



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 3, T26-S, R28-E

SRO State Com #39H

NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 01 2015

RECEIVED

Wellbore #1

Design: Wellbore #1

30015 41199

Survey Report - Geographic

21 April, 2015





HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #39H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandriil Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandriil Freedom)
Well:	SRO State Com #39H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Project	Eddy County, NM (NAD 27)		
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	Sec 3, T26-S, R28-E		
Site Position:		Northing:	392,295.70 usft
From:	Map	Easting:	579,141.10 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 4' 41.804 N
		Longitude:	104° 4' 40.145 W
		Grid Convergence:	0.14 °

Well	SRO State Com #39H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 4' 41.807 N
		Longitude:	104° 4' 39.569 W
		Ground Level:	2,954.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/2/2015	7.34	59.87	48,098

Design	Wellbore #1			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	3.46

Survey Program	Date 4/21/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
184.0	13,029.0	MWD (Wellbore #1)	MWD default	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	392,296.10	579,190.70	32° 4' 41.807 N	104° 4' 39.569 W
184.0	1.40	323.30	184.0	1.8	-1.3	392,297.90	579,189.36	32° 4' 41.825 N	104° 4' 39.584 W
First MWD Survey @ 184' MD / 184' TVD									
275.0	1.40	303.80	275.0	3.3	-2.9	392,299.41	579,187.77	32° 4' 41.840 N	104° 4' 39.603 W
368.0	1.60	303.60	367.9	4.7	-5.0	392,300.76	579,185.75	32° 4' 41.853 N	104° 4' 39.626 W
455.0	1.10	310.60	454.9	5.9	-6.6	392,301.98	579,184.10	32° 4' 41.865 N	104° 4' 39.645 W
546.0	0.30	275.80	545.9	6.5	-7.5	392,302.57	579,183.20	32° 4' 41.871 N	104° 4' 39.656 W
571.0	0.30	327.50	570.9	6.5	-7.6	392,302.63	579,183.10	32° 4' 41.872 N	104° 4' 39.657 W
699.0	0.30	269.30	698.9	6.8	-8.1	392,302.91	579,182.58	32° 4' 41.874 N	104° 4' 39.663 W
791.0	1.10	131.80	790.9	6.2	-7.7	392,302.32	579,183.00	32° 4' 41.868 N	104° 4' 39.658 W
975.0	2.20	128.30	974.8	2.9	-3.6	392,298.95	579,187.09	32° 4' 41.835 N	104° 4' 39.611 W
1,159.0	1.00	139.80	1,158.7	-0.6	0.2	392,295.54	579,190.90	32° 4' 41.801 N	104° 4' 39.567 W



