



PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

**Lea County, NM (NAD27 NME)
Huckleberry State Com
501H**

OH / 64199

Design: Surveys (Ensign 155)

Standard Survey Report

25 April, 2019

HOBBS OCD
DEC 16 2019
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Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Huckleberry State Com
Well: 501H
Wellbore: OH / 64199
Design: Surveys (Ensign 155)

Local Co-ordinate Reference: Well 501H
TVD Reference: RKB @ 3790.40usft (Ensign 155)
MD Reference: RKB @ 3790.40usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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	Huckleberry State Com				
Site Position:		Northing:	530,679.80 usft	Latitude:	32° 27' 23.5760 N
From:	Map	Easting:	739,901.70 usft	Longitude:	103° 33' 20.0715 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	501H					
Well Position	+N/-S	0.00 usft	Northing:	530,679.80 usft	Latitude:	32° 27' 23.5760 N
	+E/-W	0.00 usft	Easting:	739,901.70 usft	Longitude:	103° 33' 20.0715 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,766.40 usft	

Wellbore	OH / 64199				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	3/17/2019	6.67	60.27	48,123.07546030

Design	Surveys (Ensign 155)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	1.38	

Survey Program	Date 4/25/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	9,970.00	Scientific Gyro Surveys (OH / 64199)	NS-GYRO-MS	North sensing gyrocompassing m/s
10,003.00	21,158.00	Phoenix MWD Surveys (OH / 64199)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

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	0.60	157.45	100.00	-0.48	0.20	-0.48	0.60	0.60	0.00
125.00	0.64	166.41	125.00	-0.74	0.28	-0.73	0.42	0.16	35.84
150.00	0.69	153.43	150.00	-1.01	0.38	-1.00	0.63	0.20	-51.92
175.00	0.80	163.77	174.99	-1.31	0.50	-1.30	0.69	0.44	41.36
200.00	0.75	170.44	199.99	-1.64	0.58	-1.63	0.41	-0.20	26.68
225.00	0.92	182.43	224.99	-2.00	0.59	-1.99	0.97	0.68	47.96
250.00	0.99	195.77	249.98	-2.41	0.53	-2.40	0.93	0.28	53.36
275.00	1.14	194.92	274.98	-2.86	0.40	-2.85	0.60	0.60	-3.40
300.00	1.11	196.43	299.98	-3.33	0.27	-3.33	0.17	-0.12	6.04



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
325.00	1.27	200.81	324.97	-3.82	0.11	-3.82	0.74	0.64	17.52
350.00	1.33	203.86	349.96	-4.35	-0.11	-4.35	0.37	0.24	12.20
375.00	1.24	201.13	374.96	-4.87	-0.33	-4.87	0.44	-0.36	-10.92
400.00	1.38	206.35	399.95	-5.39	-0.56	-5.40	0.74	0.56	20.88
425.00	1.52	209.05	424.94	-5.95	-0.85	-5.97	0.62	0.56	10.80
450.00	1.38	204.13	449.93	-6.51	-1.14	-6.54	0.75	-0.56	-19.68
475.00	1.06	198.91	474.93	-7.01	-1.33	-7.04	1.35	-1.28	-20.88
500.00	0.90	193.94	499.93	-7.41	-1.46	-7.45	0.72	-0.64	-19.88
525.00	0.95	174.60	524.92	-7.81	-1.48	-7.85	1.26	0.20	-77.36
550.00	0.86	161.03	549.92	-8.20	-1.40	-8.23	0.93	-0.36	-54.28
575.00	0.80	156.98	574.92	-8.53	-1.27	-8.56	0.34	-0.24	-16.20
600.00	0.72	154.46	599.91	-8.84	-1.14	-8.86	0.35	-0.32	-10.08
625.00	0.81	150.22	624.91	-9.13	-0.98	-9.15	0.43	0.36	-16.96
650.00	0.95	151.31	649.91	-9.47	-0.79	-9.48	0.56	0.56	4.36
675.00	0.96	150.73	674.91	-9.83	-0.59	-9.84	0.06	0.04	-2.32
700.00	0.85	152.04	699.90	-10.18	-0.40	-10.18	0.45	-0.44	5.24
725.00	0.95	151.55	724.90	-10.52	-0.22	-10.53	0.40	0.40	-1.96
750.00	0.95	151.02	749.90	-10.89	-0.02	-10.88	0.04	0.00	-2.12
775.00	1.01	152.01	774.89	-11.26	0.19	-11.25	0.25	0.24	3.96
800.00	0.87	151.12	799.89	-11.62	0.38	-11.61	0.56	-0.56	-3.56
825.00	0.81	152.35	824.89	-11.95	0.55	-11.93	0.25	-0.24	4.92
850.00	0.81	152.03	849.88	-12.26	0.72	-12.24	0.02	0.00	-1.28
875.00	0.95	155.10	874.88	-12.60	0.89	-12.58	0.59	0.56	12.28
900.00	1.02	156.35	899.88	-12.99	1.07	-12.97	0.29	0.28	5.00
925.00	1.26	155.61	924.87	-13.45	1.27	-13.41	0.96	0.96	-2.96
950.00	0.92	155.84	949.87	-13.88	1.46	-13.84	1.36	-1.36	0.92
975.00	0.85	150.05	974.86	-14.23	1.64	-14.18	0.45	-0.28	-23.16
1,000.00	0.94	152.28	999.86	-14.57	1.83	-14.52	0.39	0.36	8.92
1,025.00	0.84	153.52	1,024.86	-14.91	2.00	-14.86	0.41	-0.40	4.96
1,050.00	0.94	157.07	1,049.86	-15.27	2.17	-15.21	0.46	0.40	14.20
1,075.00	0.79	152.81	1,074.85	-15.61	2.32	-15.55	0.65	-0.60	-17.04
1,100.00	0.84	148.73	1,099.85	-15.92	2.50	-15.85	0.31	0.20	-16.32
1,125.00	0.94	137.44	1,124.85	-16.23	2.73	-16.16	0.81	0.40	-45.16
1,150.00	0.93	119.92	1,149.84	-16.48	3.05	-16.40	1.14	-0.04	-70.08
1,175.00	1.05	111.65	1,174.84	-16.66	3.43	-16.58	0.75	0.48	-33.08
1,200.00	0.93	104.56	1,199.84	-16.80	3.84	-16.70	0.69	-0.48	-28.36
1,225.00	0.93	102.00	1,224.83	-16.89	4.24	-16.79	0.17	0.00	-10.24
1,250.00	1.04	101.92	1,249.83	-16.98	4.66	-16.87	0.44	0.44	-0.32
1,275.00	1.05	98.49	1,274.83	-17.06	5.11	-16.93	0.25	0.04	-13.72
1,300.00	0.81	96.60	1,299.82	-17.12	5.51	-16.98	0.97	-0.96	-7.56
1,325.00	0.53	77.06	1,324.82	-17.11	5.80	-16.97	1.43	-1.12	-78.16
1,350.00	0.36	48.09	1,349.82	-17.03	5.97	-16.88	1.11	-0.68	-115.88
1,375.00	0.38	15.12	1,374.82	-16.90	6.05	-16.75	0.84	0.08	-131.88



