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

API 47 - 033 - 05724 County Harrison District Union
Quad West Milford Pad Name Sperry 2 Pad Field/Pool Name —
Farm name Sperry, Clarence Well Number Isaac Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing	4,343,329.891m	Easting	546,060.740m
Landing Point of Curve	Northing	4,343,255.10m	Easting	546,502.87m
Bottom Hole	Northing	4,340,441.213m	Easting	547,427.322m

Elevation (ft) 1168' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 3/11/2013 Date drilling commenced 7/31/2013 Date drilling ceased 9/10/2013
Date completion activities began 3/2/2014 Date completion activities ceased 4/13/2014
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 80' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2101' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 797' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
AL. 5/27/15 ✓
W.S. 6/3/15

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API 47- 033 - 05724 Farm name Sperry, Clarence Well number Isaac Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	80'	New	133#/J-55	N/A	Y
Surface	17-1/2"	13-3/8"	338'	New	48#/H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2562'	New	36#/J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4", 8-1/2"	5-1/2"	17,359'	New	20#/P-110	N/A	Y
Tubing		2-3/8"	7345'		4.7#/N-80	N/A	
Packer type and depth set		N/A					

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	284 sx	15.6	1.18	77 Cu. Ft.	0'	8 hrs
Surface	Class A	432 sx	15.6	1.18	235 Cu. Ft.	0'	8 hrs
Coal							
Intermediate 1	Class A	988 sx	15.6	1.18	802 Cu. Ft.	0'	8 hrs
Intermediate 2							
Intermediate 3							
Production	Class H	931 sx (Lead), 1692 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.30 (Lead), 1.86 (Tail)	3505 Cu. Ft.	~500' into Intermediate Casing	8 hrs
Tubing							

Drillers TD (ft) 17,384' MD, 6895' TVD (BHL), 6978' TVD (Deepest Point Drilled) Loggers TD (ft) 17,346' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6938'

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ☐ gamma ray ☐ temperature

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Post Unit 2H API# 47-033-05492). Please reference the wireline logs submitted with Form WR-35 for the Post Unit 2H. A Cement Bond Log has been included with this submittal.

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ☐ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED N/A

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API 47- 033 - 05724 Farm name Sperry, Clarence Well number Isaac Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

*PLEASE SEE ATTACHED EXHIBIT 1

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

*PLEASE SEE ATTACHED EXHIBIT 2

Please insert additional pages as applicable.

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API 47- 033 - 05724 Farm name Sperry, Clarence Well number Isaac Unit 1H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6918' (Top)	TVD	7366' (Top)	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole ---- psi DURATION OF TEST ---- hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	11,004 mcfpd	---- bpd	---- bpd	243 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

*PLEASE SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Nabors Completions & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Natalie Komp Telephone 303-357-6820
Signature Natalie Komp Title Permitting Agent Date 5/8/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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API 47-033-05724 Farm Name Sperry, Clarence Well Number Issac Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2-Mar-14	17,114'	17,304'	60	Marcellus
2	21-Mar-14	16,888	17,078'	60	Marcellus
3	21-Mar-14	16,663'	16,853'	60	Marcellus
4	21-Mar-14	16,437'	16,627'	60	Marcellus
5	22-Mar-14	16,211'	16,401'	60	Marcellus
6	22-Mar-14	15,985'	16,176'	60	Marcellus
7	22-Mar-14	15,760'	15,950'	60	Marcellus
8	23-Mar-14	15,534'	15,724'	60	Marcellus
9	23-Mar-14	15,308'	15,498'	60	Marcellus
10	24-Mar-14	15,083'	15,273'	60	Marcellus
11	24-Mar-14	14,857'	15,047'	60	Marcellus
12	24-Mar-14	14,631'	14,821'	60	Marcellus
13	25-Mar-14	14,406'	14,596'	60	Marcellus
14	14-Mar-14	14,180'	14,370'	60	Marcellus
15	25-Mar-14	13,954'	14,144'	60	Marcellus
16	26-Mar-14	13,729'	13,919'	60	Marcellus
17	26-Mar-14	13,503'	13,693'	60	Marcellus
18	26-Mar-14	13,277'	13,467'	60	Marcellus
19	27-Mar-14	13,052'	13,242'	60	Marcellus
20	27-Mar-14	12,826'	13,016'	60	Marcellus
21	28-Mar-14	12,600'	12,790'	60	Marcellus
22	28-Mar-14	12,374'	12,565'	60	Marcellus
23	28-Mar-14	12,149'	12,339'	60	Marcellus
24	29-Mar-14	11,923'	12,113'	60	Marcellus
25	29-Mar-14	11,697'	11,887'	60	Marcellus
26	29-Mar-14	11,472'	11,662'	60	Marcellus
27	29-Mar-14	11,246'	11,436'	60	Marcellus
28	30-Mar-14	11,020'	11,210'	60	Marcellus
29	30-Mar-14	10,795'	10,985'	60	Marcellus
30	30-Mar-14	10,569'	10,759'	60	Marcellus
31	30-Mar-14	10,343'	10,533'	60	Marcellus
32	30-Mar-14	10,118'	10,308'	60	Marcellus
33	31-Mar-14	9892'	10,082'	60	Marcellus
34	31-Mar-14	9666'	9856'	60	Marcellus
35	31-Mar-14	9440'	9631'	60	Marcellus
36	1-Apr-14	9215'	9405'	60	Marcellus
37	1-Apr-14	8989'	9179'	60	Marcellus
38	1-Apr-14	8763'	8953'	60	Marcellus
39	1-Apr-14	8538'	8728'	60	Marcellus
40	2-Apr-14	8312'	8502'	60	Marcellus
41	2-Apr-14	8086'	8276'	60	Marcellus
42	2-Apr-14	7861'	8051'	60	Marcellus
43	2-Apr-14	7635'	7825'	60	Marcellus
44	3-Apr-14	7409'	7599'	60	Marcellus

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API 47-033-05724 Farm Name Sperry, Clarence Well Number Isaac Unit 1H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	21-Mar-14	67.0	8,835	6,418	5,349	249,442	6,871	N/A
2	21-Mar-14	67.1	7,981	6,071	5,787	258,170	7,023	N/A
3	21-Mar-14	73.1	8,033	5,996	4,331	267,362	6,987	N/A
4	21-Mar-14	74.0	8,142	6,640	5,393	268,913	6,916	N/A
5	22-Mar-14	67.0	8,173	6,345	4,599	202,624	7,535	N/A
6	22-Mar-14	75.5	7,991	6,007	4,382	272,298	7,064	N/A
7	22-Mar-14	74.0	8,041	5,650	5,555	232,674	6,443	N/A
8	23-Mar-14	67.0	8,171	5,668	5,848	272,833	6,866	N/A
9	23-Mar-14	72.0	8,103	5,540	5,674	270,267	6,892	N/A
10	24-Mar-14	73.0	8,206	5,750	4,537	269,657	6,894	N/A
11	24-Mar-14	71.4	8,055	5,639	4,535	272,606	6,873	N/A
12	24-Mar-14	71.9	8,060	5,642	4,635	188,926	7,395	N/A
13	25-Mar-14	73.0	7,907	5,560	4,830	246,741	7,296	N/A
14	25-Mar-14	78.0	7,771	5,996	4,677	270,724	6,766	N/A
15	25-Mar-14	74.0	7,843	5,757	4,590	289,900	6,800	N/A
16	26-Mar-14	70.0	8,204	5,920	5,029	127,349	7,310	N/A
17	26-Mar-14	70.8	7,840	5,743	4,849	200,089	7,157	N/A
18	26-Mar-14	69.0	7,736	5,905	4,717	253,199	7,327	N/A
19	27-Mar-14	72.6	7,497	5,472	4,792	269,070	6,771	N/A
20	27-Mar-14	76.0	7,849	5,409	4,546	273,683	6,730	N/A
21	28-Mar-14	73.0	7,797	5,967	4,598	273,683	6,689	N/A
22	28-Mar-14	73.4	7,663	5,271	4,911	273,288	6,629	N/A
23	28-Mar-14	77.2	7,895	5,559	5,212	272,488	6,643	N/A
24	29-Mar-14	79.0	7,915	6,117	5,328	270,858	6,613	N/A
25	29-Mar-14	73.0	7,800	5,704	4,688	230,046	6,650	N/A
26	29-Mar-14	75.0	7,806	5,904	5,278	268,727	6,644	N/A
27	29-Mar-14	79.0	7,651	5,545	4,810	271,317	6,575	N/A
28	30-Mar-14	79.0	7,692	5,920	4,667	191,540	6,544	N/A
29	30-Mar-14	74.0	7,564	5,716	5,030	270,768	6,829	N/A
30	30-Mar-14	77.0	7,772	5,890	5,415	270,433	6,506	N/A
31	30-Mar-14	82.0	7,773	6,002	4,885	272,772	6,530	N/A
32	30-Mar-14	80.0	7,909	5,600	4,678	270,901	6,489	N/A
33	31-Mar-14	80.0	7,634	5,642	4,684	270,924	6,477	N/A
34	31-Mar-14	78.0	7,458	5,497	4,798	268,183	6,417	N/A
35	31-Mar-14	79.0	7,533	5,554	4,678	269,461	6,414	N/A
36	1-Apr-14	80.0	7,610	5,699	4,454	270,754	6,410	N/A
37	1-Apr-14	76.0	7,157	5,536	5,510	229,336	7,063	N/A
38	1-Apr-14	76.0	7,076	5,583	4,799	270,262	6,365	N/A
39	1-Apr-14	79.0	7,402	6,000	4,537	268,537	6,366	N/A
40	2-Apr-14	80.0	7,435	5,781	4,356	268,644	6,337	N/A
41	2-Apr-14	80.0	7,267	5,545	4,381	267,385	6,333	N/A
42	2-Apr-14	82.0	7,227	6,004	4,288	269,128	6,308	N/A
43	2-Apr-14	80.0	7,110	5,557	4,336	267,481	6,328	N/A
44	3-Apr-14	80.0	6,913	6,215	4,368	297,597	6,786	N/A
	AVG=	75.2	7,761	5,794	4,849	11,311,040	296,841	TOTAL

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API 47-033-05724 Farm Name Sperry, Clarence Well Number Isaac Unit 1H

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	80	NA	80	N/A
Siltstone	0	107	0	107
Siltstone w/ Trace Coal	107	347	107	347
Sand/Silstone	347	797	347	797
Coal	797	857	797	857
Siltstone w/ Trace Coal	857	977	857	977
Sandstone	977	1,037	977	1,037
Shale	1,037	1,500	1,037	1,500
Big Lime	est. 1500	1,610	est. 1500	1,610
Big Injun	est. 1610	2,003	est. 1610	2,003
Fifty Foot Sandstone	est. 2003	2,143	est. 2003	2,143
Gordon	est. 2143	2,418	est. 2143	2,418
Fifth Sandstone	est. 2418	2,466	est. 2418	2,466
Bayard	est. 2466	2,848	est. 2466	2,848
Warren	2,848	3,123	2,848	3,123
Speechley	3,123	3,349	3,123	3,349
Baltown	3,349	3,863	3,349	3,863
Bradford	3,863	4,440	3,863	4,440
Benson	4,440	4,740	4,440	4,740
Alexander	4,740	4,832	4,740	4,832
Elk	4,832	5,594	4,832	5,594
Rhinestreet	5,594	6,258	5,594	6,493
Sycamore	6,258	6,527	6,493	6,800
Middlesex	6,527	6,698	6,800	6,995
Burkett	6,698	6,728	6,995	7,034
Tully	6,728	6,918	7,034	7,366
Marcellus	6,918	NA	7,366	NA

*Please note Antero determines shallow formation tops based on mud and/or wireline logs that are only run on one well on a multi-well pad (Please reference Wireline Logs submitted for the Post Unit 2H API# 47-033-05492). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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ANTERO RESOURCES

Antero Resources
Isaac Unit 1H
Harrison County West Virginia
Northing: 14249029.56
Easting: 1791486.68
As Drilled

WELL DETAILS: Isaac Unit 1H
Ground Level: 1169.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	14249029.56	1791486.68	39° 14' 16.720 N	80° 27' 59.260 W	

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Isaac Unit 1H, Grid North
Vertical (TVD) Reference: Isaac Unit 1H GL 1169 @ 1191.0usft (Original Well Elev)
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: Isaac Unit 1H GL 1169 @ 1191.0usft (Original Well Elev)
Calculation Method: Minimum Curvature

PROJECT DETAILS: Harrison County West Virginia

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level

LEGEND

- Isaac Unit 1H, Original Wellpath, Plan 4 V0
- GT Post Unit 2H, Original Wellpath, Original Wellpath V0
- Post Unit 2H, Original Wellpath, Original Wellpath V0
- Post Unit 4H, Original Wellpath, Original Wellpath V0
- Post Unit 1H, Original Wellpath, Original Wellpath V0
- AA Post Unit 1H, Original Wellpath, Original Wellpath V0
- GT Post Unit 1H, Original Wellpath, Original Wellpath V0
- Post Unit 3H, Original Wellpath, Original Wellpath V0
- As Drilled

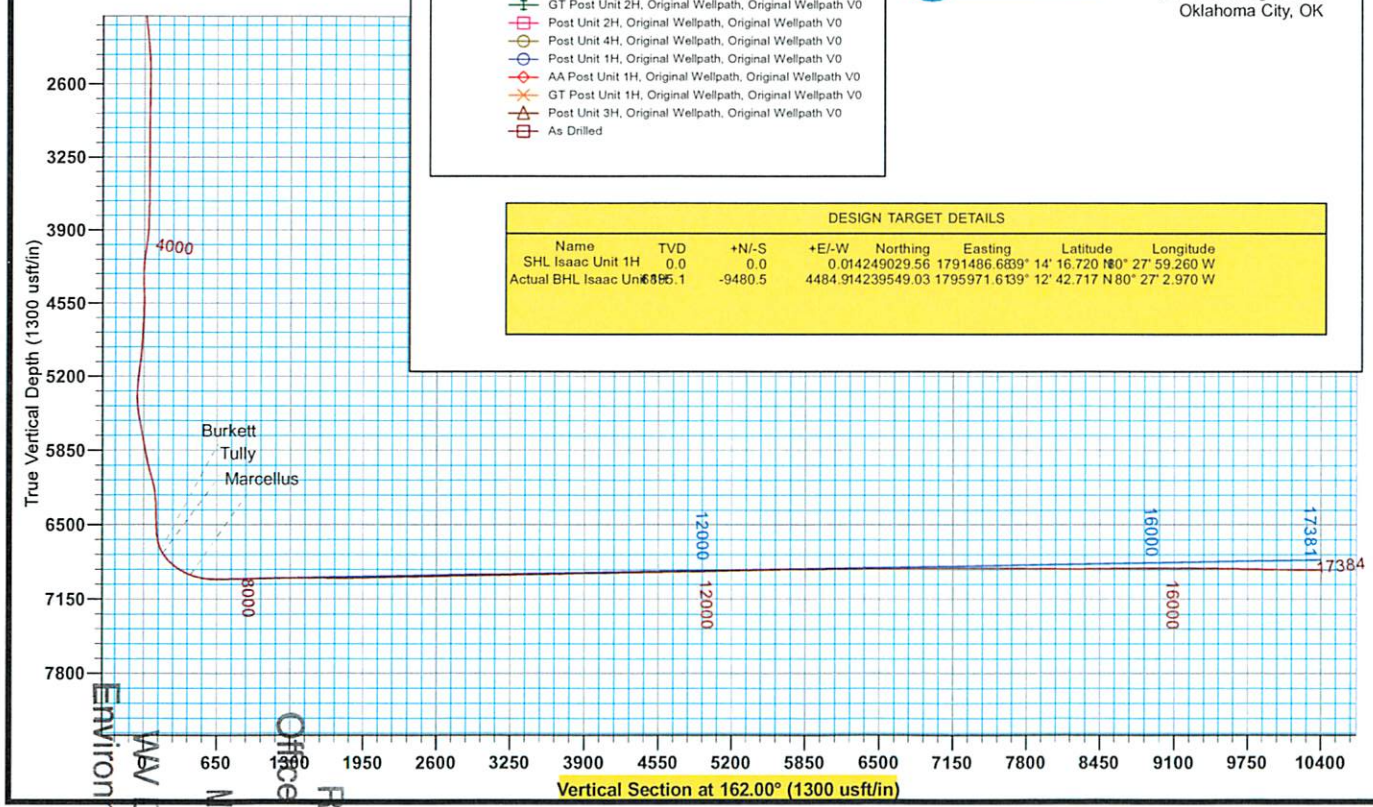
Scientific Drilling

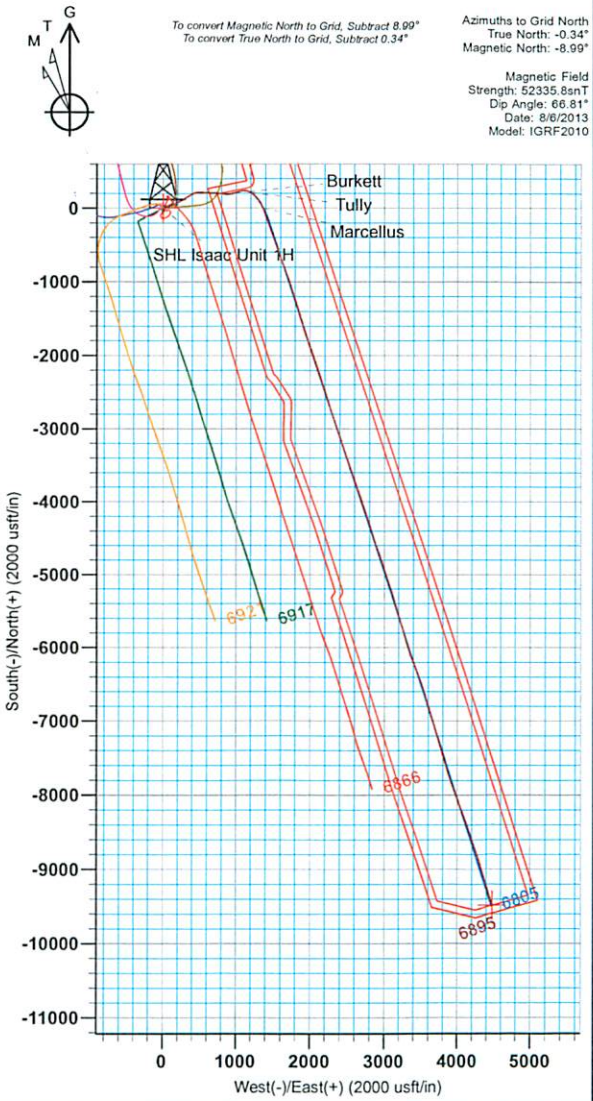
Genie Lightfoot
14:07, September 04 2013

