

4705101556



Noble Energy SHL-8L-HS Gyro+MWD 0' MD to 10400' MD Survey Report

(Def Survey)

Report Date: February 18, 2013 - 09:09 AM
Client: Noble Energy
Field: WV Marshall County (NAD 27)
Structure / Slot: CNX/Noble Energy SHL-8 Pad / SHL-8L-HS
Well: SHL-8L-HS
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Noble Energy SHL-8L-HS Gyro+MWD 0' MD to 10400' MD
Survey Date: February 06, 2013
Tort / AHD / DDI / ERD Ratio: 209.613° / 51170.280 ft / 6.235 / 0.788
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 57' 19.65762", W 80° 32' 8.64523"
Location Grid N/E Y/X: N 531792.415 RUS, E 1709648.209 RUS
CRS Grid Convergence Angle: -0.6606°
Grid Scale Factor: 0.99995724

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 297.720° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB
TVD Reference Elevation: 1149.390 ft above MSL
Seabed / Ground Elevation: 1131.470 ft above MSL
Magnetic Declination: -8.712°
Total Gravity Field Strength: 999.3811mgn (9.80665 Based)
Total Magnetic Field Strength: 52745.122 nT
Magnetic Dip Angle: 67.425°
Declination Date: February 06, 2013
Magnetic Declination Model: BGGM 2012
North Reference: Grid North
Grid Convergence Used: -0.6606°
Total Corr Mag North->Grid North: -8.0518°
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1149.39	0.00	0.00	0.00	N/A	N/A	N/A	531792.42	1709648.21	N 39 57 19.66	W 80 32 8.65	0.00
	100.00	0.50	318.62	100.00	-1049.39	0.41	0.33	-0.29	0.50	0.50	0.00	531792.74	1709647.92	N 39 57 19.66	W 80 32 8.65	0.00
	200.00	0.50	327.57	199.99	-949.40	1.19	1.02	-0.81	0.08	0.00	8.95	531793.44	1709647.40	N 39 57 19.67	W 80 32 8.66	0.00
	300.00	0.44	328.69	299.99	-849.40	1.90	1.72	-1.24	0.06	-0.06	1.12	531794.13	1709646.96	N 39 57 19.67	W 80 32 8.66	0.13
	400.00	0.22	338.38	399.99	-749.40	2.38	2.23	-1.51	0.23	-0.22	9.69	531794.64	1709646.69	N 39 57 19.68	W 80 32 8.67	0.37
	500.00	0.04	329.93	499.99	-649.40	2.55	2.43	-1.60	0.18	-0.18	-8.45	531794.85	1709646.61	N 39 57 19.68	W 80 32 8.67	0.49
	600.00	0.17	278.47	599.99	-549.40	2.72	2.49	-1.77	0.15	0.13	-51.46	531794.90	1709646.44	N 39 57 19.68	W 80 32 8.67	0.57
	700.00	0.21	288.68	699.99	-449.40	3.04	2.57	-2.09	0.05	0.04	10.21	531794.98	1709646.12	N 39 57 19.68	W 80 32 8.67	0.63
	800.00	0.15	265.92	799.99	-349.40	3.33	2.62	-2.39	0.09	-0.06	-22.76	531795.03	1709645.82	N 39 57 19.68	W 80 32 8.68	0.70
	900.00	0.13	214.09	899.99	-249.40	3.46	2.51	-2.59	0.12	-0.02	-51.83	531794.93	1709645.62	N 39 57 19.68	W 80 32 8.68	0.76
	1000.00	0.51	141.05	999.99	-149.40	3.06	2.07	-2.37	0.49	0.38	-73.04	531794.49	1709645.84	N 39 57 19.68	W 80 32 8.68	0.94
	1100.00	0.63	127.23	1099.98	-49.41	2.11	1.39	-1.65	0.18	0.12	-13.82	531793.81	1709646.56	N 39 57 19.67	W 80 32 8.67	1.07
