

4705101528



Noble Energy SHL-8H-HS Gyro+MWD 0' to 10972' MD Survey Report (Def Survey)



Report Date: January 23, 2013 - 08:59 AM
Client: Noble Energy
Field: WV Marshall County (NAD 27)
Structure / Slot: CNX/Noble Energy SHL-8 Pad / SHL-8H-HS
Well: SHL-8H-HS
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Noble Energy SHL-8H-HS Gyro+MWD 0' to 10972' MD
Survey Date: January 14, 2013
Tort / AHD / DDJ / ERD Ratio: 204.902' / 5066.390 ft / 6.239 / 0.770
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 57' 19.84595", W 80° 32' 8.56817"
Location Grid N/E Y/X: N 531811.401 ftUS, E 1709654.429 ftUS
CRS Grid Convergence Angle: -0.6606°
Grid Scale Factor: 0.99995725

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 330.039° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB
TVD Reference Elevation: 1150.120 ft above MSL
Seabed / Ground Elevation: 1131.470 ft above MSL
Magnetic Declination: -8.712°
Total Gravity Field Strength: 999.3810mgn (9.80665 Based)
Total Magnetic Field Strength: 52754.008 nT
Magnetic Dip Angle: 67.432°
Declination Date: January 14, 2013
Magnetic Declination Model: BGGM 2012
North Reference: Grid North
Grid Convergence Used: -0.6606°
Total Corr Mag North->Grid North: -8.0517°

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	-1150.12	0.00	0.00	0.00	N/A	N/A	N/A	531811.40	1709654.43	N 39 57 19.85 W	80 32 8.57	0.00
	107.00	0.60	204.45	107.00	-1043.12	0.33	-0.51	-0.23	0.56	0.56	0.00	531810.89	1709654.20	N 39 57 19.84 W	80 32 8.57	0.00
	207.00	0.73	206.14	206.99	-943.13	-0.99	-1.56	-0.73	0.13	0.13	1.69	531809.84	1709653.70	N 39 57 19.83 W	80 32 8.58	0.10
	307.00	0.68	209.04	306.98	-843.14	-1.65	-2.65	-1.30	0.06	-0.05	2.90	531808.75	1709653.13	N 39 57 19.82 W	80 32 8.58	0.37
	407.00	0.52	211.01	406.98	-743.14	-2.17	-3.56	-1.82	0.16	-0.16	1.97	531807.84	1709652.61	N 39 57 19.81 W	80 32 8.59	0.58
	507.00	0.46	213.30	506.97	-643.15	-2.57	-4.28	-2.27	0.06	-0.06	2.29	531807.12	1709652.16	N 39 57 19.80 W	80 32 8.60	0.69
	607.00	0.37	217.58	606.97	-543.15	-2.88	-4.87	-2.69	0.10	-0.09	4.28	531806.53	1709651.74	N 39 57 19.80 W	80 32 8.60	0.79
