

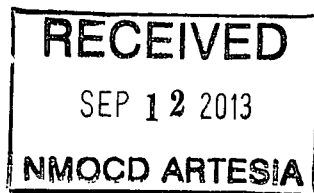


A Schlumberger Company

May 28, 2013

30-015-4115

Cimarex



Re: Client Cimarex
Well Hackberry 23 Federal #1H
Rig Cactus 115
County Eddy County, NM

Job# 13MLD0162

Please find enclosed, a copy of the End of Well Report (EOW) provided by our Directional Drilling Services from 03/06/2013 through 04/07/2013. This report consists of color planned vs. actual well drawings, proposed and actual surveys, morning reports, BHAs, and a Pathfinder office support personnel sheet for the above referenced well.

Should your office require further information, please feel free to contact your sales representative, Ryan Hempton or me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ryan J. Schneider".

Ryan J. Schneider
Well Planner



Drawn By: R. Schneider
Date Created: March 24, 2013 04:27:27 PM
Checked By:
Checked Date:
Approved By:
Approved Date:



Cimarex Hackberry 23 Federal #1H Gyro 0ft to 9925ft MD

(Def Survey)

Report Date: April 07, 2013 - 10:13 AM
 Client: Cimarex
 Field: NM Eddy County (NAD 83)
 Structure / Slot: Cactus 115 / Cimarex Hackberry 23 Federal #1H
 Well: Cimarex Hackberry 23 Federal #1H
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: Cimarex Hackberry 23 Federal #1H Gyro 0ft to 9925ft MD
 Survey Date: March 07, 2013
 Tort / AHD / DDI / ERD Ratio: 33.966 ° / 180.814 ft / 3.788 / 0.018
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
 Location Lat / Long: N 32° 38' 51.51284", W 103° 56' 0.63345"
 Location Grid N/E Y/X: N 599574.900 RUS, E 664399.500 RUS
 CRS Grid Convergence Angle: 0.2157 °
 Grid Scale Factor: 0.99992643

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 269.910 ° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: KB
 TVD Reference Elevation: 3273.000 ft above
 Seabed / Ground Elevation: 3255.000 ft above
 Magnetic Declination: 7.681 °
 Total Gravity Field Strength: 998.5363mgn (9.80665 Based)
 Total Magnetic Field Strength: 48636.364 nT
 Magnetic Dip Angle: 60.435 °
 Declination Date: March 07, 2013
 Magnetic Declination Model: BGGM 2012
 North Reference: Grid North
 Grid Convergence Used: 0.2157 °
 Total Corr Mag North->Grid: 7.4653 °
 North:
 Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
SHL Hackberry 23 Fed #1H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	254.77M
	100.00	0.12	254.77	100.00	0.10	-0.03	-0.10	0.10	254.77	0.12	270.89M
	200.00	0.75	270.89	200.00	0.86	-0.04	-0.86	0.86	267.00	0.64	279.98M
	300.00	0.70	279.98	299.99	2.11	0.07	-2.11	2.11	271.93	0.13	225.27M
	400.00	0.88	225.27	399.98	3.26	-0.36	-3.26	3.28	263.64	0.74	208.4M
	500.00	0.96	208.40	499.97	4.21	-1.64	-4.20	4.51	248.68	0.28	215.42M
	600.00	0.87	215.42	599.95	5.05	-3.00	-5.04	5.87	239.28	0.14	219.32M
	624.00	0.83	219.32	623.95	5.26	-3.28	-5.26	6.20	238.05	0.29	224.43M
	719.10	0.56	224.43	719.05	6.03	-4.14	-6.02	7.31	235.46	0.29	92.71M
	814.30	0.06	92.71	814.24	6.30	-4.48	-6.30	7.73	234.57	0.63	54.87M
	909.40	0.74	54.87	909.34	5.75	-4.13	-5.74	7.07	234.30	0.73	63.79M
	1004.60	1.62	63.79	1004.52	4.04	-3.18	-4.03	5.14	231.75	0.94	63.97M
	1099.80	2.33	63.97	1099.66	1.09	-1.74	-1.09	2.05	212.06	0.75	64.62M
	1194.90	2.70	64.62	1194.67	-2.67	0.07	2.67	2.67	88.45	0.39	64.78M
	1290.10	2.45	64.78	1289.77	-6.54	1.90	6.54	6.81	73.80	0.26	60.02M
	1385.20	2.21	60.02	1384.80	-9.97	3.68	9.97	10.63	69.72	0.32	56.49M
	1480.40	2.14	56.49	1479.93	-13.05	5.58	13.04	14.18	66.83	0.16	43.91M
	1575.60	1.52	43.91	1575.08	-15.41	7.47	15.40	17.11	64.11	0.77	39.29M
	1670.70	1.02	39.29	1670.16	-16.82	9.04	16.81	19.08	61.74	0.54	36.62M
	1765.90	0.66	36.62	1765.34	-17.69	10.13	17.67	20.67	60.17	0.38	80.59M
	1861.00	0.65	80.59	1860.44	-18.55	10.66	18.53	21.38	60.09	0.52	49.1M
	1956.20	0.50	49.10	1955.63	-19.39	11.02	19.38	22.29	60.37	0.36	2.69M
	2051.30	0.37	2.69	2050.73	-19.72	11.60	19.71	22.87	59.52	0.38	24.81M
	2146.50	0.28	24.81	2145.93	-19.84	12.12	19.82	23.23	58.56	0.16	356.07M
	2241.70	0.29	356.07	2241.13	-19.92	12.57	19.90	23.54	57.72	0.15	334.6M
	2336.80	0.77	334.60	2336.23	-19.63	13.39	19.61	23.74	55.68	0.54	270.96M
	2432.00	0.40	270.96	2431.42	-19.02	13.97	19.00	23.58	53.68	0.73	280.58M
	2527.20	0.62	280.58	2526.62	-18.18	14.07	18.16	22.97	52.24	0.25	206.66M
	2622.30	0.27	206.66	2621.71	-17.58	13.96	17.56	22.43	51.50	0.63	216.57M
	2717.50	0.84	216.57	2716.91	-17.06	13.20	17.04	21.56	52.23	0.60	207.73M
	2812.60	0.71	207.73	2812.00	-16.37	12.12	16.35	20.35	53.45	0.19	204.98M
	2907.80	0.73	204.98	2907.19	-15.84	11.05	15.82	19.30	55.07	0.04	204.26M
	3002.90	0.69	204.26	3002.29	-15.34	9.98	15.33	18.29	56.94	0.04	210.71M
	3098.10	0.77	210.71	3097.48	-14.78	8.91	14.77	17.24	58.91	0.12	215.84M
	3193.30	0.73	215.84	3192.67	-14.10	7.86	14.08	16.13	60.82	0.08	193.59M
	3288.40	0.61	193.59	3287.76	-13.62	6.88	13.61	15.25	63.18	0.30	140.43M
	3383.60	0.72	140.43	3382.96	-13.88	5.93	13.87	15.09	66.87	0.63	134.73M
	3478.80	0.75	134.73	3478.15	-14.70	5.03	14.70	15.53	71.11	0.08	132.9M
	3573.90	0.75	132.90	3573.24	-15.60	4.17	15.59	16.14	75.04	0.03	126.63M
	3669.10	0.72	126.63	3668.43	-16.54	3.38	16.53	16.87	78.43	0.09	123.11M
	3764.20	0.74	123.11	3763.53	-17.53	2.69	17.53	17.73	81.26	0.05	126.36M
	3859.40	0.73	126.36	3858.72	-18.53	2.00	18.53	18.64	83.85	0.05	136.5M
	3954.60	0.64	136.50	3953.91	-19.38	1.25	19.38	19.42	86.30	0.16	143.87M
	4049.70	0.65	143.87	4049.01	-20.07	0.43	20.07	20.07	88.77	0.09	167.3M
	4144.90	0.42	167.30	4144.20	-20.46	-0.35	20.46	20.46	90.97	0.33	192.38M
	4240.00	0.43	192.38	4239.30	-20.46	-1.03	20.46	20.49	92.89	0.19	226.83M
	4335.20	0.40	226.83	4334.50	-20.14	-1.61	20.14	20.21	94.57	0.26	288.72M
	4430.40	0.61	288.72	4429.69	-19.42	-1.67	19.42	19.49	94.93	0.58	281.25M
	4525.50	0.54	281.25	4524.79	-18.50	-1.42	18.50	18.56	94.40	0.11	269.54M
	4620.70	0.45	269.54	4619.99	-17.69	-1.34	17.69	17.74	94.33	0.14	273.58M
	4715.80	0.42	273.58	4715.08	-16.96	-1.32	16.97	17.02	94.45	0.05	284.1M
	4811.00	0.40	284.10	4810.28	-16.29	-1.22	16.30	16.34	94.28	0.08	278.09M
	4906.10	0.41	278.09	4905.38	-15.64	-1.09	15.64	15.67	93.99	0.05	283.07M
	5001.30	0.41	283.07	5000.58	-14.97	-0.97	14.97	15.00	93.69	0.04	279.37M
	5096.50	0.52	279.37	5095.77	-14.21	-0.82	14.21	14.23	93.29	0.12	284.45M
	5191.60	0.61	284.45	5190.87	-13.29	-0.62	13.29	13.31	92.68	0.11	287.29M
	5286.80	0.70	287.29	5286.06	-12.25	-0.32	12.25	12.25	91.51	0.10	290.31M

