



**C O N C H O**

# **COG Operating L L C**

**Lea County, NM (NAD27 NME)**

**Sec. 33, T 20 S. , R 34 E**

**Little Bear Federal Com 7H**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**30 January, 2019**

**HOBBS OCD**  
**AUG 15 2019**  
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**INTEGRITY**  
**DIRECTIONAL**



Survey Report



Company: COG Operating L L C  
 Project: Lea County, NM (NAD27 NME)  
 Site: Sec. 33, T 20 S. , R 34 E  
 Well: Little Bear Federal Com 7H  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Little Bear Federal Com 7H  
 TVD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 MD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1

<b>Project</b>	Lea County, NM (NAD27 NME)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

<b>Site</b>	Sec. 33, T 20 S. , R 34 E				
<b>Site Position:</b>		<b>Northing:</b>	554,965.50 usft	<b>Latitude:</b>	32.52332
<b>From:</b>	Map	<b>Easting:</b>	738,982.00 usft	<b>Longitude:</b>	-103.55799
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.42 °

<b>Well</b>	Little Bear Federal Com 7H, ACTIVE					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	555,243.40 usft	<b>Latitude:</b>	32.52412
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	737,407.40 usft	<b>Longitude:</b>	-103.56309
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b>	3,806.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	12/27/2018	6.67	60.42	48,149

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	3.49	

<b>Survey Program</b>	Date 1/30/2019				
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
100.00	10,773.00	Keeper Gyros (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2	
10,950.00	18,617.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

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	0.62	45.23	100.00	0.38	0.38	0.40	0.62	0.62	0.00
125.00	0.62	36.06	125.00	0.59	0.56	0.62	0.40	0.00	-36.68
150.00	0.59	25.08	150.00	0.81	0.69	0.85	0.48	-0.12	-43.92
175.00	0.66	17.34	174.99	1.07	0.79	1.11	0.44	0.28	-30.96
200.00	0.45	29.81	199.99	1.29	0.88	1.34	0.96	-0.84	49.88
225.00	0.54	38.48	224.99	1.47	1.01	1.52	0.47	0.36	34.68
250.00	0.53	46.68	249.99	1.64	1.16	1.70	0.31	-0.04	32.80
275.00	0.58	47.67	274.99	1.80	1.34	1.88	0.20	0.20	3.96
300.00	0.45	47.92	299.99	1.95	1.51	2.04	0.52	-0.52	1.00



Survey Report



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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
325.00	0.61	47.00	324.99	2.11	1.68	2.21	0.64	0.64	-3.68
350.00	0.60	48.73	349.99	2.29	1.87	2.40	0.08	-0.04	6.92
375.00	0.54	45.34	374.98	2.46	2.05	2.58	0.28	-0.24	-13.56
400.00	0.57	45.38	399.98	2.63	2.23	2.76	0.12	0.12	0.16
425.00	0.63	50.44	424.98	2.80	2.42	2.94	0.32	0.24	20.24
450.00	0.65	47.67	449.98	2.98	2.63	3.14	0.15	0.08	-11.08
475.00	0.71	54.31	474.98	3.17	2.86	3.34	0.40	0.24	26.56
500.00	0.62	44.75	499.98	3.36	3.08	3.54	0.57	-0.36	-38.24
525.00	0.65	44.10	524.98	3.55	3.28	3.75	0.12	0.12	-2.60
550.00	0.47	52.47	549.97	3.72	3.46	3.92	0.79	-0.72	33.48
575.00	0.73	46.58	574.97	3.89	3.65	4.11	1.07	1.04	-23.56
600.00	0.62	56.37	599.97	4.07	3.88	4.30	0.64	-0.44	39.16
625.00	0.63	55.43	624.97	4.23	4.11	4.47	0.06	0.04	-3.76
650.00	0.63	45.39	649.97	4.40	4.32	4.66	0.44	0.00	-40.16
675.00	0.70	41.48	674.97	4.61	4.52	4.88	0.33	0.28	-15.64
700.00	0.67	54.60	699.96	4.81	4.74	5.09	0.64	-0.12	52.48
725.00	0.73	57.69	724.96	4.98	4.99	5.28	0.28	0.24	12.36
750.00	0.64	50.24	749.96	5.16	5.24	5.47	0.51	-0.36	-29.80
775.00	0.62	55.71	774.96	5.32	5.45	5.64	0.25	-0.08	21.88
800.00	0.42	58.02	799.96	5.45	5.64	5.78	0.80	-0.80	9.24
825.00	0.75	59.73	824.96	5.58	5.86	5.92	1.32	1.32	6.84
850.00	0.70	54.93	849.96	5.75	6.13	6.11	0.31	-0.20	-19.20
875.00	0.72	55.91	874.95	5.92	6.38	6.30	0.09	0.08	3.92
900.00	0.70	60.64	899.95	6.09	6.65	6.48	0.25	-0.08	18.92
925.00	0.65	58.71	924.95	6.23	6.90	6.64	0.22	-0.20	-7.72
950.00	0.54	64.02	949.95	6.36	7.13	6.78	0.49	-0.44	21.24
975.00	0.60	69.76	974.95	6.46	7.36	6.89	0.33	0.24	22.96
1,000.00	0.58	79.30	999.95	6.53	7.60	6.98	0.40	-0.08	38.16
1,025.00	0.80	68.27	1,024.94	6.61	7.89	7.08	1.02	0.88	-44.12
1,050.00	0.71	71.87	1,049.94	6.73	8.20	7.21	0.41	-0.36	14.40
1,075.00	0.55	80.40	1,074.94	6.79	8.47	7.30	0.74	-0.64	34.12
1,100.00	0.56	82.98	1,099.94	6.83	8.71	7.35	0.11	0.04	10.32
1,125.00	0.57	81.24	1,124.94	6.86	8.95	7.40	0.08	0.04	-6.96
1,150.00	0.56	81.31	1,149.94	6.90	9.19	7.45	0.04	-0.04	0.28
1,175.00	0.35	83.73	1,174.94	6.93	9.39	7.49	0.84	-0.84	9.68
1,200.00	0.26	76.36	1,199.94	6.95	9.52	7.52	0.39	-0.36	-29.48
1,225.00	0.32	27.91	1,224.94	7.02	9.61	7.60	0.98	0.24	-193.80
1,250.00	0.28	348.15	1,249.93	7.15	9.63	7.72	0.83	-0.16	-159.04
1,275.00	0.19	8.95	1,274.93	7.25	9.62	7.82	0.49	-0.36	83.20
1,300.00	0.21	323.52	1,299.93	7.32	9.60	7.90	0.62	0.08	-181.72
1,325.00	0.48	354.50	1,324.93	7.47	9.56	8.03	1.28	1.08	123.92
1,350.00	0.60	338.92	1,349.93	7.69	9.51	8.26	0.75	0.48	-62.32
1,375.00	0.53	334.63	1,374.93	7.92	9.41	8.48	0.33	-0.28	-17.16

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1,400.00	0.45	344.30	1,399.93	8.12	9.33	8.67	0.46	-0.32	38.68
1,425.00	0.64	340.17	1,424.93	8.34	9.26	8.89	0.78	0.76	-16.52
1,450.00	0.59	347.02	1,449.93	8.60	9.18	9.14	0.36	-0.20	27.40
1,475.00	0.51	337.71	1,474.93	8.83	9.11	9.37	0.48	-0.32	-37.24
1,500.00	0.60	342.75	1,499.93	9.06	9.03	9.59	0.41	0.36	20.16
1,525.00	0.63	338.23	1,524.92	9.31	8.94	9.84	0.23	0.12	-18.08
1,550.00	0.64	342.53	1,549.92	9.57	8.85	10.09	0.19	0.04	17.20
1,575.00	0.65	344.75	1,574.92	9.84	8.77	10.36	0.11	0.04	8.88
1,600.00	0.64	346.00	1,599.92	10.11	8.70	10.62	0.07	-0.04	5.00
1,625.00	0.48	353.03	1,624.92	10.35	8.65	10.86	0.70	-0.64	28.12
1,650.00	0.52	345.06	1,649.92	10.57	8.61	11.07	0.32	0.16	-31.88
1,675.00	0.66	356.27	1,674.92	10.82	8.57	11.32	0.72	0.56	44.84
1,700.00	0.57	355.02	1,699.91	11.09	8.55	11.59	0.36	-0.36	-5.00
1,725.00	0.52	358.44	1,724.91	11.32	8.54	11.82	0.24	-0.20	13.68
1,750.00	0.47	4.13	1,749.91	11.54	8.54	12.04	0.28	-0.20	22.76
1,775.00	0.46	3.76	1,774.91	11.74	8.56	12.24	0.04	-0.04	-1.48
1,800.00	0.52	4.46	1,799.91	11.95	8.57	12.45	0.24	0.24	2.80
1,825.00	0.52	35.35	1,824.91	12.16	8.65	12.66	1.11	0.00	123.56
1,850.00	0.32	37.69	1,849.91	12.31	8.75	12.82	0.80	-0.80	9.36
1,875.00	0.41	47.94	1,874.91	12.42	8.86	12.94	0.44	0.36	41.00
1,900.00	0.46	59.76	1,899.91	12.53	9.02	13.06	0.41	0.20	47.28
1,925.00	0.50	49.77	1,924.91	12.65	9.19	13.19	0.37	0.16	-39.96
1,950.00	0.46	53.19	1,949.91	12.79	9.35	13.33	0.20	-0.16	13.68
1,975.00	0.40	48.99	1,974.91	12.90	9.50	13.46	0.27	-0.24	-16.80
2,000.00	0.40	59.74	1,999.91	13.00	9.64	13.57	0.30	0.00	43.00
2,025.00	0.40	47.77	2,024.90	13.11	9.78	13.68	0.33	0.00	-47.88
2,050.00	0.47	65.38	2,049.90	13.21	9.94	13.79	0.60	0.28	70.44
2,075.00	0.56	62.46	2,074.90	13.31	10.14	13.90	0.37	0.36	-11.68
2,100.00	0.38	64.24	2,099.90	13.40	10.32	14.00	0.72	-0.72	7.12
2,125.00	0.40	61.92	2,124.90	13.48	10.47	14.09	0.10	0.08	-9.28
2,150.00	0.50	59.42	2,149.90	13.57	10.64	14.20	0.41	0.40	-10.00
2,175.00	0.39	64.01	2,174.90	13.67	10.81	14.30	0.46	-0.44	18.36
2,200.00	0.35	84.67	2,199.90	13.71	10.97	14.35	0.55	-0.16	82.64
2,225.00	0.22	100.59	2,224.90	13.71	11.09	14.36	0.60	-0.52	63.68
2,250.00	0.19	116.98	2,249.90	13.68	11.17	14.34	0.26	-0.12	65.56
2,275.00	0.17	103.48	2,274.90	13.65	11.25	14.31	0.19	-0.08	-54.00
2,300.00	0.33	117.07	2,299.90	13.61	11.35	14.28	0.68	0.64	54.36
2,325.00	0.22	96.37	2,324.90	13.57	11.46	14.25	0.59	-0.44	-82.80
2,350.00	0.12	104.77	2,349.90	13.56	11.53	14.24	0.41	-0.40	33.60
2,375.00	0.10	132.45	2,374.90	13.54	11.57	14.22	0.22	-0.08	110.72
2,400.00	0.07	110.95	2,399.90	13.52	11.60	14.20	0.17	-0.12	-86.00
2,425.00	0.24	157.29	2,424.90	13.47	11.64	14.15	0.79	0.68	185.36
2,450.00	0.34	135.76	2,449.90	13.37	11.71	14.05	0.58	0.40	-86.12

