



Alan H Degarmo BRK 405H
Brooke Co, WV
SDC 40

Plan vs Actual

Plan Data for Alan H Degarmo BRK 405H

Dogleg Severity Unit: °/100.00ft		Plan Point Information:		Position Offsets from Slot centre		DLS ToolFace Comments	
MD	Inc	Az	TVD	+N/-S	+E/-W	VSec	(°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
26.00	0.00	0.00	26.00	0.00	0.00	0.00	0.0
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.0
1690.00	23.00	68.31	1619.36	84.16	211.62	42.15	2.00
5513.57	23.00	68.31	5175.80	642.00	1614.38	321.57	0.00
6498.73	70.00	345.22	5885.51	1233.93	1683.75	889.33	7.00
6745.76	90.59	336.67	5927.00	1462.45	1604.24	1128.83	9.00
15440.54	90.59	336.67	5837.00	9445.97	-1838.80	9623.28	0.00

Target Set Information:	
Name	Value
Name	Alan H Degarmo BRK 405H
Position Offsets from Slot centre	+N/-S +E/-W Northing Easting
LP AHD405H	5927.00 1296.48 1675.82 14618058.71 1761525.60 48.249977 -80.565961
PBHL AHD405H	5837.00 9445.97 -1838.80 14626208.20 1758010.98 48.272402 -80.578417

Plan Data for Alan H Degarmo BRK 405H

Field: SOUTHWESTERN_BROOKE CO, WV UTM MAD 83 (17N)
Map Unit: USFT Vertical Reference Datum (VRD): Projected Coordinate System: NAD83 / UTM zone 17N

Site: Alan H Degarmo Pad
Unit: USFeet **TVD Reference:**
 Company Name: SOUTHWESTERN ENERGY
Position: Northing: 14616754.85USft Latitude: 40.246420°
 Easting: 1759766.13USft Longitude: -80.572289°
 North Reference: Grid Grid Convergence: 0.28°
 Elevation Above VRD: 1284.00USft

