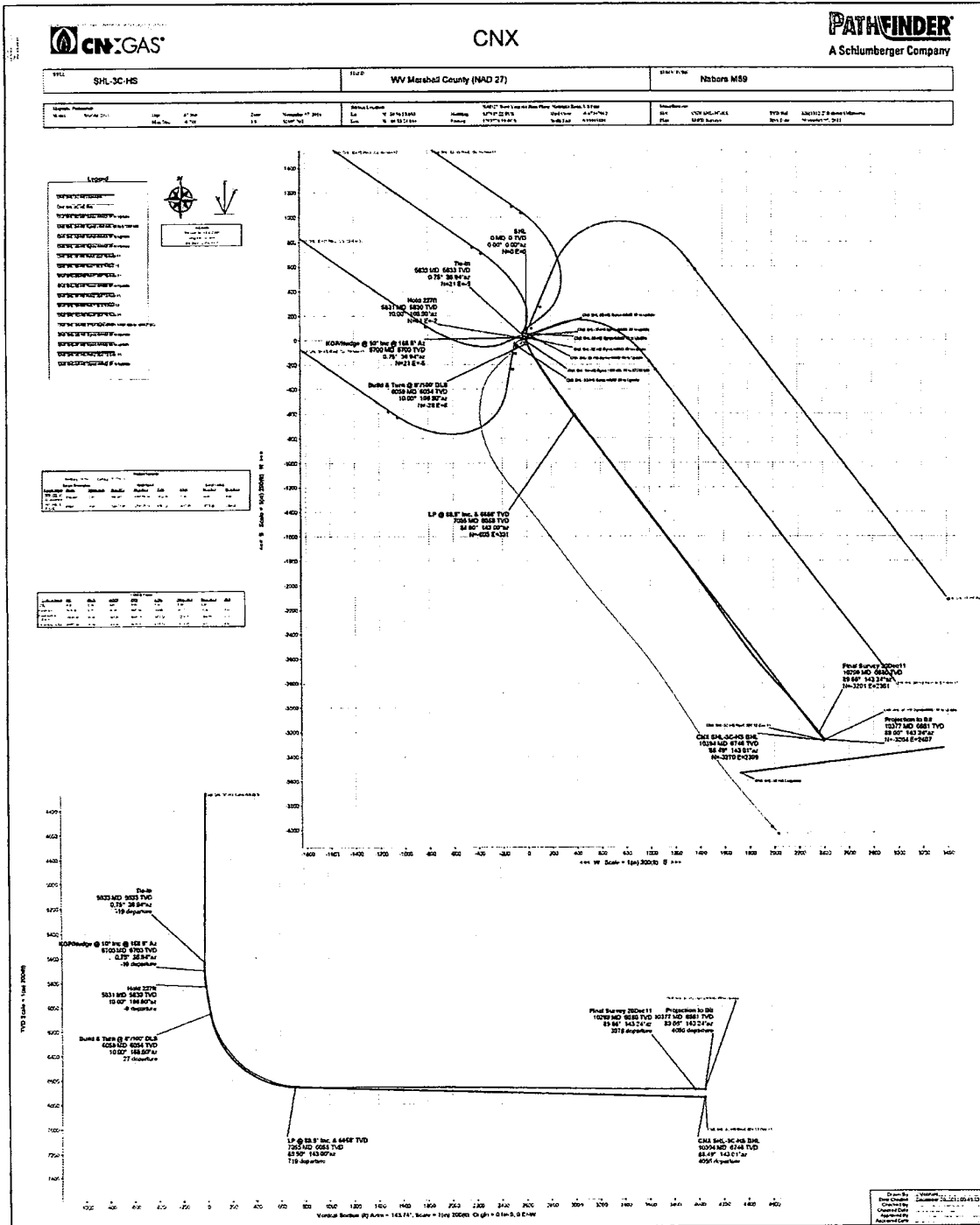


51.01364



04/04/2014

51-01364

Schlumberger

CNX SHL-3C-HS Gyros+MWD 0ft to Update Survey Report

(Def Survey)