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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)
1,400.00	0.46	347.88	1,399.82	-16.72	6.05	-16.57	0.85	0.32	-108.96
1,425.00	0.63	344.88	1,424.82	-16.49	5.99	-16.34	0.69	0.68	-12.00
1,450.00	0.63	330.00	1,449.82	-16.24	5.89	-16.09	0.65	0.00	-59.52
1,475.00	0.62	338.91	1,474.81	-15.99	5.77	-15.85	0.39	-0.04	35.64
1,500.00	0.55	334.85	1,499.81	-15.76	5.67	-15.62	0.33	-0.28	-16.24
1,525.00	0.63	316.38	1,524.81	-15.55	5.53	-15.41	0.82	0.32	-73.88
1,550.00	0.71	308.84	1,549.81	-15.36	5.31	-15.22	0.48	0.32	-30.16
1,575.00	0.49	319.18	1,574.81	-15.18	5.12	-15.05	0.98	-0.88	41.36
1,600.00	0.49	298.42	1,599.81	-15.05	4.96	-14.92	0.71	0.00	-83.04
1,625.00	0.50	298.93	1,624.81	-14.94	4.77	-14.82	0.04	0.04	2.04
1,650.00	0.45	301.62	1,649.81	-14.84	4.59	-14.72	0.22	-0.20	10.76
1,675.00	0.42	302.09	1,674.81	-14.74	4.43	-14.63	0.12	-0.12	1.88
1,700.00	0.43	296.14	1,699.80	-14.65	4.26	-14.54	0.18	0.04	-23.80
1,725.00	0.48	302.73	1,724.80	-14.55	4.09	-14.45	0.29	0.20	26.36
1,750.00	0.55	298.57	1,749.80	-14.44	3.90	-14.34	0.32	0.28	-16.64
1,775.00	0.54	300.82	1,774.80	-14.32	3.69	-14.22	0.09	-0.04	9.00
1,800.00	0.75	294.49	1,799.80	-14.19	3.44	-14.10	0.89	0.84	-25.32
1,825.00	0.50	295.16	1,824.80	-14.08	3.19	-13.99	1.00	-1.00	2.68
1,850.00	0.51	288.08	1,849.80	-13.99	2.99	-13.92	0.25	0.04	-28.32
1,875.00	0.58	279.78	1,874.80	-13.94	2.76	-13.87	0.42	0.28	-33.20
1,900.00	0.56	283.13	1,899.80	-13.89	2.52	-13.82	0.16	-0.08	13.40
1,925.00	0.42	273.75	1,924.79	-13.86	2.31	-13.80	0.64	-0.56	-37.52
1,950.00	0.35	253.55	1,949.79	-13.87	2.14	-13.82	0.61	-0.28	-80.80
1,975.00	0.32	190.38	1,974.79	-13.96	2.05	-13.91	1.41	-0.12	-252.68
2,000.00	0.79	145.35	1,999.79	-14.17	2.14	-14.12	2.43	1.88	-180.12
2,025.00	1.10	147.07	2,024.79	-14.51	2.37	-14.45	1.25	1.24	6.88
2,050.00	1.25	144.39	2,049.78	-14.94	2.66	-14.87	0.64	0.60	-10.72
2,075.00	1.45	144.10	2,074.78	-15.42	3.00	-15.34	0.80	0.80	-1.16
2,100.00	1.56	140.74	2,099.77	-15.94	3.40	-15.85	0.56	0.44	-13.44
2,125.00	1.81	142.31	2,124.76	-16.51	3.86	-16.41	1.02	1.00	6.28
2,150.00	1.77	140.85	2,149.74	-17.12	4.34	-17.01	0.24	-0.16	-5.84
2,175.00	1.63	142.49	2,174.73	-17.70	4.80	-17.58	0.59	-0.56	6.56
2,200.00	1.68	143.30	2,199.72	-18.28	5.24	-18.15	0.22	0.20	3.24
2,225.00	1.69	144.09	2,224.71	-18.87	5.68	-18.73	0.10	0.04	3.16
2,250.00	1.57	140.81	2,249.70	-19.44	6.11	-19.28	0.61	-0.48	-13.12
2,275.00	1.21	124.67	2,274.70	-19.85	6.54	-19.69	2.11	-1.44	-64.56
2,300.00	1.05	106.46	2,299.69	-20.07	6.98	-19.89	1.56	-0.64	-72.84
2,325.00	0.96	96.18	2,324.69	-20.16	7.41	-19.97	0.80	-0.36	-41.12
2,350.00	1.05	97.27	2,349.68	-20.21	7.84	-20.01	0.37	0.36	4.36
2,375.00	1.27	91.56	2,374.68	-20.24	8.35	-20.04	0.99	0.88	-22.84
2,400.00	1.44	93.46	2,399.67	-20.27	8.94	-20.05	0.70	0.68	7.60
2,425.00	1.25	79.36	2,424.66	-20.24	9.52	-20.00	1.52	-0.76	-56.40
2,450.00	1.40	77.88	2,449.66	-20.12	10.08	-19.88	0.62	0.60	-5.92



Survey Report



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2,475.00	1.56	81.75	2,474.65	-20.01	10.72	-19.75	0.75	0.64	15.48
2,500.00	1.72	86.59	2,499.64	-19.94	11.43	-19.66	0.85	0.64	19.36
2,525.00	2.17	88.86	2,524.62	-19.91	12.28	-19.61	1.83	1.80	9.08
2,550.00	1.91	85.75	2,549.61	-19.87	13.17	-19.54	1.13	-1.04	-12.44
2,575.00	1.98	85.68	2,574.59	-19.80	14.01	-19.46	0.28	0.28	-0.28
2,600.00	2.29	89.77	2,599.58	-19.77	14.94	-19.40	1.38	1.24	16.36
2,625.00	2.14	86.77	2,624.56	-19.74	15.91	-19.35	0.76	-0.60	-12.00
2,650.00	2.01	93.54	2,649.54	-19.74	16.81	-19.33	1.11	-0.52	27.08
2,675.00	1.93	94.44	2,674.53	-19.80	17.67	-19.37	0.34	-0.32	3.60
2,700.00	1.84	95.55	2,699.51	-19.87	18.49	-19.42	0.39	-0.36	4.44
2,725.00	1.92	95.97	2,724.50	-19.96	19.31	-19.49	0.32	0.32	1.68
2,750.00	2.17	103.56	2,749.48	-20.11	20.18	-19.62	1.47	1.00	30.36
2,775.00	1.96	99.02	2,774.47	-20.29	21.06	-19.78	1.06	-0.84	-18.16
2,800.00	2.13	97.91	2,799.45	-20.42	21.95	-19.88	0.70	0.68	-4.44
2,825.00	2.03	97.93	2,824.44	-20.54	22.85	-19.99	0.40	-0.40	0.08
2,850.00	1.96	98.27	2,849.42	-20.67	23.71	-20.09	0.28	-0.28	1.36
2,875.00	2.20	98.49	2,874.40	-20.80	24.60	-20.20	0.96	0.96	0.88
2,900.00	2.17	101.30	2,899.39	-20.96	25.54	-20.34	0.44	-0.12	11.24
2,925.00	1.92	101.46	2,924.37	-21.14	26.42	-20.50	1.00	-1.00	0.64
2,950.00	1.75	98.40	2,949.36	-21.28	27.21	-20.62	0.78	-0.68	-12.24
2,975.00	1.85	98.84	2,974.34	-21.40	27.98	-20.72	0.40	0.40	1.76
3,000.00	1.67	95.46	2,999.33	-21.49	28.74	-20.79	0.83	-0.72	-13.52
3,025.00	1.24	85.37	3,024.32	-21.50	29.38	-20.79	2.00	-1.72	-40.36
3,050.00	0.92	64.18	3,049.32	-21.40	29.83	-20.67	2.03	-1.28	-84.76
3,075.00	1.00	62.13	3,074.32	-21.21	30.20	-20.47	0.35	0.32	-8.20
3,100.00	1.09	56.09	3,099.31	-20.97	30.59	-20.23	0.57	0.36	-24.16
3,125.00	1.11	52.91	3,124.31	-20.69	30.98	-19.94	0.26	0.08	-12.72
3,150.00	1.17	54.61	3,149.30	-20.40	31.38	-19.64	0.28	0.24	6.80
3,175.00	1.27	47.99	3,174.30	-20.07	31.80	-19.29	0.69	0.40	-26.48
3,200.00	1.37	45.19	3,199.29	-19.67	32.21	-18.89	0.48	0.40	-11.20
3,225.00	1.82	46.72	3,224.28	-19.19	32.72	-18.39	1.81	1.80	6.12
3,250.00	1.95	46.60	3,249.27	-18.62	33.31	-17.82	0.52	0.52	-0.48
3,275.00	1.59	46.67	3,274.26	-18.09	33.87	-17.27	1.44	-1.44	0.28
3,300.00	1.57	45.45	3,299.25	-17.61	34.37	-16.78	0.16	-0.08	-4.88
3,325.00	1.61	48.88	3,324.24	-17.14	34.88	-16.30	0.41	0.16	13.72
3,350.00	1.62	49.49	3,349.23	-16.68	35.41	-15.82	0.08	0.04	2.44
3,375.00	1.55	50.25	3,374.22	-16.24	35.94	-15.37	0.29	-0.28	3.04
3,400.00	1.41	47.75	3,399.21	-15.81	36.43	-14.93	0.62	-0.56	-10.00
3,425.00	1.36	50.34	3,424.20	-15.42	36.88	-14.52	0.32	-0.20	10.36
3,450.00	1.45	53.25	3,449.19	-15.04	37.37	-14.13	0.46	0.36	11.64
3,475.00	1.67	59.00	3,474.18	-14.66	37.93	-13.74	1.08	0.88	23.00
3,500.00	1.24	72.20	3,499.18	-14.39	38.50	-13.46	2.17	-1.72	52.80
3,525.00	1.19	80.63	3,524.17	-14.27	39.02	-13.32	0.74	-0.20	33.72
3,550.00	1.20	87.31	3,549.17	-14.21	39.53	-13.26	0.56	0.04	26.72

