

015-41589



Cimarex Riverbend 14 Federal #2H XEM + MWD Off to 12455ft Survey Geodetic Report (Def Survey)

PATRINDER
A Schlumberger Company

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 22 2015

RECEIVED

Report Date: February 21, 2015 - 1:40 AM
Client: Cimarex
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Riverbend 14 Federal #2H / Cimarex Riverbend 14 Federal #2H
Well: Cimarex Riverbend 14 Federal #2H
Borehole: Original Borehole
UWI / API#: Unknown / 30-015-41589
Survey Name: Cimarex Riverbend 14 Federal #2H XEM + MWD Off to 12455ft
Survey Date: December 19, 2014
Tort / AHD / DOI / ERD Ratio: 149.047' / 2160.267 ft / 5.575 / 0.203
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 41' 13.9509" W 104° 3' 36.2708"
Location Grid N/E Y/X: N 413760.300 NUS, E 625909.400 NUS
CRS Grid Convergence Angle: 0.1453°
Grid Scale Factor: 0.9991728
Version / Patch: 2.7.1043.0

Survey / DLS Computation:
Vertical Section Azimuth:
Vertical Section Origin:
TVD Reference Datum:
TVD Reference Elevation:
Seabed / Ground Elevation:
Magnetic Declination:
Total Gravity Field Strength:
Gravity Model:
Total Magnetic Field Strength:
Magnetic Dip Angle:
Declination Date:
Magnetic Declination Model:
North Convergence:
Grid Convergence Used:
Total Corr Mag North-Grid North:
Local Coord Referenced To: Structure Reference Point

Minimum Curvature / Lubinski
179.221' (Grid Norm)
0.000 ft, 0.000 ft
KB
2957.000 ft above MSL
2959.000 ft above MSL
7.457°
998.4581 mgn (9.80665 Based)
GARM
48313.144 nT
59.979°
January 23, 2015
HDGM 2014
Grid North
0.1453°
7.3115°

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft)	Northing (NUS)	Easting (NUS)	Latitude (NUS)	Longitude (EAM)
14 Fed #2H - 1589 FWL 75' PNL	0.00	0.00	179.80	0.00	0.00	0.00	0.00	N/A	413760.30	625909.40	N 32 8 13.96 W 104 3 36.37	
	142.00	2.12	202.47	142.97	1.59	-1.61	-2.10	1.48	413750.69	625907.30	N 32 8 13.84 W 104 3 35.40	
	173.00	2.12	230.13	172.95	2.26	-2.31	-2.86	0.29	413750.00	625906.44	N 32 8 13.94 W 104 3 35.41	
	201.00	2.43	232.96	200.92	2.94	-2.99	-3.94	1.18	413757.31	625905.57	N 32 8 13.93 W 104 3 35.42	
	263.00	2.70	238.74	262.86	4.50	-4.59	-6.11	0.51	413755.71	625903.30	N 32 8 13.91 W 104 3 35.44	
	321.00	2.92	237.19	320.79	6.02	-5.14	-6.49	0.38	413754.16	625900.91	N 32 8 13.80 W 104 3 35.47	
	376.00	3.00	236.97	375.72	7.53	-7.68	-10.87	0.15	413752.62	625898.50	N 32 8 13.85 W 104 3 35.50	
	437.00	3.00	235.07	436.64	9.26	-9.46	-13.52	0.16	413750.84	625895.86	N 32 8 13.87 W 104 3 35.53	
	521.00	2.89	233.04	520.53	11.74	-11.87	-16.98	0.24	413748.33	625892.42	N 32 8 13.84 W 104 3 35.57	
	579.00	2.92	231.63	578.45	13.48	-13.75	-19.28	0.20	413746.55	625890.12	N 32 8 13.82 W 104 3 35.60	
	638.00	3.29	230.26	637.37	15.38	-15.68	-21.79	0.55	413744.63	625887.81	N 32 8 13.80 W 104 3 35.62	
	728.00	2.12	221.32	727.27	19.10	-18.44	-24.92	1.37	413741.86	625884.46	N 32 8 13.78 W 104 3 35.68	
	818.00	1.19	186.65	817.24	20.25	-20.60	-25.81	1.92	413739.70	625882.59	N 32 8 13.76 W 104 3 35.67	
	910.00	1.10	150.24	909.22	21.96	-22.30	-25.15	0.37	413738.00	625880.25	N 32 8 13.74 W 104 3 35.68	
	1001.00	1.02	153.72	1000.20	23.45	-23.78	-24.38	0.11	413736.52	625885.04	N 32 8 13.72 W 104 3 35.65	
	1091.00	0.80	148.74	1090.19	24.72	-25.04	-23.68	0.26	413734.28	625883.72	N 32 8 13.71 W 104 3 35.65	
	1185.00	0.80	134.38	1184.18	25.75	-26.06	-22.87	0.21	413732.24	625886.53	N 32 8 13.70 W 104 3 35.64	
	1273.00	1.02	149.23	1274.17	26.89	-27.19	-22.01	0.36	413730.12	625887.39	N 32 8 13.69 W 104 3 35.63	
	1368.00	1.02	137.28	1367.16	28.22	-28.51	-21.03	0.23	413731.80	625888.37	N 32 8 13.68 W 104 3 35.62	
	1462.00	0.80	143.50	1461.14	29.37	-29.65	-20.07	0.26	413730.65	625889.33	N 32 8 13.67 W 104 3 35.61	

Drilling Office 2.7.1043.0

...Original Borehole/Cimarex Riverbend 14 Federal #2H XEM + MWD Off to 12455ft

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"Denied"