	1200.00	0.60	115.72	1199.98	50.59	1.05	0.83	-0.74	0.13	-0.03	-11.51	531793.25	1709647.47	N 39 57 19.67	W 80 32 8.65	1.17
	1300.00	0.77	111.26	1299.97	150.58	-0.15	0.36	0.36	0.18	0.17	-4.46	531792.78	1709648.56	N 39 57 19.66	W 80 32 8.64	1.28
	1400.00	0.66	113.64	1399.96	250.57	-1.39	-0.11	1.51	0.11	-0.11	2.38	531792.30	1709649.72	N 39 57 19.66	W 80 32 8.63	1.36
	1500.00	0.64	117.39	1499.95	350.56	-2.52	-0.60	2.53	0.05	-0.02	3.75	531791.82	1709650.74	N 39 57 19.65	W 80 32 8.61	1.42
	1600.00	0.63	118.70	1599.95	450.56	-3.63	-1.12	3.51	0.02	-0.01	1.31	531791.30	1709651.72	N 39 57 19.65	W 80 32 8.60	1.47
	1700.00	0.43	127.59	1699.94	550.55	-4.55	-1.61	4.29	0.22	-0.20	8.89	531790.80	1709652.50	N 39 57 19.64	W 80 32 8.59	1.54
	1800.00	0.63	120.31	1799.94	650.55	-5.47	-2.12	5.06	0.21	0.20	-7.28	531790.30	1709653.27	N 39 57 19.64	W 80 32 8.58	1.60
	1900.00	0.60	114.25	1899.93	750.54	-6.54	-2.61	6.01	0.07	-0.03	-6.06	531789.80	1709654.22	N 39 57 19.63	W 80 32 8.57	1.64
	2000.00	0.56	109.03	1999.93	850.54	-7.54	-2.99	6.95	0.07	-0.04	-5.22	531789.43	1709655.16	N 39 57 19.63	W 80 32 8.56	1.68
	2100.00	0.38	117.13	2099.93	950.54	-8.36	-3.30	7.71	0.19	-0.18	8.10	531789.12	1709655.92	N 39 57 19.63	W 80 32 8.55	1.73
	2200.00	0.37	101.97	2199.92	1050.53	-9.00	-3.51	8.32	0.10	-0.01	-15.16	531788.90	1709656.53	N 39 57 19.62	W 80 32 8.54	1.76
	2300.00	0.30	80.69	2299.92	1150.53	-9.52	-3.54	8.90	0.14	-0.07	-21.28	531788.88	1709657.10	N 39 57 19.62	W 80 32 8.53	1.79

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Comments	MD (ft)	Incl (°)	Azimuth (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Eastings (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')	Directional Difficulty Index
	2400.00	0.32	56.11	2399.92	1250.53	-9.86	-3.34	9.39	0.13	0.02	-24.58	531789.07	1709657.59	N 39 57 19.63 W	80 32 8.52	1.82
	2500.00	0.20	45.71	2499.92	1350.53	-10.05	-3.06	9.74	0.13	-0.12	-10.40	531789.35	1709657.95	N 39 57 19.63 W	80 32 8.52	1.85
	2600.00	0.35	39.39	2599.92	1450.53	-10.17	-2.71	10.06	0.15	0.15	-6.32	531789.71	1709658.27	N 39 57 19.63 W	80 32 8.52	1.88
	2700.00	0.10	22.38	2699.92	1550.53	-10.22	-2.39	10.29	0.26	-0.25	-17.01	531790.03	1709658.50	N 39 57 19.64 W	80 32 8.51	1.91
	2800.00	0.15	8.94	2799.92	1650.53	-10.17	-2.18	10.34	0.06	0.05	-13.44	531790.24	1709658.55	N 39 57 19.64 W	80 32 8.51	1.92
	2900.00	0.21	15.58	2899.92	1750.53	-10.09	-1.87	10.41	0.06	0.06	6.64	531790.54	1709658.62	N 39 57 19.64 W	80 32 8.51	1.94
	2970.00	0.63	30.09	2969.91	1820.52	-10.08	-1.42	10.64	0.61	0.60	20.73	531791.00	1709658.85	N 39 57 19.64 W	80 32 8.51	1.99
	3031.00	0.16	96.15	3030.91	1881.52	-10.17	-1.14	10.89	0.96	-0.77	108.30	531791.28	1709659.10	N 39 57 19.65 W	80 32 8.51	2.05
	3103.00	1.88	290.43	3102.90	1953.51	-9.09	-0.73	9.89	2.83	2.39	-230.17	531791.68	1709658.09	N 39 57 19.65 W	80 32 8.52	2.21