	707.00	0.23	244.13	706.97	-443.15	-2.99	-5.22	-3.07	0.19	-0.14	26.55	531806.19	1709651.36	N 39 57 19.79 W	80 32 8.61	0.90
	807.00	0.15	296.76	806.97	-343.15	-2.86	-5.24	-3.37	0.18	-0.08	52.63	531806.16	1709651.06	N 39 57 19.79 W	80 32 8.61	0.98
	907.00	0.15	148.77	906.97	-243.15	-2.88	-5.30	-3.42	0.29	0.00	-147.99	531806.10	1709651.01	N 39 57 19.79 W	80 32 8.61	1.07
	1007.00	0.45	130.92	1006.97	-143.15	-3.39	-5.67	-3.05	0.31	0.30	-17.85	531805.73	1709651.38	N 39 57 19.79 W	80 32 8.61	1.17
	1107.00	0.34	86.13	1106.97	-43.15	-3.89	-5.90	-2.46	0.32	-0.11	-44.79	531805.50	1709651.97	N 39 57 19.79 W	80 32 8.60	1.27
	1207.00	0.51	88.42	1206.96	56.84	-1.72	-5.87	-1.72	0.17	0.17	2.29	531805.53	1709652.71	N 39 57 19.79 W	80 32 8.59	1.34
	1307.00	0.56	89.09	1306.96	156.84	-4.68	-5.85	-0.78	0.05	0.05	0.67	531805.55	1709653.65	N 39 57 19.79 W	80 32 8.58	1.39
	1407.00	0.48	92.19	1406.96	256.84	-5.14	-5.86	0.12	0.08	-0.08	3.10	531805.54	1709654.55	N 39 57 19.79 W	80 32 8.57	1.45
	1507.00	0.41	99.22	1506.95	356.83	-5.59	-5.93	0.90	0.09	-0.07	7.03	531805.47	1709655.32	N 39 57 19.79 W	80 32 8.56	1.49
	1607.00	0.40	113.08	1606.95	456.83	-6.09	-6.13	1.57	0.10	-0.01	13.86	531805.27	1709656.00	N 39 57 19.78 W	80 32 8.55	1.53
	1707.00	0.55	131.52	1706.95	556.83	-6.83	-6.58	2.25	0.21	0.15	18.44	531804.82	1709656.68	N 39 57 19.78 W	80 32 8.54	1.59
	1807.00	0.42	138.48	1806.94	656.82	-7.64	-7.18	2.85	0.14	-0.13	6.96	531804.23	1709657.28	N 39 57 19.78 W	80 32 8.53	1.64
	1907.00	0.57	129.56	1906.94	756.82	-8.47	-7.77	3.48	0.17	0.15	-8.92	531803.63	1709657.91	N 39 57 19.77 W	80 32 8.52	1.69
	2007.00	0.60	130.01	2006.93	856.81	-9.42	-8.42	4.26	0.03	0.03	0.45	531802.98	1709658.69	N 39 57 19.76 W	80 32 8.51	1.72
	2107.00	0.31	107.89	2106.93	956.81	-10.12	-8.84	4.92	0.33	-0.29	-22.12	531802.56	1709659.35	N 39 57 19.76 W	80 32 8.50	1.79
	2207.00	0.20	112.72	2206.93	1056.81	-10.46	-8.99	5.34	0.11	-0.11	4.83	531802.41	1709659.77	N 39 57 19.76 W	80 32 8.50	1.81
	2307.00	0.28	117.02	2306.93	1156.81	-10.80	-9.17	5.72	0.08	0.08	4.30	531802.23	1709660.15	N 39 57 19.76 W	80 32 8.49	1.83
	2407.00	0.28	114.92	2406.93	1256.81	-11.20	-9.38	6.16	0.01	0.00	-2.10	531802.02	1709660.59	N 39 57 19.75 W	80 32 8.49	1.84