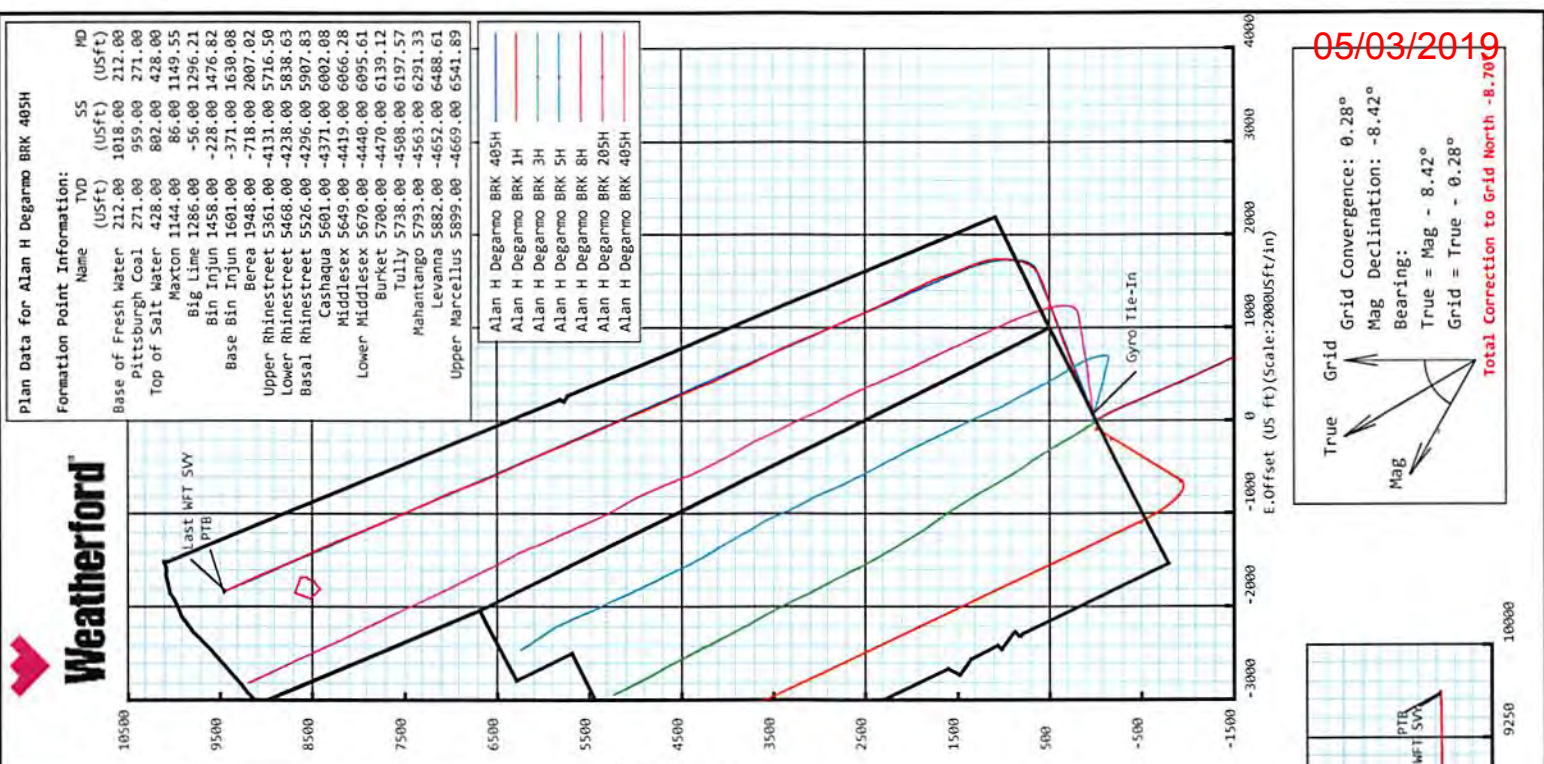
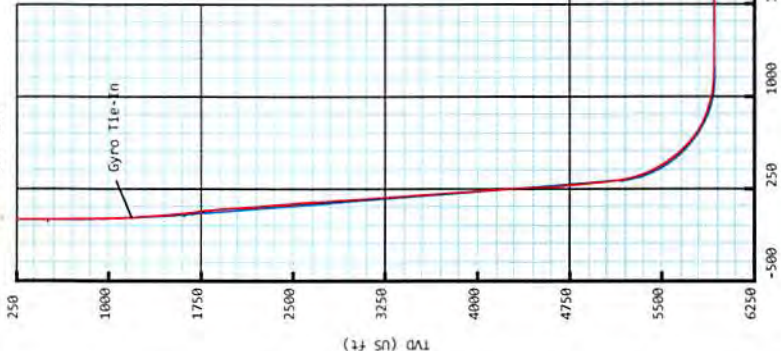
Slot: Alan H Degarmo BRK 405H
Position: Offset is from Site centre
 +N/-S: 7.38USft Northing: 14616762.23USft Latitude: 40.246440°
 +E/-W: 83.65USft Easting: 1759849.78USft Longitude: -80.571989°
 Elevation Above VRD: 1284.00USft

Well: Alan H Degarmo BRK 405H
 Type: Main-Well
 File Number:

Plan Folder: P1
Plan: P1:V3
Vertical Section: Position offset of origin from Slot centre:
 +N/-S: 0.00USft Azimuth: 348.98°
 +E/-W: 0.00USft

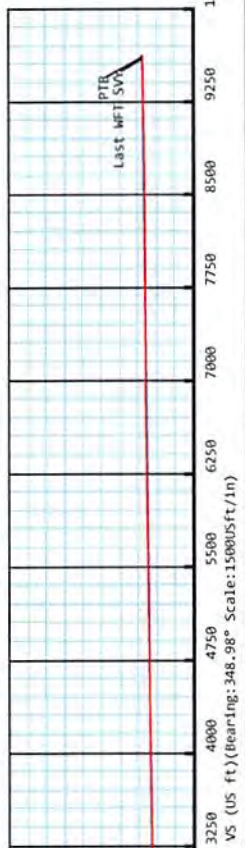
Magnetic Parameters:
 Model: Field Strength: Declination: Dip: Date:
 HDGM 52686(NT) -8.42° 67.70° 2017-11-13

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05/03/2019

True Grid
 Mag
 Grid Convergence: 0.28°
 Mag Declination: -8.42°
 Bearing:
 True = Mag - 8.42°
 Grid = True + 0.28°
 Total Correction to Grid North = -8.70°





