



August 15, 2014

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 9 2015

RECEIVED

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

15-4114

Attn: Kanicia Castillo

RE: **SRO State Com No. 043H**

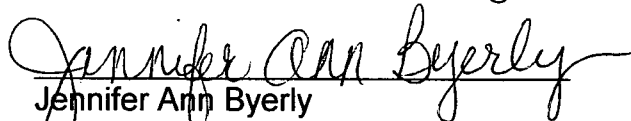
Please find enclosed a copy of the survey from 0.00' to 2338.00' ran on the above referenced well.

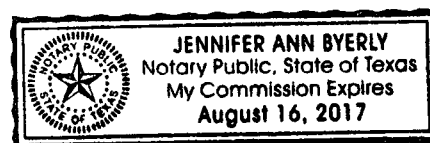
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 15 day of August, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)

Lease/Well: SRO State Com/No. 043H

Location: S17 T26S R28E

Rig Name: Scan Freedom

State/County: New Mexico/Eddy

Latitude: 32.05, Longitude: -104.11

GRID North is 0.12 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RKB = 27 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 8/15/2014 / 13:21

VES Survey International

Midland, TX

432-563-5444

Surveyor: Andrew Askew

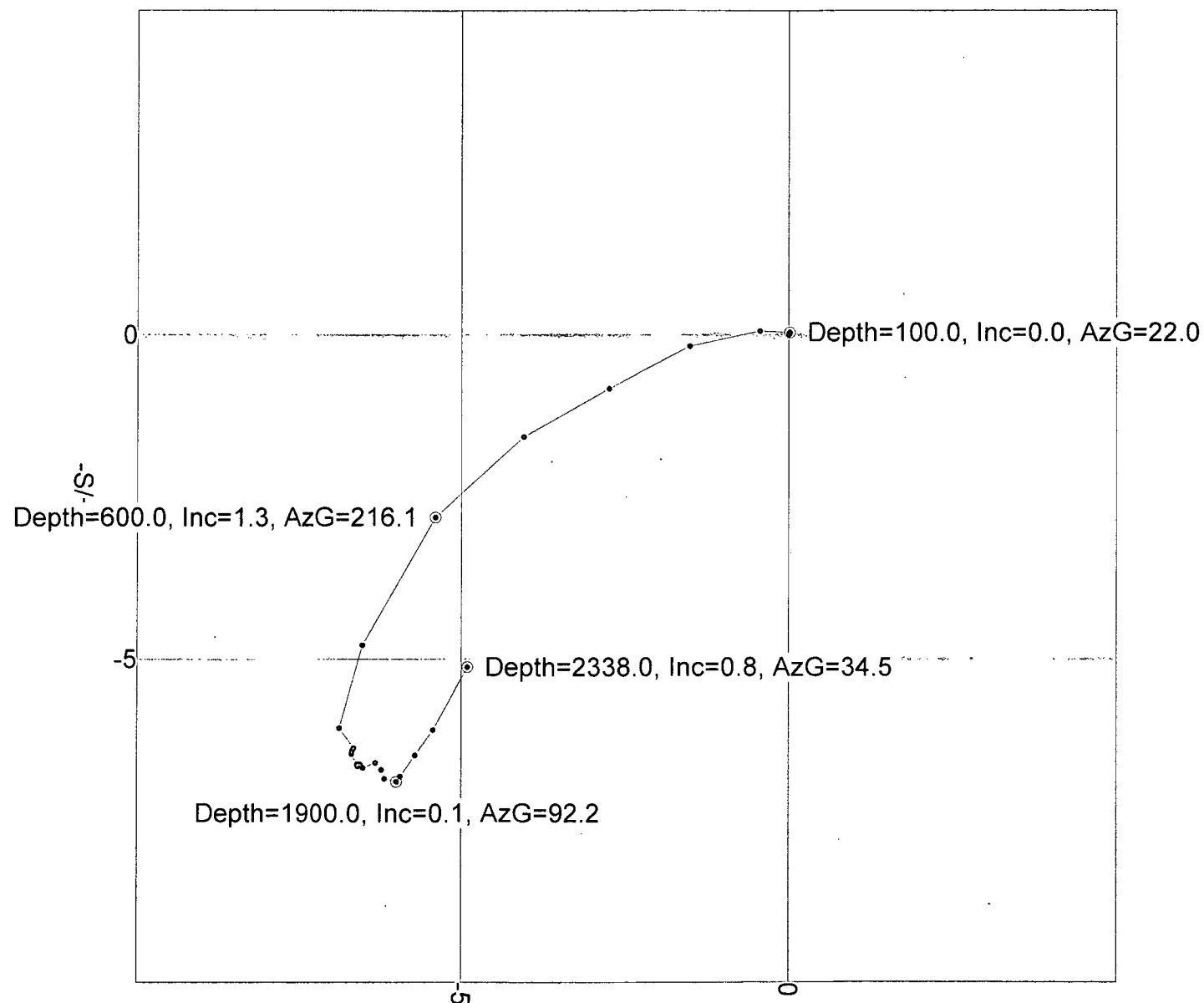
SRO State Com No. 0043H / API 30-015-41141