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2,475.00	0.54	143.13	2,474.90	13.22	11.83	13.91	0.83	0.80	29.48
2,500.00	0.78	149.30	2,499.90	12.98	11.99	13.68	1.00	0.96	24.68
2,525.00	0.89	151.37	2,524.89	12.66	12.17	13.38	0.46	0.44	8.28
2,550.00	0.84	150.09	2,549.89	12.33	12.35	13.06	0.21	-0.20	-5.12
2,575.00	0.80	153.33	2,574.89	12.02	12.52	12.76	0.24	-0.16	12.96
2,600.00	0.67	151.40	2,599.89	11.73	12.67	12.48	0.53	-0.52	-7.72
2,625.00	0.74	151.03	2,624.88	11.46	12.82	12.22	0.28	0.28	-1.48
2,650.00	0.99	149.20	2,649.88	11.14	13.01	11.91	1.01	1.00	-7.32
2,675.00	0.75	154.61	2,674.88	10.80	13.19	11.59	1.01	-0.96	21.64
2,700.00	1.02	152.51	2,699.87	10.46	13.36	11.25	1.09	1.08	-8.40
2,725.00	0.96	147.30	2,724.87	10.08	13.58	10.89	0.43	-0.24	-20.84
2,750.00	1.11	147.17	2,749.87	9.70	13.82	10.53	0.60	0.60	-0.52
2,775.00	1.18	147.94	2,774.86	9.28	14.09	10.12	0.29	0.28	3.08
2,800.00	1.00	143.80	2,799.86	8.89	14.36	9.75	0.79	-0.72	-16.56
2,825.00	1.08	143.29	2,824.85	8.52	14.63	9.40	0.32	0.32	-2.04
2,850.00	1.07	147.25	2,849.85	8.14	14.89	9.03	0.30	-0.04	15.84
2,875.00	1.43	143.49	2,874.84	7.69	15.20	8.60	1.48	1.44	-15.04
2,900.00	1.27	144.85	2,899.84	7.21	15.55	8.15	0.65	-0.64	5.44
2,925.00	1.24	137.85	2,924.83	6.79	15.89	7.74	0.62	-0.12	-28.00
2,950.00	1.23	140.79	2,949.82	6.38	16.24	7.36	0.26	-0.04	11.76
2,975.00	1.18	142.67	2,974.82	5.97	16.57	6.96	0.25	-0.20	7.52
3,000.00	1.34	139.77	2,999.81	5.54	16.91	6.56	0.69	0.64	-11.60
3,025.00	1.34	133.55	3,024.81	5.11	17.31	6.16	0.58	0.00	-24.88
3,050.00	1.59	133.79	3,049.80	4.67	17.78	5.75	1.00	1.00	0.96
3,075.00	1.41	131.48	3,074.79	4.23	18.26	5.33	0.76	-0.72	-9.24
3,100.00	1.54	131.72	3,099.78	3.80	18.74	4.93	0.52	0.52	0.96
3,125.00	1.67	127.76	3,124.77	3.35	19.28	4.52	0.68	0.52	-15.84
3,150.00	1.81	126.51	3,149.76	2.90	19.88	4.10	0.58	0.56	-5.00
3,175.00	1.72	123.07	3,174.75	2.46	20.51	3.70	0.56	-0.36	-13.76
3,200.00	1.94	121.69	3,199.73	2.03	21.19	3.32	0.90	0.88	-5.52
3,225.00	2.04	116.82	3,224.72	1.61	21.94	2.94	0.79	0.40	-19.48
3,250.00	2.02	116.39	3,249.70	1.21	22.74	2.59	0.10	-0.08	-1.72
3,275.00	2.12	115.98	3,274.69	0.81	23.55	2.24	0.40	0.40	-1.64
3,300.00	2.17	114.94	3,299.67	0.41	24.39	1.89	0.25	0.20	-4.16
3,325.00	2.15	113.38	3,324.65	0.02	25.25	1.56	0.25	-0.08	-6.24
3,350.00	2.10	114.79	3,349.63	-0.35	26.10	1.24	0.29	-0.20	5.64
3,375.00	2.26	116.76	3,374.62	-0.77	26.95	0.87	0.71	0.64	7.88
3,400.00	2.32	115.10	3,399.60	-1.20	27.85	0.49	0.36	0.24	-6.64
3,425.00	2.09	118.48	3,424.58	-1.64	28.71	0.11	1.06	-0.92	13.52
3,450.00	2.25	119.07	3,449.56	-2.09	29.54	-0.29	0.65	0.64	2.36
3,475.00	2.27	121.33	3,474.54	-2.59	30.39	-0.73	0.37	0.08	9.04
3,500.00	1.98	116.85	3,499.52	-3.04	31.20	-1.14	1.34	-1.16	-17.92
3,525.00	1.99	110.25	3,524.51	-3.39	31.99	-1.43	0.91	0.04	-26.40
3,550.00	2.06	116.85	3,549.49	-3.74	32.80	-1.74	0.97	0.28	26.40

**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 33, T 20 S. , R 34 E  
**Well:** Little Bear Federal Com 7H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Little Bear Federal Com 7H  
**TVD Reference:** KB=26' @ 3832.00usft (Scandrill Freedom)  
**MD Reference:** KB=26' @ 3832.00usft (Scandrill Freedom)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1