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Isaac Unit 1H	0.0	0.0	0.0	14249029.56	1791486.68	39° 14' 16.720 N	80° 27' 59.260 W
Actual BHL Isaac Unit	6895.1	-9480.5	4484.9	14239549.03	1795971.61	39° 12' 42.717 N	80° 27' 2.970 W





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Antero Resources

Harrison County West Virginia
Post / Sperry 2 Pad
Isaac Unit 1H
Original Wellpath

Design: As Drilled

EOW Completion Report

04 September, 2013

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Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Isaac Unit 1H
Project:	Harrison County West Virginia	**TVD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Site:	Post / Sperry 2 Pad	**MD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Well:	Isaac Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Project Harrison County West Virginia, Harrison County, USA

Map System:	Universal Transverse Mercator (US Survey Fee	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site Post / Sperry 2 Pad, Site Center: SHL of Post Unit 2H

Site Position:		**Northing:**	14,249,069.68 usft	**Latitude:**	39° 14' 17.116 N
From:	Map	**Easting:**	1,791,482.69 usft	**Longitude:**	80° 27' 59.308 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.34 °

Well Isaac Unit 1H, Marcellus

Well Position	**+N/-S**	0.0 usft	**Northing:**	14,249,029.56 usft	**Latitude:**	39° 14' 16.720 N
	+E/-W	0.0 usft	**Easting:**	1,791,486.68 usft	**Longitude:**	80° 27' 59.260 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,191.0 usft	**Ground Level:**	1,169.0 usft

Wellbore Original Wellpath

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/6/2013	-8.65	66.81	52,336

Design As Drilled

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0		
Vertical Section:		**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**		
		0.0	0.0	0.0	162.00		

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Survey Program **Date** 9/4/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,805.0	Survey #2 Gyro Inrun (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
1,825.0	6,874.0	Survey #3 Def Gyro to Int (Original Wellpa	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
6,906.0	17,384.0	Survey #4 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
100.0	0.27	212.66	100.0	-0.2	-0.1	0.1	0.27
200.0	0.18	204.55	200.0	-0.5	-0.3	0.4	0.10
300.0	0.25	192.56	300.0	-0.9	-0.4	0.7	0.08
400.0	0.19	173.24	400.0	-1.3	-0.5	1.1	0.09
500.0	0.15	151.15	500.0	-1.6	-0.4	1.4	0.08
600.0	0.08	175.85	600.0	-1.7	-0.3	1.6	0.08
700.0	0.22	194.49	700.0	-2.0	-0.4	1.8	0.15
800.0	0.29	174.47	800.0	-2.4	-0.4	2.2	0.11
900.0	0.37	125.17	900.0	-2.9	-0.1	2.7	0.28

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Isaac Unit 1H
Project:	Harrison County West Virginia	**TVD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Site:	Post / Sperry 2 Pad	**MD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Well:	Isaac Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,000.0	0.14	145.97	1,000.0	-3.2	0.2	3.1	0.24
1,100.0	0.36	160.01	1,100.0	-3.6	0.4	3.5	0.23
1,200.0	0.34	132.33	1,200.0	-4.0	0.7	4.1	0.17
1,300.0	0.08	121.78	1,300.0	-4.3	1.0	4.4	0.26
1,400.0	0.16	310.42	1,400.0	-4.2	1.0	4.3	0.24
1,500.0	0.06	299.79	1,500.0	-4.1	0.8	4.2	0.10
1,600.0	0.20	97.77	1,600.0	-4.1	1.0	4.2	0.26
1,700.0	0.23	95.38	1,700.0	-4.2	1.3	4.4	0.03
1,800.0	0.30	49.00	1,800.0	-4.0	1.7	4.3	0.22
1,805.0	0.24	75.24	1,805.0	-4.0	1.7	4.3	2.72
1,958.0	4.76	150.88	1,957.8	-9.5	5.1	10.6	3.08
2,055.0	5.76	166.14	2,054.4	-17.7	8.3	19.4	1.76
2,151.0	6.66	175.49	2,149.8	-27.9	9.9	29.6	1.41
2,215.0	6.41	187.25	2,213.4	-35.2	9.7	36.4	2.12
2,343.0	5.47	212.33	2,340.8	-47.4	5.5	46.8	2.14
2,440.0	2.26	233.23	2,437.5	-52.5	1.5	50.4	3.56
2,508.0	1.66	277.45	2,505.5	-53.1	-0.5	50.4	2.32
2,792.0	0.51	302.11	2,789.4	-51.9	-5.7	47.6	0.43
3,083.0	0.29	325.49	3,080.4	-50.6	-7.2	45.9	0.09
3,360.0	0.22	352.40	3,357.4	-49.5	-7.6	44.7	0.05
3,648.0	0.52	297.01	3,645.4	-48.4	-8.9	43.3	0.15
3,778.0	0.77	283.00	3,775.4	-47.9	-10.3	42.4	0.23
3,875.0	3.62	354.85	3,872.3	-44.7	-11.2	39.1	3.57
4,002.0	11.58	32.76	3,998.2	-30.0	-4.6	27.1	7.09
4,098.0	16.32	40.03	4,091.3	-11.5	9.3	13.8	5.25
4,194.0	14.55	45.60	4,183.9	7.2	26.6	1.3	2.40
4,291.0	14.13	69.65	4,277.9	19.9	46.4	-4.6	6.11
4,387.0	14.20	78.16	4,371.0	26.4	68.9	-3.8	2.17
4,483.0	16.53	77.26	4,463.6	31.8	93.8	-1.3	2.44
4,580.0	20.15	71.70	4,555.7	40.1	123.1	-0.1	4.14
4,676.0	22.53	68.25	4,645.1	52.1	155.9	-1.4	2.80
4,772.0	20.11	58.84	4,734.5	67.5	187.1	-6.3	4.36
4,869.0	18.55	59.33	4,826.0	84.0	214.6	-13.5	1.62
4,965.0	21.29	66.72	4,916.3	98.6	243.8	-18.5	3.87
5,062.0	28.13	60.50	5,004.4	116.9	279.9	-24.7	7.53
5,156.0	24.04	51.78	5,088.8	139.7	314.3	-35.7	5.95
5,252.0	23.45	56.32	5,176.7	162.4	345.5	-47.6	2.00
5,347.0	24.86	60.94	5,263.4	182.5	378.7	-56.6	2.48
5,443.0	25.02	68.58	5,350.5	199.8	415.3	-61.7	3.36
5,539.0	24.37	81.49	5,437.8	210.1	453.8	-59.6	5.65
5,633.0	26.48	89.23	5,522.7	213.3	493.9	-50.2	4.18
5,728.0	26.45	92.77	5,607.7	212.5	536.3	-36.4	1.66
5,823.0	28.22	93.26	5,692.1	210.2	579.8	-20.8	1.88
5,919.0	28.99	93.72	5,776.4	207.4	625.7	-3.9	0.83
6,014.0	29.54	91.00	5,859.3	205.5	672.1	12.2	1.51

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Isaac Unit 1H
Project:	Harrison County West Virginia	**TVD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Site:	Post / Sperry 2 Pad	**MD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Well:	Isaac Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
6,110.0	30.89	91.13	5,942.2	204.6	720.4	28.0	1.41
6,206.0	34.09	97.86	6,023.2	200.5	771.7	47.8	5.02
6,331.0	34.85	97.22	6,126.3	191.2	841.8	78.3	0.67
6,428.0	33.62	85.44	6,206.5	189.8	896.2	96.4	6.94
6,524.0	31.85	78.43	6,287.3	197.0	947.5	105.4	4.36
6,618.0	29.94	75.18	6,368.0	208.0	994.5	109.5	2.70
6,714.0	27.48	73.51	6,452.2	220.4	1,038.9	111.4	2.70
6,810.0	25.93	73.75	6,537.9	232.6	1,080.3	112.6	1.62
6,842.0	25.46	79.86	6,566.8	235.7	1,093.8	113.8	8.40
6,874.0	25.61	86.34	6,595.7	237.4	1,107.4	116.4	8.74
6,906.0	26.73	92.94	6,624.4	237.5	1,121.5	120.7	9.74
6,938.0	29.03	100.31	6,652.7	235.7	1,136.4	127.0	12.94
6,970.0	31.34	106.70	6,680.3	231.9	1,152.0	135.4	12.36
7,002.0	33.81	112.77	6,707.3	226.1	1,168.2	146.0	12.79
7,018.0	35.34	115.67	6,720.5	222.4	1,176.4	152.1	14.05
Burkett							
7,033.0	36.84	118.19	6,732.6	218.4	1,184.3	158.3	14.05
7,057.0	39.65	120.34	6,751.5	211.1	1,197.3	169.2	12.94
Tully							
7,065.0	40.59	121.00	6,757.6	208.5	1,201.7	173.1	12.94
7,097.0	43.92	125.39	6,781.3	196.7	1,219.7	189.9	13.90
7,129.0	46.43	129.97	6,803.8	182.8	1,237.6	208.6	12.83
7,161.0	49.68	134.45	6,825.2	166.8	1,255.2	229.3	14.54
7,192.0	52.31	138.20	6,844.7	149.4	1,271.8	251.0	12.66
7,224.0	55.29	143.07	6,863.6	129.4	1,288.2	275.0	15.41
7,256.0	57.95	147.19	6,881.2	107.5	1,303.4	300.6	13.59
7,289.0	58.81	148.83	6,898.5	83.6	1,318.3	327.8	4.97
7,321.0	62.70	151.06	6,914.2	59.5	1,332.3	355.1	13.59
7,353.0	66.48	152.82	6,927.9	34.0	1,345.9	383.6	12.81
7,385.0	69.90	155.21	6,939.8	7.3	1,358.9	413.0	12.74
7,389.0	70.25	155.39	6,941.2	3.8	1,360.5	416.7	9.73
Marcellus							
7,417.0	72.72	156.60	6,950.1	-20.4	1,371.3	443.2	9.73
7,449.0	75.45	159.23	6,958.8	-48.9	1,382.8	473.8	11.63
7,482.0	78.71	161.79	6,966.2	-79.2	1,393.6	506.0	12.44
7,514.0	81.53	162.22	6,971.7	-109.2	1,403.3	537.5	8.91
7,546.0	85.39	161.62	6,975.3	-139.4	1,413.2	569.3	12.21
7,567.0	87.58	161.17	6,976.6	-159.3	1,419.8	590.3	10.65
7,663.0	90.92	162.13	6,977.9	-250.4	1,450.1	686.2	3.62
7,760.0	92.33	159.76	6,975.1	-342.0	1,481.7	783.2	2.84
7,856.0	88.89	158.68	6,974.1	-431.8	1,515.8	879.0	3.76
7,952.0	91.71	160.11	6,973.6	-521.6	1,549.5	974.9	3.29
8,049.0	90.92	159.76	6,971.4	-612.7	1,582.8	1,071.8	0.89
8,145.0	91.01	159.59	6,969.8	-702.7	1,616.2	1,167.7	0.20
8,242.0	90.48	159.15	6,968.5	-793.5	1,650.3	1,264.6	0.71

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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
8,338.0	90.31	162.31	6,967.8	-884.1	1,682.0	1,360.6	3.30
8,434.0	90.13	161.61	6,967.5	-975.4	1,711.7	1,456.6	0.75
8,530.0	89.34	160.02	6,967.9	-1,066.0	1,743.3	1,552.6	1.85
8,626.0	89.96	162.13	6,968.5	-1,156.8	1,774.4	1,648.5	2.29
8,722.0	89.25	162.84	6,969.2	-1,248.4	1,803.3	1,744.5	1.05
8,818.0	91.19	163.28	6,968.8	-1,340.2	1,831.3	1,840.5	2.07
8,914.0	90.22	164.86	6,967.6	-1,432.5	1,857.6	1,936.4	1.93
9,011.0	91.89	163.19	6,965.8	-1,525.7	1,884.3	2,033.4	2.43
9,107.0	91.45	163.19	6,963.0	-1,617.6	1,912.1	2,129.3	0.46
9,203.0	90.13	159.76	6,961.7	-1,708.6	1,942.6	2,225.3	3.83
9,299.0	91.71	160.64	6,960.2	-1,798.9	1,975.1	2,321.2	1.88
9,395.0	91.71	161.69	6,957.3	-1,889.7	2,006.0	2,417.1	1.09
9,492.0	91.45	161.43	6,954.6	-1,981.7	2,036.7	2,514.1	0.38
9,587.0	91.45	160.99	6,952.2	-2,071.6	2,067.3	2,609.1	0.46
9,683.0	91.54	162.57	6,949.7	-2,162.8	2,097.3	2,705.0	1.65
9,779.0	91.19	161.61	6,947.4	-2,254.1	2,126.8	2,801.0	1.06
9,876.0	91.19	161.52	6,945.4	-2,346.1	2,157.5	2,898.0	0.09
9,972.0	90.75	162.31	6,943.8	-2,437.3	2,187.3	2,994.0	0.94
10,068.0	91.71	161.78	6,941.7	-2,528.6	2,216.9	3,089.9	1.14
10,165.0	92.07	163.54	6,938.5	-2,621.2	2,245.8	3,186.9	1.85
10,261.0	90.57	162.40	6,936.3	-2,712.9	2,273.9	3,282.8	1.96
10,358.0	90.31	162.57	6,935.6	-2,805.4	2,303.1	3,379.8	0.32
10,453.0	90.57	162.31	6,934.8	-2,896.0	2,331.7	3,474.8	0.39
10,550.0	90.66	162.13	6,933.8	-2,988.4	2,361.3	3,571.8	0.21
10,646.0	90.92	162.05	6,932.5	-3,079.7	2,390.9	3,667.8	0.28
10,743.0	91.89	161.17	6,930.1	-3,171.7	2,421.5	3,764.8	1.35
10,839.0	90.92	160.11	6,927.8	-3,262.3	2,453.3	3,860.7	1.50
10,936.0	89.56	161.81	6,927.3	-3,354.0	2,484.9	3,957.7	2.24
11,032.0	90.66	161.26	6,927.2	-3,445.0	2,515.3	4,053.7	1.28
11,129.0	91.80	162.05	6,925.1	-3,537.1	2,545.8	4,150.7	1.43
11,225.0	91.28	162.40	6,922.5	-3,628.4	2,575.1	4,246.6	0.65
11,321.0	91.10	162.75	6,920.5	-3,720.0	2,603.9	4,342.6	0.41
11,417.0	91.10	161.26	6,918.7	-3,811.3	2,633.5	4,438.6	1.55
11,512.0	90.75	160.64	6,917.1	-3,901.1	2,664.5	4,533.5	0.75
11,609.0	90.75	162.31	6,915.9	-3,993.1	2,695.3	4,630.5	1.72
11,705.0	91.45	162.84	6,914.0	-4,084.6	2,724.1	4,726.5	0.91
11,802.0	90.31	160.55	6,912.5	-4,176.7	2,754.6	4,823.5	2.64
11,898.0	90.84	162.75	6,911.6	-4,267.8	2,784.8	4,919.5	2.36
11,994.0	91.98	163.28	6,909.2	-4,359.6	2,812.8	5,015.4	1.30
12,091.0	92.07	162.84	6,905.8	-4,452.3	2,841.1	5,112.3	0.46
12,187.0	92.24	161.78	6,902.2	-4,543.7	2,870.2	5,208.3	1.12
12,284.0	91.68	160.59	6,898.8	-4,635.5	2,901.5	5,305.2	1.36
12,380.0	91.36	161.17	6,896.3	-4,726.2	2,932.9	5,401.2	0.69
12,471.0	89.78	160.64	6,895.4	-4,812.1	2,962.7	5,492.1	1.83

