

47-001-03312



CNX

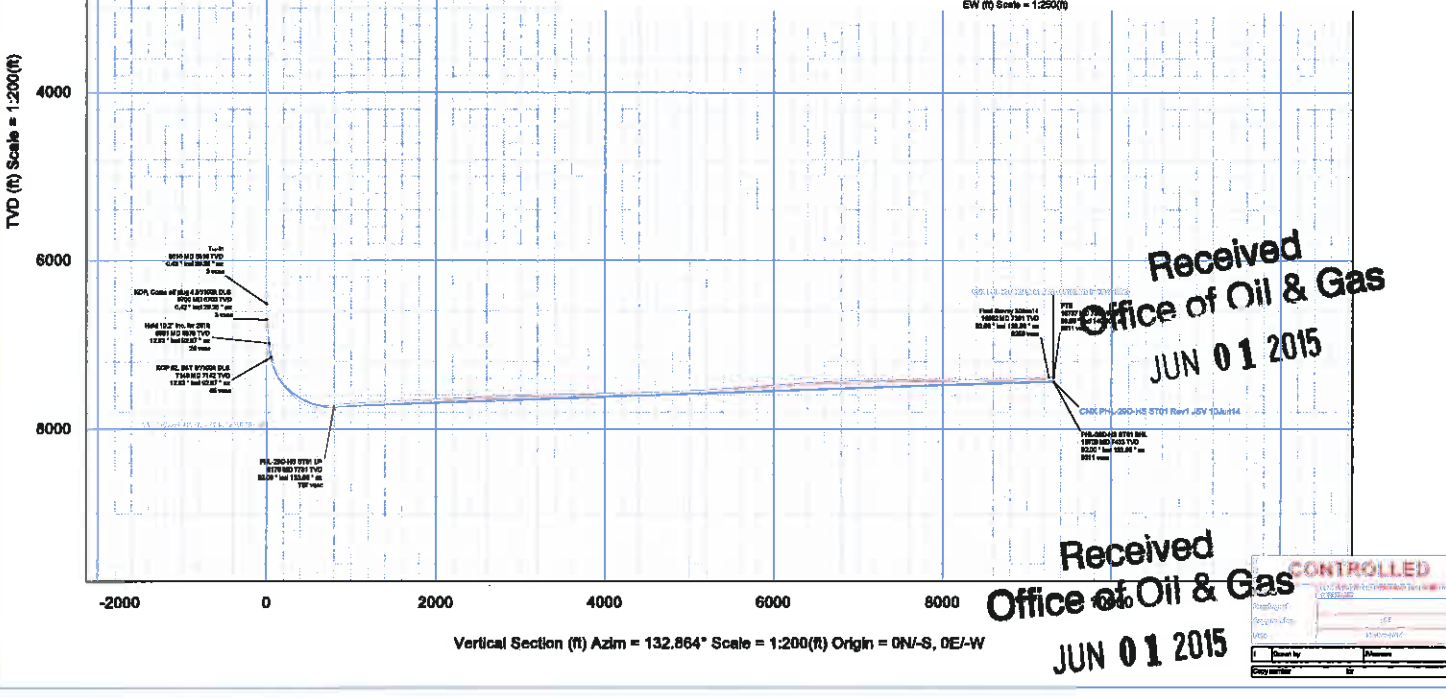
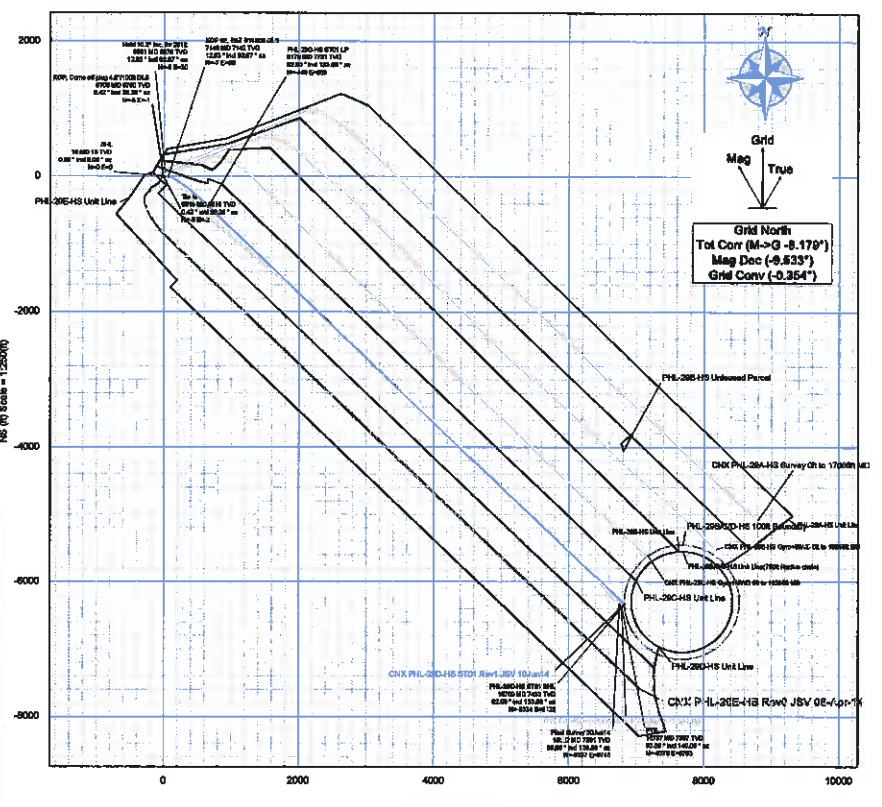
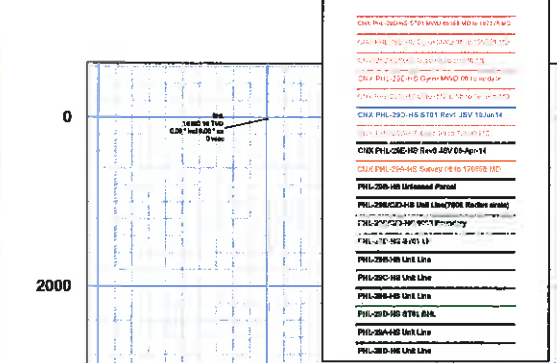