Provide signature page for Survey

Comments	MD	Incl	Actm Ghd	TVD	VSEC	NS	EW	DLS	Northng	Eastng	Latitude	Longitude
	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(N 100° E)	(E 100° W)
	1557.00	0.71	146.84	1556.14	30.41	-36.67	-19.35	0.11	413729.63	625890.05	N 32 8 13.06 W 104	3 36.60
	1651.00	0.82	155.75	1650.13	31.38	-31.64	-18.85	0.17	413728.67	625890.55	N 32 8 13.06 W 104	3 36.59
	1745.00	0.49	174.21	1744.13	32.25	-32.51	-18.63	0.21	413727.79	625890.77	N 32 8 13.06 W 104	3 36.59
	1841.00	0.31	184.15	1840.12	32.92	-33.17	-18.52	0.20	413727.13	625890.89	N 32 8 13.06 W 104	3 36.59
	1931.00	0.40	193.12	1930.12	33.30	-33.56	-18.19	0.33	413726.75	625891.21	N 32 8 13.06 W 104	3 36.58
	2028.00	1.41	202.87	2027.11	33.42	-33.85	-16.70	1.12	413726.85	625892.79	N 32 8 13.06 W 104	3 36.57
	2123.00	1.72	212.36	2122.08	34.11	-34.31	-14.30	1.00	413726.00	625895.10	N 32 8 13.06 W 104	3 36.54
	2217.00	2.43	221.61	2216.01	35.61	-35.76	-11.23	0.82	413724.54	625898.17	N 32 8 13.06 W 104	3 36.50
	2313.00	3.23	231.90	2311.90	37.43	-37.52	-8.83	0.83	413722.78	625902.57	N 32 8 13.06 W 104	3 36.45
	2408.00	1.81	240.80	2406.80	38.80	-38.84	-2.88	1.55	413721.47	625906.52	N 32 8 13.06 W 104	3 36.41
	2498.00	0.71	249.78	2497.00	38.05	-38.07	-0.88	1.33	413721.24	625908.42	N 32 8 13.06 W 104	3 36.38
	2601.00	1.33	260.01	2599.78	38.81	-38.80	-0.87	0.59	413721.50	625910.27	N 32 8 13.06 W 104	3 36.36
	2693.00	1.19	269.30	2692.00	38.69	-38.68	2.92	0.28	413721.64	625912.32	N 32 8 13.06 W 104	3 36.34
	2786.00	1.19	278.60	2785.00	38.69	-38.68	4.89	0.08	413721.68	625914.29	N 32 8 13.06 W 104	3 36.32
	2883.00	1.33	288.30	2881.70	38.63	-38.54	6.94	0.15	413721.78	625916.34	N 32 8 13.06 W 104	3 36.29
	2977.00	1.33	297.70	2975.67	38.49	-38.37	9.11	0.13	413721.59	625918.51	N 32 8 13.06 W 104	3 36.27
	3072.00	1.33	307.20	3070.65	38.30	-38.15	11.30	0.08	413721.15	625920.70	N 32 8 13.06 W 104	3 36.24
	3168.00	1.19	316.80	3166.82	38.15	-38.00	13.35	0.18	413721.38	625922.75	N 32 8 13.06 W 104	3 36.22
	3260.00	1.50	326.00	3258.60	37.85	-37.85	15.54	0.34	413722.65	625924.94	N 32 8 13.06 W 104	3 36.19
	3354.00	1.50	335.40	3352.35	37.72	-37.48	18.00	0.11	413722.82	625927.39	N 32 8 13.06 W 104	3 36.16
	3448.00	1.33	344.80	3446.54	37.60	-37.39	20.31	0.20	413722.87	625929.71	N 32 8 13.06 W 104	3 36.14
	3543.00	1.10	354.30	3541.51	37.47	-37.29	22.32	0.25	413722.13	625931.72	N 32 8 13.06 W 104	3 36.11
	3637.00	1.19	363.70	3635.50	37.33	-37.00	24.19	0.13	413723.30	625933.59	N 32 8 13.06 W 104	3 36.09
	3731.00	1.10	373.10	3729.48	37.19	-36.84	26.06	0.13	413723.46	625935.46	N 32 8 13.06 W 104	3 36.07
	3823.00	0.86	382.30	3821.48	37.22	-36.84	27.85	0.27	413723.46	625937.04	N 32 8 13.06 W 104	3 36.05
	3920.00	1.10	392.00	3918.45	37.45	-37.06	29.31	0.25	413723.25	625939.70	N 32 8 13.06 W 104	3 36.03
	4013.00	0.80	401.30	4011.44	37.70	-37.29	30.83	0.33	413723.02	625940.23	N 32 8 13.06 W 104	3 36.01
	4107.00	0.85	410.70	4105.43	37.97	-37.53	32.18	0.14	413722.77	625941.58	N 32 8 13.06 W 104	3 36.00
	4204.00	0.86	420.40	4202.41	38.41	-37.96	33.61	0.09	413722.34	625943.01	N 32 8 13.06 W 104	3 35.98
	4299.00	0.80	429.90	4297.40	38.10	-38.69	34.89	0.26	413721.67	625944.26	N 32 8 13.06 W 104	3 35.97
	4393.00	0.71	439.30	4391.39	38.85	-39.35	35.97	0.18	413720.94	625945.38	N 32 8 13.06 W 104	3 35.95
	4488.00	0.80	448.80	4486.39	40.57	-40.07	37.00	0.11	413720.24	625946.40	N 32 8 13.06 W 104	3 35.94
	4577.00	0.71	457.70	4575.37	42.10	-41.57	38.99	0.05	413718.73	625948.38	N 32 8 13.06 W 104	3 35.92
	4672.00	0.82	467.20	4670.36	42.88	-42.34	39.75	0.20	413717.96	625949.18	N 32 8 13.06 W 104	3 35.91
	4766.00	0.71	476.60	4764.36	43.82	-43.27	40.32	0.18	413717.03	625949.72	N 32 8 13.06 W 104	3 35.90
	4859.00	0.82	485.90	4857.35	44.81	-44.26	40.77	0.10	413716.05	625950.16	N 32 8 13.06 W 104	3 35.90
	4956.00	0.71	495.60	4954.34	45.83	-45.28	41.23	0.10	413715.03	625950.63	N 32 8 13.06 W 104	3 35.89
	5053.00	0.80	505.30	5050.34	46.88	-46.31	41.92	0.23	413713.99	625951.32	N 32 8 13.06 W 104	3 35.88
	5151.00	0.80	515.10	5148.34	47.94	-47.37	42.72	0.10	413712.84	625952.12	N 32 8 13.06 W 104	3 35.87
	5248.00	0.80	524.80	5246.33	48.15	-48.55	43.59	0.25	413711.74	625952.99	N 32 8 13.06 W 104	3 35.87
	5339.00	1.02	533.90	5337.31	49.15	-49.97	44.52	0.16	413710.34	625953.82	N 32 8 13.06 W 104	3 35.85
	5434.00	1.02	543.40	5432.30	50.57	-51.39	45.06	0.34	413708.91	625954.48	N 32 8 13.06 W 104	3 35.85
	5527.00	1.02	552.70	5525.29	52.00	-53.00	45.27	0.19	413707.31	625954.87	N 32 8 13.06 W 104	3 35.85
	5623.00	1.02	562.30	5621.28	53.91	-54.57	45.39	0.00	413705.64	625954.78	N 32 8 13.06 W 104	3 35.84
	5719.00	1.02	571.90	5717.26	55.81	-56.34	45.44	0.07	413703.95	625954.84	N 32 8 13.06 W 104	3 35.84
	5811.00	1.02	581.10	5811.24	56.95	-56.34	45.44	0.07	413703.95	625954.84	N 32 8 13.06 W 104	3 35.84
	5907.00	1.19	590.70	5905.23	58.75	-58.14	45.28	0.27	413702.17	625954.87	N 32 8 13.06 W 104	3 35.85
	6002.00	1.33	600.20	6000.20	60.82	-60.21	45.01	0.18	413700.10	625954.40	N 32 8 13.06 W 104	3 35.85