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	2.01	114.10	3,574.48	-4.12	33.60	-2.07	0.44	-0.20	-11.00
3,600.00	2.04	113.34	3,599.46	-4.48	34.41	-2.37	0.16	0.12	-3.04
3,625.00	2.37	112.87	3,624.44	-4.85	35.30	-2.70	1.32	1.32	-1.88
3,650.00	2.04	114.41	3,649.42	-5.24	36.18	-3.03	1.34	-1.32	6.16
3,675.00	2.07	109.33	3,674.41	-5.57	37.01	-3.31	0.74	0.12	-20.32
3,700.00	2.09	107.55	3,699.39	-5.86	37.87	-3.54	0.27	0.08	-7.12
3,725.00	2.22	108.71	3,724.37	-6.15	38.76	-3.78	0.55	0.52	4.64
3,750.00	2.14	106.00	3,749.36	-6.44	39.67	-4.01	0.52	-0.32	-10.84
3,775.00	2.27	105.15	3,774.34	-6.69	40.60	-4.21	0.54	0.52	-3.40
3,800.00	2.29	102.91	3,799.32	-6.93	41.56	-4.39	0.37	0.08	-8.96
3,825.00	2.27	104.70	3,824.30	-7.17	42.53	-4.57	0.30	-0.08	7.16
3,850.00	2.30	103.66	3,849.28	-7.42	43.49	-4.75	0.20	0.12	-4.16
3,875.00	2.38	103.82	3,874.26	-7.66	44.49	-4.94	0.32	0.32	0.64
3,900.00	2.48	102.81	3,899.24	-7.90	45.52	-5.12	0.44	0.40	-4.04
3,925.00	2.47	103.17	3,924.21	-8.15	46.57	-5.29	0.07	-0.04	1.44
3,950.00	2.56	105.71	3,949.19	-8.42	47.63	-5.50	0.57	0.36	10.16
3,975.00	2.65	105.31	3,974.16	-8.72	48.73	-5.74	0.37	0.36	-1.60
4,000.00	2.52	102.42	3,999.14	-8.99	49.82	-5.94	0.74	-0.52	-11.56
4,025.00	2.33	105.10	4,024.11	-9.24	50.85	-6.13	0.88	-0.76	10.72
4,050.00	2.55	103.94	4,049.09	-9.51	51.88	-6.33	0.90	0.88	-4.64
4,075.00	2.46	104.92	4,074.07	-9.78	52.94	-6.54	0.40	-0.36	3.92
4,100.00	2.60	104.17	4,099.04	-10.06	54.00	-6.75	0.58	0.56	-3.00
4,125.00	2.93	107.42	4,124.01	-10.39	55.16	-7.01	1.46	1.32	13.00
4,150.00	2.79	106.71	4,148.98	-10.76	56.36	-7.30	0.58	-0.56	-2.84
4,175.00	2.72	104.74	4,173.95	-11.08	57.51	-7.56	0.47	-0.28	-7.88
4,200.00	2.68	104.91	4,198.93	-11.38	58.65	-7.79	0.16	-0.16	0.68
4,225.00	2.89	103.28	4,223.90	-11.68	59.83	-8.01	0.90	0.84	-6.52
4,250.00	2.95	101.34	4,248.86	-11.95	61.07	-8.21	0.46	0.24	-7.76
4,275.00	3.18	100.77	4,273.83	-12.21	62.38	-8.38	0.93	0.92	-2.28
4,300.00	3.22	102.95	4,298.79	-12.49	63.75	-8.59	0.51	0.16	8.72
4,325.00	3.23	103.44	4,323.75	-12.81	65.12	-8.83	0.12	0.04	1.96
4,350.00	3.48	109.04	4,348.71	-13.23	66.52	-9.15	1.65	1.00	22.40
4,375.00	3.66	112.34	4,373.66	-13.78	67.98	-9.61	1.09	0.72	13.20
4,400.00	3.68	113.84	4,398.61	-14.40	69.45	-10.15	0.39	0.08	6.00
4,425.00	3.62	116.95	4,423.56	-15.09	70.89	-10.74	0.83	-0.24	12.44
4,450.00	3.63	116.71	4,448.51	-15.80	72.30	-11.37	0.07	0.04	-0.96
4,475.00	3.69	118.07	4,473.46	-16.53	73.71	-12.01	0.42	0.24	5.44
4,500.00	3.98	119.71	4,498.40	-17.34	75.18	-12.73	1.24	1.16	6.56
4,525.00	3.83	121.19	4,523.34	-18.20	76.64	-13.50	0.72	-0.60	5.92
4,550.00	4.00	124.43	4,548.28	-19.13	78.08	-14.34	1.12	0.68	12.96
4,575.00	3.98	123.46	4,573.22	-20.10	79.52	-15.22	0.28	-0.08	-3.88
4,600.00	3.83	129.28	4,598.16	-21.11	80.89	-16.14	1.69	-0.60	23.28
4,625.00	3.70	134.73	4,623.11	-22.20	82.11	-17.16	1.52	-0.52	21.80

**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 33, T 20 S., R 34 E  
**Well:** Little Bear Federal Com 7H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Little Bear Federal Com 7H  
**TVD Reference:** KB=26' @ 3832.00usft (Scandrill Freedom)  
**MD Reference:** KB=26' @ 3832.00usft (Scandrill Freedom)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1

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	3.39	140.70	4,648.06	-23.34	83.15	-18.24	1.93	-1.24	23.88
4,675.00	3.14	142.02	4,673.02	-24.46	84.04	-19.29	1.04	-1.00	5.28
4,700.00	3.07	141.23	4,697.99	-25.52	84.88	-20.30	0.33	-0.28	-3.16
4,725.00	3.28	143.42	4,722.95	-26.61	85.73	-21.34	0.97	0.84	8.76
4,750.00	3.36	143.51	4,747.91	-27.78	86.59	-22.45	0.32	0.32	0.36
4,775.00	3.33	141.69	4,772.86	-28.94	87.48	-23.56	0.44	-0.12	-7.28
4,800.00	3.31	142.28	4,797.82	-30.08	88.37	-24.64	0.16	-0.08	2.36
4,825.00	3.23	142.56	4,822.78	-31.21	89.24	-25.71	0.33	-0.32	1.12
4,850.00	3.33	142.59	4,847.74	-32.34	90.11	-26.80	0.40	0.40	0.12
4,875.00	3.21	146.39	4,872.70	-33.50	90.93	-27.90	0.99	-0.48	15.20
4,900.00	3.18	149.93	4,897.66	-34.68	91.67	-29.04	0.80	-0.12	14.16
4,925.00	3.05	154.48	4,922.62	-35.89	92.30	-30.20	1.12	-0.52	18.20
4,950.00	2.94	158.00	4,947.59	-37.08	92.83	-31.36	0.86	-0.44	14.08
4,975.00	3.21	159.08	4,972.55	-38.33	93.32	-32.57	1.10	1.08	4.32
5,000.00	3.14	158.81	4,997.51	-39.62	93.82	-33.83	0.29	-0.28	-1.08
5,025.00	3.09	158.79	5,022.48	-40.89	94.31	-35.07	0.20	-0.20	-0.08
5,050.00	3.14	158.89	5,047.44	-42.15	94.80	-36.30	0.20	0.20	0.40
5,075.00	3.07	158.68	5,072.40	-43.42	95.29	-37.53	0.28	-0.28	-0.84
5,100.00	3.21	157.37	5,097.37	-44.69	95.80	-38.77	0.63	0.56	-5.24
5,125.00	3.34	158.94	5,122.33	-46.01	96.33	-40.06	0.63	0.52	6.28
5,150.00	3.33	160.26	5,147.28	-47.37	96.84	-41.39	0.31	-0.04	5.28
5,175.00	3.29	158.41	5,172.24	-48.72	97.35	-42.71	0.46	-0.16	-7.40
5,200.00	3.46	159.52	5,197.20	-50.10	97.88	-44.05	0.73	0.68	4.44
5,225.00	3.59	159.96	5,222.15	-51.54	98.41	-45.45	0.53	0.52	1.76
5,250.00	3.64	160.06	5,247.10	-53.02	98.95	-46.90	0.20	0.20	0.40
5,275.00	3.52	160.10	5,272.05	-54.49	99.48	-48.33	0.48	-0.48	0.16
5,300.00	3.68	160.48	5,297.00	-55.97	100.01	-49.77	0.65	0.64	1.52
5,325.00	3.73	161.80	5,321.95	-57.50	100.53	-51.27	0.40	0.20	5.28
5,350.00	3.82	160.66	5,346.90	-59.05	101.06	-52.79	0.47	0.36	-4.56
5,375.00	3.83	161.41	5,371.84	-60.63	101.60	-54.33	0.20	0.04	3.00
5,400.00	3.90	162.69	5,396.78	-62.23	102.12	-55.90	0.44	0.28	5.12
5,425.00	4.01	160.70	5,421.72	-63.87	102.66	-57.50	0.70	0.44	-7.96
5,450.00	4.03	161.58	5,446.66	-65.53	103.23	-59.12	0.26	0.08	3.52
5,475.00	4.26	162.00	5,471.60	-67.25	103.80	-60.80	0.93	0.92	1.68
5,500.00	4.15	161.86	5,496.53	-68.99	104.36	-62.51	0.44	-0.44	-0.56
5,525.00	4.25	163.26	5,521.46	-70.74	104.91	-64.22	0.57	0.40	5.60
5,550.00	4.46	162.33	5,546.39	-72.55	105.47	-65.99	0.89	0.84	-3.72
5,575.00	4.40	161.81	5,571.32	-74.39	106.07	-67.79	0.29	-0.24	-2.08
5,600.00	4.67	161.47	5,596.24	-76.26	106.69	-69.62	1.09	1.08	-1.36
5,625.00	4.56	162.67	5,621.16	-78.18	107.31	-71.50	0.59	-0.44	4.80
5,650.00	4.64	161.43	5,646.08	-80.08	107.93	-73.36	0.51	0.32	-4.96
5,675.00	4.61	161.28	5,670.99	-81.99	108.57	-75.23	0.13	-0.12	-0.60
5,700.00	4.69	160.08	5,695.91	-83.91	109.24	-77.10	0.50	0.32	-4.80



Survey Report



Company: COG Operating L L C  
 Project: Lea County, NM (NAD27 NME)  
 Site: Sec. 33, T 20 S. , R 34 E  
 Well: Little Bear Federal Com 7H  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Little Bear Federal Com 7H  
 TVD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 MD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1

