



Cimarex Cuervo Federal 23H XEM+MWD 0ft to 14280ft MD Survey Geodetic Report
(Def Survey)



HOBSOOD

MAR 23 2015

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Report Date: September 23, 2014 - 09:42 AM
Client: Cimarex Energy
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Cuervo Federal #23H / Cuervo Federal #23H
Well: Cuervo Federal #23H
Borehole: Original Borehole
UWI / API#: Cactus 101 / 30-025-41921
Survey Name: Cimarex Cuervo Federal 23H XEM+MWD 0ft to 14280ft MD
Survey Date: August 29, 2014
Tort / AHD / DDI / ERD Ratio: 178.061 ° / 4824.228 ft / 6.095 / 0.490
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 18' 39.70981", W 103° 39' 9.91293"
Location Grid N/E Y/X: N 477552.780 ftUS, E 751595.940 ftUS
CRS Grid Convergence Angle: 0.3638 °
Grid Scale Factor: 0.99995972
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 175.290 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3731.000 ft above MSL
Seabed / Ground Elevation: 3713.000 ft above MSL
Magnetic Declination: 7.397 °
Total Gravity Field Strength: 998.4394mgm (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 48298.523 nT
Magnetic Dip Angle: 60.167 °
Declination Date: August 29, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 0.3638 °
Total Corr Mag North->Grid North: 7.0335 °
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Closure Azimuth (°)	Closure (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	TF (°)
SHL Cuervo Fed #23H	0.00	0.00	0.00	0.00	-3731.00	0.00	0.00	0.00	N/A	0.00	0.00	477552.78	751595.94	N 32 18 39.71	W 103 39 9.91	311.85M
	138.96	0.62	311.85	138.96	-3592.04	-0.55	0.50	-0.56	0.45	311.85	0.75	477553.28	751595.38	N 32 18 39.71	W 103 39 9.92	311.55M
	167.22	0.62	311.55	167.22	-3563.78	-0.77	0.71	-0.79	0.01	311.81	1.06	477553.49	751595.15	N 32 18 39.72	W 103 39 9.92	314.05M
	197.91	0.48	314.05	197.90	-3533.10	-0.98	0.90	-1.01	0.46	311.99	1.35	477553.68	751594.94	N 32 18 39.72	W 103 39 9.92	303.86M
	262.44	0.62	303.86	262.43	-3468.57	-1.40	1.29	-1.49	0.26	310.83	1.97	477554.07	751594.45	N 32 18 39.72	W 103 39 9.93	310.54M
	380.44	0.48	310.54	380.43	-3350.57	-2.15	1.96	-2.39	0.13	309.35	3.10	477554.74	751593.55	N 32 18 39.73	W 103 39 9.94	312.95M
	474.92	0.48	312.95	474.90	-3256.10	-2.73	2.49	-2.99	0.02	309.84	3.89	477555.27	751592.95	N 32 18 39.73	W 103 39 9.95	304.65M
	569.38	0.62	304.65	569.36	-3161.64	-3.34	3.05	-3.70	0.17	309.54	4.79	477555.83	751592.24	N 32 18 39.74	W 103 39 9.96	293.13M
	673.64	0.48	293.13	673.61	-3057.39	-3.91	3.54	-4.56	0.17	307.84	5.78	477556.32	751591.38	N 32 18 39.75	W 103 39 9.97	298.45M
	734.68	0.62	298.45	734.65	-2996.35	-4.21	3.80	-5.09	0.24	306.77	6.35	477556.58	751590.85	N 32 18 39.75	W 103 39 9.97	299.07M
	829.85	0.48	299.07	829.82	-2901.18	-4.71	4.24	-5.89	0.15	305.76	7.26	477557.02	751590.05	N 32 18 39.75	W 103 39 9.98	285.84M
	924.43	0.62	285.84	924.39	-2806.61	-5.11	4.57	-6.73	0.20	304.21	8.13	477557.35	751589.21	N 32 18 39.76	W 103 39 9.99	273.05M
	1019.45	0.40	273.05	1019.41	-2711.59	-5.33	4.73	-7.55	0.26	302.06	8.91	477557.51	751588.39	N 32 18 39.76	W 103 39 10.00	292.17M