Borehole:	Well:	Field:	Structure:
ST01	PHL-29D-HS	WV Barbour County (NAD27)	Patterson 278

Gravity & Magnetic Parameters	Date:	Surface Location	Grid Conversion	Scale Factors
Model: HJGM 2013 Mag Dec: -0.822° FB: 52170.042m Gravity FB: 980.228mgals (9.80665 Based)	10-Jun-2014	NAD27 West Virginia State Plane, Northern Zone, US Feet Lat: N 80 12 4.67 Long: W 80 3 17.48	266922.48811US Grid Conv: -0.3538° North: 1942765.3948 Scale Fact: 0.9998904	Scale Factors Shot: PHL-29D-HS TVD Ref: KR(104.028 above 1051) Plan: CNX PHL-29D-HS ST01 REV04 REV01 MD to 10737R MD

DEPTH	TIME	TEMP	GRAB	LOG	LOG	LOG	LOG	LOG	LOG	LOG	LOG
1	0.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.5	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	1.5	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	2.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Target	Depth	Interval	Start	End	Start	End	Start	End	Start	End	Start	End
PHL-29D-HS Unit Line	100.00	100.00-100.00	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40
PHL-29D-HS Unit Line	100.00	100.00-100.00	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40	1942771.40



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CONTROLLED

Issue by: _____
Checked by: _____
Date: _____



CNX PHL-29D-HS ST01 MWD 6516ft MD to 16737ft MD Survey Report

(Def Survey)