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	0.04	22.04	100.00	0.04	0.01	0.04	0.04	22.04	0.04
200.00	0.54	268.72	200.00	0.06	-0.44	0.06	0.44	277.76	0.56
300.00	0.74	249.59	299.99	-0.17	-1.51	-0.17	1.52	263.41	0.29
400.00	0.88	235.63	399.98	-0.83	-2.74	-0.83	2.87	253.16	0.24
500.00	0.85	245.22	499.97	-1.57	-4.05	-1.57	4.34	248.77	0.15
600.00	1.32	216.11	599.95	-2.81	-5.40	-2.81	6.09	242.48	0.71
700.00	1.29	202.18	699.93	-4.78	-6.50	-4.78	8.07	233.66	0.32
800.00	0.28	163.16	799.92	-6.06	-6.86	-6.06	9.15	228.51	1.08
900.00	0.19	115.53	899.92	-6.37	-6.63	-6.37	9.20	226.15	0.21
1000.00	0.21	278.92	999.92	-6.42	-6.66	-6.42	9.25	226.06	0.39
1100.00	0.21	113.61	1099.92	-6.46	-6.67	-6.46	9.29	225.89	0.41
1200.00	0.16	213.17	1199.92	-6.66	-6.58	-6.66	9.36	224.65	0.29
1300.00	0.19	25.05	1299.92	-6.62	-6.58	-6.62	9.34	224.82	0.35
1400.00	0.17	189.34	1399.92	-6.62	-6.54	-6.62	9.31	224.63	0.35
1500.00	0.13	36.76	1499.92	-6.68	-6.50	-6.68	9.32	224.20	0.29
1600.00	0.14	94.91	1599.92	-6.60	-6.31	-6.60	9.13	223.69	0.13
1700.00	0.12	199.75	1699.92	-6.71	-6.22	-6.71	9.15	222.82	0.21
1800.00	0.10	117.62	1799.92	-6.85	-6.17	-6.85	9.22	222.02	0.15

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	0.12	92.22	1899.92	-6.89	-5.99	-6.89	9.13	220.97	0.05
2000.00	0.11	333.21	1999.92	-6.81	-5.93	-6.81	9.03	221.03	0.20
2100.00	0.41	48.27	2099.91	-6.49	-5.70	-6.49	8.64	221.33	0.40
2200.00	0.17	1.17	2199.91	-6.10	-5.43	-6.10	8.17	221.70	0.32
2338.00	0.77	34.52	2337.91	-5.13	-4.91	-5.13	7.10	223.72	0.46



VES Survey International
Midland, TX
432-563-5444
Surveyor: Andrew Askew
SRO State Com No. 0043H / API 30-015-41141



-W/+E
V.E.S. Survey Date: 08/07/2014



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ARTESIA DISTRICT

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COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 17, T26S, R28E

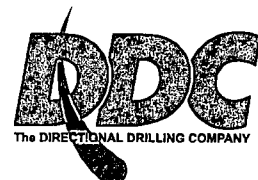
SRO State Unit #43H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

21 August, 2014





Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Unit #43H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3139.0usft (Scandril Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3139.0usft (Scandril Freedom)
Well:	SRO State Unit #43H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 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 17, T26S, R28E		
Site Position:		Northing:	381,689.10 usft
From:	Map	Easting:	570,092.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 57.035 N
		Longitude:	104° 6' 25.573 W
		Grid Convergence:	0.12 °

Well	SRO State Unit #43H		
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° 2' 56.885 N
		Longitude:	104° 6' 51.726 W
		Ground Level:	3,113.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	7/28/2014	7.44
			Dip Angle
			(°)
			59.86
			Field Strength
			(nT)
			48,143