02/28/2014

4705101528

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVSS (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
	2507.00	0.48	110.13	2506.93	1356.81	-11.73	-9.63	6.77	0.20	0.20	-4.79	531801.77	1709661.20	N 39 57 19.75 W	80 32 8.48	1.88
	2607.00	0.99	99.66	2606.92	1456.80	-12.60	-9.92	8.02	0.53	0.51	-10.47	531801.48	1709662.45	N 39 57 19.75 W	80 32 8.46	1.96
	2707.00	0.98	87.42	2706.90	1556.78	-13.54	-10.03	9.72	0.21	-0.01	-12.24	531801.38	1709664.15	N 39 57 19.75 W	80 32 8.44	2.02
	2807.00	0.67	82.51	2806.89	1656.77	-14.16	-9.91	11.16	0.32	-0.31	-4.91	531801.49	1709665.59	N 39 57 19.75 W	80 32 8.42	2.07
	2897.00	0.95	52.90	2896.88	1746.76	-14.27	-9.39	12.27	0.55	0.31	-32.90	531802.01	1709666.70	N 39 57 19.75 W	80 32 8.41	2.14
	3050.00	0.59	46.34	3049.87	1899.75	-13.92	-8.08	13.86	0.24	-0.24	-4.29	531803.32	1709668.28	N 39 57 19.77 W	80 32 8.39	2.20
	3094.00	0.63	46.45	3093.87	1943.75	-13.81	-7.76	14.20	0.09	0.09	0.25	531803.64	1709668.62	N 39 57 19.77 W	80 32 8.38	2.21
	3139.00	0.58	31.71	3138.86	1988.74	-13.65	-7.40	14.49	0.36	-0.11	-32.76	531804.01	1709669.73	N 39 57 19.77 W	80 32 8.38	2.23
	3184.00	0.56	32.41	3183.86	2033.74	-13.44	-7.02	14.73	0.05	-0.04	1.56	531804.39	1709669.16	N 39 57 19.78 W	80 32 8.38	2.24
	3229.00	0.58	24.90	3228.86	2078.74	-13.20	-6.62	14.95	0.17	0.04	-16.69	531804.78	1709669.37	N 39 57 19.78 W	80 32 8.38	2.25
	3273.00	0.59	27.66	3272.86	2122.74	-12.95	-6.22	15.14	0.07	0.02	6.27	531805.18	1709669.57	N 39 57 19.79 W	80 32 8.37	2.26
	3318.00	0.54	12.64	3317.85	2167.73	-12.67	-5.81	15.30	0.35	-0.11	-33.38	531805.59	1709669.73	N 39 57 19.79 W	80 32 8.37	2.28
	3363.00	0.57	0.78	3362.85	2212.73	-12.32	-5.38	15.35	0.26	0.07	-26.36	531806.02	1709669.78	N 39 57 19.79 W	80 32 8.37	2.29
	3408.00	0.61	357.75	3407.85	2257.73	-11.92	-4.92	15.34	0.11	0.09	-6.73	531806.49	1709669.77	N 39 57 19.80 W	80 32 8.37	2.30
	3452.00	0.67	349.09	3451.85	2301.73	-11.47	-4.43	15.28	0.26	0.14	-19.68	531806.97	1709669.71	N 39 57 19.80 W	80 32 8.37	2.31
	3497.00	0.96	340.00	3496.84	2346.72	-10.85	-3.82	15.11	0.70	0.64	-20.20	531807.59	1709669.53	N 39 57 19.81 W	80 32 8.37	2.34
	3542.00	2.08	335.76	3541.83	2391.71	-9.67	-2.72	14.64	2.48	2.47	-9.42	531808.68	1709669.07	N 39 57 19.82 W	80 32 8.38	2.42
	3587.00	2.27	332.95	3586.79	2436.67	-7.97	-1.18	13.90	0.52	0.47	-6.24	531810.22	1709668.33	N 39 57 19.84 W	80 32 8.39	2.46
	3631.00	2.21	334.82	3630.76	2480.64	6.72	0.36	13.14	0.23	-0.16	4.25	531811.77	1709667.57	N 39 57 19.85 W	80 32 8.40	2.48
	3721.00	2.38	343.87	3720.69	2570.57	8.02	3.73	11.89	0.44	0.19	10.06	531815.13	1709666.31	N 39 57 19.88 W	80 32 8.42	2.55
	3810.00	1.92	343.94	3809.63	2659.51	0.54	6.94	10.96	0.52	-0.52	0.08	531818.34	1709665.39	N 39 57 19.92 W	80 32 8.43	2.60
	3900.00	1.46	336.12	3899.59	2749.47	3.14	9.44	10.08	0.57	-0.51	-8.69	531820.84	1709664.51	N 39 57 19.94 W	80 32 8.44	2.65
	3989.00	1.10	331.20	3988.56	2838.44	5.12	11.22	9.21	0.42	-0.40	-5.53	531822.62	1709663.64	N 39 57 19.96 W	80 32 8.45	2.69
