

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

HOBBS OCD

APR 30 2015

RECEIVED

Form C-104
Revised August 1, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address BTA Oil Producers LLC 104 S. Pecos Midland, TX 79701		² OGRID Number 260297
		³ Reason for Filing Code/ Effective Date NW 09/01/2014
⁴ API Number 30 - 025-41624	⁵ Pool Name Red Hills; Bone Spring, Upper Shale	⁶ Pool Code 97900
⁷ Property Code 305274	⁸ Property Name 9418 JV-P Vaca Draw	⁹ Well Number 3H 5H

II. ¹⁰ Surface Location

UI or lot no. D	Section 10	Township 25S	Range 33E	Lot Idn	Feet from the 190	North/South Line North	Feet from the 330	East/West line West	County Lea
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¹¹ Bottom Hole Location

UI or lot no. M	Section 10	Township 25S	Range 33E	Lot Idn	Feet from the 357	North/South Line South	Feet from the 428	East/West line West	County Lea
¹² Lse Code F	¹³ Producing Method Code F	¹⁴ Gas Connection Date 07/28/2015	¹⁵ C-129 Permit Number	¹⁶ C-129 Effective Date	¹⁷ C-129 Expiration Date				

III. Oil and Gas Transporters

¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
034053	Plains Marketing, LP PO Box 4648 Houston, TX 77210-4648	O
248440	Western Refining Company, LP 6500 Trowbridge Drive El Paso, TX 79905	O
298751	Regency Field Services LLC 2001 Bryan Street, Suite 3700 Dallas, TX 75201	G

IV. Well Completion Data

²¹ Spud Date 2/17/15	²² Ready Date 4/16/15	²³ TD 13911' MD 9424' TVD	²⁴ PBDT 13890' MD 9424' TVD	²⁵ Perforations 9750-13860'	²⁶ DHC, MC
²⁷ Hole Size	²⁸ Casing & Tubing Size	²⁹ Depth Set	³⁰ Sacks Cement		
17 1/2"	13 3/8"	1190'	950 sx - circ to surf		
12 1/4"	9 5/8"	5075'	1550 sx - circ to surf		
8 3/4"	5 1/2"	13910'	2200 sx - 820'		
	2 7/8"	8881'			

V. Well Test Data

³¹ Date New Oil 4/18/15	³² Gas Delivery Date TBD	³³ Test Date 4/27/15	³⁴ Test Length 24 Hrs	³⁵ Tbg. Pressure 1225	³⁶ Csg. Pressure ---
³⁷ Choke Size 34/64	³⁸ Oil 811	³⁹ Water 1837	⁴⁰ Gas 1395		⁴¹ Test Method Flowing

⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Signature: Pam Inskeep

Printed name:
Pam Inskeep

Title:
Regulatory Administrator

E-mail Address:
pinskeep@btaoil.com

Date:
04/30/2015

Phone:
432-682-3753

OIL CONSERVATION DIVISION

Approved by:

Title: Petroleum Engineer

Approval Date:

05/14/15

E-PERMITTING—NEW WELL _____ RECOMP _____
P&A NR _____ P&A R _____ CANCEL WELL _____
INT P&A _____ COMP _____ CSNG _____
CREATE POOL _____ CHG LOC _____ TA _____
ADD NEW WELL _____ RBDMS _____

MAY 14 2015

HOBBS OGD
MAY 13 2015
RECEIVEDUNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

FORM APPROVED

OMB NO. 1004-0137

Expires: July 31, 2010

5. LEASE DESIGNATION AND SERIAL NO.

NMNM97153

1a. Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other
b. Type of Completion ☒ New Well ☐ Workover ☐ Deepen ☐ Plug Back ☐ Diff. Resvr.

Other

2. Name of Operator

BTA Oil Producers LLC

3. Address

104 S. Pecos
Midland, TX 79701

3a. Phone No. (include area code)

432-682-3753

6. INDIAN ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT

8. FARM OR LEASE NAME

9418 JV-P Vaca Draw #5H

9. API WELL NO.

30-025-41624

4. Location of Well (Report location clearly and in accordance with Federal requirements)*

At surface 190' FNL & 330' FWL, Unit D (NWNW) Sec 10-T25S-R33E

At top prod. Interval reported below

At total depth 357' FSL & 428' FWL, Unit M (SWSW) Sec 10-T25S-R33E

10. FIELD NAME

Red Hills; Bone Spring, Upper Shale

11. SEC. T. R. M. OR BLOCK AND SURVEY
OR AREA 10 T 25S R 33E

12. COUNTY OR PARISH

Lea

13. STATE

NM

14. Date Spudded

2/17/15

15. Date T.D. Reached

3/6/15

16. Date Completed

4/16/15

☐ D & A☒ Ready to Prod.

17. ELEVATIONS (DF, RKB, RT, GR, etc.)*

3419'

GR

3441'

KB

18. Total Depth:

MD

13911'

TVD

9424'

19. Plug back T.D.:

MD

13890'

TVD

9424'

20. Depth Bridge Plug Set:

MD

13890'

TVD

9424'

21. Type Electric & other Logs Run (Submit a copy of each)

None

22. Was well cored?

☒ No☐ Yes (Submit analysis)

Was DST run?

☒ No☐ Yes (Submit report)

Directional Survey?

☐ No☒ Yes (Submit copy)

23. Casing and Liner Record (Report all strings set in well)

Hole Size	Size/ Grade	Wt. (#/ft.)	Top (MD)	Bottom(MD)	Stage Cementer Depth	No. of Sk. & Type of Cement	Slurry Vol. (Bbl)	Cement Top*	Amount Pulled
17 1/2"	13 3/8" J55	54.5#	0	1190'	None	950		0	None
12 1/4"	9 5/8" J55	40#	0	5075'	None	1550		0	None
8 3/4"	5 1/2" P110	17#	0	13910'	None	2200		820'	None

24. Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)
2 7/8"	8881'	8872'						

25. Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No. of Holes	Perf. Status
A) Bone Spring	9570'	13860'	9570-13860'	0.43	1008	Open
B)						
C)						
D)						

26. Perforation Record

27. Acid/Fracture Treatment, Cement Squeeze, Etc.

Depth Interval	Amount and Type of Material
See Attached	See Attached

28. Production- Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr. API	Gas Gravity	Production Method
4/18/15	4/27/15	24	→	811	1395	1837			Flowing
Choke Size	Tbg. Press Flwg. SI	Csg. Press.	24 Hr. Rate	Oil Bbl	Gas MCF	Water Bbl	Gas: Oil Ratio	Well Status	
34/64"	SI 1225#		→	811	1395	1837		Producing	

28a. Production- Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press Flwg. SI	Csg. Press.	24 Hr. Rate	Oil Bbl	Gas MCF	Water Bbl	Gas: Oil Ratio	Well Status	
			→						

Accepted for Record Only

Additional data for EC transaction #299984 that would not fit on the form

32. Additional remarks, continued

surf.

3/8/15 Rig released.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

HOBBS OCD
MAY 13 2015
RECEIVED

965
DO NOT use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

965
SUBMIT IN TRIPLICATE - Other Instructions on page 2.

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMNM97153
2. Name of Operator BTA Oil Producers LLC		6. If Indian, Allottee, or Tribe Name ---
3a. Address 104 S. Pecos Midland, TX 79701	3b. Phone No. (include area code) 432-682-3753	7. If Unit or CA. Agreement Name and/or No. ---
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 190' FNL & 330' FWL, Unit D (NWNW) Sec 10-T25S-R33E		8. Well Name and No. 9418 JV-P Vaca Draw #5H
Lat. Long.		9. API Well No. 30-025-41624
10. Field and Pool, or Exploratory Area Red Hills; Bone Spring, Upper Shale		11. County or Parish, State Lea NM

12. CHECK APPROPRIATE BOX(S) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-off
☒ Subsequent Report	☐ Altering Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug back	☒ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths or pertinent markers and sands. Attach the Bond under which the work will performed or provide the Bond No. on file with the BLM/ BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notice shall be filed only after all requirements, including reclamantion, have been completed, and the operator has determined that the site is ready for final inspection.)