	3198.00	3.84	295.34	3197.78	2048.39	-4.37	1.17	5.55	2.08	2.06	5.17	531793.59	1709653.76	N 39 57 19.67 W	80 32 8.57	2.39
	3294.00	2.27	279.68	3293.64	2144.25	0.65	2.87	0.77	1.84	-1.64	-16.31	531795.28	1709648.98	N 39 57 19.69 W	80 32 8.64	2.55
	3413.00	0.98	212.00	3412.60	2263.21	2.97	2.40	-2.09	1.77	-1.08	-56.87	531794.82	1709646.12	N 39 57 19.68 W	80 32 8.67	2.66
	3511.00	0.89	221.38	3510.59	2361.20	3.21	1.12	-3.04	0.18	-0.09	9.57	531793.53	1709645.17	N 39 57 19.67 W	80 32 8.68	2.69
	3557.00	0.53	205.80	3556.58	2407.19	3.29	0.66	-3.37	0.88	-0.78	-33.87	531793.07	1709644.84	N 39 57 19.66 W	80 32 8.69	2.71
	3605.00	1.75	226.69	3604.57	2455.18	3.52	-0.04	-4.00	2.64	2.54	43.52	531792.37	1709644.21	N 39 57 19.66 W	80 32 8.70	2.76
	3652.00	5.37	235.93	3651.47	2502.08	4.79	-1.77	-6.34	7.77	7.70	19.66	531790.65	1709641.87	N 39 57 19.64 W	80 32 8.73	2.88
	3699.00	9.31	239.22	3698.08	2548.69	7.82	-4.95	-11.43	8.43	8.38	7.00	531787.47	1709636.78	N 39 57 19.61 W	80 32 8.79	3.02
	3746.00	11.57	236.62	3744.30	2594.91	12.09	-9.49	-18.64	4.91	4.81	-5.53	531782.93	1709629.57	N 39 57 19.56 W	80 32 8.88	3.14
	3794.00	14.20	235.26	3791.09	2641.70	17.13	-15.49	-27.50	5.52	5.48	-2.83	531776.92	1709620.71	N 39 57 19.50 W	80 32 9.00	3.26
	3841.00	16.53	234.46	3836.40	2687.01	22.81	-22.66	-37.68	4.98	4.96	-1.70	531769.75	1709610.54	N 39 57 19.43 W	80 32 9.13	3.37
	3889.00	18.60	233.38	3882.16	2732.77	29.20	-31.20	-49.38	4.37	4.31	-2.25	531761.22	1709598.83	N 39 57 19.34 W	80 32 9.27	3.47
	3936.00	20.67	233.16	3926.43	2777.04	36.01	-40.65	-62.03	4.41	4.40	-0.47	531751.77	1709586.18	N 39 57 19.25 W	80 32 9.44	3.57
	3983.00	23.28	233.17	3970.01	2820.62	43.56	-51.19	-76.11	5.55	5.55	0.02	531741.23	1709572.10	N 39 57 19.14 W	80 32 9.61	3.67
	4030.00	25.84	234.48	4012.75	2863.36	52.17	-62.71	-91.88	5.57	5.45	2.79	531729.71	1709556.33	N 39 57 19.03 W	80 32 9.82	3.76
	4078.00	28.10	234.45	4055.53	2906.14	61.96	-75.36	-109.60	4.71	4.71	-0.06	531717.06	1709538.62	N 39 57 18.90 W	80 32 10.04	3.85
	4173.00	32.51	233.02	4137.53	2988.14	82.95	-103.74	-148.21	4.70	4.64	-1.51	531688.68	1709500.00	N 39 57 18.62 W	80 32 10.53	4.00
	4263.00	30.12	231.45	4214.41	3065.02	102.37	-132.36	-185.20	2.81	-2.66	-1.74	531660.06	1709463.02	N 39 57 18.33 W	80 32 11.00	4.11
	4352.00	30.33	231.34	4291.31	3141.92	120.36	-160.32	-220.21	0.24	0.24	-0.12	531632.10	1709428.01	N 39 57 18.05 W	80 32 11.45	4.18
	4442.00	30.87	232.80	4368.78	3219.39	139.26	-188.48	-256.35	1.02	1.60	1.62	531603.95	1709391.88	N 39 57 17.77 W	80 32 11.91	4.25
	4531.00	31.92	236.00	4444.76	3295.37	160.08	-215.44	-294.04	2.21	1.18	3.60	531576.99	1709354.18	N 39 57 17.50 W	80 32 12.39	4.32