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	4.74	160.86	5,720.83	-85.84	109.93	-78.99	0.33	0.20	3.12
5,750.00	4.71	161.32	5,745.74	-87.79	110.60	-80.89	0.19	-0.12	1.84
5,775.00	4.75	160.19	5,770.66	-89.74	111.28	-82.79	0.41	0.16	-4.52
5,800.00	4.74	159.81	5,795.57	-91.68	111.98	-84.69	0.13	-0.04	-1.52
5,825.00	4.83	160.65	5,820.49	-93.64	112.69	-86.61	0.46	0.36	3.36
5,850.00	4.97	158.43	5,845.39	-95.64	113.44	-88.56	0.94	0.56	-8.88
5,875.00	4.75	157.33	5,870.30	-97.61	114.23	-90.47	0.96	-0.88	-4.40
5,900.00	4.70	157.40	5,895.22	-99.51	115.03	-92.32	0.20	-0.20	0.28
5,925.00	4.53	156.53	5,920.14	-101.36	115.81	-94.12	0.74	-0.68	-3.48
5,950.00	4.46	155.72	5,945.06	-103.15	116.61	-95.86	0.38	-0.28	-3.24
5,975.00	4.57	155.95	5,969.98	-104.94	117.41	-97.60	0.45	0.44	0.92
6,000.00	4.45	156.97	5,994.91	-106.75	118.20	-99.35	0.58	-0.48	4.08
6,025.00	4.63	155.31	6,019.83	-108.56	119.00	-101.11	0.89	0.72	-6.64
6,050.00	4.47	154.73	6,044.75	-110.35	119.84	-102.85	0.67	-0.64	-2.32
6,075.00	4.54	154.97	6,069.67	-112.13	120.67	-104.58	0.29	0.28	0.96
6,100.00	4.64	155.12	6,094.59	-113.94	121.51	-106.33	0.40	0.40	0.60
6,125.00	4.59	152.94	6,119.51	-115.75	122.39	-108.09	0.73	-0.20	-8.72
6,150.00	4.46	153.17	6,144.43	-117.51	123.29	-109.79	0.53	-0.52	0.92
6,175.00	4.50	154.00	6,169.36	-119.26	124.16	-111.48	0.30	0.16	3.32
6,200.00	4.42	153.64	6,194.28	-121.00	125.01	-113.17	0.34	-0.32	-1.44
6,225.00	4.32	153.66	6,219.21	-122.71	125.86	-114.82	0.40	-0.40	0.08
6,250.00	4.32	153.43	6,244.14	-124.40	126.70	-116.45	0.07	0.00	-0.92
6,275.00	4.39	154.10	6,269.06	-126.10	127.54	-118.10	0.35	0.28	2.68
6,300.00	4.36	153.58	6,293.99	-127.81	128.38	-119.76	0.20	-0.12	-2.08
6,325.00	4.35	152.19	6,318.92	-129.50	129.24	-121.39	0.42	-0.04	-5.56
6,350.00	4.32	154.39	6,343.85	-131.19	130.09	-123.02	0.68	-0.12	8.80
6,375.00	4.22	152.54	6,368.78	-132.85	130.92	-124.64	0.68	-0.40	-7.40
6,400.00	4.20	150.87	6,393.71	-134.47	131.79	-126.20	0.50	-0.08	-6.68
6,425.00	4.21	150.70	6,418.64	-136.07	132.69	-127.74	0.06	0.04	-0.68
6,450.00	4.41	149.42	6,443.57	-137.70	133.63	-129.31	0.89	0.80	-5.12
6,475.00	4.05	148.96	6,468.50	-139.28	134.57	-130.83	1.45	-1.44	-1.84
6,500.00	4.27	150.02	6,493.44	-140.84	135.49	-132.33	0.93	0.88	4.24
6,525.00	4.06	149.35	6,518.37	-142.41	136.41	-133.84	0.86	-0.84	-2.68
6,550.00	4.16	149.67	6,543.31	-143.96	137.32	-135.33	0.41	0.40	1.28
6,575.00	4.15	147.54	6,568.24	-145.50	138.26	-136.81	0.62	-0.04	-8.52
6,600.00	4.05	147.35	6,593.18	-147.01	139.22	-138.26	0.40	-0.40	-0.76
6,625.00	3.95	147.15	6,618.12	-148.48	140.17	-139.67	0.40	-0.40	-0.80
6,650.00	3.90	146.57	6,643.06	-149.91	141.10	-141.04	0.26	-0.20	-2.32
6,675.00	3.93	146.68	6,668.00	-151.33	142.04	-142.40	0.12	0.12	0.44
6,700.00	3.92	145.50	6,692.94	-152.75	142.99	-143.76	0.33	-0.04	-4.72
6,725.00	3.94	145.52	6,717.88	-154.17	143.96	-145.11	0.08	0.08	0.08
6,750.00	3.91	144.56	6,742.82	-155.57	144.95	-146.45	0.29	-0.12	-3.84
6,775.00	3.83	147.26	6,767.77	-156.97	145.89	-147.79	0.80	-0.32	10.80
6,800.00	3.78	146.99	6,792.71	-158.36	146.79	-149.13	0.21	-0.20	-1.08





Survey Report



Company: COG Operating L L C  
 Project: Lea County, NM (NAD27 NME)  
 Site: Sec. 33, T 20 S., R 34 E  
 Well: Little Bear Federal Com 7H  
 Wellbore: Wellbore #1  
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Local Co-ordinate Reference: Well Little Bear Federal Com 7H  
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 MD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
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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)
6,825.00	3.88	146.56	6,817.66	-159.76	147.71	-150.47	0.42	0.40	-1.72
6,850.00	3.71	147.31	6,842.60	-161.14	148.61	-151.79	0.71	-0.68	3.00
6,875.00	3.63	147.98	6,867.55	-162.49	149.47	-153.09	0.36	-0.32	2.68
6,900.00	3.60	147.63	6,892.50	-163.83	150.31	-154.37	0.15	-0.12	-1.40
6,925.00	3.59	148.79	6,917.45	-165.16	151.13	-155.65	0.29	-0.04	4.64
6,950.00	3.90	147.31	6,942.40	-166.55	152.00	-156.98	1.30	1.24	-5.92
6,975.00	3.70	147.94	6,967.34	-167.94	152.88	-158.32	0.82	-0.80	2.52
7,000.00	3.65	146.73	6,992.29	-169.29	153.75	-159.62	0.37	-0.20	-4.84
7,025.00	3.62	148.51	7,017.24	-170.63	154.60	-160.90	0.47	-0.12	7.12
7,050.00	3.59	147.47	7,042.19	-171.96	155.43	-162.18	0.29	-0.12	-4.16
7,075.00	3.65	147.89	7,067.14	-173.30	156.27	-163.46	0.26	0.24	1.68
7,100.00	3.63	146.76	7,092.09	-174.63	157.13	-164.74	0.30	-0.08	-4.52
7,125.00	3.39	149.28	7,117.05	-175.93	157.94	-165.99	1.14	-0.96	10.08
7,150.00	3.35	147.80	7,142.00	-177.19	158.71	-167.19	0.38	-0.16	-5.92
7,175.00	3.24	146.96	7,166.96	-178.40	159.48	-168.35	0.48	-0.44	-3.36
7,200.00	3.41	147.59	7,191.92	-179.62	160.27	-169.52	0.70	0.68	2.52
7,225.00	3.34	148.10	7,216.88	-180.86	161.05	-170.72	0.30	-0.28	2.04
7,250.00	3.32	146.76	7,241.83	-182.09	161.83	-171.89	0.32	-0.08	-5.36
7,275.00	3.28	147.29	7,266.79	-183.29	162.62	-173.05	0.20	-0.16	2.12
7,300.00	3.30	148.71	7,291.75	-184.51	163.38	-174.22	0.34	0.08	5.68
7,325.00	3.47	146.09	7,316.71	-185.75	164.17	-175.41	0.92	0.68	-10.48
7,350.00	3.23	147.88	7,341.66	-186.98	164.97	-176.58	1.05	-0.96	7.16
7,375.00	3.14	147.88	7,366.63	-188.15	165.71	-177.71	0.36	-0.36	0.00
7,400.00	3.13	148.38	7,391.59	-189.31	166.43	-178.83	0.12	-0.04	2.00
7,425.00	3.19	146.64	7,416.55	-190.48	167.17	-179.94	0.45	0.24	-6.96
7,450.00	3.24	149.62	7,441.51	-191.67	167.91	-181.09	0.70	0.20	11.92
7,475.00	3.21	147.19	7,466.47	-192.86	168.65	-182.24	0.56	-0.12	-9.72
7,500.00	3.03	148.61	7,491.43	-194.02	169.37	-183.34	0.78	-0.72	5.68
7,525.00	3.06	149.79	7,516.40	-195.16	170.05	-184.44	0.28	0.12	4.72
7,550.00	2.81	147.03	7,541.37	-196.25	170.72	-185.49	1.15	-1.00	-11.04
7,575.00	3.03	147.54	7,566.33	-197.32	171.41	-186.52	0.89	0.88	2.04
7,600.00	2.84	148.52	7,591.30	-198.41	172.08	-187.56	0.79	-0.76	3.92
7,625.00	2.75	148.84	7,616.27	-199.45	172.72	-188.56	0.37	-0.36	1.28
7,650.00	2.94	148.33	7,641.24	-200.51	173.36	-189.58	0.77	0.76	-2.04
7,675.00	2.90	148.08	7,666.21	-201.59	174.04	-190.62	0.17	-0.16	-1.00
7,700.00	2.70	147.57	7,691.18	-202.62	174.69	-191.61	0.81	-0.80	-2.04
7,725.00	2.77	147.07	7,716.15	-203.63	175.33	-192.57	0.30	0.28	-2.00
7,750.00	2.59	148.61	7,741.12	-204.62	175.95	-193.52	0.78	-0.72	6.16
7,775.00	2.59	149.08	7,766.10	-205.58	176.54	-194.45	0.08	0.00	1.88
7,800.00	2.64	148.33	7,791.07	-206.56	177.13	-195.39	0.24	0.20	-3.00
7,825.00	2.60	146.70	7,816.04	-207.52	177.74	-196.31	0.34	-0.16	-6.52
7,850.00	2.46	147.61	7,841.02	-208.45	178.34	-197.20	0.58	-0.56	3.64
7,875.00	2.55	147.09	7,866.00	-209.37	178.93	-198.08	0.37	0.36	-2.08

