

HOBBSOCD

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COG Operating, LLC.

Lea County, N.M.

Section 29/32 T21S-R34E Merlin State Com #3H

Merlin State Com #3H

Original Hole

30-025-42428

Design: Original Hole

Survey Report - Geographic

24 March, 2015

JUL 01 2015

fm

Stryker Directional

Survey Report - Geographic

Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well Merlin State Com #3H
Project:	Lea County, N.M.	TVD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Site:	Section 29/32 T21S-R34E Merlin State Com #3H	MD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Well:	Merlin State Com #3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Project	Lea County, N.M.		
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						Section 29/32 T21S-R34E Merlin State Com #3H											
Site Position:			Northing:			526,497.80 usft			Latitude:			32° 26' 40.766 N					
From:			Map			Easting:			758,976.00 usft			Longitude:			103° 29' 37.856 W		
Position Uncertainty:			0.0 usft			Slot Radius:			13-3/16 "			Grid Convergence:			0.45 °		

Well	Merlin State Com #3H					
Well Position	+N/-S	0.0 usft	Northing:	526,497.80 usft	Latitude:	32° 26' 40.766 N
	+E/-W	0.0 usft	Easting:	758,976.00 usft	Longitude:	103° 29' 37.856 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,718.4 usft

Wellbore	Original Hole				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/19/2015	7.18	60.31	48,316

Design	Original Hole				
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Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	178.87

Survey Program	Date 3/24/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
108.0	10,402.0	KP Gyro Survey (Original Hole)	NSG-GYC_WL	Gyro in gyrocompassing mode on wireline
10,424.0	16,484.0	Stryker MWD Survey (Original Hole)	MWD	MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	526,497.80	758,976.00	32° 26' 40.766 N	103° 29' 37.856 W
108.0	0.49	253.25	108.0	-0.1	-0.4	526,497.67	758,975.55	32° 26' 40.764 N	103° 29' 37.861 W
147.0	0.49	275.33	147.0	-0.2	-0.8	526,497.64	758,975.23	32° 26' 40.764 N	103° 29' 37.865 W
207.0	0.62	318.65	207.0	0.1	-1.2	526,497.90	758,974.76	32° 26' 40.767 N	103° 29' 37.870 W
372.0	0.49	303.49	372.0	1.2	-2.4	526,498.96	758,973.58	32° 26' 40.777 N	103° 29' 37.884 W
441.0	0.09	99.72	441.0	1.3	-2.6	526,499.12	758,973.39	32° 26' 40.779 N	103° 29' 37.886 W
490.0	0.49	93.82	490.0	1.3	-2.4	526,499.10	758,973.64	32° 26' 40.779 N	103° 29' 37.883 W
583.0	0.62	90.20	583.0	1.3	-1.5	526,499.07	758,974.54	32° 26' 40.778 N	103° 29' 37.873 W
678.0	0.22	204.91	678.0	1.1	-1.0	526,498.90	758,974.97	32° 26' 40.777 N	103° 29' 37.868 W
791.0	0.09	283.09	791.0	0.9	-1.2	526,498.72	758,974.79	32° 26' 40.775 N	103° 29' 37.870 W