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			180.22

Survey Program	Date 8/21/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	2,338.0	Gyro Survey (Wellbore #1)	Good_gyro
2,464.0	17,712.0	MWD Surveys (Wellbore #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	381,669.30	567,841.80	32° 2' 56.885 N	104° 6' 51.726 W
100.0	0.04	22.04	100.0	0.0	0.0	381,669.33	567,841.82	32° 2' 56.885 N	104° 6' 51.726 W
200.0	0.54	268.72	200.0	0.1	-0.4	381,669.35	567,841.36	32° 2' 56.886 N	104° 6' 51.732 W
300.0	0.74	249.59	300.0	-0.2	-1.5	381,669.12	567,840.28	32° 2' 56.883 N	104° 6' 51.744 W
400.0	0.88	235.63	400.0	-0.8	-2.8	381,668.46	567,839.04	32° 2' 56.877 N	104° 6' 51.759 W
500.0	0.85	245.22	500.0	-1.6	-4.1	381,667.71	567,837.74	32° 2' 56.869 N	104° 6' 51.774 W
600.0	1.32	216.11	600.0	-2.8	-5.4	381,666.47	567,836.38	32° 2' 56.857 N	104° 6' 51.789 W
700.0	1.29	202.18	699.9	-4.8	-6.5	381,664.50	567,835.28	32° 2' 56.838 N	104° 6' 51.802 W
800.0	0.28	163.16	799.9	-6.1	-6.9	381,663.22	567,834.92	32° 2' 56.825 N	104° 6' 51.806 W
900.0	0.19	115.53	899.9	-6.4	-6.7	381,662.92	567,835.15	32° 2' 56.822 N	104° 6' 51.804 W
1,000.0	0.21	278.92	999.9	-6.4	-6.7	381,662.87	567,835.11	32° 2' 56.822 N	104° 6' 51.804 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Unit #43H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3139.0usft (Scandril Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3139.0usft (Scandril Freedom)
Well:	SRO State Unit #43H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.21	113.61	1,099.9	-6.5	-6.7	381,662.83	567,835.10	32° 2' 56.821 N	104° 6' 51.804 W
1,200.0	0.16	213.17	1,199.9	-6.7	-6.6	381,662.64	567,835.19	32° 2' 56.819 N	104° 6' 51.803 W
1,300.0	0.19	25.05	1,299.9	-6.6	-6.6	381,662.67	567,835.19	32° 2' 56.820 N	104° 6' 51.803 W
1,400.0	0.17	189.34	1,399.9	-6.6	-6.6	381,662.68	567,835.23	32° 2' 56.820 N	104° 6' 51.803 W
1,500.0	0.13	36.76	1,499.9	-6.7	-6.5	381,662.62	567,835.28	32° 2' 56.819 N	104° 6' 51.802 W
1,600.0	0.14	94.91	1,599.9	-6.6	-6.3	381,662.70	567,835.47	32° 2' 56.820 N	104° 6' 51.800 W
1,700.0	0.12	199.75	1,699.9	-6.7	-6.3	381,662.59	567,835.55	32° 2' 56.819 N	104° 6' 51.799 W
1,800.0	0.10	117.62	1,799.9	-6.8	-6.2	381,662.45	567,835.59	32° 2' 56.817 N	104° 6' 51.799 W
1,900.0	0.12	92.22	1,899.9	-6.9	-6.0	381,662.41	567,835.78	32° 2' 56.817 N	104° 6' 51.797 W
2,000.0	0.11	333.21	1,999.9	-6.8	-6.0	381,662.49	567,835.84	32° 2' 56.818 N	104° 6' 51.796 W
2,100.0	0.41	48.27	2,099.9	-6.5	-5.7	381,662.81	567,836.06	32° 2' 56.821 N	104° 6' 51.793 W
2,200.0	0.17	1.17	2,199.9	-6.1	-5.5	381,663.20	567,836.33	32° 2' 56.825 N	104° 6' 51.790 W
2,338.0	0.77	34.52	2,337.9	-5.1	-4.9	381,664.17	567,836.86	32° 2' 56.834 N	104° 6' 51.784 W
TIE IN @ 2338' MD / 2338' TVD									
2,464.0	0.10	343.60	2,463.9	-4.3	-4.5	381,664.97	567,837.31	32° 2' 56.842 N	104° 6' 51.779 W
2,555.0	1.10	228.40	2,554.9	-4.8	-5.2	381,664.47	567,836.63	32° 2' 56.837 N	104° 6' 51.787 W
2,650.0	2.40	228.10	2,649.9	-6.8	-7.3	381,662.54	567,834.47	32° 2' 56.818 N	104° 6' 51.812 W
2,839.0	2.60	223.00	2,838.7	-12.5	-13.2	381,656.76	567,828.60	32° 2' 56.761 N	104° 6' 51.880 W
2,934.0	2.70	217.90	2,933.6	-15.9	-16.0	381,653.42	567,825.76	32° 2' 56.728 N	104° 6' 51.913 W
3,029.0	1.70	224.20	3,028.5	-18.7	-18.4	381,650.64	567,823.40	32° 2' 56.701 N	104° 6' 51.941 W