**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 33, T 20 S., R 34 E  
**Well:** Little Bear Federal Com 7H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Little Bear Federal Com 7H  
**TVD Reference:** KB=26' @ 3832.00usft (Scandril Freedom)  
**MD Reference:** KB=26' @ 3832.00usft (Scandril Freedom)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1

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	2.56	149.97	7,890.97	-210.32	179.51	-199.00	0.52	0.04	11.52
7,925.00	2.67	147.27	7,915.95	-211.29	180.11	-199.93	0.66	0.44	-10.80
7,950.00	2.64	146.62	7,940.92	-212.26	180.74	-200.86	0.17	-0.12	-2.60
7,975.00	2.52	147.55	7,965.89	-213.21	181.35	-201.77	0.51	-0.48	3.72
8,000.00	2.36	149.82	7,990.87	-214.11	181.90	-202.64	0.75	-0.64	9.08
8,025.00	2.32	149.15	8,015.85	-214.99	182.42	-203.49	0.19	-0.16	-2.68
8,050.00	3.09	148.13	8,040.82	-216.00	183.04	-204.46	3.09	3.08	-4.08
8,075.00	2.63	145.79	8,065.79	-217.05	183.72	-205.46	1.90	-1.84	-9.36
8,100.00	2.37	149.43	8,090.77	-217.97	184.30	-206.34	1.22	-1.04	14.56
8,125.00	2.36	147.28	8,115.75	-218.85	184.84	-207.18	0.36	-0.04	-8.60
8,150.00	2.31	148.01	8,140.72	-219.71	185.39	-208.01	0.23	-0.20	2.92
8,175.00	2.44	148.48	8,165.70	-220.59	185.93	-208.86	0.53	0.52	1.88
8,200.00	2.38	147.89	8,190.68	-221.48	186.49	-209.71	0.26	-0.24	-2.36
8,225.00	2.18	149.24	8,215.66	-222.33	187.01	-210.53	0.83	-0.80	5.40
8,250.00	2.14	149.09	8,240.64	-223.14	187.49	-211.31	0.16	-0.16	-0.60
8,275.00	2.09	148.60	8,265.63	-223.93	187.97	-212.07	0.21	-0.20	-1.96
8,300.00	2.27	148.98	8,290.61	-224.74	188.46	-212.85	0.72	0.72	1.52
8,325.00	2.17	150.57	8,315.59	-225.58	188.95	-213.65	0.47	-0.40	6.36
8,350.00	2.18	148.12	8,340.57	-226.39	189.43	-214.44	0.37	0.04	-9.80
8,375.00	2.00	148.10	8,365.55	-227.17	189.91	-215.18	0.72	-0.72	-0.08
8,400.00	2.00	149.98	8,390.54	-227.91	190.36	-215.90	0.26	0.00	7.52
8,425.00	2.08	147.41	8,415.52	-228.67	190.82	-216.63	0.49	0.32	-10.28
8,450.00	2.07	147.28	8,440.51	-229.44	191.31	-217.36	0.04	-0.04	-0.52
8,475.00	2.11	150.05	8,465.49	-230.22	191.79	-218.11	0.43	0.16	11.08
8,500.00	2.12	148.74	8,490.47	-231.01	192.26	-218.87	0.20	0.04	-5.24
8,525.00	2.11	149.54	8,515.46	-231.80	192.73	-219.64	0.12	-0.04	3.20
8,550.00	2.13	149.39	8,540.44	-232.60	193.20	-220.40	0.08	0.08	-0.60
8,575.00	2.09	149.18	8,565.42	-233.39	193.67	-221.16	0.16	-0.16	-0.84
8,600.00	2.16	149.89	8,590.41	-234.19	194.14	-221.93	0.30	0.28	2.84
8,625.00	2.11	148.79	8,615.39	-234.99	194.61	-222.70	0.26	-0.20	-4.40
8,650.00	2.15	148.01	8,640.37	-235.78	195.10	-223.46	0.20	0.16	-3.12
8,675.00	2.35	150.52	8,665.35	-236.62	195.60	-224.28	0.89	0.80	10.04
8,700.00	2.15	149.19	8,690.33	-237.47	196.09	-225.09	0.83	-0.80	-5.32
8,725.00	2.06	150.57	8,715.32	-238.27	196.55	-225.86	0.41	-0.36	5.52
8,750.00	1.95	151.74	8,740.30	-239.03	196.98	-226.60	0.47	-0.44	4.68
8,775.00	2.00	152.30	8,765.29	-239.79	197.38	-227.33	0.21	0.20	2.24
8,800.00	1.99	153.30	8,790.27	-240.57	197.78	-228.08	0.14	-0.04	4.00
8,825.00	2.11	151.45	8,815.25	-241.36	198.19	-228.85	0.55	0.48	-7.40
8,850.00	1.90	152.73	8,840.24	-242.13	198.60	-229.59	0.86	-0.84	5.12
8,875.00	1.80	151.96	8,865.23	-242.85	198.98	-230.28	0.41	-0.40	-3.08
8,900.00	1.74	153.42	8,890.21	-243.53	199.33	-230.95	0.30	-0.24	5.84
8,925.00	1.79	153.78	8,915.20	-244.22	199.67	-231.61	0.20	0.20	1.44
8,950.00	1.66	154.04	8,940.19	-244.90	200.01	-232.27	0.52	-0.52	1.04



Survey Report



Company: COG Operating L L C  
 Project: Lea County, NM (NAD27 NME)  
 Site: Sec. 33, T 20 S., R 34 E  
 Well: Little Bear Federal Com 7H  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Little Bear Federal Com 7H  
 TVD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 MD Reference: KB=26' @ 3832.00usft (Scandrill Freedom)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1

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	1.54	155.15	8,965.18	-245.53	200.31	-232.88	0.50	-0.48	4.44
9,000.00	1.48	151.43	8,990.17	-246.12	200.60	-233.45	0.46	-0.24	-14.88
9,025.00	1.46	152.25	9,015.16	-246.68	200.90	-233.99	0.12	-0.08	3.28
9,050.00	1.44	151.43	9,040.16	-247.24	201.20	-234.53	0.12	-0.08	-3.28
9,075.00	1.52	153.06	9,065.15	-247.81	201.50	-235.08	0.36	0.32	6.52
9,100.00	1.47	151.54	9,090.14	-248.39	201.81	-235.64	0.26	-0.20	-6.08
9,125.00	1.49	153.22	9,115.13	-248.96	202.10	-236.20	0.19	0.08	6.72
9,150.00	1.49	150.39	9,140.12	-249.54	202.41	-236.75	0.29	0.00	-11.32
9,175.00	1.37	151.23	9,165.11	-250.08	202.72	-237.27	0.49	-0.48	3.36
9,200.00	1.49	148.40	9,190.11	-250.62	203.03	-237.79	0.56	0.48	-11.32
9,225.00	1.50	148.09	9,215.10	-251.17	203.37	-238.32	0.05	0.04	-1.24
9,250.00	1.39	147.94	9,240.09	-251.71	203.71	-238.84	0.44	-0.44	-0.60
9,275.00	1.22	147.46	9,265.08	-252.19	204.01	-239.30	0.68	-0.68	-1.92
9,300.00	1.06	147.58	9,290.08	-252.61	204.28	-239.70	0.64	-0.64	0.48
9,325.00	0.95	147.60	9,315.07	-252.98	204.51	-240.06	0.44	-0.44	0.08
9,350.00	0.90	143.14	9,340.07	-253.31	204.74	-240.38	0.35	-0.20	-17.84
9,375.00	0.80	137.99	9,365.07	-253.60	204.98	-240.65	0.50	-0.40	-20.60
9,400.00	0.59	129.76	9,390.07	-253.81	205.19	-240.85	0.93	-0.84	-32.92
9,425.00	0.47	128.27	9,415.07	-253.96	205.37	-240.98	0.48	-0.48	-5.96
9,450.00	0.43	118.81	9,440.07	-254.06	205.54	-241.08	0.34	-0.16	-37.84
9,475.00	0.34	112.00	9,465.06	-254.14	205.69	-241.14	0.40	-0.36	-27.24
9,500.00	0.38	120.46	9,490.06	-254.21	205.83	-241.20	0.27	0.16	33.84
9,525.00	0.38	124.11	9,515.06	-254.30	205.97	-241.28	0.10	0.00	14.60
9,550.00	0.36	119.16	9,540.06	-254.38	206.10	-241.36	0.15	-0.08	-19.80
9,575.00	0.32	106.72	9,565.06	-254.44	206.24	-241.41	0.33	-0.16	-49.76
9,600.00	0.24	90.13	9,590.06	-254.46	206.36	-241.42	0.45	-0.32	-66.36
9,625.00	0.25	81.42	9,615.06	-254.45	206.46	-241.41	0.15	0.04	-34.84
9,650.00	0.25	84.43	9,640.06	-254.44	206.57	-241.39	0.05	0.00	12.04
9,675.00	0.26	78.32	9,665.06	-254.42	206.68	-241.36	0.12	0.04	-24.44
9,700.00	0.27	59.64	9,690.06	-254.38	206.79	-241.32	0.35	0.04	-74.72
9,725.00	0.18	102.20	9,715.06	-254.36	206.88	-241.29	0.73	-0.36	170.24
9,750.00	0.22	190.42	9,740.06	-254.41	206.91	-241.34	1.12	0.16	352.88
9,775.00	0.54	190.88	9,765.06	-254.58	206.88	-241.51	1.28	1.28	1.84
9,800.00	0.70	192.35	9,790.06	-254.84	206.82	-241.78	0.64	0.64	5.88
9,825.00	0.73	193.39	9,815.06	-255.15	206.75	-242.08	0.13	0.12	4.16
9,850.00	0.84	189.71	9,840.05	-255.48	206.69	-242.42	0.48	0.44	-14.72
9,875.00	0.81	192.53	9,865.05	-255.83	206.62	-242.78	0.20	-0.12	11.28
9,900.00	0.88	195.17	9,890.05	-256.19	206.53	-243.14	0.32	0.28	10.56
9,925.00	0.93	194.58	9,915.05	-256.57	206.43	-243.53	0.20	0.20	-2.36
9,950.00	0.97	189.79	9,940.04	-256.98	206.34	-243.94	0.36	0.16	-19.16
9,975.00	0.97	187.80	9,965.04	-257.40	206.27	-244.36	0.13	0.00	-7.96
10,000.00	0.91	190.14	9,990.04	-257.80	206.21	-244.77	0.28	-0.24	9.36
10,025.00	0.94	193.32	10,015.03	-258.20	206.13	-245.17	0.24	0.12	12.72
10,050.00	1.03	196.39	10,040.03	-258.61	206.02	-245.59	0.42	0.36	12.28

