

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas
Well Operator's Report of Well Work

Farm Name: Gray, John A ET UX Operator Well No: SHL-17J-HS

LOCATION: Sandhill 17 Elevation: 1,293.16 Quadrangle: Majorsville

District: Sandhill County: MARSHALL
Latitude: _____ Feet South of _____ Deg. _____ Min. _____ Sec. 39.97739200
Longitude: _____ Feet South of _____ Deg. _____ Min. _____ Sec. -80.52946100


Company: Noble Energy Inc	Casing & Tubing	Used in Drilling	Left in Well	Cement fill up Cu. Ft.
Address: 333 Technology Drive, Suite 116 Canonsburg, PA 15317	30	40.0	40.0	Cemented In
Agent: Steven Green	13 3/8	1,156.0	1,156.0	980 sxs – 206 bbls standard cement 25bbls return
Inspector: Bill Hendershot	9 5/8	3,130.5	3,130.5	1042 sxs – 221 bbls standard cement 26bbls to surface
Date Permit Issued: 1/30/2013	5 1/2	17,581.5	17,581.5	2732 sxs – 694 bbls
Date Well Work Commenced:	4/3/2013			
Date Well Work Completed:	11/22/2013			
Verbal Plugging:				
Date Permission granted on:	4/3/2013			
Rotary Cable Rig X				
Total Vertical Depth (ft): 6,632.2				
Total Measured Depth (ft): 17,610.0				
Fresh Water Depth (ft): 122'				
Salt Water Depth (ft): 1540'				
Is coal being mined in the area (N/Y)? y				
Coal Depths (ft.): 763.9'-769.5'				
Void(s) encountered (N/Y) Depth(s) N/A				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 7498
Gas: Initial open flow 1488 MCF/d Oil: Initial open flow 3 Bbl/d
Final open flow 2704 MCF/d Final open flow 18 Bbl/d
Time of open flow between initial and final tests 24 Hours
Static rock Pressure 1300 psig (surface pressure) after 24 Hours

Second producing formation _____ Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

 _____
Signature Date 09-11-14

Were core samples taken? Yes__ No_x__

Were cuttings caught during drilling? Yes_x_ No__

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Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list: Bond Log, Gamma Ray Log

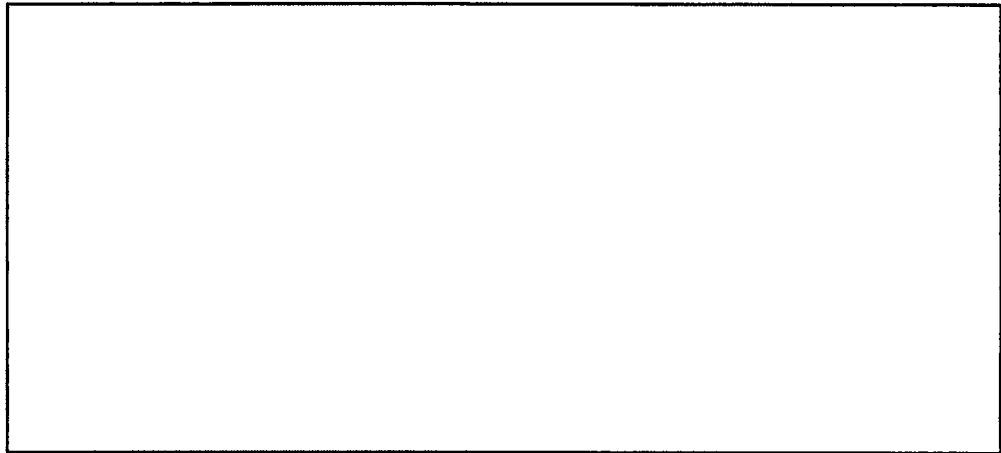
NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing or Stimulating: Please see attached

Plug Back Details including Plug Type and Depth(s): Please see attached

Surface:

Formations Encountered: Please See Attached



Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/16/2013
Job End Date:	11/17/2013
State:	West Virginia
County:	Marshall
API Number:	47-051-01609-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL17 J
Longitude:	-80.52926000
Latitude:	39.97747000
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6.632
Total Base Water Volume (gal):	14,817,041
Total Base Non Water Volume:	0