5D Survey Report

SOUTHWESTERN ENERGY

Field Name: *SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)*
Site Name: *Alan H Degarmo Pad*
Well Name: *Alan H Degarmo BRK 405H*
Survey: *Definitive survey*

26 November 2017

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Alan H Degarmo BRK 405H

Field Name:	Map Units: US ft	Company Name: SOUTHWESTERN ENERGY
SOUTHWESTER N_BROOKE CO, WV UTM NAD 83 (17N)	Vertical Reference Datum (VRD):	
	Projected Coordinate System: NAD83 / UTM zone 17N	
	Comment:	
Site:	Units: US ft	North Reference: Grid
Alan H Degarmo Pad	Position:	Convergence Angle: 0.28
	Northing: 14616754.85 US ft	Latitude: 40° 14' 47.11"
	Easting: 1759766.13 US ft	Longitude: -80° 34' 20.24"
	Elevation above Field Reference: 1204.00 US ft	
	Comment:	
Slot:	Position (Relative to Site Centre)	
Alan H Degarmo BRK 405H	+N/-S: 7.38 US ft	Northing: 14616762.23 US ft
	+E/-W: 83.65 US ft	Easting: 1759849.78 US ft
		Latitude: 40°14'47.18"
		Longitude: -80°34'19.16"
	Elevation above Field Reference: 1204.00 US ft	
	Comment:	
Well:	Type: Main well	UWI:
Alan H Degarmo BRK 405H	File Number:	Comment:
	Closure Distance: 9619.85 US ft	Closure Azimuth: 348.99°
	Vertical Section: Position of Origin (Relative to Slot centre)	
	+N/-S: -0.00 US ft	+E/-W: 0.00 US ft
		Az: 348.98°

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Drill floor:	Survey Name: Definitive Survey
Rig Height (Drill Floor): 26.00 US ft	Elevation above Field Reference: 1230.00 US ft
	Inclination: 0.00°
	Azimuth: 0.00°

Survey Name: Definitive Survey			
Date: 13/Oct/2017	Survey Tool: See Survey Tool Ranges below.	Comment:	Company:

Magnetic Model:				
Model Name: HDGM	Date: 13/Nov/2017	Field Strength: 52606.0nT	Declination: -8.42°	Dip: 67.70°

Tie Point:					
MD: 0.00 US ft	Inclination: 0.00°	Azimuth: 0.00°	TVD: 0.00 US ft	North Offset: -0.00 US ft	East Offset: 0.00 US ft

Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
GYRO_GC_WIR+DPIPE_GYD	0.00	1200.00	Gyro_01
MWD	1200.00	1623.00	WFT MWD_01
MWD	1623.00	5507.00	WFT MWD_02
MWD	5507.00	12300.00	WFT MWD_03
MWD	12300.00	15425.00	WFT MWD_04