Stryker Directional

Survey Report - Geographic

Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well Merlin State Com #3H
Project:	Lea County, N.M.	TVD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Site:	Section 29/32 T21S-R34E Merlin State Com #3H	MD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Well:	Merlin State Com #3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
893.0	0.22	73.06	893.0	1.0	-1.1	526,498.80	758,974.90	32° 26' 40.776 N	103° 29' 37.869 W
1,053.0	0.62	34.94	1,053.0	1.8	-0.3	526,499.60	758,975.69	32° 26' 40.783 N	103° 29' 37.859 W
1,145.0	0.22	40.36	1,145.0	2.3	0.1	526,500.14	758,976.09	32° 26' 40.789 N	103° 29' 37.855 W
1,238.0	0.40	156.70	1,238.0	2.2	0.3	526,499.98	758,976.34	32° 26' 40.787 N	103° 29' 37.852 W
1,334.0	0.49	178.56	1,334.0	1.5	0.5	526,499.26	758,976.48	32° 26' 40.780 N	103° 29' 37.850 W
1,426.0	0.49	197.29	1,426.0	0.7	0.4	526,498.49	758,976.37	32° 26' 40.772 N	103° 29' 37.852 W
1,518.0	0.71	202.62	1,518.0	-0.2	0.0	526,497.59	758,976.04	32° 26' 40.764 N	103° 29' 37.856 W
1,610.0	0.22	182.96	1,610.0	-0.9	-0.2	526,496.89	758,975.81	32° 26' 40.757 N	103° 29' 37.858 W
1,702.0	0.40	241.62	1,702.0	-1.2	-0.5	526,496.56	758,975.52	32° 26' 40.753 N	103° 29' 37.862 W
1,792.0	0.09	288.24	1,792.0	-1.4	-0.8	526,496.43	758,975.17	32° 26' 40.752 N	103° 29' 37.866 W
1,827.0	0.22	282.16	1,827.0	-1.3	-0.9	526,496.45	758,975.08	32° 26' 40.752 N	103° 29' 37.867 W
1,914.0	0.09	287.54	1,914.0	-1.3	-1.1	526,496.51	758,974.85	32° 26' 40.753 N	103° 29' 37.869 W
1,975.0	0.40	222.49	1,975.0	-1.4	-1.3	526,496.37	758,974.66	32° 26' 40.752 N	103° 29' 37.872 W
2,069.0	0.80	45.78	2,069.0	-1.2	-1.1	526,496.58	758,974.91	32° 26' 40.754 N	103° 29' 37.869 W
2,161.0	0.62	83.81	2,160.9	-0.7	-0.1	526,497.08	758,975.87	32° 26' 40.759 N	103° 29' 37.858 W
2,249.0	1.19	69.54	2,248.9	-0.3	1.2	526,497.46	758,977.20	32° 26' 40.762 N	103° 29' 37.842 W
2,341.0	0.88	43.36	2,340.9	0.5	2.6	526,498.30	758,978.58	32° 26' 40.770 N	103° 29' 37.826 W
2,433.0	0.80	54.33	2,432.9	1.4	3.6	526,499.19	758,979.58	32° 26' 40.779 N	103° 29' 37.814 W
2,525.0	0.40	22.52	2,524.9	2.1	4.2	526,499.86	758,980.23	32° 26' 40.786 N	103° 29' 37.806 W
2,618.0	0.22	277.53	2,617.9	2.4	4.2	526,500.19	758,980.18	32° 26' 40.789 N	103° 29' 37.807 W
2,710.0	0.22	130.30	2,709.9	2.3	4.1	526,500.09	758,980.14	32° 26' 40.788 N	103° 29' 37.807 W
2,802.0	0.49	2.27	2,801.9	2.6	4.3	526,500.37	758,980.29	32° 26' 40.791 N	103° 29' 37.806 W
2,894.0	0.49	8.19	2,893.9	3.4	4.4	526,501.16	758,980.36	32° 26' 40.798 N	103° 29' 37.805 W
2,986.0	0.71	55.13	2,985.9	4.1	4.9	526,501.87	758,980.88	32° 26' 40.806 N	103° 29' 37.799 W
3,076.0	1.02	33.84	3,075.9	5.1	5.8	526,502.86	758,981.78	32° 26' 40.815 N	103° 29' 37.788 W