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid	Fresh Water	7732-18-5	100.00000	88.39938	Density = 8.330
100 MESH	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	6.18214	
40/70 Sand	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	4.60621	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent	Hydrochloric acid	7647-01-0	10.00000	0.06675	
FR-66	Halliburton	Friction Reducer	Hydro-treated light petroleum distillate	54742-47-8	30.00000	0.02192	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive	Acetic anhydride	108-24-7	100.00000	0.00347	
			Acetic acid	34-19-7	60.00000	0.00208	
BE-9	Halliburton	Biocide	Tributyl tetradecyl phosphonium chloride	31741-28-8	10.00000	0.00412	
Scalechek® LP-65 Scale Inhibitor	Halliburton	Scale Inhibitor	Ammonium chloride	12125-02-9	10.00000	0.00244	



LoSurt-300D	Halliburton	Non-ionic Surfactant							
			Ethanol	64-17-5	60.00000		0.00070		
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000		0.00035		
			Naphthalene	91-20-3	5.00000		0.00006		
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000		0.00006		
			1,2,4 Trimethylbenzene	95-63-6	1.00000		0.00001		
ICA-1	Halliburton	Solvent	Paraffinic solvent	Confidential	100.00000		0.00079		
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor	Methanol	67-56-1	60.00000		0.00034		
			Propargyl alcohol	107-19-7	10.00000		0.00006		
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.									
		Other Ingredient(s)	Water	7732-18-5			0.76719		
		Other Ingredient(s)	Polyacrylamide copolymer	Confidential			0.02192		
		Other Ingredient(s)	Organic phosphonate	Confidential			0.01463		
		Other Ingredient(s)	Alcohols, C12-16, ethoxylated	68551-12-2			0.00365		
		Other Ingredient(s)	Fatty acid tall oil amide	Confidential			0.00365		
		Other Ingredient(s)	Ammonium chloride	12125-02-9			0.00365		
		Other Ingredient(s)	Sodium chloride	7647-14-5			0.00365		
		Other Ingredient(s)	Sorbitan monooleate polyoxyethylene derivative	9005-65-6			0.00073		
		Other Ingredient(s)	Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8			0.00073		
		Other Ingredient(s)	Oxyalkylated phenolic resin	Confidential			0.00035		
		Other Ingredient(s)	Formaldehyde	50-00-0			0.00024		
		Other Ingredient(s)	Fatty acids, tall oil	Confidential			0.00017		
		Other Ingredient(s)	Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1			0.00017		
		Other Ingredient(s)							

	Other Ingredient(s)	Alcohols, C14-C15, ethoxylated	58951-67-7		0.00017	
	Other Ingredient(s)	Oxyalkylated phenolic resin	Confidential		0.00012	
	Other Ingredient(s)	Olefins	Confidential		0.00003	
	Other Ingredient(s)	Olefins	Confidential		0.00003	
	Other Ingredient(s)	Olefins	Confidential		0.00001	
	Other Ingredient(s)	Olefins	Confidential		0.00001	
	Other Ingredient(s)	Quaternary ammonium compounds, bis(hydrogenated allow alkyl) dimethylsalts with bentonite	58953-58-2		0.00001	
	Other Ingredient(s)	Fatty alcohol polyglycol ether surfactant	9043-30-5		0.00000	
	Other Ingredient(s)	Crystalline silica, quartz	14808-60-7		0.00000	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
 Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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Stimulation Summary