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
3,575.00	1.22	93.15	3,574.16	-14.21	40.06	-13.25	0.50	0.08	23.36
3,600.00	1.27	93.60	3,599.15	-14.25	40.60	-13.26	0.20	0.20	1.80
3,625.00	1.31	94.55	3,624.15	-14.29	41.16	-13.29	0.18	0.16	3.80
3,650.00	1.26	97.08	3,649.14	-14.34	41.72	-13.33	0.30	-0.20	10.12
3,675.00	1.39	97.79	3,674.13	-14.42	42.30	-13.40	0.52	0.52	2.84
3,700.00	1.51	100.47	3,699.13	-14.52	42.92	-13.48	0.55	0.48	10.72
3,725.00	1.40	103.19	3,724.12	-14.65	43.54	-13.60	0.52	-0.44	10.88
3,750.00	1.42	105.97	3,749.11	-14.80	44.14	-13.74	0.29	0.08	11.12
3,775.00	1.32	105.48	3,774.10	-14.97	44.71	-13.88	0.40	-0.40	-1.96
3,800.00	1.34	104.71	3,799.10	-15.12	45.27	-14.02	0.11	0.08	-3.08
3,825.00	1.48	107.22	3,824.09	-15.29	45.86	-14.18	0.61	0.56	10.04
3,850.00	1.26	116.38	3,849.08	-15.50	46.42	-14.38	1.24	-0.88	36.64
3,875.00	0.86	129.86	3,874.08	-15.75	46.81	-14.61	1.87	-1.60	53.92
3,900.00	0.82	141.35	3,899.08	-16.01	47.06	-14.87	0.69	-0.16	45.96
3,925.00	0.68	148.49	3,924.07	-16.27	47.25	-15.13	0.67	-0.56	28.56
3,950.00	0.81	156.26	3,949.07	-16.56	47.40	-15.41	0.66	0.52	31.08
3,975.00	0.72	167.01	3,974.07	-16.88	47.51	-15.73	0.68	-0.36	43.00
4,000.00	0.61	168.90	3,999.07	-17.16	47.57	-16.01	0.45	-0.44	7.56
4,025.00	0.75	182.33	4,024.07	-17.45	47.59	-16.30	0.84	0.56	53.72
4,050.00	0.43	187.94	4,049.06	-17.71	47.57	-16.56	1.30	-1.28	22.44
4,075.00	0.95	177.89	4,074.06	-18.01	47.56	-16.86	2.13	2.08	-40.20
4,100.00	0.73	182.75	4,099.06	-18.38	47.56	-17.23	0.92	-0.88	19.44
4,125.00	0.60	189.12	4,124.06	-18.66	47.53	-17.51	0.60	-0.52	25.48
4,150.00	0.61	178.11	4,149.06	-18.93	47.52	-17.78	0.47	0.04	-44.04
4,175.00	0.74	177.80	4,174.05	-19.22	47.53	-18.07	0.52	0.52	-1.24
4,200.00	0.69	182.57	4,199.05	-19.53	47.53	-18.38	0.31	-0.20	19.08
4,225.00	0.53	185.11	4,224.05	-19.80	47.51	-18.65	0.65	-0.64	10.16
4,250.00	0.60	189.13	4,249.05	-20.04	47.48	-18.89	0.32	0.28	16.08
4,275.00	0.48	200.56	4,274.05	-20.27	47.42	-19.12	0.64	-0.48	45.72
4,300.00	0.32	250.22	4,299.05	-20.39	47.32	-19.25	1.46	-0.64	198.64
4,325.00	0.76	304.38	4,324.05	-20.32	47.12	-19.18	2.51	1.76	216.64
4,350.00	1.40	309.62	4,349.04	-20.03	46.75	-18.90	2.59	2.56	20.96
4,375.00	1.69	319.33	4,374.03	-19.56	46.27	-18.44	1.56	1.16	38.84
4,400.00	1.86	327.15	4,399.02	-18.94	45.81	-17.83	1.18	0.68	31.28
4,425.00	1.88	334.62	4,424.01	-18.23	45.41	-17.13	0.98	0.08	29.88
4,450.00	2.22	331.33	4,448.99	-17.43	45.01	-16.34	1.44	1.36	-13.16
4,475.00	2.66	332.51	4,473.97	-16.49	44.51	-15.42	1.77	1.76	4.72
4,500.00	2.56	336.01	4,498.94	-15.47	44.01	-14.40	0.75	-0.40	14.00
4,525.00	2.93	333.20	4,523.91	-14.39	43.50	-13.34	1.57	1.48	-11.24
4,550.00	3.47	335.78	4,548.88	-13.13	42.90	-12.09	2.23	2.16	10.32
4,575.00	3.59	335.19	4,573.83	-11.73	42.26	-10.71	0.50	0.48	-2.36
4,600.00	3.79	332.24	4,598.78	-10.28	41.54	-9.28	1.10	0.80	-11.80
4,625.00	3.80	331.21	4,623.72	-8.83	40.76	-7.84	0.28	0.04	-4.12

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
4,650.00	3.84	331.15	4,648.67	-7.37	39.96	-6.40	0.16	0.16	-0.24
4,675.00	3.92	331.19	4,673.61	-5.89	39.14	-4.94	0.32	0.32	0.16
4,700.00	4.00	327.96	4,698.55	-4.40	38.27	-3.48	0.95	0.32	-12.92
4,725.00	4.05	326.55	4,723.49	-2.92	37.32	-2.02	0.44	0.20	-5.64
4,750.00	3.43	326.49	4,748.43	-1.56	36.42	-0.69	2.48	-2.48	-0.24
4,775.00	3.20	325.24	4,773.39	-0.37	35.61	0.49	0.96	-0.92	-5.00
4,800.00	3.26	325.01	4,798.35	0.79	34.80	1.63	0.25	0.24	-0.92
4,825.00	3.24	325.95	4,823.31	1.96	34.00	2.78	0.23	-0.08	3.76
4,850.00	3.26	324.88	4,848.27	3.12	33.20	3.92	0.26	0.08	-4.28
4,875.00	3.11	323.10	4,873.23	4.25	32.38	5.03	0.72	-0.60	-7.12
4,900.00	3.08	321.87	4,898.20	5.32	31.56	6.08	0.29	-0.12	-4.92
4,925.00	3.11	322.09	4,923.16	6.38	30.73	7.12	0.13	0.12	0.88
4,950.00	3.09	321.86	4,948.12	7.45	29.89	8.16	0.09	-0.08	-0.92
4,975.00	3.09	322.44	4,973.09	8.51	29.07	9.21	0.13	0.00	2.32
5,000.00	3.15	320.46	4,998.05	9.58	28.22	10.25	0.49	0.24	-7.92
5,025.00	3.24	317.64	5,023.01	10.63	27.31	11.28	0.72	0.36	-11.28
5,050.00	3.35	316.93	5,047.97	11.68	26.33	12.31	0.47	0.44	-2.84
5,075.00	3.38	313.72	5,072.93	12.73	25.30	13.33	0.76	0.12	-12.84
5,100.00	3.33	312.19	5,097.88	13.72	24.23	14.30	0.41	-0.20	-6.12
5,125.00	3.17	309.82	5,122.84	14.65	23.16	15.21	0.84	-0.64	-9.48
5,150.00	3.11	309.27	5,147.81	15.52	22.10	16.05	0.27	-0.24	-2.20
5,175.00	3.14	309.21	5,172.77	16.39	21.05	16.89	0.12	0.12	-0.24
5,200.00	3.27	307.57	5,197.73	17.25	19.95	17.73	0.64	0.52	-6.56
5,225.00	3.26	307.14	5,222.69	18.12	18.82	18.57	0.11	-0.04	-1.72
5,250.00	3.23	306.54	5,247.65	18.97	17.69	19.39	0.18	-0.12	-2.40
5,275.00	3.32	304.77	5,272.61	19.80	16.53	20.19	0.54	0.36	-7.08
5,300.00	3.20	303.22	5,297.57	20.59	15.35	20.96	0.60	-0.48	-6.20
5,325.00	3.28	302.48	5,322.53	21.36	14.16	21.70	0.36	0.32	-2.96
5,350.00	3.17	304.10	5,347.49	22.13	12.99	22.44	0.57	-0.44	6.48
5,375.00	3.18	300.00	5,372.45	22.87	11.81	23.14	0.91	0.04	-16.40
5,400.00	3.17	298.74	5,397.41	23.55	10.61	23.79	0.28	-0.04	-5.04
5,425.00	3.20	300.55	5,422.37	24.23	9.40	24.45	0.42	0.12	7.24
5,450.00	3.15	298.92	5,447.34	24.92	8.20	25.11	0.41	-0.20	-6.52
5,475.00	3.17	297.53	5,472.30	25.57	6.98	25.73	0.32	0.08	-5.56
5,500.00	3.06	297.86	5,497.26	26.20	5.78	26.33	0.45	-0.44	1.32
5,525.00	3.05	298.64	5,522.22	26.83	4.61	26.94	0.17	-0.04	3.12
5,550.00	3.02	298.46	5,547.19	27.47	3.44	27.54	0.13	-0.12	-0.72
5,575.00	1.70	294.32	5,572.17	27.93	2.53	27.98	5.32	-5.28	-16.56
5,600.00	0.79	272.56	5,597.16	28.09	2.02	28.13	4.04	-3.64	-87.04
5,625.00	0.54	254.98	5,622.16	28.07	1.73	28.10	1.28	-1.00	-70.32
5,650.00	0.37	225.10	5,647.16	27.98	1.56	28.01	1.15	-0.68	-119.52
5,675.00	0.97	144.56	5,672.16	27.75	1.63	27.78	3.92	2.40	-322.16
5,700.00	1.26	140.54	5,697.15	27.37	1.92	27.41	1.20	1.16	-16.08

