



CONCHO

COG Operating L L C

Eddy County, NM (NAD 27 NME)

Sec. 31, T 26 S, R 28- E

Way South State Com 703H

NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 12 2018

RECEIVED

Wellbore #1

30-015-45543

Plan: Plan #1

Standard Survey Report

12 December, 2018



INTEGRITY
DIRECTIONAL

Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 31, T 26 S, R 28- E
Well: Way South State Com 703H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Way South State Com 703H
TVD Reference: KB=29' @ 3111.00usft (Noram 23)
MD Reference: KB=29' @ 3111.00usft (Noram 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

Project	Eddy County, NM (NAD 27 NME)		
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. 31, T 26 S, R 28- E				
Site Position:		Northing:	363,736.60 usft	Latitude:	31.99984
From:	Map	Easting:	566,855.10 usft	Longitude:	-104.11767
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.11 °

Well	Way South State Com 703H					
Well Position	+N/-S	0.00 usft	Northing:	364,000.90 usft	Latitude:	32.00057
	+E/-W	0.00 usft	Easting:	566,164.60 usft	Longitude:	-104.11990
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level:	3,082.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/12/2018	7.13	59.63	47,819

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	358.60	

Survey Tool Program	Date 12/12/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	21,529.46	Plan #1 (Wellbore #1)	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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00



Survey Report



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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)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,406.46	0.00	0.00	4,406.46	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
4,500.00	1.87	244.00	4,499.98	-0.67	-1.37	-0.64	2.00	2.00	0.00
4,600.00	3.87	244.00	4,599.85	-2.86	-5.87	-2.72	2.00	2.00	0.00
4,656.46	5.00	244.00	4,656.15	-4.78	-9.80	-4.54	2.00	2.00	0.00
Start 3593.54 hold at 4656.46 MD									
4,700.00	5.00	244.00	4,699.52	-6.44	-13.21	-6.12	0.00	0.00	0.00
4,800.00	5.00	244.00	4,799.14	-10.26	-21.04	-9.75	0.00	0.00	0.00
4,900.00	5.00	244.00	4,898.76	-14.08	-28.88	-13.38	0.00	0.00	0.00