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
	5381.90	0.82	290.31	5381.15	-11.06	0.09	11.06	11.06	89.55	0.13	294.97M
	5477.10	0.91	294.97	5476.34	-9.73	0.64	9.73	9.75	86.22	0.12	299.64M
	5572.30	1.00	299.64	5571.53	-8.33	1.37	8.32	8.44	80.64	0.12	302.58M
	5667.40	1.10	302.58	5666.61	-6.84	2.27	6.83	7.20	71.59	0.12	306.43M
	5762.60	1.19	306.43	5761.79	-5.27	3.35	5.27	6.24	57.52	0.12	305.62M
	5857.80	1.20	305.62	5856.97	-3.67	4.52	3.66	5.82	39.01	0.02	309.59M
	5952.90	1.32	309.59	5952.05	-2.02	5.80	2.01	6.14	19.10	0.16	313.37M
	6048.10	1.40	313.37	6047.22	-0.33	7.30	0.32	7.30	2.49	0.13	317.71M
	6143.20	1.47	317.71	6142.29	1.33	9.00	-1.35	9.10	351.48	0.14	323.43M
	6238.40	1.57	323.43	6237.46	2.93	10.95	-2.95	11.34	344.94	0.19	332.18M
	6333.60	1.49	332.18	6332.63	4.28	13.09	-4.30	13.78	341.81	0.26	334.5M
	6428.70	1.41	334.50	6427.70	5.36	15.24	-5.38	16.16	340.55	0.10	328.76M
	6523.90	1.39	328.76	6522.87	6.46	17.28	-6.48	18.46	339.43	0.15	331.39M
	6619.00	1.35	331.39	6617.94	7.59	19.25	-7.62	20.71	338.41	0.08	332.69M
	6714.20	1.36	332.69	6713.11	8.64	21.24	-8.67	22.94	337.79	0.03	328.36M
	6809.40	1.25	328.36	6808.29	9.70	23.13	-9.74	25.10	337.17	0.16	306.77M
	6904.50	0.77	306.77	6903.38	10.76	24.40	-10.79	26.68	336.13	0.64	293.75M
	6999.70	0.56	293.75	6998.57	11.69	24.97	-11.73	27.58	334.83	0.27	291.82M
	7094.80	0.71	291.82	7093.66	12.66	25.37	-12.70	28.37	333.40	0.16	276.82M
	7190.00	1.11	276.82	7188.85	14.13	25.70	-14.17	29.35	331.13	0.49	278.42M
	7285.10	1.63	278.42	7283.92	16.38	26.01	-16.42	30.76	327.73	0.55	285.68M
	7380.30	1.69	285.68	7379.08	19.07	26.59	-19.11	32.74	324.29	0.23	262.67M
	7475.50	2.03	262.67	7474.23	22.09	26.75	-22.13	34.72	320.39	0.85	250.37M
	7570.60	1.86	250.37	7569.28	25.22	26.02	-25.26	36.26	315.85	0.47	250.5M
	7665.80	1.77	250.50	7664.43	28.06	25.01	-28.10	37.62	311.67	0.09	242.82M
	7760.90	1.41	242.82	7759.50	30.49	23.98	-30.53	38.82	308.15	0.44	225.56M
	7856.10	1.27	225.56	7854.67	32.29	22.71	-32.32	39.50	305.09	0.45	214.71M
	7951.30	1.89	214.71	7949.83	33.94	20.68	-33.97	39.77	301.33	0.72	204.85M
	8046.40	2.83	204.85	8044.85	35.82	17.26	-35.85	39.79	295.71	1.07	169.44M
	8141.60	3.73	169.44	8139.90	36.25	12.08	-36.27	38.23	288.42	2.28	160.3M
	8236.80	2.88	160.30	8234.95	34.88	6.79	-34.89	35.55	281.01	1.05	176.22M
	8331.90	2.26	176.22	8329.95	33.96	2.67	-33.97	34.07	274.49	0.99	193.77M
	8427.10	2.31	193.77	8425.08	34.30	-1.07	-34.30	34.31	268.21	0.73	193.1M
	8522.20	2.17	193.10	8520.10	35.17	-4.69	-35.16	35.47	262.41	0.15	188.63M
	8617.40	2.21	188.63	8615.23	35.86	-8.26	-35.85	36.78	257.03	0.18	196.47M
	8712.50	1.66	196.47	8710.28	36.53	-11.39	-36.51	38.25	252.67	0.64	181.8M
	8807.70	0.78	181.80	8805.46	36.94	-13.36	-36.92	39.27	250.11	0.97	154.96M
	8902.90	0.76	154.96	8900.65	36.70	-14.58	-36.68	39.47	248.32	0.38	179M
	8998.00	0.68	179.00	8995.74	36.42	-15.72	-36.40	39.65	246.65	0.33	203.6M
	9093.20	1.29	203.60	9090.93	36.85	-17.26	-36.82	40.66	244.88	0.77	200.01M
	9188.40	1.04	200.01	9186.11	37.57	-19.06	-37.54	42.10	243.09	0.27	195.03M
	9283.50	0.72	195.03	9281.20	38.03	-20.44	-37.99	43.14	241.72	0.35	200.2M
	9378.70	0.73	200.20	9376.39	38.39	-21.59	-38.36	44.02	240.63	0.07	202.89M
	9473.80	0.80	202.89	9471.48	38.86	-22.77	-38.83	45.01	239.61	0.08	204.09M
	9569.00	0.65	204.09	9566.67	39.34	-23.88	-39.30	45.99	238.72	0.16	171.03M
	9664.10	0.17	171.03	9661.77	39.54	-24.51	-39.50	46.49	238.18	0.54	188.42M
	9759.30	0.42	188.42	9756.97	39.57	-24.99	-39.53	46.77	237.70	0.28	197.43M
	9854.50	0.54	197.43	9852.17	39.76	-25.77	-39.72	47.34	237.03	0.15	202.26M
Final Gyro	9924.50	0.58	202.26	9922.16	39.99	-26.41	-39.95	47.89	236.53	0.09	

