

NM OIL CONSERVATION
ARTESIA DISTRICT

APR 30 2018

RECEIVED

COG OPERATING, LLC

Eddy County, NM (NAD83) NMEZ

Myox 21 State COM #41H

SHL: 668' FSL, 870' FWL, Sec21, T-25S, R-28E, Unit M

PP: 330' FSL, 660' FWL, Sec21, T-25S, R-28E, Unit M

PBHL: 200' FNL, 660' FWL, Sec16, T-25S, R-28E, Unit D

30-015-44937

Plan: Plan #1 - PP

Standard Planning Report

25 April, 2018

Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well #41H
Company:	COG OPERATING, LLC	TVD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Project:	Eddy County, NM (NAD83) NMEZ	MD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Site:	Myox 21 State COM	North Reference:	Grid
Well:	#41H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - PP		

Project:	Eddy County, NM (NAD83) NMEZ		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	Myox 21 State COM		
Site Position:		Northing:	403,842.31 usft
From:	Map	Easting:	614,212.56 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 6' 36.083 N
		Longitude:	104° 5' 52.664 W
		Grid Convergence:	0.13 °

Well:	#41H		
Well Position	+N/-S	0.00 usft	Northing: 403,842.31 usft
	+E/-W	0.00 usft	Easting: 614,212.56 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level: 2,989.80 usft
		Latitude:	32° 6' 36.083 N
		Longitude:	104° 5' 52.664 W

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	04/25/18	7.10
			Dip Angle
			59.86
			Field Strength
			47,729.55239227

Design:	Plan #1 - PP		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			359.50

Plan Survey Tool Program	Date: 04/25/18		
Depth From	Depth To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
1	0.00	20,221.43 Plan #1 - PP (OH)	MWD
			MWD v3:standard declination
			Remarks

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,100.00	9.00	198.90	5,097.54	-44.49	-15.23	1.50	1.50	0.00	198.90	
8,544.88	9.00	198.90	8,500.00	-554.33	-189.79	0.00	0.00	0.00	0.00	
9,144.88	0.00	0.00	9,097.54	-598.83	-205.02	1.50	-1.50	0.00	180.00	
9,515.72	0.00	0.00	9,468.38	-598.83	-205.02	0.00	0.00	0.00	0.00	
10,513.95	89.84	359.50	10,105.00	36.00	-210.59	9.00	9.00	-0.05	359.50	
20,221.81	89.84	359.50	10,132.00	9,743.45	-295.74	0.00	0.00	0.00	0.00	PBHL(M21SC#41H)

Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well #41H
Company:	COG OPERATING, LLC	TVD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Project:	Eddy County, NM (NAD83) NMEZ	MD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Site:	Myox 21 State COM	North Reference:	Grid
Well:	#41H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - PP		

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
SHL(M21SC#41H)									
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
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
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start of Nudge: 8° INC, 198.9° AZ @ 1.5° DLS									
4,600.00	1.50	198.90	4,599.99	-1.24	-0.42	-1.23	1.50	1.50	0.00
4,700.00	3.00	198.90	4,699.91	-4.95	-1.70	-4.94	1.50	1.50	0.00
4,800.00	4.50	198.90	4,799.69	-11.14	-3.81	-11.11	1.50	1.50	0.00
4,900.00	6.00	198.90	4,899.27	-19.80	-8.78	-19.74	1.50	1.50	0.00
5,000.00	7.50	198.90	4,998.57	-30.92	-10.59	-30.82	1.50	1.50	0.00

Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well #41H
Company:	COG OPERATING, LLC	TVD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Project:	Eddy County, NM (NAD83) NMEZ	MD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Site:	Myox 21 State COM	North Reference:	Grid
Well:	#41H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - PP		

