

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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

NM OIL CONSERVATION Form C-101
ARTESIA DISTRICT
AUG 10 2017
RECEIVED

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address COG Operating LLC 2208 West Main Street Artesia, NM 88210		² OGRID Number 229137
³ Property Code 300269	⁴ Property Name Way South State Com	⁵ API Number 30-015-44381
		⁶ Well No 5H

1. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
A	30	26S	28E		990'	North	330'	East	Eddy

2. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
II	31	26S	28E		330'	South	400'	East	Eddy

3. Pool Information

Pool Name	Pool Code
Hay Hollow; Bone Spring	30215

Additional Well Information

¹¹ Work Type New Well	¹² Well Type Oil	¹³ Cable/Rotary	¹⁴ Lease Type State	¹⁵ Ground Level Elevation 3007.9'
¹⁶ Multiple N	¹⁷ Proposed Depth 13845'	¹⁸ Formation Bone Spring	¹⁹ Contractor	²⁰ Spud Date 11/01/2017
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/lb	Setting Depth	Sacks of Cement	Estimated TOC
Surface	17.5	13.375	48	300'	350	
Intmd I	12.25	9.625	36	2250'	900	
Production	7.875	5.5	17	13845'	1800	2000

Casing/Cement Program: Additional Comments

Plan to drill a 17-1/2" hole to 300' with FW. Run 13-3/8", 48#, H-40 csg and cmt to surface. Drill 12-1/4" hole to 2250' with brine, and run 9-5/8", 36#, J-55 and cement to surface. Drill 7-7/8" hole with cut brine to 13,845' MD to run 5-1/2", 17#, P-110 csg and cement to 2000'.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	3000	3000	Cameron

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

I further certify that I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒ if applicable.

Signature: *Mayte Reyes*

Printed name: Mayte Reyes

Title: Regulatory Analyst

E-mail Address: mreyes1@concho.com

Date: 8/10/2017

Phone: 575-748-6945

OIL CONSERVATION DIVISION

Approved By: *Raymond J. Padany*

Title: *Geologist*

Approved Date: 8-10-17

Expiration Date: 8-10-19

Conditions of Approval Attached

NM OIL CONSERVATION

ARTESIA DISTRICT

AUG 10 2017

RECEIVED

Form C-102

Revised August 1, 2011

Submit one copy to appropriate

District Office

☐ AMENDED REPORT

DISTRICT I

1825 N. FRENCH DR., ALBUQUERQUE, NM 87102
Phone: (505) 393-0101 Fax: (505) 393-0780

DISTRICT II

811 S. FIRST ST., ARTESIA, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

DISTRICT III

1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-0178 Fax: (505) 334-0170

DISTRICT IV

1820 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3486 Fax: (505) 476-3488

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 44381	Pool Code 30215	Pool Name Hay Hollow; Bone Spring
Property Code 308269	Property Name WAY SOUTH STATE COM	Well Number 5H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3007.9'