Survey Type: Def Survey

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

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	18.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Cimarex Hackberry 23 Federal #1H Gyro 0ft to 9925ft MD
	18.000	9924.500	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Cimarex Hackberry 23 Federal #1H Gyro



Cimarex Hackberry 23 Federal #1H ST01 Gyro+MWD 7951ft to 9957ft MD

(Def Survey)

Report Date:	April 07, 2013 - 10:12 AM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	269.910 ° (Grid North)
Field:	NM Eddy County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cactus 115 / Cimarex Hackberry 23 Federal #1H	TVD Reference Datum:	RKB
Well:	Cimarex Hackberry 23 Federal #1H	TVD Reference Elevation:	3273.000 ft above
Borehole:	ST01	Seabed / Ground Elevation:	3255.000 ft above
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.679 °
Survey Name:	Cimarex Hackberry 23 Federal #1H ST01 Gyro+MWD 7951ft to 9957ft MD	Total Gravity Field Strength:	998.5363mgn (9.80665 Based)
Survey Date:	March 13, 2013	Total Magnetic Field Strength:	48634.255 nT
Tort / AHD / DDI / ERD Ratio:	141.075 ° / 1787.514 ft / 5.468 / 0.209	Magnetic Dip Angle:	60.435 °
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Declination Date:	March 13, 2013
Location Lat / Long:	N 32° 38' 51.51284", W 103° 56' 0.63345"	Magnetic Declination Model:	BGGM 2012
Location Grid N/E Y/X:	N 599574.900 ftUS, E 664399.500 ftUS	North Reference:	Grid North
CRS Grid Convergence Angle:	0.2157 °	Grid Convergence Used:	0.2157 °
Grid Scale Factor:	0.99992643	Total Corr Mag North->Grid North:	7.4634 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
SHL Hackberry 23 Fed #1H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	254.77M
	100.00	0.12	254.77	100.00	0.10	-0.03	-0.10	0.10	254.77	0.12	270.89M
	200.00	0.75	270.89	200.00	0.86	-0.04	-0.86	0.86	267.00	0.84	279.98M
	300.00	0.70	279.98	299.99	2.11	0.07	-2.11	2.11	271.93	0.13	225.27M
	400.00	0.88	225.27	399.98	3.26	-0.36	-3.26	3.28	263.64	0.74	208.4M
	500.00	0.96	208.40	499.97	4.21	-1.64	-4.20	4.51	248.68	0.28	215.42M
	600.00	0.87	215.42	599.95	5.05	-3.00	-5.04	5.87	239.28	0.14	219.32M
	624.00	0.83	219.32	623.95	5.26	-3.28	-5.26	6.20	238.05	0.29	224.43M
	719.10	0.56	224.43	719.05	6.03	-4.14	-6.02	7.31	235.46	0.29	92.71M
	814.30	0.06	92.71	814.24	6.30	-4.48	-6.30	7.73	234.57	0.63	54.87M
	909.40	0.74	54.87	909.34	5.75	-4.13	-5.74	7.07	234.30	0.73	63.79M
	1004.60	1.62	63.79	1004.52	4.04	-3.18	-4.03	5.14	231.75	0.94	63.97M
	1099.80	2.33	63.97	1099.66	1.09	-1.74	-1.09	2.05	212.06	0.75	64.62M
	1194.90	2.70	64.62	1194.67	-2.67	0.07	2.67	2.67	88.45	0.39	64.78M
	1290.10	2.45	64.78	1289.77	-6.54	1.90	6.54	6.81	73.80	0.26	60.02M
	1385.20	2.21	60.02	1384.80	-9.97	3.68	9.97	10.63	69.72	0.32	56.49M
	1480.40	2.14	56.49	1479.93	-13.05	5.58	13.04	14.18	66.83	0.16	43.91M
	1575.60	1.52	43.91	1575.08	-15.41	7.47	15.40	17.11	64.11	0.77	39.25M
	1670.70	1.02	39.29	1670.16	-16.82	9.04	16.81	19.08	61.74	0.54	36.62M
	1765.90	0.66	36.62	1765.34	-17.69	10.13	17.67	20.37	60.17	0.38	80.59M
	1861.00	0.65	80.59	1860.44	-18.55	10.66	18.53	21.38	60.09	0.52	49.1M
	1956.20	0.50	49.10	1955.63	-19.39	11.02	19.38	22.29	60.37	0.36	2.69M
	2051.30	0.37	2.69	2050.73	-19.72	11.60	19.71	22.87	59.52	0.38	24.81M
	2146.50	0.28	24.81	2145.93	-19.84	12.12	19.82	23.23	58.56	0.16	356.07M
	2241.70	0.29	356.07	2241.13	-19.92	12.57	19.90	23.54	57.72	0.15	334.6M
	2336.80	0.77	334.60	2336.23	-19.63	13.39	19.61	23.74	55.68	0.54	270.96M
	2432.00	0.40	270.96	2431.42	-19.02	13.97	19.00	23.58	53.68	0.73	280.58M
	2527.20	0.62	280.58	2526.62	-18.18	14.07	18.16	22.97	52.24	0.25	206.66M
	2622.30	0.27	206.66	2621.71	-17.58	13.96	17.56	22.43	51.50	0.63	216.57M
	2717.50	0.84	216.57	2716.91	-17.06	13.20	17.04	21.56	52.23	0.60	207.73M
	2812.60	0.71	207.73	2812.00	-16.37	12.12	16.35	20.35	53.45	0.19	204.98M
	2907.80	0.73	204.98	2907.19	-15.84	11.05	15.82	19.30	55.07	0.04	204.26M
	3002.90	0.69	204.26	3002.29	-15.34	9.98	15.33	18.29	56.94	0.04	210.71M
	3098.10	0.77	210.71	3097.48	-14.78	8.91	14.77	17.24	58.91	0.12	215.84M
	3193.30	0.73	215.84	3192.67	-14.10	7.86	14.08	16.13	60.82	0.08	193.59M
	3288.40	0.61	193.59	3287.76	-13.62	6.88	13.61	15.25	63.18	0.30	140.43M
	3383.60	0.72	140.43	3382.96	-13.88	5.93	13.87	15.09	66.87	0.63	134.73M
	3478.80	0.75	134.73	3478.15	-14.70	5.03	14.70	15.53	71.11	0.08	132.9M
	3573.90	0.75	132.90	3573.24	-15.60	4.17	15.59	16.14	75.04	0.03	126.63M
	3669.10	0.72	126.63	3668.43	-16.54	3.38	16.53	16.87	78.43	0.09	123.11M
	3764.20	0.74	123.11	3763.53	-17.53	2.69	17.53	17.73	81.26	0.05	126.36M
	3859.40	0.73	126.36	3858.72	-18.53	2.00	18.53	18.64	83.85	0.05	136.5M
	3954.60	0.64	136.50	3953.91	-19.38	1.25	19.38	19.42	86.30	0.16	143.87M
	4049.70	0.65	143.87	4049.01	-20.07	0.43	20.07	20.07	88.77	0.09	167.3M
	4144.90	0.42	167.30	4144.20	-20.46	-0.35	20.46	20.46	90.97	0.33	192.38M
	4240.00	0.43	192.38	4239.30	-20.46	-1.03	20.46	20.49	92.89	0.19	226.83M
	4335.20	0.40	226.83	4334.50	-20.14	-1.61	20.14	20.21	94.57	0.26	288.72M
	4430.40	0.61	288.72	4429.69	-19.42	-1.67	19.42	19.49	94.93	0.58	281.25M
	4525.50	0.54	281.25	4524.79	-18.50	-1.42	18.50	18.56	94.40	0.11	269.54M
	4620.70	0.45	269.54	4619.99	-17.69	-1.34	17.69	17.74	94.33	0.14	273.58M
	4715.80	0.42	273.58	4715.08	-16.96	-1.32	16.97	17.02	94.45	0.05	284.1M
	4811.00	0.40	284.10	4810.28	-16.29	-1.22	16.30	16.34	94.28	0.08	278.09M
	4906.10	0.41	278.09	4905.38	-15.64	-1.09	15.64	15.67	93.99	0.05	283.07M
	5001.30	0.41	283.07	5000.58	-14.97	-0.97	14.97	15.00	93.69	0.04	279.37M
	5096.50	0.52	279.37	5095.77	-14.21	-0.82	14.21	14.23	93.29	0.12	284.45M