Required Information for the Disposal of Produced Water:

- 1) Name of formation producing water on lease: Bone Spring
- 2) Amount of water produced in barrels per day: 2000 BWPD
- 3) How water is stored on lease: 2 - 500 bbl fiberglass tanks
- 4) How water is moved to disposal facility: Trucked
- 5) Disposal Facility:
 - a) Facility Operator Name: Mesquite SWD, Inc.
 - b) Name of facility or well name & number: Paduca SWD #1 (SWD-1264)
 - c) Type of facility or well: WDW
 - d) Location by 1/4, 1/4, Section, Township & Range: SENE, 22-T25S-R32E

14. I hereby certify that the foregoing is true and correct.

Name (Printed/ Typed)

Pam Inskeep, Regulatory Administrator

Title:

Regulatory Administrator

Signature:

Pam Inskeep

Date:

5/1/15

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by:

Title:

Date:

Conditions of approval, if any are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office:

Title 18 U.S.C. Section 1001 AND Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

Accepted for Record Only
Accepted for Record Only
Accepted for Record Only

HOBBS OGD
MAY 13 2015
RECEIVEDUNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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FORM APPROVED

OMB NO. 1004-0137

Expires: July 31, 2010

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Other

2. Name of Operator

BTA Oil Producers LLC

3. Address

104 S. Pecos
Midland, TX 79701

3a. Phone No. (include area code)

432-682-3753

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9418 JV-P Vaca Draw #5H

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OR AREA 10 T 25S R 33E

12. COUNTY OR PARISH

Lea

13. STATE

NM

14. Date Spudded

2/17/15

15. Date T.D. Reached

3/6/15

16. Date Completed

4/16/15

☐ D & A☒ Ready to Prod.

17. ELEVATIONS (DF, RKB, RT, GR, etc.)*

3419'

GR

3441'

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18. Total Depth:

MD

13911'

TVD

9424'

19. Plug back T.D.:

MD

13890'

TVD

9424'

20. Depth Bridge Plug Set:

MD

13890'

TVD

9424'

21. Type Electric & other Logs Run (Submit a copy of each)

None

22. Was well cored?

☒ No☐ Yes (Submit analysis)

Was DST run?

☒ No☐ Yes (Submit report)

Directional Survey?

☐ No☒ Yes (Submit copy)

23. Casing and Liner Record (Report all strings set in well)

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24. Tubing Record

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25. Producing Intervals

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B)						
C)						
D)						

26. Perforation Record

27. Acid, Fracture Treatment, Cement Squeeze, Etc.

Depth Interval	Amount and Type of Material
See Attached	See Attached

28. Production- Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr. API	Gas Gravity	Production Method
4/18/15	4/27/15	24	→	811	1395	1837			Flowing
Choke Size	Tbg. Press Flwg. SI	Csg. Press.	24 Hr. Rate	Oil Bbl	Gas MCF	Water Bbl	Gas: Oil Ratio	Well Status	
34/64"	1225#		→	811	1395	1837		Producing	

28a. Production- Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press Flwg. SI	Csg. Press.	24 Hr. Rate	Oil Bbl	Gas MCF	Water Bbl	Gas: Oil Ratio	Well Status	
			→						

Accepted for Record Only

28b. Production- Interval C

Date First Produced	Test Date	Hours Tested	Test Production →	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press Flwe. SI	Csg. Press.	24 Hr. Rate →	Oil Bbl	Gas MCF	Water Bbl	Gas: Oil Ratio	Well Status	

28c. Production- Interval D

Date First Produced	Test Date	Hours Tested	Test Production →	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press Flwe. SI	Csg. Press.	24 Hr. Rate →	Oil Bbl	Gas MCF	Water Bbl	Gas: Oil Ratio	Well Status	

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

Flared

30. Summary of Porous Zones (include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries

Formation	Top	Bottom	Descriptions Contents, Etc.	Name	Top
					Measured Depth
Lamar	5074'	5112'		Rustler	1111'
Bell Canyon	5113'	6143'		Top of Salt	1477'
Cherry Canyon	6144'	7625'		Base of Salt	4830'
Brushy Canyon	7626'	9239'		Lamar	5074'
Bone Spring Lm	9240'	9449'		Bell Canyon	5113'
				Cherry Canyon	6144'
				Brushy Canyon	7626'
				Bone Spring Lm	9240'
					TVD. 9449'

32. Additional remarks (include plugging procedure):

33. Indicate which items have been attached by placing a check in the appropriate boxes:

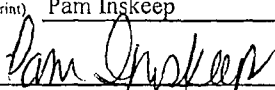
- ☐ Electrical/ Mechanical Logs (1 full set required)
 ☐ Geologic Report
 ☐ DST Report
 ☒ Directional Surveys
- ☐ Sundry Notice for plugging and cement verification
 ☐ Core Analysis
 ☒ Other: Stimulation Data

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

Name (please print) Pam Inskeep

Title Regulatory Administrator

Signature



Date 5/1/15

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 3)

(Form 3160-4, page 2)

9418 JV-P VACA DRAW #5H

30-025-41624

Sec 10-T25S-R33E

HOODS OCD
MAY 13 2015
RECEIVED

<u>Perfs</u>	<u>7 1/2% Acid (Gal)</u>	<u>Sand (#)</u>	<u>Fluid (Gal)</u>
13757-13860	1512	246030	236670
13602-13705	4284	246299	279300
13447-13550	3000	246541	258948
13297-13395	3000	246941	253320
13136-13240	3012	246701	251820
12981-13087	3024	243981	249270
12823-12930	3000	246010	250147
12675-12775	3000	246861	255523
12516-12620	3024	246845	266364
12361-12461	3000	245153	248658
12206-12309	3000	245927	246138
12051-12154	3000	247278	249666
11896-11999	3000	239515	243324
11740-11844	3000	246210	256218
11586-11685	3012	245983	244806
11436-11534	3012	246223	251316
11276-11379	3012	245313	243546
11125-11224	3000	244037	244626
10966-11069	3000	246100	250002
10810-10914	3000	246258	246115
10655-10755	3024	247291	245406
10500-10604	3012	248012	242286
10345-10449	3000	247236	249162
10190-10294	3000	248658	245676
10034-10139	3000	246827	245130
9880-9983	3000	246142	246726
9727-9828	3024	246019	240534
9570-9671	3024	252490	244230
Totals	83969	6896881	6984923

Customer Chemical Component Disclosure Report for: Water Management									
Report Date	3/30/2015	4/2/2015							
Report Name	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
API Number	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
LEA	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
Lat/Long	3/30/2015	4/2/2015							
Latitude	3/30/2015	4/2/2015							
Longitude	3/30/2015	4/2/2015							
City	3/30/2015	4/2/2015							
State	3/30/2015	4/2/2015							
ZIP	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
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Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
Lat/Long	3/30/2015	4/2/2015							
Latitude	3/30/2015	4/2/2015							
Longitude	3/30/2015	4/2/2015							
City	3/30/2015	4/2/2015							
State	3/30/2015	4/2/2015							
ZIP	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
Lat/Long	3/30/2015	4/2/2015							
Latitude	3/30/2015	4/2/2015							
Longitude	3/30/2015	4/2/2015							
City	3/30/2015	4/2/2015							
State	3/30/2015	4/2/2015							
ZIP	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
Lat/Long	3/30/2015	4/2/2015							
Latitude	3/30/2015	4/2/2015							
Longitude	3/30/2015	4/2/2015							
City	3/30/2015	4/2/2015							
State	3/30/2015	4/2/2015							
ZIP	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
Lat/Long	3/30/2015	4/2/2015							
Latitude	3/30/2015	4/2/2015							
Longitude	3/30/2015	4/2/2015							
City	3/30/2015	4/2/2015							
State	3/30/2015	4/2/2015							
ZIP	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2/2015							
VCA DRAW #	3/30/2015	4/2/2015							
Lat/Long	3/30/2015	4/2/2015							
Latitude	3/30/2015	4/2/2015							
Longitude	3/30/2015	4/2/2015							
City	3/30/2015	4/2/2015							
State	3/30/2015	4/2/2015							
ZIP	3/30/2015	4/2/2015							
Country	3/30/2015	4/2/2015							
Operator Name	3/30/2015	4/2							

30-025-41624

OPERATOR COG Operating

HOBBS OCD

WELL/LEASE 9418 JV-P Vaca Draw 5-H

APR 30 2015

COUNTY Lea Co., NM.