Report Date: June 30, 2014 - 09:58 AM
Client: CNX
Field: WV Barbour County (MAD27)
Structure / Slot: CNX PHL-29 Pad / PHL-29D-HS
Well: PHL-29D-HS
Borehole: ST01
LWD / APF: Unknown / Unknown
Survey Name: CNX PHL-29D-HS ST01 MWD 6516ft MD to 16737ft MD
Survey Date: June 10, 2014
Tort / AHD / DOI / ERD Ratio: 231.985 * 0.997, 884 ft / 8.874 / 1.216
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 30° 12' 4.88890", W 80° 3' 17.45300"
Location Grid N/E Y/X: N 255832.438 RUS, E 1842758.300 RUS
CRS Grid Convergence Angle: -0.3539 *
Grid Scale Factor: 0.9999804
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Vertical Section Azimuth: 132.884 * (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB
TVD Reference Elevation: 1434.020 ft above MSL
Sealed / Ground Elevation: 1405.620 ft above MSL
Magnetic Declination: -9.533 *
Total Gravity Field Strength: 986.2864mgn (9.80665 Base)
Gravity Model: GARM
Total Magnetic Field Strength: 52170.042 nT
Magnetic Dip Angle: 66.376 *
Declination Date: June 10, 2014
Magnetic Declination Model: HD361 2013
North Reference: Grid North
Grid Convergence Used: -0.3539 *
Total Corr Mag North->Grid North: -9.1790 *
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim Grid (°), TVD (ft), TVDSS (ft), VSEC (ft), NS (ft), EW (ft), DLS (ft/100ft), BR (ft/100ft), TR (ft/100ft), Northing (ft), Easting (ft), Latitude (N/S/E/W), Longitude (E/W), Directional Difficulty Index. The table contains multiple rows of data points for the well survey.