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
5,725.00	1.58	136.19	5,722.15	26.91	2.34	26.96	1.35	1.28	-17.40
5,750.00	2.16	120.91	5,747.13	26.42	2.98	26.48	3.04	2.32	-61.12
5,775.00	3.28	115.36	5,772.10	25.87	4.03	25.96	4.60	4.48	-22.20
5,800.00	3.39	112.78	5,797.06	25.28	5.36	25.40	0.74	0.44	-10.32
5,825.00	3.72	111.81	5,822.01	24.69	6.79	24.84	1.34	1.32	-3.88
5,850.00	4.31	111.71	5,846.95	24.04	8.42	24.23	2.36	2.36	-0.40
5,875.00	4.86	111.09	5,871.87	23.31	10.28	23.55	2.21	2.20	-2.48
5,900.00	5.09	112.90	5,896.78	22.50	12.29	22.79	1.11	0.92	7.24
5,925.00	5.05	111.37	5,921.68	21.67	14.33	22.00	0.56	-0.16	-6.12
5,950.00	5.09	111.78	5,946.58	20.85	16.39	21.24	0.22	0.16	1.64
5,975.00	5.05	111.10	5,971.48	20.05	18.45	20.48	0.29	-0.16	-2.72
6,000.00	5.06	111.80	5,996.39	19.24	20.50	19.73	0.25	0.04	2.80
6,025.00	5.36	112.17	6,021.28	18.39	22.60	18.93	1.21	1.20	1.48
6,050.00	4.96	111.99	6,046.18	17.54	24.68	18.13	1.60	-1.60	-0.72
6,075.00	4.94	111.22	6,071.09	16.75	26.69	17.39	0.28	-0.08	-3.08
6,100.00	4.78	111.34	6,096.00	15.98	28.66	16.67	0.64	-0.64	0.48
6,125.00	4.80	111.28	6,120.91	15.22	30.61	15.96	0.08	0.08	-0.24
6,150.00	5.12	111.26	6,145.82	14.44	32.62	15.22	1.28	1.28	-0.08
6,175.00	4.87	111.45	6,170.72	13.65	34.65	14.48	1.00	-1.00	0.76
6,200.00	4.91	110.39	6,195.63	12.89	36.64	13.76	0.40	0.16	-4.24
6,225.00	5.57	108.67	6,220.53	12.12	38.79	13.05	2.71	2.64	-6.88
6,250.00	6.08	106.37	6,245.40	11.36	41.21	12.35	2.24	2.04	-9.20
6,275.00	6.61	106.20	6,270.25	10.59	43.86	11.64	2.12	2.12	-0.68
6,300.00	6.51	105.59	6,295.08	9.81	46.61	10.93	0.49	-0.40	-2.44
6,325.00	7.17	107.14	6,319.90	8.97	49.47	10.15	2.74	2.64	6.20
6,350.00	7.68	106.93	6,344.69	8.02	52.56	9.28	2.04	2.04	-0.84
6,375.00	8.51	107.84	6,369.44	6.97	55.92	8.31	3.36	3.32	3.64
6,400.00	8.37	107.74	6,394.17	5.84	59.41	7.27	0.56	-0.56	-0.40
6,425.00	8.51	107.76	6,418.90	4.73	62.90	6.24	0.56	0.56	0.08
6,450.00	8.38	107.77	6,443.63	3.61	66.40	5.20	0.52	-0.52	0.04
6,475.00	8.51	107.56	6,468.36	2.49	69.90	4.17	0.53	0.52	-0.84
6,500.00	8.61	107.95	6,493.08	1.36	73.44	3.12	0.46	0.40	1.56
6,525.00	8.43	107.90	6,517.81	0.22	76.97	2.07	0.72	-0.72	-0.20
6,550.00	8.50	108.47	6,542.53	-0.93	80.46	1.01	0.44	0.28	2.28
6,575.00	8.46	109.02	6,567.26	-2.12	83.95	-0.09	0.36	-0.16	2.20
6,600.00	8.51	109.26	6,591.99	-3.33	87.44	-1.22	0.25	0.20	0.96
6,625.00	8.55	109.39	6,616.71	-4.55	90.94	-2.36	0.18	0.16	0.52
6,650.00	8.52	110.19	6,641.43	-5.81	94.43	-3.53	0.49	-0.12	3.20
6,675.00	8.34	110.43	6,666.16	-7.08	97.87	-4.72	0.73	-0.72	0.96
6,700.00	8.28	110.46	6,690.90	-8.34	101.25	-5.90	0.24	-0.24	0.12
6,725.00	8.29	110.83	6,715.64	-9.61	104.62	-7.09	0.22	0.04	1.48
6,750.00	8.41	110.53	6,740.38	-10.90	108.02	-8.29	0.51	0.48	-1.20
6,775.00	8.37	110.65	6,765.11	-12.18	111.43	-9.49	0.17	-0.16	0.48
6,800.00	8.25	110.77	6,789.85	-13.46	114.81	-10.69	0.48	-0.48	0.48



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Huckleberry State Com
Well: 501H
Wellbore: OH / 64199
Design: Surveys (Ensign 155)