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
	5191.60	0.61	284.45	5190.87	-13.29	-0.62	13.29	13.31	92.68	0.11	287.29M
	5286.80	0.70	287.29	5286.06	-12.25	-0.32	12.25	12.25	91.51	0.10	290.31M
	5381.90	0.82	290.31	5381.15	-11.06	0.09	11.06	11.06	89.55	0.13	294.97M
	5477.10	0.91	294.97	5476.34	-9.73	0.64	9.73	9.75	86.22	0.12	298.64M
	5572.30	1.00	299.64	5571.53	-8.33	1.37	8.32	8.44	80.64	0.12	302.58M
	5667.40	1.10	302.58	5666.61	-6.84	2.27	6.83	7.20	71.59	0.12	306.43M
	5762.60	1.19	306.43	5761.79	-5.27	3.35	5.27	6.24	57.52	0.12	305.62M
	5857.80	1.20	305.62	5856.97	-3.67	4.52	3.66	5.82	39.01	0.02	309.59M
	5952.90	1.32	309.59	5952.05	-2.02	5.80	2.01	6.14	19.10	0.16	313.37M
	6048.10	1.40	313.37	6047.22	-0.33	7.30	0.32	7.30	2.49	0.13	317.71M
	6143.20	1.47	317.71	6142.29	1.33	9.00	-1.35	9.10	351.48	0.14	323.43M
	6238.40	1.57	323.43	6237.46	2.93	10.95	-2.95	11.34	344.94	0.19	332.18M
	6333.60	1.49	332.18	6332.63	4.28	13.09	-4.30	13.78	341.81	0.26	334.5M
	6428.70	1.41	334.50	6427.70	5.36	15.24	-5.38	16.16	340.55	0.10	328.76M
	6523.90	1.39	328.76	6522.87	6.46	17.28	-6.48	18.46	339.43	0.15	331.39M
	6619.00	1.35	331.39	6617.94	7.59	19.25	-7.62	20.71	338.41	0.08	332.69M
	6714.20	1.36	332.69	6713.11	8.64	21.24	-8.67	22.94	337.79	0.03	328.36M
	6809.40	1.25	328.36	6808.29	9.70	23.13	-9.74	25.10	337.17	0.16	306.77M
	6904.50	0.77	306.77	6903.38	10.76	24.40	-10.79	26.68	336.13	0.64	293.75M
	6999.70	0.56	293.75	6998.57	11.69	24.97	-11.73	27.58	334.83	0.27	291.82M
	7094.80	0.71	291.82	7093.66	12.66	25.37	-12.70	28.37	333.40	0.16	276.82M
	7190.00	1.11	276.82	7188.85	14.13	25.70	-14.17	29.35	331.13	0.49	278.42M
	7285.10	1.63	278.42	7283.92	16.38	26.01	-16.42	30.76	327.73	0.55	285.68M
	7380.30	1.69	285.68	7379.08	19.07	26.59	-19.11	32.74	324.29	0.23	262.67M
	7475.50	2.03	262.67	7474.23	22.09	26.75	-22.13	34.72	320.39	0.85	250.37M
	7570.60	1.86	250.37	7569.28	25.22	26.02	-25.26	36.26	315.85	0.47	250.5M
	7665.80	1.77	250.50	7664.43	28.06	25.01	-28.10	37.62	311.67	0.09	242.82M
	7760.90	1.41	242.82	7759.50	30.49	23.98	-30.53	38.82	308.15	0.44	225.56M
	7856.10	1.27	225.56	7854.67	32.29	22.71	-32.32	39.50	305.09	0.45	214.71M
	7951.30	1.89	214.71	7949.83	33.94	20.68	-33.97	39.77	301.33	0.72	302.05M
	8055.00	8.00	302.05	8053.17	41.03	23.11	-41.07	47.12	299.36	7.84	301.7M
	8087.00	10.64	301.70	8084.75	45.43	25.84	-45.47	52.30	299.61	8.25	46.48R
	8119.00	11.26	304.95	8116.17	50.50	29.18	-50.55	58.37	300.00	2.73	16.77L
	8150.00	14.51	301.08	8146.38	56.30	32.92	-56.35	65.27	300.29	10.84	1.8R
	8182.00	19.08	301.52	8177.01	64.19	37.73	-64.25	74.51	300.42	14.29	3.06R
	8213.00	22.95	302.05	8205.94	73.63	43.59	-73.70	85.62	300.60	12.50	6.92L
	8245.00	26.91	300.99	8234.95	85.12	50.63	-85.20	99.10	300.72	12.45	15.24L
	8277.00	31.48	298.62	8262.88	98.65	58.36	-98.75	114.70	300.59	14.73	20.02L
	8308.00	35.26	296.25	8288.77	113.78	66.20	-113.88	131.73	300.17	12.90	24.14L
	8340.00	39.14	293.52	8314.25	131.32	74.32	-131.43	150.99	299.49	13.17	40.83L
	8372.00	42.91	288.86	8338.40	150.89	81.88	-151.02	171.78	298.47	15.16	61.33L
	8403.00	45.64	282.36	8360.60	171.70	87.67	-171.84	192.91	297.03	17.07	58.72L
	8435.00	48.80	275.86	8382.35	194.87	91.35	-195.01	215.35	295.10	17.87	54.17L
	8466.00	51.53	271.20	8402.21	218.61	92.79	-218.76	237.62	292.99	14.52	58.85R
	8491.00	53.32	274.78	8417.46	238.39	93.83	-238.54	256.33	291.47	13.42	11.26L
	8523.00	55.05	274.36	8436.18	264.25	95.90	-264.40	281.26	289.94	5.51	15.34R
	8554.00	56.14	274.72	8453.70	289.75	97.92	-289.90	305.99	288.66	3.64	23.45L
	8586.00	59.18	273.19	8470.81	316.71	99.78	-316.87	332.21	287.48	10.32	20.36L
	8617.00	62.96	271.62	8485.81	343.81	100.91	-343.97	358.47	286.35	12.97	45.87L
	8649.00	64.81	269.53	8499.89	372.54	101.20	-372.70	386.19	285.19	8.23	30.46L
	8681.00	67.62	267.75	8512.80	401.81	100.50	-401.97	414.34	284.04	10.15	30.23L
	8713.00	70.61	265.91	8524.21	431.66	98.84	-431.81	442.98	282.89	10.78	23.19L
	8745.00	72.98	264.85	8534.20	461.96	96.39	-462.11	472.06	281.78	8.05	19.62L
	8777.00	77.82	263.09	8542.27	492.75	93.13	-492.89	501.62	280.70	16.03	9.74L
	8808.00	82.39	262.30	8547.59	523.04	89.25	-523.18	530.74	279.68	14.95	0.91L
	8840.00	87.41	262.22	8550.44	554.62	84.96	-554.75	561.22	278.71	15.69	7.86L
	8872.00	90.31	261.82	8551.07	586.30	80.52	-586.43	591.93	277.82	9.15	32R
	8935.00	91.19	262.37	8550.25	648.71	71.85	-648.83	652.79	276.32	1.65	33.29R
	9030.00	92.24	263.06	8547.41	742.92	59.81	-743.01	745.42	274.60	1.32	78.41L
	9126.00	92.42	262.18	8543.50	838.06	47.49	-838.14	839.48	273.24	0.93	165.17R
	9220.00	90.04	262.81	8541.49	931.25	35.22	-931.31	931.97	272.17	2.62	51.84L
	9316.00	90.48	262.25	8541.05	1026.45	22.74	-1026.49	1026.74	271.27	0.74	121.26L
	9411.00	90.31	261.97	8540.40	1120.57	9.70	-1120.59	1120.63	270.50	0.34	79.83R
	9506.00	90.57	263.42	8539.67	1214.81	-2.38	-1214.81	1214.81	269.89	1.55	57.93R
	9601.00	91.19	264.41	8538.21	1309.28	-12.45	-1309.26	1309.32	269.46	1.23	127.12R
	9696.00	90.13	265.81	8537.11	1403.94	-20.55	-1403.91	1404.06	269.16	1.85	80.7L
	9791.00	90.31	264.71	8536.75	1498.62	-28.40	-1498.58	1498.85	268.91	1.17	56.88R
	9886.00	91.36	266.32	8535.36	1593.33	-35.83	-1593.27	1593.68	268.71	2.02	HS
	9957.00	91.36	266.32	8533.88	1664.17	-40.38	-1664.11	1664.60	268.61	0.00	