STATE OF NEW MEXICO
DEVIATION REPORT

RECEIVED

178	0.61
490	0.62
858	0.76
950	0.93
1264	0.40
1539	0.50
1823	0.80
2106	1.00
2390	1.20
2675	1.90
2925	0.80
3242	0.80
3810	1.10
4077	1.30
4660	0.80
5310	1.60
5595	0.02
5878	0.40
6130	0.40
6606	0.50
7296	0.10
7580	1.00
7840	0.80
8284	0.70
8670	1.00
8800	0.90
8813	1.50
8845	1.50
8876	3.80
8908	7.80

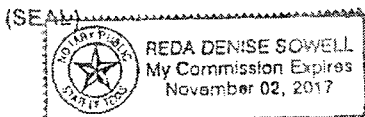
SIGNED BY: Ron Scandolari

RON SCANDOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS

COUNTY OF MIDLAND

ON THIS 17 DAY OF March, 2015, BEFORE ME, R SOWELL, A NOTARY PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.



Reda Denise Sowell
NOTARY PUBLIC

hm



March 5, 2015

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Vaca Draw 9418 JV-P No 005H**

Please find enclosed a copy of the survey from 0.00' to 8760.00' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

A handwritten signature in cursive script that reads "Kim Moller".

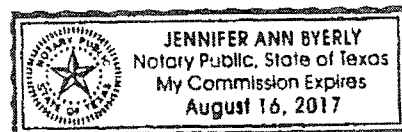
Kimberly D Moller
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 5 day of March, A.D., 2015, by Kimberly D Moller.

A handwritten signature in cursive script that reads "Jennifer Ann Byerly".

Jennifer Ann Byerly
Notary Public, State of Texas



Company: COG Operating LLC

Lease/Well: Vaca Draw 9418 JV-P/5H



Rig Name: Basic 46

State/County: New Mexico /Lea

Latitude: 32.15, Longitude: -103.57

GRID North is 0.41 Degrees East of True North

VS-Azi: 178.91 Degrees



Depth Reference : 22 FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: survey.ut

Minimum Curvature Method

Report Date/Time: 3/5/2015 / 07:56

VES Survey International

(432) 563-5444

West Texas

Surveyor: Javier Estrada

Vaca Draw 9418 JV-P 5H / API 30-025-41624

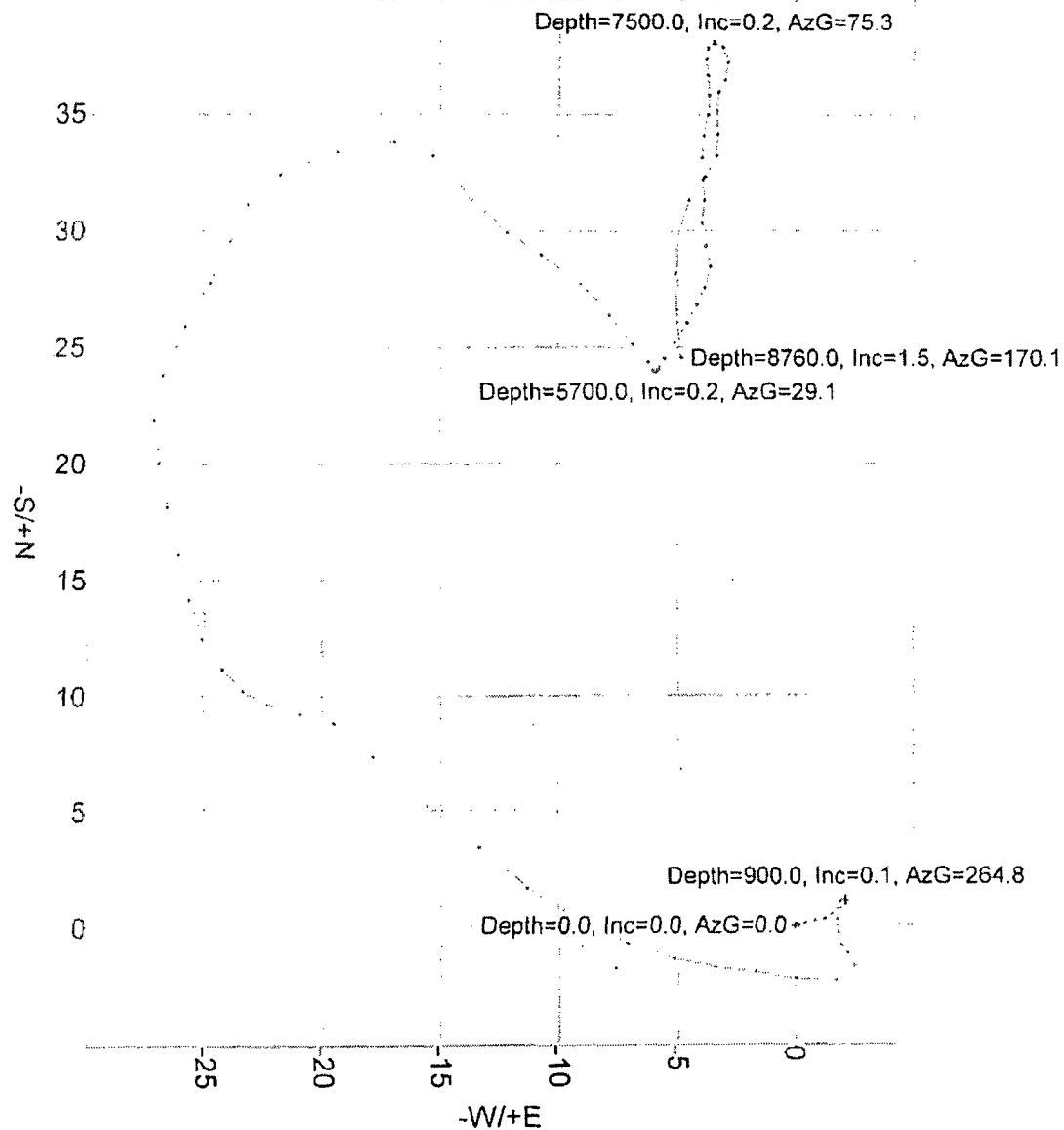
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----
100.00	0.14	97.20	100.00	-0.02	0.12	0.02	0.12	97.20	0.14
200.00	0.25	59.96	200.00	0.08	0.43	-0.07	0.44	80.05	0.16
300.00	0.23	90.34	300.00	0.18	0.82	-0.17	0.84	77.49	0.13
400.00	0.25	72.25	400.00	0.25	1.23	-0.22	1.25	78.63	0.08
500.00	0.23	36.51	500.00	0.48	1.56	-0.45	1.63	72.96	0.15
600.00	0.28	62.28	600.00	0.75	1.89	-0.72	2.04	68.28	0.12
700.00	0.09	16.38	700.00	0.95	2.13	-0.91	2.33	66.07	0.22
800.00	0.08	11.22	800.00	1.09	2.17	-1.05	2.43	63.26	0.02
900.00	0.11	264.82	900.00	1.15	2.09	-1.11	2.39	61.14	0.15
1000.00	0.15	222.88	999.99	1.05	1.91	-1.01	2.17	61.24	0.10
1100.00	0.26	191.77	1099.99	0.73	1.77	-0.69	1.91	67.70	0.15
1200.00	0.30	169.54	1199.99	0.24	1.77	-0.21	1.79	82.20	0.12
1300.00	0.32	175.46	1299.99	-0.30	1.84	0.33	1.87	99.17	0.04
1400.00	0.31	156.37	1399.99	-0.83	1.97	0.86	2.14	112.71	0.11
1500.00	0.18	122.67	1499.99	-1.16	2.21	1.20	2.50	117.63	0.19
1600.00	0.53	164.15	1599.99	-1.69	2.47	1.74	3.00	124.33	0.41
1700.00	1.02	261.23	1699.98	-2.27	1.72	2.30	2.85	142.89	1.21
1800.00	0.98	282.88	1799.97	-2.22	0.00	2.22	2.22	179.89	0.38