Local Co-ordinate Reference: Well 501H
TVD Reference: RKB @ 3790.40usft (Ensign 155)
MD Reference: RKB @ 3790.40usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)
6,825.00	8.21	111.10	6,814.59	-14.73	118.16	-11.89	0.25	-0.16	1.32
6,850.00	8.31	110.80	6,839.33	-16.02	121.51	-13.09	0.44	0.40	-1.20
6,875.00	8.34	111.54	6,864.07	-17.33	124.89	-14.31	0.45	0.12	2.96
6,900.00	8.25	111.10	6,888.80	-18.64	128.25	-15.54	0.44	-0.36	-1.76
6,925.00	8.22	111.57	6,913.55	-19.94	131.58	-16.77	0.29	-0.12	1.88
6,950.00	8.18	111.59	6,938.29	-21.25	134.90	-18.00	0.16	-0.16	0.08
6,975.00	8.35	110.98	6,963.03	-22.56	138.25	-19.22	0.77	0.68	-2.44
7,000.00	8.20	111.88	6,987.77	-23.87	141.60	-20.45	0.79	-0.60	3.60
7,025.00	7.83	113.28	7,012.53	-25.21	144.81	-21.71	1.67	-1.48	5.60
7,050.00	7.58	114.06	7,037.30	-26.55	147.88	-22.98	1.08	-1.00	3.12
7,075.00	7.60	114.12	7,062.08	-27.90	150.90	-24.26	0.09	0.08	0.24
7,100.00	7.61	114.27	7,086.86	-29.26	153.92	-25.54	0.09	0.04	0.60
7,125.00	7.71	114.62	7,111.64	-30.64	156.95	-26.85	0.44	0.40	1.40
7,150.00	7.53	114.64	7,136.42	-32.02	159.96	-28.16	0.72	-0.72	0.08
7,175.00	7.36	115.04	7,161.21	-33.38	162.90	-29.45	0.71	-0.68	1.60
7,200.00	7.24	115.01	7,186.00	-34.72	165.78	-30.72	0.48	-0.48	-0.12
7,225.00	7.19	114.60	7,210.81	-36.04	168.63	-31.97	0.29	-0.20	-1.64
7,250.00	6.85	114.54	7,235.62	-37.31	171.41	-33.17	1.36	-1.36	-0.24
7,275.00	6.78	114.63	7,260.44	-38.54	174.11	-34.34	0.28	-0.28	0.36
7,300.00	6.67	114.42	7,285.27	-39.76	176.77	-35.49	0.45	-0.44	-0.84
7,325.00	6.72	114.78	7,310.10	-40.97	179.42	-36.64	0.26	0.20	1.44
7,350.00	6.72	115.42	7,334.93	-42.21	182.07	-37.82	0.30	0.00	2.56
7,375.00	6.64	115.96	7,359.76	-43.47	184.69	-39.01	0.41	-0.32	2.16
7,400.00	6.60	115.81	7,384.59	-44.73	187.28	-40.21	0.17	-0.16	-0.60
7,425.00	6.66	116.19	7,409.42	-46.00	189.88	-41.41	0.30	0.24	1.52
7,450.00	6.77	116.92	7,434.25	-47.30	192.49	-42.66	0.56	0.44	2.92
7,475.00	6.61	116.85	7,459.08	-48.62	195.09	-43.91	0.64	-0.64	-0.28
7,500.00	6.35	117.50	7,483.92	-49.91	197.60	-45.14	1.08	-1.04	2.60
7,525.00	6.17	118.27	7,508.77	-51.18	200.01	-46.35	0.79	-0.72	3.08
7,550.00	6.14	118.58	7,533.63	-52.46	202.37	-47.57	0.18	-0.12	1.24
7,575.00	6.32	118.27	7,558.48	-53.75	204.75	-48.81	0.73	0.72	-1.24
7,600.00	6.23	119.42	7,583.33	-55.07	207.15	-50.07	0.62	-0.36	4.60
7,625.00	6.02	119.99	7,608.19	-56.39	209.46	-51.33	0.87	-0.84	2.28
7,650.00	5.88	120.14	7,633.05	-57.69	211.71	-52.58	0.56	-0.56	0.60
7,675.00	5.75	119.85	7,657.93	-58.96	213.90	-53.79	0.53	-0.52	-1.16
7,700.00	5.81	120.25	7,682.80	-60.22	216.08	-55.00	0.29	0.24	1.60
7,725.00	5.77	120.02	7,707.67	-61.48	218.26	-56.21	0.18	-0.16	-0.92
7,750.00	5.44	120.91	7,732.55	-62.72	220.37	-57.40	1.36	-1.32	3.56
7,775.00	5.34	121.70	7,757.44	-63.94	222.37	-58.57	0.50	-0.40	3.16
7,800.00	5.33	121.58	7,782.33	-65.16	224.35	-59.74	0.06	-0.04	-0.48
7,825.00	5.64	121.64	7,807.22	-66.41	226.39	-60.94	1.24	1.24	0.24
7,850.00	5.29	122.96	7,832.10	-67.68	228.40	-62.17	1.49	-1.40	5.28
7,875.00	5.13	123.36	7,857.00	-68.93	230.30	-63.36	0.66	-0.64	1.60

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
7,900.00	5.15	123.30	7,881.90	-70.16	232.17	-64.55	0.08	0.08	-0.24
7,925.00	5.19	123.97	7,906.80	-71.40	234.05	-65.75	0.29	0.16	2.68
7,950.00	5.71	122.38	7,931.69	-72.70	236.03	-67.00	2.17	2.08	-6.36
7,975.00	5.37	121.79	7,956.57	-73.98	238.08	-68.23	1.38	-1.36	-2.36
8,000.00	5.22	121.54	7,981.46	-75.20	240.04	-69.39	0.61	-0.60	-1.00
8,025.00	5.18	118.94	8,006.36	-76.34	242.00	-70.49	0.96	-0.16	-10.40
8,050.00	5.26	117.53	8,031.26	-77.41	244.00	-71.51	0.60	0.32	-5.64
8,075.00	5.35	116.30	8,056.15	-78.46	246.06	-72.51	0.58	0.36	-4.92
8,100.00	5.41	114.26	8,081.04	-79.46	248.18	-73.46	0.80	0.24	-8.16
8,125.00	4.86	110.45	8,105.94	-80.31	250.25	-74.26	2.59	-2.20	-15.24
8,150.00	4.71	110.05	8,130.85	-81.03	252.21	-74.94	0.61	-0.60	-1.60
8,175.00	4.81	110.20	8,155.77	-81.75	254.16	-75.61	0.40	0.40	0.60
8,200.00	4.75	111.41	8,180.68	-82.49	256.10	-76.30	0.47	-0.24	4.84
8,225.00	4.88	110.23	8,205.59	-83.23	258.06	-77.00	0.65	0.52	-4.72
8,250.00	4.61	109.76	8,230.50	-83.94	260.01	-77.66	1.09	-1.08	-1.88
8,275.00	4.53	108.70	8,255.43	-84.60	261.89	-78.27	0.47	-0.32	-4.24
8,300.00	4.46	109.56	8,280.35	-85.24	263.74	-78.86	0.39	-0.28	3.44
8,325.00	4.78	109.78	8,305.27	-85.92	265.64	-79.50	1.28	1.28	0.88
8,350.00	4.71	109.24	8,330.18	-86.61	267.58	-80.14	0.33	-0.28	-2.16
8,375.00	4.19	107.67	8,355.11	-87.22	269.42	-80.71	2.14	-2.08	-6.28
8,400.00	4.17	108.90	8,380.04	-87.80	271.15	-81.24	0.37	-0.08	4.92
8,425.00	4.23	109.26	8,404.97	-88.39	272.88	-81.80	0.26	0.24	1.44
8,450.00	4.28	110.52	8,429.90	-89.02	274.63	-82.39	0.42	0.20	5.04
8,475.00	4.38	109.99	8,454.83	-89.68	276.40	-83.00	0.43	0.40	-2.12
8,500.00	4.80	108.01	8,479.75	-90.33	278.29	-83.60	1.80	1.68	-7.92
8,525.00	4.96	107.24	8,504.66	-90.97	280.32	-84.20	0.69	0.64	-3.08
8,550.00	5.26	107.93	8,529.56	-91.64	282.44	-84.82	1.22	1.20	2.76
8,575.00	5.44	108.75	8,554.45	-92.38	284.65	-85.50	0.78	0.72	3.28
8,600.00	6.11	110.84	8,579.33	-93.23	287.02	-86.30	2.81	2.68	8.36
8,625.00	6.24	111.17	8,604.18	-94.20	289.53	-87.20	0.54	0.52	1.32
8,650.00	6.38	110.79	8,629.03	-95.18	292.09	-88.12	0.58	0.56	-1.52
8,675.00	6.46	110.74	8,653.87	-96.17	294.71	-89.05	0.32	0.32	-0.20
8,700.00	6.50	111.68	8,678.71	-97.19	297.34	-90.01	0.45	0.16	3.76
8,725.00	6.63	112.35	8,703.55	-98.26	299.99	-91.01	0.60	0.52	2.68
8,750.00	6.48	113.26	8,728.39	-99.37	302.62	-92.05	0.73	-0.60	3.64
8,775.00	6.10	113.65	8,753.23	-100.46	305.13	-93.08	1.53	-1.52	1.56
8,800.00	6.01	112.63	8,778.10	-101.50	307.56	-94.06	0.56	-0.36	-4.08
8,825.00	5.91	113.20	8,802.96	-102.51	309.95	-95.01	0.46	-0.40	2.28
8,850.00	5.69	114.02	8,827.83	-103.52	312.26	-95.97	0.94	-0.88	3.28
8,875.00	5.13	116.47	8,852.72	-104.52	314.39	-96.92	2.42	-2.24	9.80
8,900.00	4.43	118.44	8,877.63	-105.48	316.24	-97.83	2.88	-2.80	7.88
8,925.00	4.17	118.79	8,902.56	-106.38	317.89	-98.69	1.05	-1.04	1.40
8,950.00	3.88	118.84	8,927.50	-107.22	319.43	-99.50	1.16	-1.16	0.20