Report Date: December 20, 2011 - 09:48 AM
Client: CNX
Field: WV Marshall County (NAD 27)
Structure / Slot: CNX SHL-3Pad / CNX SHL-3C-HS
Well: SHL-3C-HS
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: CNX SHL-3C-HS Gyros+MWD 0ft to Update
Survey Dates: November 07, 2011
Tool / AHD / DDI / ERD Ratio: 134.546 / 4118.488 ft / 5.935 / 0.816
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 58' 15.8268", W 80° 33' 24.88437"
Location Grid N/E Y/Z: N 537457.220 NUS, E 1703778.587 NUS
CRS Grid Convergence Angle: -0.87407012 °
Grid Scale Factor: 0.99955884
Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 143.738 ° (Grid North)
Vertical Section Origin: 0.000 N, 0.000 N
TYD Reference Datum: KB
TYD Reference Elevation: 1312.270 ft above Unknown
Seabed / Ground Elevation: 1289.180 ft above Unknown
Magnetic Declination: -8.748 °
Total Field Strength: 52897.674 nT
Magnetic Dip Angle: 67.569 °
Declination Date: November 07, 2011
Magnetic Declination Model: BGGM 2011
North Reference: Grid North
Grid Convergence Used: -0.874 °
Total Corr Mag North-Grid North: -0.074 °
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim (°), TYD (ft), TVOSS (ft), VSECC (ft), NS (ft), EW (ft), DLS (ft/100ft), Northing (ftUS), Easting (ftUS), Latitude (N/S °), Longitude (E/W °). Rows include SHL data points and Final Gyro data points.