Surface Location

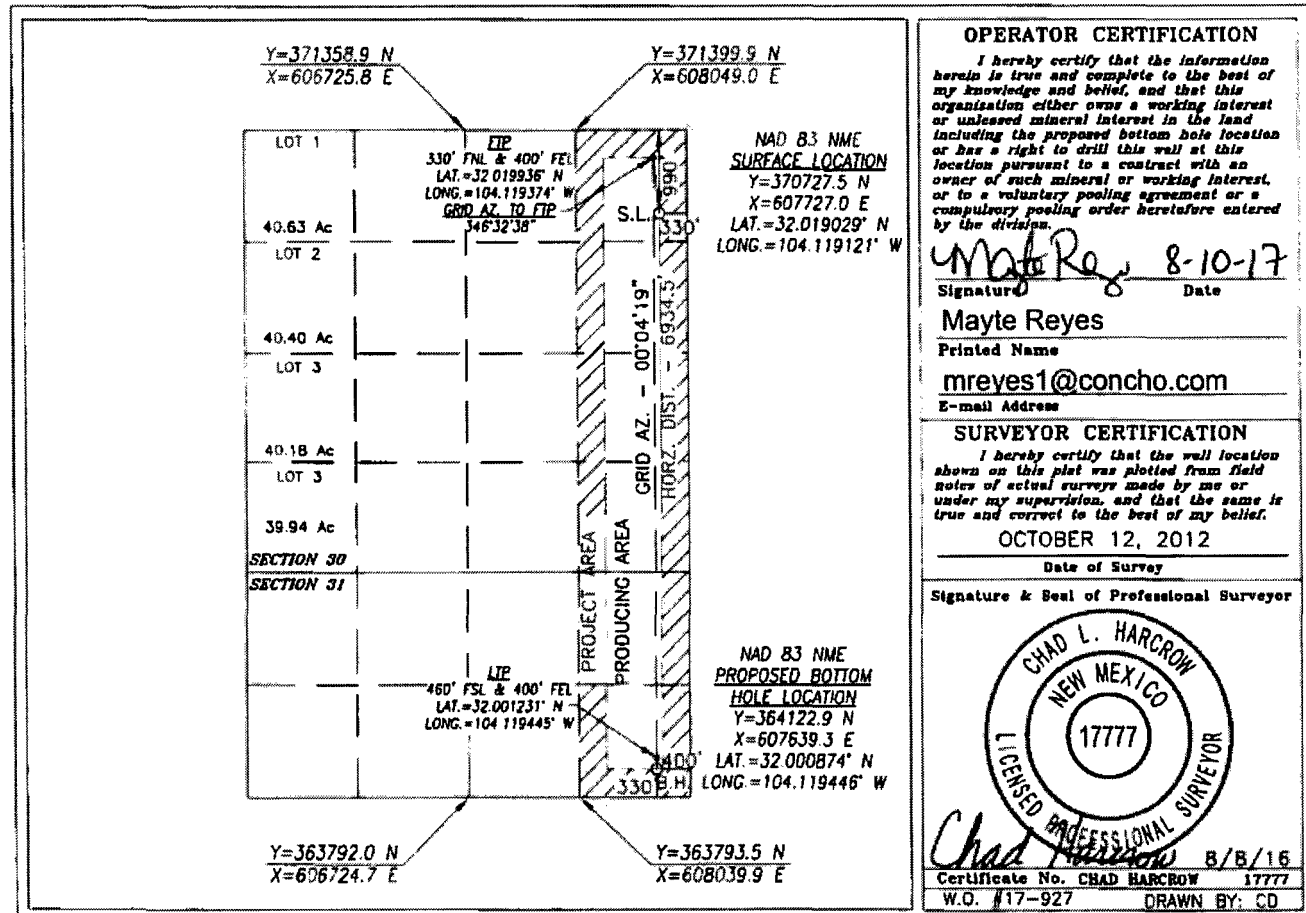
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	30	26-S	28-E		990	NORTH	330	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H (5)	31	26-S	28-E		330	SOUTH	400	EAST	EDDY

Dedicated Acres 240 (223.76) Actual	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



Way South State Com 5H

	Hole Size	Casing	Wt	Depth	Cmt	TOC
Surface	17.5	13.375	48	300	350	0
Intrmd	12.25	9.625	36	2250	900	0
Prod	7.875	5.5	17	13,845	1800	2000

Plan to drill a 17-1/2" hole to 300' with FW. Run 13-3/8", 48#, H-40 csg and cmt to surface. Drill 12-1/4" hole to 2250' with brine, and run 9-5/8", 36#, J-55 and cement to surface. Drill 7-7/8" hole with cut brine to 13,845' MD to run 5-1/2", 17#, P-110 csg and cement to 2000'.

Well Control

Type	Pressure	Test	Manufacture
Double Ram	3000	3000	Cameron

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 10 2017

RECEIVED

COG Operating LLC

**Eddy County, NM
Way South State Com
#5H**

OH

Plan: Plan #1

Standard Survey Report

25 February, 2013



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3024 9usft (Patriot #2 - 17' KB)
Site:	Way South State Com	MD Reference:	WELL @ 3024 9usft (Patriot #2 - 17' KB)
Well:	#5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Houston R5000 Database