	4079.00	0.93	333.38	4078.55	2928.43	6.72	12.63	8.46	0.19	-0.19	2.42	531824.03	1709662.89	N 39 57 19.97 W	80 32 8.46	2.71
	4169.00	0.73	328.17	4168.54	3018.42	8.02	13.77	7.83	0.24	-0.22	-5.79	531825.17	1709662.26	N 39 57 19.98 W	80 32 8.47	2.73
	4259.00	0.68	318.90	4258.53	3108.41	9.12	14.66	7.18	0.14	-0.06	-10.30	531826.06	1709661.61	N 39 57 19.99 W	80 32 8.48	2.74
	4348.00	0.60	315.50	4347.53	3197.41	10.08	15.39	6.51	0.10	-0.09	-3.82	531826.79	1709660.94	N 39 57 20.00 W	80 32 8.49	2.76
	4437.00	0.62	318.60	4436.52	3286.40	11.01	16.08	5.86	0.04	0.02	3.48	531827.48	1709660.29	N 39 57 20.01 W	80 32 8.50	2.77
	4527.00	0.63	318.64	4526.52	3376.40	11.97	16.82	5.21	0.01	0.01	0.04	531828.22	1709659.64	N 39 57 20.01 W	80 32 8.50	2.77
	4616.00	0.84	22.94	4615.51	3465.39	12.84	17.79	5.14	0.90	0.24	72.25	531829.19	1709659.57	N 39 57 20.02 W	80 32 8.50	2.81
	4706.00	0.95	31.15	4705.50	3555.38	13.60	19.04	5.79	0.19	0.12	9.12	531830.44	1709660.22	N 39 57 20.03 W	80 32 8.50	2.83
	4795.00	0.81	24.71	4794.49	3644.37	14.32	20.24	6.43	0.19	-0.16	-7.24	531831.64	1709660.86	N 39 57 20.05 W	80 32 8.49	2.85
	4840.00	0.93	32.21	4839.48	3689.36	14.68	20.84	6.76	0.37	0.27	16.67	531832.24	1709661.19	N 39 57 20.05 W	80 32 8.48	2.86
	4885.00	3.02	67.27	4884.46	3734.34	14.70	21.60	8.05	5.16	4.64	77.91	531833.00	1709662.48	N 39 57 20.06 W	80 32 8.47	2.94
	4930.00	5.76	74.38	4929.32	3779.20	13.99	22.67	11.32	6.20	6.09	15.80	531834.07	1709665.75	N 39 57 20.07 W	80 32 8.43	3.04
	4974.00	7.63	77.12	4973.02	3822.90	12.58	23.92	16.29	4.31	4.25	6.23	531835.32	1709670.72	N 39 57 20.08 W	80 32 8.36	3.12
	5019.00	9.28	82.50	5017.53	3867.41	10.32	25.05	22.80	4.06	3.67	11.96	531836.45	1709677.23	N 39 57 20.10 W	80 32 8.28	3.20
	5064.00	11.64	84.54	5061.78	3911.66	7.05	25.96	30.92	5.31	5.24	4.53	531837.36	1709685.35	N 39 57 20.11 W	80 32 8.18	3.29
	5109.00	13.62	85.54	5105.69	3955.57	2.89	26.80	40.72	4.43	4.40	2.22	531838.20	1709695.15	N 39 57 20.12 W	80 32 8.05	3.38
	5153.00	15.38	86.04	5148.28	3998.16	-1.90	27.61	51.71	4.01	4.00	1.14	531839.01	1709706.13	N 39 57 20.12 W	80 32 7.91	3.45
	5198.00	17.07	87.09	5191.49	4041.37	-7.52	28.36	64.26	3.81	3.76	2.33	531839.76	1709718.68	N 39 57 20.13 W	80 32 7.75	3.53
	5243.00	19.32	89.05	5234.24	4084.12	-14.14	28.82	78.30	5.18	5.00	4.36	531840.22	1709732.72	N 39 57 20.14 W	80 32 7.57	3.61
	5287.00	21.96	89.43	5275.41	4125.29	-21.71	29.02	93.81	6.01	6.00	0.86	531840.42	1709748.23	N 39 57 20.14 W	80 32 7.37	3.70
	5332.00	22.83	87.56	5317.02	4166.90	-29.87	29.47	110.94	2.50	1.93	-4.16	531840.87	1709765.37	N 39 57 20.15 W	80 32 7.15	3.76
	5427.00	22.14	86.32	5399.25	4249.13	-45.27	31.29	144.93	0.94	-0.78	-1.39	531842.69	1709799.35	N 39 57 20.17 W	80 32 6.71	3.85
	5466.00	20.64	83.98	5441.15	4291.03	-52.25	32.66	161.28	3.83	-3.33	-5.20	531844.06	1709815.70	N 39 57 20.19 W	80 32 6.50	3.91
	5570.00	20.53	87.78	5542.26	4392.14	-68.79	35.39	199.14	1.24	-0.10	3.52	531846.79	1709853.56	N 39 57 20.22 W	80 32 6.02	3.99
	5659.00	22.87	85.66	5630.52	4480.40	-84.53	37.43	234.19	2.60	2.46	-2.23	531848.83	1709888.61	N 39 57 20.24 W	80 32 5.57	4.08