3,171.0	1.81	68.35	3,170.9	6.3	7.7	526,504.11	758,983.65	32° 26' 40.827 N	103° 29' 37.766 W
3,220.0	2.52	54.99	3,219.8	7.2	9.3	526,505.01	758,985.25	32° 26' 40.836 N	103° 29' 37.747 W
3,363.0	1.80	54.70	3,362.7	10.3	13.7	526,508.12	758,989.66	32° 26' 40.867 N	103° 29' 37.696 W
3,455.0	1.00	16.40	3,454.7	11.9	15.1	526,509.72	758,991.07	32° 26' 40.882 N	103° 29' 37.679 W
3,548.0	1.20	345.20	3,547.7	13.6	15.0	526,511.44	758,991.05	32° 26' 40.899 N	103° 29' 37.679 W
3,640.0	1.50	345.00	3,639.6	15.7	14.5	526,513.54	758,990.49	32° 26' 40.920 N	103° 29' 37.685 W
3,732.0	0.60	312.60	3,731.6	17.2	13.8	526,515.03	758,989.82	32° 26' 40.935 N	103° 29' 37.693 W
3,824.0	0.80	255.50	3,823.6	17.4	12.8	526,515.19	758,988.85	32° 26' 40.937 N	103° 29' 37.704 W
3,917.0	0.60	244.50	3,916.6	17.0	11.8	526,514.82	758,987.78	32° 26' 40.933 N	103° 29' 37.717 W
4,009.0	0.80	244.20	4,008.6	16.5	10.8	526,514.33	758,986.76	32° 26' 40.928 N	103° 29' 37.729 W
4,101.0	0.90	254.00	4,100.6	16.1	9.5	526,513.85	758,985.49	32° 26' 40.924 N	103° 29' 37.744 W
4,194.0	1.10	251.40	4,193.6	15.6	7.9	526,513.37	758,983.94	32° 26' 40.919 N	103° 29' 37.762 W
4,286.0	1.30	249.00	4,285.6	14.9	6.1	526,512.71	758,982.13	32° 26' 40.913 N	103° 29' 37.783 W
4,378.0	1.10	240.50	4,377.5	14.1	4.4	526,511.90	758,980.39	32° 26' 40.905 N	103° 29' 37.803 W
4,471.0	0.90	214.90	4,470.5	13.1	3.2	526,510.86	758,979.19	32° 26' 40.895 N	103° 29' 37.817 W
4,563.0	0.80	187.30	4,562.5	11.8	2.7	526,509.63	758,978.70	32° 26' 40.882 N	103° 29' 37.823 W
4,655.0	0.80	182.30	4,654.5	10.6	2.6	526,508.35	758,978.59	32° 26' 40.870 N	103° 29' 37.825 W
4,747.0	1.00	183.20	4,746.5	9.1	2.5	526,506.91	758,978.52	32° 26' 40.856 N	103° 29' 37.826 W
4,839.0	0.80	182.30	4,838.5	7.7	2.5	526,505.47	758,978.45	32° 26' 40.841 N	103° 29' 37.827 W
4,932.0	1.10	174.50	4,931.5	6.1	2.5	526,503.93	758,978.51	32° 26' 40.826 N	103° 29' 37.826 W
5,024.0	1.40	177.50	5,023.5	4.1	2.6	526,501.93	758,978.64	32° 26' 40.806 N	103° 29' 37.825 W
5,117.0	0.80	169.10	5,116.4	2.4	2.8	526,500.16	758,978.82	32° 26' 40.789 N	103° 29' 37.823 W
5,209.0	0.50	136.30	5,208.4	1.4	3.2	526,499.24	758,979.21	32° 26' 40.780 N	103° 29' 37.818 W
5,301.0	0.50	151.00	5,300.4	0.8	3.7	526,498.59	758,979.69	32° 26' 40.773 N	103° 29' 37.813 W
5,393.0	0.60	134.80	5,392.4	0.1	4.2	526,497.90	758,980.22	32° 26' 40.766 N	103° 29' 37.807 W
5,486.0	0.80	134.90	5,485.4	-0.7	5.0	526,497.10	758,981.03	32° 26' 40.758 N	103° 29' 37.797 W
5,578.0	0.80	123.80	5,577.4	-1.5	6.0	526,496.29	758,982.02	32° 26' 40.750 N	103° 29' 37.786 W
5,670.0	0.70	124.30	5,669.4	-2.2	7.0	526,495.62	758,983.02	32° 26' 40.743 N	103° 29' 37.774 W
5,760.0	0.80	129.50	5,759.4	-2.9	8.0	526,494.91	758,983.95	32° 26' 40.736 N	103° 29' 37.763 W