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)	
5,100.00	9.00	198.90	5,097.54	-44.49	-15.23	-44.36	1.50	1.50	0.00	
5,200.00	9.00	198.90	5,196.30	-59.29	-20.30	-59.11	0.00	0.00	0.00	
5,300.00	9.00	198.90	5,295.07	-74.09	-25.37	-73.87	0.00	0.00	0.00	
5,400.00	9.00	198.90	5,393.84	-88.89	-30.43	-88.62	0.00	0.00	0.00	
5,500.00	9.00	198.90	5,492.61	-103.69	-35.50	-103.38	0.00	0.00	0.00	
5,600.00	9.00	198.90	5,591.38	-118.49	-40.57	-118.13	0.00	0.00	0.00	
5,700.00	9.00	198.90	5,690.15	-133.29	-45.64	-132.89	0.00	0.00	0.00	
5,800.00	9.00	198.90	5,788.92	-148.09	-50.70	-147.64	0.00	0.00	0.00	
5,900.00	9.00	198.90	5,887.69	-162.89	-55.77	-162.40	0.00	0.00	0.00	
6,000.00	9.00	198.90	5,986.46	-177.69	-60.84	-177.15	0.00	0.00	0.00	
6,100.00	9.00	198.90	6,085.22	-192.49	-65.90	-191.91	0.00	0.00	0.00	
6,200.00	9.00	198.90	6,183.99	-207.29	-70.97	-206.66	0.00	0.00	0.00	
6,300.00	9.00	198.90	6,282.76	-222.09	-76.04	-221.42	0.00	0.00	0.00	
6,400.00	9.00	198.90	6,381.53	-236.89	-81.11	-236.18	0.00	0.00	0.00	
6,500.00	9.00	198.90	6,480.30	-251.69	-86.17	-250.93	0.00	0.00	0.00	
6,600.00	9.00	198.90	6,579.07	-266.49	-91.24	-265.69	0.00	0.00	0.00	
6,700.00	9.00	198.90	6,677.84	-281.29	-96.31	-280.44	0.00	0.00	0.00	
6,800.00	9.00	198.90	6,776.61	-296.09	-101.38	-295.20	0.00	0.00	0.00	
6,900.00	9.00	198.90	6,875.37	-310.89	-106.44	-309.95	0.00	0.00	0.00	
7,000.00	9.00	198.90	6,974.14	-325.69	-111.51	-324.71	0.00	0.00	0.00	
7,100.00	9.00	198.90	7,072.91	-340.49	-116.58	-339.46	0.00	0.00	0.00	
7,200.00	9.00	198.90	7,171.68	-355.29	-121.64	-354.22	0.00	0.00	0.00	
7,300.00	9.00	198.90	7,270.45	-370.09	-126.71	-368.97	0.00	0.00	0.00	
7,400.00	9.00	198.90	7,369.22	-384.89	-131.78	-383.73	0.00	0.00	0.00	
7,500.00	9.00	198.90	7,467.99	-399.69	-136.85	-398.48	0.00	0.00	0.00	
7,600.00	9.00	198.90	7,566.76	-414.49	-141.91	-413.24	0.00	0.00	0.00	
7,700.00	9.00	198.90	7,665.53	-429.29	-146.98	-427.99	0.00	0.00	0.00	
7,800.00	9.00	198.90	7,764.29	-444.09	-152.05	-442.75	0.00	0.00	0.00	
7,900.00	9.00	198.90	7,863.06	-458.89	-157.11	-457.50	0.00	0.00	0.00	
8,000.00	9.00	198.90	7,961.83	-473.69	-162.18	-472.26	0.00	0.00	0.00	
8,100.00	9.00	198.90	8,060.60	-488.49	-167.25	-487.01	0.00	0.00	0.00	
8,200.00	9.00	198.90	8,159.37	-503.29	-172.32	-501.77	0.00	0.00	0.00	
8,300.00	9.00	198.90	8,258.14	-518.09	-177.38	-516.53	0.00	0.00	0.00	
8,400.00	9.00	198.90	8,356.91	-532.89	-182.45	-531.28	0.00	0.00	0.00	
8,500.00	9.00	198.90	8,455.68	-547.69	-187.52	-546.04	0.00	0.00	0.00	
8,544.88	9.00	198.90	8,500.00	-554.34	-189.79	-552.66	0.00	0.00	0.00	
Drop to Vertical @1.5°DLS										
8,600.00	8.17	198.90	8,554.51	-562.12	-192.46	-560.42	1.50	-1.50	0.00	
8,700.00	6.67	198.90	8,653.66	-574.34	-196.64	-572.61	1.50	-1.50	0.00	
8,800.00	5.17	198.90	8,753.13	-584.11	-199.98	-582.34	1.50	-1.50	0.00	
8,900.00	3.67	198.90	8,852.83	-591.40	-202.48	-589.61	1.50	-1.50	0.00	
9,000.00	2.17	198.90	8,952.69	-596.23	-204.13	-594.42	1.50	-1.50	0.00	
9,100.00	0.67	198.90	9,052.66	-598.58	-204.94	-596.77	1.50	-1.50	0.00	
9,144.88	0.00	0.00	9,097.54	-598.83	-205.02	-597.01	1.50	-1.50	0.00	
9,200.00	0.00	0.00	9,152.66	-598.83	-205.02	-597.01	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,252.66	-598.83	-205.02	-597.01	0.00	0.00	0.00	
9,400.00	0.00	0.00	9,352.66	-598.83	-205.02	-597.01	0.00	0.00	0.00	
9,500.00	0.00	0.00	9,452.66	-598.83	-205.02	-597.01	0.00	0.00	0.00	
9,515.72	0.00	0.00	9,468.38	-598.83	-205.02	-597.01	0.00	0.00	0.00	
KOP: 9515.72' MD, 9468.38' TVD, Build at 9°/100ft to 89.84° INC @ 359.50° AZ										
9,550.00	3.09	359.50	9,502.64	-597.90	-205.03	-596.09	9.00	9.00	0.00	
9,600.00	7.59	359.50	9,552.41	-593.26	-205.07	-591.44	9.00	9.00	0.00	
9,650.00	12.09	359.50	9,601.87	-584.72	-205.15	-582.91	9.00	9.00	0.00	
9,700.00	16.59	359.50	9,650.10	-572.34	-205.26	-570.53	9.00	9.00	0.00	

Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well #41H
Company:	COG OPERATING, LLC	TVD Reference:	RKB @ 3019.80usft (SDQ - KB=30)
Project:	Eddy County, NM (NAD83) NMEZ	MD Reference:	RKB @ 3019.80usft (SDQ - KB=30)
Site:	Myox 21 State COM	North Reference:	Grid
Well:	#41H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - PP		

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)	
9,750.00	21.09	359.50	9,697.41	-556.20	-205.40	-554.39	9.00	9.00	0.00	
9,800.00	25.59	359.50	9,743.31	-536.40	-205.57	-534.59	9.00	9.00	0.00	
9,850.00	30.09	359.50	9,787.51	-513.07	-205.78	-511.25	9.00	9.00	0.00	
9,900.00	34.59	359.50	9,829.74	-486.33	-206.01	-484.51	9.00	9.00	0.00	
9,950.00	39.09	359.50	9,869.75	-456.36	-206.27	-454.55	9.00	9.00	0.00	
10,000.00	43.59	359.50	9,907.29	-423.35	-206.56	-421.53	9.00	9.00	0.00	
10,050.00	48.09	359.50	9,942.11	-387.49	-206.88	-385.67	9.00	9.00	0.00	
10,100.00	52.59	359.50	9,974.02	-349.01	-207.22	-347.19	9.00	9.00	0.00	
10,150.00	57.09	359.50	10,002.81	-308.15	-207.57	-306.33	9.00	9.00	0.00	
10,157.71	57.78	359.50	10,006.96	-301.66	-207.63	-299.83	9.00	9.00	0.00	
FTP(M21SC#41H)										
10,200.00	61.59	359.50	10,028.30	-265.16	-207.95	-263.33	9.00	9.00	0.00	
10,250.00	66.09	359.50	10,050.35	-220.29	-208.34	-218.47	9.00	9.00	0.00	
10,300.00	70.59	359.50	10,068.80	-173.84	-208.75	-172.01	9.00	9.00	0.00	
10,350.00	75.09	359.50	10,083.55	-126.08	-209.17	-124.25	9.00	9.00	0.00	
10,400.00	79.59	359.50	10,094.51	-77.31	-209.60	-75.48	9.00	9.00	0.00	
10,450.00	84.09	359.50	10,101.61	-27.83	-210.03	-26.00	9.00	9.00	0.00	
10,500.00	88.59	359.50	10,104.81	22.05	-210.47	23.89	9.00	9.00	0.00	
10,513.95	89.84	359.50	10,105.00	36.00	-210.59	37.83	9.00	9.00	0.00	
EOC: 10513.95' MD, 10105.00' TVD, 89.84° INC, 359.50° AZ, 37.83° VS										
10,600.00	89.84	359.50	10,105.24	122.04	-211.35	123.88	0.00	0.00	0.00	
10,700.00	89.84	359.50	10,105.52	222.04	-212.22	223.88	0.00	0.00	0.00	
10,800.00	89.84	359.50	10,105.79	322.04	-213.10	323.88	0.00	0.00	0.00	
10,900.00	89.84	359.50	10,106.07	422.03	-213.98	423.88	0.00	0.00	0.00	
11,000.00	89.84	359.50	10,106.35	522.03	-214.86	523.88	0.00	0.00	0.00	
11,100.00	89.84	359.50	10,106.63	622.02	-215.73	623.88	0.00	0.00	0.00	
11,200.00	89.84	359.50	10,106.91	722.02	-216.61	723.88	0.00	0.00	0.00	
11,300.00	89.84	359.50	10,107.18	822.02	-217.49	823.88	0.00	0.00	0.00	
11,400.00	89.84	359.50	10,107.46	922.01	-218.36	923.88	0.00	0.00	0.00	
11,500.00	89.84	359.50	10,107.74	1,022.01	-219.24	1,023.88	0.00	0.00	0.00	
11,600.00	89.84	359.50	10,108.02	1,122.00	-220.12	1,123.88	0.00	0.00	0.00	
11,700.00	89.84	359.50	10,108.30	1,222.00	-221.00	1,223.88	0.00	0.00	0.00	
11,800.00	89.84	359.50	10,108.57	1,321.99	-221.87	1,323.88	0.00	0.00	0.00	
11,900.00	89.84	359.50	10,108.85	1,421.99	-222.75	1,423.88	0.00	0.00	0.00	
12,000.00	89.84	359.50	10,109.13	1,521.99	-223.63	1,523.88	0.00	0.00	0.00	
12,100.00	89.84	359.50	10,109.41	1,621.98	-224.50	1,623.88	0.00	0.00	0.00	
12,200.00	89.84	359.50	10,109.69	1,721.98	-225.38	1,723.88	0.00	0.00	0.00	