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Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
12,563.0	90.84	162.31	6,894.9	-4,899.4	2,991.9	5,584.1	2.15
12,654.0	90.13	159.85	6,894.1	-4,985.4	3,021.4	5,675.1	2.81
12,745.0	90.75	161.87	6,893.4	-5,071.4	3,051.2	5,766.1	2.32
12,837.0	89.34	161.87	6,893.4	-5,158.8	3,079.9	5,858.1	1.53
12,928.0	90.31	161.69	6,893.6	-5,245.3	3,108.3	5,949.1	1.08
13,019.0	89.96	165.39	6,893.4	-5,332.5	3,134.1	6,040.0	4.08
13,110.0	90.66	163.54	6,892.9	-5,420.2	3,158.5	6,130.9	2.17
13,202.0	91.11	164.16	6,891.5	-5,508.6	3,184.0	6,222.9	0.83
13,292.0	90.40	163.80	6,890.3	-5,595.0	3,208.9	6,312.8	0.88
13,384.0	90.48	164.33	6,889.6	-5,683.5	3,234.1	6,404.7	0.58
13,474.0	90.13	163.54	6,889.1	-5,770.0	3,259.0	6,494.7	0.96
13,571.0	89.43	163.45	6,889.5	-5,863.0	3,286.6	6,591.7	0.73
13,667.0	90.92	162.49	6,889.2	-5,954.8	3,314.7	6,687.6	1.85
13,764.0	90.84	163.19	6,887.7	-6,047.5	3,343.3	6,784.6	0.73
13,860.0	91.54	159.23	6,885.7	-6,138.3	3,374.2	6,880.6	4.19
13,956.0	91.10	159.67	6,883.5	-6,228.2	3,407.9	6,976.4	0.65
14,052.0	90.48	158.44	6,882.2	-6,317.8	3,442.2	7,072.3	1.43
14,148.0	89.34	158.88	6,882.3	-6,407.2	3,477.2	7,168.1	1.27
14,245.0	90.40	161.96	6,882.6	-6,498.6	3,509.7	7,265.1	3.36
14,341.0	89.43	161.53	6,882.7	-6,589.8	3,539.8	7,361.1	1.11
14,438.0	90.84	164.68	6,882.5	-6,682.6	3,567.9	7,458.1	3.56
14,533.0	89.52	161.87	6,882.2	-6,773.5	3,595.3	7,553.0	3.27
14,630.0	88.55	161.43	6,883.8	-6,865.6	3,625.8	7,650.0	1.10
14,726.0	89.78	164.07	6,885.2	-6,957.3	3,654.3	7,746.0	3.03
14,822.0	89.78	163.36	6,885.6	-7,049.4	3,681.2	7,841.9	0.74
14,918.0	89.43	165.03	6,886.2	-7,141.8	3,707.3	7,937.9	1.78
15,015.0	90.48	163.19	6,886.3	-7,235.1	3,733.9	8,034.8	2.18
15,111.0	90.22	163.45	6,885.7	-7,327.0	3,761.4	8,130.8	0.38
15,208.0	89.87	163.19	6,885.7	-7,419.9	3,789.3	8,227.7	0.45
15,304.0	89.34	162.40	6,886.3	-7,511.6	3,817.7	8,323.7	0.99
15,400.0	89.60	162.22	6,887.2	-7,603.1	3,846.8	8,419.7	0.33
15,497.0	90.66	163.19	6,887.0	-7,695.7	3,875.7	8,516.7	1.48
15,593.0	91.10	163.45	6,885.5	-7,787.7	3,903.2	8,612.7	0.53
15,690.0	91.80	159.94	6,883.1	-7,879.7	3,933.7	8,709.6	3.69
15,786.0	90.40	158.44	6,881.2	-7,969.4	3,967.8	8,805.5	2.14
15,883.0	90.04	159.85	6,880.8	-8,060.1	4,002.3	8,902.4	1.50
15,979.0	89.78	160.20	6,881.0	-8,150.3	4,035.1	8,998.3	0.45
16,076.0	89.60	158.53	6,881.5	-8,241.1	4,069.3	9,095.2	1.73
16,172.0	89.96	160.29	6,881.9	-8,330.9	4,103.1	9,191.1	1.87
16,269.0	90.40	159.23	6,881.6	-8,421.9	4,136.6	9,288.0	1.18
16,365.0	88.99	160.02	6,882.1	-8,511.9	4,170.0	9,383.9	1.68
16,461.0	89.08	160.73	6,883.7	-8,602.3	4,202.3	9,479.9	0.75
16,558.0	88.46	158.18	6,885.8	-8,693.1	4,236.3	9,576.7	2.70
16,654.0	89.60	161.43	6,887.4	-8,783.2	4,269.4	9,672.6	3.59

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Isaac Unit 1H
Project:	Harrison County West Virginia	**TVD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Site:	Post / Sperry 2 Pad	**MD Reference:**	Isaac Unit 1H GL 1169 @ 1191.0usft (Original We
Well:	Isaac Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
16,751.0	88.55	163.45	6,889.0	-8,875.7	4,298.7	9,769.6	2.35
16,847.0	88.72	163.80	6,891.3	-8,967.7	4,325.7	9,865.6	0.41
16,943.0	89.08	162.49	6,893.1	-9,059.6	4,353.6	9,961.5	1.41
17,039.0	89.69	163.98	6,894.1	-9,151.5	4,381.3	10,057.5	1.68
17,135.0	89.69	162.84	6,894.7	-9,243.5	4,408.7	10,153.5	1.19
17,231.0	89.87	162.66	6,895.0	-9,335.2	4,437.1	10,249.4	0.27
17,337.0	90.04	161.34	6,895.1	-9,436.0	4,469.9	10,355.4	1.26
17,384.0	90.04	161.34	6,895.1	-9,480.5	4,484.9	10,402.4	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
7,018.0	6,720.5	222.4	1,176.4	Burkett
7,057.0	6,751.5	211.1	1,197.3	Tully
7,389.0	6,941.2	3.8	1,360.5	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/20/2014
Job End Date:	4/2/2014
State:	West Virginia
County:	Harrison
API Number:	47-033-05724-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Isaac Unit 1H
Longitude:	-80.46646110
Latitude:	39.23797780
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,978
Total Base Water Volume (gal):	12,577,992
Total Base Non Water Volume:	0

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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
Water	Operator	Carrier					
			Water	7732-18-5	100.00000	90.11703	
Sand, White, 40/70	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	5.67551	
Sand, White, 20/40	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	3.09235	
Sand, White, 100 mesh	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	0.59605	
HCl, 10.1 - 15%	Baker Hughes	Acidizing					
			Water	7732-18-5	85.00000	0.17123	SmartCare Product
			Hydrochloric Acid	7647-01-0	15.00000	0.03022	SmartCare Product
GW-3LDF	Baker Hughes	Gelling Agent					
			Guar Gum	9000-30-0	60.00000	0.07518	SmartCare Product
			Petroleum Distillates	64742-47-8	30.00000	0.03759	SmartCare Product
			Paraffinic Petroleum Distillate	64742-55-8	30.00000	0.03759	SmartCare Product
			Crystalline Silica: Quartz	14808-60-7	5.00000	0.00626	SmartCare Product
			1-butoxy-2-propanol	5131-66-8	5.00000	0.00626	SmartCare Product
			Isotridecanol, ethoxylated	9043-30-5	5.00000	0.00626	SmartCare Product
Enzyme G-NE	Baker Hughes	Breaker					

			No hazardous ingredients	NA	100.00000	0.02304	SmartCare Product
FRW-18	Baker Hughes	Friction Reducer					
			Petroleum Distillates	64742-47-8	30.00000	0.01702	SmartCare Product
Alpha 1427	Baker Hughes	Biocide					
			Glutaraldehyde	111-30-8	30.00000	0.00409	SmartCare Product
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00136	SmartCare Product
			Ethanol	64-17-5	5.00000	0.00068	SmartCare Product
			Quaternary Ammonium Compound	68424-85-1	5.00000	0.00068	SmartCare Product
Scaletrol 720	Baker Hughes	Scale Inhibitor					
			Ethylene Glycol	107-21-1	30.00000	0.00458	SmartCare Product
			Calcium Chloride	10043-52-4	5.00000	0.00076	SmartCare Product
Ferrotrol 300L	Baker Hughes	Iron Control					
			Citric Acid	77-92-9	60.00000	0.00079	SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor					
			Methanol	67-56-1	100.00000	0.00031	SmartCare Product
			Polyoxyalkylenes	Trade Secret	30.00000	0.00009	SmartCare Product
			Fatty Acids	Trade Secret	10.00000	0.00003	SmartCare Product
			Propargyl Alcohol	107-19-7	5.00000	0.00002	SmartCare Product
			Olefin	Trade Secret	5.00000	0.00002	SmartCare Product
GasFlo G, 55 gal drum	Baker Hughes	Surfactant					
			Methanol	67-56-1	30.00000	0.00001	SmartCare Product
			Oxyalkylated Alkylphenol (1)	Trade Secret	10.00000	0.00000	SmartCare Product
			Oxyalkylated Alkylphenol (2)	Trade Secret	10.00000	0.00000	SmartCare Product
			Polyoxyalkylene	Trade Secret	10.00000	0.00000	SmartCare Product
			Oxyalkylated Amne	Trade Secret	5.00000	0.00000	SmartCare Product
NE-900, drum	Baker Hughes	Non-emulsifier					
			Methanol	67-56-1	30.00000	0.00001	SmartCare Product
			Nonyl Phenyl Polyethylene Glycol Ether	9016-45-9	10.00000	0.00000	SmartCare Product
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 Chemicals					
			Water	7732-18-5		0.06676	
			Poly (acrylamide-co-acrylic acid)	Trade Secret		0.01702	
			Polyacrylate	Trade Secret		0.00305	
			Salt	Trade Secret		0.00284	
			Sorbitan Monooleate	Trade Secret		0.00284	
			Hemicellulase Enzyme Concentrate	9025-56-3		0.00115	
			Ethoxylated Alcohol	Trade Secret		0.00113	
			2-butoxy-1-propanol	15821-83-7		0.00013	
			Modified Thiorea Polymer	68527-49-1		0.00002	
			Copolymer	Trade Secret		0.00001	
			Potassium Chloride	7447-40-7		0.00001	
			Sodium Chloride	7647-14-5		0.00000	

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			Hydrochloric Acid	7647-01-0		0.00000	
			Formaldehyde	50-00-0		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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Antero Resources
Well No. Isaac Unit 1H
As-Drilled Plat
Antero Resources Corporation

		Tax Map 364 Owner	Bk/Pg	Acres
1	17.1	Ronald D. Cork	1245/1115	22.81
2	15	Blue Heron Property Mgt II LLC	1441/1042	25.14
3	15.1	Blue Heron Property Mgt II LLC	1441/1045	131.61
4	17	Ronald & Carol Cork	993/216	6.63
5	16	Blue Heron Property Mgt II LLC	1441/1045	5.0

9,822' to Bottom Hole

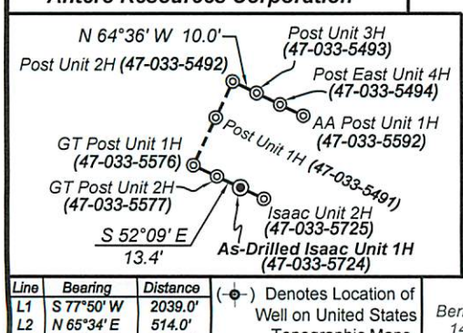
2,349' to Top Hole

TOP HOLE LATITUDE 39 - 15 - 00
BOTTOM HOLE LATITUDE 39 - 15 - 00

TOP HOLE LONGITUDE 80 - 27 - 30
BOTTOM HOLE LONGITUDE 80 - 25 - 00

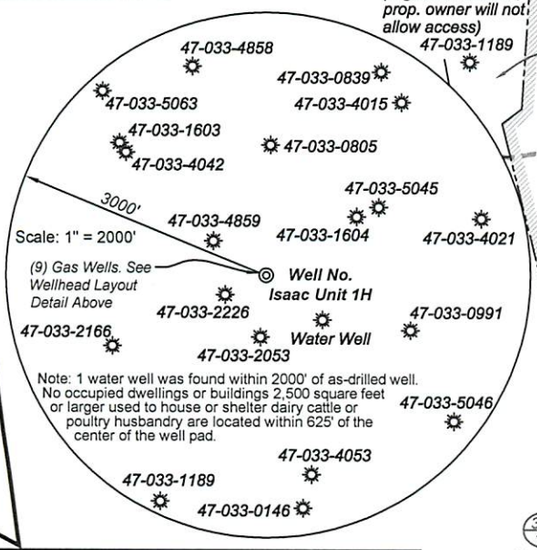
4,359' to Top Hole

13,790' to Bottom Hole

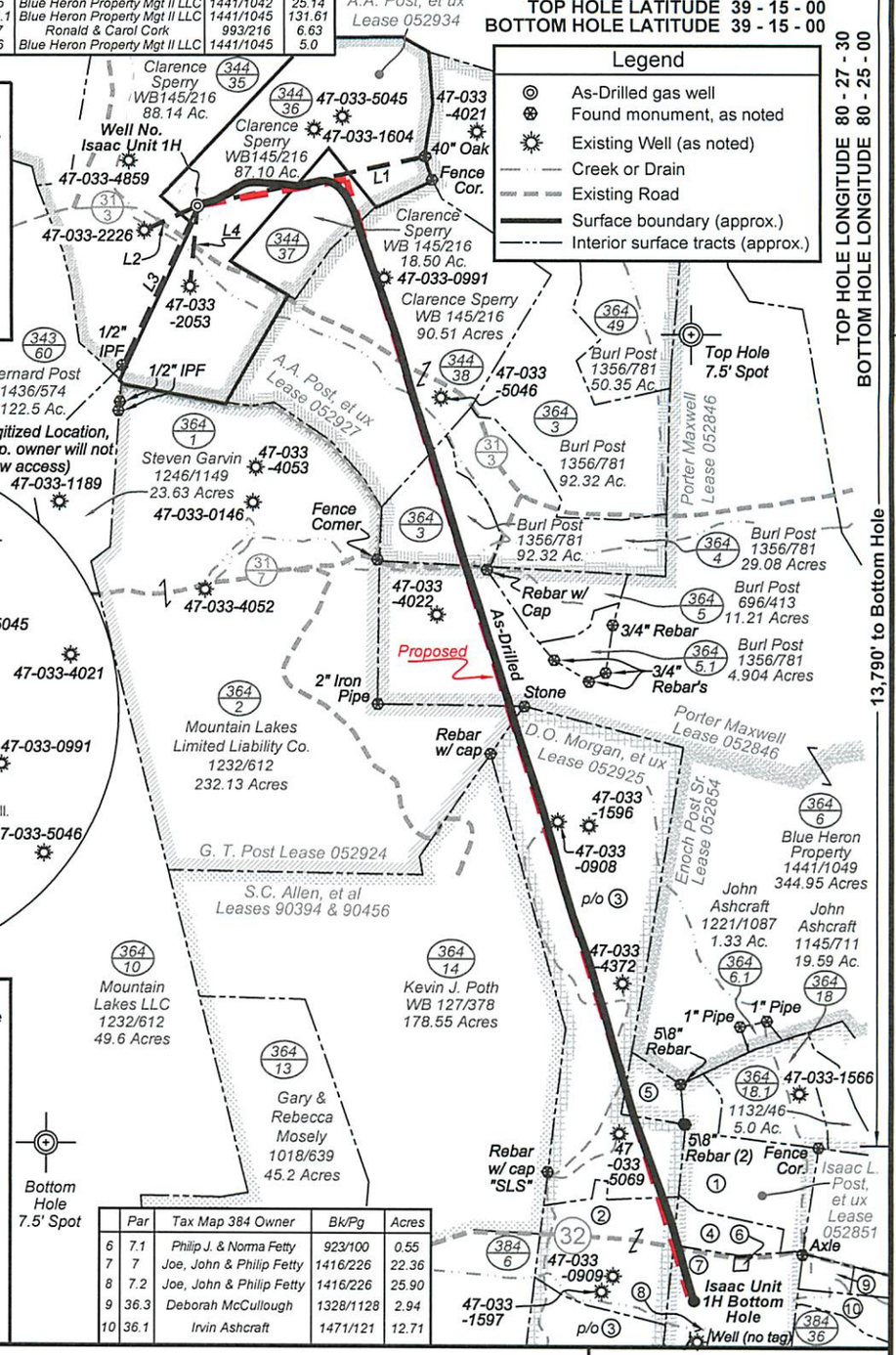


Line	Bearing	Distance
L1	S 77°50' W	2039.0'
L2	N 65°34' E	514.0'
L3	N 25°23' E	1545.8'
L4	N 05°25' E	706.1'

(-⊕-) Denotes Location of Well on United States Topographic Maps



Note: 1 water well was found within 2000' of as-drilled well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.