Date	Stage #	Formation	Frac Type	Top Perf	Bottom Perf	# of Perfs	BD Press (psi)	ATP (psi)	Avg Rate (bpm)	ISIP (psi)	Frac Gradient	Sand (lbs)	Acid (gals)	Water (gals)
10/16/2013	1	Marcellus	Slickwater	17224	17408	48	5402	7712	73.8	3457	0.95	385738	3000	443184
10/17/2013	2	Marcellus	Slickwater	16923	17177	40	6404	8095	79.5	3579	0.97	468478	3000	533309
10/19/2013	3	Marcellus	Slickwater	16623	16877	40	5363	8302	73.7	3734	1.00	464716	6000	493542
10/20/2013	4	Marcellus	Slickwater	16323	16577	40	4725	8286	88.7	4050	1.04	466463	3000	430864
10/21/2013	5	Marcellus	Slickwater	16023	16277	40	6496	7684	80.8	4008	1.04	465935	3000	437446
10/22/2013	6	Marcellus	Slickwater	15723	15977	40	5663	7854	90.0	3781	1.00	465594	3000	438464
10/22/2013	7	Marcellus	Slickwater	15423	15677	40	5877	7930	78.0	3930	1.03	468558	3000	433119
10/23/2013	8	Marcellus	Slickwater	15123	15377	40	6252	8101	81.8	4249	1.07	468602	3000	441494
10/24/2013	9	Marcellus	Slickwater	14823	15077	40	6505	8072	74.7	5456	1.25	465532	3000	453647
10/25/2013	10	Marcellus	Slickwater	14523	14777	40	6294	8316	78.9	4141	1.06	477293	3000	530133
10/29/2013	11	Marcellus	Slickwater	14275	14477	40	6306	7856	85.8	4160	1.06	390540	3000	377996
10/30/2013	12	Marcellus	Slickwater	13973	14227	40	6541	8016	85.5	5012	1.19	422310	6000	528456
10/31/2013	13	Marcellus	Slickwater	13673	13927	40	6101	7918	78.8	4337	1.09	452528	3000	430140
11/1/2013	14	Marcellus	Slickwater	13373	13627	40	5794	7604	88.4	4658	1.13	467821	3000	432156
11/1/2013	15	Marcellus	Slickwater	13073	13327	40	5750	7819	90.4	4433	1.10	465762	3000	434657
11/2/2013	16	Marcellus	Slickwater	12825	13027	40	6167	8242	89.4	5760	1.30	370724	6000	412703
11/3/2013	17	Marcellus	Slickwater	12523	12777	40	5865	7668	86.8	4542	1.12	432676	3000	424940
11/7/2013	18	Marcellus	Slickwater	12223	12477	40	6399	8038	83.8	4496	1.11	450026	3000	423429
11/8/2013	19	Marcellus	Slickwater	11923	12177	40	6374	7619	85.5	4395	1.09	468732	3000	451981
11/8/2013	20	Marcellus	Slickwater	11623	11877	40	5612	7472	85.0	4166	1.06	467358	3000	458650
11/8/2013	21	Marcellus	Slickwater	11323	11577	40	5905	8193	86.4	4091	1.05	411621	3000	448250
11/9/2013	22	Marcellus	Slickwater	11073	11327	40	6338	7716	90.0	4540	1.12	471901	3000	429647
11/9/2013	23	Marcellus	Slickwater	10723	10977	40	6157	8144	90.7	4321	1.08	467140	3000	418359
11/10/2013	24	Marcellus	Slickwater	10473	10727	40	5905	7349	88.3	4252	1.07	407450	3000	392763
11/10/2013	25	Marcellus	Slickwater	10173	10427	40	6243	7022	91.1	4472	1.10	466633	3000	421664
11/10/2013	26	Marcellus	Slickwater	9925	10127	40	5736	6649	90.1	4468	1.10	390318	3000	359072
11/11/2013	27	Marcellus	Slickwater	9675	9877	40	5922	6833	90.3	4486	1.11	469500	3000	421302
11/11/2013	28	Marcellus	Slickwater	9373	9627	40	6021	6963	90.8	4439	1.10	462719	3000	415013
11/11/2012	29	Marcellus	Slickwater	9073	9327	40	6346	7768	88.5	4207	1.06	323040	3000	349210
11/12/2013	29B (w/ test (1))	Marcellus	Slickwater	9073	9327	0	0	7165	89.2	0	0.00	121418	0	138697
11/13/2013	29 (w/ test (2))	Marcellus	Slickwater	9073	9327	0	0	0	0.0	0	0.00	0	0	2894
11/13/2013	29 (w/ test (3))	Marcellus	Slickwater	9073	9327	0	0	0	2.8	0	0.00	0	0	21101
11/15/2013	29 (w/ test (4))	Marcellus	Slickwater	9073	9327	0	0	0	0.0	0	0.00	0	0	126000
11/16/2013	30	Marcellus	Slickwater	8773	9027	40	5708	7392	75.4	5293	1.23	372409	3000	415786
11/16/2013	31	Marcellus	Slickwater	8473	8727	40	5804	7075	84.5	4389	1.09	389520	3000	359164
11/16/2013	32	Marcellus	Slickwater	8173	8427	40	5402	6941	86.2	4449	1.10	449168	3000	417734
11/16/2013	33	Marcellus	Slickwater	7823	8077	40	6005	6959	89.7	4578	1.12	466720	3000	415411
11/17/2013	34	Marcellus	Slickwater	7575	7777	40	6175	6836	89.5	4634	1.13	432800	3000	370830

