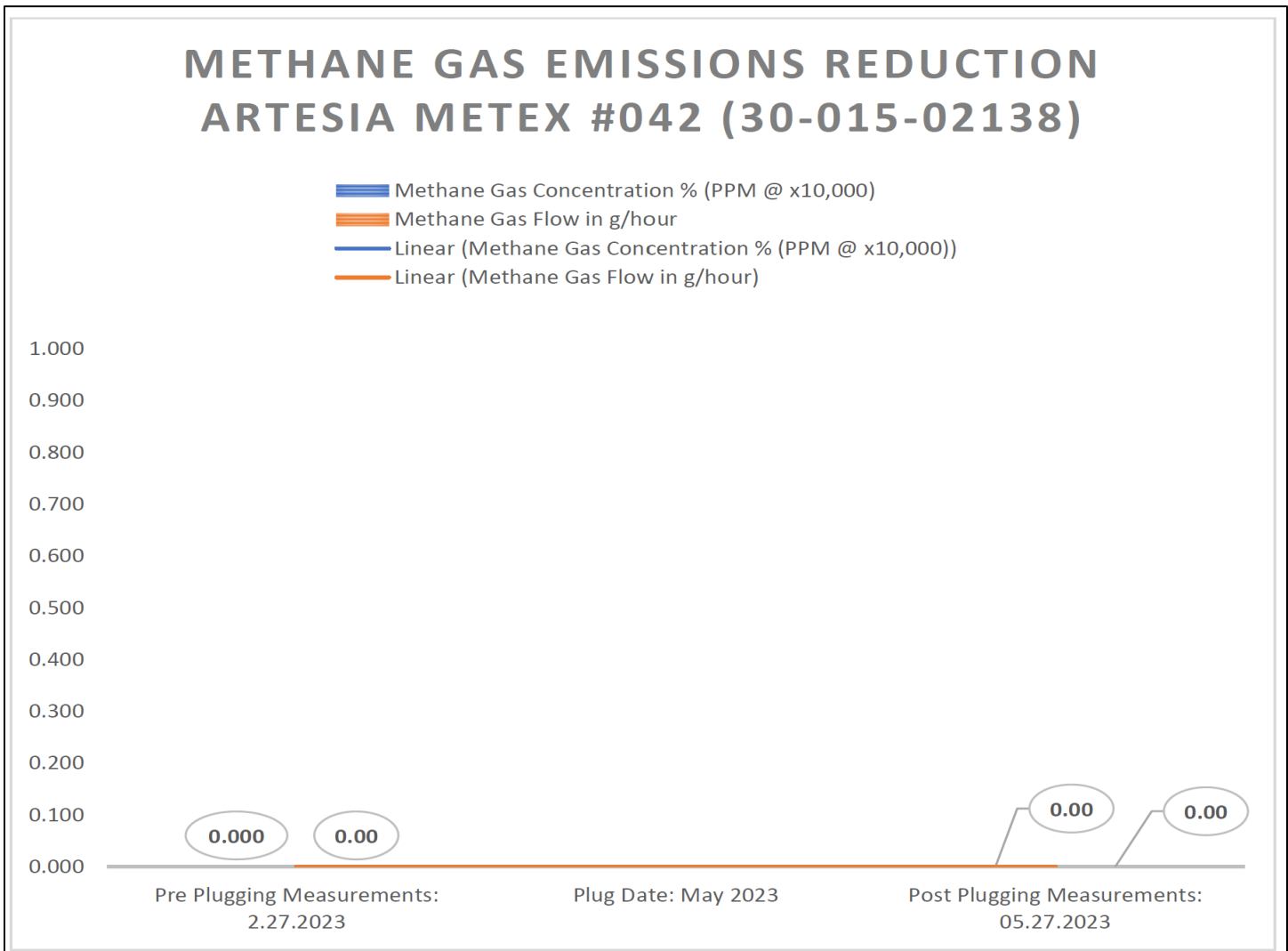


Image 3.1 – Artesia Metex #042 (30-015-02138) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

### TECHNICAL FINDINGS

Artesia Metex #042 (30-015-02138):

- Total C1 through C6 Gas Concentration: 4,289 ppm
- Total Measured Wellhead Gas Emissions: 0.00 m3/day
- Methane Gas Concentration: 0.00 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 Artesia Metex #04 (30-015-02138) 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 Artesia Metex #042 (30-015-02138) 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	2023-05-27	ces: WDF Measure 1 on location to collect post plugging gas samples. Cement is down more than 25' from surface. Collect sample for Lab Analysis. Place green ribbon at well casing.
2	2023-03-12	Arrived 11:31am 3/12/2023. Rigged down flow test and Toto. SP VB #54
3	2023-03-11	Arrived 12:35pm 3/11/2023. Rigged up flow test with toto. SP VB #54
4	2023-02-28	Arrived 10:20am 2/28/2023. Rigged down flow test.
5	2023-02-27	Arrived 2:38pm 2/27/2023. Rigged up Ventbuster #16 with Dorothy for flow testing.