4705101528

Comments	MD (ft)	Incl (°)	Azim Grd (°)	TVD (ft)	TVSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Eastng (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	5764.00	24.08	84.50	5717.66	4567.54	-100.53	40.69	271.89	1.36	1.27	-1.22	531852.09	1709926.31	N 39 57 20.28 W	80 32 5.08	4.15
	5858.00	23.98	88.26	5803.52	4653.40	-117.51	43.11	310.08	1.63	-0.11	4.00	531854.51	1709964.49	N 39 57 20.31 W	80 32 4.59	4.21
	5953.00	24.45	90.89	5890.16	4740.04	-136.72	43.39	349.03	1.24	0.49	2.77	531854.79	1710003.45	N 39 57 20.31 W	80 32 4.09	4.27
	5999.00	24.32	89.62	5932.06	4781.94	-146.28	43.30	368.02	1.17	-0.28	-2.76	531854.70	1710022.44	N 39 57 20.32 W	80 32 3.85	4.29
	6048.00	20.31	79.23	5977.40	4827.28	-154.06	44.96	386.48	11.45	-8.18	-21.20	531856.36	1710040.89	N 39 57 20.33 W	80 32 3.61	4.36
	6093.00	17.55	61.77	6019.99	4869.87	-156.84	49.63	400.15	13.93	-6.13	-38.80	531861.03	1710054.56	N 39 57 20.38 W	80 32 3.44	4.43
	6137.00	17.03	46.09	6062.03	4911.91	-155.48	57.24	410.64	10.63	-1.18	-35.64	531868.64	1710065.05	N 39 57 20.46 W	80 32 3.30	4.47
	6182.00	17.55	32.08	6105.01	4954.89	-150.71	67.57	418.99	9.30	1.16	-31.13	531878.97	1710073.40	N 39 57 20.56 W	80 32 3.20	4.51
	6227.00	19.51	20.49	6147.69	4997.57	-142.74	80.36	425.23	9.25	4.36	-25.76	531891.76	1710079.64	N 39 57 20.69 W	80 32 3.12	4.55
	6271.00	22.39	10.90	6188.79	5038.67	-131.72	95.48	429.39	10.16	6.55	-21.80	531906.88	1710083.80	N 39 57 20.84 W	80 32 3.07	4.59
	6316.00	25.16	5.24	6229.97	5079.85	-117.42	113.43	431.88	7.97	6.16	-12.58	531924.82	1710086.29	N 39 57 21.02 W	80 32 3.04	4.63
	6361.00	29.20	358.20	6270.01	5119.89	-99.91	133.94	432.41	11.46	8.98	-15.64	531945.33	1710086.82	N 39 57 21.22 W	80 32 3.04	4.67
	6406.00	33.55	354.81	6308.42	5158.30	-78.93	157.31	430.94	10.43	9.67	-7.53	531968.70	1710085.35	N 39 57 21.45 W	80 32 3.06	4.71
	6451.00	39.04	351.26	6344.68	5194.56	-54.41	183.72	427.66	13.06	12.20	-7.89	531995.11	1710082.07	N 39 57 21.71 W	80 32 3.10	4.76
	6495.00	43.92	350.70	6377.63	5227.51	-27.19	212.50	423.09	11.12	11.09	-1.27	532023.89	1710077.50	N 39 57 21.99 W	80 32 3.17	4.80