	1115.47	0.48	292.17	1115.43	-2615.57	-5.56	4.90	-8.26	0.17	300.68	9.60	477557.68	751587.68	N 32 18 39.76	W 103 39 10.01	294.45M
	1212.22	0.48	294.45	1212.17	-2518.83	-5.94	5.22	-9.00	0.02	300.11	10.41	477558.00	751586.94	N 32 18 39.76	W 103 39 10.02	297.35M
	1304.00	0.62	297.35	1303.95	-2427.05	-6.39	5.61	-9.79	0.16	299.79	11.29	477558.39	751586.15	N 32 18 39.77	W 103 39 10.03	305.13M
	1397.00	0.48	305.13	1396.94	-2334.06	-6.91	6.06	-10.56	0.17	299.86	12.18	477558.84	751585.38	N 32 18 39.77	W 103 39 10.04	302.36M
	1496.00	0.40	302.36	1495.94	-2235.06	-7.38	6.49	-11.19	0.08	300.10	12.94	477559.27	751584.75	N 32 18 39.77	W 103 39 10.04	289.66M
	1591.00	0.40	289.66	1590.94	-2140.06	-7.72	6.78	-11.78	0.09	299.90	13.59	477559.56	751584.16	N 32 18 39.78	W 103 39 10.05	293.35M
	1686.00	0.48	293.35	1685.94	-2045.06	-8.04	7.04	-12.46	0.09	299.48	14.31	477559.82	751583.48	N 32 18 39.78	W 103 39 10.06	296.17M
	1779.00	0.48	296.17	1778.93	-1952.07	-8.43	7.37	-13.17	0.03	299.24	15.09	477560.15	751582.77	N 32 18 39.78	W 103 39 10.07	289.35M
	1875.00	0.62	289.35	1874.93	-1856.07	-8.85	7.72	-14.02	0.16	298.84	16.00	477560.50	751581.92	N 32 18 39.79	W 103 39 10.08	295.95M
	1969.00	0.62	285.95	1968.92	-1762.08	-9.31	8.11	-14.96	0.08	298.47	17.01	477560.89	751580.98	N 32 18 39.79	W 103 39 10.09	294.76M
	2063.00	0.62	294.76	2062.92	-1668.08	-9.82	8.55	-15.88	0.01	298.30	18.03	477561.33	751580.07	N 32 18 39.80	W 103 39 10.10	292.56M
	2158.00	0.62	292.56	2157.91	-1573.09	-10.31	8.96	-16.82	0.03	298.05	19.05	477561.74	751579.12	N 32 18 39.80	W 103 39 10.11	292.17M
	2254.00	0.70	292.17	2253.90	-1477.10	-10.81	9.38	-17.84	0.08	297.74	20.16	477562.16	751578.10	N 32 18 39.80	W 103 39 10.12	299.86M
	2347.00	0.62	299.86	2346.90	-1384.10	-11.36	9.85	-18.80	0.13	297.64	21.22	477562.62	751577.14	N 32 18 39.81	W 103 39 10.13	312.16M
	2442.00	0.79	312.16	2441.89	-1289.11	-12.13	10.54	-19.73	0.24	298.11	22.37	477563.32	751576.21	N 32 18 39.82	W 103 39 10.14	319.15M
	2537.00	0.79	319.15	2536.88	-1194.12	-13.13	11.48	-20.65	0.10	299.07	23.62	477564.26	751575.29	N 32 18 39.82	W 103 39 10.15	315.63M
	2632.00	0.70	315.63	2631.87	-1099.13	-14.11	12.39	-21.48	0.11	299.97	24.80	477565.17	751574.46	N 32 18 39.83	W 103 39 10.16	320.34M
	2726.00	0.88	320.34	2725.87	-1005.13	-15.14	13.35	-22.34	0.20	300.86	26.03	477566.13	751573.60	N 32 18 39.84	W 103 39 10.17	318.36M
	2820.00	0.88	318.36	2819.85	-911.15	-16.31	14.45	-23.28	0.03	301.82	27.40	477567.23	751572.66	N 32 18 39.85	W 103 39 10.18	311.77M
	2915.00	0.88	311.77	2914.84	-816.16	-17.42	15.48	-24.31	0.11	302.48	28.82	477568.26	751571.63	N 32 18 39.86	W 103 39 10.20	314.36M
	3014.00	0.88	314.36	3013.83	-717.17	-18.55	16.52	-25.42	0.04	303.01	30.32	477569.30	751570.52	N 32 18 39.87	W 103 39 10.21	320.34M
	3107.00	0.88	320.34	3106.82	-624.18	-19.67	17.57	-26.39	0.10	303.65	31.70	477570.34	751569.55	N 32 18 39.89	W 103 39 10.22	330.05M
	3202.00	1.01	330.05	3201.81	-529.19	-21.03	18.85	-27.27	0.22	304.65	33.15	477571.63	751568.67	N 32 18 39.90	W 103 39 10.23	328.47M