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Huckleberry State Com
Well: 501H
Wellbore: OH / 64199
Design: Surveys (Ensign 155)

Local Co-ordinate Reference: Well 501H
TVD Reference: RKB @ 3790.40usft (Ensign 155)
MD Reference: RKB @ 3790.40usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)
8,975.00	3.05	119.24	8,952.46	-107.96	320.75	-100.20	3.32	-3.32	1.60
9,000.00	2.22	120.60	8,977.43	-108.53	321.75	-100.75	3.33	-3.32	5.44
9,025.00	2.11	122.82	9,002.41	-109.02	322.55	-101.22	0.55	-0.44	8.88
9,050.00	1.99	124.18	9,027.40	-109.52	323.30	-101.70	0.52	-0.48	5.44
9,075.00	1.98	124.45	9,052.38	-110.00	324.01	-102.17	0.05	-0.04	1.08
9,100.00	1.98	124.21	9,077.37	-110.49	324.72	-102.64	0.03	0.00	-0.96
9,125.00	1.91	126.26	9,102.35	-110.98	325.42	-103.11	0.39	-0.28	8.20
9,150.00	1.73	123.73	9,127.34	-111.44	326.07	-103.55	0.79	-0.72	-10.12
9,175.00	1.60	121.34	9,152.33	-111.83	326.68	-103.93	0.59	-0.52	-9.56
9,200.00	1.47	114.41	9,177.32	-112.14	327.27	-104.23	0.91	-0.52	-27.72
9,225.00	1.37	111.55	9,202.31	-112.38	327.84	-104.46	0.49	-0.40	-11.44
9,250.00	1.35	105.61	9,227.30	-112.57	328.40	-104.63	0.57	-0.08	-23.76
9,275.00	1.28	103.40	9,252.30	-112.72	328.96	-104.76	0.35	-0.28	-8.84
9,300.00	1.25	94.86	9,277.29	-112.80	329.50	-104.84	0.76	-0.12	-34.16
9,325.00	1.21	87.54	9,302.29	-112.82	330.03	-104.84	0.65	-0.16	-29.28
9,350.00	1.39	79.13	9,327.28	-112.75	330.60	-104.76	1.05	0.72	-33.64
9,375.00	1.43	74.51	9,352.27	-112.61	331.19	-104.60	0.48	0.16	-18.48
9,400.00	1.55	74.26	9,377.26	-112.43	331.82	-104.41	0.48	0.48	-1.00
9,425.00	1.81	79.78	9,402.25	-112.27	332.53	-104.23	1.22	1.04	22.08
9,450.00	2.10	85.90	9,427.24	-112.17	333.38	-104.11	1.43	1.16	24.48
9,475.00	2.36	89.58	9,452.22	-112.13	334.35	-104.05	1.19	1.04	14.72
9,500.00	2.44	88.99	9,477.20	-112.12	335.40	-104.01	0.33	0.32	-2.36
9,525.00	2.40	85.09	9,502.17	-112.06	336.45	-103.93	0.68	-0.16	-15.60
9,550.00	2.28	78.00	9,527.15	-111.92	337.46	-103.76	1.25	-0.48	-28.36
9,575.00	2.28	76.22	9,552.13	-111.69	338.43	-103.51	0.28	0.00	-7.12
9,600.00	1.99	74.41	9,577.12	-111.46	339.33	-103.26	1.19	-1.16	-7.24
9,625.00	1.48	68.50	9,602.11	-111.22	340.05	-103.00	2.16	-2.04	-23.64
9,650.00	0.90	62.44	9,627.10	-111.01	340.52	-102.78	2.37	-2.32	-24.24
9,675.00	0.65	54.30	9,652.10	-110.84	340.81	-102.60	1.09	-1.00	-32.56
9,700.00	0.42	72.19	9,677.10	-110.73	341.01	-102.49	1.13	-0.92	71.56
9,725.00	0.48	68.64	9,702.10	-110.66	341.20	-102.42	0.26	0.24	-14.20
9,750.00	0.49	83.92	9,727.09	-110.61	341.40	-102.36	0.52	0.04	61.12
9,775.00	0.53	74.70	9,752.09	-110.57	341.62	-102.32	0.36	0.16	-36.88
9,800.00	0.60	77.59	9,777.09	-110.51	341.86	-102.25	0.30	0.28	11.56
9,825.00	0.73	59.79	9,802.09	-110.41	342.13	-102.14	0.97	0.52	-71.20
9,850.00	0.69	92.09	9,827.09	-110.33	342.41	-102.05	1.59	-0.16	129.20
9,875.00	0.71	100.47	9,852.09	-110.36	342.72	-102.08	0.42	0.08	33.52
9,900.00	0.69	108.75	9,877.09	-110.44	343.01	-102.15	0.41	-0.08	33.12
9,925.00	0.80	112.57	9,902.08	-110.56	343.32	-102.26	0.48	0.44	15.28
9,950.00	0.85	133.33	9,927.08	-110.75	343.61	-102.45	1.21	0.20	83.04
9,970.00	0.90	133.59	9,947.08	-110.96	343.83	-102.65	0.25	0.25	1.30
Tie In - Tie In									
10,003.00	0.93	136.61	9,980.07	-111.33	344.20	-103.01	0.17	0.09	9.15
First Phoenix MWD Survey									