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5,000.00	5.00	244.00	4,998.38	-17.90	-36.71	-17.00	0.00	0.00	0.00
5,100.00	5.00	244.00	5,098.00	-21.72	-44.54	-20.63	0.00	0.00	0.00
5,200.00	5.00	244.00	5,197.61	-25.55	-52.38	-24.26	0.00	0.00	0.00
5,300.00	5.00	244.00	5,297.23	-29.37	-60.21	-27.89	0.00	0.00	0.00
5,400.00	5.00	244.00	5,396.85	-33.19	-68.04	-31.52	0.00	0.00	0.00
5,500.00	5.00	244.00	5,496.47	-37.01	-75.88	-35.15	0.00	0.00	0.00
5,600.00	5.00	244.00	5,596.09	-40.83	-83.71	-38.77	0.00	0.00	0.00
5,700.00	5.00	244.00	5,695.71	-44.65	-91.54	-42.40	0.00	0.00	0.00
5,800.00	5.00	244.00	5,795.33	-48.47	-99.38	-46.03	0.00	0.00	0.00
5,900.00	5.00	244.00	5,894.95	-52.29	-107.21	-49.66	0.00	0.00	0.00
6,000.00	5.00	244.00	5,994.57	-56.11	-115.04	-53.29	0.00	0.00	0.00
6,100.00	5.00	244.00	6,094.19	-59.93	-122.88	-56.92	0.00	0.00	0.00
6,200.00	5.00	244.00	6,193.81	-63.75	-130.71	-60.55	0.00	0.00	0.00
6,300.00	5.00	244.00	6,293.43	-67.57	-138.54	-64.17	0.00	0.00	0.00
6,400.00	5.00	244.00	6,393.05	-71.39	-146.38	-67.80	0.00	0.00	0.00
6,500.00	5.00	244.00	6,492.67	-75.21	-154.21	-71.43	0.00	0.00	0.00
6,600.00	5.00	244.00	6,592.29	-79.03	-162.05	-75.06	0.00	0.00	0.00
6,700.00	5.00	244.00	6,691.91	-82.86	-169.88	-78.69	0.00	0.00	0.00
6,800.00	5.00	244.00	6,791.53	-86.68	-177.71	-82.32	0.00	0.00	0.00
6,900.00	5.00	244.00	6,891.15	-90.50	-185.55	-85.95	0.00	0.00	0.00
7,000.00	5.00	244.00	6,990.77	-94.32	-193.38	-89.57	0.00	0.00	0.00
7,100.00	5.00	244.00	7,090.38	-98.14	-201.21	-93.20	0.00	0.00	0.00
7,200.00	5.00	244.00	7,190.00	-101.96	-209.05	-96.83	0.00	0.00	0.00
7,300.00	5.00	244.00	7,289.62	-105.78	-216.88	-100.46	0.00	0.00	0.00
7,400.00	5.00	244.00	7,389.24	-109.60	-224.71	-104.09	0.00	0.00	0.00
7,500.00	5.00	244.00	7,488.86	-113.42	-232.55	-107.72	0.00	0.00	0.00
7,600.00	5.00	244.00	7,588.48	-117.24	-240.38	-111.35	0.00	0.00	0.00
7,700.00	5.00	244.00	7,688.10	-121.06	-248.21	-114.97	0.00	0.00	0.00
7,800.00	5.00	244.00	7,787.72	-124.88	-256.05	-118.60	0.00	0.00	0.00
7,900.00	5.00	244.00	7,887.34	-128.70	-263.88	-122.23	0.00	0.00	0.00
8,000.00	5.00	244.00	7,986.96	-132.52	-271.71	-125.86	0.00	0.00	0.00
8,100.00	5.00	244.00	8,086.58	-136.34	-279.55	-129.49	0.00	0.00	0.00
8,200.00	5.00	244.00	8,186.20	-140.17	-287.38	-133.12	0.00	0.00	0.00
8,250.00	5.00	244.00	8,236.01	-142.08	-291.30	-134.93	0.00	0.00	0.00
Start Drop -2.00									
8,300.00	4.00	244.00	8,285.85	-143.80	-294.82	-136.56	2.00	-2.00	0.00
8,400.00	2.00	244.00	8,385.71	-146.09	-299.53	-138.74	2.00	-2.00	0.00
8,500.00	0.00	0.00	8,485.69	-146.85	-301.10	-139.47	2.00	-2.00	116.00
Start 177.37 hold at 8500.00 MD									
8,600.00	0.00	0.00	8,585.69	-146.85	-301.10	-139.47	0.00	0.00	0.00
8,677.37	0.00	0.00	8,663.06	-146.85	-301.10	-139.47	0.00	0.00	0.00
Start DLS 10.00 TFO 360.00									
8,700.00	2.26	360.00	8,685.69	-146.41	-301.10	-139.02	10.00	10.00	0.00
8,800.00	12.26	360.00	8,784.76	-133.78	-301.10	-126.40	10.00	10.00	0.00