	6540.00	48.68	348.50	6408.72	5258.60	3.46	244.48	419.19	11.15	10.58	-4.89	532055.87	1710071.60	N 39 57 22.31 W	80 32 3.25	4.85
	6585.00	53.70	344.95	6436.92	5286.80	37.04	278.58	409.11	12.73	11.16	-7.89	532089.96	1710063.52	N 39 57 22.65 W	80 32 3.36	4.90
	6630.00	59.44	341.51	6461.70	5311.58	73.59	314.50	398.24	14.26	12.76	-7.64	532125.89	1710052.65	N 39 57 23.00 W	80 32 3.50	4.94
	6675.00	63.32	337.70	6483.26	5333.14	112.52	351.50	384.46	11.38	8.62	-8.47	532162.88	1710038.87	N 39 57 23.36 W	80 32 3.68	4.99
	6719.00	66.07	332.83	6502.07	5351.95	152.12	387.60	367.81	11.80	6.25	-11.07	532198.98	1710022.22	N 39 57 23.72 W	80 32 3.90	5.03
	6764.00	69.10	330.01	6519.23	5369.11	193.70	424.12	347.90	8.88	6.73	-6.27	532235.50	1710002.31	N 39 57 24.08 W	80 32 4.16	5.07
	6809.00	73.27	327.14	6533.75	5383.63	236.26	460.45	325.69	11.06	9.27	-6.38	532271.83	1709980.10	N 39 57 24.43 W	80 32 4.45	5.10
	6854.00	77.68	325.22	6545.03	5394.91	279.71	496.62	301.44	10.63	9.80	-4.27	532308.00	1709955.86	N 39 57 24.79 W	80 32 4.77	5.14
	6898.00	81.37	324.93	6553.03	5402.91	322.81	532.09	276.68	8.41	8.39	-0.66	532343.47	1709931.09	N 39 57 25.14 W	80 32 5.03	5.18
	6943.00	87.11	324.27	6557.54	5407.42	367.36	568.57	250.75	12.84	12.76	-1.47	532379.94	1709905.17	N 39 57 25.49 W	80 32 5.43	5.21
	6988.00	90.38	322.32	6558.53	5408.41	412.03	604.63	223.87	8.46	7.27	-4.33	532416.01	1709878.29	N 39 57 25.85 W	80 32 5.78	5.25
	7033.00	90.69	322.31	6558.11	5407.99	456.62	640.24	196.36	0.69	0.69	-0.02	532451.61	1709850.78	N 39 57 26.20 W	80 32 6.14	5.27
	7122.00	88.25	321.60	6558.93	5408.81	544.72	710.32	141.52	2.86	-2.74	-0.80	532521.69	1709795.94	N 39 57 26.88 W	80 32 6.86	5.31
	7212.00	88.35	322.01	6561.60	5411.48	633.76	781.02	85.89	0.47	0.11	0.46	532592.39	1709740.32	N 39 57 27.57 W	80 32 7.58	5.35
	7302.00	90.24	318.68	6562.71	5412.59	722.45	850.30	28.47	4.25	2.10	-3.70	532661.66	1709682.90	N 39 57 28.25 W	80 32 8.33	5.40
	7391.00	91.27	316.86	6561.54	5411.42	809.40	916.19	-31.34	2.35	1.16	-2.04	532727.55	1709623.09	N 39 57 28.90 W	80 32 9.11	5.43
	7481.00	92.34	318.99	6558.70	5408.58	897.35	982.95	-91.61	2.65	1.19	2.37	532794.31	1709562.82	N 39 57 29.55 W	80 32 9.89	5.47