12,300.00	89.84	359.50	10,109.97	1,821.97	-226.26	1,823.88	0.00	0.00	0.00	
12,400.00	89.84	359.50	10,110.24	1,921.97	-227.13	1,923.88	0.00	0.00	0.00	
12,500.00	89.84	359.50	10,110.52	2,021.96	-228.01	2,023.88	0.00	0.00	0.00	
12,600.00	89.84	359.50	10,110.80	2,121.96	-228.89	2,123.88	0.00	0.00	0.00	
12,700.00	89.84	359.50	10,111.08	2,221.96	-229.77	2,223.88	0.00	0.00	0.00	
12,800.00	89.84	359.50	10,111.36	2,321.95	-230.64	2,323.88	0.00	0.00	0.00	
12,900.00	89.84	359.50	10,111.63	2,421.95	-231.52	2,423.88	0.00	0.00	0.00	
13,000.00	89.84	359.50	10,111.91	2,521.94	-232.40	2,523.88	0.00	0.00	0.00	
13,100.00	89.84	359.50	10,112.19	2,621.94	-233.27	2,623.87	0.00	0.00	0.00	
13,200.00	89.84	359.50	10,112.47	2,721.93	-234.15	2,723.87	0.00	0.00	0.00	
13,300.00	89.84	359.50	10,112.75	2,821.93	-235.03	2,823.87	0.00	0.00	0.00	
13,400.00	89.84	359.50	10,113.03	2,921.93	-235.91	2,923.87	0.00	0.00	0.00	
13,500.00	89.84	359.50	10,113.30	3,021.92	-236.78	3,023.87	0.00	0.00	0.00	
13,600.00	89.84	359.50	10,113.58	3,121.92	-237.66	3,123.87	0.00	0.00	0.00	
13,700.00	89.84	359.50	10,113.86	3,221.91	-238.54	3,223.87	0.00	0.00	0.00	
13,800.00	89.84	359.50	10,114.14	3,321.91	-239.41	3,323.87	0.00	0.00	0.00	
13,900.00	89.84	359.50	10,114.42	3,421.91	-240.29	3,423.87	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well #41H
Company:	COG OPERATING, LLC	TVD Reference:	RKB @ 3019.80usft (SDQ - KB=30)
Project:	Eddy County, NM (NAD83) NMEZ	MD Reference:	RKB @ 3019.80usft (SDQ - KB=30)
Site:	Myox 21 State COM	North Reference:	Grid
Well:	#41H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - PP		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buird Rate (°/100usft)	Turn Rate (°/100usft)
14,000.00	89.84	359.50	10,114.69	3,521.90	-241.17	3,523.87	0.00	0.00	0.00
14,100.00	89.84	359.50	10,114.97	3,621.90	-242.05	3,623.87	0.00	0.00	0.00
14,200.00	89.84	359.50	10,115.25	3,721.89	-242.92	3,723.87	0.00	0.00	0.00
14,300.00	89.84	359.50	10,115.53	3,821.89	-243.80	3,823.87	0.00	0.00	0.00
14,400.00	89.84	359.50	10,115.81	3,921.88	-244.68	3,923.87	0.00	0.00	0.00
14,500.00	89.84	359.50	10,116.08	4,021.88	-245.55	4,023.87	0.00	0.00	0.00
14,600.00	89.84	359.50	10,116.36	4,121.88	-246.43	4,123.87	0.00	0.00	0.00
14,700.00	89.84	359.50	10,116.64	4,221.87	-247.31	4,223.87	0.00	0.00	0.00
14,800.00	89.84	359.50	10,116.92	4,321.87	-248.19	4,323.87	0.00	0.00	0.00
14,900.00	89.84	359.50	10,117.20	4,421.86	-249.06	4,423.87	0.00	0.00	0.00
15,000.00	89.84	359.50	10,117.48	4,521.86	-249.94	4,523.87	0.00	0.00	0.00
15,100.00	89.84	359.50	10,117.75	4,621.85	-250.82	4,623.87	0.00	0.00	0.00
15,200.00	89.84	359.50	10,118.03	4,721.85	-251.69	4,723.87	0.00	0.00	0.00
15,300.00	89.84	359.50	10,118.31	4,821.85	-252.57	4,823.87	0.00	0.00	0.00
15,400.00	89.84	359.50	10,118.59	4,921.84	-253.45	4,923.87	0.00	0.00	0.00
15,500.00	89.84	359.50	10,118.87	5,021.84	-254.32	5,023.87	0.00	0.00	0.00
15,600.00	89.84	359.50	10,119.14	5,121.83	-255.20	5,123.87	0.00	0.00	0.00
15,700.00	89.84	359.50	10,119.42	5,221.83	-256.08	5,223.86	0.00	0.00	0.00