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
10,048.00	0.89	139.89	10,025.07	-111.87	344.68	-103.54	0.15	-0.09	7.29
10,113.00	1.03	140.89	10,090.06	-112.71	345.37	-104.36	0.22	0.22	1.54
10,145.00	1.10	140.63	10,122.05	-113.17	345.75	-104.81	0.22	0.22	-0.81
10,176.00	0.65	348.82	10,153.05	-113.22	345.91	-104.86	5.49	-1.45	-489.71
10,207.00	2.92	16.53	10,184.04	-112.29	346.10	-103.93	7.63	7.32	89.39
10,239.00	7.07	4.50	10,215.91	-109.55	346.48	-101.18	13.31	12.97	-37.59
10,270.00	10.20	2.17	10,246.55	-104.90	346.74	-96.52	10.16	10.10	-7.52
10,302.00	13.12	2.80	10,277.89	-98.44	347.02	-90.06	9.13	9.13	1.97
10,333.00	16.17	7.08	10,307.88	-90.64	347.73	-82.24	10.43	9.84	13.81
10,365.00	18.73	5.50	10,338.40	-81.11	348.77	-72.68	8.14	8.00	-4.94
10,396.00	20.21	1.50	10,367.63	-70.80	349.38	-62.36	6.42	4.77	-12.90
10,427.00	22.04	1.43	10,396.55	-59.63	349.67	-51.19	5.90	5.90	-0.23
10,490.00	25.43	356.06	10,454.22	-34.31	349.04	-25.89	6.38	5.38	-8.52
10,521.00	27.78	357.40	10,481.93	-20.45	348.25	-12.06	7.82	7.58	4.32
10,552.00	29.51	358.96	10,509.14	-5.60	347.78	2.78	6.08	5.58	5.03
10,583.00	32.21	0.16	10,535.75	10.30	347.67	18.67	8.93	8.71	3.87
10,615.00	35.56	359.51	10,562.31	28.14	347.61	36.50	10.53	10.47	-2.03
10,646.00	39.28	359.22	10,586.92	46.97	347.40	55.32	12.01	12.00	-0.94
10,677.00	42.35	358.58	10,610.38	67.23	347.01	75.56	9.99	9.90	-2.06
10,709.00	47.69	358.02	10,632.99	89.85	346.33	98.16	16.73	16.69	-1.75
10,740.00	52.76	357.74	10,652.82	113.65	345.45	121.93	16.37	16.35	-0.90
10,773.00	57.13	357.83	10,671.77	140.63	344.41	148.89	13.24	13.24	0.27
10,804.00	61.34	357.44	10,687.62	167.24	343.31	175.46	13.62	13.58	-1.26
10,836.00	65.75	358.01	10,701.88	195.86	342.17	204.04	13.87	13.78	1.78
10,867.00	68.11	357.38	10,714.02	224.36	341.02	232.50	7.84	7.61	-2.03
10,898.00	69.65	357.79	10,725.19	253.25	339.80	261.36	5.12	4.97	1.32
10,930.00	72.37	357.68	10,735.60	283.48	338.61	291.55	8.51	8.50	-0.34
10,962.00	76.24	357.26	10,744.26	314.25	337.25	322.28	12.16	12.09	-1.31
11,023.00	79.74	357.56	10,756.95	373.85	334.55	381.79	5.76	5.74	0.49
11,054.00	79.93	357.27	10,762.42	404.33	333.18	412.23	1.11	0.61	-0.94
11,086.00	79.82	356.92	10,768.05	435.79	331.58	443.65	1.13	-0.34	-1.09
11,117.00	80.24	356.08	10,773.41	466.26	329.72	474.07	2.99	1.35	-2.71
11,127.52	80.50	355.71	10,775.17	476.61	328.97	484.39	4.29	2.51	-3.52
FTP: 11128' MD									
11,148.00	81.02	354.99	10,778.46	496.76	327.34	504.49	4.29	2.52	-3.51
11,180.00	81.61	353.56	10,783.29	528.23	324.18	535.88	4.79	1.84	-4.47
11,211.00	83.63	352.21	10,787.28	558.73	320.37	566.29	7.82	6.52	-4.35
11,242.00	86.06	350.92	10,790.06	589.27	315.84	596.71	8.87	7.84	-4.16
11,270.00	88.27	350.16	10,791.45	616.86	311.25	624.17	8.35	7.89	-2.71
11,301.00	90.58	350.60	10,791.76	647.42	306.07	654.60	7.59	7.45	1.42
11,333.00	91.12	355.39	10,791.28	679.16	302.16	686.24	15.06	1.69	14.97
11,364.00	90.89	358.56	10,790.74	710.11	300.53	717.14	10.25	-0.74	10.23
11,395.00	90.64	0.81	10,790.32	741.11	300.36	748.12	7.30	-0.81	7.26

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
11,426.00	90.41	3.27	10,790.04	772.08	301.46	779.12	7.97	-0.74	7.94
11,458.00	90.78	3.71	10,789.71	804.02	303.41	811.09	1.80	1.16	1.38
11,480.00	90.82	3.83	10,789.40	825.97	304.86	833.07	0.57	0.18	0.55
11,571.00	90.92	2.52	10,788.02	916.82	309.90	924.02	1.44	0.11	-1.44
11,663.00	91.75	1.65	10,785.88	1,008.73	313.24	1,015.98	1.31	0.90	-0.95
11,755.00	92.66	0.35	10,782.34	1,100.65	314.85	1,107.91	1.72	0.99	-1.41
11,849.00	93.57	0.13	10,777.23	1,194.51	315.24	1,201.75	1.00	0.97	-0.23
11,943.00	94.29	359.95	10,770.79	1,288.29	315.31	1,295.50	0.79	0.77	-0.19
12,033.00	94.54	359.09	10,763.86	1,378.01	314.55	1,385.19	0.99	0.28	-0.96
12,127.00	92.18	0.09	10,758.35	1,471.84	313.88	1,478.97	2.73	-2.51	1.06
12,219.00	91.36	0.57	10,755.51	1,563.80	314.41	1,570.91	1.03	-0.89	0.52
12,313.00	90.75	1.03	10,753.78	1,657.77	315.73	1,664.89	0.81	-0.65	0.49
12,408.00	89.38	1.28	10,753.67	1,752.75	317.64	1,759.89	1.47	-1.44	0.26
12,501.00	89.47	1.31	10,754.60	1,845.72	319.74	1,852.88	0.10	0.10	0.03
12,595.00	88.53	0.41	10,756.24	1,939.69	321.15	1,946.86	1.38	-1.00	-0.96
12,690.00	88.17	359.72	10,758.98	2,034.65	321.26	2,041.80	0.82	-0.38	-0.73
12,783.00	89.38	358.74	10,760.97	2,127.62	320.01	2,134.71	1.67	1.30	-1.05
12,877.00	90.76	358.52	10,760.85	2,221.59	317.76	2,228.60	1.49	1.47	-0.23
12,971.00	91.79	357.64	10,758.76	2,315.51	314.62	2,322.42	1.44	1.10	-0.94
13,066.00	88.58	357.70	10,758.45	2,410.42	310.75	2,417.20	3.38	-3.38	0.06
13,160.00	88.67	358.49	10,760.71	2,504.34	307.63	2,511.02	0.85	0.10	0.84
13,254.00	88.85	0.47	10,762.74	2,598.31	306.78	2,604.94	2.11	0.19	2.11
13,348.00	88.99	0.55	10,764.51	2,692.29	307.61	2,698.92	0.17	0.15	0.09
13,443.00	91.67	0.56	10,763.97	2,787.28	308.53	2,793.90	2.82	2.82	0.01
13,537.00	92.90	0.23	10,760.22	2,881.20	309.18	2,887.81	1.35	1.31	-0.35
13,631.00	93.09	359.33	10,755.31	2,975.07	308.82	2,981.64	0.98	0.20	-0.96
13,725.00	92.49	359.98	10,750.73	3,068.95	308.26	3,075.49	0.94	-0.64	0.69
13,819.00	92.32	1.89	10,746.79	3,162.85	309.79	3,169.40	2.04	-0.18	2.03
13,913.00	94.06	2.62	10,741.56	3,256.63	313.48	3,263.23	2.01	1.85	0.78
14,006.00	93.06	2.08	10,735.78	3,349.37	317.29	3,356.04	1.22	-1.08	-0.58
14,100.00	90.56	1.45	10,732.81	3,443.27	320.18	3,449.98	2.74	-2.66	-0.67
14,194.00	91.16	0.28	10,731.40	3,537.25	321.60	3,543.97	1.40	0.64	-1.24
14,288.00	89.56	359.22	10,730.81	3,631.24	321.19	3,637.92	2.04	-1.70	-1.13
14,382.00	90.99	359.78	10,730.36	3,725.23	320.37	3,731.87	1.63	1.52	0.60
14,476.00	92.07	359.77	10,727.85	3,819.20	320.00	3,825.80	1.15	1.15	-0.01
14,570.00	93.37	359.53	10,723.39	3,913.09	319.43	3,919.65	1.41	1.38	-0.26
14,664.00	92.98	359.43	10,718.18	4,006.94	318.57	4,013.45	0.43	-0.41	-0.11
14,758.00	92.09	359.38	10,714.03	4,100.84	317.60	4,107.30	0.95	-0.95	-0.05
14,852.00	90.13	358.58	10,712.21	4,194.80	315.93	4,201.20	2.25	-2.09	-0.85
14,945.00	91.61	358.17	10,710.79	4,287.75	313.29	4,294.05	1.65	1.59	-0.44
15,040.00	90.82	358.53	10,708.78	4,382.69	310.55	4,388.90	0.91	-0.83	0.38
15,133.00	88.78	359.66	10,709.10	4,475.67	309.08	4,481.82	2.51	-2.19	1.22
15,226.00	89.25	359.82	10,710.70	4,568.66	308.66	4,574.77	0.53	0.51	0.17
15,320.00	88.96	359.15	10,712.17	4,662.64	307.82	4,668.70	0.78	-0.31	-0.71



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 501H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3790.40usft (Ensign 155)
Site:	Huckleberry State Com	MD Reference:	RKB @ 3790.40usft (Ensign 155)
Well:	501H	North Reference:	Grid
Wellbore:	OH / 64199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	USA Compass