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Well:	SRO State Com #39H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
1,343.0	0.50	215.00	1,342.7	-2.4	0.8	392,293.65	579,191.47	32° 4' 41.783 N	104° 4' 39.560 W	
1,527.0	0.70	216.60	1,526.7	-4.0	-0.4	392,292.09	579,190.34	32° 4' 41.767 N	104° 4' 39.573 W	
1,714.0	1.00	213.80	1,713.7	-6.3	-1.9	392,289.82	579,188.75	32° 4' 41.745 N	104° 4' 39.592 W	
1,902.0	1.90	126.00	1,901.6	-9.5	-0.3	392,286.62	579,190.36	32° 4' 41.713 N	104° 4' 39.573 W	
2,092.0	3.70	144.30	2,091.4	-16.3	5.8	392,279.79	579,196.49	32° 4' 41.645 N	104° 4' 39.502 W	
2,280.0	3.90	176.30	2,279.0	-27.6	9.7	392,268.49	579,200.44	32° 4' 41.533 N	104° 4' 39.456 W	
2,429.0	1.50	187.60	2,427.8	-34.6	9.8	392,261.50	579,200.51	32° 4' 41.464 N	104° 4' 39.456 W	
2,563.0	0.90	300.20	2,561.8	-35.8	8.7	392,260.29	579,199.37	32° 4' 41.452 N	104° 4' 39.469 W	
2,751.0	1.10	313.10	2,749.8	-33.8	6.1	392,262.26	579,196.78	32° 4' 41.472 N	104° 4' 39.499 W	
2,940.0	1.00	306.70	2,938.8	-31.6	3.4	392,264.49	579,194.13	32° 4' 41.494 N	104° 4' 39.530 W	
3,128.0	1.10	308.70	3,126.7	-29.5	0.7	392,266.60	579,191.41	32° 4' 41.515 N	104° 4' 39.561 W	
3,317.0	1.10	326.30	3,315.7	-26.9	-1.7	392,269.24	579,188.98	32° 4' 41.541 N	104° 4' 39.590 W	
3,507.0	1.00	311.70	3,505.7	-24.2	-4.0	392,271.86	579,186.73	32° 4' 41.567 N	104° 4' 39.616 W	
3,696.0	1.20	320.50	3,694.6	-21.6	-6.5	392,274.48	579,184.24	32° 4' 41.593 N	104° 4' 39.644 W	
3,885.0	0.40	171.90	3,883.6	-20.7	-7.6	392,275.36	579,183.08	32° 4' 41.602 N	104° 4' 39.658 W	
4,075.0	0.80	161.20	4,073.6	-22.7	-7.1	392,273.45	579,183.60	32° 4' 41.583 N	104° 4' 39.652 W	
4,264.0	0.70	167.20	4,262.6	-25.0	-6.4	392,271.07	579,184.28	32° 4' 41.559 N	104° 4' 39.644 W	
4,454.0	1.00	166.60	4,452.6	-27.8	-5.8	392,268.33	579,184.92	32° 4' 41.532 N	104° 4' 39.637 W	
4,642.0	1.10	179.30	4,640.5	-31.2	-5.4	392,264.93	579,185.32	32° 4' 41.498 N	104° 4' 39.632 W	
4,831.0	1.10	81.20	4,829.5	-32.7	-3.6	392,263.39	579,187.14	32° 4' 41.483 N	104° 4' 39.611 W	
5,021.0	1.10	88.80	5,019.5	-32.4	0.1	392,263.71	579,190.76	32° 4' 41.486 N	104° 4' 39.569 W	
5,210.0	1.10	79.60	5,208.5	-32.0	3.7	392,264.07	579,194.36	32° 4' 41.490 N	104° 4' 39.527 W	
5,397.0	1.10	93.50	5,395.4	-31.8	7.2	392,264.29	579,197.92	32° 4' 41.492 N	104° 4' 39.486 W	
5,586.0	1.40	110.80	5,584.4	-32.7	11.2	392,263.36	579,201.89	32° 4' 41.482 N	104° 4' 39.440 W	
5,774.0	0.80	352.40	5,772.4	-32.3	13.2	392,263.84	579,203.86	32° 4' 41.487 N	104° 4' 39.417 W	
5,964.0	0.70	313.30	5,962.3	-30.1	12.1	392,265.95	579,202.84	32° 4' 41.508 N	104° 4' 39.429 W	
6,153.0	0.90	271.90	6,151.3	-29.3	9.8	392,266.79	579,200.52	32° 4' 41.517 N	104° 4' 39.456 W	
6,343.0	1.10	132.40	6,341.3	-30.5	9.7	392,265.61	579,200.37	32° 4' 41.505 N	104° 4' 39.457 W	
6,532.0	1.40	138.90	6,530.3	-33.4	12.5	392,262.65	579,203.23	32° 4' 41.475 N	104° 4' 39.424 W	
6,721.0	0.80	282.30	6,719.2	-34.9	12.8	392,261.19	579,203.46	32° 4' 41.461 N	104° 4' 39.421 W	
6,910.0	1.80	267.70	6,908.2	-34.7	8.5	392,261.35	579,199.20	32° 4' 41.463 N	104° 4' 39.471 W	
7,099.0	1.90	315.40	7,097.1	-32.6	3.3	392,263.46	579,194.04	32° 4' 41.484 N	104° 4' 39.531 W	
7,287.0	0.20	260.00	7,285.1	-30.5	0.8	392,265.63	579,191.53	32° 4' 41.505 N	104° 4' 39.560 W	
7,475.0	0.80	248.40	7,473.1	-31.0	-0.7	392,265.09	579,189.98	32° 4' 41.500 N	104° 4' 39.578 W	
7,540.0	1.60	226.90	7,538.0	-31.8	-1.8	392,264.30	579,188.90	32° 4' 41.492 N	104° 4' 39.591 W	
7,571.0	1.70	318.00	7,569.0	-31.8	-2.4	392,264.35	579,188.27	32° 4' 41.493 N	104° 4' 39.598 W	
7,603.0	4.90	343.70	7,601.0	-30.1	-3.1	392,266.01	579,187.57	32° 4' 41.509 N	104° 4' 39.606 W	
7,634.0	9.90	0.00	7,631.7	-26.2	-3.5	392,269.95	579,187.20	32° 4' 41.548 N	104° 4' 39.610 W	
7,665.0	14.00	1.60	7,662.0	-19.7	-3.4	392,276.36	579,187.31	32° 4' 41.612 N	104° 4' 39.609 W	
7,697.0	17.50	1.80	7,692.8	-11.1	-3.1	392,285.05	579,187.57	32° 4' 41.697 N	104° 4' 39.606 W	
7,728.0	20.50	0.50	7,722.1	-1.0	-2.9	392,295.13	579,187.76	32° 4' 41.797 N	104° 4' 39.603 W	
7,759.0	23.60	0.00	7,750.9	10.7	-2.9	392,306.77	579,187.81	32° 4' 41.912 N	104° 4' 39.602 W	
7,791.0	26.40	1.80	7,779.9	24.2	-2.7	392,320.29	579,188.03	32° 4' 42.046 N	104° 4' 39.599 W	
7,822.0	29.90	5.60	7,807.2	38.8	-1.7	392,334.87	579,189.00	32° 4' 42.191 N	104° 4' 39.588 W	
7,853.0	33.80	7.60	7,833.5	55.0	0.2	392,351.12	579,190.90	32° 4' 42.351 N	104° 4' 39.565 W	
7,885.0	37.20	7.00	7,859.6	73.4	2.5	392,369.55	579,193.25	32° 4' 42.534 N	104° 4' 39.537 W	
7,916.0	40.20	5.30	7,883.8	92.7	4.6	392,388.81	579,195.32	32° 4' 42.724 N	104° 4' 39.513 W	
7,948.0	43.40	4.80	7,907.6	114.0	6.5	392,410.06	579,197.19	32° 4' 42.934 N	104° 4' 39.490 W	
7,979.0	45.90	4.80	7,929.7	135.7	8.3	392,431.77	579,199.02	32° 4' 43.149 N	104° 4' 39.468 W	
8,010.0	49.50	5.60	7,950.5	158.5	10.4	392,454.60	579,201.10	32° 4' 43.375 N	104° 4' 39.444 W	
8,042.0	52.10	4.90	7,970.8	183.2	12.7	392,479.29	579,203.37	32° 4' 43.619 N	104° 4' 39.417 W	
8,050.6	52.85	4.87	7,976.0	190.0	13.2	392,486.08	579,203.95	32° 4' 43.687 N	104° 4' 39.410 W	
Crossed Lease Line @ 8051' MD / 7976' TVD										
8,073.0	54.80	4.80	7,989.2	208.0	14.8	392,504.10	579,205.47	32° 4' 43.865 N	104° 4' 39.391 W	
8,104.0	57.90	4.10	8,006.4	233.7	16.8	392,529.82	579,207.47	32° 4' 44.119 N	104° 4' 39.367 W	