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

Site	Way South State Com				
Site Position:		Northing:	370 342.40 usft	Latitude:	32° 1' 4.813 N
From:	Map	Easting:	566 531.60 usft	Longitude:	104° 7' 7.211 W
Position Uncertainty:	2.0 usft	Slot Radius:	7-7/8 "	Grid Convergence:	0.11 °

Well	#5H					
Well Position	+N-S	0.0 usft	Northing:	370 342.40 usft	Latitude:	32° 1' 4.813 N
	+E-W	0.0 usft	Easting:	566 531.60 usft	Longitude:	104° 7' 7.211 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,007.9 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	2/25/2013	(°)	(°)	(nT)
			7.61	59.86	48 265

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	180.70	

Survey Tool Program	Date		2/25/2013		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
0.0	13,845.3	Plan #1 (OH)	MWD	MWD - Standard	

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM
Site: Way South State Com
Well: #5H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #5H
TVD Reference: WELL @ 3024.9usft (Patriot #2 - 17' KB)
MD Reference: WELL @ 3024.9usft (Patriot #2 - 17' KB)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Houston R5000 Database

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00

Survey Report



Company: COG Operating LLC
 Project: Eddy County, NM
 Site: Way South State Com
 Well: #5H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well #5H
 TVD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
 MD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Houston R5000 Database

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,292.5	0.00	0.00	7,292.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP - 7292.5' MD, 7292.5' TVD									
7,300.0	0.90	186.80	7,300.0	-0.1	0.0	0.1	12.00	12.00	0.00
7,325.0	3.90	186.80	7,325.0	-1.1	-0.1	1.1	12.00	12.00	0.00
7,350.0	6.90	186.80	7,348.9	-3.4	-0.4	3.4	12.00	12.00	0.00
7,375.0	9.90	186.80	7,374.6	-7.1	-0.8	7.1	12.00	12.00	0.00
7,400.0	12.90	186.80	7,399.1	-12.0	-1.4	12.0	12.00	12.00	0.00
7,425.0	15.90	186.80	7,423.3	-18.1	-2.2	18.2	12.00	12.00	0.00
7,450.0	18.90	186.80	7,447.2	-25.6	-3.0	25.6	12.00	12.00	0.00
7,475.0	21.90	186.80	7,470.6	-34.2	-4.1	34.3	12.00	12.00	0.00
7,500.0	24.90	186.80	7,493.5	-44.1	-5.3	44.1	12.00	12.00	0.00
7,525.0	27.90	186.80	7,515.9	-55.1	-6.6	55.2	12.00	12.00	0.00
7,550.0	30.90	186.80	7,537.7	-67.3	-8.0	67.4	12.00	12.00	0.00
7,575.0	33.90	186.80	7,558.8	-80.6	-9.6	80.7	12.00	12.00	0.00
7,600.0	36.90	186.80	7,579.2	-95.0	-11.3	95.1	12.00	12.00	0.00
7,625.0	39.90	186.80	7,598.8	-110.4	-13.2	110.5	12.00	12.00	0.00
7,650.0	42.90	186.80	7,617.5	-126.8	-15.1	127.0	12.00	12.00	0.00
7,675.0	45.90	186.80	7,635.4	-144.2	-17.2	144.4	12.00	12.00	0.00
7,700.0	48.90	186.80	7,652.3	-162.4	-19.4	162.7	12.00	12.00	0.00
7,725.0	51.90	186.80	7,668.2	-181.6	-21.6	181.8	12.00	12.00	0.00
7,750.0	54.90	186.80	7,683.1	-201.5	-24.0	201.8	12.00	12.00	0.00
7,775.0	57.90	186.80	7,697.0	-222.2	-26.5	222.5	12.00	12.00	0.00
7,800.0	60.90	186.80	7,709.7	-243.5	-29.0	243.9	12.00	12.00	0.00
7,825.0	63.89	186.80	7,721.3	-265.5	-31.7	265.9	12.00	12.00	0.00

Survey Report



Company: COG Operating LLC
 Project: Eddy County, NM
 Site: Way South State Com
 Well: #5H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well #5H
 TVD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
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 North Reference: Grid
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 Database: Houston R5000 Database