3,217.0	0.30	225.30	3,216.5	-21.0	-20.7	381,648.29	567,821.11	32° 2' 56.678 N	104° 6' 51.967 W
3,406.0	0.60	235.80	3,405.5	-21.9	-21.9	381,647.39	567,819.94	32° 2' 56.669 N	104° 6' 51.981 W
3,596.0	0.60	244.10	3,595.4	-22.9	-23.6	381,646.40	567,818.22	32° 2' 56.659 N	104° 6' 52.001 W
3,785.0	0.30	231.10	3,784.4	-23.6	-24.9	381,645.65	567,816.94	32° 2' 56.652 N	104° 6' 52.016 W
3,975.0	0.50	208.40	3,974.4	-24.7	-25.6	381,644.61	567,816.16	32° 2' 56.641 N	104° 6' 52.025 W
4,164.0	0.60	214.70	4,163.4	-26.2	-26.6	381,643.07	567,815.21	32° 2' 56.626 N	104° 6' 52.036 W
4,353.0	0.70	217.90	4,352.4	-28.0	-27.9	381,641.35	567,813.93	32° 2' 56.609 N	104° 6' 52.051 W
4,542.0	0.60	30.00	4,541.4	-28.0	-28.1	381,641.29	567,813.72	32° 2' 56.608 N	104° 6' 52.053 W
4,732.0	0.30	114.20	4,731.4	-27.3	-27.1	381,641.95	567,814.67	32° 2' 56.615 N	104° 6' 52.042 W
4,921.0	0.60	171.90	4,920.4	-28.5	-26.5	381,640.77	567,815.26	32° 2' 56.603 N	104° 6' 52.035 W
5,110.0	0.40	337.80	5,109.4	-28.9	-26.7	381,640.40	567,815.15	32° 2' 56.600 N	104° 6' 52.037 W
5,300.0	0.00	243.60	5,299.4	-28.3	-26.9	381,641.01	567,814.90	32° 2' 56.606 N	104° 6' 52.040 W
5,489.0	0.30	186.10	5,488.4	-28.8	-27.0	381,640.52	567,814.85	32° 2' 56.601 N	104° 6' 52.040 W
5,678.0	0.60	183.60	5,677.4	-30.3	-27.1	381,639.04	567,814.73	32° 2' 56.586 N	104° 6' 52.042 W
5,867.0	0.70	33.30	5,866.4	-30.3	-26.5	381,639.02	567,815.31	32° 2' 56.586 N	104° 6' 52.035 W
6,056.0	0.10	66.70	6,055.4	-29.2	-25.7	381,640.05	567,816.09	32° 2' 56.596 N	104° 6' 52.026 W
6,245.0	0.70	284.90	6,244.4	-28.9	-26.7	381,640.41	567,815.13	32° 2' 56.600 N	104° 6' 52.037 W
6,434.0	0.80	300.50	6,433.4	-27.9	-28.9	381,641.38	567,812.87	32° 2' 56.609 N	104° 6' 52.063 W
6,623.0	0.60	293.80	6,622.3	-26.9	-31.0	381,642.45	567,810.83	32° 2' 56.620 N	104° 6' 52.087 W
6,812.0	0.50	119.10	6,811.3	-26.9	-31.2	381,642.45	567,810.65	32° 2' 56.620 N	104° 6' 52.089 W
7,001.0	0.60	139.30	7,000.3	-28.0	-29.8	381,641.29	567,812.01	32° 2' 56.609 N	104° 6' 52.073 W
7,191.0	1.00	162.00	7,190.3	-30.3	-28.6	381,638.96	567,813.17	32° 2' 56.585 N	104° 6' 52.060 W
7,380.0	0.30	151.10	7,379.3	-32.3	-27.9	381,636.96	567,813.92	32° 2' 56.566 N	104° 6' 52.051 W
7,413.0	0.30	151.00	7,412.3	-32.5	-27.8	381,636.81	567,814.01	32° 2' 56.564 N	104° 6' 52.050 W
7,444.0	2.90	165.50	7,443.3	-33.3	-27.6	381,635.98	567,814.24	32° 2' 56.556 N	104° 6' 52.047 W
7,476.0	6.60	162.50	7,475.2	-35.9	-26.8	381,633.44	567,815.00	32° 2' 56.531 N	104° 6' 52.039 W
7,507.0	11.10	162.20	7,505.8	-40.4	-25.4	381,628.90	567,816.45	32° 2' 56.486 N	104° 6' 52.022 W
7,539.0	14.40	163.90	7,537.0	-47.2	-23.3	381,622.14	567,818.49	32° 2' 56.419 N	104° 6' 51.998 W
7,571.0	16.70	166.20	7,567.8	-55.4	-21.1	381,613.85	567,820.69	32° 2' 56.337 N	104° 6' 51.973 W
7,603.0	20.00	169.70	7,598.2	-65.3	-19.0	381,604.00	567,822.77	32° 2' 56.239 N	104° 6' 51.949 W
7,634.0	23.30	175.20	7,627.0	-76.6	-17.6	381,592.67	567,824.23	32° 2' 56.127 N	104° 6' 51.932 W
7,666.0	25.30	181.30	7,656.2	-89.8	-17.2	381,579.52	567,824.61	32° 2' 55.997 N	104° 6' 51.928 W
7,697.0	26.60	185.00	7,684.1	-103.3	-18.0	381,565.99	567,823.85	32° 2' 55.863 N	104° 6' 51.937 W
7,729.0	28.60	184.50	7,712.4	-118.1	-19.2	381,551.21	567,822.62	32° 2' 55.717 N	104° 6' 51.952 W