Stryker Directional

Survey Report - Geographic

Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well Merlin State Com #3H
Project:	Lea County, N.M.	TVD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Site:	Section 29/32 T21S-R34E Merlin State Com #3H	MD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Well:	Merlin State Com #3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude		Longitude
5,941.0	0.22	112.68	5,940.4	-3.8	9.3	526,493.97	758,985.25	32° 26' 40.727 N		103° 29' 37.748 W
6,033.0	0.31	104.83	6,032.4	-4.0	9.7	526,493.84	758,985.65	32° 26' 40.726 N		103° 29' 37.744 W
6,124.0	0.31	84.21	6,123.4	-4.0	10.1	526,493.80	758,986.14	32° 26' 40.725 N		103° 29' 37.738 W
6,219.0	0.40	85.80	6,218.4	-4.0	10.7	526,493.85	758,986.72	32° 26' 40.726 N		103° 29' 37.731 W
6,310.0	0.40	87.12	6,309.4	-3.9	11.4	526,493.89	758,987.36	32° 26' 40.726 N		103° 29' 37.724 W
6,401.0	0.40	82.98	6,400.4	-3.9	12.0	526,493.94	758,987.99	32° 26' 40.727 N		103° 29' 37.716 W
6,497.0	0.40	80.38	6,496.4	-3.8	12.7	526,494.04	758,988.65	32° 26' 40.727 N		103° 29' 37.709 W
6,589.0	0.49	74.47	6,588.4	-3.6	13.4	526,494.20	758,989.35	32° 26' 40.729 N		103° 29' 37.701 W
6,680.0	0.49	63.45	6,679.4	-3.3	14.1	526,494.48	758,990.07	32° 26' 40.732 N		103° 29' 37.692 W
6,772.0	0.40	76.89	6,771.4	-3.1	14.7	526,494.73	758,990.74	32° 26' 40.734 N		103° 29' 37.684 W
6,863.0	0.49	103.03	6,862.4	-3.1	15.4	526,494.71	758,991.42	32° 26' 40.734 N		103° 29' 37.676 W
6,954.0	0.62	114.26	6,953.4	-3.4	16.3	526,494.42	758,992.25	32° 26' 40.731 N		103° 29' 37.667 W
7,046.0	0.80	119.90	7,045.4	-3.9	17.3	526,493.90	758,993.26	32° 26' 40.726 N		103° 29' 37.655 W
7,141.0	0.88	121.09	7,140.3	-4.6	18.5	526,493.19	758,994.46	32° 26' 40.719 N		103° 29' 37.641 W
7,233.0	0.80	122.59	7,232.3	-5.3	19.6	526,492.48	758,995.61	32° 26' 40.711 N		103° 29' 37.628 W
7,325.0	0.62	129.73	7,324.3	-6.0	20.5	526,491.82	758,996.53	32° 26' 40.705 N		103° 29' 37.617 W
7,417.0	0.49	124.31	7,416.3	-6.5	21.2	526,491.28	758,997.24	32° 26' 40.699 N		103° 29' 37.609 W
7,507.0	0.40	148.68	7,506.3	-7.0	21.7	526,490.79	758,997.72	32° 26' 40.695 N		103° 29' 37.603 W
7,603.0	0.40	155.29	7,602.3	-7.6	22.0	526,490.20	758,998.04	32° 26' 40.689 N		103° 29' 37.600 W
7,695.0	0.31	137.93	7,694.3	-8.1	22.3	526,489.72	758,998.34	32° 26' 40.684 N		103° 29' 37.596 W
7,787.0	0.31	132.33	7,786.3	-8.4	22.7	526,489.37	758,998.69	32° 26' 40.680 N		103° 29' 37.592 W
7,878.0	0.62	138.85	7,877.3	-9.0	23.2	526,488.83	758,999.19	32° 26' 40.675 N		103° 29' 37.586 W
7,969.0	0.49	137.36	7,968.3	-9.6	23.8	526,488.18	758,999.78	32° 26' 40.669 N		103° 29' 37.579 W
8,061.0	0.49	153.57	8,060.3	-10.3	24.2	526,487.54	759,000.22	32° 26' 40.662 N		103° 29' 37.574 W
8,152.0	0.31	177.76	8,151.3	-10.9	24.4	526,486.94	759,000.41	32° 26' 40.656 N		103° 29' 37.572 W