	3297.00	1.10	328.47	3296.79	-434.21	-22.60	20.36	-28.17	0.10	305.85	34.75	477573.13	751567.77	N 32 18 39.91	W 103 39 10.24	326.66M
	3392.00	1.10	326.66	3391.77	-339.23	-24.21	21.89	-29.15	0.04	306.91	36.45	477574.67	751566.80	N 32 18 39.93	W 103 39 10.25	328.25M

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100R)	Closure Azimuth (°)	Closure (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	TF (°)
	3488.00	1.01	328.25	3487.76	-243.24	-25.78	23.38	-30.10	0.10	307.84	38.11	477576.16	751565.84	N 32 18 39.94	W 103 39 10.26	329.17M
	3582.00	1.19	329.17	3581.74	-149.26	-27.39	24.93	-31.03	0.19	308.77	39.80	477577.71	751564.91	N 32 18 39.96	W 103 39 10.27	337.26M
	3677.00	1.19	337.26	3676.72	-54.28	-29.21	26.68	-31.92	0.18	309.89	41.60	477579.46	751564.02	N 32 18 39.98	W 103 39 10.28	331.06M
	3771.00	1.01	331.06	3770.70	39.70	-32.70	28.31	-30.90	0.23	310.88	43.25	477581.09	751563.24	N 32 18 39.99	W 103 39 10.29	341.74M
	3865.00	1.10	341.74	3864.69	133.69	-32.53	29.89	-33.38	0.23	311.84	44.81	477582.67	751562.56	N 32 18 40.01	W 103 39 10.30	341.65M
	3960.00	1.19	341.65	3959.67	228.67	-34.38	31.69	-33.98	0.09	313.01	46.46	477584.47	751561.96	N 32 18 40.03	W 103 39 10.31	351.23M
	4055.00	1.01	351.23	4054.65	323.65	-36.17	33.46	-34.42	0.27	314.19	48.00	477586.23	751561.52	N 32 18 40.04	W 103 39 10.31	5.86M
	4150.00	0.88	5.86	4149.64	418.64	-37.72	35.01	-34.47	0.29	315.44	49.13	477587.79	751561.47	N 32 18 40.06	W 103 39 10.31	16.85M
	4245.00	0.88	16.85	4244.63	513.63	-39.12	36.43	-34.18	0.18	316.82	49.96	477589.21	751561.76	N 32 18 40.07	W 103 39 10.31	22.96M
	4339.00	1.01	22.96	4338.61	607.61	-40.52	37.89	-33.65	0.17	318.39	50.67	477590.67	751562.29	N 32 18 40.09	W 103 39 10.30	49.85M
	4434.00	0.79	49.85	4433.60	702.60	-41.64	39.08	-32.82	0.49	319.97	51.04	477591.86	751563.12	N 32 18 40.10	W 103 39 10.29	62.73M
	4530.00	1.10	62.73	4529.59	798.59	-42.38	39.93	-31.50	0.39	321.73	50.86	477592.71	751564.44	N 32 18 40.11	W 103 39 10.28	77.14M
	4624.00	1.41	77.14	4623.57	892.57	-42.89	40.60	-29.57	0.47	323.93	50.23	477593.38	751566.37	N 32 18 40.11	W 103 39 10.25	77.14M
	4718.00	1.49	77.14	4717.54	986.54	-43.23	41.13	-27.25	0.09	326.47	49.34	477593.91	751568.69	N 32 18 40.12	W 103 39 10.23	82.06M
	4813.00	1.49	82.06	4812.50	1081.50	-43.47	41.57	-24.82	0.13	329.16	48.42	477594.35	751571.12	N 32 18 40.12	W 103 39 10.20	76.66M
	4880.00	1.49	76.66	4879.48	1148.48	-43.65	41.90	-23.11	0.21	331.11	47.85	477594.67	751572.83	N 32 18 40.13	W 103 39 10.18	81.36M
	4997.00	1.41	81.36	4996.44	1265.44	-43.98	42.46	-20.21	0.12	334.55	47.03	477595.24	751575.73	N 32 18 40.13	W 103 39 10.15	78.24M
	5094.00	1.41	78.24	5093.41	1362.41	-44.21	42.89	-17.86	0.08	337.39	46.46	477595.66	751578.08	N 32 18 40.14	W 103 39 10.12	71.65M
	5189.00	1.71	71.65	5188.38	1457.38	-44.69	43.57	-15.37	0.37	340.57	46.20	477596.35	751580.57	N 32 18 40.14	W 103 39 10.09	76.66M
	5285.00	1.89	76.66	5284.33	1553.33	-45.26	44.39	-12.47	0.25	344.30	46.11	477597.16	751583.47	N 32 18 40.15	W 103 39 10.05	78.46M
