



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 5, T 21 S., R 33 E
Well: Becknell State Com 4H
Wellbore: Wellbore #1
Plan: Plan #1 (Becknell State Com 4H/Wellbore #1)
McVay 8

WELL DETAILS: Becknell State Com 4H

Ground Elevation:: 3790.60
RKB Elevation: KB=26' @ 3816.60ft (McVay 8)
Rig Name: McVay 8

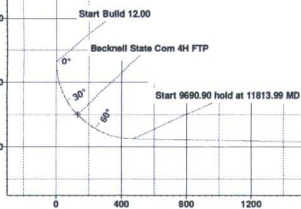
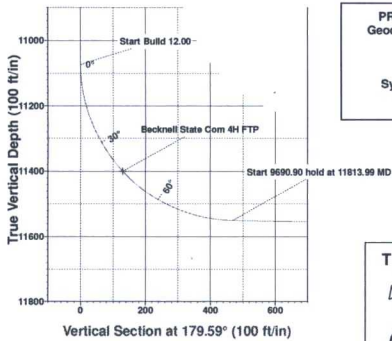
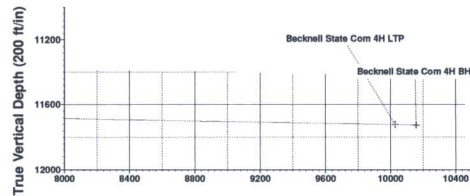
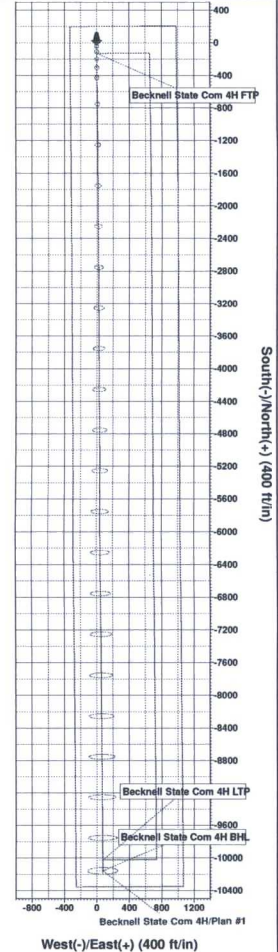
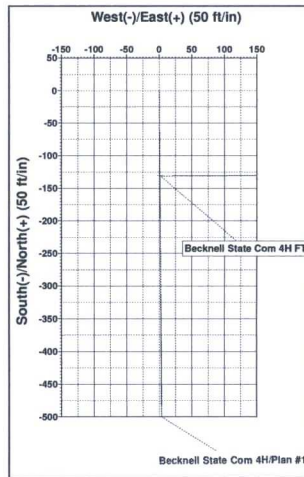
Northing	Easting	Latitude	Longitude
549022.4000	725569.1000	32.5072448	-103.6016303

Planned Section Details

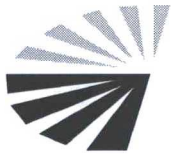
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	11072.61	0.00	0.00	11072.61	0.00	0.00	0.00	0.00	0.00
3	11813.99	88.97	179.59	11550.00	-468.83	3.32	12.00	179.59	468.84
4	21504.89	88.97	179.59	11725.00	-10157.91	71.94	0.00	0.00	10158.16

PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

Azimuths to Grid North
True North: -0.39°
Magnetic North: 6.47°
Magnetic Field
Strength: 48340.5enT
Dip Angle: 60.43°
Date: 6/6/2017
Model: HDGM



Vertical Section at 179.59° (200 ft/in)



CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 5, T 21 S. , R 33 E

Becknell State Com 4H

Wellbore #1

Plan: Plan #1

Standard Survey Report

06 June, 2017





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Becknell State Com 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3816.60ft (McVay 8)
Site:	Sec. 5, T 21 S. , R 33 E	MD Reference:	KB=26' @ 3816.60ft (McVay 8)
Well:	Becknell State Com 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 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. 5, T 21 S. , R 33 E		
Site Position:		Northing:	549,022.4000 usft
From:	Map	Easting:	725,569.1000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32.5072449
		Longitude:	-103.6016303
		Grid Convergence:	0.39 °

Well	Becknell State Com 4H		
Well Position	+N/-S	0.00 ft	Northing: 549,022.4000 usft
	+E/-W	0.00 ft	Easting: 725,569.1000 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32.5072449
		Longitude:	-103.6016303
		Ground Level:	3,790.60 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	6/6/2017	6.87
			Dip Angle (°) 60.43
			Field Strength (nT) 48,341