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (%/100US ft)	Comment
5321.00	23.40	65.34	4996.21	302.21	609.78	1550.17	14617372.01	1761399.95	1.05	
5414.00	22.26	64.17	5081.93	311.07	625.16	1582.81	14617387.39	1761432.59	1.32	
5460.00	21.44	59.43	5124.63	316.11	633.23	1597.90	14617395.46	1761447.68	4.23	
5507.00	21.19	52.11	5168.42	322.83	642.82	1612.00	14617405.05	1761461.78	5.68	
5583.00	21.31	38.70	5239.29	337.97	662.04	1631.48	14617424.27	1761481.26	6.38	
5614.00	21.42	35.11	5268.16	345.54	671.07	1638.26	14617433.30	1761488.04	4.23	
5661.00	23.97	34.03	5311.52	358.23	686.00	1648.54	14617448.23	1761498.32	5.50	
5707.00	27.78	33.36	5352.90	372.50	702.71	1659.67	14617464.94	1761509.45	8.31	
5753.00	30.36	29.56	5393.11	389.00	721.78	1671.30	14617484.01	1761521.08	6.89	
5800.00	32.12	24.86	5433.30	408.15	743.45	1682.42	14617505.68	1761532.20	6.39	
5846.00	33.10	21.10	5472.05	428.69	766.27	1692.08	14617528.50	1761541.86	4.89	
5893.00	35.49	16.57	5510.88	451.66	791.33	1700.60	14617553.56	1761550.38	7.44	
5939.00	38.15	12.13	5547.71	476.57	818.02	1707.39	14617580.25	1761557.17	8.18	
5985.00	39.44	8.50	5583.57	503.41	846.37	1712.54	14617608.60	1761562.32	5.68	
6032.00	40.71	6.70	5619.53	532.08	876.36	1716.53	14617638.59	1761566.31	3.66	
6078.00	43.06	5.88	5653.77	561.40	906.88	1719.89	14617669.11	1761569.67	5.25	
6124.00	46.46	5.98	5686.43	592.38	939.10	1723.24	14617701.33	1761573.02	7.39	
6171.00	49.19	5.47	5717.99	625.73	973.75	1726.71	14617735.98	1761576.49	5.86	
6217.00	51.80	2.93	5747.25	659.98	1009.14	1729.29	14617771.37	1761579.07	7.09	
6263.00	55.10	359.60	5774.64	696.07	1046.07	1730.09	14617808.30	1761579.87	9.23	
6309.00	58.13	356.54	5799.96	733.99	1084.45	1728.78	14617846.68	1761578.56	8.62	
6356.00	63.08	353.12	5823.02	774.71	1125.21	1725.06	14617887.44	1761574.84	12.29	
6402.00	67.16	349.53	5842.38	816.39	1166.44	1718.74	14617928.67	1761568.52	11.35	
6449.00	70.52	344.66	5859.35	860.17	1209.13	1708.94	14617971.36	1761558.72	12.02	
6495.00	73.58	341.45	5873.53	903.69	1250.98	1696.18	14618013.21	1761545.96	9.40	
6541.00	75.23	339.88	5885.90	947.52	1292.79	1681.51	14618055.02	1761531.29	4.87	
6588.00	76.63	339.02	5897.32	992.48	1335.47	1665.51	14618097.70	1761515.29	3.47	
6634.00	79.21	339.21	5906.95	1036.80	1377.49	1649.47	14618139.72	1761499.25	5.62	
6680.00	83.27	338.74	5913.95	1081.56	1419.92	1633.16	14618182.15	1761482.94	8.88	
6727.00	85.99	338.54	5918.35	1127.59	1463.50	1616.12	14618225.73	1761465.90	5.80	
6773.00	88.83	338.60	5920.43	1172.78	1506.27	1599.33	14618268.50	1761449.11	6.18	
6866.00	89.75	341.63	5921.58	1264.65	1593.71	1567.71	14618355.94	1761417.49	3.40	
6959.00	89.08	339.78	5922.53	1356.67	1681.47	1536.98	14618443.70	1761386.76	2.12	
7051.00	89.14	336.28	5923.96	1446.97	1766.77	1502.57	14618529.00	1761352.35	3.80	
7144.00	90.25	334.38	5924.46	1537.34	1851.27	1463.76	14618613.50	1761313.54	2.37	
7237.00	89.88	335.41	5924.35	1627.54	1935.49	1424.30	14618697.72	1761274.08	1.18	
7329.00	90.06	334.62	5924.40	1716.82	2018.88	1385.44	14618781.11	1761235.22	0.88	
7422.00	90.25	333.63	5924.15	1806.71	2102.55	1344.85	14618864.78	1761194.63	1.08	
7515.00	90.31	333.63	5923.69	1896.39	2185.87	1303.55	14618948.10	1761153.33	0.06	
7607.00	90.37	334.66	5923.15	1985.32	2268.66	1263.43	14619030.89	1761113.21	1.12	
7700.00	90.43	336.13	5922.50	2075.72	2353.21	1224.71	14619115.44	1761074.49	1.58	
7793.00	90.31	335.79	5921.90	2166.32	2438.15	1186.82	14619200.38	1761036.60	0.39	
7886.00	90.43	336.02	5921.30	2256.91	2523.04	1148.86	14619285.27	1760998.64	0.28	
7979.00	90.80	337.02	5920.30	2347.71	2608.33	1111.81	14619370.56	1760961.59	1.15	
8071.00	91.17	337.48	5918.72	2437.78	2693.16	1076.23	14619455.39	1760926.01	0.64	
8164.00	90.86	335.41	5917.07	2528.54	2778.40	1039.08	14619540.63	1760888.86	2.25	
8257.00	91.17	336.82	5915.42	2619.19	2863.42	1001.43	14619625.65	1760851.21	1.55	
8349.00	90.53	336.84	5914.06	2709.12	2947.99	965.23	14619710.22	1760815.01	0.70	
8442.00	91.05	337.12	5912.77	2800.08	3033.57	928.87	14619795.80	1760778.65	0.64	
8534.00	90.86	338.13	5911.24	2890.26	3118.63	893.85	14619880.86	1760743.63	1.12	
8627.00	90.25	337.74	5910.34	2981.54	3204.82	858.92	14619967.05	1760708.70	0.78	
8720.00	90.37	336.44	5909.84	3072.54	3290.48	822.72	14620052.71	1760672.50	1.40	
8812.00	90.74	335.88	5908.95	3162.24	3374.62	785.53	14620136.85	1760635.31	0.73	
8905.00	90.55	335.40	5907.90	3252.72	3459.34	747.18	14620221.57	1760596.96	0.56	
8998.00	90.31	333.26	5907.20	3342.69	3543.15	706.89	14620305.38	1760556.67	2.32	
9090.00	90.49	332.60	5906.56	3431.10	3625.07	665.03	14620387.30	1760514.81	0.74	
9183.00	90.86	334.56	5905.46	3520.75	3708.35	623.65	14620470.58	1760473.43	2.14	
9276.00	90.55	335.16	5904.32	3610.94	3792.53	584.15	14620554.76	1760433.93	0.73	
9369.00	90.62	335.51	5903.37	3701.31	3877.04	545.34	14620639.27	1760395.12	0.38	