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Stage #	Plug Type	Plug Depth
1	Toe Sleeve	17,448 - 17,451.30
2	Composite Frac Plug	17,200
3	Composite Frac Plug	16,895
4	Composite Frac Plug	16,600
5	Composite Frac Plug	16,300
6	Composite Frac Plug	16,000
7	Composite Frac Plug	15,700
8	Composite Frac Plug	15,400
9	Composite Frac Plug	15,100
10	Composite Frac Plug	14,800
11	Composite Frac Plug	14,500
12	Composite Frac Plug	14,250
13	Composite Frac Plug	13,950
14	Composite Frac Plug	13,650
15	Composite Frac Plug	13,350
16	Composite Frac Plug	13,050
17	Composite Frac Plug	12,800
18	Composite Frac Plug	12,500
19	Composite Frac Plug	12,200
20	Composite Frac Plug	11,900
21	Composite Frac Plug	11,600
22	Composite Frac Plug	11,300
23	Composite Frac Plug	11,000
24	Composite Frac Plug	10,700
25	Composite Frac Plug	10,400
26	Composite Frac Plug	10,100
27	Composite Frac Plug	9,850
28	Composite Frac Plug	9,550
29	Composite Frac Plug	9,250
30	Composite Frac Plug	8,950
31	Composite Frac Plug	8,650
32	Composite Frac Plug	8,400
33	Composite Frac Plug	8,100
34	Composite Frac Plug	7,800
	Kill Plug	6,500



Noble Energy SHL17JHS Gyro+MWD 0ft to 17610ft MD Survey Report

(Def Survey)

Report Date: September 04, 2013 - 10:18 AM
Client: Noble Energy
Field: WV Marshall County (H&A) 277
Structure / Slot: Noble Energy SHL17 Pad / SHL17JHS
Well: SHL17JHS
Borehole: Original Borehole
UWI / ANF: Unknown / Unknown
Survey Name: Noble Energy SHL17JHS Gyro+MWD 0ft to 17610ft MD
Survey Date: August 23, 2013
Tort / AHD / DDI / ERD Ratio: 231.788 * / 12282.224 ft / 6.838 / 1.842
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 58' 38.9085", W 80° 31' 46.09250"
Location Grid N/E Y/X: N 530702.222 NUB, E 1711468.218 NUB
CRS Grid Convergence Angle: -0.8595 *
Grid Scale Factor: 0.99995051

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 314.614 * (Grid North)
Vertical Section Origin: 0.000 0.000 0
TVD Reference Datum: KB
TVD Reference Elevation: 1250.500 ft above MSL
Sunset / Ground Elevation: 1272.500 ft above MSL
Magnetic Declination: -8.472 *
Total Gravity Field Strength: 939.30600m (9.82655 Easels)
Total Magnetic Field Strength: 51179.300 nT
Magnetic Dip Angle: 67.535 *
Declination Date: August 23, 2013
Magnetic Declination Model: IGM13 2013
Grid North: Grid North
Grid Convergence Used: -0.8595 *
Total Corr Mag North+Grid North: -7.8153 *
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim Grid (°), TVD (ft), TVD88 (ft), VSEB (ft), NS (ft), EW (ft), DLS (ft/100ft), DR (ft/100ft), TR (ft/100ft), Heading (RUS), Easting (RUS), Latitude (N/S * °), Longitude (E/W * °), Directional Difficulty Index. The table contains multiple rows of survey data points.

Table with columns: Comments, MD (ft), Incl (°), Azim Grid (°), TYD (ft), TVDBS (ft), VBC (ft), NB (ft), EW (ft), DLS (ft/100ft), DR (ft/100ft), TR (ft/100ft), Northing (ft), Easting (ft), Latitude (N/S), Longitude (E/W), Directional Drift (ft/100ft). The table contains multiple rows of data representing well logs or survey points.