	Par	Tax Map 384 Owner	Bk/Pg	Acres
6	7.1	Philip J. & Norma Fetty	923/100	0.55
7	7	Joe, John & Philip Fetty	1416/226	22.36
8	7.2	Joe, John & Philip Fetty	1416/226	25.90
9	36.3	Deborah McCullough	1328/1128	2.94
10	36.1	Irvin Ashcraft	1471/121	12.71

Notes:

West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.

Well No. Isaac Unit 1H Top Hole coordinates are
N: 270,253.91' Latitude: 39°14'16.67"
E: 1,726,255.34' Longitude: 80°27'59.27"
Bottom Hole coordinates are
N: 260,700.01' Latitude: 39°12'42.70"
E: 1,730,581.82' Longitude: 80°27'03.00"

UTM Zone 17, NAD 1983

Top Hole Coordinates	Bottom Hole Coordinates
N: 4,343,329.891m	N: 4,340,441.213m
E: 546,060.740m	E: 547,427.322m

Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

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Top Hole coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys, Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

FILE NO: 183-36-U-11
DRAWING NO: Isaac 1H As-Drill Well Plat
SCALE: 1" = 1500'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: March 31 2015
OPERATOR'S WELL NO. Isaac Unit 1H

API WELL NO
47 - 033 - 05724
STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION: ☐ STORAGE ☐ DEEP ☒ SHALLOW

LOCATION: ELEVATION: Existing Grade - 1168' Original Grade - 1169' WATERSHED: Middle West Fork River QUADRANGLE: West Milford
DISTRICT: Union COUNTY: Harrison
SURFACE OWNER: Clarence Sperry ACREAGE: 87.10
ROYALTY OWNER: Isaac L. Post, et ux; S.C. Allen, et al; D.O. Morgan, et ux; A.A. Post, et ux; A.A. Post, et ux; Porter Maxwell; G.T. Post LEASE NO: 90394 & 90456; 052846; 052924; 052851; 052934; 052927; 052925 ACREAGE: 156; 121; 235; 237; 291.5; 270; 254.5
PROPOSED WORK: ☐ DRILL ☐ CONVERT ☐ DRILL DEEPER ☐ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION
☐ PERFORATE NEW FORMATION ☒ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled
☐ PLUG AND ABANDON ☐ CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale DEPTH: 6,895' TVD 17,384' MD

WELL OPERATOR: Antero Resources Corporation
ADDRESS: 1615 Wynkoop Street, Denver, CO 80202
DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 5400 D Big Tyler Road, Charleston, WV 25313

WR-35
Rev. 8/23/13

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

API 47 - 039 - 06367 County KANAWHA District ELK
Quad BLUE CREEK 7.5' Pad Name N/A Field/Pool Name BLUE CREEK
Farm name J.V.R. SKINNER Well Number 21
Operator (as registered with the OOG) PETRO HOLDINGS INC.
Address P.O. BOX 987 City SPENCER State WV Zip 25276

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,253,939 Easting 463,230
Landing Point of Curve Northing ____ Easting ____
Bottom Hole Northing ____ Easting ____

Elevation (ft) 1018 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal □ Horizontal 6A ■ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas ■ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other ____

Type of Completion □ Single ■ Multiple Fluids Produced ■ Brine ■Gas □ NGL ■ Oil □ Other ____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole ■ Air □ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)

Date permit issued 07/28/14 Date drilling commenced 12/01/14 Date drilling ceased 12/04/14
Date completion activities began 12/15/14 Date completion activities ceased 01/19/15
Verbal plugging (Y/N) N/A Date permission granted ____ Granted by ____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths NO
Salt water depth(s) ft +/- 1750' Void(s) encountered (Y/N) depths NO
Coal depth(s) ft 454' - 460' Cavern(s) encountered (Y/N) depths NO
Is coal being mined in area (Y/N) NO

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Reviewed by:
AL 6/3/15 ✓
W.S. 6/3/15

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API 47- 039 - 06367 Farm name J.V.R. SKINNER Well number 21

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor							
Surface	8 7/8"	7"	547'	USED	20	168'	YES
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 1/4"	4 1/2"	2205	NEW/USED	10.5/11.6	N/A	YES
Tubing		2 3/8"	2135	USED	4.6		
Packer type and depth set							

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ^{3}/sks)	Volume (ft ^{3})	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	A	120	15.6	1.18	142	CTS	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	50/50 POZ	230	14.4	1.28	294	+/- 87	N/A
Tubing							

Drillers TD (ft) 2240 Loggers TD (ft) 2220
Deepest formation penetrated WEIR Plug back to (ft) N/A
Plug back procedure

Kick off depth (ft) N/A

Check all wireline logs run ☒ caliper ☒ density ☐ deviated/directional ☒ induction
☒ neutron ☒ resistivity ☒ gamma ray ☒ temperature ☐ sonic

Well cored ☐ Yes ☒ No Conventional Sidewall Were cuttings collected ☐ Yes ☒ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

PRODUCTION - 4 1/2" CASING CENTRALIZERS 2017, 2049, 2081, 2113

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WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ☒ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ☒ No DETAILS

WERE TRACERS USED ☐ Yes ☒ No TYPE OF TRACER(S) USED

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API 47- 039 - 06367 Farm name J.V.R. SKINNER Well number 21

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	12/15/14	2077'	2100'	22	WEIR
2	12/22/14	2038.5'	2051.5'	24	WEIR

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	12/22/14	22.4	3799	3560	+/- 2500	50,000	640	138 Mscf of N2
2	12/22/14	23.4	3849	4226	2089	29,700	477	99 Mscf of N2

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PRODUCING FORMATION(S)	DEPTHS			
WEIR	2007-2080	TVD	2007-2080	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☒ Open Flow OIL TEST ☒ Flow ☒ Pump

SHUT-IN PRESSURE Surface 250 psi Bottom Hole _____ psi DURATION OF TEST 168 hrs

OPEN FLOW Gas 50 mcfpd Oil 3 bpd NGL _____ bpd Water TRACE bpd GAS MEASURED BY ☒ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
SHALE	0	70	0		
SAND	70	90			
RED ROCK	90	110			
SHALE	110	260			
SAND	260	280			
SHALE	280	454			
COAL	454	460			
SHALE	460	740			
SAND	740	760			
SHALE	760	798			
SAND	798	806			
SHALE	806	811			
SAND	811	844			
SHALE	844	906			

Please insert additional pages as applicable.

Drilling Contractor DECKER DRILLING INC.
Address 11565 STATE ROUTE 676 City VINCENT State OH Zip 45784

Logging Company PRECISION ENERGY SERVICES/WEATHERFORD (SEE ADDITIONAL PAGE)
Address 500 WINSCOTT ROAD City FORT WORTH State TX Zip 78126

Cementing Company UNIVERSAL WELL SERVICES
Address PO BOX 2437 City BUCKHANNON State WV Zip 26201

Stimulating Company UNIVERSAL WELL SERVICES
Address PO BOX 2437 City BUCKHANNON State WV Zip 26201

Please insert additional pages as applicable.

Completed by C. I. McKOWN, II Telephone (304) 565-7318
Signature _____ Title ENGINEER Date 05/27/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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API 47- 039- 06367 FARM NAME: J.V.R. SKINNER WELL #: 21

LITHOLOGY FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
sand	906	909			
shale	909	915			
sand	915	920			
shale	920	971			
sand	971	981			
shale	981	987			
sand	987	1480			
shale	1480	1582			
sand	1582	1600			
shale	1600	1612			
lime	1612	1830			
shale	1830	1834			
sand	1834	1838			
shale	1838	2007			
sand	2007	2080			
shale	2080	2220			

Logging Company APPALACHAIN WELL SURVEYS
Address PO BOX 1058 City CAMBRIDGE State OHIO Zip 43725

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TREATMENT SUMMARY

C.I. McKown Skinner #21	Stage #1	Date: 12/22/2014

DESCRIPTION OF JOB: Energized Crosslink

Pressures (psi)		Treatment Stats			Perforations (ft)	
Well Open	0				Mid (TVD)	1102
Breakdown	3560	Avg Pressure	3799	psi		
ISIP		Max Pressure	4081	psi	Top Depth (MD)	2077
					Middle (MD)	
Pumping Volumes (SCF)/(BBL)		Avg Rate	4502.8	SCF/min	Bottom Depth (MD)	2100
Load & Breakdown	1 bbl	Max Rate	4508.0	SCF/min		
Total Nitrogen	138352	Avg Rate	22.4	BPM	Number of Perfs	24
Total Clean	640	Max Rate	23.2	BPM		
Total Slurry	706					

Time	Rate (SCF/min)	Nitrogen Cum. Volume (SCF)	Slurry Rate (BPM)	Slurry Cum Vol. (BBL)	Pressure (psi)	Description of Stage or Event
7:15						Arrived on Location
11:20						Safety Meeting
11:48					4730	Test Lines
11:50						Change Release Valve
11:57					4597	Test Lines
12:01					0	Open Well
12:05			3	1	3560	Break Formation
12:06	4508.0		19.6	5	4100	Establish Rate
12:11	4487.0	23171	21.9	101	4081	Start Sand @ 1.00# 20/40
12:15	4508.0	41128	21.6	188	3966	Start Sand @ 2.00# 20/40
12:24	4508.0	81420	22.9	371	3705	Start Sand @ 3.00# 20/40
12:35	4487.0	131524	23.2	628	3445	Start Sand @ 4.00# 20/40
12:37		138352		684	2185	Pump Acid 500 Gal 15% HCL
12:41			19.1	684	2350	Displace Acid
12:42				706	2285	Shut Down

Material Totals

Proppant	20/40	500	sks

Additives			
	Nitrogen	138352	SCF
	19XL Gel	700	lbs
	15% HCL Acid	500	gal
	Unilink 8.5	50	gal
	Super Surf	55	gal
	Iron	10	gal
	Clay Chek	13	gal
	NE-90G	14	gal
	LEB 10X	4	qts
	Unihib	0.5	lbs

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TREATMENT SUMMARY

C.I. McKown Skinner #21	Stage #2	Date: 12/22/2014

DESCRIPTION OF JOB: Energized Crosslink

Pressures (psi)		Treatment Stats			Perforations (ft)	
Well Open	1206				Mid (TVD)	1102
Breakdown	4226	Avg Pressure	3849	psi		
ISIP	2089	Max Pressure	4268	psi	Top Depth (MD)	2040
					Middle (MD)	
Pumping Volumes (SCF)/(BBL)		Avg Rate	4293.0	SCF/min	Bottom Depth (MD)	2053
Load & Breakdown	6 bbl	Max Rate	4384.0	SCF/min		
Total Nitrogen	99346	Avg Rate	23.36	BPM	Number of Perfs	24
Total Clean	477	Max Rate	28.8	BP		
Total Slurry	526					

Time	Rate (SCF/min)	Nitrogen Cum. Volume (SCF)	Slurry Rate (BPM)	Slurry Cum Vol. (BBL)	Pressure (psi)	Description of Stage or Event
14:07					4760	Test Lines
14:09					1206	Open Well
14:15	4384.0		5.8	6	4226	Break Formation
14:18	4384.0	14657	11.2	20	4268	Establish Rate
14:22	4363.0	3685[illegible]	20.9	113	4078	Start Sand @ 0.50# 20/40
14:25	4343.0	4717[illegible]	20.9	163	3940	Start Sand @ 1.00# 20/40
14:27	4363.0	5866[illegible]	20.9	218	3635	Start Sand @ 2.00# 20/40
14:32	4012.0	7376[illegible]	28.8	309	3589	Start Sand @ 3.00# 20/40
14:38		9934[illegible]	25.3	495	4002	Cut Sand/N2 Out
14:39				526	3690	Shut Down
					1597	Shut In 5 Min

Material Totals

Proppant	20/40	297	sks

Additives			
	Nitrogen	99346	SCF
	19XL Gel	440	lbs
	15% HCL Acid	0	gal
	Unilink 8.5	35	gal
	Super Surf	41	gal
	Iron	14	gal
	Clay Chek	9	gal
	NE-90G	10	gal
	LEB 10X	4	qts
	Unihib	0	lbs

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

API 47 - 039 - 06368 County KANAWHA District ELK
Quad BLUE CREEK 7.5' Pad Name N/A Field/Pool Name BLUE CREEK
Farm name ANNA C. SKINNER Well Number 28
Operator (as registered with the OOG) C. I. McKOWN & SON, INC.
Address P.O. BOX 711 City NEWTON State WV Zip 25266

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,254,413 Easting 464,879
Landing Point of Curve Northing ____ Easting ____
Bottom Hole Northing ____ Easting ____

Elevation (ft) 1099 GL Type of Well ☒New ☐ Existing Type of Report ☐Interim ☒Final

Permit Type ☐ Deviated ☐ Horizontal ☐ Horizontal 6A ☒ Vertical Depth Type ☐ Deep ☒ Shallow

Type of Operation ☐ Convert ☐ Deepen ☒ Drill ☐ Plug Back ☐ Redrilling ☐ Rework ☒ Stimulate

Well Type ☐ Brine Disposal ☐ CBM ☒ Gas ☒ Oil ☐ Secondary Recovery ☐ Solution Mining ☐ Storage ☐ Other ____

Type of Completion ☐ Single ☒ Multiple Fluids Produced ☒ Brine ☒Gas ☐ NGL ☒ Oil ☐ Other ____
Drilled with ☐ Cable ☒ Rotary

Drilling Media Surface hole ☒ Air ☐ Mud ☐Fresh Water Intermediate hole ☐ Air ☐ Mud ☐ Fresh Water ☐ Brine
Production hole ☒ Air ☐ Mud ☐ Fresh Water ☐ Brine
Mud Type(s) and Additive(s)

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Date permit issued 07/24/14 Date drilling commenced 12/04/14 Date drilling ceased 12/09/14
Date completion activities began 12/16/14 Date completion activities ceased 02/25/15
Verbal plugging (Y/N) N/A Date permission granted ____ Granted by ____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths NO
Salt water depth(s) ft +/- 540 Void(s) encountered (Y/N) depths NO
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths NO
Is coal being mined in area (Y/N) NO

Reviewed by:
AL 6/3/15
W.S. 6/3/15

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API 47- 039 - 06368 Farm name ANNA C. SKINNER Well number 28

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor							
Surface	8 7/8"	7"	629'	USED	20	153'	YES
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 1/4"	4 1/2"	2241	NEW/USED	10.5/11.6	N/A	YES
Tubing		2 3/8"	2181	USED	4.6		
Packer type and depth set							

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	A	120	15.6	1.20	144	CTS	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	50/50 POZ	230	14.4	1.28	[illegible]	+/- 26	N/A
Tubing							

Drillers TD (ft) 2270 Loggers TD (ft) 2268

Deepest formation penetrated WEIR Plug back to (ft) N/A

Plug back procedure

Kick off depth (ft) N/A

Check all wireline logs run ☒ caliper ☒ density ☐ deviated/directional ☒ induction ☒ neutron ☒ resistivity ☒ gamma ray ☒ temperature ☐ sonic

Well cored ☐ Yes ☒ No Conventional Sidewall Were cuttings collected ☐ Yes ☒ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
PRODUCTION - 4 1/2" CASING CENTRALIZERS 2028,2071,2114,2156

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WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ☒ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ☒ No DETAILS

WERE TRACERS USED ☐ Yes ☒ No TYPE OF TRACER(S) USED

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API 47- 039 - 06368 Farm name ANNA C. SKINNER Well number 28

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	12/15/14	2128'	2145'	24	WEIR
2	12/16/14	2095'	2110'	26	WEIR

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	12/16/14	29.7	3195	4386	1628	41,300	568	97 Mscf of N2
2	12/16/14	29.7	3006	3115	1645	50,300	615	93 Mscf of N2

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Please insert additional pages as applicable.

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API 47- 039 - 06368 Farm name ANNA C. SKINNER Well number 28

PRODUCING FORMATION(S)	DEPTHS	
weir	2086 - 2148 TVD	2086 - 2148 MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☒ Open Flow OIL TEST ☒ Flow ☒ Pump

SHUT-IN PRESSURE Surface 250 psi Bottom Hole _____ psi DURATION OF TEST 168 hrs

OPEN FLOW Gas 80 mcfpd Oil 5 bpd NGL _____ bpd Water TRACE bpd GAS MEASURED BY ☒ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
SOIL/SAND	0	22	0		
SHALE	22	260			
SAND	260	320			
SHALE	320	380			
SAND	380	410			
SHALE	410	770			
SAND/SHALE	770	1064			
SAND	1064	1283			
SAND/SHALE	1283	1332			
SAND	1332	1415			
SHALE	1415	1430			
SAND	1430	1482			
SHALE	1482	1643			
LIME	1643	1904			

Please insert additional pages as applicable.