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3D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (%/100US ft)	Comment
9462.00	90.74	335.09	5902.26	3791.66	3961.53	506.48	14620723.76	1760356.26	0.47	
9554.00	90.74	334.26	5901.08	3880.80	4044.68	467.13	14620806.91	1760316.91	0.90	
9647.00	90.80	335.62	5899.83	3971.01	4128.91	427.74	14620891.14	1760277.52	1.46	
9740.00	90.92	337.97	5898.43	4061.90	4214.37	391.10	14620976.60	1760240.88	2.53	
9832.00	90.80	339.67	5897.05	4152.45	4300.15	357.87	14621062.38	1760207.65	1.85	
9925.00	91.05	338.00	5895.55	4243.98	4386.86	324.30	14621149.09	1760174.08	1.82	
10018.00	90.80	337.92	5894.05	4335.25	4473.05	289.40	14621235.28	1760139.18	0.28	
10111.00	90.74	336.19	5892.80	4426.23	4558.68	253.15	14621320.91	1760102.93	1.86	
10203.00	90.68	336.68	5891.66	4516.03	4643.00	216.38	14621405.23	1760066.16	0.54	
10296.00	90.55	335.96	5890.66	4606.76	4728.17	179.03	14621490.40	1760028.81	0.79	
10389.00	90.49	337.31	5889.81	4697.60	4813.53	142.15	14621575.76	1759991.93	1.45	
10482.00	90.74	338.37	5888.82	4788.85	4899.66	107.07	14621661.89	1759956.85	1.17	
10574.00	90.74	337.79	5887.63	4879.18	4985.00	72.73	14621747.23	1759922.51	0.63	
10667.00	90.68	337.89	5886.48	4970.42	5071.12	37.65	14621833.35	1759887.43	0.13	
10760.00	90.80	337.04	5885.27	5061.54	5157.02	2.01	14621919.25	1759851.79	0.92	
10852.00	90.31	336.52	5884.38	5151.46	5241.56	-34.26	14622003.79	1759815.52	0.78	
10945.00	90.86	336.75	5883.43	5242.30	5326.93	-71.14	14622089.16	1759778.64	0.64	
11038.00	90.80	336.22	5882.09	5333.09	5412.20	-108.24	14622174.43	1759741.54	0.57	
11130.00	90.99	336.32	5880.65	5422.82	5496.41	-145.26	14622258.64	1759704.52	0.23	
11223.00	91.05	337.14	5878.99	5513.69	5581.83	-181.99	14622344.06	1759667.79	0.88	
11316.00	91.11	336.56	5877.24	5604.60	5667.32	-218.55	14622429.55	1759631.23	0.63	
11408.00	90.99	337.04	5875.56	5694.51	5751.87	-254.79	14622514.10	1759594.99	0.54	
11501.00	90.62	338.24	5874.25	5785.68	5837.87	-290.16	14622600.10	1759559.62	1.35	
11594.00	90.74	337.89	5873.14	5876.99	5924.13	-324.90	14622686.36	1759524.88	0.40	
11686.00	90.92	336.63	5871.81	5967.07	6008.97	-360.46	14622771.20	1759489.32	1.38	
11779.00	90.86	336.67	5870.37	6057.91	6094.34	-397.31	14622856.57	1759452.47	0.08	
11872.00	90.37	336.47	5869.37	6148.73	6179.67	-434.29	14622941.90	1759415.49	0.57	
11964.00	90.80	335.13	5868.43	6238.30	6263.57	-472.00	14623025.80	1759377.78	1.53	
12057.00	90.31	335.80	5867.53	6328.72	6348.17	-510.62	14623110.40	1759339.16	0.89	