Comments	MD (ft)	Incl (%)	Adm Grid	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S, W/E)	Longitude (E/W, N/S)
	6998.00	0.68	178.22	6586.13	62.66	-62.36	44.93	0.48	413654.25	625954.32	N 32 8 13.34 W 104	335.85
	6193.00	0.71	171.89	6191.18	63.97	-63.37	45.03	0.20	413696.94	625954.43	N 32 8 13.33 W 104	335.85
	6287.00	0.71	178.88	6285.17	65.13	-64.53	45.13	0.09	413695.78	625954.52	N 32 8 13.32 W 104	335.85
	6381.00	0.71	170.86	6379.16	68.29	-65.58	45.23	0.11	413694.82	625954.63	N 32 8 13.31 W 104	335.85
	6475.00	0.80	98.47	6473.16	68.51	-65.90	45.87	1.35	413694.41	625954.27	N 32 8 13.31 W 104	335.84
	6570.00	1.19	48.36	6568.14	69.51	-66.87	47.16	0.44	413695.42	625954.56	N 32 8 13.32 W 104	335.82
	6664.00	1.41	44.63	6662.12	64.06	-63.41	48.71	0.25	413696.90	625956.10	N 32 8 13.33 W 104	335.81
	6760.00	1.33	27.47	6758.09	82.25	-61.58	50.05	0.44	413698.73	625958.45	N 32 8 13.35 W 104	335.79
	6855.00	0.66	42.93	6853.07	60.78	-60.09	51.09	0.60	413700.21	625960.49	N 32 8 13.36 W 104	335.78
	6949.00	0.80	303.07	6947.07	59.52	-59.23	51.05	1.40	413701.07	625960.45	N 32 8 13.37 W 104	335.78
	7044.00	1.10	286.34	7042.06	59.57	-59.80	49.53	0.67	413701.41	625960.98	N 32 8 13.38 W 104	335.80
	7138.00	0.71	302.36	7136.04	59.26	-58.81	48.19	0.69	413701.69	625967.59	N 32 8 13.38 W 104	335.81
	7233.00	0.60	305.27	7231.04	58.55	-57.91	47.15	0.10	413702.39	625966.55	N 32 8 13.39 W 104	335.82
	7327.00	1.19	291.61	7325.02	57.79	-57.18	45.71	0.48	413703.13	625965.11	N 32 8 13.39 W 104	335.84
	7422.00	1.19	295.93	7420.00	56.97	-56.38	43.91	0.08	413703.92	625963.30	N 32 8 13.40 W 104	335.85
	7486.00	1.33	286.32	7483.99	56.34	-55.76	42.64	0.22	413704.54	625962.04	N 32 8 13.41 W 104	335.88
	7610.00	2.53	287.51	7607.93	54.99	-54.46	39.26	0.60	413705.84	625948.68	N 32 8 13.42 W 104	335.92
	7704.00	2.43	284.51	7701.86	53.94	-53.46	35.74	0.44	413706.84	625945.14	N 32 8 13.43 W 104	335.96
	7798.00	2.43	287.46	7796.78	53.47	-53.05	31.78	0.76	413707.28	625941.18	N 32 8 13.43 W 104	336.00
	7886.00	1.59	282.44	7883.72	53.70	-53.32	26.39	0.88	413708.99	625937.79	N 32 8 13.43 W 104	336.04
	7980.00	0.48	255.12	7987.70	53.65	-53.59	26.71	1.18	413706.71	625936.11	N 32 8 13.43 W 104	336.08
	8084.00	0.31	109.49	8081.70	54.13	-53.78	26.56	0.82	413706.53	625935.86	N 32 8 13.43 W 104	336.06
	8178.00	0.31	118.73	8178.70	54.35	-53.89	27.03	0.05	413706.32	625936.43	N 32 8 13.42 W 104	336.06
	8274.00	0.22	196.86	8271.70	54.65	-54.29	27.20	0.36	413708.02	625936.60	N 32 8 13.42 W 104	336.08
	8369.00	0.71	233.97	8366.69	55.16	-54.81	26.67	0.58	413705.50	625936.50	N 32 8 13.42 W 104	336.06
	8557.00	1.10	228.24	8554.67	57.12	-56.79	24.27	0.26	413703.51	625933.67	N 32 8 13.43 W 104	336.09
	8652.00	2.03	212.90	8649.63	58.16	-58.86	22.63	0.99	413701.44	625932.02	N 32 8 13.43 W 104	336.11
	8746.00	2.30	205.10	8743.56	62.20	-61.92	20.83	0.35	413698.38	625930.23	N 32 8 13.35 W 104	336.13
	8874.00	2.83	210.51	8871.49	65.21	-64.96	19.11	0.69	413895.34	625928.51	N 32 8 13.32 W 104	336.15
	8935.00	2.60	216.00	8932.35	69.91	-69.69	16.35	0.63	413690.41	625925.75	N 32 8 13.23 W 104	336.19
	9031.00	2.52	197.04	9028.24	73.95	-73.76	14.55	0.71	413886.54	625923.94	N 32 8 13.23 W 104	336.20
	9126.00	2.90	191.53	9123.16	77.80	-77.63	13.55	0.34	413682.88	625922.95	N 32 8 13.18 W 104	336.22
	9219.00	2.43	191.05	9216.08	81.58	-81.39	12.60	0.14	413676.92	625922.20	N 32 8 13.15 W 104	336.22
	9315.00	2.30	190.12	9312.00	85.44	-85.28	12.07	0.14	413675.02	625921.47	N 32 8 13.12 W 104	336.23
	9409.00	2.21	180.83	9405.83	89.07	-88.92	11.40	0.10	413671.59	625920.80	N 32 8 13.08 W 104	336.24
	9505.00	2.50	180.34	9501.85	92.77	-92.63	10.71	0.10	413667.67	625920.11	N 32 8 13.04 W 104	336.25
	9597.00	2.43	187.43	9593.77	96.51	-96.38	10.12	0.19	413663.82	625919.52	N 32 8 13.01 W 104	336.26
	9694.00	2.21	185.64	9690.69	100.39	-100.27	9.45	0.24	413660.04	625918.94	N 32 8 12.97 W 104	336.26
	9789.00	2.52	190.83	9785.81	104.24	-104.12	8.85	0.33	413656.18	625918.25	N 32 8 12.93 W 104	336.27
	9884.00	2.52	186.07	9880.52	108.26	-108.18	7.88	0.24	413652.13	625917.27	N 32 8 12.89 W 104	336.28
	9978.00	2.50	187.44	9974.44	111.83	-111.75	6.29	0.78	413648.55	625915.88	N 32 8 12.85 W 104	336.30
	10073.00	2.43	238.85	10069.38	114.44	-114.40	3.52	1.14	413645.91	625912.93	N 32 8 12.83 W 104	336.33
Final Extreme Survey	10153.00	2.52	254.02	10149.29	115.76	-115.76	0.39	0.82	413644.55	625909.79	N 32 8 12.81 W 104	336.37
	10231.00	1.66	245.00	10227.24	116.78	-116.80	-2.24	1.27	413643.51	625907.15	N 32 8 12.80 W 104	336.40
	10282.00	0.65	186.32	10280.20	117.95	-118.00	-2.80	9.26	413642.51	625905.60	N 32 8 12.79 W 104	336.41
	10324.00	7.67	187.40	10320.04	121.06	-121.12	-3.26	12.59	413639.19	625905.14	N 32 8 12.78 W 104	336.41
	10324.00	10.27	187.74	10319.67	125.69	-125.75	-3.88	8.67	413634.25	625905.52	N 32 8 12.72 W 104	336.42

Dilling Office 2.7.104.0

...Original BatchfileC:\murex Riverband 1\4 Federal 82H XEM + MWID Off to 12455RT