7,760.0	31.20	184.30	7,739.3	-133.5	-20.4	381,535.81	567,821.44	32° 2' 55.564 N	104° 6' 51.966 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Unit #43H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3139.0usft (Scandril Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3139.0usft (Scandril Freedom)
Well:	SRO State Unit #43H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,766.6	32.03	183.96	7,746.6	-138.0	-20.7	381,531.31	567,821.12	32° 2' 55.520 N	104° 6' 51.970 W
CROSSED 330' HARD LINE @ 7769' MD / 7747' TVD									
7,792.0	34.30	183.10	7,766.2	-150.8	-21.5	381,518.53	567,820.33	32° 2' 55.393 N	104° 6' 51.979 W
7,824.0	36.30	182.80	7,792.3	-169.2	-22.4	381,500.07	567,819.38	32° 2' 55.211 N	104° 6' 51.991 W
7,855.0	38.60	181.70	7,816.9	-188.1	-23.2	381,481.23	567,818.65	32° 2' 55.024 N	104° 6' 52.000 W
7,887.0	42.20	180.30	7,841.3	-208.8	-23.5	381,460.50	567,818.29	32° 2' 54.819 N	104° 6' 52.005 W
7,918.0	45.50	180.10	7,863.6	-230.3	-23.6	381,439.03	567,818.22	32° 2' 54.607 N	104° 6' 52.006 W
7,950.0	48.30	179.20	7,885.5	-253.6	-23.4	381,415.67	567,818.37	32° 2' 54.375 N	104° 6' 52.005 W
7,981.0	52.10	178.20	7,905.3	-277.4	-22.9	381,391.86	567,818.91	32° 2' 54.140 N	104° 6' 51.999 W
8,013.0	56.00	177.80	7,924.1	-303.3	-22.0	381,365.98	567,819.82	32° 2' 53.884 N	104° 6' 51.989 W
8,044.0	60.40	178.90	7,940.5	-329.6	-21.2	381,339.65	567,820.57	32° 2' 53.623 N	104° 6' 51.981 W
8,075.0	65.10	178.90	7,954.6	-357.2	-20.7	381,312.10	567,821.10	32° 2' 53.350 N	104° 6' 51.975 W
8,107.0	69.60	178.50	7,967.0	-386.7	-20.0	381,282.59	567,821.77	32° 2' 53.058 N	104° 6' 51.968 W
8,139.0	74.20	178.20	7,976.9	-417.1	-19.2	381,252.19	567,822.65	32° 2' 52.757 N	104° 6' 51.959 W
8,170.0	79.80	179.40	7,983.9	-447.3	-18.5	381,222.00	567,823.28	32° 2' 52.459 N	104° 6' 51.952 W
8,197.0	83.00	182.40	7,987.9	-474.0	-18.9	381,195.32	567,822.85	32° 2' 52.195 N	104° 6' 51.958 W
8,229.0	84.60	183.30	7,991.4	-505.8	-20.5	381,163.54	567,821.27	32° 2' 51.880 N	104° 6' 51.977 W
8,260.0	84.90	183.40	7,994.2	-536.6	-22.3	381,132.73	567,819.47	32° 2' 51.575 N	104° 6' 51.999 W
8,291.0	86.00	183.80	7,996.7	-567.4	-24.3	381,101.89	567,817.53	32° 2' 51.270 N	104° 6' 52.022 W
8,323.0	87.40	184.00	7,998.5	-599.3	-26.4	381,070.01	567,815.35	32° 2' 50.955 N	104° 6' 52.048 W
8,355.0	88.90	183.40	7,999.5	-631.2	-28.5	381,038.10	567,813.29	32° 2' 50.639 N	104° 6' 52.073 W
8,386.0	89.30	183.60	8,000.0	-662.1	-30.4	381,007.16	567,811.40	32° 2' 50.333 N	104° 6' 52.095 W
8,418.0	89.80	183.40	8,000.3	-694.1	-32.4	380,975.22	567,809.44	32° 2' 50.017 N	104° 6' 52.119 W
8,481.0	91.80	182.80	7,999.4	-757.0	-35.8	380,912.32	567,806.04	32° 2' 49.394 N	104° 6' 52.160 W
8,575.0	90.80	181.70	7,997.3	-850.9	-39.5	380,818.42	567,802.35	32° 2' 48.465 N	104° 6' 52.205 W
8,670.0	91.40	180.60	7,995.4	-945.8	-41.4	380,723.46	567,800.44	32° 2' 47.525 N	104° 6' 52.229 W
8,764.0	91.30	179.40	7,993.2	-1,039.8	-41.4	380,629.49	567,800.44	32° 2' 46.595 N	104° 6' 52.231 W
8,859.0	89.90	178.40	7,992.2	-1,134.8	-39.5	380,534.52	567,802.27	32° 2' 45.655 N	104° 6' 52.213 W
8,954.0	89.90	179.80	7,992.4	-1,229.8	-38.0	380,439.53	567,803.76	32° 2' 44.715 N	104° 6' 52.197 W
9,049.0	91.00	179.60	7,991.7	-1,324.8	-37.5	380,344.54	567,804.26	32° 2' 43.775 N	104° 6' 52.194 W
9,143.0	90.20	180.50	7,990.7	-1,418.8	-37.6	380,250.54	567,804.17	32° 2' 42.845 N	104° 6' 52.197 W
9,237.0	89.20	180.60	7,991.2	-1,512.7	-38.5	380,156.55	567,803.27	32° 2' 41.915 N	104° 6' 52.210 W