15,800.00	89.84	359.50	10,119.70	5,321.82	-256.96	5,323.86	0.00	0.00	0.00
15,900.00	89.84	359.50	10,119.98	5,421.82	-257.83	5,423.86	0.00	0.00	0.00
16,000.00	89.84	359.50	10,120.26	5,521.82	-258.71	5,523.86	0.00	0.00	0.00
16,100.00	89.84	359.50	10,120.54	5,621.81	-259.59	5,623.86	0.00	0.00	0.00
16,200.00	89.84	359.50	10,120.81	5,721.81	-260.46	5,723.86	0.00	0.00	0.00
16,300.00	89.84	359.50	10,121.09	5,821.80	-261.34	5,823.86	0.00	0.00	0.00
16,400.00	89.84	359.50	10,121.37	5,921.80	-262.22	5,923.86	0.00	0.00	0.00
16,500.00	89.84	359.50	10,121.65	6,021.79	-263.10	6,023.86	0.00	0.00	0.00
16,600.00	89.84	359.50	10,121.93	6,121.79	-263.97	6,123.86	0.00	0.00	0.00
16,700.00	89.84	359.50	10,122.20	6,221.79	-264.85	6,223.86	0.00	0.00	0.00
16,800.00	89.84	359.50	10,122.48	6,321.78	-265.73	6,323.86	0.00	0.00	0.00
16,900.00	89.84	359.50	10,122.76	6,421.78	-266.60	6,423.86	0.00	0.00	0.00
17,000.00	89.84	359.50	10,123.04	6,521.77	-267.48	6,523.86	0.00	0.00	0.00
17,100.00	89.84	359.50	10,123.32	6,621.77	-268.36	6,623.86	0.00	0.00	0.00
17,200.00	89.84	359.50	10,123.59	6,721.77	-269.24	6,723.86	0.00	0.00	0.00
17,300.00	89.84	359.50	10,123.87	6,821.76	-270.11	6,823.86	0.00	0.00	0.00
17,400.00	89.84	359.50	10,124.15	6,921.76	-270.99	6,923.86	0.00	0.00	0.00
17,500.00	89.84	359.50	10,124.43	7,021.75	-271.87	7,023.86	0.00	0.00	0.00
17,600.00	89.84	359.50	10,124.71	7,121.75	-272.74	7,123.86	0.00	0.00	0.00
17,700.00	89.84	359.50	10,124.99	7,221.74	-273.62	7,223.86	0.00	0.00	0.00
17,800.00	89.84	359.50	10,125.26	7,321.74	-274.50	7,323.86	0.00	0.00	0.00
17,900.00	89.84	359.50	10,125.54	7,421.74	-275.38	7,423.86	0.00	0.00	0.00
18,000.00	89.84	359.50	10,125.82	7,521.73	-276.25	7,523.86	0.00	0.00	0.00
18,100.00	89.84	359.50	10,126.10	7,621.73	-277.13	7,623.86	0.00	0.00	0.00
18,200.00	89.84	359.50	10,126.38	7,721.72	-278.01	7,723.86	0.00	0.00	0.00
18,300.00	89.84	359.50	10,126.65	7,821.72	-278.88	7,823.85	0.00	0.00	0.00
18,400.00	89.84	359.50	10,126.93	7,921.71	-279.76	7,923.85	0.00	0.00	0.00
18,500.00	89.84	359.50	10,127.21	8,021.71	-280.64	8,023.85	0.00	0.00	0.00
18,600.00	89.84	359.50	10,127.49	8,121.71	-281.52	8,123.85	0.00	0.00	0.00
18,700.00	89.84	359.50	10,127.77	8,221.70	-282.39	8,223.85	0.00	0.00	0.00
18,800.00	89.84	359.50	10,128.05	8,321.70	-283.27	8,323.85	0.00	0.00	0.00
18,900.00	89.84	359.50	10,128.32	8,421.69	-284.15	8,423.85	0.00	0.00	0.00
19,000.00	89.84	359.50	10,128.60	8,521.69	-285.02	8,523.85	0.00	0.00	0.00
19,100.00	89.84	359.50	10,128.88	8,621.68	-285.90	8,623.85	0.00	0.00	0.00
19,200.00	89.84	359.50	10,129.16	8,721.68	-286.78	8,723.85	0.00	0.00	0.00
19,300.00	89.84	359.50	10,129.44	8,821.68	-287.65	8,823.85	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well #41H
Company:	COG.OPERATING, LLC	TVD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Project:	Eddy County, NM (NAD83) NMEZ	MD Reference:	RKB @ 3019.80usft (SDQ - KB=30')
Site:	Myox 21 State COM	North Reference:	Grid
Well:	#41H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - PP		