Survey Type: Def Survey

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

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	18.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Cimarex Hackberry 23 Federal #1H Gyro 0ft to 9925ft MD

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
	18.000		7951.300		Act Sins	30.000	30.000	SLB_NSG+MSHOT		Original Borehole / Cimarex Hackberry 23 Federal #1H Gyro	
	7951.300		9886.000		Act Sins	30.000	30.000	SLB_MWD-STD		ST01 / Cimarex Hackberry 23 Federal #1H ST01 Gyro+MWD	
	9886.000		9957.000		Act Sins	30.000	30.000	SLB_BLIND+TREND		ST01 / Cimarex Hackberry 23 Federal #1H ST01 Gyro+MWD	



**Cimarex Hackberry 23 Federal #1H ST02 Gyro +MWD 7951ft to 13355ft
MD
(Def Survey)**



Report Date: April 07, 2013 - 10:00 AM
Client: Cimarex
Field: NM Eddy County (NAD 83)
Structure / Slot: Cactus 115 / Cimarex Hackberry 23 Federal #1H
Well: Cimarex Hackberry 23 Federal #1H
Borehole: ST02
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Hackberry 23 Federal #1H ST02 Gyro +MWD 7951ft to 13355ft MD
Survey Date: March 24, 2013
Tort / AHD / DDI / ERD Ratio: 155.427 ° / 5235.400 ft / 6.104 / 0.612
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 38' 51.51284", W 103° 56' 0.63345"
Location Grid N/E Y/X: N 599574.900 ftUS, E 664399.500 ftUS
CRS Grid Convergence Angle: 0.2157 °
Grid Scale Factor: 0.99992643