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8,900.00	22.26	360.00	8,880.13	-104.14	-301.10	-96.77	10.00	10.00	0.00
9,000.00	32.26	360.00	8,968.91	-58.39	-301.10	-51.03	10.00	10.00	0.00
9,100.00	42.26	360.00	9,048.40	2.08	-301.11	9.42	10.00	10.00	0.00
9,200.00	52.26	360.00	9,116.17	75.43	-301.11	82.75	10.00	10.00	0.00
9,300.00	62.26	360.00	9,170.18	159.44	-301.12	166.74	10.00	10.00	0.00
9,400.00	72.26	360.00	9,208.78	251.55	-301.12	258.82	10.00	10.00	0.00
9,500.00	82.26	360.00	9,230.80	348.97	-301.13	356.21	10.00	10.00	0.00
9,573.20	89.58	360.00	9,236.00	421.93	-301.13	429.15	10.00	10.00	0.00
Start 11956.28 hold at 9573.20 MD									
9,600.00	89.58	360.00	9,236.20	448.73	-301.13	455.94	0.00	0.00	0.00
9,700.00	89.58	360.00	9,236.93	548.73	-301.14	555.91	0.00	0.00	0.00
9,800.00	89.58	360.00	9,237.65	648.73	-301.15	655.88	0.00	0.00	0.00
9,900.00	89.58	360.00	9,238.38	748.73	-301.15	755.85	0.00	0.00	0.00
10,000.00	89.58	360.00	9,239.11	848.72	-301.16	855.81	0.00	0.00	0.00
10,100.00	89.58	360.00	9,239.84	948.72	-301.17	955.78	0.00	0.00	0.00
10,200.00	89.58	360.00	9,240.56	1,048.72	-301.17	1,055.75	0.00	0.00	0.00
10,300.00	89.58	360.00	9,241.29	1,148.72	-301.18	1,155.72	0.00	0.00	0.00
10,400.00	89.58	360.00	9,242.02	1,248.71	-301.19	1,255.69	0.00	0.00	0.00
10,500.00	89.58	360.00	9,242.75	1,348.71	-301.19	1,355.65	0.00	0.00	0.00
10,600.00	89.58	360.00	9,243.47	1,448.71	-301.20	1,455.62	0.00	0.00	0.00
10,700.00	89.58	360.00	9,244.20	1,548.70	-301.20	1,555.59	0.00	0.00	0.00
10,800.00	89.58	360.00	9,244.93	1,648.70	-301.21	1,655.56	0.00	0.00	0.00
10,900.00	89.58	360.00	9,245.66	1,748.70	-301.22	1,755.52	0.00	0.00	0.00
11,000.00	89.58	360.00	9,246.38	1,848.70	-301.22	1,855.49	0.00	0.00	0.00
11,100.00	89.58	360.00	9,247.11	1,948.69	-301.23	1,955.46	0.00	0.00	0.00
11,200.00	89.58	360.00	9,247.84	2,048.69	-301.24	2,055.43	0.00	0.00	0.00
11,300.00	89.58	360.00	9,248.57	2,148.69	-301.24	2,155.40	0.00	0.00	0.00
11,400.00	89.58	360.00	9,249.30	2,248.69	-301.25	2,255.36	0.00	0.00	0.00
11,500.00	89.58	360.00	9,250.02	2,348.68	-301.26	2,355.33	0.00	0.00	0.00
11,600.00	89.58	360.00	9,250.75	2,448.68	-301.26	2,455.30	0.00	0.00	0.00
11,700.00	89.58	360.00	9,251.48	2,548.68	-301.27	2,555.27	0.00	0.00	0.00
11,800.00	89.58	360.00	9,252.21	2,648.68	-301.28	2,655.23	0.00	0.00	0.00
11,900.00	89.58	360.00	9,252.93	2,748.67	-301.28	2,755.20	0.00	0.00	0.00
12,000.00	89.58	360.00	9,253.66	2,848.67	-301.29	2,855.17	0.00	0.00	0.00
12,100.00	89.58	360.00	9,254.39	2,948.67	-301.29	2,955.14	0.00	0.00	0.00
12,200.00	89.58	360.00	9,255.12	3,048.67	-301.30	3,055.11	0.00	0.00	0.00
12,300.00	89.58	360.00	9,255.84	3,148.66	-301.31	3,155.07	0.00	0.00	0.00
12,400.00	89.58	360.00	9,256.57	3,248.66	-301.31	3,255.04	0.00	0.00	0.00
12,500.00	89.58	360.00	9,257.30	3,348.66	-301.32	3,355.01	0.00	0.00	0.00
12,600.00	89.58	360.00	9,258.03	3,448.65	-301.33	3,454.98	0.00	0.00	0.00
12,700.00	89.58	360.00	9,258.75	3,548.65	-301.33	3,554.94	0.00	0.00	0.00
12,800.00	89.58	360.00	9,259.48	3,648.65	-301.34	3,654.91	0.00	0.00	0.00
12,900.00	89.58	360.00	9,260.21	3,748.65	-301.35	3,754.88	0.00	0.00	0.00

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Design: Plan #1

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TVD Reference: KB=29' @ 3111.00usft (Noram 23)
MD Reference: KB=29' @ 3111.00usft (Noram 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