**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 33, T 20 S., R 34 E  
**Well:** Little Bear Federal Com 7H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Little Bear Federal Com 7H  
**TVD Reference:** KB=26' @ 3832.00usft (Scandril Freedom)  
**MD Reference:** KB=26' @ 3832.00usft (Scandril Freedom)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1

**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)
10,075.00	1.10	194.76	10,065.02	-259.06	205.89	-246.04	0.31	0.28	-6.52
10,100.00	1.02	194.60	10,090.02	-259.51	205.78	-246.50	0.32	-0.32	-0.64
10,125.00	1.05	200.87	10,115.02	-259.94	205.64	-246.93	0.47	0.12	25.08
10,150.00	1.18	196.97	10,140.01	-260.40	205.48	-247.40	0.60	0.52	-15.60
10,175.00	1.03	201.72	10,165.01	-260.85	205.32	-247.87	0.70	-0.60	19.00
10,200.00	1.14	207.35	10,190.00	-261.28	205.13	-248.31	0.61	0.44	22.52
10,225.00	1.18	203.77	10,215.00	-261.74	204.91	-248.78	0.33	0.16	-14.32
10,250.00	1.16	209.01	10,239.99	-262.19	204.68	-249.25	0.44	-0.08	20.96
10,275.00	1.29	206.51	10,264.99	-262.67	204.43	-249.73	0.56	0.52	-10.00
10,300.00	1.29	211.80	10,289.98	-263.16	204.16	-250.24	0.48	0.00	21.16
10,325.00	1.19	205.49	10,314.97	-263.63	203.90	-250.73	0.68	-0.40	-25.24
10,350.00	1.38	214.28	10,339.97	-264.12	203.62	-251.23	1.09	0.76	35.16
10,375.00	1.43	212.71	10,364.96	-264.63	203.28	-251.76	0.25	0.20	-6.28
10,400.00	1.47	208.94	10,389.95	-265.17	202.96	-252.32	0.41	0.16	-15.08
10,425.00	1.59	210.69	10,414.94	-265.75	202.62	-252.92	0.52	0.48	7.00
10,450.00	1.53	211.78	10,439.93	-266.33	202.27	-253.52	0.27	-0.24	4.36
10,475.00	1.65	212.73	10,464.92	-266.92	201.90	-254.13	0.49	0.48	3.80
10,500.00	1.60	215.26	10,489.91	-267.51	201.50	-254.74	0.35	-0.20	10.12
10,525.00	1.62	216.47	10,514.90	-268.07	201.09	-255.33	0.16	0.08	4.84
10,550.00	1.61	215.47	10,539.89	-268.64	200.68	-255.93	0.12	-0.04	-4.00
10,575.00	1.62	215.06	10,564.88	-269.22	200.27	-256.53	0.06	0.04	-1.64
10,600.00	1.66	215.64	10,589.87	-269.80	199.86	-257.13	0.17	0.16	2.32
10,625.00	1.77	215.48	10,614.86	-270.41	199.42	-257.77	0.44	0.44	-0.64
10,650.00	1.71	216.19	10,639.85	-271.03	198.98	-258.41	0.26	-0.24	2.84
10,675.00	1.61	216.55	10,664.84	-271.61	198.55	-259.02	0.40	-0.40	1.44
10,700.00	1.60	221.11	10,689.83	-272.16	198.11	-259.59	0.51	-0.04	18.24
10,725.00	1.76	218.93	10,714.82	-272.72	197.64	-260.18	0.69	0.64	-8.72
10,750.00	1.77	216.41	10,739.81	-273.33	197.17	-260.81	0.31	0.04	-10.08
10,773.00	1.81	217.89	10,762.80	-273.90	196.74	-261.41	0.27	0.17	6.43
10,950.00	1.88	217.06	10,939.71	-278.42	193.27	-266.14	0.04	0.04	-0.47
<b>First MWD Survey @ 10950'MD</b>									
11,000.00	1.19	220.45	10,989.69	-279.47	192.44	-267.24	1.39	-1.38	6.78
11,032.00	3.83	21.16	11,021.67	-278.73	192.61	-266.48	15.53	8.25	502.22
11,095.00	16.01	23.13	11,083.61	-268.74	196.80	-256.26	19.34	19.33	3.13
11,142.00	23.85	21.01	11,127.76	-253.88	202.76	-241.07	16.75	16.68	-4.51
11,190.00	26.78	18.97	11,171.15	-234.59	209.75	-221.39	6.37	6.10	-4.25
11,237.00	28.81	19.36	11,212.72	-213.89	216.95	-200.29	4.34	4.32	0.83
11,284.00	33.09	20.51	11,253.02	-191.18	225.21	-177.11	9.19	9.11	2.45
11,331.00	39.53	19.89	11,290.88	-165.07	234.80	-150.47	13.72	13.70	-1.32
11,379.00	44.09	18.46	11,326.64	-134.85	245.29	-119.67	9.70	9.50	-2.98
11,426.00	48.56	18.32	11,359.09	-102.60	256.01	-86.82	9.51	9.51	-0.30
11,473.00	52.40	18.06	11,389.00	-68.16	267.32	-51.76	8.18	8.17	-0.55
11,520.00	55.98	17.63	11,416.49	-31.89	279.00	-14.84	7.65	7.62	-0.91

**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 33, T 20 S., R 34 E  
**Well:** Little Bear Federal Com 7H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Little Bear Federal Com 7H  
**TVD Reference:** KB=26' @ 3832.00usft (Scandrift Freedom)  
**MD Reference:** KB=26' @ 3832.00usft (Scandrift Freedom)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1