8,248.0	0.31	204.73	8,247.3	-11.4	24.3	526,486.45	759,000.31	32° 26' 40.651 N		103° 29' 37.573 W
8,339.0	0.40	248.54	8,338.3	-11.7	23.9	526,486.11	758,999.91	32° 26' 40.648 N		103° 29' 37.578 W
8,431.0	0.40	264.31	8,430.3	-11.8	23.3	526,485.96	758,999.29	32° 26' 40.647 N		103° 29' 37.585 W
8,522.0	0.31	266.21	8,521.3	-11.9	22.7	526,485.91	758,998.73	32° 26' 40.646 N		103° 29' 37.592 W
8,615.0	0.40	311.82	8,614.3	-11.7	22.2	526,486.11	758,998.24	32° 26' 40.648 N		103° 29' 37.598 W
8,711.0	0.49	308.91	8,710.3	-11.2	21.7	526,486.59	758,997.67	32° 26' 40.653 N		103° 29' 37.604 W
8,803.0	0.80	309.00	8,802.3	-10.6	20.9	526,487.24	758,996.86	32° 26' 40.660 N		103° 29' 37.614 W
8,893.0	1.33	325.26	8,892.3	-9.3	19.8	526,488.49	758,995.78	32° 26' 40.672 N		103° 29' 37.626 W
9,076.0	1.02	356.55	9,075.2	-5.9	18.5	526,491.87	758,994.47	32° 26' 40.705 N		103° 29' 37.641 W
9,167.0	1.10	357.87	9,166.2	-4.3	18.4	526,493.55	758,994.39	32° 26' 40.722 N		103° 29' 37.642 W
9,266.0	1.10	356.33	9,265.2	-2.4	18.3	526,495.45	758,994.29	32° 26' 40.741 N		103° 29' 37.643 W
9,358.0	1.50	323.94	9,357.2	-0.5	17.5	526,497.30	758,993.53	32° 26' 40.759 N		103° 29' 37.652 W
9,448.0	1.72	331.38	9,447.1	1.6	16.2	526,499.44	758,992.19	32° 26' 40.781 N		103° 29' 37.667 W
9,540.0	1.59	3.16	9,539.1	4.1	15.6	526,501.92	758,991.59	32° 26' 40.805 N		103° 29' 37.674 W
9,631.0	1.81	356.06	9,630.1	6.8	15.6	526,504.62	758,991.57	32° 26' 40.832 N		103° 29' 37.674 W
9,724.0	1.81	343.90	9,723.0	9.7	15.1	526,507.49	758,991.06	32° 26' 40.860 N		103° 29' 37.679 W
9,815.0	1.72	332.27	9,814.0	12.3	14.0	526,510.08	758,990.02	32° 26' 40.886 N		103° 29' 37.691 W
9,907.0	1.33	310.01	9,905.9	14.2	12.6	526,511.99	758,988.56	32° 26' 40.905 N		103° 29' 37.708 W
9,998.0	1.50	315.03	9,996.9	15.7	10.9	526,513.51	758,986.91	32° 26' 40.920 N		103° 29' 37.727 W
10,095.0	1.72	314.64	10,093.9	17.6	9.0	526,515.44	758,984.98	32° 26' 40.939 N		103° 29' 37.750 W
10,186.0	1.72	308.42	10,184.8	19.4	6.9	526,517.24	758,982.94	32° 26' 40.957 N		103° 29' 37.773 W
10,277.0	1.72	310.10	10,275.8	21.2	4.8	526,518.97	758,980.82	32° 26' 40.975 N		103° 29' 37.798 W
10,341.0	1.81	317.86	10,339.8	22.5	3.4	526,520.34	758,979.41	32° 26' 40.988 N		103° 29' 37.814 W
10,402.0	1.81	317.86	10,400.7	24.0	2.1	526,521.77	758,978.12	32° 26' 41.003 N		103° 29' 37.829 W
10402' MD KP Gyro Survey										
10,424.0	2.30	216.20	10,422.7	23.9	1.6	526,521.67	758,977.62	32° 26' 41.002 N		103° 29' 37.835 W
10,455.0	5.10	191.60	10,453.7	22.0	1.0	526,519.82	758,976.98	32° 26' 40.983 N		103° 29' 37.843 W
10,485.0	8.10	185.90	10,483.5	18.6	0.5	526,516.41	758,976.49	32° 26' 40.950 N		103° 29' 37.848 W
10,516.0	11.60	184.20	10,514.0	13.3	0.0	526,511.13	758,976.04	32° 26' 40.897 N		103° 29' 37.854 W