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Comments	MD (ft)	Incl (°)	Actm Ghd (ft)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft)	Northng (ft)	Eastng (ft)	Latitude (N/S)	Longitude (E/W)
	1037.00	14.71	188.88	1035.88	132.75	-132.83	-4.78	13.47	41367.48	625904.62	N 32 8 12.85 W 104	3 36.43
	1388.00	18.82	183.86	1039.58	141.84	-141.73	-5.59	13.55	413818.58	625903.81	N 32 8 12.56 W 104	3 36.44
	10420.00	23.14	181.25	10411.43	153.08	-153.17	-4.37	13.81	413807.14	625903.33	N 32 8 12.44 W 104	3 36.45
	10431.00	28.38	177.91	10439.58	166.05	-166.15	-3.95	11.38	413594.16	625903.45	N 32 8 12.32 W 104	3 36.45
	10483.00	28.31	174.98	10483.00	180.73	-180.81	-3.03	7.34	413578.50	625904.37	N 32 8 12.17 W 104	3 36.43
	10512.00	30.86	175.30	10483.22	195.01	-195.08	-3.82	8.61	413565.24	625905.36	N 32 8 12.03 W 104	3 36.42
	10545.00	34.11	175.10	10521.05	212.89	-212.74	-2.34	9.85	413541.58	625907.06	N 32 8 11.95 W 104	3 36.40
	10577.00	36.30	173.91	10546.87	231.52	-231.55	-4.52	13.28	413528.77	625908.88	N 32 8 11.87 W 104	3 36.36
	10587.00	41.96	175.24	10588.80	250.79	-250.79	1.30	12.53	413508.53	625910.70	N 32 8 11.48 W 104	3 36.38
	10640.00	45.77	178.08	10593.59	273.51	-273.59	3.02	11.68	413488.73	625912.42	N 32 8 11.25 W 104	3 36.34
	10672.00	49.83	177.96	10615.08	297.29	-297.28	4.24	13.40	413463.07	625913.84	N 32 8 11.02 W 104	3 36.33
	10701.00	53.42	178.22	10633.08	320.02	-319.88	5.00	12.40	413440.35	625914.40	N 32 8 10.79 W 104	3 36.32
	10734.00	57.12	178.28	10651.88	347.13	-347.08	5.83	11.21	413413.25	625915.23	N 32 8 10.52 W 104	3 36.31
	10796.00	63.30	178.91	10681.71	401.41	-401.35	7.16	12.23	413358.98	625918.58	N 32 8 9.99 W 104	3 36.30
	10835.00	71.37	178.80	10696.71	437.84	-437.58	7.88	15.57	413322.76	625917.28	N 32 8 8.83 W 104	3 36.29
	10865.00	80.92	181.35	10727.20	563.88	-563.84	7.66	7.59	413196.71	625917.06	N 32 8 8.38 W 104	3 36.30
	11080.00	85.25	179.81	10738.64	657.94	-657.91	8.71	4.83	413102.44	625916.11	N 32 8 7.45 W 104	3 36.31
	11250.00	87.77	179.50	10744.42	752.76	-752.73	7.28	2.87	413007.84	625916.88	N 32 8 6.51 W 104	3 36.31
	11294.00	88.90	181.29	10748.50	847.71	-847.69	8.63	2.79	412912.68	625916.03	N 32 8 5.57 W 104	3 36.32
	11345.00	88.46	181.10	10747.19	942.85	-942.87	4.65	0.35	412817.71	625914.05	N 32 8 4.53 W 104	3 36.34
	11440.00	98.78	178.58	10748.88	1037.82	-1037.85	4.91	2.75	412722.74	625914.31	N 32 8 3.68 W 104	3 36.34
	11534.00	88.52	178.77	10750.91	1131.59	-1131.60	7.09	0.33	412628.90	625916.49	N 32 8 2.78 W 104	3 36.32
	11579.00	89.31	179.74	10752.71	1226.57	-1226.57	8.32	1.32	412533.93	625917.72	N 32 8 1.82 W 104	3 36.31
	11724.00	88.90	178.10	10754.19	1321.58	-1321.58	9.28	0.80	412438.96	625918.66	N 32 8 0.88 W 104	3 36.30
	11818.00	89.24	181.03	10755.73	1416.53	-1416.54	9.17	2.06	412343.98	625918.57	N 32 7.59 W 104	3 36.31
	11913.00	90.00	181.39	10756.36	1510.47	-1510.51	7.19	0.99	412249.91	625918.59	N 32 7.59 W 104	3 36.33
	12008.00	90.07	181.84	10756.30	1605.39	-1605.47	4.43	0.58	412154.98	625913.83	N 32 7.58 W 104	3 36.37
	12103.00	90.31	178.87	10753.88	1700.34	-1700.46	3.09	2.40	412059.99	625912.49	N 32 7.57 W 104	3 36.39
	12188.00	89.28	179.08	10756.32	1795.34	-1795.45	4.13	1.25	411965.00	625913.53	N 32 7.56 W 104	3 36.38
	12293.00	89.97	179.03	10756.84	1890.34	-1890.43	5.70	0.73	411870.03	625915.10	N 32 7.55 W 104	3 36.36
	12388.00	89.90	178.44	10757.05	1985.33	-1985.41	7.79	0.63	411775.09	625917.19	N 32 7.54 W 104	3 36.34
Final Survey												
PTB Cimarex Riverbend 14 Fed 2H	12455.00	89.80	179.50	10757.23	2052.33	-2052.40	9.00	1.59	411706.08	625916.40	N 32 7.53 W 104	3 36.33

Del 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)	EDU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	18.000	Act Sys	30.000	30.000	SLB_MWD-POOR-Depth Only	Original Borehole / Cimarex Riverbend 14 Federal #2H XEM +
	1	18.000	10153.000	Act Sys	30.000	30.000	SLB_MWD-POOR	Original Borehole / Cimarex Riverbend 14 Federal #2H XEM +

Drilling Office 2.7.1043.0

...Original Borehole/Cimarex Riverbend 14 Federal #2H XEM + MWD OR to 12455ft

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Comments	MD (ft)	Incl (°)	Asim Grid (ft)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS 1/10000	Northing (ft)	Easting (ft)	Latitude (NAD 83)	Longitude (WGS 84)
					Act Spts	30.000	30.000	SLE_MWD-STO		Original Borehole / Cimarax Riverbend 14 Federal #2H XEM +		
					Act Spts	30.000	30.000	SLE_BLIND-TREND		Original Borehole / Cimarax Riverbend 14 Federal #2H XEM +		



Cimarex Riverbend 14 Federal #2H MWD 10734ft to 15325ft Survey Geodetic Report
(Def Survey)

Report Date: February 21, 2015 - 11:37 AM
Client: Cimarex
Field: NW Eddy County (NAD 83)
Structure / Slat: Cimarex Riverbend 14 Federal #2H / Cimarex Riverbend 14 Federal #2H
Well: Cimarex Riverbend 14 Federal #2H
Borehole: ST01 Borehole
UWI / API: Unknown / 30-015-41589
Survey Name: Cimarex Riverbend 14 Federal #2H MWD 10734ft to 15325ft
Survey Date: February 03, 2015
Tort / AHD / DDI / ERD Ratio: 228.645' / 5945.408 ft / 0.210 / 0.469
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 8' 13.8593" W 104° 3' 36.3708"
Location Grid N/E Y/X: N 413760.300 NUS E 625908.400 RUS
CRS Grid Convergence Angle: 0.1453°
Grid Scale Factor: 0.99991728
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 178.221° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 2957.000 ft above MSL
Seasbed / Ground Elevation: 2938.000 ft above MSL
Magnetic Declination: 7.450°
Total Gravity Field Strength: 998.458 Imgn (0.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 48305.242 nT
Magnetic Dip Angle: 59.879°
Declination Date: February 17, 2015
HDGM 2014
Grid North
North Reference: 0.1453°
Total Corr Mag North-Grid North: 7.3044°
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	N (ft)	E (ft)	DLS (°/100ft)	Northing (NUS)	Easting (RUS)	Latitude (NUS ° ' ")	Longitude (EAM ° ' ")
SHL Riverbend 14 Fed #2H - 1980 FVLL 75 FNL	0.00	0.00	179.80	0.00	0.00	0.00	0.00	N/A	413760.30	625908.40	N 32° 8' 13.86" W 104° 3' 36.37"	
	143.00	2.12	232.47	142.87	1.58	-1.51	-2.10	1.48	413758.69	625907.30	N 32° 8' 13.84" W 104° 3' 36.40"	
	173.00	2.12	230.13	172.95	2.26	-2.31	-2.86	0.29	413756.00	625906.44	N 32° 8' 13.94" W 104° 3' 36.41"	
	201.00	2.43	232.96	200.92	2.94	-2.89	-3.64	1.18	413757.31	625905.57	N 32° 8' 13.93" W 104° 3' 36.42"	
	203.00	2.70	236.74	202.86	4.50	-4.59	-6.11	0.51	413755.71	625903.30	N 32° 8' 13.91" W 104° 3' 36.44"	
	321.00	2.92	237.19	320.79	6.02	-6.14	-8.49	0.38	413754.16	625900.91	N 32° 8' 13.60" W 104° 3' 36.47"	
	376.00	3.00	236.97	375.72	7.53	-7.68	-10.87	0.15	413752.82	625898.53	N 32° 8' 13.88" W 104° 3' 36.50"	
	437.00	3.09	235.07	436.64	9.28	-9.46	-13.52	0.18	413750.84	625895.88	N 32° 8' 13.87" W 104° 3' 36.53"	
	521.00	2.83	233.04	520.53	11.74	-11.87	-16.98	0.24	413748.33	625892.42	N 32° 8' 13.84" W 104° 3' 36.57"	
	578.00	2.92	231.63	578.45	13.48	-13.75	-19.28	0.20	413746.55	625890.12	N 32° 8' 13.82" W 104° 3' 36.60"	
	638.00	3.23	233.26	637.37	15.38	-15.68	-21.78	0.55	413744.63	625887.61	N 32° 8' 13.80" W 104° 3' 36.62"	
	728.00	2.12	221.32	727.27	18.10	-18.44	-24.92	1.37	413741.86	625884.48	N 32° 8' 13.78" W 104° 3' 36.66"	
	818.00	1.19	166.85	817.24	20.25	-20.60	-25.81	1.92	413739.70	625883.59	N 32° 8' 13.78" W 104° 3' 36.67"	
	910.00	1.10	150.24	909.22	21.96	-21.15	-25.15	0.37	413739.00	625884.25	N 32° 8' 13.74" W 104° 3' 36.65"	
	1001.00	1.02	153.72	1000.20	23.45	-23.78	-24.38	0.11	413736.52	625885.04	N 32° 8' 13.72" W 104° 3' 36.65"	
	1091.00	0.90	148.74	1090.19	24.72	-25.04	-23.68	0.26	413735.28	625885.72	N 32° 8' 13.71" W 104° 3' 36.65"	
	1185.00	0.80	134.38	1184.18	25.75	-26.06	-22.67	0.21	413734.24	625886.53	N 32° 8' 13.70" W 104° 3' 36.64"	
	1275.00	1.02	149.23	1274.17	26.89	-27.19	-22.01	0.36	413733.12	625887.39	N 32° 8' 13.69" W 104° 3' 36.63"	
	1368.00	1.02	137.28	1367.18	28.22	-28.51	-21.03	0.23	413731.80	625888.37	N 32° 8' 13.68" W 104° 3' 36.62"	
	1462.00	0.80	143.50	1461.14	29.37	-29.65	-20.07	0.26	413730.65	625889.33	N 32° 8' 13.67" W 104° 3' 36.61"	