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°) 179.59

Survey Tool Program	Date 6/6/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
0.00	21,504.29	Plan #1 (Wellbore #1)	MWD
			Description MWD - Standard

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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



Integrity Directional Services, LLC

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MD Reference: KB=26' @ 3816.60ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



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5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00
9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00



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9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,900.00	0.00	0.00	9,900.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100.00	0.00	0.00	10,100.00	0.00	0.00	0.00	0.00	0.00	0.00
10,200.00	0.00	0.00	10,200.00	0.00	0.00	0.00	0.00	0.00	0.00
10,300.00	0.00	0.00	10,300.00	0.00	0.00	0.00	0.00	0.00	0.00
10,400.00	0.00	0.00	10,400.00	0.00	0.00	0.00	0.00	0.00	0.00
10,500.00	0.00	0.00	10,500.00	0.00	0.00	0.00	0.00	0.00	0.00
10,600.00	0.00	0.00	10,600.00	0.00	0.00	0.00	0.00	0.00	0.00
10,700.00	0.00	0.00	10,700.00	0.00	0.00	0.00	0.00	0.00	0.00
10,800.00	0.00	0.00	10,800.00	0.00	0.00	0.00	0.00	0.00	0.00
10,900.00	0.00	0.00	10,900.00	0.00	0.00	0.00	0.00	0.00	0.00
11,000.00	0.00	0.00	11,000.00	0.00	0.00	0.00	0.00	0.00	0.00
11,072.61	0.00	0.00	11,072.61	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 12.00									
11,100.00	3.29	179.59	11,099.99	-0.79	0.01	0.79	12.00	12.00	0.00
11,200.00	15.29	179.59	11,198.49	-16.89	0.12	16.89	12.00	12.00	0.00
11,300.00	27.29	179.59	11,291.50	-53.13	0.38	53.13	12.00	12.00	0.00
11,400.00	39.29	179.59	11,374.94	-107.91	0.76	107.91	12.00	12.00	0.00
11,500.00	51.29	179.59	11,445.17	-178.84	1.27	178.85	12.00	12.00	0.00
11,600.00	63.29	179.59	11,499.11	-262.83	1.86	262.83	12.00	12.00	0.00
11,700.00	75.29	179.59	11,534.42	-356.19	2.52	356.20	12.00	12.00	0.00
11,800.00	87.29	179.59	11,549.54	-454.85	3.22	454.86	12.00	12.00	0.00
11,813.99	88.97	179.59	11,550.00	-468.83	3.32	468.84	12.00	12.00	0.00
Start 9690.90 hold at 11813.99 MD									
11,900.00	88.97	179.59	11,551.55	-554.83	3.93	554.84	0.00	0.00	0.00
12,000.00	88.97	179.59	11,553.36	-654.81	4.64	654.82	0.00	0.00	0.00
12,100.00	88.97	179.59	11,555.16	-754.79	5.35	754.81	0.00	0.00	0.00
12,200.00	88.97	179.59	11,556.97	-854.77	6.05	854.79	0.00	0.00	0.00
12,300.00	88.97	179.59	11,558.77	-954.75	6.76	954.78	0.00	0.00	0.00
12,400.00	88.97	179.59	11,560.58	-1,054.73	7.47	1,054.76	0.00	0.00	0.00
12,500.00	88.97	179.59	11,562.39	-1,154.71	8.18	1,154.74	0.00	0.00	0.00
12,600.00	88.97	179.59	11,564.19	-1,254.70	8.89	1,254.73	0.00	0.00	0.00
12,700.00	88.97	179.59	11,566.00	-1,354.68	9.59	1,354.71	0.00	0.00	0.00
12,800.00	88.97	179.59	11,567.80	-1,454.66	10.30	1,454.69	0.00	0.00	0.00
12,900.00	88.97	179.59	11,569.61	-1,554.64	11.01	1,554.68	0.00	0.00	0.00
13,000.00	88.97	179.59	11,571.42	-1,654.62	11.72	1,654.66	0.00	0.00	0.00
13,100.00	88.97	179.59	11,573.22	-1,754.60	12.43	1,754.65	0.00	0.00	0.00
13,200.00	88.97	179.59	11,575.03	-1,854.58	13.13	1,854.63	0.00	0.00	0.00
13,300.00	88.97	179.59	11,576.83	-1,954.56	13.84	1,954.61	0.00	0.00	0.00
13,400.00	88.97	179.59	11,578.64	-2,054.54	14.55	2,054.60	0.00	0.00	0.00
13,500.00	88.97	179.59	11,580.44	-2,154.53	15.26	2,154.58	0.00	0.00	0.00