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)
11,568.00	59.79	17.54	11,442.00	6.86	291.28	24.58	7.94	7.94	-0.19
11,615.00	61.89	17.75	11,464.90	45.97	303.72	64.38	4.49	4.47	0.45
11,663.00	68.66	18.90	11,484.97	87.33	317.43	106.50	14.27	14.10	2.40
11,710.00	73.14	18.65	11,500.34	129.37	331.72	149.33	9.55	9.53	-0.53
11,757.00	74.45	16.68	11,513.46	172.37	345.41	193.08	4.90	2.79	-4.19
11,804.00	77.36	14.63	11,524.91	216.26	357.71	237.64	7.50	6.19	-4.36
11,852.00	81.86	13.71	11,533.56	262.02	369.26	284.02	9.56	9.38	-1.92
11,899.00	84.04	12.97	11,539.33	307.41	380.02	329.98	4.89	4.64	-1.57
11,947.00	89.23	11.96	11,542.15	354.18	390.36	377.29	11.01	10.81	-2.10
11,972.00	90.80	11.89	11,542.14	378.64	395.52	402.02	6.29	6.28	-0.28
12,069.00	91.08	12.07	11,540.55	473.51	415.65	497.94	0.34	0.29	0.19
12,164.00	91.81	12.94	11,538.15	566.23	436.22	591.74	1.20	0.77	0.92
12,259.00	93.61	11.47	11,533.66	658.97	456.28	685.53	2.45	1.89	-1.55
12,353.00	90.24	4.46	11,530.50	751.94	469.28	779.12	8.27	-3.59	-7.46
12,449.00	90.27	3.21	11,530.07	847.72	475.70	875.11	1.30	0.03	-1.30
12,543.00	91.11	0.10	11,528.94	941.66	478.42	969.05	3.43	0.89	-3.31
12,638.00	91.30	358.88	11,526.94	1,036.64	477.57	1,063.79	1.30	0.20	-1.28
12,732.00	91.28	357.71	11,524.83	1,130.57	474.77	1,157.38	1.24	-0.02	-1.24
12,827.00	90.77	358.27	11,523.13	1,225.50	471.44	1,251.93	0.80	-0.54	0.59
12,922.00	89.09	355.91	11,523.24	1,320.36	466.62	1,346.33	3.05	-1.77	-2.48
13,016.00	89.90	357.08	11,524.07	1,414.18	460.87	1,439.62	1.51	0.86	1.24
13,111.00	91.16	356.69	11,523.19	1,509.04	455.71	1,533.98	1.39	1.33	-0.41
13,206.00	90.69	358.25	11,521.66	1,603.93	451.52	1,628.44	1.71	-0.49	1.64
13,301.00	91.14	358.84	11,520.14	1,698.88	449.11	1,723.08	0.78	0.47	0.62
13,395.00	92.34	0.10	11,517.29	1,792.83	448.24	1,816.80	1.85	1.28	1.34
13,490.00	92.43	359.75	11,513.34	1,887.75	448.11	1,911.53	0.38	0.09	-0.37
13,585.00	92.40	359.01	11,509.33	1,982.66	447.09	2,006.20	0.78	-0.03	-0.78
13,680.00	92.34	0.85	11,505.40	2,077.57	446.97	2,100.94	1.94	-0.06	1.94
13,775.00	91.02	359.61	11,502.62	2,172.53	447.35	2,195.74	1.91	-1.39	-1.31
13,871.00	91.39	359.80	11,500.60	2,268.51	446.86	2,291.51	0.43	0.39	0.20
13,965.00	91.95	0.18	11,497.86	2,362.47	446.84	2,385.29	0.72	0.60	0.40
14,060.00	93.29	0.18	11,493.52	2,457.36	447.14	2,480.03	1.41	1.41	0.00
14,154.00	94.11	0.39	11,487.45	2,551.17	447.61	2,573.69	0.90	0.87	0.22
14,249.00	92.23	1.30	11,482.20	2,646.00	449.00	2,668.43	2.20	-1.98	0.96
14,344.00	93.38	2.31	11,477.55	2,740.84	451.99	2,763.28	1.61	1.21	1.06
14,439.00	92.62	0.15	11,472.58	2,835.68	454.03	2,858.07	2.41	-0.80	-2.27
14,533.00	93.71	1.20	11,467.39	2,929.53	455.13	2,951.81	1.61	1.16	1.12
14,628.00	91.64	358.83	11,462.95	3,024.41	455.16	3,046.52	3.31	-2.18	-2.49
14,723.00	91.64	358.05	11,460.23	3,119.34	452.57	3,141.11	0.82	0.00	-0.82
14,818.00	92.48	358.31	11,456.82	3,214.23	449.56	3,235.64	0.93	0.88	0.27
14,914.00	90.43	359.96	11,454.38	3,310.18	448.11	3,331.32	2.74	-2.14	1.72
15,009.00	91.11	0.40	11,453.10	3,405.17	448.41	3,426.15	0.85	0.72	0.46
15,104.00	91.92	1.24	11,450.59	3,500.12	449.77	3,521.02	1.23	0.85	0.88



Survey Report



Company: COG Operating L L C  
 Project: Lea County, NM (NAD27 NME)  
 Site: Sec. 33, T 20 S. , R 34 E  
 Well: Little Bear Federal Com 7H  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Little Bear Federal Com 7H  
 TVD Reference: KB=26' @ 3832.00usft (Scandril Freedom)  
 MD Reference: KB=26' @ 3832.00usft (Scandril Freedom)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1

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)
15,199.00	90.55	0.44	11,448.55	3,595.09	451.16	3,615.89	1.67	-1.44	-0.84
15,294.00	91.81	1.45	11,446.59	3,690.05	452.72	3,710.77	1.70	1.33	1.06
15,389.00	89.79	0.68	11,445.26	3,785.02	454.49	3,805.67	2.28	-2.13	-0.81
15,485.00	90.60	0.78	11,444.94	3,881.01	455.71	3,901.56	0.85	0.84	0.10
15,580.00	91.19	1.48	11,443.45	3,975.98	457.59	3,996.47	0.96	0.62	0.74
15,675.00	91.44	1.30	11,441.27	4,070.93	459.89	4,091.38	0.32	0.26	-0.19
15,770.00	91.78	0.89	11,438.60	4,165.87	461.70	4,186.26	0.56	0.36	-0.43
15,865.00	92.03	1.23	11,435.44	4,260.80	463.46	4,281.12	0.44	0.26	0.36
15,961.00	92.54	359.46	11,431.62	4,356.72	464.04	4,376.89	1.92	0.53	-1.84
16,056.00	92.14	358.69	11,427.74	4,451.63	462.51	4,471.53	0.91	-0.42	-0.81
16,151.00	89.93	358.20	11,426.02	4,546.57	459.93	4,566.14	2.38	-2.33	-0.52
16,246.00	89.62	357.58	11,426.39	4,641.51	456.43	4,660.69	0.73	-0.33	-0.65
16,341.00	90.80	358.93	11,426.05	4,736.46	453.54	4,755.29	1.89	1.24	1.42
16,437.00	89.51	357.63	11,425.79	4,832.41	450.66	4,850.88	1.91	-1.34	-1.35
16,531.00	88.67	357.34	11,427.28	4,926.31	446.53	4,944.36	0.95	-0.89	-0.31
16,627.00	89.31	357.92	11,428.97	5,022.21	442.56	5,039.84	0.90	0.67	0.60
16,722.00	90.63	359.23	11,429.02	5,117.18	440.20	5,134.49	1.96	1.39	1.38
16,817.00	90.99	359.99	11,427.68	5,212.16	439.55	5,229.26	0.89	0.38	0.80
16,912.00	92.09	0.38	11,425.13	5,307.13	439.86	5,324.06	1.23	1.16	0.41
17,007.00	90.41	359.97	11,423.05	5,402.10	440.15	5,418.88	1.82	-1.77	-0.43
17,103.00	88.36	358.83	11,424.08	5,498.08	439.15	5,514.62	2.44	-2.14	-1.19
17,197.00	88.98	359.06	11,426.27	5,592.04	437.42	5,608.30	0.70	0.66	0.24
17,292.00	89.71	359.33	11,427.35	5,687.03	436.08	5,703.03	0.82	0.77	0.28
17,387.00	90.88	1.01	11,426.86	5,782.02	436.36	5,797.86	2.15	1.23	1.77
17,482.00	91.16	1.38	11,425.17	5,876.98	438.34	5,892.77	0.49	0.29	0.39
17,576.00	89.65	358.78	11,424.51	5,970.97	438.47	5,986.59	3.20	-1.61	-2.77
17,670.00	89.59	358.75	11,425.13	6,064.95	436.45	6,080.27	0.07	-0.06	-0.03
17,766.00	89.90	358.94	11,425.56	6,160.92	434.51	6,175.95	0.38	0.32	0.20
17,860.00	91.22	0.47	11,424.64	6,254.91	434.03	6,269.74	2.15	1.40	1.63
17,956.00	91.86	0.64	11,422.06	6,350.87	434.96	6,365.57	0.69	0.67	0.18
18,051.00	92.59	0.47	11,418.37	6,445.80	435.88	6,460.38	0.79	0.77	-0.18
18,145.00	92.28	0.67	11,414.38	6,539.71	436.81	6,554.17	0.39	-0.33	0.21
18,240.00	91.86	359.89	11,410.95	6,634.64	437.28	6,648.96	0.93	-0.44	-0.82
18,335.00	91.44	0.22	11,408.21	6,729.60	437.37	6,743.75	0.56	-0.44	0.35
18,430.00	89.85	358.20	11,407.14	6,824.58	436.06	6,838.47	2.71	-1.67	-2.13
18,507.26	89.44	357.43	11,407.62	6,901.78	433.11	6,915.35	1.13	-0.54	-1.00
<b>North 330' Crossing Point @ 18507.26'MD</b>									
18,525.00	89.34	357.25	11,407.81	6,919.50	432.29	6,932.99	1.13	-0.54	-1.00
18,556.00	90.91	358.04	11,407.74	6,950.48	431.01	6,963.82	5.67	5.06	2.55
<b>Final MWD Survey @ 18556'MD</b>									
18,617.00	90.91	358.04	11,406.78	7,011.43	428.93	7,024.54	0.00	0.00	0.00
<b>Projection To TD @ 18617'MD</b>									



Survey Report



**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 33, T 20 S. , R 34 E  
**Well:** Little Bear Federal Com 7H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Little Bear Federal Com 7H  
**TVD Reference:** KB=26' @ 3832.00usft (Scandril Freedom)  
**MD Reference:** KB=26' @ 3832.00usft (Scandril Freedom)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,950.00	10,939.71	-278.42	193.27	First MWD Survey @ 10950'MD
18,507.26	11,407.62	6,901.78	433.11	North 330' Crossing Point @ 18507.26'MD
18,556.00	11,407.74	6,950.48	431.01	Final MWD Survey @ 18556'MD
18,617.00	11,406.78	7,011.43	428.93	Projection To TD @ 18617'MD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots			
	Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs				
From Bottom to Top	18,484	26	5	18,272	62	5	18,108	31	5	17,904	40	5	17,718	32	5
	18,458	12	5	18,253	19	5	18,090	24	5	17,890	19	5	17,701	25	5
	18,446	22	4	18,234	19	4	18,066	24	4	17,871	24	4	17,676	24	4
	18,424	23	4	18,215	19	4	18,042	25	4	17,847	24	4	17,652	24	4
	18,401	22	3	18,196	19	3	18,017		3	17,823	25	3	17,628	23	3
	18,379	22	3	18,177	19	3	17,993	24	3	17,798	24	3	17,605	26	3
	18,357	23	3	18,158	19	3	17,969	25	3	17,774	24	3	17,579	20	3
	18,334		3	18,139		3	17,944		3	17,750		3	17,559		3
Plug to Plug	60	30	Plug to Plug	67	30	Plug to Plug	76	30	Plug to Plug	67	30	Plug to Plug	76	30	
Frac Plug	18,484	Total Shots	Frac Plug	18,282	Total Shots	Frac Plug	18,118	Total Shots	Frac Plug	17,914	Total Shots	Frac Plug	17,728	Total Shots	