Comments	MD	Incl	Adm Grid	TVD	VSEC	NS	EW	DLS	Northing	Easting	Latitude	Longitude
	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(NUS)	(EUS)	(NUS)	(EUS)
	1557.00	0.71	145.94	1556.14	30.41	-30.67	-19.35	0.11	413729.63	625890.05	N 32° 8' 13.65" W 104° 33.60"	
	1551.00	0.62	152.75	1650.13	31.28	-31.84	-18.65	0.17	413728.67	625890.55	N 32° 8' 13.65" W 104° 33.60"	
	1745.00	0.49	174.21	1744.13	32.25	-32.51	-18.63	0.21	413727.79	625890.77	N 32° 8' 13.65" W 104° 33.59"	
	1841.00	0.39	166.15	1840.12	32.92	-32.17	-18.52	0.20	413727.13	625890.88	N 32° 8' 13.65" W 104° 33.58"	
	1951.00	0.40	117.92	1950.12	33.30	-33.56	-19.19	0.33	413726.75	625891.21	N 32° 8' 13.65" W 104° 33.58"	
	2028.00		86.67	2027.11	33.42	-33.85	-16.70	1.12	413726.65	625892.70	N 32° 8' 13.63" W 104° 33.57"	
	2123.00	1.72	120.36	2122.06	34.11	-34.31	-14.30	1.00	413726.00	625893.10	N 32° 8' 13.62" W 104° 33.54"	
	2217.00	2.43	111.90	2216.01	35.61	-35.78	-11.23	0.82	413724.54	625893.17	N 32° 8' 13.61" W 104° 33.50"	
	2313.00	3.23	111.73	2311.90	37.43	-37.52	-8.63	0.83	413722.78	625892.57	N 32° 8' 13.59" W 104° 33.45"	
	2408.00	1.81	102.52	2406.60	38.80	-38.84	-2.85	1.55	413721.47	625890.52	N 32° 8' 13.58" W 104° 33.41"	
	2496.00	0.71	82.24	2494.78	39.05	-39.07	-0.98	1.33	413721.24	625890.42	N 32° 8' 13.57" W 104° 33.39"	
	2591.00	1.33	81.63	2590.76	38.81	-38.80	0.97	0.58	413721.50	625891.07	N 32° 8' 13.56" W 104° 33.34"	
	2695.00	1.19	90.97	2693.74	38.69	-38.66	2.92	0.26	413721.64	625912.32	N 32° 8' 13.58" W 104° 33.34"	
	2790.00	1.19	87.14	2788.72	38.63	-38.63	4.09	0.06	413721.68	625914.29	N 32° 8' 13.58" W 104° 33.32"	
	2883.00	1.33	86.15	2881.70	38.63	-38.54	6.54	0.15	413721.76	625916.34	N 32° 8' 13.58" W 104° 33.29"	
	2977.00	1.33	82.73	2975.67	38.49	-38.37	9.11	0.13	413721.93	625916.51	N 32° 8' 13.58" W 104° 33.27"	
	3072.00	1.33	85.86	3070.65	38.30	-38.15	11.40	0.09	413722.15	625920.70	N 32° 8' 13.58" W 104° 33.24"	
	3166.00	1.19	81.32	3164.82	38.10	-37.92	13.35	0.18	413722.38	625922.75	N 32° 8' 13.58" W 104° 33.22"	
	3260.00	1.50	84.05	3258.60	37.86	-37.65	15.54	0.34	413722.65	625924.94	N 32° 8' 13.59" W 104° 33.19"	
	3354.00	1.50	87.97	3352.58	37.72	-37.48	18.00	0.11	413722.82	625927.38	N 32° 8' 13.58" W 104° 33.18"	
	3448.00	1.30	84.54	3446.54	37.60	-37.33	20.31	0.20	413723.97	625928.71	N 32° 8' 13.59" W 104° 33.14"	
	3543.00	1.10	86.74	3541.51	37.47	-37.17	22.32	0.25	413723.13	625931.72	N 32° 8' 13.59" W 104° 33.11"	
	3637.00	1.19	82.93	3635.50	37.33	-37.00	24.19	0.13	413723.30	625933.58	N 32° 8' 13.59" W 104° 33.07"	
	3731.00	1.10	87.27	3729.48	37.19	-36.84	26.06	0.13	413723.46	625935.46	N 32° 8' 13.59" W 104° 33.07"	
	3823.00	0.85	93.79	3821.48	37.22	-36.84	27.65	0.27	413723.40	625937.04	N 32° 8' 13.59" W 104° 33.05"	
	3920.00	1.10	100.09	3918.45	37.45	-37.09	29.31	0.25	413723.25	625938.70	N 32° 8' 13.59" W 104° 33.03"	
	4013.00	0.80	96.39	4011.44	37.70	-37.29	30.83	0.33	413723.02	625940.23	N 32° 8' 13.59" W 104° 33.01"	
	4107.00	0.89	103.68	4105.43	37.97	-37.53	32.18	0.14	413722.77	625941.58	N 32° 8' 13.59" W 104° 33.00"	
	4204.00	0.89	109.51	4202.41	38.41	-37.96	33.61	0.09	413722.54	625943.01	N 32° 8' 13.59" W 104° 32.98"	
	4298.00	0.88	125.56	4297.40	39.10	-38.63	34.69	0.26	413721.57	625944.29	N 32° 8' 13.58" W 104° 32.97"	
	4393.00	0.71	122.35	4391.39	39.85	-39.36	35.97	0.19	413720.94	625945.36	N 32° 8' 13.57" W 104° 32.95"	
	4488.00	0.60	126.05	4486.39	40.57	-40.07	37.00	0.11	413720.24	625946.43	N 32° 8' 13.56" W 104° 32.94"	
	4577.00	0.71	128.38	4575.37	42.10	-41.57	38.99	0.05	413719.73	625948.38	N 32° 8' 13.55" W 104° 32.92"	
	4772.00	0.62	142.62	4770.36	42.88	-42.34	39.78	0.20	413717.98	625949.16	N 32° 8' 13.54" W 104° 32.91"	
	4866.00	0.71	154.56	4864.38	43.82	-43.27	40.32	0.18	413717.03	625949.72	N 32° 8' 13.53" W 104° 32.90"	
	4959.00	0.62	158.63	4957.35	44.81	-44.26	40.77	0.10	413716.05	625950.16	N 32° 8' 13.52" W 104° 32.90"	
	5056.00	0.71	154.25	5054.34	45.83	-45.38	41.23	0.10	413715.00	625950.63	N 32° 8' 13.51" W 104° 32.88"	
	5151.00	0.80	139.31	5149.34	46.88	-46.31	41.92	0.23	413713.99	625951.32	N 32° 8' 13.50" W 104° 32.86"	
	5246.00	0.80	148.32	5244.33	47.94	-47.37	42.72	0.10	413712.84	625952.12	N 32° 8' 13.49" W 104° 32.85"	
	5339.00	1.02	142.22	5337.31	49.15	-48.56	43.59	0.25	413711.74	625952.99	N 32° 8' 13.48" W 104° 32.87"	
	5434.00	1.02	150.95	5432.30	50.57	-49.97	44.52	0.16	413710.24	625953.92	N 32° 8' 13.46" W 104° 32.85"	
	5527.00	0.85	163.45	5525.29	52.00	-51.39	45.06	0.34	413708.91	625954.46	N 32° 8' 13.45" W 104° 32.85"	
	5625.00	1.02	176.11	5623.27	53.81	-53.00	45.27	0.19	413707.41	625954.97	N 32° 8' 13.43" W 104° 32.85"	
	5719.00	1.02	176.26	5717.26	55.28	-54.87	45.49	0.09	413706.64	625955.78	N 32° 8' 13.42" W 104° 32.84"	
	5813.00	1.02	180.09	5811.24	56.95	-56.34	45.44	0.07	413705.86	625956.84	N 32° 8' 13.40" W 104° 32.84"	
	5907.00	1.19	189.84	5905.23	58.75	-58.14	45.28	0.27	413702.47	625958.07	N 32° 8' 13.38" W 104° 32.85"	
	6002.00	1.33	183.32	6000.20	60.82	-60.21	45.01	0.18	413700.10	625958.40	N 32° 8' 13.36" W 104° 32.85"	