Stryker Directional

Survey Report - Geographic

Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well Merlin State Com #3H
Project:	Lea County, N.M.	TVD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Site:	Section 29/32 T21S-R34E Merlin State Com #3H	MD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Well:	Merlin State Com #3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,547.0	15.30	180.90	10,544.1	6.1	-0.2	526,503.93	758,975.75	32° 26' 40.826 N	103° 29' 37.858 W	
10,578.0	19.10	178.20	10,573.7	-3.0	-0.2	526,494.76	758,975.84	32° 26' 40.736 N	103° 29' 37.858 W	
10,608.0	22.60	179.20	10,601.8	-13.7	0.1	526,484.09	758,976.08	32° 26' 40.630 N	103° 29' 37.856 W	
10,639.0	25.30	179.00	10,630.1	-26.3	0.3	526,471.51	758,976.28	32° 26' 40.505 N	103° 29' 37.855 W	
10,670.0	27.20	177.90	10,657.9	-40.0	0.7	526,457.80	758,976.65	32° 26' 40.370 N	103° 29' 37.852 W	
10,701.0	30.00	177.90	10,685.1	-54.8	1.2	526,442.98	758,977.20	32° 26' 40.223 N	103° 29' 37.847 W	
10,731.0	33.40	177.50	10,710.6	-70.6	1.8	526,427.23	758,977.83	32° 26' 40.067 N	103° 29' 37.841 W	
10,762.0	37.10	178.20	10,736.0	-88.4	2.5	526,409.35	758,978.50	32° 26' 39.890 N	103° 29' 37.835 W	
10,793.0	41.30	179.30	10,760.0	-108.0	2.9	526,389.77	758,978.92	32° 26' 39.696 N	103° 29' 37.832 W	
10,824.0	45.80	179.90	10,782.4	-129.4	3.1	526,368.42	758,979.06	32° 26' 39.485 N	103° 29' 37.832 W	
10,855.0	48.10	180.00	10,803.6	-152.0	3.1	526,345.76	758,979.08	32° 26' 39.261 N	103° 29' 37.834 W	
10,885.0	49.70	180.80	10,823.3	-174.6	2.9	526,323.16	758,978.92	32° 26' 39.037 N	103° 29' 37.838 W	
10,916.0	53.10	180.80	10,842.7	-198.9	2.6	526,298.94	758,978.58	32° 26' 38.798 N	103° 29' 37.844 W	
10,947.0	57.10	181.20	10,860.4	-224.3	2.1	526,273.52	758,978.14	32° 26' 38.546 N	103° 29' 37.852 W	
10,978.0	61.80	181.30	10,876.1	-251.0	1.6	526,246.84	758,977.55	32° 26' 38.282 N	103° 29' 37.861 W	
11,008.0	66.20	180.70	10,889.3	-277.9	1.1	526,219.89	758,977.09	32° 26' 38.016 N	103° 29' 37.869 W	
11,039.0	70.50	179.80	10,900.7	-306.7	1.0	526,191.08	758,976.96	32° 26' 37.731 N	103° 29' 37.873 W	
11,070.0	74.10	179.70	10,910.1	-336.2	1.1	526,161.55	758,977.09	32° 26' 37.438 N	103° 29' 37.874 W	
11,101.0	77.10	179.30	10,917.9	-366.3	1.4	526,131.53	758,977.35	32° 26' 37.141 N	103° 29' 37.874 W	
11,132.0	80.30	178.90	10,923.9	-396.7	1.8	526,101.14	758,977.83	32° 26' 36.841 N	103° 29' 37.871 W	
11,164.0	85.10	177.60	10,928.0	-428.4	2.8	526,069.42	758,978.80	32° 26' 36.527 N	103° 29' 37.863 W	
11,219.0	91.00	176.60	10,929.9	-483.2	5.6	526,014.55	758,981.58	32° 26' 35.983 N	103° 29' 37.835 W	
11,250.0	91.10	176.40	10,929.3	-514.2	7.5	525,983.62	758,983.48	32° 26' 35.677 N	103° 29' 37.816 W	
11,342.0	91.90	175.40	10,926.9	-605.9	14.1	525,891.88	758,990.05	32° 26' 34.769 N	103° 29' 37.748 W	
11,434.0	90.20	176.10	10,925.2	-697.6	20.9	525,800.16	758,996.87	32° 26' 33.861 N	103° 29' 37.676 W	