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS ("/100ft)	Northing (ft)	Easting (ft)	Latitude (N/S ° ° '")	Longitude (E/W ° ° '")
	7890.00	90.07	143.11	6659.13	5346.86	1571.24	-1290.18	897.65	0.32	536257.10	1704676.20	N 39 58 3.21	W 80 33 13.16
	7986.00	90.07	142.55	6659.01	5346.74	1667.22	-1366.67	955.65	0.58	536180.81	1704734.20	N 39 58 2.46	W 80 33 12.41
	8079.00	90.07	142.79	6658.90	5346.63	1760.21	-1440.52	1012.05	0.26	536106.66	1704790.29	N 39 58 1.73	W 80 33 11.67
	8175.00	90.07	142.25	6658.78	5346.51	1856.19	-1516.80	1070.46	0.56	536030.49	1704849.00	N 39 58 0.99	W 80 33 10.91
	8268.00	89.76	142.93	6658.52	5346.65	1956.17	-1591.47	1127.57	0.80	535955.82	1704906.10	N 39 58 0.26	W 80 33 10.16
	8364.00	89.59	143.40	6659.46	5347.19	2048.16	-1667.80	1184.82	0.53	535879.79	1704963.06	N 39 57 59.51	W 80 33 9.42
	8453.00	89.28	142.93	6660.40	5348.13	2140.15	-1743.53	1241.47	0.59	535803.76	1705020.00	N 39 57 58.77	W 80 33 8.68
	8533.00	89.31	144.41	6661.55	5349.26	2234.14	-1819.26	1297.15	1.57	535728.05	1705075.68	N 39 57 58.03	W 80 33 7.95
	8648.00	89.14	144.69	6662.64	5350.57	2329.12	-1898.63	1352.25	0.34	535650.67	1705140.78	N 39 57 57.27	W 80 33 7.23
	8743.00	89.14	144.43	6664.26	5351.99	2424.10	-1974.02	1407.33	0.27	535573.28	1705195.85	N 39 57 56.51	W 80 33 6.51
	8837.00	89.11	143.86	6665.70	5353.43	2518.09	-2050.20	1462.38	0.61	535497.11	1705240.80	N 39 57 55.78	W 80 33 5.79
	8932.00	89.24	144.07	6667.07	5354.89	2613.09	-2127.02	1518.26	0.26	535420.29	1705296.78	N 39 57 55.01	W 80 33 5.07
	9027.00	89.28	145.39	6668.29	5356.22	2708.08	-2204.67	1573.11	1.39	535342.74	1705351.63	N 39 57 54.25	W 80 33 4.35
	9121.00	89.45	145.93	6669.34	5357.07	2801.99	-2282.18	1626.13	0.60	535265.14	1705404.63	N 39 57 53.49	W 80 33 3.66
	9216.00	89.21	146.30	6670.45	5358.18	2896.90	-2361.04	1679.09	0.46	535188.28	1705457.61	N 39 57 52.72	W 80 33 2.97
	9311.00	89.04	145.77	6671.90	5359.63	2991.82	-2439.82	1732.16	0.59	535107.50	1705510.67	N 39 57 51.94	W 80 33 2.27
	9406.00	89.00	143.68	6673.51	5361.24	3085.78	-2519.85	1786.44	2.22	535030.78	1705564.95	N 39 57 51.19	W 80 33 1.56
	9500.00	89.94	141.59	6675.21	5362.94	3180.76	-2599.04	1844.08	2.20	534953.30	1705622.99	N 39 57 50.45	W 80 33 0.81
	9595.00	88.90	139.67	6677.00	5364.73	3276.69	-2678.57	1904.20	1.81	534871.77	1705682.70	N 39 57 49.73	W 80 33 0.03
	9690.00	89.69	138.63	6678.17	5365.90	3370.23	-2737.53	1966.20	1.55	534809.81	1705744.71	N 39 57 49.03	W 80 32 58.22
	9784.00	89.45	138.16	6678.88	5368.81	3463.98	-2807.81	2028.62	0.56	534739.83	1705807.12	N 39 57 48.34	W 80 32 58.41
	9878.00	89.97	138.33	6679.35	5367.89	3557.45	-2877.94	2091.22	0.38	534685.41	1705869.71	N 39 57 47.68	W 80 32 57.69
	9973.00	90.27	138.47	6679.16	5366.89	3652.04	-2948.58	2154.29	0.35	534638.37	1705932.78	N 39 57 47.06	W 80 32 56.77
	10067.00	89.90	140.09	6679.02	5366.75	3745.76	-3020.22	2215.61	1.77	534587.13	1705994.40	N 39 57 46.28	W 80 32 55.98
	10162.00	89.55	140.98	6679.47	5367.20	3840.80	-3093.26	2275.99	1.01	534543.80	1706054.48	N 39 57 45.55	W 80 32 55.19
	10257.00	89.73	142.11	6680.07	5367.80	3935.82	-3167.95	2335.07	1.20	534379.41	1706113.55	N 39 57 44.82	W 80 32 54.42
Final Survey	10299.00	89.66	143.24	6680.29	5368.02	3977.52	-3201.25	2360.53	2.70	534346.01	1706139.02	N 39 57 44.49	W 80 32 54.09
20Dec11 Projection to Bit	10377.00	89.66	143.24	6680.78	5368.49	4058.51	-3283.83	2407.21	0.00	534283.53	1706189.70	N 39 57 43.88	W 80 32 53.48

Survey Type: Def Survey

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

Survey Program:	Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Survey Tool Type	Borehole / Survey
		0.000	23.090	Act Sins	SLB_MSG+MSHOT-Depth Only	Original Borehole / CNX SHL-3C-HS Gyros+MWD Off to Update
		23.090	5633.000	Act Sins	SLB_MSG+MSHOT	Original Borehole / CNX SHL-3C-HS Gyros+MWD Off to Update
		5633.000	10299.000	Act Sins	SLB_MWD-STD	Original Borehole / CNX SHL-3C-HS Gyros+MWD Off to Update
		10299.000	10377.000	Act Sins	SLB_BLIND+TREND	Original Borehole / CNX SHL-3C-HS Gyros+MWD Off to Update