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.97	275.45	1899.96	-1.95	-1.67	1.91	2.57	220.68	0.13
2000.00	0.99	277.71	1999.94	-1.75	-3.37	1.88	3.80	242.58	0.04
2100.00	1.09	283.85	2099.92	-1.41	-5.15	1.31	5.34	254.75	0.15
2200.00	1.23	293.89	2199.90	-0.74	-7.06	0.61	7.10	264.01	0.25
2300.00	1.39	295.60	2299.87	0.22	-9.14	-0.39	9.14	271.36	0.16
2400.00	1.57	309.71	2399.84	1.61	-11.28	-1.83	11.40	278.14	0.40
2500.00	1.56	312.34	2499.80	3.40	-13.34	-3.65	13.76	284.31	0.07
2600.00	1.73	305.55	2599.76	5.19	-15.57	-5.49	16.41	288.45	0.26
2700.00	1.87	320.45	2699.71	7.32	-17.83	-7.66	19.27	292.33	0.49
2800.00	0.79	287.15	2799.69	8.78	-19.53	-9.15	21.41	294.22	1.28
2900.00	0.92	285.77	2899.68	9.21	-20.96	-9.60	22.90	293.71	0.13
3000.00	0.72	290.59	2999.67	9.65	-22.33	-10.07	24.32	293.37	0.21
3100.00	0.65	307.31	3099.66	10.22	-23.37	-10.66	25.51	293.61	0.21
3200.00	0.84	323.66	3199.65	11.15	-24.26	-11.61	26.70	294.69	0.28
3300.00	0.93	333.67	3299.64	12.47	-25.06	-12.95	27.99	296.46	0.18
3400.00	1.11	347.78	3399.62	14.15	-25.62	-14.63	29.27	298.90	0.31
3500.00	1.23	345.55	3499.60	16.13	-26.09	-16.62	30.68	301.72	0.12
3600.00	1.12	351.24	3599.58	18.13	-26.51	-18.63	32.12	304.37	0.16
3700.00	1.09	349.32	3699.56	20.03	-26.83	-20.54	33.49	306.75	0.05
3800.00	1.04	356.92	3799.54	21.87	-27.06	-22.38	34.79	308.95	0.15
3900.00	1.30	22.83	3899.52	23.82	-26.67	-24.33	35.76	311.77	0.58
4000.00	1.27	25.74	3999.50	25.87	-25.75	-26.35	36.50	315.13	0.07
4100.00	1.22	31.11	4099.48	27.78	-24.71	-28.24	37.18	318.34	0.13
4200.00	1.08	19.73	4199.46	29.57	-23.85	-30.02	37.99	321.12	0.27
4300.00	0.91	30.37	4299.44	31.14	-23.13	-31.58	38.79	323.40	0.25
4400.00	1.30	58.21	4399.42	32.42	-21.77	-32.83	39.05	326.13	0.65
4500.00	1.71	76.69	4499.39	33.36	-19.36	-33.72	38.57	329.88	0.63
4600.00	1.10	82.55	4599.36	33.83	-16.95	-34.15	37.84	333.38	0.62
4700.00	1.16	136.22	4699.34	33.23	-15.31	-33.52	36.59	335.27	1.02
4800.00	1.67	140.12	4799.31	31.38	-13.67	-31.64	34.23	336.46	0.53
4900.00	0.76	121.57	4899.29	29.92	-12.17	-30.14	32.30	337.86	0.99
5000.00	1.25	123.76	4999.27	28.97	-10.70	-29.16	30.88	339.72	0.49
5100.00	1.11	130.24	5099.25	27.73	-9.06	-27.90	29.18	341.91	0.19
5200.00	1.00	148.47	5199.23	26.37	-7.87	-26.51	27.52	343.39	0.35
5300.00	0.79	133.89	5299.22	25.16	-6.91	-25.28	26.08	344.63	0.31
5400.00	0.42	148.45	5399.22	24.36	-6.22	-24.47	25.14	345.68	0.40
5500.00	0.05	173.90	5499.22	24.00	-6.02	-24.11	24.74	345.92	0.37
5600.00	0.08	120.46	5599.22	23.92	-5.95	-24.03	24.65	346.02	0.07
5700.00	0.20	29.13	5699.22	24.03	-5.81	-24.14	24.72	346.41	0.22

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.42	27.88	5799.21	24.50	-5.55	-24.61	25.13	347.23	0.22
5900.00	0.53	33.55	5899.21	25.21	-5.13	-25.30	25.73	348.50	0.12
6000.00	0.59	30.75	5999.21	26.03	-4.61	-25.11	26.44	349.95	0.07
6100.00	0.43	26.93	6099.20	26.81	-4.18	-26.88	27.13	351.13	0.16
6200.00	0.51	17.24	6199.20	27.57	-3.88	-27.64	27.84	351.99	0.11
6300.00	0.55	14.08	6299.19	28.47	-3.63	-28.53	28.70	352.74	0.05
6400.00	0.60	323.98	6399.19	29.36	-3.82	-29.42	29.60	352.59	0.49
6500.00	0.65	12.61	6499.18	30.33	-4.00	-30.40	30.60	352.49	0.52
6600.00	0.51	357.92	6599.18	31.33	-3.89	-31.40	31.57	352.92	0.21
6700.00	0.50	356.25	6699.18	32.21	-3.94	-32.28	32.45	353.03	0.02
6800.00	0.59	356.63	6799.17	33.16	-3.99	-33.23	33.40	353.13	0.09
6900.00	0.50	12.81	6899.17	34.10	-3.93	-34.16	34.32	353.43	0.18
7000.00	0.53	10.43	6999.16	34.98	-3.75	-35.04	35.18	353.89	0.04
7100.00	0.48	355.01	7099.16	35.85	-3.70	-35.91	36.04	354.11	0.14
7200.00	0.47	359.64	7199.15	36.68	-3.74	-36.75	36.87	354.18	0.04
7300.00	0.36	349.18	7299.15	37.40	-3.80	-37.47	37.59	354.20	0.14
7400.00	0.22	36.14	7399.15	37.86	-3.75	-37.93	38.05	354.35	0.26
7500.00	0.19	75.35	7499.15	38.06	-3.47	-38.11	38.21	354.78	0.14
7600.00	0.32	131.52	7599.15	37.91	-3.10	-37.96	38.04	355.33	0.27
7700.00	0.52	179.58	7699.15	37.27	-2.89	-37.32	37.38	355.57	0.39
7800.00	0.36	204.87	7799.14	36.53	-3.02	-36.58	36.65	355.28	0.25
7900.00	0.33	205.83	7899.14	35.98	-3.27	-36.04	36.13	354.80	0.03
8000.00	0.64	176.17	7999.14	36.16	-3.36	-35.22	35.32	354.53	0.38
8100.00	0.52	179.49	8099.13	34.15	-3.32	-34.21	34.32	354.44	0.12
8200.00	0.56	188.16	8199.13	33.22	-3.39	-33.28	33.39	354.18	0.09
8300.00	0.63	223.45	8299.12	32.33	-3.84	-32.40	32.56	353.23	0.37
8400.00	0.77	207.15	8399.12	31.33	-4.52	-31.41	31.66	351.78	0.24
8500.00	0.97	189.28	8499.11	29.90	-4.97	-29.99	30.31	350.56	0.33
8600.00	1.02	180.24	8599.09	28.17	-5.11	-28.26	28.63	349.72	0.17
8700.00	1.41	176.49	8699.07	26.05	-5.04	-26.15	26.54	349.06	0.39
8760.00	1.52	170.07	8759.05	24.54	-4.86	-24.63	25.01	348.81	0.33



VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Vaca Draw 9418 JV-P 5H / API 30-025-41624



VES Survey Date: 02/27/2015



COG Operating LLC

Lea County, NM

9418 JV-P Vaca Draw

#5H

OH

Design: OH

Survey Report - Geographic

10 March, 2015





TDS
Survey Report - Geographic



Company: COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project: Lea County, NM	TVD Reference:	KB @ 3441.4usft (Basic 48)
Site: 9418 JV-P Vaca Draw	MD Reference:	KB @ 3441.4usft (Basic 48)
Well: #5H	North Reference:	Grid
Wellbore: OH	Survey Calculation Method:	Minimum Curvature
Design: OH	Database:	EDM 5000.1 Single User Db

Project: Lea County, NM	System Datum:	Mean Sea Level
Map System: US State Plane 1927 (Exact solution)		
Geo Datum: NAD 1927 (NADCON CONUS)		
Map Zone: New Mexico East 3001		

Site: 9418 JV-P Vaca Draw			
Site Position:	Northing:	Latitude:	32° 9' 5.972 N
From: Map	Easting:	Longitude:	103° 34' 2.127 W
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16"	Grid Convergence:	0.41°

Well: #5H			
Well Position: +N/-S	Northing:	Latitude:	32° 9' 5.972 N
+E/-W	Easting:	Longitude:	103° 34' 2.127 W
Position Uncertainty: 0.0 usft	Wellhead Elevation: 0.0 usft	Ground Level:	3,419.4 usft

Wellbore: OH			
Magnetica	Model Name	Sample Date	Declination
	IGRF2010	2/9/2015	(°) 7.13
			Dip Angle (°) 60.03
			Field Strength (nT) 48,203

Design: OH			
Audit Notes:			
Version: 1.0	Phase: ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°) 178.91

Survey Program		Date: 3/10/2015	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.0	8,760.0	GYRO #1 (OH)	Good_gyro
8,813.0	13,910.0	MWD #1 (OH)	MWD
			Description
			Good Gyro
			MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	419,738.40	737,090.80	32° 9' 5.972 N	103° 34' 2.127 W
100.0	0.14	97.20	100.0	0.0	0.1	419,738.38	737,090.92	32° 9' 5.972 N	103° 34' 2.128 W
200.0	0.25	59.96	200.0	0.1	0.4	419,738.48	737,091.23	32° 9' 5.973 N	103° 34' 2.122 W
300.0	0.23	90.34	300.0	0.2	0.8	419,738.59	737,091.62	32° 9' 5.974 N	103° 34' 2.118 W
400.0	0.25	72.25	400.0	0.3	1.2	419,738.65	737,092.03	32° 9' 5.974 N	103° 34' 2.113 W
500.0	0.23	36.51	500.0	0.5	1.6	419,738.88	737,092.35	32° 9' 5.976 N	103° 34' 2.109 W
600.0	0.28	62.28	600.0	0.8	1.9	419,739.15	737,092.69	32° 9' 5.979 N	103° 34' 2.105 W
700.0	0.09	16.38	700.0	0.9	2.1	419,739.34	737,092.93	32° 9' 5.981 N	103° 34' 2.102 W
800.0	0.08	11.22	800.0	1.1	2.2	419,739.49	737,092.98	32° 9' 5.982 N	103° 34' 2.102 W
900.0	0.11	264.82	900.0	1.1	2.1	419,739.55	737,092.88	32° 9' 5.983 N	103° 34' 2.103 W
1,000.0	0.15	222.88	1,000.0	1.0	1.9	419,739.44	737,092.70	32° 9' 5.982 N	103° 34' 2.105 W