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 269.910 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3273.000 ft above
Seabed / Ground Elevation: 3255.000 ft above
Magnetic Declination: 7.676 °
Total Gravity Field Strength: 998.5363mgn (9.80665 Based)
Total Magnetic Field Strength: 48630.388 nT
Magnetic Dip Angle: 60.434 °
Declination Date: March 24, 2013
Magnetic Declination Model: BGGM 2012
North Reference: Grid North
Grid Convergence Used: 0.2157 °
Total Corr Mag North->Grid North: 7.4599 °
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
SHL Hackberry 23 Fed #1H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	254.77M
	100.00	0.12	254.77	100.00	0.10	-0.03	-0.10	0.10	254.77	0.12	270.89M
	200.00	0.75	270.89	200.00	0.86	-0.04	-0.86	0.86	267.00	0.64	279.96M
	300.00	0.70	279.98	299.99	2.11	0.07	-2.11	2.11	271.93	0.13	225.27M
	400.00	0.88	225.27	399.98	3.26	-0.36	-3.26	3.28	263.64	0.74	208.4M
	500.00	0.96	208.40	499.97	4.21	-1.64	-4.20	4.51	248.68	0.28	215.42M
	600.00	0.87	215.42	599.95	5.05	-3.00	-5.04	5.87	239.28	0.14	219.32M
	624.00	0.83	219.32	623.95	5.26	-3.28	-5.26	6.20	238.05	0.29	224.43M
	719.10	0.56	224.43	719.05	6.03	-4.14	-6.02	7.31	235.46	0.29	92.71M
	814.30	0.06	92.71	814.24	6.30	-4.48	-6.30	7.73	234.57	0.63	54.87M
	909.40	0.74	54.87	909.34	5.75	-4.13	-5.74	7.07	234.30	0.73	63.79M
	1004.60	1.62	63.79	1004.52	4.04	-3.18	-4.03	5.14	231.75	0.94	63.97M
	1099.80	2.33	63.97	1099.66	1.09	-1.74	-1.09	2.05	212.06	0.75	64.62M
	1194.90	2.70	64.62	1194.67	-2.67	0.07	2.67	2.67	88.45	0.39	64.78M
	1290.10	2.45	64.78	1289.77	-6.54	1.90	6.54	6.81	73.80	0.26	60.02M
	1385.20	2.21	60.02	1384.80	-9.97	3.68	9.97	10.63	69.72	0.32	56.49M
	1480.40	2.14	56.49	1479.93	-13.05	5.58	13.04	14.18	66.83	0.16	43.91M
	1575.60	1.52	43.91	1575.08	-15.41	7.47	15.40	17.11	64.11	0.77	39.29M
	1670.70	1.02	39.29	1670.16	-16.82	9.04	16.81	19.08	61.74	0.54	36.62M
	1765.90	0.66	36.62	1765.34	-17.69	10.13	17.67	20.37	60.17	0.38	80.59M
	1861.00	0.65	80.59	1860.44	-18.55	10.66	18.53	21.38	60.09	0.52	49.1M
	1956.20	0.50	49.10	1955.63	-19.39	11.02	19.38	22.29	60.37	0.36	2.69M
	2051.30	0.37	2.69	2050.73	-19.72	11.60	19.71	22.87	59.52	0.38	24.81M
	2146.50	0.28	24.81	2145.93	-19.84	12.12	19.82	23.23	58.56	0.16	356.07M
	2241.70	0.29	356.07	2241.13	-19.92	12.57	19.90	23.54	57.72	0.15	334.6M
	2336.80	0.77	334.60	2336.23	-19.63	13.39	19.61	23.74	55.68	0.54	270.96M
	2432.00	0.40	270.96	2431.42	-19.02	13.97	19.00	23.58	53.68	0.73	280.58M
	2527.20	0.62	280.58	2526.62	-18.18	14.07	18.16	22.97	52.24	0.25	206.66M
	2622.30	0.27	206.66	2621.71	-17.58	13.96	17.56	22.43	51.50	0.63	216.57M
	2717.50	0.84	216.57	2716.91	-17.06	13.20	17.04	21.56	52.23	0.60	207.73M
	2812.60	0.71	207.73	2812.00	-16.37	12.12	16.35	20.35	53.45	0.19	204.98M
	2907.80	0.73	204.98	2907.19	-15.84	11.05	15.82	19.30	55.07	0.04	204.26M
	3002.90	0.69	204.26	3002.29	-15.34	9.98	15.33	18.29	56.94	0.04	210.71M
	3098.10	0.77	210.71	3097.48	-14.78	8.91	14.77	17.24	58.91	0.12	215.84M
	3193.30	0.73	215.84	3192.67	-14.10	7.86	14.08	16.13	60.82	0.08	193.59M
	3288.40	0.61	193.59	3287.76	-13.62	6.88	13.61	15.25	63.18	0.30	140.43M
	3383.60	0.72	140.43	3382.96	-13.88	5.93	13.87	15.09	66.87	0.63	134.73M
	3478.80	0.75	134.73	3478.15	-14.70	5.03	14.70	15.53	71.11	0.08	132.9M
	3573.90	0.75	132.90	3573.24	-15.60	4.17	15.59	16.14	75.04	0.03	126.63M
	3669.10	0.72	126.63	3668.43	-16.54	3.38	16.53	16.87	78.43	0.09	123.11M
	3764.20	0.74	123.11	3763.53	-17.53	2.69	17.53	17.73	81.26	0.05	126.36M
	3859.40	0.73	126.36	3858.72	-18.53	2.00	18.53	18.64	83.85	0.05	136.5M
	3954.60	0.64	136.50	3953.91	-19.38	1.25	19.38	19.42	86.30	0.16	143.87M
	4049.70	0.65	143.87	4049.01	-20.07	0.43	20.07	20.07	88.77	0.09	167.3M
	4144.90	0.42	167.30	4144.20	-20.46	-0.35	20.46	20.46	90.97	0.33	192.38M
	4240.00	0.43	192.38	4239.30	-20.46	-1.03	20.46	20.49	92.89	0.19	226.83M
	4335.20	0.40	226.83	4334.50	-20.14	-1.61	20.14	20.21	94.57	0.26	288.72M
	4430.40	0.61	288.72	4429.69	-19.42	-1.67	19.42	19.49	94.93	0.58	281.25M
	4525.50	0.54	281.25	4524.79	-18.50	-1.42	18.50	18.56	94.40	0.11	269.54M
	4620.70	0.45	269.54	4619.99	-17.69	-1.34	17.69	17.74	94.33	0.14	273.58M
	4715.80	0.42	273.58	4715.08	-16.96	-1.32	16.97	17.02	94.45	0.05	284.1M
	4811.00	0.40	284.10	4810.28	-16.29	-1.22	16.30	16.34	94.28	0.08	278.09M
	4906.10	0.41	278.09	4905.38	-15.64	-1.09	15.64	15.67	93.99	0.05	283.07M
	5001.30	0.41	283.07	5000.58	-14.97	-0.97	14.97	15.00	93.69	0.04	279.37M
	5096.50	0.52	279.37	5095.77	-14.21	-0.82	14.21	14.23	93.29	0.12	284.45M