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7.850 0	66.89	186.80	7,731.7	-288.1	-34.4	288.5	12.00	12.00	0.00
7.875 0	69.89	186.80	7,740.9	-311.2	-37.1	311.6	12.00	12.00	0.00
7.900 0	72.89	186.80	7,748.9	-334.7	-39.9	335.1	12.00	12.00	0.00
7.925 0	75.89	186.80	7,755.6	-358.6	-42.8	359.1	12.00	12.00	0.00
7.950 0	78.89	186.80	7,761.1	-382.8	-45.6	383.3	12.00	12.00	0.00
7.975 0	81.89	186.80	7,765.2	-407.3	-48.6	407.8	12.00	12.00	0.00
8.000 0	84.89	186.80	7,768.1	-431.9	-51.5	432.5	12.00	12.00	0.00
8.025 0	87.89	186.80	7,769.7	-456.7	-54.5	457.3	12.00	12.00	0.00
8.044 2	90.20	186.80	7,770.0	-475.6	-56.7	476.4	12.00	12.00	0.00
EOC - 8044.2' MD, 7770.0' TVD, 90.20° INC, 186.80° AZI, 476.4' VS									
8.100 0	90.20	185.68	7,769.8	-531.2	-62.8	532.0	2.00	0.01	-2.00
8.200 0	90.20	183.68	7,769.5	-630.9	-71.0	631.7	2.00	0.00	-2.00
8.300 0	90.20	181.68	7,769.1	-730.8	-75.6	731.7	2.00	0.00	-2.00
8.384 2	90.20	180.00	7,768.8	-814.9	-76.9	815.8	2.00	0.00	-2.00
8.400 0	90.20	180.00	7,768.8	-830.8	-76.9	831.7	0.00	0.00	0.00
8.500 0	90.20	180.00	7,768.4	-930.8	-76.9	931.6	0.00	0.00	0.00
8.600 0	90.20	180.00	7,768.1	-1,030.8	-76.9	1,031.6	0.00	0.00	0.00
8.700 0	90.20	180.00	7,767.7	-1,130.8	-76.9	1,131.6	0.00	0.00	0.00
8.800 0	90.20	180.00	7,767.4	-1,230.8	-76.9	1,231.6	0.00	0.00	0.00
8.900 0	90.20	180.00	7,767.0	-1,330.8	-76.9	1,331.6	0.00	0.00	0.00
9.000 0	90.20	180.00	7,766.7	-1,430.8	-76.9	1,431.6	0.00	0.00	0.00
9.100 0	90.20	180.00	7,766.4	-1,530.8	-76.9	1,531.6	0.00	0.00	0.00
9.200 0	90.20	180.00	7,766.0	-1,630.8	-76.9	1,631.6	0.00	0.00	0.00
9.300 0	90.20	180.00	7,765.7	-1,730.8	-76.9	1,731.6	0.00	0.00	0.00
9.400 0	90.20	180.00	7,765.3	-1,830.8	-76.9	1,831.6	0.00	0.00	0.00
9.500 0	90.20	180.00	7,765.0	-1,930.8	-76.9	1,931.6	0.00	0.00	0.00
9.600 0	90.20	180.00	7,764.6	-2,030.8	-76.9	2,031.6	0.00	0.00	0.00
9.700 0	90.20	180.00	7,764.3	-2,130.8	-76.9	2,131.5	0.00	0.00	0.00
9.800 0	90.20	180.00	7,763.9	-2,230.8	-76.9	2,231.5	0.00	0.00	0.00
9.900 0	90.20	180.00	7,763.6	-2,330.8	-76.9	2,331.5	0.00	0.00	0.00
10.000 0	90.20	180.00	7,763.3	-2,430.8	-76.9	2,431.5	0.00	0.00	0.00
10.100 0	90.20	180.00	7,762.9	-2,530.8	-76.9	2,531.5	0.00	0.00	0.00
10.200 0	90.20	180.00	7,762.6	-2,630.8	-76.9	2,631.5	0.00	0.00	0.00
10.300 0	90.20	180.00	7,762.2	-2,730.8	-76.9	2,731.5	0.00	0.00	0.00
10.400 0	90.20	180.00	7,761.9	-2,830.8	-76.9	2,831.5	0.00	0.00	0.00
10.500 0	90.20	180.00	7,761.5	-2,930.8	-76.9	2,931.5	0.00	0.00	0.00
10.600 0	90.20	180.00	7,761.2	-3,030.8	-76.9	3,031.5	0.00	0.00	0.00
10.700 0	90.20	180.00	7,760.8	-3,130.8	-76.9	3,131.5	0.00	0.00	0.00
10.800 0	90.20	180.00	7,760.5	-3,230.8	-76.9	3,231.5	0.00	0.00	0.00
10.900 0	90.20	180.00	7,760.2	-3,330.8	-76.9	3,331.5	0.00	0.00	0.00
11.000 0	90.20	180.00	7,759.8	-3,430.8	-76.9	3,431.4	0.00	0.00	0.00
11.100 0	90.20	180.00	7,759.5	-3,530.8	-76.9	3,531.4	0.00	0.00	0.00
11.200 0	90.20	180.00	7,759.1	-3,630.8	-76.9	3,631.4	0.00	0.00	0.00
11.300 0	90.20	180.00	7,758.8	-3,730.8	-76.9	3,731.4	0.00	0.00	0.00