Drawing Offset 2.7:104.10

...ST01 Bonhold-Cramer Riverbed 14 Federal 82th NWD 10734ft to 1523ft

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Comments	MD	Incl	Azim Grid	TVD	VSEC	NS	EW	OLS	Northng	Eastng	Latitude	Longitude
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(N 32 E)	(W 104 33.55 E)
	6098.50	0.88	178.22	6098.50	62.60	-62.06	44.93	0.19	41369.35	625954.32	N 32 E 13.34 W 104 33.55	
	6191.00	0.71	171.85	6191.18	63.97	-63.37	45.03	0.20	41369.84	625954.32	N 32 E 13.34 W 104 33.55	
	6287.00	0.71	178.88	6285.17	65.13	-64.53	45.13	0.09	41369.76	625954.52	N 32 E 13.32 W 104 33.55	
	6391.00	0.71	170.86	6379.18	66.29	-65.69	45.23	0.11	41369.42	625954.53	N 32 E 13.31 W 104 33.55	
	6475.00	0.80	56.47	6473.16	66.51	-65.90	45.87	1.35	41369.41	625955.27	N 32 E 13.31 W 104 33.54	
	6570.00	1.19	48.36	6568.14	65.51	-64.87	47.16	0.44	41369.50	625956.56	N 32 E 13.32 W 104 33.52	
	6664.00	1.41	44.83	6662.12	64.06	-63.41	48.71	0.25	41369.80	625958.10	N 32 E 13.33 W 104 33.51	
	6760.00	1.33	27.47	6758.09	62.25	-61.50	50.05	0.44	41369.75	625959.43	N 32 E 13.35 W 104 33.59	
	6855.00	0.88	45.93	6853.07	60.78	-60.09	51.39	0.60	41370.21	625960.48	N 32 E 13.36 W 104 33.57	
	6949.00	0.80	303.07	6947.07	59.93	-59.23	51.39	1.40	41370.07	625960.43	N 32 E 13.37 W 104 33.58	
	7044.00	1.10	268.34	7042.06	59.57	-58.80	44.38	0.67	41370.11	625961.98	N 32 E 13.38 W 104 33.50	
	7138.00	0.71	302.36	7136.04	59.26	-58.51	44.38	0.99	41370.69	625957.29	N 32 E 13.38 W 104 33.51	
	7233.00	0.80	305.27	7231.04	58.55	-57.81	47.13	2.10	41370.39	625958.35	N 32 E 13.39 W 104 33.52	
	7327.00	1.19	291.81	7325.02	57.79	-57.18	45.71	0.48	41370.13	625955.11	N 32 E 13.39 W 104 33.54	
	7422.00	1.19	295.93	7420.05	56.97	-56.38	42.91	0.59	41370.92	625953.30	N 32 E 13.40 W 104 33.56	
	7486.00	1.33	298.32	7483.93	56.34	-55.76	42.91	0.22	41370.54	625952.04	N 32 E 13.41 W 104 33.58	
	7510.00	2.03	267.51	7507.93	54.86	-54.26	36.56	0.60	41370.84	625948.65	N 32 E 13.42 W 104 33.52	
	7704.00	2.43	284.51	7701.85	53.94	-53.46	35.74	0.44	41370.64	625943.14	N 32 E 13.43 W 104 33.56	
	7798.00	2.43	267.46	7795.78	53.47	-53.05	31.78	0.76	41370.26	625941.18	N 32 E 13.43 W 104 33.60	
	7886.00	1.59	262.44	7883.72	53.70	-53.22	28.79	0.88	41370.99	625937.79	N 32 E 13.43 W 104 33.64	
	7980.00	0.49	255.12	7987.70	53.95	-53.59	28.71	1.18	41370.71	625936.11	N 32 E 13.43 W 104 33.68	
	8084.00	0.31	109.43	8081.70	54.11	-53.76	28.36	0.82	41370.53	625935.96	N 32 E 13.43 W 104 33.68	
	8179.00	0.31	118.73	8176.70	54.35	-53.99	27.03	0.05	41370.32	625936.43	N 32 E 13.42 W 104 33.68	
	8274.00	0.22	188.89	8271.70	54.85	-54.29	27.20	0.36	41370.62	625938.60	N 32 E 13.42 W 104 33.68	
	8369.00	0.71	233.97	8366.69	55.16	-54.61	26.87	0.58	41370.50	625936.07	N 32 E 13.42 W 104 33.68	
	8457.00	1.19	228.24	8454.67	57.12	-56.79	24.27	0.28	41370.51	625933.67	N 32 E 13.40 W 104 33.69	
	8552.00	2.03	212.80	8549.83	58.16	-58.86	22.63	0.99	41370.44	625922.02	N 32 E 13.38 W 104 33.61	
	8748.00	2.30	208.10	8745.56	62.20	-61.92	20.83	0.35	413698.38	625930.23	N 32 E 13.35 W 104 33.61	
	8824.00	2.63	210.81	8821.48	65.21	-64.96	19.11	0.69	413695.34	625928.51	N 32 E 13.32 W 104 33.61	
	8935.00	2.63	210.00	8932.35	69.81	-69.69	16.35	0.03	413680.61	625925.75	N 32 E 13.27 W 104 33.61	
	9031.00	2.52	197.84	9028.24	73.85	-73.76	14.35	0.71	413686.54	625923.84	N 32 E 13.23 W 104 33.60	
	9126.00	2.30	191.53	9123.16	77.80	-77.53	13.55	0.34	413682.68	625922.95	N 32 E 13.19 W 104 33.62	
	9219.00	2.43	191.05	9216.08	81.56	-81.39	12.80	0.14	413678.92	625922.20	N 32 E 13.15 W 104 33.62	
	9315.00	2.30	190.12	9312.00	85.44	-85.28	12.07	0.14	413675.02	625921.47	N 32 E 13.12 W 104 33.62	
	9409.00	2.21	190.83	9406.93	89.67	-89.52	11.40	0.10	413671.39	625920.80	N 32 E 13.08 W 104 33.62	
	9505.00	2.30	190.34	9501.85	92.77	-92.63	10.71	0.10	413667.87	625920.11	N 32 E 13.04 W 104 33.62	
	9597.00	2.43	187.43	9593.77	96.51	-96.38	10.12	0.19	413663.82	625919.52	N 32 E 13.01 W 104 33.62	
	9694.00	2.21	195.84	9690.69	100.39	-100.27	9.55	0.24	413660.04	625918.94	N 32 E 12.97 W 104 33.62	
	9789.00	2.52	190.83	9785.61	104.24	-104.12	8.85	0.33	413656.18	625918.25	N 32 E 12.93 W 104 33.62	
	9884.00	2.52	190.07	9880.52	108.28	-108.18	7.88	0.24	413652.13	625917.27	N 32 E 12.89 W 104 33.62	
	9978.00	2.30	212.88	9974.44	111.83	-111.76	6.29	0.78	413648.55	625916.68	N 32 E 12.85 W 104 33.60	
	10073.00	2.43	238.86	10069.36	114.44	-114.40	3.53	1.14	413643.91	625912.83	N 32 E 12.83 W 104 33.63	
Final Extreme Survey	10152.00	2.52	254.02	10149.29	115.76	-115.76	0.39	0.82	413644.55	625908.79	N 32 E 12.81 W 104 33.63	
	10231.00	1.66	240.00	10227.24	116.78	-116.80	-2.24	1.27	413643.51	625907.16	N 32 E 12.80 W 104 33.64	
	10282.00	3.65	190.32	10278.20	117.95	-118.00	-2.80	2.26	413642.31	625906.80	N 32 E 12.78 W 104 33.64	
	10294.00	7.67	187.40	10290.04	121.08	-121.12	-3.26	1.59	413639.19	625906.14	N 32 E 12.76 W 104 33.64	
	10321.00	10.27	187.74	10319.67	125.60	-125.75	-3.88	5.67	413634.96	625905.52	N 32 E 12.72 W 104 33.62	