	4621.00	32.62	236.33	4520.86	3371.47	182.97	-242.19	-333.96	0.80	0.78	0.37	531550.23	1709314.27	N 39 57 17.23 W	80 32 12.90	4.38
	4710.00	32.43	234.01	4595.90	3446.51	205.03	-269.52	-373.23	1.42	-0.21	-2.61	531522.91	1709274.99	N 39 57 16.95 W	80 32 13.40	4.44
	4800.00	32.55	231.77	4671.82	3522.43	225.59	-298.68	-411.78	1.34	0.13	-2.49	531493.75	1709236.45	N 39 57 16.66 W	80 32 13.89	4.49
	4889.00	31.10	231.41	4747.43	3598.04	244.58	-327.84	-448.55	1.64	-1.63	-0.40	531464.59	1709199.68	N 39 57 16.37 W	80 32 14.36	4.54
	4979.00	30.61	231.02	4824.70	3675.31	262.98	-356.75	-484.53	0.59	-0.54	-0.43	531435.68	1709163.70	N 39 57 16.08 W	80 32 14.81	4.57
	5068.00	31.76	232.06	4900.83	3751.44	281.60	-385.41	-520.62	1.43	1.29	1.17	531407.03	1709127.61	N 39 57 15.79 W	80 32 15.27	4.61
	5158.00	34.20	234.73	4976.33	3826.94	302.85	-414.58	-559.96	3.16	2.71	2.97	531377.85	1709088.27	N 39 57 15.50 W	80 32 15.77	4.67
	5247.00	34.06	235.22	5050.00	3900.61	325.72	-443.24	-600.85	0.35	-0.16	0.55	531349.19	1709047.38	N 39 57 15.21 W	80 32 16.29	4.70
	5337.00	34.41	235.88	5124.41	3975.02	349.36	-471.88	-642.61	0.57	0.39	0.73	531320.56	1709005.63	N 39 57 14.92 W	80 32 16.83	4.73
	5426.00	34.81	235.67	5197.66	4048.27	373.13	-500.31	-684.40	0.47	0.45	-0.24	531292.12	1708963.84	N 39 57 14.64 W	80 32 17.36	4.76
	5516.00	34.87	236.32	5271.53	4122.14	397.49	-529.07	-727.03	0.42	0.07	0.72	531263.37	1708921.22	N 39 57 14.35 W	80 32 17.90	4.79
	5605.00	31.37	233.87	5346.06	4196.67	419.89	-556.84	-766.92	4.21	-3.93	-2.75	531235.59	1708881.32	N 39 57 14.07 W	80 32 18.41	4.84
	5695.00	29.49	234.26	5423.66	4274.27	440.11	-583.60	-803.83	2.10	-2.09	0.43	531208.84	1708844.42	N 39 57 13.80 W	80 32 18.88	4.87
	5784.00	28.88	234.11	5501.36	4351.97	459.45	-608.99	-839.02	0.69	-0.69	-0.17	531183.45	1708809.23	N 39 57 13.54 W	80 32 19.33	4.89
	5873.00	32.56	234.75	5577.86	4428.47	479.89	-635.42	-876.00	4.15	4.13	0.72	531157.02	1708772.25	N 39 57 13.28 W	80 32 19.80	4.93
	5963.00	34.41	234.37	5652.92	4503.53	502.31	-664.22	-916.45	2.07	2.06	-0.42	531128.23	1708731.80	N 39 57 12.99 W	80 32 20.31	4.96
	6052.00	33.75	234.11	5726.63	4577.24	524.58	-693.36	-956.92	0.76	-0.74	-0.29	531099.08	1708691.33	N 39 57 12.70 W	80 32 20.83	4.99
	6142.00	33.71	233.35	5801.48	4652.09	546.49	-722.93	-997.21	0.47	-0.04	-0.84	531069.52	1708651.04	N 39 57 12.40 W	80 32 21.34	5.01

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (RUS)	Eastng (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	6231.00	33.50	234.67	5875.61	4726.22	568.31	-751.87	-1037.06	0.85	-0.24	1.48	531040.58	1708611.19	N 39 57 12.11 W	80 32 21.85	5.03
	6321.00	33.92	234.20	5950.47	4801.08	590.76	-780.92	-1077.70	0.55	0.47	-0.52	531011.53	1708570.56	N 39 57 11.82 W	80 32 22.37	5.05