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDGS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLR (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ft)	Easting (ft)	Latitude (N/S ° '' ''')	Longitude (E/W ° '' ''')	Directional Difficulty Index
	7736.00	61.44	142.79	7630.01	6195.98	364.81	-182.95	328.20	11.86	10.16	7.57	266748.90	1643006.49	N 30 12 3.06 W	80 3 13.27	4.57
	7761.00	65.45	144.83	7654.72	6220.70	396.12	-210.07	348.20	12.62	11.95	5.10	265722.38	1643105.49	N 30 12 2.81 W	80 3 13.01	4.63
	7832.00	62.43	147.91	7680.00	6246.62	440.52	-248.57	372.99	12.51	11.73	5.06	265686.98	1643190.87	N 30 12 2.46 W	80 3 12.70	4.70
	7876.00	67.90	148.06	7698.73	6264.71	478.50	-279.58	383.36	12.54	12.48	1.28	265652.89	1643181.05	N 30 12 2.13 W	80 3 12.43	4.78
	7827.00	74.39	148.46	7716.67	6261.55	526.80	-321.38	418.23	12.89	12.87	0.77	265611.07	1643177.51	N 30 12 1.72 W	80 3 12.10	4.82
	7866.00	80.26	148.25	7724.77	6260.75	585.37	-356.25	440.72	14.03	14.02	-0.00	265578.20	1643160.10	N 30 12 1.37 W	80 3 11.83	4.88
	8019.00	87.14	148.12	7733.25	6260.43	633.26	-385.45	466.90	13.72	13.72	-0.28	265534.00	1643125.19	N 30 12 0.96 W	80 3 11.49	4.94
	8068.00	95.12	148.15	7730.14	6258.12	656.90	-437.91	482.39	13.40	13.40	-4.19	265494.54	1643120.89	N 30 12 0.57 W	80 3 11.16	4.99
	8110.00	94.44	141.03	7727.24	6258.22	701.93	-473.23	518.44	11.99	3.00	-11.84	265456.22	1643121.26	N 30 12 0.22 W	80 3 10.88	5.04
	8159.00	97.17	139.52	7722.36	6258.26	750.43	-508.80	550.87	12.50	5.97	-11.24	265422.85	1643103.15	N 30 11 59.87 W	80 3 10.42	5.08
	8177.00	98.20	139.59	7720.19	6258.17	789.30	-522.14	593.61	11.94	-5.39	-10.72	265410.91	1643118.89	N 30 11 58.74 W	80 3 10.25	5.10
	8223.00	95.94	126.89	7715.32	6261.30	814.01	-552.32	687.87	9.96	-9.57	-10.00	265350.14	1643138.25	N 30 11 59.45 W	80 3 9.89	5.14
	8317.00	93.95	128.45	7707.48	6273.44	807.49	-611.54	670.83	2.48	-2.44	0.49	265320.82	1643208.81	N 30 11 58.87 W	80 3 8.89	5.19
	8611.00	93.12	128.92	7701.91	6267.88	1001.18	-671.46	742.74	0.75	-0.58	0.50	265281.00	1643301.02	N 30 11 58.28 W	80 3 7.97	5.24
	8635.00	92.95	129.57	7695.83	6262.91	1084.91	-721.48	814.82	0.41	-0.18	-0.37	265200.98	1643378.19	N 30 11 57.69 W	80 3 7.04	5.28
	8690.00	92.95	130.03	7692.10	6259.00	1188.85	-781.89	887.05	0.48	0.00	0.48	265140.90	1643445.32	N 30 11 57.10 W	80 3 6.12	5.32
	8690.00	92.98	130.24	7687.70	6253.88	1278.44	-820.15	956.54	0.48	-0.40	0.24	265082.32	1643714.81	N 30 11 56.52 W	80 3 5.24	5.36
	8785.00	92.98	129.59	7683.33	6249.31	1374.21	-811.04	1029.33	0.89	-0.89	-0.89	265021.43	1643787.59	N 30 11 55.93 W	80 3 4.31	5.39
	8980.00	92.51	129.92	7678.03	6245.01	1468.97	-871.72	1102.30	0.37	-0.18	0.33	264980.75	1643860.89	N 30 11 55.33 W	80 3 3.36	5.43
	8974.00	92.86	129.40	7674.83	6240.81	1582.72	-939.63	1174.80	0.65	0.37	0.65	264930.84	1643933.28	N 30 11 54.74 W	80 3 2.45	5.48
	9086.00	92.51	130.00	7670.22	6236.20	1656.48	-1081.61	1248.64	0.74	-0.37	0.84	264848.87	1644005.10	N 30 11 54.15 W	80 3 1.52	5.48
	9181.00	92.59	129.88	7666.00	6232.07	1748.27	-1151.22	1310.02	0.89	0.00	-0.02	264781.16	1644078.29	N 30 11 53.57 W	80 3 0.62	5.52