	5379.00	1.89	78.46	5378.28	1647.28	-45.68	45.05	-9.45	0.06	348.16	46.03	477597.83	751586.49	N 32 18 40.16	W 103 39 10.02	79.87M
	5432.00	1.89	79.87	5431.25	1700.25	-45.86	45.38	-7.73	0.09	350.33	46.04	477598.16	751588.21	N 32 18 40.16	W 103 39 10.00	77.45M
	5567.00	1.89	77.45	5566.18	1835.18	-46.38	46.26	-3.36	0.06	355.84	46.38	477599.04	751592.58	N 32 18 40.17	W 103 39 9.95	72.97M
	5660.00	1.89	72.97	5659.13	1928.13	-46.91	47.04	-0.40	0.16	359.51	47.04	477599.82	751595.54	N 32 18 40.18	W 103 39 9.91	71.03M
	5754.00	1.58	71.03	5753.09	2022.09	-47.56	47.92	2.31	0.34	2.76	47.97	477600.69	751598.25	N 32 18 40.18	W 103 39 9.88	65.54M
	5853.00	1.41	65.54	5852.05	2121.05	-48.31	48.86	4.71	0.22	5.50	49.09	477601.64	751600.65	N 32 18 40.19	W 103 39 9.85	64.13M
	5947.00	1.71	64.13	5946.02	2215.02	-49.21	49.95	7.02	0.32	8.00	50.45	477602.73	751602.96	N 32 18 40.20	W 103 39 9.83	57.15M
	6041.00	1.49	57.15	6039.98	2308.98	-50.29	51.23	9.31	0.31	10.30	52.07	477604.01	751605.25	N 32 18 40.22	W 103 39 9.80	61.23M
	6136.00	1.41	61.23	6134.95	2403.95	-51.35	52.46	11.37	0.14	12.23	53.68	477605.24	751607.31	N 32 18 40.23	W 103 39 9.78	54.16M
	6231.00	1.71	54.16	6229.91	2498.91	-52.56	53.85	13.55	0.37	14.12	55.53	477606.63	751609.48	N 32 18 40.24	W 103 39 9.75	52.34M
	6325.00	1.80	54.34	6323.87	2592.87	-54.04	55.54	15.88	0.10	15.96	57.76	477608.31	751611.82	N 32 18 40.26	W 103 39 9.72	54.05M
	6419.00	1.71	52.05	6417.83	2686.83	-55.57	57.26	18.19	0.12	17.62	60.08	477610.04	751614.13	N 32 18 40.28	W 103 39 9.70	55.17M
	6516.00	1.89	55.17	6514.78	2783.78	-57.17	59.06	20.64	0.21	19.26	62.57	477611.84	751616.58	N 32 18 40.29	W 103 39 9.67	56.44M
	6610.00	1.89	56.44	6608.73	2877.73	-58.69	60.81	23.21	0.04	20.89	65.08	477613.58	751619.14	N 32 18 40.31	W 103 39 9.64	58.07M
	6706.00	1.89	58.07	6704.67	2973.67	-60.18	62.52	25.87	0.06	22.48	67.66	477615.30	751621.81	N 32 18 40.33	W 103 39 9.61	62.47M
	6799.00	1.71	62.47	6797.63	3066.63	-61.42	63.97	28.40	0.24	23.94	69.99	477616.75	751624.34	N 32 18 40.34	W 103 39 9.58	63.65M
	6896.00	2.02	63.65	6894.58	3163.58	-62.61	65.40	31.22	0.32	25.52	72.47	477618.18	751627.15	N 32 18 40.35	W 103 39 9.54	60.44M
	6991.00	1.80	60.44	6989.52	3258.52	-63.86	66.88	34.01	0.26	26.96	75.03	477619.65	751629.95	N 32 18 40.37	W 103 39 9.51	62.47M
	7084.00	1.89	62.47	7082.48	3351.48	-65.07	68.31	36.64	0.12	28.21	77.52	477621.08	751632.58	N 32 18 40.38	W 103 39 9.48	94.46M
	7177.00	0.79	94.46	7175.45	3444.45	-65.56	68.97	38.64	1.39	29.26	79.05	477621.74	751634.58	N 32 18 40.39	W 103 39 9.46	91.03M
	7273.00	0.70	91.03	7271.44	3540.44	-65.40	68.90	39.89	0.10	30.07	79.62	477621.68	751635.83	N 32 18 40.39	W 103 39 9.44	104.04M
	7369.00	1.10	104.04	7367.43	3636.43	-65.04	68.67	41.37	0.47	31.07	80.17	477621.45	751637.31	N 32 18 40.39	W 103 39 9.43	102.37M
	7464.00	1.01	102.37	7462.41	3731.41	-64.50	68.27	43.07	0.10	32.25	80.72	477621.05	751639.01	N 32 18 40.38	W 103 39 9.41	105.36M
	7556.00	1.19	105.36	7554.40	3823.40	-63.94	67.84	44.79	0.21	33.43	81.29	477620.62	751640.72	N 32 18 40.38	W 103 39 9.39	98.15M