Survey Report



Company: COG Operating LLC
 Project: Eddy County, NM
 Site: Wey South State Com
 Well: #5H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well #5H
 TVD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
 MD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Houston R5000 Database

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,400.0	90.20	180.00	7,758.4	-3,830.8	-77.9	3,831.4	0.00	0.00	0.00
11,500.0	90.20	180.00	7,758.1	-3,930.8	-77.0	3,931.4	0.00	0.00	0.00
11,600.0	90.20	180.00	7,757.7	-4,030.8	-77.0	4,031.4	0.00	0.00	0.00
11,700.0	90.20	180.00	7,757.4	-4,130.8	-77.0	4,131.4	0.00	0.00	0.00
11,800.0	90.20	180.00	7,757.0	-4,230.8	-77.0	4,231.4	0.00	0.00	0.00
11,900.0	90.20	180.00	7,756.7	-4,330.8	-77.0	4,331.4	0.00	0.00	0.00
12,000.0	90.20	180.00	7,756.4	-4,430.8	-77.0	4,431.4	0.00	0.00	0.00
12,100.0	90.20	180.00	7,756.0	-4,530.8	-77.0	4,531.4	0.00	0.00	0.00
12,200.0	90.20	180.00	7,755.7	-4,630.7	-77.0	4,631.3	0.00	0.00	0.00
12,300.0	90.20	180.00	7,755.3	-4,730.7	-77.0	4,731.3	0.00	0.00	0.00
12,400.0	90.20	180.00	7,755.0	-4,830.7	-77.0	4,831.3	0.00	0.00	0.00
12,500.0	90.20	180.00	7,754.6	-4,930.7	-77.0	4,931.3	0.00	0.00	0.00
12,600.0	90.20	180.00	7,754.3	-5,030.7	-77.0	5,031.3	0.00	0.00	0.00
12,700.0	90.20	180.00	7,753.9	-5,130.7	-77.0	5,131.3	0.00	0.00	0.00
12,800.0	90.20	180.00	7,753.6	-5,230.7	-77.0	5,231.3	0.00	0.00	0.00
12,900.0	90.20	180.00	7,753.3	-5,330.7	-77.0	5,331.3	0.00	0.00	0.00
13,000.0	90.20	180.00	7,752.9	-5,430.7	-77.0	5,431.3	0.00	0.00	0.00
13,100.0	90.20	180.00	7,752.6	-5,530.7	-77.0	5,531.3	0.00	0.00	0.00
13,200.0	90.20	180.00	7,752.2	-5,630.7	-77.0	5,631.3	0.00	0.00	0.00
13,300.0	90.20	180.00	7,751.9	-5,730.7	-77.0	5,731.3	0.00	0.00	0.00
13,400.0	90.20	180.00	7,751.5	-5,830.7	-77.0	5,831.2	0.00	0.00	0.00
13,500.0	90.20	180.00	7,751.2	-5,930.7	-77.0	5,931.2	0.00	0.00	0.00
13,600.0	90.20	180.00	7,750.8	-6,030.7	-77.0	6,031.2	0.00	0.00	0.00
13,700.0	90.20	180.00	7,750.5	-6,130.7	-77.0	6,131.2	0.00	0.00	0.00
13,800.0	90.20	180.00	7,750.2	-6,230.7	-77.0	6,231.2	0.00	0.00	0.00
13,845.7	90.20	180.00	7,750.0	-6,276.4	-77.0	6,276.9	0.00	0.00	0.00