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Drilling Contractor DECKER DRILLING
Address 11565 STATE ROUTE 676 City VINCENT State OH Zip 45784

Logging Company APPALACHAIN WELL SURVEYS
Address P.O. BOX 1058 City CAMBRIDGE State OH Zip 43725

Cementing Company UNIVERSAL WELL SERVICES
Address P.O. BOX 2437 City BUCKHANNON State WV Zip 26201

Stimulating Company UNIVERSAL WELL SERVICES
Address P.O. BOX 2437 City BUCKHANNON State WV Zip 26201

Please insert additional pages as applicable.

Completed by C. McKOWN, II Telephone (304) 565-7318
Signature _____ Title PRESIDENT Date 05/27/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

LITHOLOGY FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
SHALE	1904	2086	0		
SAND	2086	2148			
SHALE	2148	2247			

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TREATMENT SUMMARY

C.I. McKown Skinner #28	Stage #1	Date: 12/16/2014

DESCRIPTION OF JOB: Energized Crosslin

Pressures (psi)		Treatment Stats			Perforations (ft)	
Well Open	0				Mid (TVD)	1250
Breakdown	4386	Avg Pressure	3195	psi		
ISIP	1628	Max Pressure	3850	psi	Top Depth (MD)	2128
					Middle (MD)	
Pumping Volumes (SCF)/(BBL)		Avg Rate	4495.5	SCF/min	Bottom Depth (MD)	2145
Load & Breakdown	1bbl	Max Rate	4505.0	SCF/min		
Total Nitrogen	97210	Avg Rate	29.66666667	BPM	Number of Perfs	24
Total Clean	568	Max Rate	29.8	BPM		
Total Slurry	626					

Time	Rate (SCF/min)	Nitrogen Cum. Volume (SCF)	Slurry Rate (BPM)	Slurry Cum Vol. (BBL)	Pressure (psi)	Description of Stage or Event
7:05						Arrived on Location
14:45						Safety Meeting
15:12					4550	Test Lines
15:18					0	Open Well
15:21			3	1	4386	Break Formation
15:22	4486.0		29.6	5	3850	Establish Rate
15:25	4486.0	15977	29.6	94	3630	Start Sand @ 1.00# 20/40
15:28	4505.0	29485	29.8	183	3108	Start Sand @ 2.00# 20/40
15:34	4505.0	57167	29.6	366	2848	Start Sand @ 3.00# 20/40
15:42	4505.0	91683	6	578	1881	Blender Lost Tub
15:43	0.0	94458	16.8	591	2480	Establish Rate
15:44		97210	5.5	602	1899	Pump Acid 500 Gal 15% HCL
15:46			15.8	603	2582	Displace Acid
15:47			15.8	611	2561	Drop 3.75 Frac Ball
15:48				626	2406	Shut Down

Material Totals

Proppant	20/40	413	sks

Additives			
	Nitrogen	97210	SCF
	19XL Gel	750	lbs
	15% HCL Acid	500	gal
	Unilink 8.5	51	gal
	SuperSurf	52	gal
	Iron	13	gal
	Clay Chek	14	gal
	NE-90	13	gal
	LEB 10X	4	qts
	Unihib G	0.5	gal

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TREATMENT SUMMARY

C.I. McKown Skinner #28	Stage #2	Date: 12/16/2014

DESCRIPTION OF JOB: Energized Crosslink

Pressures (psi)		Treatment Stats			Perforations (ft)	
Well Open	1204					
Breakdown	3115	Avg Pressure	3006	psi	Mid (TVD)	1250
ISIP	1645	Max Pressure	3590	psi	Top Depth (MD)	2097
					Middle (MD)	
Pumping Volumes (SCF)/(BBL)		Avg Rate	4495.5	SCF/min	Bottom Depth (MD)	2113
Load & Breakdown	1bbl	Max Rate	4505.0	SCF/min		
Total Nitrogen	93227	Avg Rate	29.675	BPM	Number of Perfs	26
Total Clean	615	Max Rate	29.9	BPM		
Total Slurry	683					

Time	Rate (SCF/min)	Nitrogen Cum. Volume (SCF)	Slurry Rate (BPM)	Slurry Cum Vol. (BBL)	Pressure (psi)	Description of Stage or Event
17:48					4700	Test Lines
17:50					1204	Open Well
17:53			2.8	1	3115	Break Formation
17:53	4486.0		29.9	5	3590	Establish Rate
17:57	4505.0	14461	29.8	90	3380	Start Sand @ 1.00# 20/40
18:00	4486.0	27334	29.6	176	3080	Start Sand @ 2.00# 20/40
18:06	4505.0	54357	29.8	354	2829	Start Sand @ 3.00# 20/40
18:14	4486.0	92960	29.5	610	2735	Start Sand @ 4.00# 20/40
18:14		93227	29.5	611	2501	N2 Out
18:15			29.9	650	2475	Start Flush
18:17				683	2563	Shut Down
18:22					1401	Shut In 5 Min

Material Totals

Proppant	20/40	503	sks

Additives			
	Nitrogen	93227	SCF
	19XL Gel	450	lbs
	15% HCL Acid	0	gal
	Unilink 8.5	52	gal
	SuperSurf	50	gal
	Iron	11	gal
	Clay Chek	10	gal
	NE-90	11	gal
	LEB 10X	4	qts
	Unihib G	0	gal

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

API 47 - 061 - 01665 County Monongalia District Clay
Quad Blacksville, WV Pad Name Beach Field/Pool Name Blacksville
Farm name Nancy Kay Beach Davis and Russell C. Beach Well Number 2H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia Street E., Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4395279.5	Easting 572652.7
Landing Point of Curve	Northing 4394858.6	Easting 572597.9
Bottom Hole	Northing 4393180.7	Easting 573602.1

Elevation (ft) 1361 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion □ Single ■ Multiple Fluids Produced ■ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine

Mud Type(s) and Additive(s)
Synthetic Based Mud for horizontal section

BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-SEAL PLUS, HRP, LIME, M-I WATE (BARITE), M-I-X II MEDIUM, MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUI

Date permit issued 3-13-14 Date drilling commenced 7-10-14 Date drilling ceased 10-7-14
Date completion activities began 12/5/2014 Date completion activities ceased 12/28/2014
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 1,206' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,550' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 300',800' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
AL 6/3/15 ✓
W.S. 6/3/15

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API 47- 061 - 01665 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30	24	52'	N	N/A	N/A	Y to surface
Surface	17.5	13 3/8	1,282'	N	54.5	N/A	Y 50 BBL return
Coal							
Intermediate 1	12.25	9 5/8	2,538'	N	40	N/A	Y 28 BBL return
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15,284'	N	20	N/A	N TOC @ 700'
Tubing							
Packer type and depth set							

Comment Details All casing and cement jobs went with out issue.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	4,500 psi ready mix	36.4		.75	27.27	CTS	48
Surface	Class A	1004	15.2	1.27	1,271	CTS	8
Coal							
Intermediate 1	Class A	852	15.2	1.26	1,074	CTS	8
Intermediate 2							
Intermediate 3							
Production	50/50 Poz Prem Ne	2926	14.5	1.17	3,225	700'	48
Tubing							

Drillers TD (ft) 15,322' Loggers TD (ft) 15,296'
Deepest formation penetrated Marcellus Plug back to (ft) N/A
Plug back procedure

Kick off depth (ft) 6,225'

Check all wireline logs run □ caliper □ density □ deviated/directional □ induction
□ neutron □ resistivity ■ gamma ray □ temperature □sonic

Well cored □ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes □ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
Surface: bow spring centralizers every 3rd joint or aprox 120'
Intermediate: bow spring centralizers every 3rd joint or aprox 120'
Production: Hard bodied spiral centralizers every other joint or aprox 80' from TD to KOP then bow spring from KOP to 9 5/8" every forth joint or aprox 140'

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 061 - 01665 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 2H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					*See Attachment

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

Please insert additional pages as applicable.

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API 47- 061 - 01665 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 2H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	8111.21'	TVD	15,322'	MD

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown □ Open Flow OIL TEST □ Flow □ Pump

SHUT-IN PRESSURE Surface 3,965 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	4,104 mcfpd	_____ bpd	_____ bpd	_____ bpd	□ Estimated □ Orifice □ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		See Attachment

Please insert additional pages as applicable.

Drilling Contractor Pioneer 63
Address 1250 NE Loop 410 Suite 1000 City San Antonio State TX Zip 78209

Logging Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Cementing Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Schlumberger
Address 1080 US-33 City Weston State WV Zip 26452

Please insert additional pages as applicable.

Completed by Zack Arnold Telephone 304-203-8059
Signature _____ Title General Manager - Operations Date 9/29/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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Beach 2H

Lithology/Formation	Top Depth in FT Name TVD	Bottom Depth in FT TVD	Top Depth in FT MD	Bottom Depth in FT MD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Sand/Shale	0	1225	0		sand/shale
Red Rock	1225	1235			red rock
Sand/shale	1235	1950			sand/shale
Red Rock	1950	2000			red rock
Maxon	2000	2135			sand
Little Lime	2135	2160			limestone
Big Lime	2160	2200			limestone
Injun	2200	2260			sandstone
Sand/Shale	2260	6061			sand/shale
Geneseo	7898	7946	8148	8221	shale
Tully	7946	7994	8221	8299	limestone
Hamilton	7994	8109	8299	8508	shale
Marcellus	8109	8154	8508	8639	shale
Cherry Valley	8154	8159	8639	8653	limestone
Lower Marcellus	8159		8653		shale

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Perforation Record

Stage Number	Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12/6/2014	15,127	15,017	40	Marcellus Shale
2	12/6/2014	14,977	14,867	40	Marcellus Shale
3	12/8/2014	14,827	14,717	40	Marcellus Shale
4	12/7/2014	14,677	14,567	40	Marcellus Shale
5	12/8/2014	14,527	14,417	40	Marcellus Shale
6	12/9/2014	14,377	14,267	40	Marcellus Shale
7	12/9/2014	14,227	14,117	40	Marcellus Shale
8	12/10/2014	14,077	13,967	40	Marcellus Shale
9	12/10/2014	13,927	13,817	40	Marcellus Shale
10	12/11/2014	13,777	13,667	40	Marcellus Shale
11	12/11/2014	13,627	13,517	40	Marcellus Shale
12	12/11/2014	13,477	13,367	40	Marcellus Shale
13	12/12/2014	13,327	13,217	40	Marcellus Shale
14	12/13/2014	13,177	13,067	40	Marcellus Shale
15	12/13/2014	13,027	12,917	40	Marcellus Shale
16	12/13/2014	12,877	12,767	40	Marcellus Shale
17	12/14/2014	12,727	12,617	40	Marcellus Shale
18	12/14/2014	12,577	12,463	40	Marcellus Shale
19	12/15/2014	12,427	12,317	40	Marcellus Shale
20	12/15/2014	12,277	12,167	40	Marcellus Shale
21	12/15/2014	12,127	12,017	40	Marcellus Shale
22	12/15/2014	11,975	11,867	40	Marcellus Shale
23	12/16/2014	11,827	11,717	40	Marcellus Shale
24	12/16/2014	11,677	11,567	40	Marcellus Shale
25	12/17/2014	11,527	11,417	40	Marcellus Shale
26	12/17/2014	11,374	11,267	40	Marcellus Shale
27	12/17/2014	11,227	11,117	40	Marcellus Shale
28	12/17/2014	11,077	10,967	40	Marcellus Shale
29	12/18/2014	10,927	10,817	40	Marcellus Shale
30	12/18/2014	10,777	10,667	40	Marcellus Shale
31	12/18/2014	10,621	10,520	40	Marcellus Shale
32	12/19/2014	10,477	10,367	40	Marcellus Shale
33	12/20/2014	10,327	10,217	40	Marcellus Shale
34	12/21/2014	10,177	10,067	40	Marcellus Shale
35	12/21/2014	10,027	9,916	40	Marcellus Shale
36	12/21/2014	9,877	9,766	40	Marcellus Shale
37	12/22/2014	9,727	9,616	40	Marcellus Shale
38	12/23/2014	9,577	9,466	40	Marcellus Shale
39	12/23/2014	9,427	9,316	40	Marcellus Shale
40	12/26/2014	9,277	9,166	40	Marcellus Shale
41	12/26/2014	9,127	9,016	40	Marcellus Shale
42	12/27/2014	8,977	8,866	40	Marcellus Shale
43	12/27/2014	8,827	8,716	40	Marcellus Shale
44	12/28/2014	8,677	8,566	40	Marcellus Shale

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Stimulation Record

Stage Number	Date	Average Treating Rate (BPM)	Average Testing Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Propant Amount	Total Clean Fluid (Bbls)
1	12/6/2014	59	8,954	7,851	6,153	403,700	8,810
2	12/6/2014	69	8,938	7,830	6,645	405,160	8,727
3	12/8/2014	75	8,833	7,750	6,847	385,580	8,547
4	12/7/2014	76	8,748	7,433	6,589	400,660	7,357
5	12/8/2014	73	9,068	8,315	6,819	398,860	8,388
6	12/9/2014	76	8,857	7,775	5,777	382,640	7,103
7	12/9/2014	76	8,613	6,973	6,125	403,820	7,806
8	12/10/2014	76	8,564	6,527	6,589	401,620	7,682
9	12/10/2014	74	8,760	7,032	6,589	397,900	7,647
10	12/11/2014	80	8,620	6,907	6,386	401,500	7,534
11	12/11/2014	75	8,663	7,647	6,327	407,360	7,479
12	12/11/2014	81	8,597	6,704	5,689	403,800	7,593
13	12/12/2014	54	9,014	6,879	6,877	322,460	11,427
14	12/13/2014	72	8,893	7,487	6,153	402,540	9,237
15	12/13/2014	79	8,618	7,220	6,356	404,160	7,793
16	12/13/2014	82	8,632	6,746	6,551	407,160	8,018
17	12/14/2014	73	8,817	7,984	6,184	377,260	8,613
18	12/14/2014	83	8,704	7,847	1	398,010	7,769
19	12/15/2014	82	8,558	6,995	5,651	401,160	7,706
20	12/15/2014	81	8,851	8,185	5,632	403,540	7,273
21	12/15/2014	86	8,655	8,692	5,873	400,140	7,115
22	12/15/2014	82	8,850	8,337	6,095	401,200	7,296
23	12/16/2014	80	8,659	633	6,213	399,020	7,147
24	12/16/2014	63	9,056	9,306	5,940	406,120	8,643
25	12/17/2014	84	8,904	8,255	5,737	400,640	7,117
26	12/17/2014	87	8,613	6,269	6,542	400,060	7,032
27	12/17/2014	90	8,533	7,389	6,352	400,060	7,914
28	12/17/2014	89	8,753	8,564	6,194	402,760	7,121
29	12/18/2014	79	8,931	8,844	5,876	398,020	6,993
30	12/18/2014	86	8,928	8,038	7,112	403,466	6,958
31	12/18/2014	72	9,096	7,830	6,645	405,160	7,596
32	12/19/2014	80	8,863	7,750	6,847	385,580	6,934
33	12/20/2014	87	8,841	8,381	6,384	395,660	6,846
34	12/21/2014	89	8,817	7,594	6,638	396,260	6,897
35	12/21/2014	87	9,034	7,635	5,592	399,140	6,912
36	12/21/2014	81	8,518	7,626	6,143	384,760	7,250
37	12/22/2014	89	8,952	9,094	5,908	371,160	7,172
38	12/23/2014	81	8,620	7,963	6,510	401,180	8,630
39	12/23/2014	73	8,616	7,969	6,860	316,140	6,908
40	12/26/2014	82	8,841	7,033	6,480	396,500	7,053
41	12/26/2014	82	8,809	8,479	6,893	395,480	7,137
42	12/27/2014	84	8,794	8,307	6,764	358,540	6,776
43	12/27/2014	84	8,555	7,526	6,067	403,420	7,546
44	12/28/2014	87	8,589	8,049	6,651	398,100	7,041

northeast
NATURAL ENERGY

May 28, 2015

WV Department of Environmental Protection
Office of Oil and Gas Management
601 57th Street, SE
Charleston, WV 25304-2345

RE: WR-35 Forms for:
API #'s 47-6101665, 47-6101666, 47-6101668, 47-6101669
Clay District, Monongalia County, West Virginia

To Whom It May Concern:

Please find enclosed Northeast Natural Energy LLC's updated Well Operator's Report of Well Work Forms (WR-35) for its' Beach 2H well (API # 47-6101665), Beach 4H well (API #47-6101666), Beach 6H well (API # 47-6101668), and Beach 10H well (API # 47-6101669).

Should you have any questions please feel free to contact me at 304-241-5752 ext. 7108 or by email at hmedley@nne-llc.com.

Sincerely,.