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)
19,400.00	89.84	359.50	10,129.71	8,921.67	-288.53	8,923.85	0.00	0.00	0.00
19,500.00	89.84	359.50	10,129.99	9,021.67	-289.41	9,023.85	0.00	0.00	0.00
19,600.00	89.84	359.50	10,130.27	9,121.66	-290.29	9,123.85	0.00	0.00	0.00
19,700.00	89.84	359.50	10,130.55	9,221.66	-291.16	9,223.85	0.00	0.00	0.00
19,800.00	89.84	359.50	10,130.83	9,321.66	-292.04	9,323.85	0.00	0.00	0.00
19,900.00	89.84	359.50	10,131.11	9,421.65	-292.92	9,423.85	0.00	0.00	0.00
20,000.00	89.84	359.50	10,131.38	9,521.65	-293.79	9,523.85	0.00	0.00	0.00
20,091.84	89.84	359.50	10,131.64	9,613.48	-294.60	9,615.69	0.00	0.00	0.00
LTP(MX21SC#41H)									
20,100.00	89.84	359.50	10,131.66	9,621.64	-294.67	9,623.85	0.00	0.00	0.00
20,200.00	89.84	359.50	10,131.94	9,721.64	-295.55	9,723.85	0.00	0.00	0.00
20,221.81	89.84	359.50	10,132.00	9,743.45	-295.74	9,745.66	0.00	0.00	0.00
TD: 20221.81' MD, 10132.00' TVD - PBHL(M21SC#41H)									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL(M21SC#41H) - hit/miss target - Shape	0.00	0.00	0.00	0.00	0.00	403,842.31	614,212.56	32° 6' 36.083 N	104° 5' 52.664 W
FTP(M21SC#41H) - plan hits target center - Point	0.00	0.00	10,105.00	-359.78	-206.74	403,482.53	614,005.82	32° 6' 32.527 N	104° 5' 55.077 W
LTP(MX21SC#41H) - plan misses target center by 0.36usft at 20091.84usft MD (10131.64 TVD, 9613.48 N, -294.60 E) - Point	0.00	0.00	10,132.00	9,613.48	-294.58	413,455.79	613,917.98	32° 8' 11.226 N	104° 5' 55.846 W
PBHL(M21SC#41H) - plan hits target center - Point	0.00	0.00	10,132.00	9,743.45	-295.74	413,585.76	613,916.82	32° 8' 12.512 N	104° 5' 55.856 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
4,500.00	4,500.00	0.00	0.00	Start of Nudge: 9° INC, 198.9°AZ/@1.5°DLS
8,544.88	8,500.00	-554.34	-189.79	Drop to Vertical /@1.5°DLS
9,515.72	9,468.38	-598.83	-205.02	KOP: 9515.72' MD, 9468.38' TVD
9,515.72	9,468.38	-598.83	-205.02	Build at 9°/100ft to 89.84° INC @ 359.50° AZ
10,513.95	10,105.00	36.00	-210.59	EOC: 10513.95' MD, 10105.00' TVD, 89.84° INC, 359.50° AZ, 37.83° VS
20,221.81	10,132.00	9,743.45	-295.74	TD: 20221.81' MD, 10132.00' TVD