	7570.00	89.86	321.59	6556.99	5406.87	985.03	1051.40	-148.46	4.04	-2.79	2.92	532862.75	1709505.98	N 39 57 30.22 W	80 32 10.63	5.51
	7660.00	90.45	322.89	6556.75	5406.63	1074.20	1122.55	-203.57	1.59	0.66	1.44	532933.90	1709450.87	N 39 57 30.92 W	80 32 11.35	5.54
	7749.00	90.65	324.02	6555.90	5405.78	1162.61	1194.04	-256.56	1.29	0.22	1.27	533005.39	1709397.88	N 39 57 31.62 W	80 32 12.04	5.57
	7839.00	91.17	324.47	6554.47	5404.35	1252.14	1287.07	-309.14	0.76	0.58	0.50	533078.42	1709345.30	N 39 57 32.33 W	80 32 12.73	5.60
	7928.00	91.24	324.08	6552.59	5402.47	1340.67	1339.31	-361.10	0.45	0.08	-0.44	533150.65	1709293.35	N 39 57 33.04 W	80 32 13.40	5.62
	8017.00	91.31	324.73	6550.61	5400.49	1429.21	1411.66	-412.89	0.73	0.08	0.73	533223.00	1709241.56	N 39 57 33.75 W	80 32 14.08	5.65
	8107.00	90.93	324.15	6548.85	5398.73	1518.77	1484.86	-465.22	0.77	-0.42	-0.64	533296.20	1709189.23	N 39 57 34.47 W	80 32 14.76	5.67
	8196.00	91.65	323.39	6546.85	5396.73	1607.21	1556.63	-517.80	1.18	0.81	-0.85	533367.97	1709136.65	N 39 57 35.17 W	80 32 15.45	5.70
	8286.00	90.86	323.99	6544.88	5394.76	1696.64	1629.14	-571.08	1.10	-0.88	0.67	533440.47	1709083.37	N 39 57 35.88 W	80 32 16.14	5.72
	8375.00	91.13	324.02	6543.33	5393.21	1785.13	1701.14	-623.38	0.31	0.30	0.03	533512.46	1709031.08	N 39 57 36.59 W	80 32 16.82	5.74
	8465.00	90.14	323.74	6542.34	5392.22	1874.60	1773.83	-676.43	1.14	-1.10	-0.31	533585.15	1708978.03	N 39 57 37.30 W	80 32 17.52	5.77
	8554.00	89.76	323.80	6542.41	5392.29	1963.07	1845.62	-729.03	0.43	-0.43	0.07	533656.94	1708925.43	N 39 57 38.00 W	80 32 18.20	5.79
	8643.00	89.97	322.81	6542.63	5392.51	2052.45	1917.79	-782.81	1.12	0.23	-1.10	533729.10	1708871.65	N 39 57 38.71 W	80 32 18.90	5.81
	8733.00	89.62	322.08	6542.95	5392.83	2140.67	1988.34	-837.06	0.91	-0.39	-0.82	533799.65	1708817.41	N 39 57 39.40 W	80 32 19.61	5.83
	8823.00	90.21	322.66	6543.08	5392.96	2229.86	2059.62	-892.01	0.92	0.66	0.64	533870.93	1708762.46	N 39 57 40.10 W	80 32 20.33	5.85
	8912.00	91.06	324.00	6542.09	5391.97	2318.24	2131.00	-945.15	1.78	0.96	1.51	533942.30	1708709.32	N 39 57 40.80 W	80 32 21.02	5.87