Image 4.1 – Artesia Metex #042 (30-015-02138) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT

Appendix A – Site Photos for Artesia Metex #042 (30-015-02138)



1) Artesia Metex #042 – Cement



2) Artesia Metex #042 – Gas Sample



3) Artesia Metex #042 – Ribbon



www.permianls.com  
575.397.3713 2609 W Marland Hobbs NM 88240

C6+ Gas Analysis Report

<u>17152G</u>	<u>Artesia Metex #042 Post Plug</u>	<u>Artesia Metex #042 Post Plug</u>	
Sample Point Code	Sample Point Name	Sample Point Location	
<u>Laboratory Services</u>	<u>2023069829</u>	<u>bag</u>	<u>CES - Spot</u>
Source Laboratory	Lab File No	Container Identity	Sampler
<u>USA</u>	<u>USA</u>	<u>USA</u>	<u>New Mexico</u>
District	Area Name	Field Name	Facility Name
<u>May 27, 2023 14:45</u>	<u>May 27, 2023 14:45</u>	<u>Jun 6, 2023 08:52</u>	<u>Jun 6, 2023</u>
Date Sampled	Date Effective	Date Received	Date Reported
<u>Torrance</u>			
<u>Ambient Temp (°F)</u>	<u>Flow Rate (Mcf)</u>	<u>Analyst</u>	<u>Press PSI @ Temp °F</u>
			Source Conditions
<u>Well Done Foundation</u>		<u>ng</u>	
Operator		Lab Source Description	

Component	Normalized Mol %	Un-Normalized Mol %	GPM
H2S (H2S)	0.0000	0	
Nitrogen (N2)	97.7570	97.7567	
CO2 (CO2)	0.0360	0.03609	
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)	0.0230	0.02304	0.0080
Hexanes Plus (C6+)	2.1840	2.18417	0.9470
<b>TOTAL</b>	<b>100.0000</b>	<b>100.0000</b>	<b>0.9550</b>

Gross Heating Values (Real, BTU/ft <sup>3</sup> )			
14.696 PSI @ 60.00 Å°F		14.73 PSI @ 60.00 Å°F	
Dry	Saturated	Dry	Saturated
113.3	112.3	113.6	112.6

Calculated Total Sample Properties	
GPA2145-16 *Calculated at Contract Conditions	
Relative Density Real	Relative Density Ideal
1.0171	1.0169
Molecular Weight	
29.4527	

C6+ Group Properties		
Assumed Composition		
C6 - 60.000%	C7 - 30.000%	C8 - 10.000%

Field H2S 0 PPM
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**PROTREND STATUS:** Passed By Validator on Jun 9, 2023  
**DATA SOURCE:** Imported

**PASSED BY VALIDATOR REASON:** First sample taken @ this point, composition looks reasonable

**VALIDATOR:**  
. Rush

**VALIDATOR COMMENTS:**  
OK

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

Analyzer Information			
Device Type:	Gas Chromatograph	Device Make:	Shimadzu
Device Model:	GC-2014	Last Cal Date:	Jun 5, 2023

Source	Date	Notes
Luis Cano	Jun 7, 2023 3:08 pm	Methane: 0 PPM
. Rush	Jun 9, 2023 2:38 pm	Methane = 0 PPM

**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 243687

**DEFINITIONS**

Operator: CANYON E & P COMPANY 251 O'Connor Ridge Blvd. Irving, TX 75038	OGRID: 269864
	Action Number: 243687
	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 243687

**QUESTIONS**

Operator: CANYON E & P COMPANY 251 O'Connor Ridge Blvd. Irving, TX 75038	OGRID: 269864
	Action Number: 243687
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

**QUESTIONS**

<b>Prerequisites</b>	
[OGRID] Well Operator	[269864] CANYON E & P COMPANY
[API] Well Name and Number	[30-015-02138] ARTESIA METEX UNIT #042
Well Status	Plugged (not released)

<b>Monitoring Event Information</b>	
<i>Please answer all the questions in this group.</i>	
Reason For Filing	Post-Plug Methane Monitoring
Date of monitoring	05/27/2023
Latitude	32.7209854
Longitude	-104.2159729

<b>Monitoring Event Details</b>	
<i>Please answer all the questions in this group.</i>	
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)	28.8
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

<b>Monitoring Contractor</b>	
<i>Please answer all the questions in this group.</i>	
Name of monitoring contractor	Well Done New Mexico LLC