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM
Site: 9418 JV-P Vaca Draw
Well: #5H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #5H
TVD Reference: KB @ 3441.4usft (Basic 48)
MD Reference: KB @ 3441.4usft (Basic 48)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.26	191.77	1,100.0	0.7	1.8	419,739.12	737,092.56	32° 9' 5.979 N	103° 34' 2.107 W
1,200.0	0.30	169.54	1,200.0	0.2	1.8	419,738.64	737,092.56	32° 9' 5.974 N	103° 34' 2.107 W
1,300.0	0.32	175.46	1,300.0	-0.3	1.8	419,738.11	737,092.63	32° 9' 5.969 N	103° 34' 2.106 W
1,400.0	0.31	156.37	1,400.0	-0.8	2.0	419,737.58	737,092.78	32° 9' 5.984 N	103° 34' 2.104 W
1,500.0	0.18	122.67	1,500.0	-1.1	2.2	419,737.25	737,093.00	32° 9' 5.980 N	103° 34' 2.102 W
1,600.0	0.53	184.15	1,600.0	-1.7	2.5	419,736.72	737,093.26	32° 9' 5.955 N	103° 34' 2.099 W
1,700.0	1.02	261.23	1,700.0	-2.3	1.7	419,736.14	737,092.51	32° 9' 5.949 N	103° 34' 2.107 W
1,800.0	0.98	282.88	1,800.0	-2.2	0.0	419,736.19	737,090.79	32° 9' 5.950 N	103° 34' 2.127 W
1,900.0	0.87	275.45	1,900.0	-1.9	-1.7	419,736.47	737,089.12	32° 9' 5.953 N	103° 34' 2.147 W
2,000.0	0.99	277.71	1,999.9	-1.7	-3.4	419,736.66	737,087.42	32° 9' 5.955 N	103° 34' 2.167 W
2,100.0	1.09	283.85	2,099.9	-1.4	-5.2	419,737.01	737,085.84	32° 9' 5.958 N	103° 34' 2.187 W
2,200.0	1.23	293.89	2,199.9	-0.7	-7.1	419,737.67	737,083.74	32° 9' 5.985 N	103° 34' 2.209 W
2,300.0	1.39	295.60	2,299.9	0.2	-9.1	419,738.63	737,081.66	32° 9' 5.975 N	103° 34' 2.233 W
2,400.0	1.57	309.71	2,399.8	1.6	-11.3	419,740.03	737,079.51	32° 9' 5.989 N	103° 34' 2.258 W
2,500.0	1.56	312.34	2,499.8	3.4	-13.3	419,741.82	737,077.45	32° 9' 6.007 N	103° 34' 2.282 W
2,600.0	1.73	305.55	2,599.8	5.2	-15.6	419,743.61	737,075.22	32° 9' 6.024 N	103° 34' 2.308 W
2,700.0	1.87	320.45	2,699.7	7.3	-17.8	419,745.75	737,072.95	32° 9' 6.046 N	103° 34' 2.334 W
2,800.0	0.79	287.15	2,799.7	8.8	-19.5	419,747.21	737,071.25	32° 9' 6.060 N	103° 34' 2.354 W
2,900.0	0.92	285.77	2,899.7	9.2	-21.0	419,747.63	737,069.82	32° 9' 6.065 N	103° 34' 2.370 W
3,000.0	0.72	290.59	2,999.7	9.7	-22.3	419,748.07	737,068.46	32° 9' 6.069 N	103° 34' 2.388 W
3,100.0	0.65	307.31	3,099.7	10.2	-23.4	419,748.63	737,067.42	32° 9' 6.075 N	103° 34' 2.398 W
3,200.0	0.84	323.66	3,199.6	11.2	-24.3	419,749.57	737,066.54	32° 9' 6.084 N	103° 34' 2.408 W
3,300.0	0.93	333.67	3,299.6	12.5	-25.1	419,750.89	737,065.74	32° 9' 6.097 N	103° 34' 2.418 W
3,400.0	1.11	347.78	3,399.6	14.2	-25.6	419,752.58	737,065.18	32° 9' 6.114 N	103° 34' 2.424 W
3,500.0	1.23	345.55	3,499.6	16.1	-26.1	419,754.55	737,064.70	32° 9' 6.133 N	103° 34' 2.429 W
3,600.0	1.12	351.24	3,599.6	18.2	-26.5	419,756.55	737,064.29	32° 9' 6.153 N	103° 34' 2.434 W
3,700.0	1.09	349.32	3,699.6	20.1	-26.8	419,758.45	737,063.98	32° 9' 6.172 N	103° 34' 2.438 W
3,800.0	1.04	356.92	3,799.5	21.9	-27.1	419,760.29	737,063.74	32° 9' 6.190 N	103° 34' 2.440 W
3,900.0	1.30	22.83	3,899.5	23.8	-26.7	419,762.25	737,064.13	32° 9' 6.210 N	103° 34' 2.435 W
4,000.0	1.27	25.74	3,999.5	25.9	-25.7	419,764.29	737,065.05	32° 9' 6.230 N	103° 34' 2.424 W
4,100.0	1.22	31.11	4,099.5	27.8	-24.7	419,766.20	737,066.08	32° 9' 6.249 N	103° 34' 2.412 W
4,200.0	1.08	19.73	4,199.5	29.6	-23.8	419,768.00	737,066.95	32° 9' 6.266 N	103° 34' 2.402 W
4,300.0	0.91	30.37	4,299.4	31.2	-23.1	419,769.57	737,067.67	32° 9' 6.282 N	103° 34' 2.394 W
4,400.0	1.30	59.21	4,399.4	32.5	-21.8	419,770.85	737,069.04	32° 9' 6.294 N	103° 34' 2.378 W
4,500.0	1.71	78.69	4,499.4	33.4	-19.3	419,771.79	737,071.45	32° 9' 6.304 N	103° 34' 2.349 W
4,600.0	1.10	82.55	4,599.4	33.9	-18.9	419,772.28	737,073.88	32° 9' 6.308 N	103° 34' 2.321 W
4,700.0	1.15	136.22	4,699.3	33.3	-15.3	419,771.68	737,075.50	32° 9' 6.302 N	103° 34' 2.302 W
4,800.0	1.67	140.12	4,799.3	31.4	-13.7	419,769.82	737,077.13	32° 9' 6.284 N	103° 34' 2.284 W
4,900.0	0.76	121.57	4,899.3	30.0	-12.2	419,768.35	737,078.63	32° 9' 6.289 N	103° 34' 2.266 W
5,000.0	1.25	123.76	4,899.3	29.0	-10.7	419,767.40	737,080.10	32° 9' 6.259 N	103° 34' 2.249 W
5,100.0	1.11	130.24	5,099.3	27.8	-9.0	419,766.17	737,081.75	32° 9' 6.247 N	103° 34' 2.230 W
5,200.0	1.00	148.47	5,199.2	26.4	-7.9	419,764.80	737,082.94	32° 9' 6.234 N	103° 34' 2.216 W
5,300.0	0.79	133.69	5,299.2	25.2	-8.9	419,763.58	737,083.60	32° 9' 6.221 N	103° 34' 2.205 W
5,400.0	0.42	146.45	5,399.2	24.4	-6.2	419,762.79	737,084.59	32° 9' 6.214 N	103° 34' 2.187 W
5,500.0	0.05	173.90	5,499.2	24.0	-6.0	419,762.43	737,084.78	32° 9' 6.210 N	103° 34' 2.195 W
5,600.0	0.08	120.46	5,599.2	24.0	-5.9	419,762.36	737,084.85	32° 9' 6.209 N	103° 34' 2.184 W
5,700.0	0.20	29.13	5,699.2	24.1	-5.8	419,762.47	737,084.99	32° 9' 6.210 N	103° 34' 2.183 W
5,800.0	0.42	27.88	5,799.2	24.5	-5.5	419,762.95	737,085.25	32° 9' 6.215 N	103° 34' 2.180 W
5,900.0	0.53	33.55	5,899.2	25.3	-5.1	419,763.66	737,085.88	32° 9' 6.222 N	103° 34' 2.185 W
6,000.0	0.59	30.75	5,999.2	26.1	-4.6	419,764.49	737,086.20	32° 9' 6.230 N	103° 34' 2.178 W
6,100.0	0.43	28.93	6,099.2	26.9	-4.2	419,765.28	737,086.83	32° 9' 6.238 N	103° 34' 2.173 W
6,200.0	0.51	17.24	6,199.2	27.6	-3.9	419,766.02	737,086.93	32° 9' 6.245 N	103° 34' 2.170 W
6,300.0	0.55	14.08	6,299.2	28.5	-3.6	419,766.91	737,087.18	32° 9' 6.254 N	103° 34' 2.167 W
6,400.0	0.60	323.98	6,399.2	29.4	-3.8	419,767.80	737,086.99	32° 9' 6.263 N	103° 34' 2.168 W
6,500.0	0.65	12.81	6,499.2	30.4	-4.0	419,768.78	737,086.81	32° 9' 6.273 N	103° 34' 2.171 W