	6430.00	32.23	232.07	6041.81	4892.42	616.31	-816.59	-1125.29	1.88	-1.55	-1.95	530975.87	1708522.97	N 39 57 11.46 W	80 32 22.97	5.08
	6475.00	31.89	234.10	6079.95	4930.56	626.54	-830.93	-1144.39	2.51	-0.76	4.51	530961.52	1708503.87	N 39 57 11.32 W	80 32 23.22	5.09
	6520.00	30.74	243.84	6118.42	4969.03	638.61	-842.98	-1164.35	11.52	-2.56	21.64	530949.47	1708483.91	N 39 57 11.19 W	80 32 23.47	5.13
	6564.00	32.01	251.62	6156.00	5006.61	653.33	-851.62	-1185.52	9.64	2.89	17.68	530940.83	1708462.74	N 39 57 11.11 W	80 32 23.74	5.15
	6610.00	32.99	256.93	6194.80	5045.41	671.27	-858.30	-1209.30	6.56	2.13	11.54	530934.16	1708438.97	N 39 57 11.04 W	80 32 24.05	5.18
	6654.00	34.21	263.68	6231.46	5082.07	690.59	-862.37	-1233.27	8.93	2.77	15.34	530930.08	1708415.00	N 39 57 10.99 W	80 32 24.35	5.20
	6698.00	34.32	271.56	6267.84	5118.45	711.99	-863.39	-1257.97	10.08	0.25	17.91	530929.06	1708390.29	N 39 57 10.98 W	80 32 24.67	5.23
	6744.00	35.00	279.22	6305.70	5156.31	736.15	-860.93	-1283.97	9.58	1.48	16.65	530931.53	1708364.30	N 39 57 11.00 W	80 32 25.00	5.25
	6788.00	37.72	282.85	6341.13	5191.74	761.13	-855.91	-1309.56	7.88	6.18	8.25	530936.54	1708338.71	N 39 57 11.05 W	80 32 25.33	5.28
	6834.00	42.98	287.11	6376.19	5226.80	790.17	-848.16	-1338.29	12.91	11.43	9.26	530944.29	1708309.98	N 39 57 11.12 W	80 32 25.70	5.31
	6878.00	49.34	291.44	6406.65	5257.26	821.54	-837.63	-1368.19	16.10	14.45	9.84	530954.82	1708280.08	N 39 57 11.22 W	80 32 26.09	5.34
	6923.00	54.71	296.37	6434.34	5284.95	856.91	-823.22	-1400.57	14.72	11.93	10.96	530969.23	1708247.70	N 39 57 11.36 W	80 32 26.51	5.38
	6967.00	60.94	300.44	6457.77	5308.38	894.12	-805.48	-1433.28	16.18	14.16	9.25	530986.97	1708214.99	N 39 57 11.53 W	80 32 26.93	5.41
	7011.00	65.46	303.38	6477.61	5328.22	933.27	-784.71	-1466.60	11.88	10.27	6.68	531007.74	1708181.68	N 39 57 11.74 W	80 32 27.36	5.44
	7058.00	68.58	307.32	6495.96	5346.57	976.14	-759.67	-1501.87	10.18	6.64	8.38	531032.78	1708146.41	N 39 57 11.98 W	80 32 27.82	5.46
	7102.00	70.36	310.72	6511.39	5362.00	1016.53	-733.73	-1533.87	8.29	4.05	7.73	531058.72	1708114.41	N 39 57 12.23 W	80 32 28.23	5.49
	7147.00	71.22	313.93	6526.20	5376.81	1057.65	-705.12	-1565.28	7.00	1.91	7.13	531087.33	1708083.00	N 39 57 12.51 W	80 32 28.64	5.51
	7192.00	75.10	317.17	6539.24	5389.85	1098.63	-674.37	-1595.42	11.04	8.62	7.20	531118.07	1708052.86	N 39 57 12.81 W	80 32 29.03	5.53
	7236.00	78.98	319.42	6549.11	5399.72	1138.76	-642.37	-1623.94	10.13	8.82	5.11	531150.08	1708024.35	N 39 57 13.12 W	80 32 29.40	5.55
	7281.00	82.84	319.97	6556.22	5406.83	1179.96	-608.49	-1652.67	8.66	8.58	1.22	531183.96	1707995.61	N 39 57 13.46 W	80 32 29.78	5.58
	7326.00	87.80	320.76	6559.89	5410.50	1221.34	-573.96	-1681.27	11.16	11.02	1.76	531218.48	1707967.01	N 39 57 13.79 W	80 32 30.15	5.60