13,600.00	88.97	179.59	11,582.25	-2,254.51	15.97	2,254.56	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 5, T 21 S. , R 33 E
Well: Becknell State Com 4H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Becknell State Com 4H
TVD Reference: KB=26' @ 3816.60ft (McVay 8)
MD Reference: KB=26' @ 3816.60ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,700.00	88.97	179.59	11,584.06	-2,354.49	16.68	2,354.55	0.00	0.00	0.00
13,800.00	88.97	179.59	11,585.86	-2,454.47	17.38	2,454.53	0.00	0.00	0.00
13,900.00	88.97	179.59	11,587.67	-2,554.45	18.09	2,554.51	0.00	0.00	0.00
14,000.00	88.97	179.59	11,589.47	-2,654.43	18.80	2,654.50	0.00	0.00	0.00
14,100.00	88.97	179.59	11,591.28	-2,754.41	19.51	2,754.48	0.00	0.00	0.00
14,200.00	88.97	179.59	11,593.09	-2,854.39	20.22	2,854.47	0.00	0.00	0.00
14,300.00	88.97	179.59	11,594.89	-2,954.38	20.92	2,954.45	0.00	0.00	0.00
14,400.00	88.97	179.59	11,596.70	-3,054.36	21.63	3,054.43	0.00	0.00	0.00
14,500.00	88.97	179.59	11,598.50	-3,154.34	22.34	3,154.42	0.00	0.00	0.00
14,600.00	88.97	179.59	11,600.31	-3,254.32	23.05	3,254.40	0.00	0.00	0.00
14,700.00	88.97	179.59	11,602.11	-3,354.30	23.76	3,354.38	0.00	0.00	0.00
14,800.00	88.97	179.59	11,603.92	-3,454.28	24.46	3,454.37	0.00	0.00	0.00
14,900.00	88.97	179.59	11,605.73	-3,554.26	25.17	3,554.35	0.00	0.00	0.00
15,000.00	88.97	179.59	11,607.53	-3,654.24	25.88	3,654.34	0.00	0.00	0.00
15,100.00	88.97	179.59	11,609.34	-3,754.22	26.59	3,754.32	0.00	0.00	0.00
15,200.00	88.97	179.59	11,611.14	-3,854.21	27.30	3,854.30	0.00	0.00	0.00
15,300.00	88.97	179.59	11,612.95	-3,954.19	28.01	3,954.29	0.00	0.00	0.00
15,400.00	88.97	179.59	11,614.76	-4,054.17	28.71	4,054.27	0.00	0.00	0.00
15,500.00	88.97	179.59	11,616.56	-4,154.15	29.42	4,154.25	0.00	0.00	0.00
15,600.00	88.97	179.59	11,618.37	-4,254.13	30.13	4,254.24	0.00	0.00	0.00
15,700.00	88.97	179.59	11,620.17	-4,354.11	30.84	4,354.22	0.00	0.00	0.00
15,800.00	88.97	179.59	11,621.98	-4,454.09	31.55	4,454.20	0.00	0.00	0.00
15,900.00	88.97	179.59	11,623.79	-4,554.07	32.25	4,554.19	0.00	0.00	0.00
16,000.00	88.97	179.59	11,625.59	-4,654.06	32.96	4,654.17	0.00	0.00	0.00
16,100.00	88.97	179.59	11,627.40	-4,754.04	33.67	4,754.16	0.00	0.00	0.00
16,200.00	88.97	179.59	11,629.20	-4,854.02	34.38	4,854.14	0.00	0.00	0.00
16,300.00	88.97	179.59	11,631.01	-4,954.00	35.09	4,954.12	0.00	0.00	0.00
16,400.00	88.97	179.59	11,632.81	-5,053.98	35.79	5,054.11	0.00	0.00	0.00
16,500.00	88.97	179.59	11,634.62	-5,153.96	36.50	5,154.09	0.00	0.00	0.00
16,600.00	88.97	179.59	11,636.43	-5,253.94	37.21	5,254.07	0.00	0.00	0.00
16,700.00	88.97	179.59	11,638.23	-5,353.92	37.92	5,354.06	0.00	0.00	0.00
16,800.00	88.97	179.59	11,640.04	-5,453.91	38.63	5,454.04	0.00	0.00	0.00
16,900.00	88.97	179.59	11,641.84	-5,553.89	39.33	5,554.03	0.00	0.00	0.00
17,000.00	88.97	179.59	11,643.65	-5,653.87	40.04	5,654.01	0.00	0.00	0.00
17,100.00	88.97	179.59	11,645.46	-5,753.85	40.75	5,753.99	0.00	0.00	0.00
17,200.00	88.97	179.59	11,647.26	-5,853.83	41.46	5,853.98	0.00	0.00	0.00
17,300.00	88.97	179.59	11,649.07	-5,953.81	42.17	5,953.96	0.00	0.00	0.00
17,400.00	88.97	179.59	11,650.87	-6,053.79	42.88	6,053.94	0.00	0.00	0.00
17,500.00	88.97	179.59	11,652.68	-6,153.77	43.58	6,153.93	0.00	0.00	0.00
17,600.00	88.97	179.59	11,654.48	-6,253.75	44.29	6,253.91	0.00	0.00	0.00
17,700.00	88.97	179.59	11,656.29	-6,353.74	45.00	6,353.90	0.00	0.00	0.00
17,800.00	88.97	179.59	11,658.10	-6,453.72	45.71	6,453.88	0.00	0.00	0.00
17,900.00	88.97	179.59	11,659.90	-6,553.70	46.42	6,553.86	0.00	0.00	0.00