11,527.0	89.70	177.80	10,925.3	-790.5	25.8	525,707.29	759,001.82	32° 26' 32.942 N	103° 29' 37.627 W	
11,619.0	90.50	177.10	10,925.1	-882.4	29.9	525,615.38	759,005.91	32° 26' 32.032 N	103° 29' 37.588 W	
11,711.0	90.50	178.90	10,924.3	-974.4	33.1	525,523.45	759,009.12	32° 26' 31.122 N	103° 29' 37.559 W	
11,804.0	90.70	180.00	10,923.3	-1,067.3	34.0	525,430.46	759,010.01	32° 26' 30.202 N	103° 29' 37.557 W	
11,896.0	91.40	178.60	10,921.7	-1,159.3	35.1	525,338.48	759,011.14	32° 26' 29.291 N	103° 29' 37.552 W	
11,989.0	89.30	179.10	10,921.1	-1,252.3	37.0	525,245.51	759,013.00	32° 26' 28.371 N	103° 29' 37.539 W	
12,081.0	89.90	179.30	10,921.7	-1,344.3	38.3	525,153.52	759,014.29	32° 26' 27.461 N	103° 29' 37.533 W	
12,173.0	90.40	179.00	10,921.5	-1,436.3	39.7	525,061.53	759,015.65	32° 26' 26.551 N	103° 29' 37.525 W	
12,266.0	91.40	178.60	10,920.0	-1,529.2	41.6	524,968.57	759,017.60	32° 26' 25.631 N	103° 29' 37.511 W	
12,358.0	92.90	177.70	10,916.6	-1,621.1	44.6	524,876.68	759,020.57	32° 26' 24.721 N	103° 29' 37.485 W	
12,450.0	90.80	177.90	10,913.6	-1,713.0	48.1	524,784.80	759,024.10	32° 26' 23.812 N	103° 29' 37.452 W	
12,543.0	89.00	177.70	10,913.8	-1,805.9	51.7	524,691.87	759,027.67	32° 26' 22.892 N	103° 29' 37.419 W	
12,635.0	89.80	177.30	10,914.7	-1,897.8	55.7	524,599.97	759,031.68	32° 26' 21.982 N	103° 29' 37.380 W	
12,728.0	89.60	179.30	10,915.2	-1,990.8	58.4	524,507.02	759,034.44	32° 26' 21.062 N	103° 29' 37.357 W	
12,820.0	90.70	179.10	10,915.0	-2,082.8	59.7	524,415.03	759,035.72	32° 26' 20.152 N	103° 29' 37.350 W	
12,912.0	92.00	178.60	10,912.8	-2,174.7	61.6	524,323.07	759,037.57	32° 26' 19.242 N	103° 29' 37.337 W	
13,004.0	91.10	180.30	10,910.3	-2,266.7	62.5	524,231.11	759,038.45	32° 26' 18.332 N	103° 29' 37.335 W	
13,097.0	92.80	179.80	10,907.2	-2,359.6	62.4	524,138.17	759,038.37	32° 26' 17.412 N	103° 29' 37.345 W	
13,189.0	91.60	180.90	10,903.6	-2,451.6	61.8	524,046.25	759,037.81	32° 26' 16.503 N	103° 29' 37.360 W	
13,281.0	89.60	180.80	10,902.7	-2,543.5	60.4	523,954.26	759,036.44	32° 26' 15.593 N	103° 29' 37.384 W	
13,374.0	91.30	180.20	10,901.9	-2,636.5	59.6	523,861.28	759,035.63	32° 26' 14.673 N	103° 29' 37.402 W	
13,466.0	90.10	180.70	10,900.8	-2,728.5	58.9	523,769.29	759,034.91	32° 26' 13.762 N	103° 29' 37.419 W	
13,558.0	90.50	180.20	10,900.3	-2,820.5	58.2	523,677.29	759,034.19	32° 26' 12.852 N	103° 29' 37.436 W	
13,651.0	89.30	179.90	10,900.5	-2,913.5	58.1	523,584.29	759,034.10	32° 26' 11.932 N	103° 29' 37.445 W	
13,743.0	90.40	179.60	10,900.7	-3,005.5	58.5	523,492.30	759,034.51	32° 26' 11.022 N	103° 29' 37.449 W	
13,835.0	92.10	179.10	10,898.7	-3,097.5	59.6	523,400.33	759,035.55	32° 26' 10.112 N	103° 29' 37.445 W	
13,928.0	91.20	178.70	10,896.1	-3,190.4	61.3	523,307.38	759,037.33	32° 26' 9.192 N	103° 29' 37.433 W	
14,020.0	90.50	180.50	10,894.7	-3,282.4	62.0	523,215.40	759,037.98	32° 26' 8.282 N	103° 29' 37.434 W	
14,112.0	91.70	180.40	10,892.9	-3,374.4	61.3	523,123.42	759,037.25	32° 26' 7.371 N	103° 29' 37.451 W	