	7371.00	90.14	320.45	6560.69	5411.30	1262.79	-539.19	-1709.82	5.25	5.20	-0.69	531253.25	1707938.46	N 39 57 14.13 W	80 32 30.52	5.62
	7415.00	91.96	321.37	6559.89	5410.50	1303.22	-505.05	-1737.56	4.63	4.14	2.09	531287.39	1707910.72	N 39 57 14.47 W	80 32 30.88	5.64
	7459.00	92.20	321.47	6556.62	5407.23	1355.58	-434.74	-1793.65	0.29	0.27	0.11	531357.70	1707854.64	N 39 57 15.16 W	80 32 31.61	5.66
	7504.00	92.61	321.17	6552.89	5403.50	1467.06	-365.32	-1849.22	0.57	0.46	-0.34	531427.11	1707799.07	N 39 57 15.84 W	80 32 32.34	5.68
	7685.00	90.58	321.57	6550.35	5400.96	1550.38	-294.26	-1906.01	2.27	-2.23	0.44	531498.17	1707742.29	N 39 57 16.53 W	80 32 33.07	5.71
	7773.00	90.65	321.93	6549.41	5400.02	1630.75	-225.16	-1960.49	0.42	0.08	0.41	531567.27	1707687.81	N 39 57 17.21 W	80 32 33.78	5.73
	7863.00	90.93	322.14	6548.17	5398.78	1712.76	-154.21	-2015.85	0.39	0.31	0.23	531638.21	1707632.45	N 39 57 17.90 W	80 32 34.51	5.75
	7953.00	89.18	322.52	6548.08	5398.69	1794.58	-82.97	-2070.84	1.99	-1.94	0.42	531709.44	1707577.46	N 39 57 18.60 W	80 32 35.22	5.77
	8042.00	88.70	322.46	6549.73	5400.34	1875.38	-12.39	-2125.03	0.54	-0.54	-0.07	531780.03	1707523.28	N 39 57 19.29 W	80 32 35.93	5.79
	8132.00	89.86	322.19	6550.86	5401.47	1957.20	58.84	-2180.03	1.32	1.29	-0.30	531851.25	1707468.28	N 39 57 19.99 W	80 32 36.65	5.82
	8221.00	90.96	322.50	6550.22	5400.83	2038.28	129.03	-2234.75	1.27	1.24	-0.29	531921.44	1707413.56	N 39 57 20.68 W	80 32 37.36	5.84
	8310.00	91.17	321.93	6548.57	5399.18	2119.63	198.79	-2289.98	0.71	0.24	-0.67	531991.20	1707358.33	N 39 57 21.36 W	80 32 38.08	5.86
	8400.00	91.58	321.22	6546.41	5397.02	2202.11	288.99	-2346.27	0.47	0.46	-0.12	532061.39	1707302.05	N 39 57 22.05 W	80 32 38.81	5.87
	8490.00	90.34	321.02	6544.90	5395.51	2284.69	339.04	-2402.75	1.40	-1.38	-0.22	532131.44	1707245.57	N 39 57 22.73 W	80 32 39.55	5.89
	8579.00	90.52	321.27	6544.23	5394.84	2366.36	408.34	-2458.58	0.35	0.20	0.28	532200.74	1707189.74	N 39 57 23.41 W	80 32 40.27	5.91
	8669.00	91.03	322.50	6543.02	5393.63	2448.46	479.14	-2514.13	1.48	0.57	1.37	532271.54	1707134.19	N 39 57 24.10 W	80 32 41.00	5.93
	8758.00	90.27	321.77	6542.01	5392.62	2529.49	549.40	-2568.75	1.18	-0.85	-0.82	532341.79	1707079.57	N 39 57 24.79 W	80 32 41.71	5.95
	8848.00	91.34	322.65	6540.74	5391.35	2611.39	620.51	-2623.90	1.54	1.19	0.98	532412.90	1707024.43	N 39 57 25.49 W	80 32 42.43	5.97
	8938.00	91.72	324.28	6538.34	5388.95	2692.42	692.80	-2677.45	1.86	0.42	1.81	532485.18	1706970.88	N 39 57 26.20 W	80 32 43.13	5.99
	9027.00	90.24	325.69	6536.82	5387.43	2771.52	765.68	-2728.51	2.30	-1.66	1.58	532558.06	1706919.82	N 39 57 26.91 W	80 32 43.79	6.00
	9117.00	89.73	324.71	6536.84	5387.45	2851.36	839.58	-2779.87	1.23	-0.57	-1.09	532631.96	1706868.46	N 39 57 27.64 W	80 32 44.46	6.02