12150.00	90.92	336.11	5866.53	6419.32	6433.10	-548.51	14623195.33	1759301.27	0.74	
12243.00	91.42	336.47	5864.63	6510.03	6518.23	-585.89	14623280.46	1759263.89	0.66	
12300.00	91.54	336.51	5863.16	6565.66	6570.48	-608.63	14623332.71	1759241.15	0.22	
12335.00	90.99	336.93	5862.39	6599.86	6602.62	-622.45	14623364.85	1759227.33	1.98	
12428.00	89.51	337.52	5861.98	6690.90	6688.37	-658.45	14623450.60	1759191.33	1.71	
12520.00	91.35	340.28	5861.29	6781.47	6774.18	-691.57	14623536.41	1759158.21	3.61	
12613.00	89.82	339.14	5860.34	6873.24	6861.41	-723.82	14623623.64	1759125.96	2.05	
12706.00	89.69	339.62	5860.74	6964.94	6948.45	-756.57	14623710.68	1759093.21	0.53	
12798.00	88.95	336.42	5861.83	7055.24	7033.74	-790.99	14623795.97	1759058.79	3.57	
12891.00	90.49	334.26	5862.29	7145.61	7118.25	-829.79	14623880.48	1759019.99	2.85	
12984.00	90.55	335.48	5861.44	7235.80	7202.44	-869.28	14623964.67	1758980.50	1.31	
13077.00	90.43	336.48	5860.65	7326.41	7287.39	-907.14	14624049.62	1758942.64	1.08	
13169.00	90.68	337.10	5859.75	7416.33	7371.94	-943.39	14624134.17	1758906.39	0.73	
13262.00	90.25	337.17	5859.00	7507.35	7457.62	-979.53	14624219.85	1758870.25	0.47	
13355.00	90.25	337.17	5858.59	7598.38	7543.34	-1015.61	14624305.57	1758834.17	0.00	
13448.00	90.25	336.84	5858.19	7689.35	7628.95	-1051.94	14624391.18	1758797.84	0.35	
13541.00	89.69	336.30	5858.24	7780.18	7714.28	-1088.92	14624476.51	1758760.86	0.84	
13633.00	90.18	337.03	5858.34	7870.06	7798.75	-1125.36	14624560.98	1758724.42	0.96	
13726.00	89.56	336.67	5858.55	7960.99	7884.26	-1161.93	14624646.49	1758687.85	0.77	
13819.00	92.46	337.44	5856.91	8051.95	7969.88	-1198.17	14624732.11	1758651.61	3.23	
13912.00	89.57	336.61	5855.27	8142.91	8055.48	-1234.46	14624817.71	1758615.32	3.23	
14004.00	90.99	339.21	5854.82	8233.19	8140.72	-1269.06	14624902.95	1758580.72	3.22	
14097.00	89.82	338.11	5854.16	8324.68	8227.34	-1302.90	14624989.57	1758546.88	1.73	
14190.00	90.18	335.96	5854.16	8415.66	8312.96	-1339.18	14625075.19	1758510.60	2.34	
14282.00	90.00	336.12	5854.01	8505.32	8397.03	-1376.54	14625159.26	1758473.24	0.26	
14375.00	90.86	335.40	5853.32	8595.86	8481.83	-1414.72	14625244.06	1758435.06	1.21	
14468.00	90.37	335.11	5852.32	8686.19	8566.28	-1453.65	14625328.51	1758396.13	0.61	
14561.00	90.68	336.17	5851.47	8776.68	8651.00	-1492.01	14625413.23	1758357.77	1.19	
14653.00	91.06	337.55	5850.07	8866.62	8735.59	-1528.15	14625497.82	1758321.63	1.56	
14746.00	90.68	336.97	5848.66	8957.67	8821.35	-1564.10	14625583.58	1758285.68	0.75	