	7649.00	0.70	98.15	7647.38	3916.38	-63.48	67.51	46.28	0.54	34.43	81.85	477620.28	751642.22	N 32 18 40.37	W 103 39 9.37	93.45M
	7747.00	0.79	93.45	7745.38	4014.38	-63.25	67.38	47.55	0.11	35.21	82.47	477620.16	751643.48	N 32 18 40.37	W 103 39 9.35	108.87M
	7841.00	0.62	108.87	7839.37	4108.37	-62.95	67.18	48.67	0.27	35.93	82.96	477619.95	751644.61	N 32 18 40.37	W 103 39 9.34	130.67M
	7934.00	0.62	130.67	7932.36	4201.36	-62.39	66.69	49.53	0.25	36.60	83.07	477619.46	751645.47	N 32 18 40.37	W 103 39 9.33	138.53M
	8029.00	0.70	138.53	8027.36	4296.36	-61.56	65.92	50.31	0.13	37.35	82.92	477618.69	751646.24	N 32 18 40.36	W 103 39 9.32	154.97M
	8126.00	0.62	154.97	8124.35	4393.35	-60.60	65.00	50.92	0.21	38.08	82.57	477617.77	751646.86	N 32 18 40.35	W 103 39 9.31	137.44M
	8220.00	0.48	137.44	8218.35	4487.35	-59.81	64.25	51.40	0.23	38.66	82.28	477617.02	751647.34	N 32 18 40.34	W 103 39 9.31	147.06M
	8315.00	0.70	147.06	8313.34	4582.34	-58.98	63.47	51.99	0.25	39.32	82.04	477616.24	751647.92	N 32 18 40.33	W 103 39 9.30	170.35M
	8407.00	0.79	170.35	8405.33	4674.33	-57.86	62.37	52.40	0.34	40.03	81.46	477615.15	751648.34	N 32 18 40.32	W 103 39 9.30	166.35M
	8504.76	0.88	166.35	8503.08	4772.08	-56.44	60.98	52.69	0.11	40.83	80.59	477613.75	751648.63	N 32 18 40.31	W 103 39 9.29	193.73M
	8599.00	0.88	193.73	8597.31	4866.31	-55.04	59.57	52.69	0.44	41.49	79.53	477612.35	751648.63	N 32 18 40.30	W 103 39 9.29	184.24M
	8691.00	1.10	184.24	8689.30	4958.30	-53.50	58.00	52.45	0.30	42.12	78.20	477610.78	751648.39	N 32 18 40.28	W 103 39 9.30	199.97M
	8786.00	1.19	199.97	8784.28	5053.28	-51.70	56.17	52.05	0.34	42.82	76.58	477608.94	751647.99	N 32 18 40.26	W 103 39 9.30	211.66M
	8883.00	1.32	211.66	8881.26	5150.26	-49.89	54.27	51.12	0.30	43.29	74.55	477607.05	751647.06	N 32 18 40.24	W 103 39 9.31	218.95M
	8977.00	2.02	218.95	8975.22	5244.22	-47.82	52.06	49.51	0.78	43.56	71.84	477604.84	751645.45	N 32 18 40.22	W 103 39 9.33	239.17M
	9072.00	2.29	239.17	9070.15	5339.15	-45.77	49.78	46.83	0.84	43.25	68.35	477602.56	751642.77	N 32 18 40.20	W 103 39 9.36	258.86M
	9168.00	3.12	258.86	9166.05	5435.05	-44.63	48.30	42.62	1.29	41.43	64.41	477601.07	751638.56	N 32 18 40.19	W 103 39 9.41	252.69M
	9262.00	2.68	252.66	9259.93	5529.93	-43.87	47.1									

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Closure Azimuth (°)	Closure (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')	TF (°)
	9363.00	4.24	119.91	9360.84	5629.84	-41.23	44.58	38.99	6.31	41.18	59.23	477597.36	751634.93	N 32 18 40.15	W 103 39 9.46	194.81M
	9395.00	7.34	194.81	9392.71	5661.71	-38.62	42.01	39.50	23.29	43.24	57.66	477594.79	751635.43	N 32 18 40.12	W 103 39 9.45	187.78M
	9427.00	10.63	187.78	9424.31	5693.31	-33.81	37.11	38.57	10.82	46.11	53.52	477589.88	751634.51	N 32 18 40.07	W 103 39 9.46	8.33L
	9459.00	14.19	185.66	9455.56	5724.56	-27.07	30.28	37.79	11.21	51.30	48.42	477583.06	751633.73	N 32 18 40.01	W 103 39 9.47	0.52L
	9490.00	17.11	185.57	9485.40	5754.40	-18.85	21.95	36.97	9.42	59.30	43.00	477574.73	751632.91	N 32 18 39.92	W 103 39 9.48	22.48L