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
	5191.60	0.61	284.45	5190.87	-13.29	-0.62	13.29	13.31	92.68	0.11	287.29M
	5286.80	0.70	287.29	5286.06	-12.25	-0.32	12.25	12.25	91.51	0.10	290.31M
	5381.90	0.82	290.31	5381.15	-11.06	0.09	11.06	11.06	89.55	0.13	294.97M
	5477.10	0.91	294.97	5476.34	-9.73	0.64	9.73	9.75	86.22	0.12	299.64M
	5572.30	1.00	299.64	5571.53	-8.33	1.37	8.32	8.44	80.64	0.12	302.58M
	5667.40	1.10	302.58	5666.61	-6.84	2.27	6.83	7.20	71.59	0.12	306.43M
	5762.60	1.19	306.43	5761.79	-5.27	3.35	5.27	6.24	57.52	0.12	305.62M
	5857.80	1.20	305.62	5856.97	-3.67	4.52	3.66	5.82	39.01	0.02	309.59M
	5952.90	1.32	309.59	5952.05	-2.02	5.80	2.01	6.14	19.10	0.16	313.37M
	6048.10	1.40	313.37	6047.22	-0.33	7.30	0.32	7.30	2.49	0.13	317.71M
	6143.20	1.47	317.71	6142.29	1.33	9.00	-1.35	9.10	351.48	0.14	323.43M
	6238.40	1.57	323.43	6237.46	2.93	10.95	-2.95	11.34	344.94	0.19	332.18M
	6333.60	1.49	332.18	6332.63	4.28	13.09	-4.30	13.78	341.81	0.26	334.5M
	6428.70	1.41	334.50	6427.70	5.36	15.24	-5.38	16.16	340.55	0.10	328.76M
	6523.90	1.39	328.76	6522.87	6.46	17.28	-6.48	18.46	339.43	0.15	331.39M
	6619.00	1.35	331.39	6617.94	7.59	19.25	-7.62	20.71	338.41	0.08	332.69M
	6714.20	1.36	332.69	6713.11	8.64	21.24	-8.67	22.94	337.79	0.03	328.36M
	6809.40	1.25	328.36	6808.29	9.70	23.13	-9.74	25.10	337.17	0.16	306.77M
	6904.50	0.77	306.77	6903.38	10.76	24.40	-10.79	26.68	336.13	0.64	293.75M
	6999.70	0.56	293.75	6998.57	11.69	24.97	-11.73	27.58	334.83	0.27	291.82M
	7094.80	0.71	291.82	7093.66	12.66	25.37	-12.70	28.37	333.40	0.16	276.82M
	7190.00	1.11	276.82	7188.85	14.13	25.70	-14.17	29.35	331.13	0.49	278.42M
	7285.10	1.63	278.42	7283.92	16.38	26.01	-16.42	30.76	327.73	0.55	285.68M
	7380.30	1.69	285.68	7379.08	19.07	26.59	-19.11	32.74	324.29	0.23	262.67M
	7475.50	2.03	262.67	7474.23	22.09	26.75	-22.13	34.72	320.39	0.85	250.37M
	7570.60	1.86	250.37	7569.28	25.22	26.02	-25.26	36.26	315.85	0.47	250.5M
	7665.80	1.77	250.50	7664.43	28.06	25.01	-28.10	37.62	311.67	0.09	242.82M
	7760.90	1.41	242.82	7759.50	30.49	23.98	-30.53	38.82	308.15	0.44	225.56M
	7856.10	1.27	225.56	7854.67	32.29	22.71	-32.32	39.50	305.09	0.45	214.71M
Tie-In ST02	7951.30	1.89	214.71	7949.83	33.94	20.68	-33.97	39.77	301.33	0.72	243M
	7991.00	8.35	243.00	7989.36	36.88	18.83	-36.91	41.44	297.03	16.99	3.99R
	8023.00	11.61	244.13	8020.87	41.86	16.37	-41.88	44.97	291.35	10.21	33.38R
Survey 28-Mar-13	8055.00	14.51	251.47	8052.04	48.56	13.69	-48.58	50.47	285.74	10.42	22.64R
	8086.00	17.50	255.56	8081.84	56.76	11.29	-56.78	57.89	281.25	10.30	10.38R
	8118.00	20.58	257.16	8112.08	66.91	8.84	-66.93	67.51	277.53	9.76	0.68R
	8149.00	24.01	257.26	8140.76	78.38	6.24	-78.39	78.64	274.55	11.07	1.98L
	8181.00	27.79	256.98	8169.54	92.01	3.12	-92.02	92.07	271.94	11.82	5.44L
	8212.00	31.04	256.38	8196.54	106.83	-0.39	-106.83	106.83	269.79	10.53	8L
	8244.00	34.03	255.63	8223.52	123.53	-4.55	-123.52	123.61	267.89	9.43	1.02R
	8276.00	37.81	255.74	8249.43	141.72	-9.19	-141.71	142.01	266.29	11.81	5.41R
	8307.00	41.15	256.22	8273.35	160.85	-13.97	-160.83	161.44	265.04	10.82	2.83R
Survey 29-Mar-13	8339.00	44.41	256.45	8296.83	181.98	-19.10	-181.95	182.95	264.01	10.20	2.48L
	8371.00	48.01	256.24	8318.98	204.43	-24.55	-204.39	205.86	263.15	11.26	0.92L
	8402.00	50.91	256.18	8339.12	227.31	-30.17	-227.27	229.26	262.44	9.36	5.39L
Survey 30-Mar-13	8434.00	53.82	255.84	8358.66	251.91	-36.29	-251.85	254.46	261.80	9.13	21.33R
	8462.00	55.49	256.63	8374.86	274.10	-41.73	-274.04	277.20	261.34	6.39	8.71R
	8493.00	58.04	257.09	8391.85	299.36	-47.62	-299.29	303.05	260.96	8.32	6.68R
	8525.00	61.03	257.49	8408.07	326.27	-53.69	-326.19	330.58	260.65	9.41	9.77R
	8557.00	63.58	257.98	8422.94	353.97	-59.70	-353.87	358.87	260.42	8.08	0.66L
	8588.00	65.16	257.96	8436.35	381.31	-65.53	-381.21	386.80	260.25	5.10	37.97R
	8620.00	66.04	258.71	8449.57	409.86	-71.42	-409.75	415.93	260.11	3.48	11.27R
	8652.00	67.01	258.92	8462.32	438.66	-77.11	-438.54	445.27	260.03	3.09	18.32R
	8684.00	68.50	259.45	8474.43	467.76	-82.67	-467.63	474.88	259.97	4.90	20.66R
	8716.00	70.35	260.19	8485.68	497.26	-87.96	-497.12	504.84	259.97	6.17	20.25R
	8748.00	72.55	261.04	8495.86	527.19	-92.91	-527.05	535.18	260.00	7.32	5.22R
	8779.00	73.60	261.14	8504.88	556.50	-97.50	-556.35	564.83	260.06	3.40	26.01R
	8811.00	74.39	261.54	8513.70	586.92	-102.13	-586.76	595.58	260.13	2.75	19.34R
	8842.00	74.83	261.70	8521.93	616.49	-106.49	-616.33	625.46	260.20	1.50	36.89R
	8874.00	75.80	262.45	8530.04	647.16	-110.76	-646.98	656.40	260.29	3.79	9.27R
	8906.00	78.08	262.83	8537.27	678.08	-114.75	-677.90	687.54	260.39	7.22	13.12R
	8938.00	80.11	263.31	8543.33	709.27	-118.54	-709.09	718.93	260.51	6.51	15.56R
	8969.00	82.39	263.95	8548.04	739.73	-121.94	-739.54	749.52	260.64	7.63	12.14R
	9001.00	85.03	264.52	8551.55	771.38	-125.13	-771.18	781.27	260.78	8.44	0.22L
	9033.00	87.58	264.51	8553.61	803.17	-128.18	-802.96	813.13	260.93	7.97	2.73R
	9064.00	90.31	264.64	8554.18	834.02	-131.11	-833.82	844.06	261.06	8.82	26.03R
	9096.00	92.07	265.50	8553.52	865.90	-133.86	-865.69	875.98	261.21	6.12	56.12R
	9128.00	92.68	266.41	8552.19	897.80	-136.12	-897.58	907.85	261.38	3.42	116.9R
	9223.00	92.33	267.10	8548.04	929.56	-141.49	-929.34	939.38	261.89	0.81	176.21L
	9318.00	89.16	266.89	8546.80	1067.42	-146.47	-1067.19	1077.01	262.33	3.34	84.71R
	9413.00	89.25	267.86	8548.12	1162.31	-150.82	-1162.08	1171.66	262.73	1.03	25.51R
	9509.00	91.45	268.91	8547.53	1278.27	-153.53	-1278.03	1287.22	263.15	2.54	32.02R
	9604.00	92.68	269.68	8544.11	1373.20	-154.69	-1372.96	1381.65	263.57	1.53	170.64L
	9699.00	91.71	269.52	8540.47	1468.13	-155.36	-1467.89	1476.09	263.96	1.03	123.35R
	9794.00	91.19	270.31	8538.07	1563.10	-155.50	-1562.86	1570.57	264.32	1.00	152.7R
Survey 1-Apr-13	9889.00	90.57	270.63	8536.61	1658.08	-154.72	-1657.84	1665.04	264.67	0.73	0.76L
	9984.00	92.07	270.61	8534.42	1753.05	-153.69	-1752.81	1759.53	264.99	1.58	18.04R
	10080.00	94.00	271.24	8529.34	1848.89	-152.14	-1848.66	1854.91	265.30	2.11	40.86R
	10175.00	94.53	271.70	8522.27	1943.59	-149.71	-1943.36	1949.12	265.59	0.74	66.36R
	10271.00	94.70	272.09	8514.55	2039.22	-146.55	-2039.00	2044.26	265.89	0.44	177.62L
	10366.00	93.74	272.05	8507.56	2133.90	-143.13	-2133.68	2138.47	266.16	1.01	57.2L
	10461.00	93.83	271.91	8501.29	2228.63	-139.85	-2228.41	2232.80	266.41	0.17	140.88R