	9206.00	90.69	324.65	6536.51	5387.12	2930.69	912.20	-2831.33	1.08	1.08	-0.07	532704.57	1706817.01	N 39 57 28.35 W	80 32 45.14	6.04
	9295.00	90.41	324.22	6535.66	5386.27	3010.18	984.59	-2883.09	0.58	-0.31	0.58	532776.96	1706765.25	N 39 57 29.06 W	80 32 45.81	6.05
	9385.00	90.51	325.05	6534.94	5385.55	3090.43	1057.98	-2935.18	0.93	0.11	0.92	532850.35	1706713.16	N 39 57 29.78 W	80 32 46.49	6.07
	9474.00	90.03	325.42	6534.52	5385.13	3169.36	1131.09	-2985.93	0.68	-0.54	0.42	532923.46	1706662.42	N 39 57 30.49 W	80 32 47.15	6.08

2014

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ft)	Easting (ft)	Latitude (N/S ° ° ')	Longitude (E/W ° ° ')	Directional Difficulty Index
	9564.00	89.59	325.41	6534.82	5385.43	3249.05	1205.19	-3037.01	0.49	-0.49	-0.01	532997.55	1706611.33	N 39 57 31.22 W	80 32 47.82	6.10
	9654.00	89.69	323.81	6535.38	5385.99	3329.32	1278.56	-3089.13	1.78	0.11	-1.78	533070.91	1706559.22	N 39 57 31.94 W	80 32 48.50	6.11
	9743.00	91.48	326.05	6534.47	5385.08	3408.46	1351.39	-3140.26	3.22	2.01	2.52	533143.74	1706508.09	N 39 57 32.65 W	80 32 49.17	6.13
	9833.00	91.24	324.61	6532.34	5382.95	3488.18	1425.38	-3191.44	1.62	-0.27	-1.60	533217.73	1706456.91	N 39 57 33.38 W	80 32 49.84	6.15
	9922.00	91.58	323.17	6530.15	5380.76	3568.03	1497.26	-3243.88	1.66	0.38	-1.62	533289.61	1706404.48	N 39 57 34.08 W	80 32 50.52	6.16
	10012.00	91.31	323.62	6527.88	5378.49	3649.12	1569.49	-3297.52	0.58	-0.30	0.50	533361.83	1706350.83	N 39 57 34.79 W	80 32 51.22	6.18
	10102.00	90.89	322.21	6526.15	5376.76	3730.54	1641.27	-3351.78	1.63	-0.47	-1.57	533433.61	1706296.58	N 39 57 35.49 W	80 32 51.93	6.19
	10191.00	91.10	320.82	6524.60	5375.21	3811.96	1710.92	-3407.16	1.58	0.24	-1.56	533503.26	1706241.20	N 39 57 36.17 W	80 32 52.65	6.21
	10281.00	91.00	321.51	6522.95	5373.56	3894.52	1781.02	-3463.59	0.77	-0.11	0.77	533573.35	1706184.78	N 39 57 36.86 W	80 32 53.38	6.22
Survey 16Feb13	10339.00	90.69	321.39	6522.10	5372.71	3947.61	1826.37	-3499.73	0.57	-0.53	-0.21	533618.70	1706148.64	N 39 57 37.30 W	80 32 53.86	6.23
Projection to Bit	10400.00	90.69	321.39	6521.36	5371.97	4003.47	1874.03	-3537.79	0.00	0.00	0.00	533666.36	1706110.58	N 39 57 37.77 W	80 32 54.35	6.24

Survey Type: Def Survey

Survey Error Model: ISWISA 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	17.920	Act Sins	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-8L-HS Gyro+MWD 0' MD to 10400' MD
	17.920	3413.000	Act Sins	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-8L-HS Gyro+MWD 0' MD to
	3413.000	10339.000	Act Sins	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-8L-HS Gyro+MWD 0' MD to
	10339.000	10400.000	Act Sins	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-8L-HS Gyro+MWD 0' MD to

03/07/2014