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5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/1000US ft)	Comment
14839.00	90.86	337.09	5847.41	9048.64	8906.97	-1600.39	14625669.20	1758249.39	0.23	
14932.00	91.05	337.44	5845.86	9139.69	8992.73	-1636.33	14625754.96	1758213.45	0.43	
15025.00	90.62	336.49	5844.50	9230.64	9078.30	-1672.71	14625840.53	1758177.07	1.12	
15117.00	91.05	336.57	5843.16	9320.47	9162.68	-1709.35	14625924.91	1758140.43	0.48	
15210.00	90.68	334.59	5841.76	9410.92	9247.35	-1747.79	14626009.58	1758101.99	2.17	
15303.00	90.92	335.46	5840.46	9501.17	9331.64	-1787.05	14626093.87	1758062.73	0.97	
15402.00	90.86	335.70	5838.92	9597.46	9421.77	-1827.98	14626184.00	1758021.80	0.25	Last WFT SVY
15425.00	90.86	335.70	5838.58	9619.85	9442.73	-1837.44	14626204.96	1758012.34	0.00	PTB

Formation Points: (Relative to Slot centre)(TVD relative to Drill Floor)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name	Comment
212.00	0.12	249.14	212.00	-0.19	-0.33	14616762.04	1759849.45	Base of Fresh Water	
271.00	0.17	263.20	271.00	-0.23	-0.47	14616762.00	1759849.31	Pittsburgh Coal	
428.00	0.27	296.31	428.00	-0.13	-1.12	14616762.10	1759848.66	Top of Salt Water	
1149.97	13.11	66.82	1144.00	28.96	69.68	14616791.19	1759919.46	Maxton	
1296.44	15.44	65.77	1286.00	43.70	102.36	14616805.93	1759952.14	Big Lime	
1477.16	20.24	66.44	1458.00	65.87	153.01	14616828.10	1760002.79	Bin Injun	
1631.29	22.83	64.27	1601.00	89.67	205.31	14616851.90	1760055.09	Base Bin Injun	
2005.35	21.48	69.17	1948.00	153.65	329.31	14616915.88	1760179.09	Berea	
5716.17	28.29	32.55	5361.00	706.32	1662.01	14617468.55	1761511.79	Upper Rhinestreet	
5841.17	32.99	21.49	5468.00	763.81	1691.13	14617526.04	1761540.91	Lower Rhinestreet	
5911.69	36.55	14.70	5526.00	801.91	1703.56	14617564.14	1761553.34	Basal Rhinestreet	
6007.67	40.05	7.62	5601.00	860.72	1714.57	14617622.95	1761564.35	Cashaqua	
6071.48	42.73	5.99	5649.00	902.47	1719.43	14617664.70	1761569.21	Middlesex	
6100.51	44.72	5.93	5670.00	922.41	1721.50	14617684.64	1761571.28	Lower Middlesex	
6143.90	47.62	5.76	5700.00	953.59	1724.73	14617715.82	1761574.51	Burket	
6202.18	50.95	3.73	5738.00	997.58	1728.62	14617759.81	1761578.40	Tully	
6295.97	57.26	357.39	5793.00	1073.45	1729.36	14617835.68	1761579.14	Mahantango	
6525.98	74.69	340.39	5882.00	1279.14	1686.44	14618041.37	1761536.22	Levanna	
6595.36	77.04	339.05	5899.00	1342.16	1662.94	14618104.39	1761512.72	Upper Marcellus	