	9252.00	92.33	129.28	7662.16	6228.16	1840.04	-1208.29	1386.05	0.84	-0.29	-0.79	264723.19	1644148.31	N 30 11 53.00 W	80 3 2.98	5.55
	9348.00	92.95	129.36	7657.71	6223.89	1936.75	-1270.68	1463.02	0.85	0.84	0.10	264681.26	1644221.26	N 30 11 92.40 W	80 2 58.77	5.57
	9411.00	93.03	129.65	7652.91	6218.89	2026.46	-1329.13	1533.91	0.33	0.09	0.32	264630.36	1644292.19	N 30 11 91.83 W	80 2 57.87	5.57
	9538.00	92.42	129.25	7646.40	6214.38	2123.19	-1389.42	1619.17	-0.77	-0.64	-0.42	264583.07	1644365.43	N 30 11 91.23 W	80 2 56.93	5.62
	9632.00	92.89	129.48	7644.20	6210.18	2218.92	-1450.24	1681.35	0.28	0.18	0.22	264482.25	1644435.59	N 30 11 50.64 W	80 2 55.88	5.65
	9728.00	92.77	127.80	7638.81	6205.79	2312.59	-1509.82	1754.84	1.87	0.19	-1.88	264433.57	1644512.89	N 30 11 50.06 W	80 2 55.05	5.67
	9820.00	92.33	130.89	7633.62	6201.60	2406.26	-1668.61	1827.21	3.21	-0.47	3.18	264383.88	1644595.44	N 30 11 48.48 W	80 2 54.12	5.70
	9894.00	92.51	131.62	7633.78	6199.74	2450.23	-1697.47	1869.28	1.49	0.41	1.43	264335.02	1644678.52	N 30 11 48.19 W	80 2 53.70	5.71
	9913.00	92.68	132.38	7631.95	6197.63	2496.17	-1830.19	1898.68	1.79	0.35	1.78	264302.90	1644654.92	N 30 11 48.87 W	80 2 53.23	5.73
	10077.00	92.07	133.06	7627.05	6193.65	2593.06	-1993.91	1981.03	0.97	-0.65	0.72	264238.99	1644739.82	N 30 11 48.25 W	80 2 52.36	5.75
	10103.00	91.98	133.08	7624.38	6190.24	2696.05	-1757.38	2033.58	-0.10	-0.10	0.02	264176.12	1644791.81	N 30 11 47.82 W	80 2 51.49	5.77
	10194.00	92.33	132.62	7620.83	6188.81	2779.96	-1821.38	2120.33	0.48	0.37	-0.28	264111.12	1644860.56	N 30 11 46.98 W	80 2 50.81	5.79
	10288.00	92.42	132.87	7618.95	6182.91	2873.88	-1895.25	2171.20	0.11	0.10	0.05	264047.28	1644929.42	N 30 11 46.37 W	80 2 49.73	5.81
	10382.00	92.07	133.49	7613.33	6179.23	2987.81	-1949.52	2236.88	0.78	-0.37	0.69	263982.99	1645007.91	N 30 11 45.74 W	80 2 48.85	5.82
	10476.00	92.33	132.48	7608.64	6176.82	3081.74	-2013.55	2308.41	1.13	0.28	-1.13	263918.87	1645083.85	N 30 11 45.11 W	80 2 47.88	5.84
	10588.00	92.24	132.36	7605.98	6171.96	3153.66	-2075.55	2378.28	0.15	-0.10	-0.11	263856.88	1645134.50	N 30 11 44.50 W	80 2 47.11	5.88
	10694.00	92.07	131.25	7602.37	6168.95	3249.57	-2138.50	2447.78	1.17	-1.16	-1.16	263793.02	1645208.01	N 30 11 43.87 W	80 2 46.20	5.88
	10717.00	91.10	131.77	7600.77	6165.77	3342.51	-2201.11	2517.41	1.18	-1.04	0.56	263731.41	1645279.82	N 30 11 43.27 W	80 2 45.31	5.90
	10853.00	90.75	135.25	7593.24	6164.22	3438.48	-2297.18	2607.01	3.64	-0.36	3.63	263669.83	1645348.23	N 30 11 42.62 W	80 2 44.43	5.92
	10848.00	91.19	135.81	7596.67	6162.65	3531.36	-2333.54	2692.15	0.77	0.47	0.80	263608.06	1645410.36	N 30 11 41.97 W	80 2 43.58	5.94
	11040.00	91.01	135.86	7594.88	6160.84	3626.22	-2400.07	2771.82	0.21	-0.19	0.07	263531.85	1645478.51	N 30 11 41.52 W	80 2 42.75	5.98
	11184.00	91.10	135.80	7593.06	6159.04	3719.07	-2488.39	2878.08	0.21	0.19	-0.09	263484.13	1645541.30	N 30 11 40.84 W	80 2 41.91	5.97
	11228.00	91.19	134.09	7591.18	6157.16	3812.85	-2534.78	2943.81	1.82	-1.10	1.82	263437.97	1645608.19	N 30 11 40.19 W	80 2 41.05	5.99