Hollie M. Medley
Regulatory Coordinator

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NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV
Field: Monongalia
Facility: Beach Pad

Slot: 02
Well: Beach 2H
Wellbore: Beach 2H PWB

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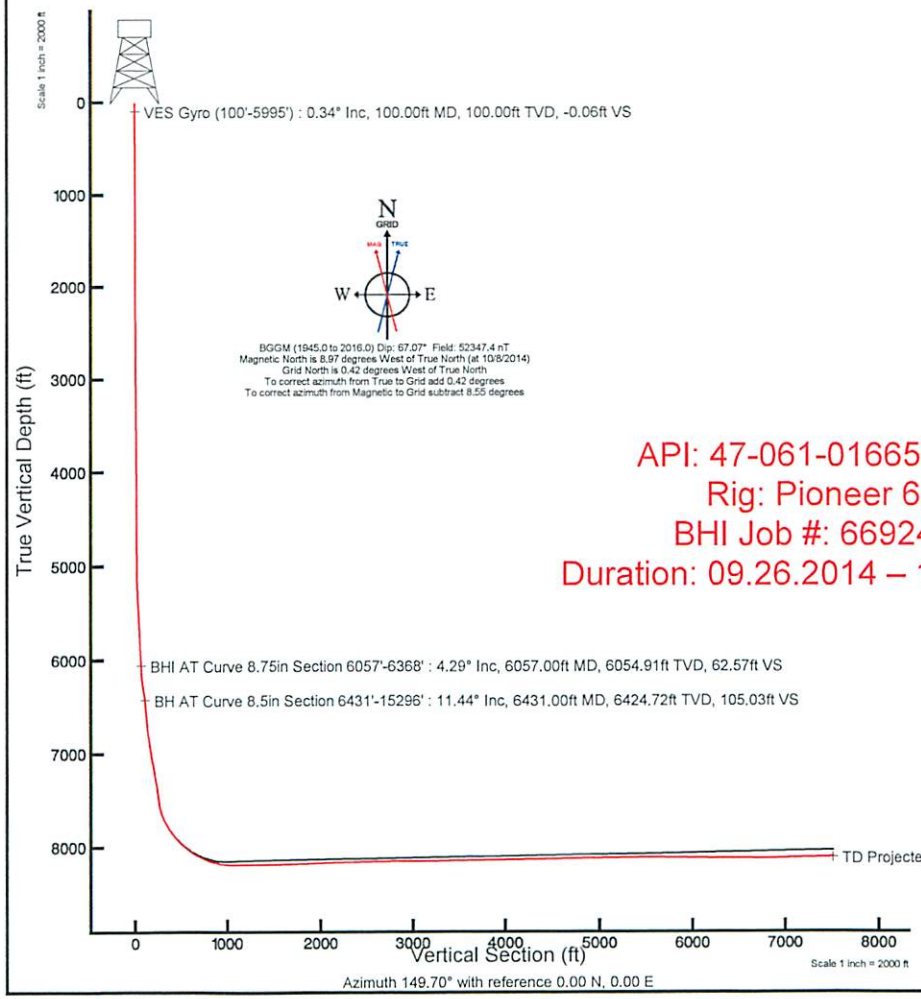
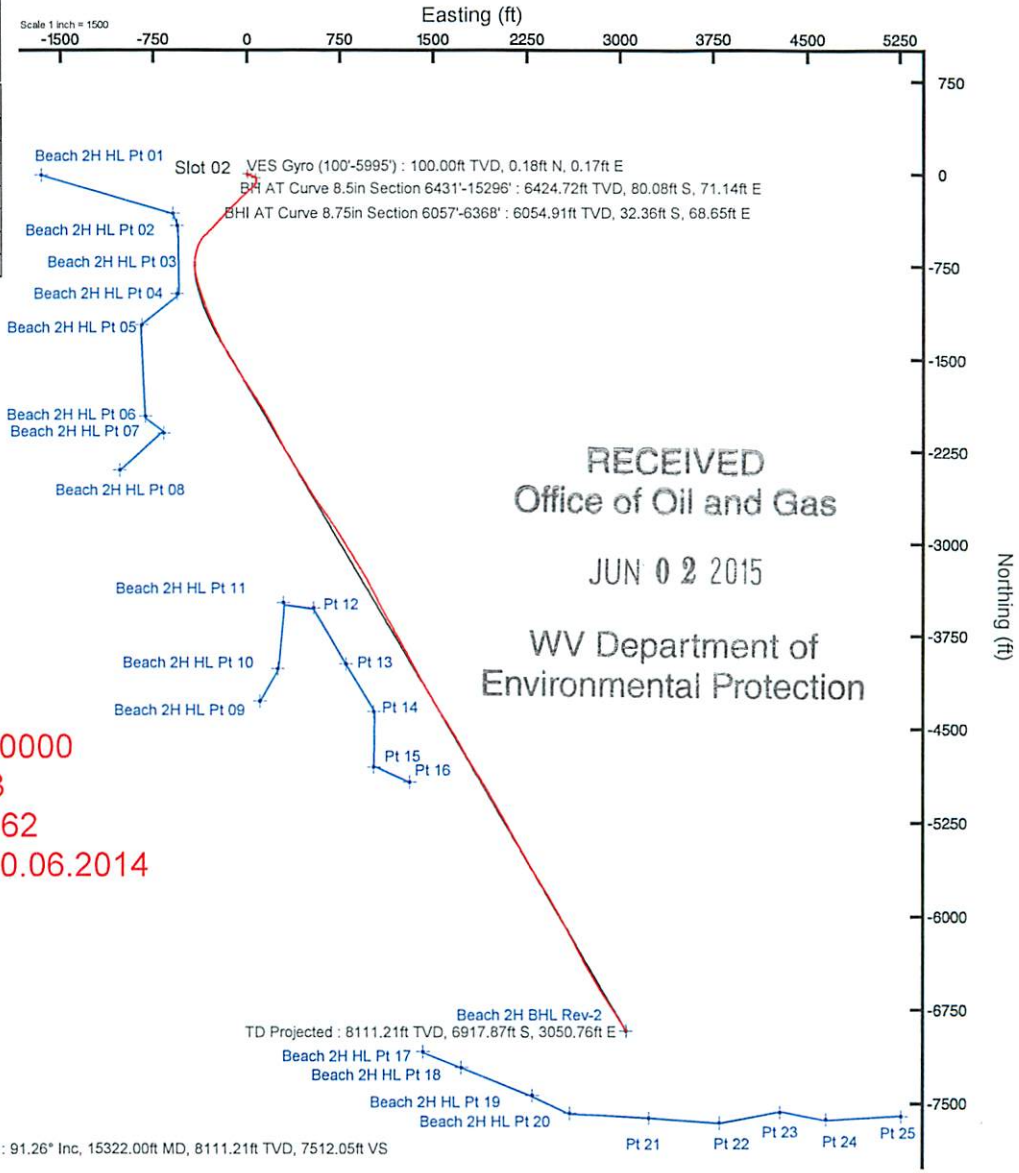
Plot reference wellpath is Beach 2H PWB Rev-B.0	
True vertical depths are referenced to Pioneer 63 (RKB)	Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Pioneer 63 (RKB)	North Reference: Grid north
Pioneer 63 (RKB) to Mean Sea Level: 1376.7 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: 02): -1358.7 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: gotfbral on 10/9/2014

Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Beach Pad			1784915.100	439301.800	39°42'15.411"N	80°09'09.060"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
02	0.00	0.00	1784915.100	439301.800	39°42'15.411"N	80°09'09.060"W
Pioneer 63 (RKB) to Mud line (At Slot: 02)					18ft	
Mean Sea Level to Mud line (At Slot: 02)					-1358.7ft	
Pioneer 63 (RKB) to Mean Sea Level					1376.7ft	





API: 47-061-01665-0000
Rig: Pioneer 63
BHI Job #: 6692462
Duration: 09.26.2014 – 10.06.2014

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 13-JUL-14	F.R. # 10011082407	SERV. SUPV. Scott J Carson
LEASE & WELL NAME BEACH #2H - API 47061016850000	LOCATION CLAY		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PRECISION # 1		TYPE OF JOB Surface

SIZE & TYPE OF PLUGS	LIST CSG HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
BJ Cement Plug, Rubber, Top 13-3/8	Float Collar, Auto Fill, 13-3/8 - 8rd	NONE			NONE		
	Guide Shoe, Cement Nose 13-3/8 I						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT3	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
H2O			8.34				180	
GEL/FLAKE			8.45				25	
H2O			8.34				10	
PREMIUM NE-1 W/2% CACL	N/A	1,004	15.2	1.27	5.77	04:14	227	137.87
H2O			8.34				198	
400 # SUGAR ON SIDE			0				0	
Available Mix Water 500 Bbl. Available Displ. Fluid 500 Bbl.						TOTAL	640	137.07

HOLE SIZE	% EXCESS	DEPTH	TBG CSG D.P. ID	OD	WGT	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
17.5	30	1345	12.62	13.38	54.5	CSG	1285	1285	J-55	1285	1242	1

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CNT RET BR PL LINER BRAND & TYPE	DEPTH	PERF DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT
23.	24	94.6	CSG	50	50	NO PACKER				13.375	8 RD	OTHER	0

DISPL VOLUME VOLUME	UOM	DISPL FLUID TYPE	WGT	CALC PSI BUMP PLUG	CALC MAX PSI TO REV	OP MAX SQ PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
192	BBLS	H2O	8.34	456	0	0	0	0	1284	900	TANK

Circulation Prior to Job

Circulated Well: Rig [ ] BJ [X] | Circulation Time: | Circulation Rate: BPM

Mud Density In: LBS/GAL Mud Density Out: LBS/GAL | PV & YP Mud In: | PV & YP Mud Out:

Gas Present: NO [X] YES [ ] Units: | Solids Present at End of Circulation: NO [X] YES [ ]

Displacement And Mud Removal

Displaced By: Rig [ ] BJ [ ] | Amount Bled Back After Job: BBLS

Returns During Job: [ ] NONE [ ] PARTIAL [ ] FULL | Method Used to Verify Returns:

Cement Returns at Surface: [ ] YES [X] NO | Were Returns Planned at Surface: [X] NO [ ] YES

Pipe Movement: [ ] ROTATION [ ] RECIPROCATION [ ] NONE [ ] UNABLE DUE TO STUCK PIPE

Centralizers: [X] NO [ ] YES | Quantity: | Type: [ ] BOW [ ] RIGID

Job Pumped Through: [ ] CHOKE MANIFOLD [ ] SQUEEZE MANIFOLD [ ] MANIFOLD [ ] NO MANIFOLD

Plugs

Number of Attempts by BJ: Competition: | Wiper Balls Used: [X] NO [ ] YES Quantity:

Plug Catcher Used: [X] NO [ ] YES | Parabow Used: [X] NO [ ] YES

Was There a Bottom: [X] NO [ ] YES | Top of Plug: FT Bottom of Plug: FT

Squeezes (Update Original Treatment Report for Primary Job)

BLOCK SQUEEZE [ ] SHOE SQUEEZE [ ] TOP OF LINER SQUEEZE [ ] PLANNED [ ] UNPLANNED [ ]

Liner Packer: [X] NO [ ] YES | Bond Log: [X] NO [ ] YES PSI Applied: Fluid Weight: LBS/GAL

Casing Test (Update Original Treatment Report for Primary Job)

Casing Test Pressure: PSI With LBS/GAL Mud | Time Held: Hours Minutes

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

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Shoe Test (Update Original Treatment Report for Primary Job)

Depth Drilled out of Shoe: FT	Target EMW: LBS/GAL Actual EMW: LBS/GAL
Number of Times Tests Conducted:	Mud Weight When Test was Conducted: LBS/GAL

Problems Before Job (I.E. Running Casing, Circulating Well, ETC)

Problems During Job (I.E. Lost Returns, Equipment Failure, Bulk Delivery, Foaming, ETC)

Problems After Job (I.E. Gas at Surface, Float Equipment Failed, ETC)

PRESSURE/RATE DETAIL

TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 3900 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
17:30						ARRIVE AT LOCATION 7-12-2014 LOCATION TIME 1800
19:30						PRE JOB RIG IN SAFETY MEETING
19:45						RIG IN
23:15						PRE JOB SAFETY MEETING
23:53	114		5	5	H2O	LINE FILL
23:56					H2O	PRESSURE TEST TO 3900 PSI
23:57	190		5.5	195	H2O	WATER AHEAD
00:23	134		5	25	GEL/FLAKE	GEL SPACER W/FLAKE
00:38	132		5.7	10	H2O	WATER SPACER
00:40	200		5	227	SLURRY	15.2# PREMIUM NE W/2% CALCIUM (1ST 30 BBL W/50# FLAKE)
01:25	0					SHUT DOWN / RELEASE PLUG
01:27	350		7.2	191	H2O	DISPLACEMENT
01:52	688					PLUG DOWN
01:56	0					RELEASE PRESS, CHECK FLOAT
02:00						POST JOB SAFETY MEETING
02:13						RIG OUT

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	Service Supervisor Signature:
[Y] N	466	[Y] N	60	653	0	Y [N]	

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 16-JUL-14	F.R.# 10011082856	SERV. SUPV. Scott J Carson
LEASE & WELL NAME BEACH 2H - API 47061016650000	LOCATION BLACKSVILLE		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PERFORMANCE DRILLING		TYPE OF JOB Intermediate

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
BJ Cement Plug, Rubber, Top 9-5/8 I	Guide Shoe, Cement Nose, 9-5/8 In	NONE			NONE		
	Float Collar, Al Flap, 9-5/8 - 8rd						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
		PHYSICAL SLURRY PROPERTIES						
H2O			8.34				315	
GEL W/ FLAKE			8.45				25	
H2O			8.34				10	
PREM NE 1 1.5% CACL	N/A	852	15.2	1.26	5.76	00:00	191	116.73
H2O			8.34				189	
400# SUGAR ON THE SIDE			0				0	
						TOTAL	730	116.73

Available Mix Water 500 Bbl. Available Displ. Fluid 500 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
12.25	30	2586	8.835	9.625	40	CSG	2547	2547	J-55	2547	2500	1

LAST CASING ID	OD	WGT.	TYPE	MD	TVD	PKR-OMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
13.	13.38	54.5	CSG	1279	1278	NO PACKER				9.625	8 RD	FRESH WATER	8.34
	12.25		OPEN HOLE	2586	2586								

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
189	BBLS	H2O	8.34	690	0	0	0	0	3160	1500	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 2950 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
22:12						ARRIVED ON LOC. ON 7/15/2014
02:00						PRE RIG IN SAFETY MEETING
02:30						SPOT EQUIP.
02:50						RIG IN
04:20						PRE JOB SAFETY MEETING
04:40				5	H2O	LINE FILL
04:42	0		.5	.25	H2O	PRESS. TEST TO 2950 PSI
04:45	270		7.3	200	H2O	PUMP H2O
05:10	170		5.7	25	6% GEL	6% GEL W/FLAKE
05:13	165		5.7	10	H2O	H2O SPACER
05:15	285		5.3	191	CEMENT	CEMENT SLURRY 15.2# 1.26 5.76
05:56						SHUT DOWN / DROP PLUG
05:57	925		6.7	189	H2O	DISPLACEMENT
06:25	1450					LAND PLUG AND HOLD 500 PSI OVER W.P.
06:30	0					RELEASE PRESSURE / CHECK FLOAT
06:34						POST JOB SAFETY MEETING

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CEMENT JOB REPORT

BAKER HUGHES

PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI		RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X]
	PIPE	ANNULUS				TEST LINES 2050 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
06:48						RIG OUT

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE:
[Y] N	960	[Y] N	28	616	0	Y [N]	

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER	DATE	F.R. #	SERV. SUPV.
NORTHEAST NATURAL ENER	08-OCT-14	10011106493	Brian Lough

LEASE & WELL NAME	LOCATION	COUNTY-PARISH-BLOCK
BEACH 2H - API 47081016850000	MONONGALIA	Monongalia West Virginia
DISTRICT	**DRILLING CONTRACTOR RIG #**	**TYPE OF JOB**
Clarksburg	PERFORMANCE 1	Long String

SIZE & TYPE OF PLUGS	LIST CSG HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
5-1/2" Top Cem Plug, Nitri cvr, Phen	Guide Shoe, Cement Nose, 5-1/2 I						
	Float Collar, Al Flap, 5-1/2 - 8rd						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
H2O			8.34				5	
ULTRA FLUSH HV			13				100	
50/50 POZ-PREM NE-1+.25%R-3+.3%MPA-170		2,926	14.5	1.17	5.14	05:54	575	337.70
SUGAR WATER			8.34				10	
H2O			8.34				338	
						TOTAL	1028	337.70

Available Mix Water 750 Bbl. Available Displ. Fluid 750 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
8.5	10	15322	4.778	5.5	20	CSG	15276		J-55	15276	15219	

LAST CASING ID	OD	WGT.	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
8.9	9.625	36	CSG	2551	2551					5.5	BUTT	SYNTHETIC MUD	12.5