Corrections	MD (ft)	Incl (°)	Azim Ori (°)	TYD (ft)	TYD\$6 (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLB (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ft)	Easting (ft)	Latitude (N/S)	Longitude (E/W)	Directional Drift Index
	15020.00	90.03	325.25	6643.43	6352.08	6270.15	6400.04	-8200.04	0.86	0.11	-0.86	545250.83	1706207.84	N 39 59 32.10 W	80 33 0.53	6.66
	15128.00	90.27	324.03	6643.19	6352.60	6267.70	5553.22	-8232.14	1.40	0.27	-1.37	545323.21	1705240.34	N 39 59 32.87 W	80 33 7.20	6.69
	15218.00	90.21	324.38	6642.82	6352.32	6446.53	5636.21	-8504.80	0.37	-0.07	0.37	545396.19	1705170.80	N 39 59 33.58 W	80 33 7.89	6.70
	15307.00	90.86	324.87	6641.99	6351.40	8534.17	6708.77	-8386.33	0.93	0.73	0.57	545496.76	1705142.16	N 39 59 34.29 W	80 33 8.86	6.71
	15397.00	90.86	324.50	6640.04	6350.14	8622.77	6782.22	-8408.31	0.34	0.00	-0.34	545542.20	1705050.18	N 39 59 35.01 W	80 33 9.24	6.71
	15486.00	90.93	324.71	6639.24	6348.74	8710.40	5654.70	-8469.82	0.18	0.08	0.17	545614.77	1704958.88	N 39 59 35.79 W	80 33 9.91	6.71
	15576.00	90.66	324.17	6638.08	6347.60	8789.08	6028.00	-8612.15	0.73	-0.42	-0.00	545687.87	1704868.34	N 39 59 36.44 W	80 33 10.80	6.72
	15665.00	90.17	324.02	6637.52	6347.02	8868.86	6000.09	-8664.34	0.46	-0.43	-0.17	545760.00	1704834.16	N 39 59 37.15 W	80 33 11.28	6.73
	15756.00	90.38	323.40	6637.00	6346.60	8976.70	6073.48	-8610.15	0.83	0.23	-0.66	545833.44	1704800.35	N 39 59 37.87 W	80 33 11.80	6.74
	15846.00	90.31	323.48	6636.54	6346.08	9065.63	6145.81	-8671.70	0.08	-0.06	-0.01	545905.77	1704726.80	N 39 59 38.58 W	80 33 12.68	6.74
	15935.00	90.38	323.87	6636.01	6345.51	9153.52	6217.40	-8724.45	0.20	0.06	0.36	545977.45	1704774.05	N 39 59 39.29 W	80 33 13.27	6.75
	16025.00	90.10	323.90	6635.83	6345.19	9242.34	6290.20	-8777.49	0.25	-0.31	0.16	546050.18	1704721.02	N 39 59 39.99 W	80 33 14.06	6.76
	16114.00	90.03	323.17	6635.53	6345.03	9330.26	6361.80	-8830.35	0.89	-0.89	0.89	546121.70	1704608.18	N 39 59 40.69 W	80 33 14.76	6.77
	16204.00	90.14	323.75	6635.40	6344.90	9410.10	6434.11	-8883.33	0.86	0.12	0.04	546194.00	1704614.56	N 39 59 41.40 W	80 33 15.45	6.77
	16294.00	90.21	324.57	6635.04	6344.54	9507.94	6507.07	-8936.83	0.83	0.10	0.01	546267.02	1704561.89	N 39 59 42.11 W	80 33 16.14	6.78
	16384.00	90.17	325.55	6634.07	6344.17	9605.47	6580.03	-8987.80	1.11	-0.10	1.10	546339.87	1704510.92	N 39 59 42.83 W	80 33 16.80	6.78
	16474.00	90.21	326.75	6634.20	6343.80	9682.87	6653.84	-9037.17	1.26	0.16	1.26	546413.88	1704401.35	N 39 59 43.55 W	80 33 17.45	6.79
	16564.00	90.17	326.81	6633.02	6343.42	9770.88	6729.14	-9080.61	0.22	-0.16	-0.16	546489.89	1704411.91	N 39 59 44.28 W	80 33 18.10	6.80
	16654.00	90.21	328.00	6633.63	6343.13	9857.89	6803.58	-9135.40	0.33	0.04	0.23	546565.51	1704363.12	N 39 59 45.02 W	80 33 18.74	6.81
	16744.00	90.17	328.80	6633.33	6342.85	9944.65	6878.13	-9184.00	0.04	-0.04	0.00	546638.00	1704314.52	N 39 59 45.73 W	80 33 19.37	6.81
	16834.00	90.24	328.58	6633.01	6342.51	10031.07	6952.85	-9232.81	0.57	0.08	-0.35	546712.48	1704265.71	N 39 59 46.48 W	80 33 20.01	6.82
	16924.00	90.76	329.04	6633.01	6342.51	10119.82	7027.30	-9282.80	0.89	-0.50	-0.71	546787.32	1704215.73	N 39 59 47.22 W	80 33 20.66	6.83
	17014.00	80.80	324.90	6633.52	6343.02	10207.24	7100.67	-9333.31	1.18	-0.10	-1.17	546860.89	1704105.72	N 39 59 47.93 W	80 33 21.32	6.83
	17104.00	90.41	325.48	6633.62	6343.02	10295.71	7174.80	-9384.00	1.12	0.01	0.84	546934.48	1704119.84	N 39 59 48.60 W	80 33 22.00	6.84
	17194.00	90.21	325.17	6633.04	6342.54	10383.16	7247.75	-9433.32	0.41	-0.22	-0.26	547007.87	1704085.21	N 39 59 49.38 W	80 33 22.68	6.85
	17284.00	90.07	324.85	6632.92	6342.32	10471.88	7321.40	-9480.93	0.39	-0.18	-0.35	547081.40	1704011.00	N 39 59 50.15 W	80 33 23.33	6.85
	17374.00	90.10	324.80	6632.08	6342.18	10560.28	7394.28	-9536.14	0.07	0.03	0.06	547154.10	1703980.40	N 39 59 50.81 W	80 33 24.00	6.86
	17464.00	90.10	325.17	6632.53	6342.03	10647.70	7468.01	-9589.75	0.24	0.00	0.24	547227.92	1703906.70	N 39 59 51.64 W	80 33 24.07	6.87
	17554.00	90.21	324.08	6632.20	6341.70	10735.35	7540.83	-9640.02	0.51	0.12	-0.48	547300.73	1703857.02	N 39 59 52.29 W	80 33 25.34	6.87
	17644.00	90.28	323.87	6632.17	6341.57	10823.90	7613.73	-9687.03	1.42	0.25	1.28	547373.83	1703841.51	N 39 59 52.47 W	80 33 25.55	6.87
Final Survey 00-Base-13 Proportion to B/L	17610.00	90.28	325.07	6631.90	6341.40	10799.29	7504.06	-9678.22	0.00	0.00	0.00	547383.06	1703820.33	N 39 59 52.77 W	80 33 26.83	6.88