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)
13,000.00	89.58	360.00	9,260.94	3,848.64	-301.35	3,854.85	0.00	0.00	0.00
13,100.00	89.58	360.00	9,261.66	3,948.64	-301.36	3,954.82	0.00	0.00	0.00
13,200.00	89.58	360.00	9,262.39	4,048.64	-301.37	4,054.78	0.00	0.00	0.00
13,300.00	89.58	360.00	9,263.12	4,148.64	-301.37	4,154.75	0.00	0.00	0.00
13,400.00	89.58	360.00	9,263.85	4,248.63	-301.38	4,254.72	0.00	0.00	0.00
13,500.00	89.58	360.00	9,264.58	4,348.63	-301.38	4,354.69	0.00	0.00	0.00
13,600.00	89.58	360.00	9,265.30	4,448.63	-301.39	4,454.65	0.00	0.00	0.00
13,700.00	89.58	360.00	9,266.03	4,548.63	-301.40	4,554.62	0.00	0.00	0.00
13,800.00	89.58	360.00	9,266.76	4,648.62	-301.40	4,654.59	0.00	0.00	0.00
13,900.00	89.58	360.00	9,267.49	4,748.62	-301.41	4,754.56	0.00	0.00	0.00
14,000.00	89.58	360.00	9,268.21	4,848.62	-301.42	4,854.53	0.00	0.00	0.00
14,100.00	89.58	360.00	9,268.94	4,948.61	-301.42	4,954.49	0.00	0.00	0.00
14,200.00	89.58	360.00	9,269.67	5,048.61	-301.43	5,054.46	0.00	0.00	0.00
14,300.00	89.58	360.00	9,270.40	5,148.61	-301.44	5,154.43	0.00	0.00	0.00
14,400.00	89.58	360.00	9,271.12	5,248.61	-301.44	5,254.40	0.00	0.00	0.00
14,500.00	89.58	360.00	9,271.85	5,348.60	-301.45	5,354.36	0.00	0.00	0.00
14,600.00	89.58	360.00	9,272.58	5,448.60	-301.46	5,454.33	0.00	0.00	0.00
14,700.00	89.58	360.00	9,273.31	5,548.60	-301.46	5,554.30	0.00	0.00	0.00
14,800.00	89.58	360.00	9,274.03	5,648.60	-301.47	5,654.27	0.00	0.00	0.00
14,900.00	89.58	360.00	9,274.76	5,748.59	-301.47	5,754.24	0.00	0.00	0.00
15,000.00	89.58	360.00	9,275.49	5,848.59	-301.48	5,854.20	0.00	0.00	0.00
15,100.00	89.58	360.00	9,276.22	5,948.59	-301.49	5,954.17	0.00	0.00	0.00
15,200.00	89.58	360.00	9,276.95	6,048.59	-301.49	6,054.14	0.00	0.00	0.00
15,300.00	89.58	360.00	9,277.67	6,148.58	-301.50	6,154.11	0.00	0.00	0.00
15,400.00	89.58	360.00	9,278.40	6,248.58	-301.51	6,254.07	0.00	0.00	0.00
15,500.00	89.58	360.00	9,279.13	6,348.58	-301.51	6,354.04	0.00	0.00	0.00
15,600.00	89.58	360.00	9,279.86	6,448.58	-301.52	6,454.01	0.00	0.00	0.00
15,700.00	89.58	360.00	9,280.58	6,548.57	-301.53	6,553.98	0.00	0.00	0.00
15,800.00	89.58	360.00	9,281.31	6,648.57	-301.53	6,653.95	0.00	0.00	0.00
15,900.00	89.58	360.00	9,282.04	6,748.57	-301.54	6,753.91	0.00	0.00	0.00
16,000.00	89.58	360.00	9,282.77	6,848.56	-301.55	6,853.88	0.00	0.00	0.00
16,100.00	89.58	360.00	9,283.49	6,948.56	-301.55	6,953.85	0.00	0.00	0.00
16,200.00	89.58	360.00	9,284.22	7,048.56	-301.56	7,053.82	0.00	0.00	0.00
16,300.00	89.58	360.00	9,284.95	7,148.56	-301.56	7,153.78	0.00	0.00	0.00
16,400.00	89.58	360.00	9,285.68	7,248.55	-301.57	7,253.75	0.00	0.00	0.00
16,500.00	89.58	360.00	9,286.40	7,348.55	-301.58	7,353.72	0.00	0.00	0.00
16,600.00	89.58	360.00	9,287.13	7,448.55	-301.58	7,453.69	0.00	0.00	0.00
16,700.00	89.58	360.00	9,287.86	7,548.55	-301.59	7,553.66	0.00	0.00	0.00
16,800.00	89.58	360.00	9,288.59	7,648.54	-301.60	7,653.62	0.00	0.00	0.00
16,900.00	89.58	360.00	9,289.31	7,748.54	-301.60	7,753.59	0.00	0.00	0.00
17,000.00	89.58	360.00	9,290.04	7,848.54	-301.61	7,853.56	0.00	0.00	0.00
17,100.00	89.58	360.00	9,290.77	7,948.54	-301.62	7,953.53	0.00	0.00	0.00
17,200.00	89.58	360.00	9,291.50	8,048.53	-301.62	8,053.49	0.00	0.00	0.00
17,300.00	89.58	360.00	9,292.23	8,148.53	-301.63	8,153.46	0.00	0.00	0.00

Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 31, T 26 S, R 28- E
Well: Way South State Com 703H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Way South State Com 703H
TVD Reference: KB=29' @ 3111.00usft (Noram 23)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

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)
17,400.00	89.58	360.00	9,292.95	8,248.53	-301.63	8,253.43	0.00	0.00	0.00
17,500.00	89.58	360.00	9,293.68	8,348.52	-301.64	8,353.40	0.00	0.00	0.00
17,600.00	89.58	360.00	9,294.41	8,448.52	-301.65	8,453.37	0.00	0.00	0.00
17,700.00	89.58	360.00	9,295.14	8,548.52	-301.65	8,553.33	0.00	0.00	0.00
17,800.00	89.58	360.00	9,295.86	8,648.52	-301.66	8,653.30	0.00	0.00	0.00
17,900.00	89.58	360.00	9,296.59	8,748.51	-301.67	8,753.27	0.00	0.00	0.00
18,000.00	89.58	360.00	9,297.32	8,848.51	-301.67	8,853.24	0.00	0.00	0.00
18,100.00	89.58	360.00	9,298.05	8,948.51	-301.68	8,953.20	0.00	0.00	0.00
18,200.00	89.58	360.00	9,298.77	9,048.51	-301.69	9,053.17	0.00	0.00	0.00
18,300.00	89.58	360.00	9,299.50	9,148.50	-301.69	9,153.14	0.00	0.00	0.00
18,400.00	89.58	360.00	9,300.23	9,248.50	-301.70	9,253.11	0.00	0.00	0.00
18,500.00	89.58	360.00	9,300.96	9,348.50	-301.71	9,353.08	0.00	0.00	0.00
18,600.00	89.58	360.00	9,301.68	9,448.50	-301.71	9,453.04	0.00	0.00	0.00
18,700.00	89.58	360.00	9,302.41	9,548.49	-301.72	9,553.01	0.00	0.00	0.00
18,800.00	89.58	360.00	9,303.14	9,648.49	-301.72	9,652.98	0.00	0.00	0.00
18,900.00	89.58	360.00	9,303.87	9,748.49	-301.73	9,752.95	0.00	0.00	0.00
19,000.00	89.58	360.00	9,304.59	9,848.49	-301.74	9,852.91	0.00	0.00	0.00
19,100.00	89.58	360.00	9,305.32	9,948.48	-301.74	9,952.88	0.00	0.00	0.00
19,200.00	89.58	360.00	9,306.05	10,048.48	-301.75	10,052.85	0.00	0.00	0.00
19,300.00	89.58	360.00	9,306.78	10,148.48	-301.76	10,152.82	0.00	0.00	0.00
19,400.00	89.58	360.00	9,307.51	10,248.47	-301.76	10,252.79	0.00	0.00	0.00
19,500.00	89.58	360.00	9,308.23	10,348.47	-301.77	10,352.75	0.00	0.00	0.00
19,600.00	89.58	360.00	9,308.96	10,448.47	-301.78	10,452.72	0.00	0.00	0.00
19,700.00	89.58	360.00	9,309.69	10,548.47	-301.78	10,552.69	0.00	0.00	0.00
19,800.00	89.58	360.00	9,310.42	10,648.46	-301.79	10,652.66	0.00	0.00	0.00
19,900.00	89.58	360.00	9,311.14	10,748.46	-301.80	10,752.62	0.00	0.00	0.00
20,000.00	89.58	360.00	9,311.87	10,848.46	-301.80	10,852.59	0.00	0.00	0.00
20,100.00	89.58	360.00	9,312.60	10,948.46	-301.81	10,952.56	0.00	0.00	0.00
20,200.00	89.58	360.00	9,313.33	11,048.45	-301.81	11,052.53	0.00	0.00	0.00
20,300.00	89.58	360.00	9,314.05	11,148.45	-301.82	11,152.50	0.00	0.00	0.00
20,400.00	89.58	360.00	9,314.78	11,248.45	-301.83	11,252.46	0.00	0.00	0.00
20,500.00	89.58	360.00	9,315.51	11,348.45	-301.83	11,352.43	0.00	0.00	0.00
20,600.00	89.58	360.00	9,316.24	11,448.44	-301.84	11,452.40	0.00	0.00	0.00
20,700.00	89.58	360.00	9,316.96	11,548.44	-301.85	11,552.37	0.00	0.00	0.00
20,800.00	89.58	360.00	9,317.69	11,648.44	-301.85	11,652.33	0.00	0.00	0.00
20,900.00	89.58	360.00	9,318.42	11,748.44	-301.86	11,752.30	0.00	0.00	0.00
21,000.00	89.58	360.00	9,319.15	11,848.43	-301.87	11,852.27	0.00	0.00	0.00
21,100.00	89.58	360.00	9,319.88	11,948.43	-301.87	11,952.24	0.00	0.00	0.00
21,200.00	89.58	360.00	9,320.60	12,048.43	-301.88	12,052.21	0.00	0.00	0.00
21,300.00	89.58	360.00	9,321.33	12,148.42	-301.89	12,152.17	0.00	0.00	0.00
21,400.00	89.58	360.00	9,322.06	12,248.42	-301.89	12,252.14	0.00	0.00	0.00
21,500.00	89.58	360.00	9,322.79	12,348.42	-301.90	12,352.11	0.00	0.00	0.00
21,529.48	89.58	360.00	9,323.00	12,377.90	-301.90	12,381.58	0.00	0.00	0.00

Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 31, T 26 S, R 28- E
Well: Way South State Cor 703H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Way South State Cor 703H
TVD Reference: KB=29' @ 3111.00usft (Noram 23)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

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)
TD at 21529.48									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Way South State Cor - hit/miss target - Shape - Point	0.00	0.00	8,663.06	-146.85	-301.10	363,854.04	565,863.51	32.00017	-104.12087
Way South State Cor - plan hits target center - Point	0.00	0.00	9,107.50	64.50	-300.10	364,065.40	565,864.50	32.00075	-104.12086
- plan misses target center by 1.01usft at 9186.07usft MD (9107.51 TVD, 64.52 N, -301.11 E)									
Way South State Cor - plan misses target center by 0.01usft at 21399.48usft MD (9322.05 TVD, 12247.90 N, -301.89 E) - Point	0.00	0.00	9,322.05	12,247.90	-301.90	376,248.80	565,862.70	32.03425	-104.12079
Way South State Cor - plan hits target center - Point	0.00	0.00	9,323.00	12,377.90	-301.90	376,378.80	565,862.70	32.03460	-104.12079

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5.00	5.00	Rustler		0.00	
594.00	594.00	TOS		0.00	
2,186.00	2,186.00	BOS (Fletcher)		0.00	
2,367.00	2,367.00	LMAR (Top Delaware)		0.00	
2,401.00	2,401.00	BLCN		0.00	
3,174.00	3,174.00	CYCN			
4,427.00	4,427.00	BYCN			
6,011.47	6,006.00	Bone Sprg (BSGL)			
6,369.84	6,363.00	U Avalon Sh			
6,577.63	6,570.00	L Avalon Sh			
6,782.41	6,774.00	B Avalon Sh			
6,928.96	6,920.00	FBSG_sand			
7,545.31	7,534.00	SBSG_sand			
7,861.51	7,849.00	SBSG_sand_Base			
8,679.31	8,665.00	TBSG_sand			
9,053.81	9,013.00	WFMP			
9,280.88	9,161.00	WFMP A SHALE			



Survey Report



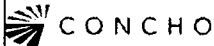
Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 31, T 26 S, R 28- E
Well: Way South State Com 703H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Way South State Com 703H
TVD Reference: KB=29' @ 3111.00usft (Noram 23)
MD Reference: KB=29' @ 3111.00usft (Noram 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4406	4406	0	0	Start Build 2.00
4656	4656	-5	-10	Start 3593.54 hold at 4656.46 MD
8250	8236	-142	-291	Start Drop -2.00
8500	8486	-147	-301	Start 177.37 hold at 8500.00 MD
8677	8663	-147	-301	Start DLS 10.00 TFO 360.00
9573	9236	422	-301	Start 11956.28 hold at 9573.20 MD
21,529	9323	12,378	-302	TD at 21529.48