4705101528

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
	9002.00	90.76	323.31	6540.66	5390.54	2407.67	2203.48	-998.48	0.84	-0.33	-0.77	534014.78	1708655.99	N 39 57 41.51 W	80 32 21.72	5.89
	9091.00	91.07	322.28	6539.24	5389.12	2495.95	2274.36	-1052.29	1.21	0.35	-1.16	534085.66	1708602.18	N 39 57 42.20 W	80 32 22.42	5.91
	9181.00	90.52	321.41	6537.99	5387.87	2585.02	2345.12	-1107.89	1.14	-0.61	-0.97	534156.42	1708546.59	N 39 57 42.89 W	80 32 23.14	5.93
	9271.00	91.51	320.92	6536.40	5386.28	2673.93	2415.21	-1164.32	1.23	1.10	-0.54	534226.51	1708490.17	N 39 57 43.58 W	80 32 23.88	5.95
	9360.00	91.99	319.94	6533.68	5383.56	2761.64	2483.79	-1220.98	1.23	0.54	-1.10	534295.08	1708433.50	N 39 57 44.25 W	80 32 24.61	5.96
	9450.00	91.79	320.39	6530.71	5380.59	2850.26	2552.86	-1278.60	0.55	-0.22	0.50	534364.14	1708375.88	N 39 57 44.93 W	80 32 25.37	5.98
	9539.00	91.85	320.68	6527.89	5377.77	2937.99	2621.53	-1335.14	0.33	0.07	0.33	534432.82	1708319.35	N 39 57 45.60 W	80 32 26.10	6.00
	9629.00	90.65	322.79	6525.92	5375.80	3027.02	2692.17	-1390.86	2.70	-1.33	2.34	534503.45	1708263.63	N 39 57 46.29 W	80 32 26.83	6.02
	9718.00	88.80	324.03	6526.35	5376.23	3115.42	2763.63	-1443.91	2.50	-2.08	1.39	534574.91	1708210.58	N 39 57 46.99 W	80 32 27.52	6.04
	9808.00	89.62	323.57	6527.59	5377.47	3204.87	2836.25	-1497.06	1.04	0.91	-0.51	534647.52	1708157.44	N 39 57 47.70 W	80 32 28.21	6.05
	9897.00	89.35	323.70	6528.39	5378.27	3293.32	2907.91	-1549.83	0.34	-0.30	0.15	534719.18	1708104.67	N 39 57 48.40 W	80 32 28.90	6.07
	9987.00	89.00	323.23	6529.69	5379.57	3382.71	2980.22	-1603.40	0.65	-0.39	-0.52	534791.49	1708051.10	N 39 57 49.11 W	80 32 29.60	6.08
	10076.00	89.79	323.07	6530.63	5380.51	3471.07	3051.43	-1656.77	0.91	0.89	-0.18	534862.70	1707997.73	N 39 57 49.81 W	80 32 30.30	6.10
	10166.00	90.96	324.75	6530.04	5379.92	3560.54	3124.16	-1709.78	2.27	1.30	1.87	534935.42	1707944.72	N 39 57 50.52 W	80 32 30.99	6.11
	10256.00	91.24	325.03	6528.31	5378.19	3650.16	3197.77	-1761.54	0.44	0.31	0.31	535009.02	1707892.97	N 39 57 51.24 W	80 32 31.66	6.13
	10345.00	91.10	324.60	6526.49	5376.37	3738.78	3270.49	-1812.81	0.51	-0.16	-0.48	535081.75	1707841.70	N 39 57 51.96 W	80 32 32.33	6.14
	10435.00	90.14	323.70	6525.52	5375.40	3828.29	3343.43	-1865.52	1.46	-1.07	-1.00	535154.69	1707789.00	N 39 57 52.67 W	80 32 33.02	6.16
	10524.00	90.72	323.74	6524.85	5374.73	3916.75	3415.18	-1918.18	0.65	0.65	0.04	535226.43	1707736.34	N 39 57 53.38 W	80 32 33.71	6.17
	10613.00	90.45	322.37	6523.94	5373.82	4005.08	3486.30	-1971.67	1.57	-0.30	-1.54	535297.55	1707682.85	N 39 57 54.07 W	80 32 34.40	6.19
	10703.00	90.86	322.58	6522.91	5372.79	4094.29	3557.68	-2026.48	0.51	0.46	0.23	535368.92	1707628.04	N 39 57 54.77 W	80 32 35.12	6.20
	10793.00	91.72	321.75	6520.89	5370.77	4183.42	3628.74	-2081.67	1.33	0.96	-0.92	535439.98	1707572.85	N 39 57 55.47 W	80 32 35.84	6.21
	10882.00	91.17	322.24	6518.64	5368.52	4271.52	3698.84	-2136.45	0.83	-0.62	0.55	535510.08	1707518.07	N 39 57 56.15 W	80 32 36.55	6.23
Final Survey 22Jan13	10909.00	91.24	323.13	6518.07	5367.95	4298.29	3720.31	-2152.82	3.31	0.26	3.30	535531.55	1707501.71	N 39 57 56.36 W	80 32 36.77	6.23
Projection to Bit	10972.00	91.24	323.13	6516.71	5366.59	4360.82	3770.70	-2190.61	0.00	0.00	0.00	5355581.93	1707463.92	N 39 57 56.86 W	80 32 37.26	6.24

Survey Type: Def Survey

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

Survey Program: ISCSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	18.650		30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-8H-HS Gyro+MWD 0' to 10972 MD
	18.650	2897.000		30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-8H-HS Gyro+MWD 0' to
	2897.000	3452.000		30.000	SLB_MWD-INC_ONLY	Original Borehole / Noble Energy SHL-8H-HS Gyro+MWD 0' to
	3452.000	10909.000		30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-8H-HS Gyro+MWD 0' to
	10909.000	10972.000		30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-8H-HS Gyro+MWD 0' to

02/28/2014