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)
15,413.00	89.92	359.45	10,713.08	4,755.63	306.68	4,761.64	1.08	1.03	0.32
15,508.00	91.07	359.25	10,712.26	4,850.62	305.60	4,856.57	1.23	1.21	-0.21
15,600.00	91.93	359.03	10,709.85	4,942.58	304.22	4,948.47	0.96	0.93	-0.24
15,694.00	92.40	359.16	10,706.30	5,036.50	302.74	5,042.33	0.52	0.50	0.14
15,788.00	93.46	359.11	10,701.49	5,130.36	301.32	5,136.13	1.13	1.13	-0.05
15,883.00	94.12	358.75	10,695.21	5,225.14	299.55	5,230.83	0.79	0.69	-0.38
15,977.00	94.70	358.40	10,687.99	5,318.83	297.22	5,324.44	0.72	0.62	-0.37
16,071.00	94.79	357.99	10,680.21	5,412.46	294.27	5,417.98	0.45	0.10	-0.44
16,166.00	91.93	358.85	10,674.64	5,507.25	291.66	5,512.68	3.14	-3.01	0.91
16,260.00	91.26	0.60	10,672.03	5,601.21	291.21	5,606.60	1.99	-0.71	1.86
16,354.00	91.13	1.19	10,670.07	5,695.18	292.68	5,700.57	0.64	-0.14	0.63
16,448.00	91.79	1.24	10,667.67	5,789.12	294.67	5,794.54	0.70	0.70	0.05
16,543.00	91.32	0.51	10,665.09	5,884.08	296.12	5,889.50	0.91	-0.49	-0.77
16,637.00	91.58	0.63	10,662.72	5,978.04	297.05	5,983.46	0.30	0.28	0.13
16,731.00	91.90	0.34	10,659.86	6,072.00	297.85	6,077.41	0.46	0.34	-0.31
16,825.00	92.29	0.73	10,656.42	6,165.93	298.73	6,171.33	0.59	0.41	0.41
16,919.00	92.61	0.50	10,652.41	6,259.84	299.73	6,265.24	0.42	0.34	-0.24
17,013.00	92.07	0.69	10,648.57	6,353.75	300.71	6,359.15	0.61	-0.57	0.20
17,107.00	92.01	0.42	10,645.22	6,447.69	301.62	6,453.08	0.29	-0.06	-0.29
17,200.00	93.03	0.17	10,641.13	6,540.60	302.10	6,545.97	1.13	1.10	-0.27
17,294.00	93.83	0.00	10,635.51	6,634.43	302.24	6,639.78	0.87	0.85	-0.18
17,390.00	96.50	359.49	10,626.87	6,730.03	301.81	6,735.34	2.83	2.78	-0.53
17,484.00	93.92	359.08	10,618.33	6,823.62	300.64	6,828.88	2.78	-2.74	-0.44
17,577.00	92.41	358.74	10,613.20	6,916.46	298.88	6,921.65	1.66	-1.62	-0.37
17,671.00	92.72	358.08	10,608.99	7,010.33	296.27	7,015.43	0.78	0.33	-0.70
17,765.00	90.62	357.92	10,606.25	7,104.23	292.99	7,109.22	2.24	-2.23	-0.17
17,860.00	91.16	357.43	10,604.78	7,199.14	289.14	7,204.01	0.77	0.57	-0.52
17,955.00	89.92	358.03	10,603.88	7,294.06	285.38	7,298.81	1.45	-1.31	0.63
18,050.00	89.70	357.63	10,604.20	7,388.99	281.78	7,393.63	0.48	-0.23	-0.42
18,144.00	90.18	357.03	10,604.29	7,482.89	277.40	7,487.40	0.82	0.51	-0.64
18,238.00	90.50	357.87	10,603.74	7,576.79	273.22	7,581.17	0.96	0.34	0.89
18,331.00	89.64	358.93	10,603.62	7,669.75	270.62	7,674.04	1.47	-0.92	1.14
18,425.00	89.04	0.56	10,604.71	7,763.74	270.20	7,768.00	1.85	-0.64	1.73
18,520.00	89.44	1.55	10,605.97	7,858.71	271.95	7,862.98	1.12	0.42	1.04
18,614.00	89.28	1.45	10,607.02	7,952.68	274.41	7,956.98	0.20	-0.17	-0.11
18,708.00	89.71	1.69	10,607.84	8,046.64	276.99	8,050.97	0.52	0.46	0.26
18,802.00	91.15	1.50	10,607.14	8,140.60	279.60	8,144.97	1.55	1.53	-0.20
18,896.00	92.18	1.04	10,604.41	8,234.53	281.69	8,238.93	1.20	1.10	-0.49
18,990.00	90.79	0.83	10,601.97	8,328.49	283.22	8,332.89	1.50	-1.48	-0.22
19,084.00	90.45	0.43	10,600.95	8,422.47	284.25	8,426.88	0.56	-0.36	-0.43
19,179.00	90.61	0.12	10,600.08	8,517.47	284.71	8,521.85	0.37	0.17	-0.33
19,273.00	91.30	359.61	10,598.51	8,611.45	284.49	8,615.81	0.91	0.73	-0.54
19,367.00	89.79	359.56	10,597.62	8,705.44	283.81	8,709.75	1.61	-1.61	-0.05



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Huckleberry State Com
Well: 501H
Wellbore: OH / 64199
Design: Surveys (Ensign 155)

Local Co-ordinate Reference: Well 501H
TVD Reference: RKB @ 3790.40usft (Ensign 155)
MD Reference: RKB @ 3790.40usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)
19,461.00	90.47	358.99	10,597.40	8,799.44	282.62	8,803.69	0.94	0.72	-0.61
19,555.00	89.95	358.50	10,597.06	8,893.41	280.56	8,897.59	0.76	-0.55	-0.52
19,650.00	89.99	358.35	10,597.11	8,988.38	277.95	8,992.46	0.16	0.04	-0.16
19,744.00	89.73	358.26	10,597.34	9,082.33	275.17	9,086.33	0.29	-0.28	-0.10
19,838.00	88.79	358.33	10,598.55	9,176.28	272.37	9,180.18	1.00	-1.00	0.07
19,932.00	88.37	359.55	10,600.88	9,270.24	270.63	9,274.07	1.37	-0.45	1.30
20,026.00	89.04	359.78	10,603.00	9,364.21	270.08	9,368.00	0.75	0.71	0.24
20,120.00	89.88	0.09	10,603.89	9,458.21	269.98	9,461.96	0.95	0.89	0.33
20,215.00	90.53	359.70	10,603.55	9,553.20	269.80	9,556.93	0.80	0.68	-0.41
20,309.00	91.47	358.88	10,601.91	9,647.18	268.64	9,650.85	1.33	1.00	-0.87
20,403.00	91.98	358.89	10,599.08	9,741.12	266.81	9,744.72	0.54	0.54	0.01
20,498.00	90.21	358.33	10,597.27	9,836.07	264.51	9,839.59	1.95	-1.86	-0.59
20,593.00	90.81	358.62	10,596.42	9,931.03	261.98	9,934.46	0.70	0.63	0.31
20,686.00	91.66	358.67	10,594.42	10,023.98	259.78	10,027.33	0.92	0.91	0.05
20,780.00	91.32	0.36	10,591.97	10,117.95	258.98	10,121.25	1.83	-0.36	1.80
20,874.00	91.79	1.25	10,589.42	10,211.90	260.30	10,215.21	1.07	0.50	0.95
20,969.00	92.26	0.75	10,586.06	10,306.83	261.96	10,310.15	0.72	0.49	-0.53
21,029.01	90.90	0.79	10,584.41	10,366.81	262.77	10,370.13	2.27	-2.27	0.06
LTP: 21029' MD									
21,064.00	90.10	0.81	10,584.11	10,401.79	263.25	10,405.11	2.27	-2.27	0.06
21,092.00	89.51	0.28	10,584.20	10,429.79	263.52	10,433.11	2.83	-2.11	-1.89
Final Phoenix MWD Survey									
21,158.00	89.51	0.28	10,584.77	10,495.79	263.84	10,499.10	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,970.00	9,947.08	-110.96	343.83	Tie In
9,970.00	9,947.08	-110.96	343.83	Tie In
10,003.00	9,980.07	-111.33	344.20	First Phoenix MWD Survey
11,127.52	10,775.17	476.61	328.97	FTP: 11128' MD
21,029.01	10,584.41	10,366.81	262.77	LTP: 21029' MD
21,092.00	10,584.20	10,429.79	263.52	Final Phoenix MWD Survey
21,158.00	10,584.77	10,495.79	263.84	Projection to TD