Drilling Office 2.7.1043.0

...ST01 Borehole-Cinacex Rhetend 14 Federal #2H MWMD 1073411 to 15325E

Comments	MD	Incl	Azim Grid	TVD	VSEC	NS	EW	DLS	Northing	Easting	Latitude	Longitude
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(°)
	10357.00	14.71	186.88	10351.88	132.75	-132.83	-4.78	13.47	413627.48	625804.62	N 32 8 12.63 W 104 3 38.43	
	10368.00	18.82	183.86	10381.58	141.84	-141.73	-5.59	13.55	413618.58	625803.81	N 32 8 12.56 W 104 3 38.44	
	10420.00	23.14	181.25	10411.43	153.08	-153.17	-6.07	13.81	413607.14	625803.33	N 32 8 12.44 W 104 3 38.45	
	10451.00	28.38	177.91	10438.58	168.05	-168.15	-5.95	11.38	413594.16	625803.45	N 32 8 12.32 W 104 3 38.45	
	10483.00	30.86	174.99	10468.00	180.73	-180.81	-5.03	7.34	413578.50	625804.37	N 32 8 12.17 W 104 3 38.43	
	10512.00	30.86	175.30	10491.22	195.01	-195.08	-3.82	8.81	413565.24	625803.58	N 32 8 12.03 W 104 3 38.42	
	10545.00	34.11	175.10	10521.05	212.69	-212.74	-2.34	9.85	413547.58	625807.08	N 32 8 11.85 W 104 3 38.40	
	10577.00	39.30	173.91	10548.87	231.52	-231.55	-0.52	13.28	413528.77	625808.88	N 32 8 11.67 W 104 3 38.38	
	10607.00	41.96	175.24	10588.80	250.79	-250.79	1.30	12.53	413509.53	625810.70	N 32 8 11.48 W 104 3 38.36	
	10640.00	45.77	176.09	10632.58	273.61	-273.59	0.02	11.68	413480.73	625812.42	N 32 8 11.25 W 104 3 38.34	
	10672.00	49.83	177.86	10615.08	297.29	-297.28	4.24	13.40	413463.07	625813.64	N 32 8 11.02 W 104 3 38.33	
	10701.00	53.42	178.22	10635.08	320.02	-319.98	5.00	12.40	413440.35	625814.40	N 32 8 10.79 W 104 3 38.32	
	10734.00	57.12	178.26	10651.88	347.13	-347.08	5.83	11.21	413413.25	625815.23	N 32 8 10.52 W 104 3 38.31	
	10829.00	67.01	188.70	10696.43	430.53	-430.56	0.40	14.22	413329.77	625908.80	N 32 8 9.70 W 104 3 38.38	
	10925.00	75.02	184.76	10727.97	521.38	-521.57	-10.26	8.11	413238.77	625899.14	N 32 8 8.80 W 104 3 38.51	
	10958.00	76.38	182.70	10735.38	550.36	-550.58	-12.15	8.05	413209.77	625897.25	N 32 8 8.51 W 104 3 38.53	
	10989.00	77.92	182.10	10742.72	582.48	-582.72	-13.50	4.99	413177.63	625885.81	N 32 8 8.18 W 104 3 38.55	
	11021.00	80.02	182.02	10748.84	613.85	-614.11	-14.83	5.57	413146.25	625884.78	N 32 8 7.88 W 104 3 38.55	
	11051.00	81.68	181.69	10753.61	643.44	-643.71	-15.58	5.84	413115.63	625883.83	N 32 8 7.58 W 104 3 38.57	
	11082.00	83.28	182.82	10762.01	678.88	-679.21	-16.35	6.97	413081.15	625880.05	N 32 8 7.31 W 104 3 38.59	
	11251.00	90.45	189.49	10783.18	842.05	-842.54	-30.49	6.74	412917.83	625878.91	N 32 8 5.62 W 104 3 38.75	
	11348.00	81.03	180.73	10781.93	935.33	-935.06	-47.17	1.44	412824.22	625862.24	N 32 8 4.70 W 104 3 38.95	
	11441.00	80.83	188.72	10780.39	1028.72	-1028.67	-83.21	2.13	412730.71	625846.19	N 32 8 3.77 W 104 3 37.14	
	11536.00	80.55	186.84	10759.25	1122.85	-1123.79	-76.07	2.00	412638.54	625834.34	N 32 8 2.84 W 104 3 37.29	
	11631.00	90.65	183.06	10758.05	1217.15	-1218.41	-84.27	3.98	412541.86	625825.14	N 32 8 1.91 W 104 3 37.62	
	11725.00	90.00	183.55	10757.72	1310.91	-1312.25	-89.68	0.87	412448.16	625819.72	N 32 8 0.98 W 104 3 37.45	
	11820.00	89.90	183.26	10757.80	1405.68	-1407.08	-95.34	0.30	412353.34	625814.08	N 32 8 0.04 W 104 3 37.52	
	11915.00	89.97	182.20	10757.91	1500.48	-1501.97	-98.89	1.14	412259.45	625808.52	N 32 7 59.10 W 104 3 37.58	
	12010.00	90.55	180.20	10757.48	1595.41	-1596.95	-101.87	2.18	412163.59	625807.33	N 32 7 56.16 W 104 3 37.60	
	12105.00	91.17	180.82	10756.05	1690.36	-1691.83	-102.72	0.92	412068.51	625806.89	N 32 7 57.22 W 104 3 37.62	
	12200.00	89.83	180.47	10755.72	1785.34	-1786.92	-103.79	1.46	411973.33	625805.82	N 32 7 56.28 W 104 3 37.63	
	12295.00	90.65	180.71	10754.82	1880.31	-1881.81	-104.77	0.90	411878.55	625804.64	N 32 7 55.34 W 104 3 37.64	
	12390.00	90.10	178.32	10754.70	1975.28	-1976.86	-102.31	1.66	411783.91	625807.10	N 32 7 54.40 W 104 3 37.62	
	12484.00	80.10	182.48	10754.04	2068.65	-2070.66	-90.69	7.28	411690.40	625818.71	N 32 7 53.46 W 104 3 37.49	
	12579.00	87.88	186.58	10754.86	2161.31	-2163.38	-71.49	3.99	411597.50	625838.41	N 32 7 52.56 W 104 3 37.28	
	12674.00	89.55	172.16	10754.21	2255.34	-2256.28	-62.49	6.20	411504.21	625859.91	N 32 7 51.63 W 104 3 37.05	
	12769.00	91.31	174.07	10753.50	2349.79	-2350.58	-42.10	2.73	411409.91	625887.30	N 32 7 50.70 W 104 3 36.93	
	12864.00	91.62	175.21	10754.82	2444.45	-2445.13	-33.23	1.36	411315.38	625876.17	N 32 7 49.77 W 104 3 36.83	
	12959.00	90.11	176.11	10753.87	2539.25	-2539.83	-26.04	1.94	411220.88	625883.36	N 32 7 48.83 W 104 3 36.75	
	13054.00	91.24	176.98	10753.89	2634.13	-2634.85	-20.32	1.34	411125.87	625888.08	N 32 7 47.89 W 104 3 36.68	
	13149.00	91.20	176.77	10749.68	2729.03	-2731.48	-15.14	0.22	411031.04	625894.26	N 32 7 46.95 W 104 3 36.63	
	13244.00	90.52	178.56	10748.24	2823.86	-2824.38	-11.27	2.02	410936.14	625898.13	N 32 7 46.01 W 104 3 36.59	
	13339.00	89.28	178.15	10748.40	2917.97	-2918.35	-8.50	1.39	410842.19	625900.82	N 32 7 45.08 W 104 3 36.56	
	13434.00	89.42	177.93	10748.81	3012.87	-3013.20	-3.35	2.78	410747.36	625905.05	N 32 7 44.14 W 104 3 36.50	
	13529.00	89.44	177.66	10748.53	3107.78	-3108.04	1.37	3.31	410652.58	625911.27	N 32 7 43.20 W 104 3 36.44	
	13623.00	89.97	178.77	10747.43	3202.76	-3202.99	4.42	1.39	410557.58	625913.02	N 32 7 42.26 W 104 3 36.41	
	13718.00	91.14	179.69	10746.51	3297.75	-3297.98	5.69	1.57	410462.60	625915.09	N 32 7 41.32 W 104 3 36.40	