Crossing HL	9520.00	19.81	182.31	9513.86	5782.86	-9.46	12.48	36.34	9.63	71.04	38.42	477565.26	751632.28	N 32 18 39.83	W 103 39 9.49	25.81L
	9553.80	22.66	178.78	9545.36	5814.36	2.73	0.25	36.24	9.25	89.61	36.25	477553.03	751632.18	N 32 18 39.71	W 103 39 9.49	22.51L
	9554.00	22.68	178.76	9545.55	5814.55	2.81	0.17	36.25	9.25	89.73	36.25	477552.95	751632.18	N 32 18 39.71	W 103 39 9.49	9.18L
	9585.00	25.78	177.61	9573.81	5842.81	15.51	-12.55	36.66	10.11	108.89	38.74	477540.24	751632.60	N 32 18 39.58	W 103 39 9.49	0.76R
	9616.00	28.67	177.69	9601.38	5870.38	29.68	-26.71	37.24	9.32	125.66	45.83	477526.07	751633.18	N 32 18 39.44	W 103 39 9.48	10.19R
	9649.00	32.14	178.86	9629.83	5898.83	46.36	-43.41	37.73	10.67	139.00	57.51	477509.38	751633.67	N 32 18 39.28	W 103 39 9.48	7.41L
	9680.00	36.39	177.93	9655.45	5924.45	63.78	-60.85	38.23	13.81	147.86	71.86	477491.94	751634.17	N 32 18 39.11	W 103 39 9.47	12.68L
	9712.00	40.28	176.58	9680.54	5949.54	83.61	-80.67	39.19	12.43	154.09	89.68	477472.12	751635.13	N 32 18 38.91	W 103 39 9.46	19.37L
	9744.00	44.84	174.32	9704.11	5973.11	105.25	-102.23	40.92	15.03	158.18	110.12	477450.55	751636.86	N 32 18 38.70	W 103 39 9.44	20.55L
	9776.00	48.75	172.38	9726.01	5995.01	128.55	-125.39	43.64	12.99	160.81	132.77	477427.39	751639.57	N 32 18 38.47	W 103 39 9.41	17.94L
	9807.00	51.92	171.08	9745.80	6014.80	152.37	-149.00	47.07	10.72	162.47	156.26	477403.78	751643.01	N 32 18 38.23	W 103 39 9.38	15.16L
	9839.00	56.75	169.52	9764.45	6033.45	178.26	-174.62	51.46	15.60	163.58	182.04	477378.17	751647.40	N 32 18 37.98	W 103 39 9.33	22.93L
	9870.00	60.49	167.71	9780.59	6049.59	204.53	-200.56	56.69	13.05	164.21	208.42	477352.23	751652.63	N 32 18 37.72	W 103 39 9.27	22.12L
	9902.00	63.95	166.15	9795.50	6064.50	232.54	-228.13	63.10	11.64	164.54	236.69	477324.66	751659.04	N 32 18 37.45	W 103 39 9.19	16.19L
	9936.00	67.75	164.96	9809.41	6078.41	263.11	-258.16	70.84	11.62	164.65	267.71	477294.63	751666.78	N 32 18 37.15	W 103 39 9.11	9.78R
	9967.00	72.86	165.88	9819.86	6088.86	291.85	-286.40	78.19	16.72	164.73	296.88	477266.39	751674.12	N 32 18 36.87	W 103 39 9.02	15.57R
	9996.00	77.60	167.23	9827.25	6096.25	319.56	-313.67	84.70	16.95	164.89	324.90	477239.13	751680.64	N 32 18 36.60	W 103 39 8.95	20.63R
	10030.00	84.77	169.93	9832.46	6101.46	352.91	-346.58	91.34	22.50	165.24	358.41	477206.22	751687.28	N 32 18 36.27	W 103 39 8.87	33.92R
	10061.00	90.96	174.08	9833.61	6102.61	383.81	-377.23	95.64	24.03	165.77	389.17	477175.56	751691.58	N 32 18 35.97	W 103 39 8.83	45.99R
	10079.00	92.61	175.79	9833.05	6102.05	401.80	-395.15	97.23	13.20	166.18	406.94	477157.64	751693.17	N 32 18 35.79	W 103 39 8.81	56.23R
	10097.00	93.61	177.29	9832.07	6101.07	419.77	-413.09	98.32	10.01	166.61	424.63	477139.70	751694.25	N 32 18 35.62	W 103 39 8.80	75.43R
	10192.00	93.68	177.56	9826.03	6095.03	514.51	-507.80	102.58	0.29	168.58	518.06	477045.00	751698.51	N 32 18 34.68	W 103 39 8.76	33.27R
	10285.00	94.06	177.81	9819.76	6088.76	607.22	-600.52	106.32	0.49	169.96	609.86	476952.29	751702.26	N 32 18 33.76	W 103 39 8.72	73.34L