TD @ 13845.7' MD, 7750.0' TVD

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- h/miss target									
- Shape									
PBHL (WS#5H)	0.00	0.00	7,750.0	-6,276.4	-77.0	364,066.00	568,454.60	32° 0' 2.699 N	104° 7' 8.250 W
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
7293	7293	0	0	KOP - 7292.5' MD, 7292.5' TVD
8044	7770	-476	-57	EOC - 8044.2' MD, 7770.0' TVD, 90.20° INC, 188.80° AZ, 476.4' VS
13,848	7750	-6276	-77	TD @ 13845.7' MD, 7750.0' TVD

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM
Site: Way South State Corn
Well: #5H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #5H
TVD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
MD Reference: WELL @ 3024 9usft (Patriot #2 - 17' KB)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Houston R5000 Database

Checked By: _____ Approved By: _____ Date: _____

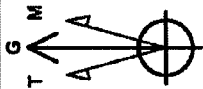
COG Operating LLC
 Project: Eddy County, NM
 Site: Way South State Com
 Well: #5H
 Wellbore: OH
 Plan: Plan #1 (#5H/OH)



WELL DETAILS: #5H

Ground Elevation: 3007.9
 RKB Elevation: WELL @ 3024.9usft (Patriot #2 - 17" KB)
 Rig Name: Patriot #2 - 17" KB