9,332.0	90.50	180.60	7,991.4	-1,607.7	-39.5	380,061.56	567,802.28	32° 2' 40.975 N	104° 6' 52.224 W
9,427.0	89.40	181.30	7,991.5	-1,702.7	-41.1	379,966.57	567,800.70	32° 2' 40.035 N	104° 6' 52.244 W
9,521.0	90.40	181.20	7,991.7	-1,796.7	-43.2	379,872.60	567,798.65	32° 2' 39.105 N	104° 6' 52.270 W
9,616.0	89.50	181.30	7,991.7	-1,891.7	-45.2	379,777.62	567,796.58	32° 2' 38.165 N	104° 6' 52.296 W
9,710.0	90.80	181.30	7,991.5	-1,985.7	-47.4	379,683.65	567,794.45	32° 2' 37.235 N	104° 6' 52.323 W
9,805.0	90.00	181.00	7,990.8	-2,080.6	-49.3	379,588.67	567,792.54	32° 2' 36.295 N	104° 6' 52.348 W
9,899.0	91.20	180.80	7,989.8	-2,174.6	-50.7	379,494.69	567,791.06	32° 2' 35.365 N	104° 6' 52.367 W
9,994.0	90.30	180.80	7,988.6	-2,269.6	-52.1	379,399.70	567,789.74	32° 2' 34.425 N	104° 6' 52.385 W
10,088.0	91.10	180.10	7,987.5	-2,363.6	-52.8	379,305.72	567,789.00	32° 2' 33.495 N	104° 6' 52.396 W
10,183.0	89.80	179.80	7,986.7	-2,458.6	-52.7	379,210.72	567,789.08	32° 2' 32.555 N	104° 6' 52.397 W
10,277.0	90.80	179.60	7,986.2	-2,552.6	-52.2	379,116.73	567,789.57	32° 2' 31.624 N	104° 6' 52.393 W
10,372.0	89.50	179.20	7,986.0	-2,647.6	-51.2	379,021.73	567,790.57	32° 2' 30.684 N	104° 6' 52.384 W
10,466.0	90.20	179.10	7,986.2	-2,741.6	-49.8	378,927.74	567,791.96	32° 2' 29.754 N	104° 6' 52.370 W
10,561.0	92.00	179.10	7,984.4	-2,836.5	-48.3	378,832.78	567,793.46	32° 2' 28.814 N	104° 6' 52.355 W
10,656.0	90.80	178.50	7,982.1	-2,931.5	-46.4	378,737.83	567,795.44	32° 2' 27.874 N	104° 6' 52.334 W
10,751.0	89.80	178.40	7,981.6	-3,026.4	-43.8	378,642.87	567,798.01	32° 2' 26.935 N	104° 6' 52.306 W
10,846.0	91.00	177.80	7,980.9	-3,121.4	-40.6	378,547.92	567,801.16	32° 2' 25.995 N	104° 6' 52.272 W
10,940.0	90.00	178.00	7,980.1	-3,215.3	-37.2	378,453.99	567,804.61	32° 2' 25.065 N	104° 6' 52.234 W
11,035.0	89.30	179.60	7,980.7	-3,310.3	-35.2	378,359.02	567,806.60	32° 2' 24.125 N	104° 6' 52.213 W
11,130.0	89.30	181.50	7,981.8	-3,405.3	-36.1	378,264.03	567,805.69	32° 2' 23.185 N	104° 6' 52.226 W
11,224.0	90.50	181.30	7,982.0	-3,499.2	-38.4	378,170.06	567,803.39	32° 2' 22.255 N	104° 6' 52.255 W
11,319.0	89.70	181.00	7,981.8	-3,594.2	-40.3	378,075.08	567,801.48	32° 2' 21.315 N	104° 6' 52.280 W
11,412.0	91.10	181.50	7,981.2	-3,687.2	-42.3	377,982.11	567,799.45	32° 2' 20.395 N	104° 6' 52.305 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Unit #43H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3139.0usft (Scandrell Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3139.0usft (Scandrell Freedom)
Well:	SRO State Unit #43H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
11,506.0	91.30	180.80	7,979.2	-3,781.1	-44.2	377,888.15	567,797.57	32° 2' 19.465 N	104° 6' 52.329 W	
11,601.0	90.50	180.60	7,977.7	-3,876.1	-45.4	377,793.17	567,796.41	32° 2' 18.525 N	104° 6' 52.345 W	
11,695.0	89.70	180.30	7,977.6	-3,970.1	-46.1	377,699.17	567,795.67	32° 2' 17.595 N	104° 6' 52.356 W	
11,789.0	90.20	181.00	7,977.6	-4,064.1	-47.2	377,605.18	567,794.60	32° 2' 16.665 N	104° 6' 52.371 W	
11,883.0	88.40	181.30	7,978.8	-4,158.1	-49.1	377,511.21	567,792.72	32° 2' 15.735 N	104° 6' 52.395 W	
11,977.0	89.30	180.80	7,980.7	-4,252.1	-50.8	377,417.25	567,790.99	32° 2' 14.805 N	104° 6' 52.417 W	
12,071.0	90.00	180.50	7,981.2	-4,346.0	-51.9	377,323.25	567,789.93	32° 2' 13.875 N	104° 6' 52.431 W	
12,165.0	89.30	180.60	7,981.8	-4,440.0	-52.8	377,229.26	567,789.03	32° 2' 12.945 N	104° 6' 52.444 W	