	11222.00	91.01	133.29	7589.45	6155.43	3908.98	-2599.70	2917.57	0.86	-0.10	-0.85	263332.63	1645675.77	N 30 11 39.35 W	80 2 40.19	6.01
	11416.00	91.10	133.74	7587.72	6153.70	4000.94	-2684.41	2985.72	0.48	0.10	0.48	263288.12	1645743.92	N 30 11 38.71 W	80 2 39.32	6.02
	11508.00	91.01	133.21	7586.03	6152.01	4092.92	-2727.70	3052.48	0.58	-0.10	-0.58	263204.63	1645810.67	N 30 11 38.08 W	80 2 38.47	6.04
	11601.00	91.01	133.09	7584.39	6150.37	4185.80	-2791.29	3121.31	0.13	0.00	-0.13	263141.24	1645878.51	N 30 11 37.47 W	80 2 37.60	6.05
	11693.00	91.01	133.29	7582.76	6148.74	4277.89	-2854.24	3197.39	0.21	0.00	0.21	263078.29	1645946.99	N 30 11 36.85 W	80 2 36.75	6.06
	11615.00	91.60	132.56	7578.77	6145.75	4388.85	-2933.30	3277.70	0.89	0.65	-0.59	262996.24	1646034.69	N 30 11 36.04 W	80 2 35.61	6.08
	11808.00	92.95	131.87	7575.86	6141.85	4493.78	-3000.46	3346.20	1.37	-1.22	-0.63	262932.06	1646104.30	N 30 11 35.41 W	80 2 34.72	6.10
	12003.00	91.98	133.43	7571.83	6137.81	4597.07	-3064.15	3412.22	1.89	-1.03	1.55	262868.40	1646173.40	N 30 11 34.77 W	80 2 33.84	6.11
	12095.00	90.57	132.82	7569.70	6135.77	4679.84	-3127.08	3482.28	1.63	-1.53	-0.85	262805.47	1646240.47	N 30 11 34.17 W	80 2 32.88	6.13
	12184.00	91.01	131.80	7568.08	6134.54	4768.83	-3187.04	3554.05	1.35	0.48	-1.28	262745.61	1646308.23	N 30 11 33.58 W	80 2 32.14	6.14
	12280.00	93.12	131.84	7566.10	6131.06	4864.95	-3251.07	3618.48	2.20	2.20	0.18	262681.48	1646377.88	N 30 11 32.96 W	80 2 31.23	6.16
	12374.00	92.86	133.04	7564.28	6128.15	4958.42	-3314.98	3686.23	2.09	-0.29	-0.29	262617.87	1646446.40	N 30 11 32.33 W	80 2 30.35	6.18
	12468.00	95.03	138.42	7562.57	6121.35	5052.26	-3374.78	3758.15	0.53	0.18	-0.50	262552.77	1646514.32	N 30 11 31.69 W	80 2 29.48	6.19
	12558.00	93.74	132.58	7550.05	6116.03	5142.12	-3441.07	3821.85	1.21	0.79	-0.82	262491.49	1646580.02	N 30 11 31.00 W	80 2 28.64	6.20
	12650.00	93.65	133.35	7547.35	6113.33	5184.04	-3499.89	3892.82	1.62	-0.21	1.61	262432.82	1646648.98	N 30 11 30.31 W	80 2 28.28	6.21
	12852.00	93.91	133.20	7543.92	6109.50	5287.81	-3561.24	3966.23	0.81	0.83	-3.63					

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TYD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')	Directional Difficulty Index
Survey Error Model: Survey Program:	ISOWSA Rev 0 3-D 95.000% Confidence 2.7855 sigma															
Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type		Borehole / Survey							
		0.000	16.000	Act Slns	30.000	30.000	SLB_NSG+MSHOT-Depth Only		Original Borehole / CNX PHL-29D-HS Gyro Off to 7690ft MD (Projected-Up)							
		16.000	28.500	Act Slns	30.000	30.000	SLB_NSG+MSHOT-Depth Only		Original Borehole / CNX PHL-29D-HS Gyro Off to 7690ft MD							
		28.500	6516.000	Act Slns	30.000	30.000	SLB_NSG+MSHOT		Original Borehole / CNX PHL-29D-HS Gyro Off to 7690ft MD							
		6516.000	16982.000	Act Slns	30.000	30.000	SLB_MWD-STD		STD1 / CNX PHL-29D-HS STD1 MWD 6516ft MD to 16737ft MD							
		16982.000	16737.000	Act Slns	30.000	30.000	SLB_BLIND+TREND		STD1 / CNX PHL-29D-HS STD1 MWD 6516ft MD to 16737ft MD							

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