WELL DETAILS: #41H

Ground Elevation:: 2989.80
RKB Elevation: RKB @ 3019.80usft (SDQ - KB=30')
Rig Name: SDQ - KB=30'



Azimuths to Grid North
True North: -0.12°
Magnetic North: 6.97°

**Magnetic Field
Strength: 47729.6snT
Dip Angle: 59.86°
Date: 04/25/2018
Model: IGRF2015**

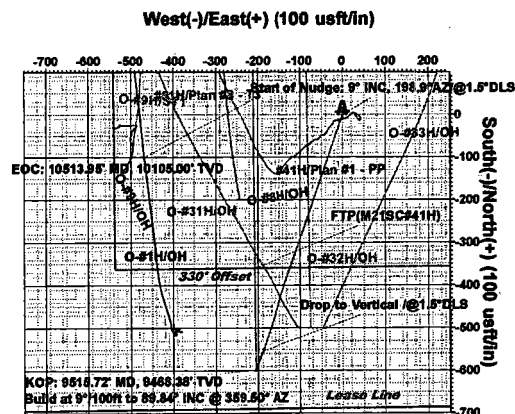
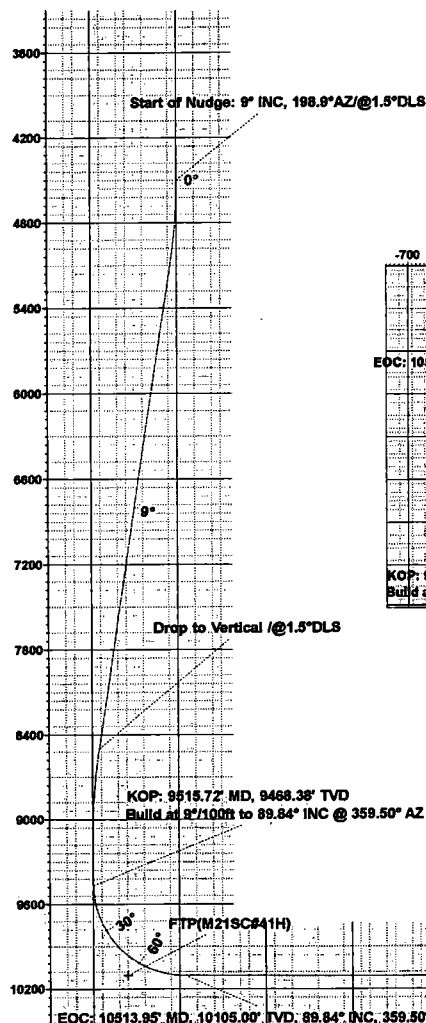
Surface Hole Location

Northing	Easting	Latitude	Longitude
403842.31	614212.56	32° 6' 36.083 N	104° 5' 52.664 W