	10380.00	94.34	176.87	9812.80	6081.80	701.90	-695.16	110.72	1.03	170.95	703.92	476857.65	751706.66	N 32 18 32.82	W 103 39 8.67	166.21L
	10474.00	92.10	176.32	9807.52	6076.52	795.72	-788.84	116.29	2.45	171.61	797.36	476763.98	751712.23	N 32 18 31.90	W 103 39 8.62	165.44R
	10569.00	90.41	176.76	9805.44	6074.44	890.67	-883.64	122.03	1.84	172.14	892.02	476669.18	751717.96	N 32 18 30.96	W 103 39 8.56	177.21L
	10663.00	89.59	176.72	9805.44	6074.44	984.64	-977.49	127.37	0.87	172.58	985.75	476575.34	751723.31	N 32 18 30.03	W 103 39 8.50	172.51L
	10758.00	88.45	176.57	9807.06	6076.06	1079.80	-1072.31	132.93	1.21	172.93	1080.52	476480.52	751728.87	N 32 18 29.09	W 103 39 8.44	78.52R
	10853.00	88.80	178.29	9809.34	6078.34	1174.50	-1167.18	137.19	1.85	173.30	1175.22	476385.65	751733.12	N 32 18 28.15	W 103 39 8.40	115.94R
	10948.00	88.28	179.36	9811.76	6080.76	1269.29	-1262.13	139.14	1.25	173.71	1269.77	476290.71	751735.07	N 32 18 27.21	W 103 39 8.39	135.4R
	11041.00	87.49	180.14	9815.20	6084.20	1361.94	-1355.06	139.54	1.19	174.12	1362.23	476197.77	751735.48	N 32 18 26.29	W 103 39 8.39	129.97R
	11136.00	86.42	181.42	9820.24	6089.24	1456.37	-1449.92	138.25	1.75	174.55	1456.49	476102.93	751734.19	N 32 18 25.35	W 103 39 8.41	12.24R
	11231.00	88.31	181.83	9824.61	6093.61	1550.69	-1544.77	135.56	2.04	174.98	1550.71	476008.07	751731.49	N 32 18 24.42	W 103 39 8.45	93.59R
	11325.00	88.25	182.79	9827.43	6096.43	1643.94	-1638.65	131.77	1.02	175.40	1643.94	475914.20	751727.71	N 32 18 23.49	W 103 39 8.50	76.54R
	11420.00	88.42	183.50	9830.19	6099.19	1738.01	-1733.47	126.56	0.77	175.82	1738.08	475819.38	751722.50	N 32 18 22.55	W 103 39 8.57	120.98R
	11515.00	88.18	183.90	9833.01	6102.01	1831.94	-1828.23	120.44	0.49	176.23	1832.19	475724.63	751716.37	N 32 18 21.61	W 103 39 8.64	171.45L
	11609.00	87.25	183.76	9836.76	6105.76	1924.83	-1921.94	114.16	1.00	176.60	1925.33	475630.92	751710.10	N 32 18 20.69	W 103 39 8.73	33.82L
	11702.00	88.25	183.09	9840.41	6109.41	2016.82	-2014.70	108.61	1.29	176.91	2017.63	475538.16	751704.55	N 32 18 19.77	W 103 39 8.80	19.27L
	11796.00	89.48	182.66	9842.27	6111.27	2109.98	-2108.57	103.90	1.39	177.18	2111.12	475444.30	751699.83	N 32 18 18.84	W 103 39 8.86	56.31L
	11892.00	90.10	181.73	9842.62	6111.62	2205.28	-2204.49	100.22	1.16	177.40	2206.77	475348.38	751696.16	N 32 18 17.89	W 103 39 8.91	132.33L
	11987.00	89.59	181.17	9842.88	6111.88	2299.73	-2299.46	97.82	0.80	177.56	2301.54	475253.42	751693.75	N 32 18 16.95	W 103 39 8.94	28.16R
	12081.00	90.58	181.70	9842.74	6111.74	2393.19	-2393.43	95.46	1.19	177.72	2395.33	475159.45	751691.40	N 32 18 16.02	W 103 39 8.98	90L
	12176.00	90.58	181.18	9841.78	6110.78	2487.63	-2488.40	93.07	0.55	177.86	2490.14	475064.49	751689.01	N 32 18 15.08	W 103 39 9.01	57.91R
	12270.00	91.00	181.85	9840.48	6109.48	2581.07	-2582.35	90.59	0.84	177.99	2583.94	474970.54	751686.53	N 32 18 14.15	W 103 39 9.05	99.69R
	12366.00	90.93	182.26	9838.87	6107.87	2676.39	-2678.28	87.15	0.43	178.14	2679.69	474874.62	751683.08	N 32 18 13.20	W 103 39 9.10	140.79L
	12460.00	90.17	181.64	9837.96	6106.96	2769.75	-2772.22	83.95	1.04	178.27	2773.49	474780.68	751679.89	N 32 18 12.27	W 103 39 9.14	176.01R