Checked By: _____ Approved By: _____ Date: _____



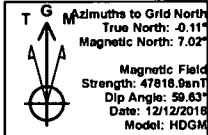
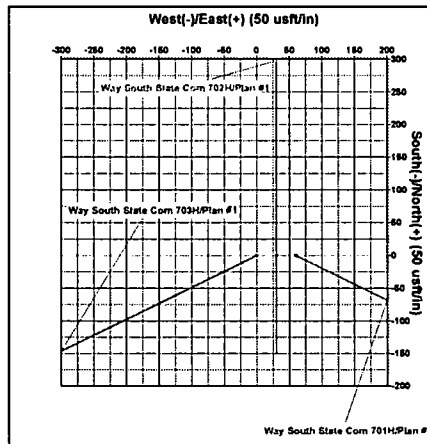
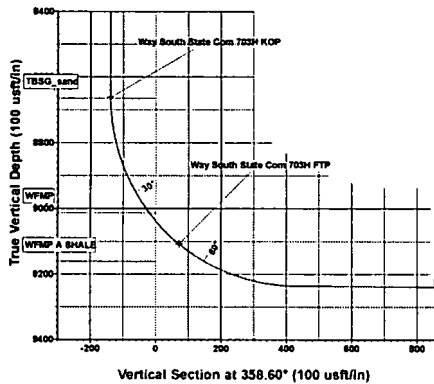
COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 31, T 28 S, R 28 E
Well: Way South State Com 703H
Wellbore: Wellbore #1
Plan: Plan #1 (Way South State Com 703H/Wellbore #1)
Noram 23

WELL DETAILS: Way South State Com 703H
Ground Elevation: 3082.00
RKB Elevation: KB=29' @ 3111.00usft (Noram 23)
Rig Name: Noram 23

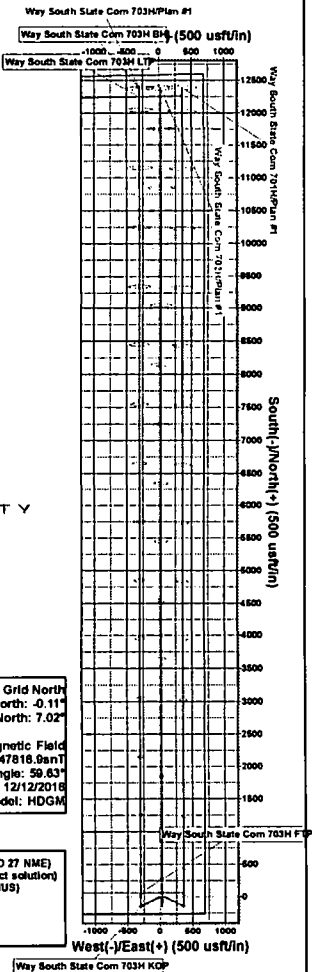
Northing 364000.90 Easting 566164.60 Latitude 32.00057 Longitude -104.11989

Planned Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	V Sect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
2	4406.46	0.00	0.00	4406.46	0.00	0.00	0.00	0.00	0.00	Start 3593.54 hold at 4656.46 MD
3	4656.46	5.00	244.00	4656.15	-4.78	-9.80	2.00	244.00	-4.54	Start Drop -2.00
4	8250.00	5.00	244.00	8236.01	-142.08	-291.30	0.00	0.00	-134.93	Start DLS 10.00 TFO 360.00
5	8500.00	0.00	0.00	8485.69	-146.85	-301.10	2.00	180.00	-139.47	Start 177.37 hold at 8500.00 MD
6	8677.37	0.00	0.00	8663.06	-146.85	-301.10	0.00	0.00	-139.47	Start 11956.28 hold at 9573.20 MD
7	9573.20	89.58	360.00	9236.00	421.93	-301.13	10.00	360.00	429.15	TD at 21529.48
8	21529.48	89.58	360.00	9323.00	12377.90	-301.90	0.00	0.00	2381.58	



PROJECT DETAILS: Eddy County, NM (NAD 27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1886
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



Vertical Section at 358.60° (300 usft/in)