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
338	BBLS	H2O	8.34	2600	0	0	0	0	7352	5500	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 6500 PSI
						CIRCULATING WELL. - RIG [X] BJ [X]
17:00						ARRIVE ON LOCATION. JOB TIME 1730
19:00						SAFETY MEETING WITH BHI CREW
19:30						SPOT EQUIPMENT AND RIG IN
23:30						SAFETY MEETING WITH RIG CREW AND CO.MAN
00:24	550		5	5	H2O	LINE FILL
00:26	0		.2	.2	H2O	PRESSURE TEST TO 6950 PSI
00:31	575		4	100	FLUSH	ULTRA FLUSH HV
01:13	1000		5.7	575	CEMENT	2926 SACKS-50/50 POZ-PREM NE-1+.25%R-3+.3%MPA-170,44 LBS PER SACK- 68 TEMP f
02:53	250		8	10	H2O	SHUT DOWN / WASH LINES / DROP PLUG
02:55	975		5	10	RETARDE	SUGAR WATER
03:00	4200		6	385	H2O	FRESH WATER DISPLACEMENT
04:00	4650		.2		H2O	LAND PLUG.
04:05	0					RELEASE PRESSURE / CHECK FLOATS
04:06						END JOB / SAFETY MEETING WITH BHI CREW

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE:
[Y] N	3500	[Y] N	0	1040	0	Y [N]	

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Actual Wellpath Report

Beach 2H AWP Proj: 15322'

BAKER HUGHES

REFERENCE WELLPATH IDENTIFICATION			
Operator	NORTHEAST NATURAL ENERGY, LLC	Slot	02
Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet	Software System	WellArchitect® 4.0.1
North Reference	Grid	User	Gotfbral
Scale	0.999942	Report Generated	10/9/2014 at 2:52:07 PM
Convergence at slot	0.42° West	Database/Source file	WANorthEast/Beach_2H_AWB.xml

WELLPATH LOCATION	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	1784915.10	439301.80	39°42'15.411"N	80°09'09.060"W
Facility Reference Pt			1784915.10	439301.80	39°42'15.411"N	80°09'09.060"W
Field Reference Pt			1777685.71	440640.65	39°42'28.114"N	80°10'41.690"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Pioneer 63 (RKB) to GL	18.00ft
Horizontal Reference Pt	Slot	Pioneer 63 (RKB) to Mean Sea Level	1376.70ft
Vertical Reference Pt	Pioneer 63 (RKB)	Pioneer 63 (RKB) to Mud Line at Slot (02)	18.00ft
MD Reference Pt	Pioneer 63 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	149.70°

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Facility	Beach Pad		

WELLPATH DATA (211 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
0.00†	0.000	44.520	0.00	0.00	0.00	0.00	1784915.10	439301.80	39°42'15.411"N	80°09'09.060"W	0.00	0.000	0.00
18.00	0.000	44.520	18.00	0.00	0.00	0.00	1784915.10	439301.80	39°42'15.411"N	80°09'09.060"W	0.00	0.000	0.00
118.00	0.420	44.520	118.00	-0.10	0.26	0.25	1784915.36	439302.06	39°42'15.414"N	80°09'09.057"W	0.37	44.520	0.42
218.00	0.220	59.510	218.00	-0.19	0.62	0.68	1784915.78	439302.42	39°42'15.417"N	80°09'09.052"W	0.92	47.615	0.22
318.00	0.230	69.240	318.00	-0.17	0.84	1.01	1784916.16	439302.64	39°42'15.419"N	80°09'09.046"W	1.39	52.855	0.12
418.00	0.160	101.480	418.00	-0.04	0.93	1.50	1784916.60	439302.73	39°42'15.420"N	80°09'09.041"W	1.77	58.256	0.22
518.00	0.120	112.050	518.00	0.13	0.86	1.74	1784916.84	439302.66	39°42'15.420"N	80°09'09.038"W	1.94	63.580	0.05
618.00	0.180	67.470	617.99	0.24	0.88	1.98	1784917.08	439302.68	39°42'15.420"N	80°09'09.035"W	2.17	65.932	0.13
718.00	0.120	78.800	717.99	0.29	0.97	2.23	1784917.33	439302.77	39°42'15.421"N	80°09'09.032"W	2.43	66.582	0.07
818.00	0.180	92.000	817.99	0.41	0.98	2.48	1784917.59	439302.78	39°42'15.421"N	80°09'09.029"W	2.67	68.502	0.07
918.00	0.110	152.630	917.99	0.59	0.89	2.69	1784917.79	439302.69	39°42'15.420"N	80°09'09.026"W	2.83	71.702	0.16
1018.00	0.180	107.910	1017.99	0.80	0.76	2.88	1784917.98	439302.56	39°42'15.419"N	80°09'09.024"W	2.98	75.310	0.13
1118.00	0.100	112.650	1117.99	0.99	0.67	3.11	1784918.21	439302.47	39°42'15.418"N	80°09'09.021"W	3.19	77.785	0.08
1218.00	0.120	214.730	1217.99	1.10	0.55	3.13	1784918.23	439302.35	39°42'15.417"N	80°09'09.020"W	3.18	79.971	0.17
1318.00	0.210	203.720	1317.99	1.26	0.30	3.00	1784918.10	439302.10	39°42'15.414"N	80°09'09.022"W	3.02	84.338	0.10
1418.00	0.130	213.830	1417.99	1.42	0.04	2.87	1784917.97	439301.84	39°42'15.412"N	80°09'09.024"W	2.87	89.285	0.09
1518.00	0.100	219.710	1517.99	1.50	-0.13	2.75	1784917.85	439301.67	39°42'15.410"N	80°09'09.025"W	2.75	92.613	0.03
1618.00	0.260	208.870	1617.99	1.64	-0.39	2.59	1784917.69	439301.41	39°42'15.407"N	80°09'09.027"W	2.61	98.608	0.16
1718.00	0.150	116.530	1717.99	1.87	-0.65	2.59	1784917.69	439301.15	39°42'15.405"N	80°09'09.027"W	2.67	104.043	0.31
1818.00	0.120	85.830	1817.99	2.05	-0.80	2.70	1784917.80	439301.00	39°42'15.403"N	80°09'09.026"W	2.82	106.552	0.05
1918.00	0.130	190.200	1917.99	2.22	-1.01	2.67	1784917.77	439300.79	39°42'15.401"N	80°09'09.026"W	2.85	110.711	0.02
2018.00	0.270	235.770	2017.99	2.32	-1.25	2.46	1784917.56	439300.55	39°42'15.399"N	80°09'09.029"W	2.76	117.051	0.20
2118.00	0.440	233.630	2117.99	2.38	-1.61	1.95	1784917.05	439300.19	39°42'15.395"N	80°09'09.035"W	2.53	129.594	0.17
2218.00	0.630	215.230	2217.98	2.65	-2.29	1.33	1784916.43	439299.51	39°42'15.389"N	80°09'09.043"W	2.65	149.952	0.25
2318.00	0.590	212.520	2317.98	3.14	-3.19	0.78	1784915.88	439298.63	39°42'15.380"N	80°09'09.050"W	3.26	167.027	0.05
2418.00	0.520	203.840	2417.97	3.61	-4.02	0.27	1784915.37	439297.78	39°42'15.371"N	80°09'09.057"W	4.03	176.146	0.11
2518.00	0.550	206.390	2517.97	4.14	-4.87	-0.13	1784914.97	439296.93	39°42'15.363"N	80°09'09.062"W	4.87	181.479	0.04
2618.00	0.680	211.550	2617.96	4.68	-5.80	-0.65	1784914.45	439296.00	39°42'15.354"N	80°09'09.068"W	5.84	186.386	0.14
2718.00	0.740	214.720	2717.96	5.24	-6.84	-1.33	1784913.77	439294.96	39°42'15.343"N	80°09'09.077"W	6.97	190.985	0.07
2818.00	0.490	220.940	2817.95	5.71	-7.74	-1.92	1784913.18	439294.06	39°42'15.335"N	80°09'09.084"W	8.07	193.906	0.25

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Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

WELLPATH DATA (211 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
2918.00	0.590	229.750	2917.95	6.01	-8.44	-2.53	1784912.57	439293.36	39°42'15.328"N	80°09'09.092"W	8.81	196.681	0.20
3018.00	0.610	213.920	3017.94	6.33	-9.21	-3.22	1784911.88	439292.59	39°42'15.320"N	80°09'09.101"W	9.76	199.258	0.17
3118.00	0.660	191.500	3117.93	6.99	-10.22	-3.63	1784911.47	439291.58	39°42'15.310"N	80°09'09.106"W	10.84	199.559	0.25
3218.00	0.540	166.940	3217.93	7.87	-11.24	-3.64	1784911.46	439290.56	39°42'15.300"N	80°09'09.106"W	11.82	197.535	0.28
3318.00	0.210	149.410	3317.93	8.50	-11.86	-3.44	1784911.66	439289.94	39°42'15.294"N	80°09'09.103"W	12.35	196.172	0.35
3418.00	0.530	167.810	3417.92	9.13	-12.47	-3.25	1784911.85	439289.33	39°42'15.288"N	80°09'09.101"W	12.88	194.601	0.34
3518.00	0.330	175.870	3517.92	9.82	-13.21	-3.13	1784911.97	439288.59	39°42'15.280"N	80°09'09.099"W	13.57	193.330	0.21
3618.00	0.530	146.140	3617.92	10.54	-13.88	-2.85	1784912.25	439287.92	39°42'15.274"N	80°09'09.096"W	14.17	191.609	0.29
3718.00	0.350	143.040	3717.92	11.31	-14.51	-2.41	1784912.69	439287.29	39°42'15.268"N	80°09'09.090"W	14.71	189.431	0.18
3818.00	0.570	138.220	3817.91	12.10	-15.12	-1.89	1784913.21	439286.68	39°42'15.262"N	80°09'09.083"W	15.24	187.139	0.22
3918.00	0.300	174.320	3917.91	12.83	-15.75	-1.54	1784913.56	439286.05	39°42'15.255"N	80°09'09.079"W	15.83	185.569	0.37
4018.00	0.360	159.440	4017.91	13.37	-16.25	-1.31	1784913.79	439285.55	39°42'15.250"N	80°09'09.076"W	16.30	184.594	0.21
4118.00	0.370	119.550	4117.91	13.96	-16.65	-0.82	1784914.28	439285.15	39°42'15.247"N	80°09'09.069"W	16.67	182.822	0.13
4218.00	0.490	100.720	4217.90	14.52	-16.89	-0.12	1784914.98	439284.91	39°42'15.244"N	80°09'09.060"W	16.89	180.406	0.18
4318.00	0.550	87.240	4317.90	15.02	-16.94	0.78	1784915.88	439284.86	39°42'15.244"N	80°09'09.049"W	16.96	177.365	0.14
4418.00	0.510	74.050	4417.89	15.56	-16.80	1.69	1784916.79	439285.00	39°42'15.245"N	80°09'09.037"W	16.88	174.265	0.13
4518.00	0.720	79.190	4517.89	15.68	-16.56	2.73	1784917.83	439285.24	39°42'15.248"N	80°09'09.024"W	16.78	170.630	0.22
4618.00	0.690	76.740	4617.88	16.06	-16.30	3.94	1784919.04	439285.50	39°42'15.250"N	80°09'09.009"W	16.77	166.428	0.04
4718.00	0.730	71.800	4717.87	16.37	-15.97	5.13	1784920.23	439285.84	39°42'15.254"N	80°09'08.993"W	16.77	162.197	0.07
4818.00	0.510	64.590	4817.87	16.54	-15.58	6.03	1784921.23	439286.22	39°42'15.258"N	80°09'08.981"W	16.74	158.505	0.23
4918.00	1.020	74.990	4917.86	16.82	-15.16	7.40	1784922.50	439286.65	39°42'15.262"N	80°09'08.964"W	16.86	153.986	0.53
5018.00	1.580	81.820	5017.83	17.57	-14.73	9.62	1784924.72	439287.07	39°42'15.265"N	80°09'08.936"W	17.59	146.848	0.58
5118.00	2.430	85.540	5117.77	19.01	-14.37	13.10	1784928.20	439287.43	39°42'15.270"N	80°09'08.892"W	19.44	137.645	0.86
5218.00	3.440	99.430	5217.64	21.86	-14.70	18.17	1784933.27	439287.10	39°42'15.267"N	80°09'08.827"W	23.37	128.965	1.23
5318.00	3.320	103.010	5317.45	24.76	-15.84	23.55	1784938.65	439285.96	39°42'15.256"N	80°09'08.755"W	28.37	123.482	0.24
5418.00	4.160	104.950	5417.25	30.53	-17.43	30.28	1784945.38	439284.37	39°42'15.241"N	80°09'08.671"W	34.94	119.928	0.85
5518.00	3.830	113.220	5517.01	35.59	-19.68	36.85	1784951.95	439282.12	39°42'15.219"N	80°09'08.587"W	41.78	118.107	0.66
5618.00	3.380	112.260	5616.81	40.61	-22.12	42.65	1784957.75	439279.68	39°42'15.196"N	80°09'08.513"W	48.04	117.410	0.45
5718.00	3.210	113.170	5716.65	45.20	-24.33	47.95	1784963.05	439277.47	39°42'15.174"N	80°09'08.445"W	53.77	116.907	0.18
5818.00	3.590	115.140	5816.47	50.03	-26.77	53.36	1784968.46	439275.04	39°42'15.150"N	80°09'08.375"W	59.70	116.639	0.40

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WELLPATH DATA (211 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
5918.00	3.890	110.220	5916.26	55.23	-29.27	59.38	1784974.47	439272.53	39°42'15.126"N	80°09'08.298"W	66.20	116.240	0.44
5013.00	4.050	106.680	6011.03	60.17	-31.35	65.61	1784980.71	439270.46	39°42'15.106"N	80°09'08.218"W	72.72	115.535	0.31
6057.00	4.290	110.170	6054.91	62.57	-32.36	68.65	1784983.74	439269.44	39°42'15.096"N	80°09'08.179"W	75.89	115.238	0.79
6121.00	3.790	108.460	6118.75	66.01	-33.85	72.90	1784988.00	439267.95	39°42'15.082"N	80°09'08.125"W	80.38	114.910	0.80
6184.00	5.750	165.040	6181.57	70.55	-37.68	75.75	1784990.85	439264.12	39°42'15.044"N	80°09'08.085"W	84.07	114.630	3.75
6246.00	10.050	181.080	6242.97	77.90	-46.21	75.32	1784990.42	439255.59	39°42'14.960"N	80°09'08.092"W	88.37	121.530	6.99
6307.00	11.080	178.430	6302.93	87.58	-57.39	75.38	1784990.48	439244.41	39°42'14.849"N	80°09'08.091"W	94.74	127.284	1.87
6368.00	10.520	188.610	6362.86	97.06	-68.76	74.71	1784989.80	439233.05	39°42'14.737"N	80°09'08.098"W	101.53	132.625	3.25
6431.00	11.440	205.700	6424.72	105.03	-80.08	71.14	1784986.23	439221.73	39°42'14.625"N	80°09'08.143"W	107.11	138.384	5.35
6495.00	13.690	221.050	6487.20	113.00	-91.55	63.41	1784978.50	439210.29	39°42'14.511"N	80°09'08.231"W	111.93	145.283	6.26
6558.00	17.480	225.290	6547.88	115.74	-103.80	51.78	1784966.88	439198.01	39°42'14.389"N	80°09'08.388"W	116.00	153.486	6.28
6623.00	21.850	227.490	6609.07	120.73	-118.84	35.92	1784951.02	439182.96	39°42'14.239"N	80°09'08.590"W	124.15	163.183	6.82
6685.00	26.110	228.180	6665.71	125.90	-135.75	17.24	1784932.34	439166.06	39°42'14.071"N	80°09'08.827"W	136.84	172.762	6.89
6748.00	30.690	228.080	6721.11	131.91	-155.74	-5.07	1784910.03	439146.07	39°42'13.872"N	80°09'09.111"W	155.82	181.863	7.27
6811.00	31.590	227.360	6775.03	138.58	-177.66	-29.17	1784885.93	439124.15	39°42'13.653"N	80°09'09.447"W	180.04	189.324	1.65
6875.00	31.690	225.540	6829.52	146.37	-200.79	-53.50	1784861.60	439101.02	39°42'13.423"N	80°09'09.726"W	207.80	194.919	1.50
6938.00	31.670	224.510	6883.13	154.75	-224.17	-76.90	1784838.20	439077.64	39°42'13.190"N	80°09'10.024"W	237.00	198.935	0.86
7001.00	31.710	225.570	6936.74	163.13	-247.56	-100.32	1784814.79	439054.26	39°42'12.957"N	80°09'10.321"W	267.11	202.050	0.89
7063.00	31.600	224.860	6989.52	171.27	-270.48	-123.41	1784791.69	439031.34	39°42'12.729"N	80°09'10.614"W	297.31	204.526	0.65
7126.00	31.700	225.570	7043.35	180.09	-294.17	-146.27	1784768.84	439007.65	39°42'12.493"N	80°09'10.907"W	328.62	206.453	0.95
7189.00	31.700	222.810	7096.75	189.50	-318.31	-169.12	1784745.99	438983.51	39°42'12.253"N	80°09'11.195"W	360.45	207.983	0.63
7252.00	31.800	222.250	7150.32	199.29	-342.74	-191.53	1784723.58	438959.08	39°42'12.010"N	80°09'11.479"W	392.62	209.198	0.49
7315.00	30.420	221.750	7204.26	209.18	-366.92	-213.32	1784701.80	438934.90	39°42'11.770"N	80°09'11.756"W	424.43	210.172	2.23
7379.00	30.480	221.560	7259.43	219.22	-391.15	-234.88	1784680.24	438910.67	39°42'11.529"N	80°09'12.029"W	456.26	210.983	0.18
7442.00	28.950	220.770	7314.03	229.12	-414.67	-255.45	1784659.67	438887.15	39°42'11.295"N	80°09'12.290"W	487.04	211.634	2.45
7505.00	29.040	223.380	7369.23	238.40	-437.35	-275.92	1784639.20	438864.47	39°42'11.069"N	80°09'12.550"W	517.11	212.247	2.01
7568.00	29.020	224.980	7424.32	246.58	-459.27	-297.22	1784617.89	438842.55	39°42'10.851"N	80°09'12.820"W	547.06	212.909	1.23
7632.00	28.930	224.770	7480.30	254.51	-481.24	-319.10	1784596.02	438820.58	39°42'10.632"N	80°09'13.098"W	577.43	213.547	0.21
7695.00	29.000	225.060	7535.42	262.30	-502.85	-340.64	1784574.48	438798.98	39°42'10.417"N	80°09'13.372"W	607.37	214.114	0.25
7759.00	30.010	216.090	7591.43	272.98	-526.95	-360.86	1784554.26	438774.87	39°42'10.177"N	80°09'13.628"W	638.68	214.605	1.87