12,259.0	89.70	180.50	7,982.6	-4,534.0	-53.7	377,135.27	567,788.12	32° 2' 12.015 N	104° 6' 52.457 W	
12,353.0	90.50	180.10	7,982.5	-4,628.0	-54.2	377,041.27	567,787.63	32° 2' 11.084 N	104° 6' 52.465 W	
12,447.0	91.00	179.90	7,981.2	-4,722.0	-54.2	376,947.28	567,787.63	32° 2' 10.154 N	104° 6' 52.467 W	
12,541.0	91.40	179.60	7,979.3	-4,816.0	-53.8	376,853.30	567,788.04	32° 2' 9.224 N	104° 6' 52.464 W	
12,635.0	90.00	179.90	7,978.1	-4,910.0	-53.4	376,759.31	567,788.45	32° 2' 8.294 N	104° 6' 52.462 W	
12,729.0	90.50	179.40	7,977.7	-5,004.0	-52.8	376,665.32	567,789.02	32° 2' 7.364 N	104° 6' 52.457 W	
12,823.0	89.20	179.80	7,978.0	-5,098.0	-52.1	376,571.32	567,789.68	32° 2' 6.433 N	104° 6' 52.452 W	
12,917.0	90.00	179.80	7,978.6	-5,192.0	-51.8	376,477.32	567,790.01	32° 2' 5.503 N	104° 6' 52.450 W	
13,011.0	90.90	179.80	7,977.9	-5,286.0	-51.5	376,383.33	567,790.34	32° 2' 4.573 N	104° 6' 52.449 W	
13,106.0	89.70	180.30	7,977.4	-5,381.0	-51.5	376,288.33	567,790.25	32° 2' 3.633 N	104° 6' 52.452 W	
13,200.0	90.70	180.10	7,977.1	-5,475.0	-51.9	376,194.33	567,789.93	32° 2' 2.703 N	104° 6' 52.458 W	
13,293.0	89.40	180.50	7,977.0	-5,568.0	-52.4	376,101.34	567,789.44	32° 2' 1.782 N	104° 6' 52.466 W	
13,387.0	90.10	180.10	7,977.4	-5,662.0	-52.9	376,007.34	567,788.95	32° 2' 0.852 N	104° 6' 52.474 W	
13,481.0	90.80	179.90	7,976.6	-5,756.0	-52.9	375,913.34	567,788.95	32° 1' 59.922 N	104° 6' 52.476 W	
13,575.0	89.90	180.10	7,976.1	-5,850.0	-52.9	375,819.35	567,788.95	32° 1' 58.991 N	104° 6' 52.478 W	
13,670.0	90.40	179.10	7,975.8	-5,944.9	-52.2	375,724.35	567,789.61	32° 1' 58.051 N	104° 6' 52.473 W	
13,764.0	91.20	178.90	7,974.5	-6,038.9	-50.6	375,630.38	567,791.25	32° 1' 57.121 N	104° 6' 52.456 W	
13,858.0	90.00	178.70	7,973.5	-6,132.9	-48.6	375,536.40	567,793.22	32° 1' 56.191 N	104° 6' 52.435 W	
13,952.0	90.80	178.50	7,972.9	-6,226.9	-46.3	375,442.43	567,795.52	32° 1' 55.261 N	104° 6' 52.411 W	
14,046.0	92.00	178.70	7,970.6	-6,320.8	-44.0	375,348.49	567,797.81	32° 1' 54.331 N	104° 6' 52.386 W	
14,140.0	91.60	180.10	7,967.6	-6,414.8	-43.0	375,254.55	567,798.80	32° 1' 53.402 N	104° 6' 52.377 W	
14,234.0	90.90	181.20	7,965.6	-6,508.7	-44.1	375,160.58	567,797.73	32° 1' 52.472 N	104° 6' 52.392 W	
14,328.0	90.10	180.80	7,964.7	-6,602.7	-45.7	375,066.60	567,796.09	32° 1' 51.542 N	104° 6' 52.413 W	
14,422.0	89.80	181.20	7,964.8	-6,696.7	-47.4	374,972.61	567,794.45	32° 1' 50.612 N	104° 6' 52.434 W	
14,516.0	88.80	181.20	7,966.0	-6,790.7	-49.3	374,878.64	567,792.48	32° 1' 49.682 N	104° 6' 52.459 W	
14,610.0	89.30	181.20	7,967.5	-6,884.6	-51.3	374,784.67	567,790.51	32° 1' 48.752 N	104° 6' 52.484 W	
14,704.0	90.00	181.30	7,968.1	-6,978.6	-53.3	374,690.70	567,788.46	32° 1' 47.822 N	104° 6' 52.510 W	
14,799.0	90.60	180.80	7,967.6	-7,073.6	-55.1	374,595.72	567,786.72	32° 1' 46.882 N	104° 6' 52.533 W	
14,893.0	89.50	181.20	7,967.5	-7,167.6	-56.7	374,501.73	567,785.08	32° 1' 45.952 N	104° 6' 52.554 W	
14,987.0	90.20	181.20	7,967.8	-7,261.5	-58.7	374,407.75	567,783.11	32° 1' 45.022 N	104° 6' 52.579 W	
15,080.0	90.50	180.80	7,967.2	-7,354.5	-60.3	374,314.77	567,781.49	32° 1' 44.101 N	104° 6' 52.600 W	
15,174.0	90.60	180.80	7,966.3	-7,448.5	-61.6	374,220.78	567,780.18	32° 1' 43.171 N	104° 6' 52.618 W	
15,268.0	90.90	180.30	7,965.1	-7,542.5	-62.5	374,126.80	567,779.27	32° 1' 42.241 N	104° 6' 52.630 W	