	12555.00	89.31	181.70	9838.39	6107.39	2864.16	-2867.18	81.18	0.91	178.38	2868.32	474685.73	751677.12	N 32 18 11.33	W 103 39 9.18	55.53L
	12649.00	90.34	180.20	9838.68	6107.68	2957.70	-2961.16	79.62	1.94	178.46	2962.23	474591.75	751675.56	N 32 18 10.40	W 103 39 9.20	43.29L
	12744.00	90.86	179.71	9837.69	6106.69	3052.38	-3056.15	79.70	0.75	178.51	3057.19	474496.76	751675.63	N 32 18 9.46	W 103 39 9.21	113.55R
	12839.00	90.52	180.49	9836.54	6105.54	3147.03	-3151.14	79.53	0.90	178.55	3152.15	474401.77	751675.47	N 32 18 8.52	W 103 39 9.22	165.46L
	12934.00	89.00	179.89	9836.94	6105.94	3241.68	-3246.14	79.22	1.72	178.60	3247.11	474306.78	751675.15	N 32 18 7.58	W 103 39 9.23	18.21R
	13028.00	91.31	180.65	9836.69	6105.69	3335.32	-3340.13	78.77	2.59	178.65	3341.06	474212.79	751674.71	N 32 18 6.65	W 103 39 9.24	78.36R
	13124.00	91.38	180.99	9834.43	6103.43	3430.85	-3436.09	77.40	0.36	178.71	3436.97	474116.83	751673.34	N 32 18 5.71	W 103 39 9.27	90R
	13219.00	91.38	181.60	9832.14	6101.14	3525.30	-3531.04	75.25	0.64	178.78	3531.84	474021.89	751671.19	N 32 18 4.77	W 103 39 9.30	69.01L
	13314.00	91.61	181													

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Closure Azimuth (°)	Closure (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')	TF (°)
	13694.00	87.18	179.98	9833.75	6102.75	3997.74	-4005.80	66.53	1.55	179.05	4006.35	473547.15	751662.47	N 32 18 0.07	W 103 39 9.43	16.73L
	13789.00	89.11	179.40	9836.83	6105.83	4092.40	-4100.74	67.05	2.12	179.06	4101.29	473452.21	751662.99	N 32 17 59.13	W 103 39 9.44	166.95R
	13884.00	88.42	179.56	9838.87	6107.87	4187.12	-4195.72	67.91	0.75	179.07	4196.27	473357.24	751663.85	N 32 17 58.19	W 103 39 9.43	91.6L
	13977.00	88.35	177.00	9841.50	6110.50	4279.95	-4288.63	70.70	2.75	179.06	4289.21	473264.33	751666.64	N 32 17 57.27	W 103 39 9.41	90R
	14071.00	88.35	178.86	9844.20	6113.20	4373.81	-4382.53	74.09	1.98	179.03	4383.15	473170.44	751670.03	N 32 17 56.34	W 103 39 9.37	59.03R
	14167.00	88.62	179.31	9846.74	6115.74	4469.57	-4478.48	75.63	0.55	179.03	4479.12	473074.49	751671.56	N 32 17 55.39	W 103 39 9.36	118.76L
Final Survey	14224.00	88.28	178.69	9848.28	6117.28	4526.43	-4535.45	76.62	1.24	179.03	4536.10	473017.52	751672.56	N 32 17 54.83	W 103 39 9.36	134.01L
Proj to TD	14280.00	88.00	178.40	9850.10	6119.10	4582.31	-4591.40	78.04	0.72	179.03	4592.07	472961.57	751673.98	N 32 17 54.27	W 103 39 9.34	

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	18.000	Act Stns	30.000	30.000	SLB_MWD-POOR-Depth Only	Original Borehole / Cimarex Cuervo Federal 23H XEM+MWD
	1	18.000	9262.000	Act Stns	30.000	30.000	SLB_MWD-POOR	Original Borehole / Cimarex Cuervo Federal 23H XEM+MWD
	1	9262.000	9363.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY	Original Borehole / Cimarex Cuervo Federal 23H XEM+MWD
	1	9363.000	14224.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Cimarex Cuervo Federal 23H XEM+MWD
	1	14224.000	14280.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Cimarex Cuervo Federal 23H XEM+MWD