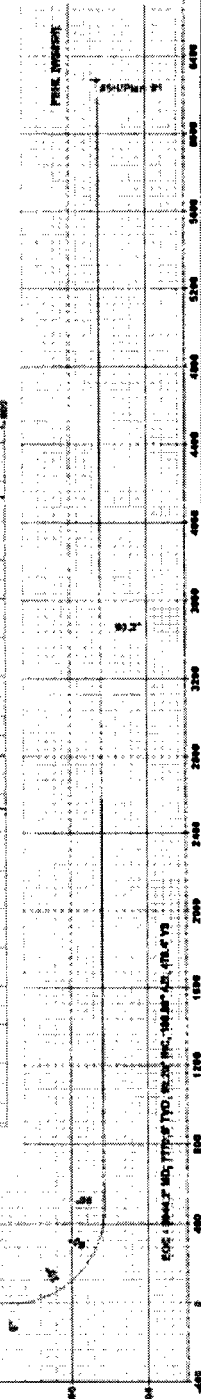
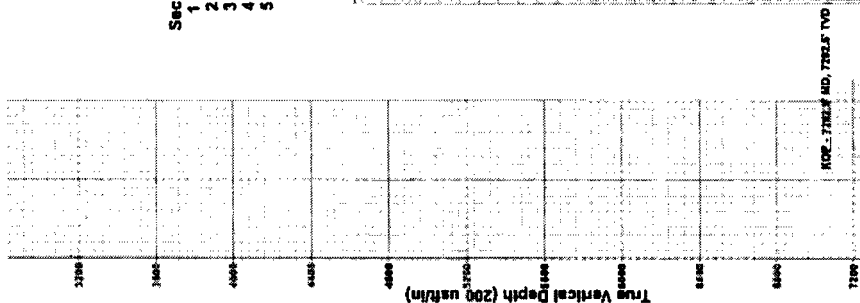
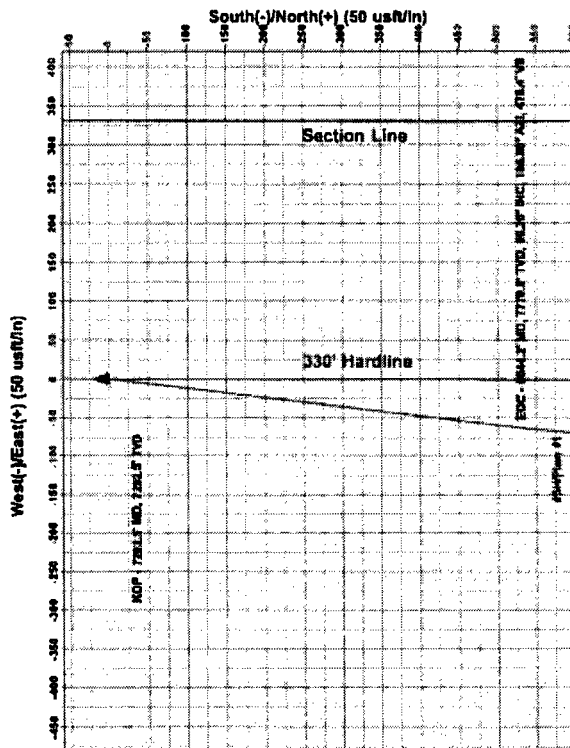
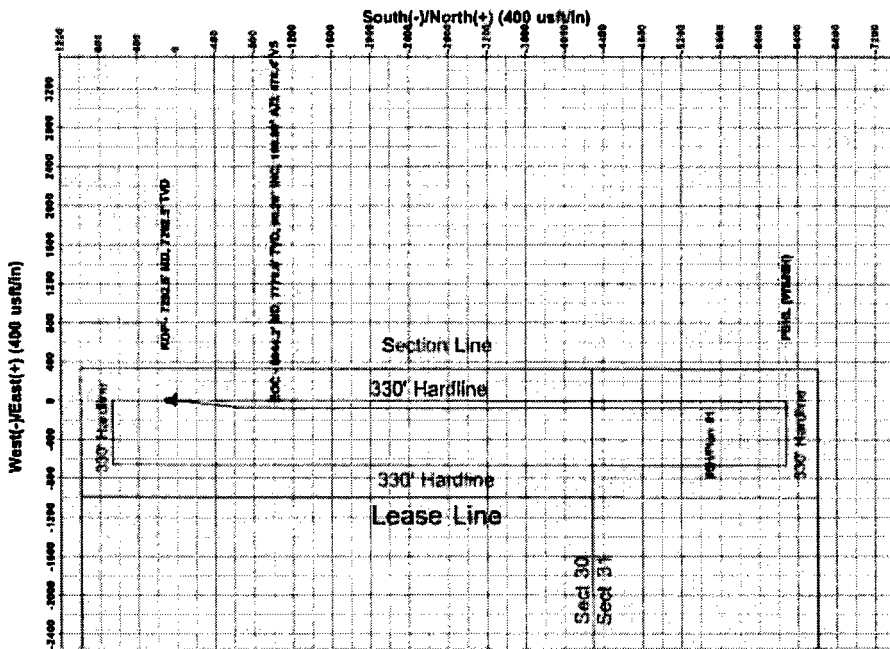
Surface Hole Location
 Northing 370342.40
 Easting 568531.60
 Latitude 32° 1' 4.813 N
 Longitude 104° 7' 7.211 W



Asimuths to Grid North
 True North: -0.11°
 Magnetic North: 7.50°
 Magnetic Field
 Strength: 48264.7nT
 Dip Angle: 59.86°
 Date: 2/25/2013
 Model: IGRF2010

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSeet	Target
1	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0	
2	7292.5	0.00	0.00	7292.5	0.0	0.00	0.00	0.00	0.0	
3	8644.2	90.20	186.86	7770.0	-475.8	-56.7	12.00	186.86	476.5	
4	8384.2	90.20	180.00	7788.8	-814.9	-76.9	2.00	-90.01	815.8	
5	13845.7	90.20	180.00	7758.0	-6276.4	-77.0	0.00	0.00	8276.9	PBHL (WS#5H)



PROJECT DETAILS: Eddy County, NM
 Decade: 1970s
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level
 Local North: Grid



Vertical Section at 180.70° (200 usft/in)
 Crescent Directional Drilling
 7715 West Industrial Ave. Midland, Tx 79706
 Phone: 432-618-1135

Plan: Plan #1 (#5H/OH)
 Created By: Matt Higgins
 Date: 2/26/2013