15,363.0	90.00	180.80	7,964.3	-7,637.5	-63.4	374,031.80	567,778.36	32° 1' 41.301 N	104° 6' 52.643 W	
15,457.0	90.80	179.90	7,963.7	-7,731.5	-64.0	373,937.81	567,777.79	32° 1' 40.371 N	104° 6' 52.652 W	
15,551.0	89.30	180.10	7,963.6	-7,825.5	-64.0	373,843.81	567,777.79	32° 1' 39.441 N	104° 6' 52.654 W	
15,645.0	90.20	179.90	7,964.0	-7,919.5	-64.0	373,749.81	567,777.79	32° 1' 38.510 N	104° 6' 52.657 W	
15,740.0	90.80	179.80	7,963.2	-8,014.5	-63.8	373,654.82	567,778.04	32° 1' 37.570 N	104° 6' 52.656 W	
15,834.0	89.90	180.60	7,962.6	-8,108.5	-64.1	373,560.82	567,777.71	32° 1' 36.640 N	104° 6' 52.662 W	
15,929.0	90.40	180.60	7,962.4	-8,203.5	-65.1	373,465.83	567,776.71	32° 1' 35.700 N	104° 6' 52.676 W	
16,023.0	91.00	180.30	7,961.2	-8,297.5	-65.8	373,371.84	567,775.97	32° 1' 34.770 N	104° 6' 52.687 W	
16,117.0	90.10	180.50	7,960.3	-8,391.5	-66.5	373,277.85	567,775.32	32° 1' 33.839 N	104° 6' 52.696 W	
16,211.0	90.80	179.90	7,959.6	-8,485.4	-66.8	373,183.85	567,774.99	32° 1' 32.909 N	104° 6' 52.702 W	
16,305.0	90.00	179.80	7,958.9	-8,579.4	-66.6	373,089.85	567,775.24	32° 1' 31.979 N	104° 6' 52.702 W	
16,399.0	90.00	179.60	7,958.9	-8,673.4	-66.1	372,995.86	567,775.73	32° 1' 31.049 N	104° 6' 52.698 W	
16,493.0	90.40	179.40	7,958.6	-8,767.4	-65.3	372,901.86	567,776.55	32° 1' 30.118 N	104° 6' 52.691 W	
16,587.0	90.20	179.10	7,958.1	-8,861.4	-64.0	372,807.87	567,777.78	32° 1' 29.188 N	104° 6' 52.679 W	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Unit #43H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3139.0usft (Scandril Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3139.0usft (Scandril Freedom)
Well:	SRO State Unit #43H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,681.0	90.40	179.90	7,957.6	-8,955.4	-63.2	372,713.88	567,778.60	32° 1' 28.258 N	104° 6' 52.671 W
16,776.0	90.70	179.40	7,956.7	-9,050.4	-62.6	372,618.88	567,779.18	32° 1' 27.318 N	104° 6' 52.667 W
16,870.0	90.70	178.50	7,955.5	-9,144.4	-60.9	372,524.91	567,780.90	32° 1' 26.388 N	104° 6' 52.649 W
16,964.0	90.90	179.40	7,954.2	-9,238.4	-59.2	372,430.93	567,782.62	32° 1' 25.458 N	104° 6' 52.631 W
17,058.0	90.90	179.90	7,952.7	-9,332.4	-58.6	372,336.95	567,783.20	32° 1' 24.528 N	104° 6' 52.627 W
17,152.0	91.10	179.40	7,951.1	-9,426.3	-58.0	372,242.96	567,783.77	32° 1' 23.597 N	104° 6' 52.622 W
17,246.0	90.80	180.50	7,949.5	-9,520.3	-57.9	372,148.98	567,783.85	32° 1' 22.667 N	104° 6' 52.624 W
17,340.0	91.30	180.30	7,947.8	-9,614.3	-58.6	372,054.99	567,783.20	32° 1' 21.737 N	104° 6' 52.634 W
17,434.0	90.40	180.80	7,946.4	-9,708.3	-59.5	371,961.01	567,782.30	32° 1' 20.807 N	104° 6' 52.646 W
17,529.0	90.70	180.30	7,945.5	-9,803.3	-60.4	371,866.02	567,781.38	32° 1' 19.867 N	104° 6' 52.659 W
17,622.0	90.80	179.90	7,944.3	-9,896.3	-60.6	371,773.03	567,781.22	32° 1' 18.947 N	104° 6' 52.663 W
17,665.0	90.80	180.10	7,943.7	-9,939.3	-60.6	371,730.03	567,781.22	32° 1' 18.521 N	104° 6' 52.664 W
17,712.0	90.80	180.10	7,943.0	-9,986.3	-60.7	371,683.04	567,781.14	32° 1' 18.056 N	104° 6' 52.666 W
TD @ 17712' MD / 7943' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,338.0	2,337.9	-5.1	-4.9	TIE IN @ 2338' MD / 2338' TVD
7,768.6	7,746.6	-138.0	-20.7	CROSSED 330' HARD LINE @ 7769' MD / 7747' TVD
17,712.0	7,943.0	-9,986.3	-60.7	TD @ 17712' MD / 7943' TVD

Checked By: _____ Approved By: _____ Date: _____