Integrity Directional Services, LLC
Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 5, T 21 S., R 33 E
Well: Becknell State Com 4H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Becknell State Com 4H
TVD Reference: KB=26' @ 3816.60ft (McVay 8)
MD Reference: KB=26' @ 3816.60ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,000.00	88.97	179.59	11,661.71	-6,653.68	47.12	6,653.85	0.00	0.00	0.00
18,100.00	88.97	179.59	11,663.51	-6,753.66	47.83	6,753.83	0.00	0.00	0.00
18,200.00	88.97	179.59	11,665.32	-6,853.64	48.54	6,853.81	0.00	0.00	0.00
18,300.00	88.97	179.59	11,667.13	-6,953.62	49.25	6,953.80	0.00	0.00	0.00
18,400.00	88.97	179.59	11,668.93	-7,053.60	49.96	7,053.78	0.00	0.00	0.00
18,500.00	88.97	179.59	11,670.74	-7,153.59	50.66	7,153.76	0.00	0.00	0.00
18,600.00	88.97	179.59	11,672.54	-7,253.57	51.37	7,253.75	0.00	0.00	0.00
18,700.00	88.97	179.59	11,674.35	-7,353.55	52.08	7,353.73	0.00	0.00	0.00
18,800.00	88.97	179.59	11,676.15	-7,453.53	52.79	7,453.72	0.00	0.00	0.00
18,900.00	88.97	179.59	11,677.96	-7,553.51	53.50	7,553.70	0.00	0.00	0.00
19,000.00	88.97	179.59	11,679.77	-7,653.49	54.21	7,653.68	0.00	0.00	0.00
19,100.00	88.97	179.59	11,681.57	-7,753.47	54.91	7,753.67	0.00	0.00	0.00
19,200.00	88.97	179.59	11,683.38	-7,853.45	55.62	7,853.65	0.00	0.00	0.00
19,300.00	88.97	179.59	11,685.18	-7,953.43	56.33	7,953.63	0.00	0.00	0.00
19,400.00	88.97	179.59	11,686.99	-8,053.42	57.04	8,053.62	0.00	0.00	0.00
19,500.00	88.97	179.59	11,688.80	-8,153.40	57.75	8,153.60	0.00	0.00	0.00
19,600.00	88.97	179.59	11,690.60	-8,253.38	58.45	8,253.59	0.00	0.00	0.00
19,700.00	88.97	179.59	11,692.41	-8,353.36	59.16	8,353.57	0.00	0.00	0.00
19,800.00	88.97	179.59	11,694.21	-8,453.34	59.87	8,453.55	0.00	0.00	0.00
19,900.00	88.97	179.59	11,696.02	-8,553.32	60.58	8,553.54	0.00	0.00	0.00
20,000.00	88.97	179.59	11,697.82	-8,653.30	61.29	8,653.52	0.00	0.00	0.00
20,100.00	88.97	179.59	11,699.63	-8,753.28	61.99	8,753.50	0.00	0.00	0.00
20,200.00	88.97	179.59	11,701.44	-8,853.27	62.70	8,853.49	0.00	0.00	0.00
20,300.00	88.97	179.59	11,703.24	-8,953.25	63.41	8,953.47	0.00	0.00	0.00
20,400.00	88.97	179.59	11,705.05	-9,053.23	64.12	9,053.45	0.00	0.00	0.00
20,500.00	88.97	179.59	11,706.85	-9,153.21	64.83	9,153.44	0.00	0.00	0.00
20,600.00	88.97	179.59	11,708.66	-9,253.19	65.53	9,253.42	0.00	0.00	0.00
20,700.00	88.97	179.59	11,710.47	-9,353.17	66.24	9,353.41	0.00	0.00	0.00
20,800.00	88.97	179.59	11,712.27	-9,453.15	66.95	9,453.39	0.00	0.00	0.00
20,900.00	88.97	179.59	11,714.08	-9,553.13	67.66	9,553.37	0.00	0.00	0.00
21,000.00	88.97	179.59	11,715.88	-9,653.11	68.37	9,653.36	0.00	0.00	0.00
21,100.00	88.97	179.59	11,717.69	-9,753.10	69.08	9,753.34	0.00	0.00	0.00
21,200.00	88.97	179.59	11,719.49	-9,853.08	69.78	9,853.32	0.00	0.00	0.00
21,300.00	88.97	179.59	11,721.30	-9,953.06	70.49	9,953.31	0.00	0.00	0.00
21,400.00	88.97	179.59	11,723.11	-10,053.04	71.20	10,053.29	0.00	0.00	0.00
21,500.00	88.97	179.59	11,724.91	-10,153.02	71.91	10,153.28	0.00	0.00	0.00
21,504.89	88.97	179.59	11,725.00	-10,157.91	71.94	10,158.16	0.00	0.00	0.00