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM
Site: 9418 JV-P Vaca Draw
Well: #5H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #5H
TVD Reference: KB @ 3441.4usft (Basic 46)
MD Reference: KB @ 3441.4usft (Basic 48)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.0	0.51	357.92	6,599.2	31.4	-3.9	419,769.78	737,086.91	32° 9' 6.283 N	103° 34' 2.170 W
6,700.0	0.50	356.25	6,699.2	32.3	-3.9	419,770.66	737,086.87	32° 9' 6.291 N	103° 34' 2.170 W
6,800.0	0.59	356.63	6,799.2	33.2	-4.0	419,771.61	737,086.81	32° 9' 6.301 N	103° 34' 2.171 W
6,900.0	0.50	12.81	6,899.2	34.1	-3.9	419,772.55	737,086.88	32° 9' 6.310 N	103° 34' 2.170 W
7,000.0	0.53	10.43	6,999.2	35.0	-3.7	419,773.43	737,087.06	32° 9' 6.319 N	103° 34' 2.168 W
7,100.0	0.48	355.01	7,099.2	35.9	-3.7	419,774.30	737,087.10	32° 9' 6.327 N	103° 34' 2.167 W
7,200.0	0.47	359.64	7,199.2	36.7	-3.7	419,775.13	737,087.06	32° 9' 6.335 N	103° 34' 2.168 W
7,300.0	0.38	349.18	7,299.2	37.4	-3.8	419,775.85	737,087.00	32° 9' 6.343 N	103° 34' 2.168 W
7,400.0	0.22	36.14	7,399.2	37.9	-3.7	419,776.31	737,087.08	32° 9' 6.347 N	103° 34' 2.168 W
7,500.0	0.19	75.35	7,499.1	38.1	-3.5	419,776.51	737,087.33	32° 9' 6.349 N	103° 34' 2.164 W
7,600.0	0.32	131.52	7,599.1	38.0	-3.1	419,776.36	737,087.70	32° 9' 6.348 N	103° 34' 2.160 W
7,700.0	0.52	179.58	7,699.1	37.3	-2.9	419,775.72	737,087.91	32° 9' 6.341 N	103° 34' 2.158 W
7,800.0	0.36	204.87	7,799.1	36.6	-3.0	419,774.99	737,087.78	32° 9' 6.334 N	103° 34' 2.159 W
7,900.0	0.33	205.83	7,899.1	36.0	-3.3	419,774.44	737,087.53	32° 9' 6.329 N	103° 34' 2.162 W
8,000.0	0.64	176.17	7,999.1	35.2	-3.4	419,773.62	737,087.44	32° 9' 6.321 N	103° 34' 2.163 W
8,100.0	0.52	179.49	8,099.1	34.2	-3.3	419,772.61	737,087.48	32° 9' 6.311 N	103° 34' 2.163 W
8,200.0	0.56	188.16	8,199.1	33.3	-3.4	419,771.68	737,087.41	32° 9' 6.301 N	103° 34' 2.164 W
8,300.0	0.63	223.45	8,299.1	32.4	-3.8	419,770.79	737,086.97	32° 9' 6.293 N	103° 34' 2.169 W
8,400.0	0.77	207.15	8,399.1	31.4	-4.5	419,769.80	737,086.28	32° 9' 6.283 N	103° 34' 2.177 W
8,500.0	0.97	189.28	8,499.1	30.0	-5.0	419,768.36	737,085.84	32° 9' 6.269 N	103° 34' 2.182 W
8,600.0	1.02	180.24	8,599.1	28.2	-5.1	419,766.84	737,085.70	32° 9' 6.252 N	103° 34' 2.184 W
8,700.0	1.41	176.49	8,699.1	26.1	-5.0	419,764.52	737,085.77	32° 9' 6.231 N	103° 34' 2.183 W
8,780.0	1.52	170.07	8,759.0	24.6	-4.8	419,763.00	737,085.95	32° 9' 6.216 N	103° 34' 2.181 W
TIE-IN to VES Gyro									
8,813.0	1.50	177.50	8,812.0	23.2	-4.7	419,761.81	737,088.10	32° 9' 6.202 N	103° 34' 2.180 W
8,845.0	1.50	181.20	8,844.0	22.4	-4.7	419,760.78	737,086.11	32° 9' 5.194 N	103° 34' 2.180 W
8,876.0	3.80	179.70	8,875.0	20.9	-4.7	419,759.34	737,086.11	32° 9' 5.179 N	103° 34' 2.180 W
8,908.0	7.80	179.10	8,908.8	17.7	-4.6	419,756.11	737,088.15	32° 9' 5.147 N	103° 34' 2.180 W
8,939.0	11.70	171.10	8,937.4	12.5	-4.1	419,750.90	737,088.87	32° 9' 5.096 N	103° 34' 2.174 W
8,971.0	15.60	167.60	8,968.5	5.1	-2.7	419,743.49	737,088.10	32° 9' 5.022 N	103° 34' 2.158 W
9,002.0	20.20	169.20	8,997.9	-4.2	-0.5	419,734.21	737,090.27	32° 9' 5.930 N	103° 34' 2.134 W
9,034.0	24.30	167.80	9,027.6	-16.0	2.2	419,722.41	737,092.98	32° 9' 5.813 N	103° 34' 2.103 W
9,065.0	27.60	171.90	9,055.4	-29.3	4.5	419,709.08	737,095.34	32° 9' 5.681 N	103° 34' 2.077 W
9,097.0	30.70	176.70	9,083.4	-44.8	6.1	419,693.56	737,096.86	32° 9' 5.528 N	103° 34' 2.060 W
9,128.0	33.60	180.70	9,109.6	-81.3	6.4	419,677.08	737,097.21	32° 9' 5.364 N	103° 34' 2.058 W
9,160.0	35.80	182.10	9,135.9	-79.5	6.0	419,658.87	737,096.76	32° 9' 5.184 N	103° 34' 2.064 W
9,191.0	38.60	181.50	9,160.6	-98.3	5.4	419,640.14	737,096.17	32° 9' 4.999 N	103° 34' 2.073 W
9,223.0	40.90	181.10	9,185.2	-118.7	4.9	419,619.68	737,095.71	32° 9' 4.797 N	103° 34' 2.080 W
9,254.0	42.50	180.40	9,208.4	-139.3	4.6	419,599.06	737,095.44	32° 9' 4.593 N	103° 34' 2.085 W
9,286.0	44.70	177.90	9,231.5	-161.4	5.0	419,577.00	737,095.78	32° 9' 4.374 N	103° 34' 2.083 W
9,317.0	46.50	175.80	9,253.2	-183.5	6.2	419,554.89	737,097.00	32° 9' 4.155 N	103° 34' 2.070 W
9,349.0	49.00	176.30	9,274.7	-207.1	7.8	419,531.26	737,098.63	32° 9' 3.921 N	103° 34' 2.053 W
9,381.0	51.00	176.60	9,295.3	-231.0	9.3	419,506.80	737,100.15	32° 9' 3.679 N	103° 34' 2.038 W
9,412.0	53.60	175.20	9,314.3	-256.1	11.1	419,482.33	737,101.90	32° 9' 3.437 N	103° 34' 2.019 W
9,444.0	56.70	173.40	9,332.6	-282.2	13.7	419,456.21	737,104.52	32° 9' 3.178 N	103° 34' 1.991 W
9,475.0	60.20	171.30	9,348.8	-308.4	17.2	419,430.03	737,108.04	32° 9' 2.919 N	103° 34' 1.952 W
9,507.0	64.30	170.80	9,363.7	-336.3	21.7	419,402.07	737,112.45	32° 9' 2.642 N	103° 34' 1.903 W
9,538.0	68.90	172.00	9,376.0	-364.5	25.9	419,373.94	737,116.70	32° 9' 2.363 N	103° 34' 1.858 W
9,570.0	73.80	173.10	9,386.2	-394.5	29.8	419,343.89	737,120.63	32° 9' 2.066 N	103° 34' 1.813 W
9,602.0	79.00	173.10	9,393.7	-425.4	33.6	419,313.02	737,124.36	32° 9' 1.760 N	103° 34' 1.772 W
9,633.0	83.80	173.50	9,398.4	-455.6	37.1	419,282.59	737,127.94	32° 9' 1.459 N	103° 34' 1.733 W
9,665.0	86.30	172.50	9,401.2	-488.4	41.1	419,249.86	737,131.94	32° 9' 1.135 N	103° 34' 1.689 W
9,698.0	86.70	172.70	9,403.2	-520.1	45.3	419,218.29	737,136.06	32° 9' 0.822 N	103° 34' 1.644 W
9,730.0	88.10	173.50	9,404.6	-551.8	49.1	419,186.55	737,139.90	32° 9' 0.507 N	103° 34' 1.602 W
9,761.0	89.70	174.90	9,405.2	-582.7	52.2	419,155.72	737,143.03	32° 9' 0.202 N	103° 34' 1.568 W