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
Survey 2-Apr-13	10556.00	93.56	272.13	8495.16	2323.37	-136.51	-2323.16	2327.16	266.64	0.37	90R
	10651.00	93.56	272.36	8489.27	2418.11	-132.80	-2417.90	2421.54	266.86	0.24	173.49R
	10746.00	92.51	272.48	8484.24	2512.88	-128.79	-2512.68	2515.98	267.07	1.11	64.69R
	10840.00	92.68	272.84	8479.98	2606.67	-124.43	-2606.48	2609.45	267.27	0.42	104.88L
	10935.00	92.51	272.20	8475.68	2701.48	-120.26	-2701.29	2703.97	267.45	0.70	157.59L
	11031.00	91.71	271.87	8472.14	2797.35	-116.85	-2797.17	2799.61	267.61	0.90	127.88L
	11126.00	91.36	271.42	8469.60	2892.27	-114.13	-2892.09	2894.34	267.74	0.60	65.21L
	11221.00	91.54	271.03	8467.20	2987.21	-112.10	-2987.04	2989.14	267.85	0.45	6.52L
	11316.00	91.89	270.99	8464.35	3082.15	-110.42	-3081.98	3083.96	267.95	0.37	38.63L
	11412.00	92.59	270.43	8460.60	3178.07	-109.24	-3177.90	3179.78	268.03	0.93	133.41L
Survey 3-Apr-13	11507.00	92.07	269.88	8456.74	3272.99	-108.98	-3272.82	3274.64	268.09	0.80	166.73L
	11602.00	90.84	269.59	8454.33	3367.96	-109.42	-3367.79	3369.56	268.14	1.33	81.25L
	11697.00	90.92	269.07	8452.87	3462.94	-110.53	-3462.77	3464.53	268.17	0.55	48.01R
	11793.00	91.19	269.37	8451.10	3558.92	-111.84	-3558.74	3560.50	268.20	0.42	131.35L
	11888.00	90.75	268.87	8449.49	3653.89	-113.29	-3653.72	3655.48	268.22	0.70	116.57L
Survey 4-Apr-13	11983.00	90.66	268.69	8448.32	3748.87	-115.32	-3748.69	3750.46	268.24	0.21	138.37R
	12078.00	90.48	268.85	8447.38	3843.84	-117.36	-3843.66	3845.45	268.25	0.25	64.65L
	12173.00	90.66	268.47	8446.43	3938.82	-119.58	-3938.63	3940.45	268.26	0.44	80.36L
	12268.00	90.75	267.94	8445.26	4033.77	-122.55	-4033.58	4035.44	268.26	0.57	14.79L
	12363.00	91.28	267.80	8443.58	4128.69	-126.08	-4128.50	4130.42	268.25	0.58	70.01R
	12458.00	91.36	268.02	8441.39	4223.61	-129.55	-4223.41	4225.40	268.24	0.25	59.85R
	12552.00	91.54	268.33	8439.01	4317.53	-132.54	-4317.33	4319.37	268.24	0.38	176.1R
	12647.00	90.66	268.39	8437.19	4412.48	-135.26	-4412.27	4414.35	268.24	0.93	147.16R
	12742.00	89.25	269.30	8437.26	4507.46	-137.17	-4507.25	4509.34	268.26	1.77	177.51R
	12837.00	87.41	269.38	8440.03	4602.41	-138.27	-4602.20	4604.28	268.28	1.94	176.11L
Survey 6-Apr-13	12932.00	86.53	269.32	8445.05	4697.27	-139.34	-4697.06	4699.13	268.30	0.93	31.96R
	13028.00	86.61	269.37	8450.80	4793.10	-140.44	-4792.88	4794.94	268.32	0.10	36.46R
	13122.00	87.76	270.22	8455.41	4886.98	-140.77	-4886.77	4888.79	268.35	1.52	4.07R
	13217.00	89.87	270.37	8457.38	4981.95	-140.28	-4981.74	4983.71	268.39	2.23	46.08R
	13273.00	90.13	270.64	8457.38	5037.95	-139.79	-5037.74	5039.68	268.41	0.67	HS
Final Survey Proj to TD	13355.00	90.13	270.64	8457.19	5119.94	-138.87	-5119.73	5121.61	268.45	0.00	

Survey Type: Def Survey

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

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	18.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Cimarex Hackberry 23 Federal #1H Gyro 0ft to 9925ft MD
	18.000	7951.300	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Cimarex Hackberry 23 Federal #1H Gyro ST02 / Cimarex Hackberry 23
	7951.300	13273.000	Act Stns	30.000	30.000	SLB_MWD-STD	Federal #1H ST02 Gyro +MWD ST02 / Cimarex Hackberry 23
	13273.000	13355.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Federal #1H ST02 Gyro +MWD