	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots			
	Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs				
From Bottom to Top	17,523	36	5	17,325	41	5	17,138	36	5	16,938	32	5	16,748	32	5
	17,506	24	5	17,311	29	5	17,116	24	5	16,925	28	5	16,723	21	5
	17,482	25	4	17,282	19	4	17,092	24	4	16,897	24	4	16,702	24	4
	17,457	24	4	17,283	21	4	17,068	25	4	16,873	24	4	16,678	24	4
	17,433	24	3	17,242	28	3	17,043	24	3	16,849	23	3	16,654	25	3
	17,409	25	3	17,214	29	3	17,019	24	3	16,826	26	3	16,629	24	3
	17,384	18	3	17,185	11	3	16,995	25	3	16,800	20	3	16,605	24	3
	17,366		3	17,174		3	16,970		3	16,780		3	16,581		3
Plug to Plug	76	30	Plug to Plug	77	30	Plug to Plug	85	30	Plug to Plug	75	30	Plug to Plug	80	30	
Frac Plug	17,533	Total Shots	Frac Plug	17,340	Total Shots	Frac Plug	17,153	Total Shots	Frac Plug	16,948	Total Shots	Frac Plug	16,758	Total Shots	

	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots			
	Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs				
From Bottom to Top	16,548	33	5	16,340	46	5	16,153	38	5	15,964	32	5	15,776	32	5
	16,532	24	5	16,330	23	5	16,142	24	5	15,948	25	5	15,752	24	5
	16,508	25	4	16,307	19	4	16,118	24	4	15,923	22	4	15,728	24	4
	16,483	24	4	16,288	27	4	16,094	25	4	15,901	27	4	15,704	24	4
	16,459	24	3	16,261	21	3	16,069	24	3	15,874	19	3	15,680	25	3
	16,435	25	3	16,240	25	3	16,045	24	3	15,855	29	3	15,655	24	3
	16,410	24	3	16,215	24	3	16,021	25	3	15,826	18	3	15,631	24	3
	16,386		3	16,191		3	15,996		3	15,808		3	15,607		3
Plug to Plug	75	30	Plug to Plug	62	30	Plug to Plug	69	30	Plug to Plug	73	30	Plug to Plug	82	30	
Frac Plug	16,558	Total Shots	Frac Plug	16,350	Total Shots	Frac Plug	16,163	Total Shots	Frac Plug	15,974	Total Shots	Frac Plug	15,786	Total Shots	

	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots			
	Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs				
From Bottom to Top	15,568	39	5	15,372	40	5	15,192	30	5	14,990	32	5	14,795	32	5
	15,555	20	5	15,358	19	5	15,165	21	5	14,973	24	5	14,779	30	5
	15,535	26	4	15,339	25	4	15,144	25	4	14,949	24	4	14,749	19	4
	15,509	19	4	15,314	24	4	15,119	24	4	14,925	25	4	14,730	27	4
	15,490	30	3	15,290	22	3	15,095	24	3	14,900	24	3	14,703	22	3
	15,460	17	3	15,268	27	3	15,071	25	3	14,876	24	3	14,681	24	3
	15,443	31	3	15,241	19	3	15,046	24	3	14,852	25	3	14,657	25	3
	15,412		3	15,222		3	15,022		3	14,827		3	14,632		3
Plug to Plug	75	30	Plug to Plug	68	30	Plug to Plug	83	30	Plug to Plug	75	30	Plug to Plug	79	30	
Frac Plug	15,584	Total Shots	Frac Plug	15,382	Total Shots	Frac Plug	15,202	Total Shots	Frac Plug	15,000	Total Shots	Frac Plug	14,809	Total Shots	

	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots			
	Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs				
From Bottom to Top	14,598	34	5	14,406	32	5	14,212	31	5	14,011	37	5	13,821	32	5
	14,584	25	5	14,392	27	5	14,194	24	5	13,995	21	5	13,810	30	5
	14,559	24	4	14,365	19	4	14,170	25	4	13,974	23	4	13,780	20	4
	14,535	24	4	14,346	30	4	14,145	24	4	13,951	25	4	13,760	29	4
	14,511	25	3	14,316	27	3	14,121	24	3	13,926	24	3	13,731	18	3
	14,486	24	3	14,289	22	3	14,097	22	3	13,902	24	3	13,713	30	3
	14,462	24	3	14,267	24	3	14,075	27	3	13,878	25	3	13,683	26	3
	14,438		3	14,243		3	14,048		3	13,853		3	13,657		3
Plug to Plug	73	30	Plug to Plug	70	30	Plug to Plug	77	30	Plug to Plug	75	30	Plug to Plug	71	30	
Frac Plug	14,608	Total Shots	Frac Plug	14,416	Total Shots	Frac Plug	14,222	Total Shots	Frac Plug	14,026	Total Shots	Frac Plug	13,831	Total Shots	

	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots	Distance	Shots			
	Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs		Between Perfs				
From Bottom to Top	13,626	31	5	13,428	36	5	13,225	44	5	13,046	31	5	12,848	31	5
	13,610	25	5	13,415	23	5	13,210	14	5	13,020	19	5	12,830	23	5
	13,585	24	4	13,392	26	4	13,196	25	4	13,001	26	4	12,807	25	4
	13,561	24	4	13,366	20	4	13,171	24	4	12,975	23	4	12,782	30	4
	13,537	25	3	13,346	29	3	13,147	24	3	12,952	25	3	12,752	19	3
	13,512	24	3	13,317	27	3	13,123	25	3	12,927	23	3	12,733	24	3
	13,488	24	3	13,290	21	3	13,098	21	3	12,904	25	3	12,709	27	3
	13,464		3	13,269		3	13,077		3	12,879		3	12,682		3
Plug to Plug	75	30	Plug to Plug	77	30	Plug to Plug	68	30	Plug to Plug	81	30	Plug to Plug	76	30	
Frac Plug	13,636	Total Shots	Frac Plug	13,443	Total Shots	Frac Plug	13,239	Total Shots	Frac Plug	13,056	Total Shots	Frac Plug	12,858	Total Shots	



	Distance Between Perfs		Shots		Distance Between Perfs		Shots		Distance Between Perfs		Shots		Distance Between Perfs		Shots	
From Bottom to Top	12,652	30	5	12,456	31	5	12,260	35	5	12,060	40	5	11,873	30	5	
	12,636	28	5	12,441	26	5	12,246	24	5	12,050	23	5	11,855	23	5	
	12,608	20	4	12,415	23	4	12,222	25	4	12,027	22	4	11,832	24	4	
	12,588	25	4	12,392	24	4	12,197	21	4	12,005	27	4	11,808	25	4	
	12,563	20	3	12,368	25	3	12,176	27	3	11,978	28	3	11,783	24	3	
	12,543	29	3	12,343	24	3	12,149	20	3	11,950	21	3	11,759	24	3	
	12,514	27	3	12,319	24	3	12,129	29	3	11,929	26	3	11,735	25	3	
	12,487		3	12,295		3	12,100		3	11,903		3	11,710		3	
	Plug to Plug	74	30	Plug to Plug	74	30	Plug to Plug	78	30	Plug to Plug	65	30	Plug to Plug	75	30	
	Frac Plug	12,662	Total Shots	Frac Plug	12,466	Total Shots	Frac Plug	12,275	Total Shots	Frac Plug	12,070	Total Shots	Frac Plug	11,883	Total Shots	

### Little Bear Federal Com #7H

<u>Perfs</u>	<u>7 1/2% Acid (Gal)</u>	<u>Sand (#)</u>	<u>Fluid (Gal)</u>
1	1512	400006	337596
2	1512	396900	411054
3	1512	399995	408786
4	1554	399644	445158
5	1512	401626	338745
6	1554	400407	328902
7	1512	402761	340914
8	1512	400310	336966
9	1512	401428	335916
10	3066	402048	443016
11	1512	400805	337890
12	1512	399696	365526
13	2478	399247	350784
14	1512	399692	342300
15	1512	401897	346584
16	1554	402118	322854
17	1512	400916	365694
18	1554	411992	348516
19	1512	400150	318864
20	1512	401714	334068
21	1596	402792	316554
22	1638	400479	312984
23	1470	399609	326676
24	1512	400105	331422
25	1512	400172	322602
26	1512	344919	416010
27	1512	400452	321972
28	1512	402349	344568
29	1512	398144	341712
30	1512	399437	368256
31	1512	400083	320922
32	1512	400947	344778
33	1512	400478	323232
34	1512	399832	336294
35	2940	400479	480018
<b>Totals</b>	<b>57,204</b>	<b>13,973,629</b>	<b>12,368,133</b>

**HOBBS OCD**  
**AUG 15 2019**  
**RECEIVED**