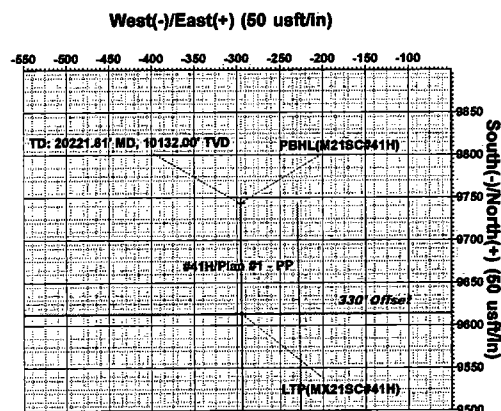
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4500.00	0.00	0.00	4500.00	0.00	0.00	0.00	0.00	0.00
3	5100.00	9.00	198.90	5097.54	-44.49	-15.23	1.50	198.90	-44.36
4	8544.88	9.00	198.90	8500.00	-554.33	-189.79	0.00	0.00	-552.66
5	9144.88	0.00	0.00	9097.54	-598.83	-205.02	1.50	180.00	-597.01
6	9516.72	0.00	0.00	9468.38	-598.83	-205.02	0.00	0.00	-597.01
7	10513.95	89.84	359.50	10105.00	36.00	-210.69	9.00	359.50	37.83
8	20221.81	89.84	359.50	10132.00	9743.45	-295.74	0.00	0.00	9745.66

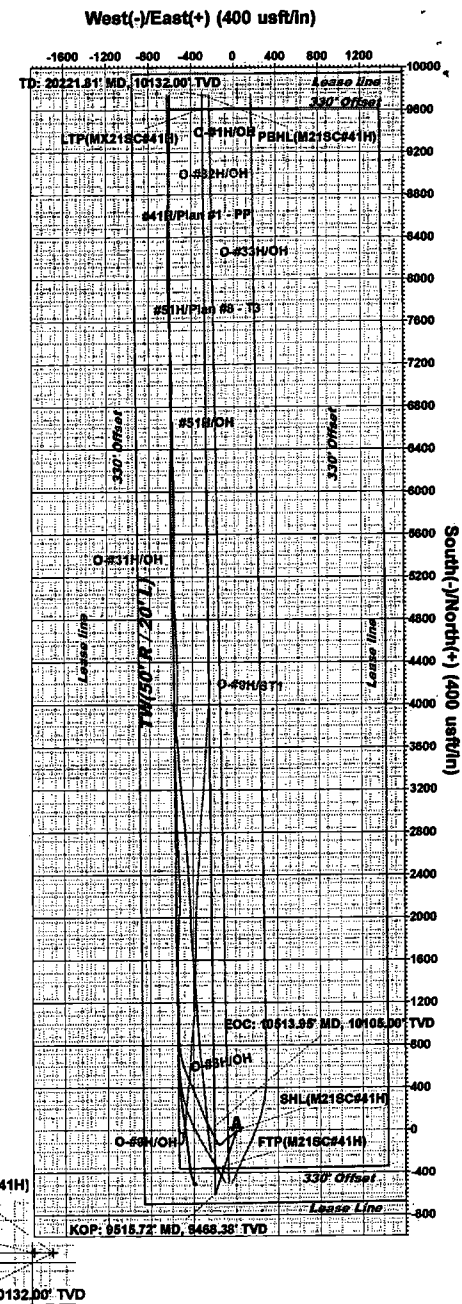
COG OPERATING, LLC
Project: Eddy County, NM (NAD83) NMEZ
Site: Myox 21 State COM
Well: #41H
Wellbore: OH
Plan: Plan #1 - PP (#41H/OH)



DESIGN TARGET DETAILS				
Name	+N-S	+E-W	Northing	Easting
FTP(M213C41H)	-353.78	-306.74	403482.53	614002.52
LTP(MX21SC41H)	9613.48	-394.53	413458.79	613917.88
PBL(M213C41H)	9743.45	-398.74	413585.78	613916.82
SHL(M213C41H)	0.00	0.00	403842.31	614212.56



PROJECT DETAILS: Eddy County, NM (NAD83) NMEZ
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid



Vertical Section at 359.50° (300 usft/in)



VON Directional
2407 E. Murphy St. Bldg. E3 Odessa, TX 79761
Phone: 432-232-8838

Plan: Plan #1 - PP (#41H/OH)
Created By: Gabriel Cruz Date: 18:34, April 26 2018