Survey Type: Def Survey

Survey Error Model: IBCWSA Rev 0 *** 3-D 06.000% Confidence 2.7055 sigma

Survey Program:

Description	MD From (ft)	MD To (ft)	EDU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	18.500		30.000	30.000	SLB_NSG+MSHOT-Daphn Only	Original Borehole / Noble Energy SHL 17JHS Gyro+MWD Off to 17610ft MD
	18.500	3086.500		30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL 17JHS Gyro+MWD Off to 17610ft MD
	3086.500	17670.000		30.000	30.000	SLB_MWD-BTD	Original Borehole / Noble Energy SHL 17JHS Gyro+MWD Off to 17610ft MD
	17670.000	17910.000		30.000	30.000	SLB_BLWD+TREN	Original Borehole / Noble Energy SHL 17JHS Gyro+MWD Off to 17610ft MD

51-01609

SHL 17J

47-051-01609

Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale	0	472	0	472	
Pittsburgh Coal	472	533	472	533	
Shale and Sandstone	533	656	533	656	
Gas Sand	656	723	656	723	
Shale	723	769	723	769	
1st Salt Sand	769	788	769	788	
Shale	788	906	788	906	
2nd Salt Sand	906	955	906	955	
Shale	955	989	955	989	
Big Lime	989	1105	989	1105	
Big Injun	1105	1150	1105	1150	
Price	1150	1270	1150	1270	
Murrysville	1270	1305	1270	1305	
Shale	1305	1463	1305	1150	
50' Sand	1150	1270	1150	1270	
Shale	1270	1305	1270	1305	
Gordon	1305	1463	1305	1463	
Shale	1463	1720	1463	1720	
Fifth Sand	1720	1910	1720	1910	
Shale	1910	1962	1910	1962	
Speechley Sand	1962	3197	1962	3197	
Shale	3197	4346	3197	4351	
Warren Sand	4346	4366	4351	4665	
Shale	4632	4703	4665	4748	
Java Shale	4703	4797	4748	4997	
Pipe Creek Shale	4899	5496	4997	5805	
Angola Shale	5496	5528	5805	5848	
Rhinestreet	5528	5762	5848	6154	
Cashaqua	5762	5804	6154	6209	
Middlesex	5804	5869	6209	6295	
West River	5869	5895	6295	6330	
Burkett	5895	5897	6330	6333	
Tully Limestone	5897	5899	6333	6336	
Hamilton	5899	5947	6336	6401	
Marcellus	5947	5952	6401	not encountered	Gas
Onondaga	5952	not encountered	not encountered	not encountered	

03/21/2014