HP
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Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #39H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandriil Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandriil Freedom)
Well:	SRO State Com #39H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,306.0	89.70	4.10	8,219.0	4,400.6	264.9	396,696.73	579,455.58	32° 5' 25.351 N	104° 4' 36.368 W
12,400.0	90.50	4.40	8,218.8	4,494.4	271.8	396,790.47	579,462.55	32° 5' 26.279 N	104° 4' 36.285 W
12,494.0	88.80	4.10	8,219.4	4,588.1	278.8	396,884.21	579,469.52	32° 5' 27.206 N	104° 4' 36.201 W
12,588.0	89.50	3.20	8,220.8	4,681.9	284.8	396,978.01	579,475.50	32° 5' 28.135 N	104° 4' 36.129 W
12,682.0	89.30	3.00	8,221.8	4,775.8	289.9	397,071.86	579,480.58	32° 5' 29.063 N	104° 4' 36.068 W
12,776.0	90.50	1.90	8,221.9	4,869.7	293.9	397,165.77	579,484.60	32° 5' 29.993 N	104° 4' 36.018 W
12,870.0	89.30	2.10	8,222.1	4,963.6	297.2	397,259.71	579,487.88	32° 5' 30.922 N	104° 4' 35.977 W
12,976.0	90.30	1.60	8,222.5	5,069.6	300.6	397,365.66	579,491.30	32° 5' 31.971 N	104° 4' 35.935 W
13,029.0	90.30	1.60	8,222.2	5,122.5	302.1	397,418.64	579,492.78	32° 5' 32.495 N	104° 4' 35.916 W
TD @ 13029' MD / 8222' TVD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
184.0	184.0	1.8	-1.3	First MWD Survey @ 184' MD / 184' TVD
8,050.6	7,976.0	190.0	13.2	Crossed Lease Line @ 8051' MD / 7976' TVD
8,414.9	8,122.3	520.1	35.2	Crossed 330' Hard Line @ 8415' MD / 8122' TVD
13,029.0	8,222.2	5,122.5	302.1	TD @ 13029' MD / 8222' TVD

Checked By: _____ Approved By: _____ Date: _____