Stryker Directional

Survey Report - Geographic

Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well Merlin State Com #3H
Project:	Lea County, N.M.	TVD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Site:	Section 29/32 T21S-R34E Merlin State Com #3H	MD Reference:	GL 3718.4+26 @ 3744.4usft (Precision 590)
Well:	Merlin State Com #3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,205.0	88.90	181.70	10,892.4	-3,467.4	59.6	523,030.45	759,035.55	32° 26' 6.452 N	103° 29' 37.479 W
14,297.0	89.80	182.40	10,893.5	-3,559.3	56.3	522,938.52	759,032.26	32° 26' 5.542 N	103° 29' 37.526 W
14,389.0	89.50	180.00	10,894.0	-3,651.3	54.3	522,846.55	759,030.33	32° 26' 4.632 N	103° 29' 37.557 W
14,482.0	90.20	180.20	10,894.3	-3,744.3	54.2	522,753.55	759,030.17	32° 26' 3.712 N	103° 29' 37.567 W
14,574.0	91.80	180.40	10,892.7	-3,836.2	53.7	522,661.57	759,029.69	32° 26' 2.802 N	103° 29' 37.581 W
14,666.0	90.80	178.60	10,890.6	-3,928.2	54.5	522,569.60	759,030.49	32° 26' 1.892 N	103° 29' 37.580 W
14,758.0	91.80	178.20	10,888.5	-4,020.1	57.1	522,477.66	759,033.06	32° 26' 0.982 N	103° 29' 37.559 W
14,850.0	92.40	179.00	10,885.1	-4,112.1	59.3	522,385.75	759,035.31	32° 26' 0.072 N	103° 29' 37.541 W
14,942.0	92.90	179.60	10,880.9	-4,203.9	60.4	522,293.85	759,036.43	32° 25' 59.163 N	103° 29' 37.536 W
15,034.0	92.70	178.90	10,876.4	-4,295.8	61.6	522,201.97	759,037.63	32° 25' 58.254 N	103° 29' 37.531 W
15,126.0	90.00	178.40	10,874.2	-4,387.8	63.8	522,110.03	759,039.80	32° 25' 57.344 N	103° 29' 37.514 W
15,219.0	91.70	178.10	10,872.8	-4,480.7	66.6	522,017.09	759,042.64	32° 25' 56.424 N	103° 29' 37.489 W
15,311.0	90.70	178.60	10,870.9	-4,572.7	69.3	521,925.15	759,045.29	32° 25' 55.514 N	103° 29' 37.467 W
15,403.0	89.20	178.80	10,871.0	-4,664.6	71.4	521,833.18	759,047.37	32° 25' 54.604 N	103° 29' 37.451 W
15,496.0	90.60	179.20	10,871.2	-4,757.6	73.0	521,740.19	759,049.00	32° 25' 53.684 N	103° 29' 37.441 W
15,588.0	92.40	178.10	10,868.7	-4,849.5	75.2	521,648.26	759,051.16	32° 25' 52.774 N	103° 29' 37.424 W
15,680.0	91.00	178.30	10,866.0	-4,941.5	78.1	521,556.34	759,054.05	32° 25' 51.864 N	103° 29' 37.398 W
15,772.0	88.80	178.20	10,866.2	-5,033.4	80.9	521,464.39	759,056.86	32° 25' 50.954 N	103° 29' 37.374 W
15,865.0	89.60	177.90	10,867.5	-5,126.3	84.0	521,371.46	759,060.02	32° 25' 50.034 N	103° 29' 37.346 W
15,957.0	90.00	177.90	10,867.8	-5,218.3	87.4	521,279.52	759,063.40	32° 25' 49.124 N	103° 29' 37.315 W
16,049.0	90.70	177.50	10,867.2	-5,310.2	91.1	521,187.59	759,067.09	32° 25' 48.214 N	103° 29' 37.280 W
16,141.0	91.50	176.50	10,865.5	-5,402.1	95.9	521,095.74	759,071.90	32° 25' 47.305 N	103° 29' 37.232 W
16,234.0	90.40	176.60	10,863.9	-5,494.9	101.5	521,002.92	759,077.50	32° 25' 46.386 N	103° 29' 37.176 W
16,326.0	90.30	175.70	10,863.4	-5,586.7	107.7	520,911.13	759,083.67	32° 25' 45.477 N	103° 29' 37.112 W
16,418.0	91.20	175.10	10,862.2	-5,678.4	115.1	520,819.44	759,091.05	32° 25' 44.569 N	103° 29' 37.034 W
16,427.0	91.10	174.90	10,862.0	-5,687.3	115.8	520,810.47	759,091.84	32° 25' 44.481 N	103° 29' 37.026 W
16,484.0	91.10	174.90	10,860.9	-5,744.1	120.9	520,753.71	759,096.90	32° 25' 43.919 N	103° 29' 36.972 W

16484' MD Projected to Bit

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,402.0	10,400.7	24.0	2.1	10402' MD KP Gyro Survey
16,484.0	10,860.9	-5,744.1	120.9	16484' MD Projected to Bit