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM
Site: 9418 JV-P Vaca Draw
Well: #5H
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference: KB @ 3441.4usft (Basic 48)
MD Reference: KB @ 3441.4usft (Basic 48)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,824.0	90.10	175.60	9,405.3	-645.5	57.4	419,092.93	737,148.25	32° 8' 59.580 N	103° 34' 1.512 W
9,919.0	88.60	175.60	9,406.4	-740.2	64.7	418,998.22	737,155.53	32° 8' 58.843 N	103° 34' 1.435 W
10,014.0	89.70	174.90	9,407.8	-834.8	72.6	418,903.56	737,163.40	32° 8' 57.705 N	103° 34' 1.352 W
10,109.0	87.70	176.20	9,410.0	-929.5	80.0	418,808.88	737,170.77	32° 8' 56.768 N	103° 34' 1.274 W
10,204.0	88.40	175.60	9,413.2	-1,024.2	86.8	418,714.18	737,177.56	32° 8' 55.830 N	103° 34' 1.203 W
10,298.0	88.70	174.00	9,415.6	-1,117.8	95.3	418,620.60	737,186.07	32° 8' 54.904 N	103° 34' 1.112 W
10,393.0	87.90	176.40	9,418.4	-1,212.4	103.2	418,525.98	737,194.02	32° 8' 53.967 N	103° 34' 1.027 W
10,487.0	87.80	177.70	9,421.9	-1,309.2	108.1	418,432.17	737,198.85	32° 8' 53.038 N	103° 34' 0.978 W
10,582.0	89.00	179.20	9,424.6	-1,401.1	110.6	418,337.25	737,201.42	32° 8' 52.099 N	103° 34' 0.958 W
10,676.0	90.40	179.70	9,425.1	-1,495.1	111.5	418,243.26	737,202.32	32° 8' 51.169 N	103° 34' 0.954 W
10,771.0	87.40	179.30	9,426.9	-1,590.1	112.4	418,148.29	737,203.15	32° 8' 50.229 N	103° 34' 0.952 W
10,865.0	87.60	179.10	9,431.0	-1,684.0	113.7	418,054.39	737,204.46	32° 8' 49.299 N	103° 34' 0.944 W
10,960.0	94.50	181.40	9,429.2	-1,778.9	113.3	417,959.47	737,204.05	32° 8' 48.360 N	103° 34' 0.957 W
11,054.0	92.90	181.40	9,423.2	-1,872.7	111.0	417,865.70	737,201.76	32° 8' 47.432 N	103° 34' 0.992 W
11,149.0	89.90	178.60	9,420.9	-1,967.7	111.0	417,770.74	737,201.76	32° 8' 46.493 N	103° 34' 0.998 W
11,243.0	87.10	179.30	9,423.3	-2,061.6	112.7	417,676.80	737,203.48	32° 8' 45.563 N	103° 34' 0.987 W
11,338.0	86.60	177.90	9,428.5	-2,156.4	115.0	417,581.88	737,205.80	32° 8' 44.625 N	103° 34' 0.968 W
11,432.0	87.90	177.80	9,433.1	-2,250.2	118.5	417,488.15	737,209.32	32° 8' 43.696 N	103° 34' 0.935 W
11,527.0	87.50	178.10	9,436.9	-2,345.1	121.8	417,393.29	737,212.72	32° 8' 42.757 N	103° 34' 0.903 W
11,622.0	86.80	179.40	9,441.5	-2,440.0	124.0	417,298.43	737,214.79	32° 8' 41.818 N	103° 34' 0.887 W
11,716.0	89.20	179.50	9,444.7	-2,533.9	124.9	417,204.49	737,215.69	32° 8' 40.888 N	103° 34' 0.884 W
11,811.0	90.20	179.80	9,445.2	-2,628.9	125.5	417,109.50	737,216.27	32° 8' 39.948 N	103° 34' 0.885 W
11,906.0	91.30	179.80	9,444.0	-2,723.9	125.8	417,014.51	737,216.60	32° 8' 39.008 N	103° 34' 0.889 W
12,000.0	91.50	179.50	9,441.7	-2,817.8	127.2	416,920.55	737,218.00	32° 8' 38.078 N	103° 34' 0.881 W
12,094.0	91.60	177.20	9,439.1	-2,911.7	130.7	416,826.95	737,221.52	32° 8' 37.149 N	103° 34' 0.848 W
12,189.0	93.10	178.00	9,435.2	-3,006.8	134.7	416,731.82	737,225.50	32° 8' 36.210 N	103° 34' 0.809 W
12,284.0	91.40	177.80	9,431.5	-3,101.4	138.2	416,638.96	737,228.97	32° 8' 35.271 N	103° 34' 0.777 W
12,378.0	90.60	177.20	9,429.9	-3,195.3	142.3	416,543.06	737,233.07	32° 8' 34.342 N	103° 34' 0.737 W
12,473.0	87.80	176.50	9,431.2	-3,280.2	147.5	416,448.23	737,238.29	32° 8' 33.403 N	103° 34' 0.684 W
12,567.0	87.00	176.30	9,435.4	-3,383.9	153.4	416,354.51	737,244.19	32° 8' 32.475 N	103° 34' 0.623 W
12,662.0	86.40	176.10	9,440.9	-3,478.5	159.7	416,259.88	737,250.47	32° 8' 31.538 N	103° 34' 0.558 W
12,756.0	87.70	176.30	9,445.7	-3,572.2	165.9	416,166.21	737,256.70	32° 8' 30.611 N	103° 34' 0.493 W
12,851.0	89.00	176.80	9,448.5	-3,667.0	171.6	416,071.42	737,262.41	32° 8' 29.673 N	103° 34' 0.435 W
12,946.0	90.40	177.30	9,449.0	-3,761.8	176.5	415,976.55	737,267.30	32° 8' 28.734 N	103° 34' 0.386 W
13,041.0	91.50	179.50	9,447.4	-3,858.8	179.2	415,881.61	737,269.95	32° 8' 27.794 N	103° 34' 0.363 W
13,135.0	92.40	179.80	9,444.2	-3,950.7	179.7	415,787.87	737,270.52	32° 8' 26.864 N	103° 34' 0.364 W
13,229.0	93.40	181.40	9,439.5	-4,044.8	178.7	415,693.80	737,269.54	32° 8' 25.935 N	103° 34' 0.383 W
13,323.0	90.60	182.90	9,436.2	-4,138.5	175.2	415,599.93	737,268.02	32° 8' 25.007 N	103° 34' 0.432 W
13,418.0	92.70	184.30	9,433.4	-4,233.2	169.3	415,505.17	737,260.08	32° 8' 24.069 N	103° 34' 0.509 W
13,512.0	93.60	184.50	9,428.3	-4,328.8	162.1	415,411.59	737,252.88	32° 8' 23.144 N	103° 34' 0.600 W
13,607.0	92.80	183.10	9,423.0	-4,421.5	155.8	415,316.95	737,246.57	32° 8' 22.208 N	103° 34' 0.681 W
13,701.0	92.10	184.10	9,418.9	-4,515.2	149.9	415,223.22	737,240.67	32° 8' 21.281 N	103° 34' 0.756 W
13,796.0	88.70	183.20	9,418.3	-4,610.0	143.8	415,128.43	737,234.63	32° 8' 20.343 N	103° 34' 0.836 W
13,892.0	86.60	182.80	9,421.0	-4,705.8	140.4	415,032.58	737,231.17	32° 8' 19.992 N	103° 34' 0.881 W
Final MWD Survey									
13,910.0	86.60	182.80	9,423.8	-4,723.7	138.0	415,014.72	737,228.83	32° 8' 19.218 N	103° 34' 0.913 W
Projection to BHTD									



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM
Site: 9418 JV-P Vaca Draw
Well: #5H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #5H
TVD Reference: KB @ 3441.4usft (Basic 46)
MD Reference: KB @ 3441.4usft (Basic 46)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
8,760.0	8,759.0	24.6	-4.8	TIE-IN to VES Gyro
13,862.0	9,421.0	-4,675.8	140.4	Final MWD Survey
13,910.0	9,423.8	-4,723.7	138.0	Projection to Bit/UD

Checked By: _____ Approved By: _____ Date: _____