TD at 21504.89



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
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Site: Sec. 5, T 21 S., R 33 E
Well: Becknell State Com 4H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Becknell State Com 4H
TVD Reference: KB=26' @ 3816.60ft (McVay 8)
MD Reference: KB=26' @ 3816.60ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Becknell State Com 4 - plan misses target center by 0.25ft at 11433.19ft MD (11399.88 TVD, -129.80 N, 0.92 E) - Point	0.00	0.00	11,399.90	-129.82	0.68	548,892.5795	725,569.7754	32.5068880	-103.6016310
Becknell State Com 4 - plan misses target center by 0.03ft at 21374.99ft MD (11722.65 TVD, -10028.03 N, 71.02 E) - Point	0.00	0.00	11,722.65	-10,028.03	71.05	538,994.3907	725,640.1516	32.4796800	-103.6016230
Becknell State Com 4 - plan hits target center - Point	0.00	0.00	11,725.00	-10,157.91	71.94	538,864.5152	725,641.0424	32.4793230	-103.6016230

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
11,073	11,073	0	0	Start Build 12.00	
11,814	11,550	-469	3	Start 9690.90 hold at 11813.99 MD	
21,505	11,725	-10,158	72	TD at 21504.89	

Checked By: _____ Approved By: _____ Date: _____

Becknell State Com 4H

Casing and Cement

<u>String</u>	<u>Hole Size</u>	<u>Csg OD</u>	<u>PPF</u>	<u>Depth</u>	<u>Sx Cement</u>	<u>TOC</u>
Surface	17-1/2"	13-3/8"	54.5#	1700'	1220	0'
Intermediate	12-1/4"	9-5/8"	40#	5650'	2000	0'
Production	8-3/4"	5-1/2"	17#	21504'	3800	0'

Well Plan

Drill 17-1/2" hole to ~1,700' w/ fresh water spud mud. Run 13-3/8" 54.5# J-55 BTC casing to TD and cement to surface in one stage.

Drill 12-1/4" hole to ~5,650' with saturated brine. Run 9-5/8 40# J-55 BTC to 3500' and 9-5/8 40# L-80 BTC casing from 3500' to TD and cement to surface in two stages with DV/ECP 100' above reef.

Drill 8-3/4" vertical hole, curve & lateral to 21,504' with cut brine. Run 5-1/2" 17# HCP110 BTC casing from TD to surface and cement to surface in one stage.

Well Control

<u>Type</u>	<u>Working Pressure</u>	<u>Test Pressure</u>	<u>Manufacture</u>
Double Ram	3000 psi	3000 psi	Cameron