Tie-in ST01

Comments	MD (ft)	Incl (°)	Azimuth (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Northing (ftUS)	Eastings (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	13613.00	91.20	180.53	10744.57	3387.72	-3387.72	5.51	0.89	410367.63	625911.91	N 32 7 40.38 W 104 3 36.41	
	13608.00	91.82	183.53	10742.23	3487.57	-3487.56	2.15	3.19	410372.74	625911.55	N 32 7 39.45 W 104 3 36.45	
	14003.00	90.83	184.88	10740.20	3582.18	-3582.58	-4.82	1.65	410178.02	625904.58	N 32 7 38.51 W 104 3 36.53	
	14098.00	91.24	194.28	10738.49	3676.75	-3677.26	-12.38	0.78	410083.35	625887.02	N 32 7 37.57 W 104 3 36.62	
	14183.00	91.62	193.02	10736.11	3771.44	-3772.04	-18.41	1.36	409988.58	625890.99	N 32 7 36.83 W 104 3 36.70	
	14288.00	91.00	180.55	10733.94	3868.32	-3868.96	-21.21	2.88	409893.87	625888.20	N 32 7 35.70 W 104 3 36.73	
	14382.00	91.27	178.48	10731.08	3960.29	-3960.93	-20.25	2.01	409799.70	625885.16	N 32 7 34.77 W 104 3 36.72	
	14477.00	91.41	177.03	10728.66	4055.23	-4055.83	-16.53	1.53	409704.81	625882.88	N 32 7 33.83 W 104 3 36.68	
	14572.00	90.58	178.25	10726.21	4150.12	-4150.85	-10.88	1.20	409610.00	625888.44	N 32 7 32.89 W 104 3 36.82	
	14667.00	90.52	177.70	10723.30	4245.04	-4245.51	-5.95	1.53	409515.14	625903.46	N 32 7 31.95 W 104 3 36.57	
	14762.00	91.68	178.78	10725.47	4340.01	-4340.47	-3.84	2.49	409420.20	625905.58	N 32 7 31.01 W 104 3 36.54	
	14857.00	90.31	180.85	10723.82	4434.98	-4435.45	-4.55	1.84	409325.23	625905.35	N 32 7 30.07 W 104 3 36.55	
	14952.00	91.20	181.83	10722.57	4529.83	-4530.43	-5.90	0.96	409230.38	625903.50	N 32 7 29.13 W 104 3 36.57	
	15047.00	90.65	178.33	10721.04	4624.88	-4625.36	-3.72	4.98	409135.33	625903.88	N 32 7 28.19 W 104 3 36.55	
	15237.00	91.00	177.19	10718.30	4814.69	-4815.04	7.02	0.49	408945.87	625916.42	N 32 7 26.31 W 104 3 36.43	
Final Survey	15280.00	90.41	177.25	10717.77	4857.56	-4857.88	9.11	1.38	408802.73	625916.51	N 32 7 25.88 W 104 3 36.41	
Projection to Bit	15325.00	90.41	177.25	10717.45	4902.83	-4902.93	11.27	0.00	408657.79	625920.68	N 32 7 25.44 W 104 3 36.38	

Survey Type: Def Survey

Survey Error Model: ISCVSA 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 Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	18.050	Act Stps	30.000	SLB_MWD-POOR-Depth Only	Original Borehole / Cimarex Riverbend 14 Federal #2H XEM +
	1	18.000	10153.000	Act Stps	30.000	SLB_MWD-POOR	Original Borehole / Cimarex Riverbend 14 Federal #2H XEM +
	1	10153.000	10734.000	Act Stps	30.000	SLB_MWD-STD	Original Borehole / Cimarex Riverbend 14 Federal #2H XEM +
	1	10734.000	15280.000	Act Stps	30.000	SLB_MWD-STD	ST01 Borehole / Cimarex Riverbend 14 Federal #2H MWD
	1	15280.000	15325.000	Act Stps	30.000	SLB_BUND-TREND	ST01 Borehole / Cimarex Riverbend 14 Federal #2H MWD