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Actual Wellpath Report

Beach 2H AWP Proj: 15522'

BAKER HUGHES

REFERENCE WELLPATH IDENTIFICATION			
Operator	NORTHEAST NATURAL ENERGY, LLC	Slot	02
Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

WELLPATH DATA (211 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
7820.00	32.090	205.250	7643.39	288.22	-554.03	-376.83	1784538.29	438747.80	39°42'09.909"N	80°09'13.830"W	670.04	214.222	8.15
7883.00	34.770	199.900	7695.98	308.96	-585.94	-390.36	1784524.77	438715.89	39°42'09.592"N	80°09'14.000"W	704.07	213.672	6.99
7946.00	38.000	194.660	7746.70	334.19	-621.62	-401.39	1784513.74	438680.22	39°42'09.239"N	80°09'14.138"W	739.94	212.851	7.11
8009.00	41.550	190.290	7795.12	363.79	-660.96	-410.03	1784505.09	438640.88	39°42'08.850"N	80°09'14.245"W	777.81	211.814	7.17
8072.00	43.590	185.130	7841.57	397.27	-703.26	-416.00	1784499.02	438598.56	39°42'08.431"N	80°09'14.319"W	817.05	210.610	5.82
8136.00	42.770	177.970	7887.93	434.33	-747.13	-417.71	1784497.42	438554.71	39°42'07.998"N	80°09'14.335"W	855.97	209.209	8.96
8199.00	46.580	170.810	7932.75	474.55	-791.14	-413.29	1784501.84	438510.71	39°42'07.563"N	80°09'14.274"W	892.58	207.583	10.01
8262.00	50.240	166.580	7974.57	519.09	-837.30	-404.01	1784511.11	438464.55	39°42'07.107"N	80°09'14.151"W	929.68	205.758	7.68
8325.00	52.380	163.940	8013.95	566.46	-884.85	-391.48	1784523.64	438417.01	39°42'05.638"N	80°09'13.987"W	967.58	203.866	4.72
8387.00	57.050	162.830	8049.76	615.62	-933.32	-377.00	1784538.12	438368.53	39°42'06.180"N	80°09'13.797"W	1006.59	201.996	7.57
8451.00	61.900	161.480	8082.26	669.44	-985.78	-360.10	1784555.02	438316.08	39°42'05.643"N	80°09'13.576"W	1049.49	200.067	7.79
8514.00	65.280	160.570	8110.27	724.76	-1039.13	-341.75	1784573.37	438262.74	39°42'05.117"N	80°09'13.336"W	1095.88	198.205	5.52
8577.00	67.700	159.050	8135.40	781.62	-1093.34	-321.81	1784593.31	438208.53	39°42'04.583"N	80°09'13.076"W	1139.72	196.401	4.43
8640.00	72.650	157.600	8156.77	840.20	-1148.39	-299.91	1784615.20	438153.48	39°42'04.041"N	80°09'12.791"W	1186.91	194.636	8.15
8704.00	77.080	156.610	8173.47	900.45	-1205.29	-275.88	1784639.24	438096.58	39°42'03.480"N	80°09'12.478"W	1236.46	192.892	7.08
8767.00	80.730	155.450	8185.59	962.89	-1261.77	-250.77	1784664.35	438040.11	39°42'02.924"N	80°09'12.151"W	1286.44	191.241	5.87
8830.00	85.750	154.090	8193.01	1025.18	-1318.34	-224.10	1784691.01	437983.54	39°42'02.366"N	80°09'11.805"W	1337.25	189.647	8.25
8893.00	91.230	152.310	8194.67	1088.02	-1374.53	-195.72	1784719.39	437927.35	39°42'01.813"N	80°09'11.437"W	1388.39	188.104	9.15
8956.00	91.200	151.050	8193.33	1150.96	-1429.97	-165.83	1784749.28	437871.92	39°42'01.267"N	80°09'11.049"W	1439.55	186.615	2.00
9020.00	89.970	149.060	8192.68	1215.95	-1485.31	-133.88	1784781.22	437816.58	39°42'00.722"N	80°09'10.635"W	1492.43	185.150	3.13
9083.00	89.970	148.460	8192.71	1277.95	-1539.28	-101.20	1784813.90	437762.61	39°42'00.192"N	80°09'10.212"W	1542.60	183.762	0.95
9146.00	89.880	148.780	8192.79	1340.93	-1593.06	-68.40	1784846.70	437708.83	39°41'59.663"N	80°09'09.787"W	1594.53	182.459	0.53
9209.00	89.880	147.860	8192.93	1403.92	-1646.68	-35.31	1784879.79	437655.22	39°41'59.135"N	80°09'09.359"W	1647.05	181.229	1.46
9272.00	89.880	146.570	8193.06	1466.85	-1699.64	-1.20	1784913.90	437602.26	39°41'58.614"N	80°09'08.918"W	1699.64	180.040	2.05
9335.00	90.400	147.140	8192.99	1529.78	-1752.39	33.24	1784948.34	437549.52	39°41'58.095"N	80°09'08.472"W	1752.70	178.816	1.22
9399.00	91.970	147.380	8191.58	1593.70	-1806.21	67.85	1784982.94	437495.70	39°41'57.566"N	80°09'08.025"W	1807.48	177.849	2.48
9462.00	92.000	147.490	8189.40	1656.62	-1859.27	101.74	1785016.83	437442.64	39°41'57.044"N	80°09'07.586"W	1862.05	176.868	0.18
9525.00	92.120	148.090	8187.13	1719.54	-1912.54	135.30	1785050.39	437389.38	39°41'56.520"N	80°09'07.152"W	1917.32	175.954	0.97
9589.00	92.030	152.090	8184.81	1783.48	-1967.97	167.18	1785082.27	437333.95	39°41'55.975"N	80°09'06.739"W	1975.06	175.144	6.25
9651.00	92.000	153.710	8182.63	1845.10	-2022.63	196.37	1785111.46	437279.30	39°41'55.436"N	80°09'06.360"W	2032.14	174.455	0.61

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Actual Wellpath Report

Beach 2H AWP Proj: 15322'

BAKER HUGHES

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Operator	NORTHEAST NATURAL ENERGY, LLC	Slot	02
Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

WELLPATH DATA (211 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
9715.00	92.430	152.740	8180.16	1909.29	-2079.21	226.17	1785141.26	437222.72	39°41'54.879"N	80°09'05.974"W	2091.47	173.792	1.74
9778.00	92.180	153.950	8177.63	1972.11	-2135.47	254.41	1785169.49	437165.46	39°41'54.325"N	80°09'05.607"W	2150.57	173.206	1.96
9841.00	91.410	152.010	8175.65	2034.97	-2191.56	283.01	1785198.10	437110.37	39°41'53.773"N	80°09'05.236"W	2209.76	172.642	3.31
9903.00	92.000	150.950	8173.81	2096.91	-2246.01	312.61	1785227.69	437055.93	39°41'53.237"N	80°09'04.852"W	2267.65	172.076	1.98
9966.00	92.030	148.930	8171.71	2159.87	-2300.69	343.03	1785258.97	437000.25	39°41'52.699"N	80°09'04.448"W	2326.24	171.500	3.08
10029.00	91.450	146.950	8169.92	2222.82	-2354.26	376.93	1785292.00	436947.69	39°41'52.172"N	80°09'04.020"W	2384.24	170.904	4.29
10092.00	92.030	147.130	8168.01	2285.73	-2407.09	411.18	1785326.25	436894.85	39°41'51.652"N	80°09'03.576"W	2441.96	170.306	0.96
10152.00	92.060	148.380	8165.87	2345.65	-2457.80	443.18	1785358.25	436844.14	39°41'51.153"N	80°09'03.162"W	2497.44	169.779	2.08
10218.00	92.000	148.870	8163.53	2411.60	-2514.12	477.52	1785392.59	436787.83	39°41'50.599"N	80°09'02.718"W	2559.06	169.246	0.75
10284.00	92.060	149.700	8161.30	2477.56	-2568.25	509.67	1785424.74	436733.71	39°41'50.067"N	80°09'02.302"W	2618.83	168.775	1.27
10344.00	91.510	145.550	8159.34	2537.50	-2621.80	542.78	1785457.85	436680.16	39°41'49.540"N	80°09'01.873"W	2677.40	168.303	4.61
10408.00	90.550	144.050	8158.18	2601.31	-2674.50	579.07	1785494.13	436627.46	39°41'49.022"N	80°09'01.404"W	2736.47	167.783	4.62
10470.00	91.050	144.600	8157.32	2663.03	-2724.86	615.22	1785530.29	436577.11	39°41'48.527"N	80°09'00.937"W	2793.45	167.277	1.20
10533.00	91.110	146.040	8156.13	2725.53	-2776.65	651.06	1785566.12	436525.31	39°41'48.017"N	80°09'00.473"W	2851.96	166.804	2.29
10596.00	90.530	146.270	8155.20	2788.70	-2828.97	686.35	1785601.20	436473.00	39°41'47.503"N	80°09'00.020"W	2910.99	166.367	0.92
10659.00	90.120	146.880	8154.82	2851.61	-2881.55	720.85	1785635.91	436420.42	39°41'46.986"N	80°08'59.571"W	2970.35	165.955	1.21
10722.00	90.830	149.010	8154.30	2914.57	-2934.94	754.28	1785669.34	436367.04	39°41'46.460"N	80°08'59.138"W	3030.32	165.587	3.56
10785.00	90.740	148.130	8153.43	2977.55	-2988.69	787.13	1785702.18	436313.29	39°41'45.932"N	80°08'58.713"W	3090.61	165.245	1.40
10849.00	90.120	147.980	8152.95	3041.52	-3043.00	820.59	1785736.04	436258.98	39°41'45.397"N	80°08'58.275"W	3151.80	164.901	1.00
10912.00	89.258	148.210	8153.30	3104.51	-3095.77	853.53	1785768.98	436206.21	39°41'44.878"N	80°08'57.854"W	3212.38	164.585	0.86
10974.00	90.180	149.500	8153.63	3166.50	-3149.83	885.88	1785800.92	436152.16	39°41'44.345"N	80°08'57.435"W	3272.04	164.292	1.96
11037.00	90.490	147.780	8153.26	3229.49	-3203.63	918.66	1785833.70	436098.37	39°41'43.817"N	80°08'57.011"W	3332.74	163.999	2.77
11100.00	91.910	150.490	8151.94	3292.46	-3257.68	950.97	1785866.01	436044.31	39°41'43.285"N	80°08'56.592"W	3393.65	163.727	4.86
11163.00	91.690	153.020	8149.96	3355.38	-3313.15	980.77	1785895.81	435988.85	39°41'42.739"N	80°08'56.206"W	3455.27	163.510	4.03
11226.00	91.050	152.720	8148.45	3418.27	-3369.20	1009.49	1785924.53	435932.80	39°41'42.187"N	80°08'55.836"W	3517.19	163.321	1.12
11290.00	91.020	152.860	8147.30	3482.17	-3426.11	1038.75	1785953.78	435875.89	39°41'41.627"N	80°08'55.454"W	3580.12	163.133	0.22
11353.00	90.950	153.020	8146.22	3545.06	-3482.21	1067.40	1785982.44	435819.80	39°41'41.074"N	80°08'55.082"W	3642.13	162.958	0.28
11415.00	90.800	151.980	8145.27	3606.97	-3537.19	1096.03	1786011.06	435764.82	39°41'40.533"N	80°08'54.711"W	3703.11	162.784	1.69
11478.00	91.050	151.220	8144.25	3669.93	-3592.60	1125.99	1786041.02	435709.41	39°41'39.988"N	80°08'54.322"W	3764.92	162.598	1.27
11542.00	91.020	150.480	8143.10	3733.89	-3648.75	1156.68	1786071.71	435653.27	39°41'39.435"N	80°08'53.925"W	3827.10	162.410	0.231

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11605.00	90.950	151.160	8142.01	3796.86	-3704.01	1186.92	1786101.95	435598.01	39°41'38.891"N	80°08'53.535"W	3889.53	162.232	0.49
11668.00	90.950	151.140	8140.97	3859.83	-3759.18	1217.31	1786132.54	435542.84	39°41'38.348"N	80°08'53.139"W	3951.37	162.057	0.03
11732.00	90.950	151.740	8139.91	3923.79	-3815.39	1247.90	1786162.93	435486.64	39°41'37.795"N	80°08'52.742"W	4014.28	161.889	0.94
11795.00	90.890	152.080	8138.90	3986.74	-3870.96	1277.56	1786192.59	435431.07	39°41'37.247"N	80°08'52.358"W	4076.34	161.735	0.55
11858.00	90.950	152.220	8137.88	4049.67	-3926.66	1306.99	1786222.03	435375.38	39°41'36.699"N	80°08'51.976"W	4138.46	161.590	0.24
11921.00	90.920	151.710	8136.85	4112.61	-3982.26	1336.60	1786251.62	435319.78	39°41'36.152"N	80°08'51.592"W	4200.58	161.446	0.81
11985.00	90.890	151.430	8135.84	4176.57	-4038.53	1367.06	1786282.08	435263.51	39°41'35.598"N	80°08'51.197"W	4263.64	161.299	0.44
12048.00	90.920	150.370	8134.85	4239.55	-4093.57	1397.70	1786312.71	435208.48	39°41'35.056"N	80°08'50.800"W	4325.61	161.148	1.68
12111.00	90.830	150.030	8133.89	4302.54	-4148.23	1429.00	1786344.02	435153.82	39°41'34.518"N	80°08'50.395"W	4387.47	160.992	0.56
12174.00	90.950	150.230	8132.92	4365.53	-4202.86	1460.38	1786375.39	435099.20	39°41'33.980"N	80°08'49.989"W	4449.35	160.839	0.37
12237.00	90.920	150.080	8131.88	4428.52	-4257.50	1491.72	1786406.73	435044.56	39°41'33.443"N	80°08'49.585"W	4511.26	160.691	0.24
12300.00	91.020	150.430	8130.81	4491.51	-4312.19	1522.98	1786437.98	434989.87	39°41'32.904"N	80°08'49.178"W	4573.23	160.548	0.58
12363.00	91.010	148.410	8129.70	4554.49	-4366.41	1555.02	1786470.03	434935.65	39°41'32.371"N	80°08'48.765"W	4635.05	160.398	3.21
12426.00	90.890	148.020	8128.65	4617.46	-4419.96	1588.20	1786503.20	434882.11	39°41'31.844"N	80°08'48.333"W	4696.64	160.235	0.65
12489.00	90.920	147.900	8127.65	4680.42	-4473.30	1621.71	1786536.71	434828.77	39°41'31.319"N	80°08'47.900"W	4758.09	160.073	0.21
12552.00	90.950	149.390	8126.63	4743.40	-4527.03	1654.58	1786569.58	434775.04	39°41'30.791"N	80°08'47.474"W	4819.92	159.923	2.68
12615.00	90.890	150.290	8125.62	4806.39	-4581.49	1686.23	1786601.23	434720.58	39°41'30.255"N	80°08'47.065"W	4881.95	159.794	1.43
12677.00	90.890	150.260	8124.66	4868.38	-4635.33	1716.97	1786631.96	434666.75	39°41'29.725"N	80°08'46.666"W	4943.10	159.675	0.05
12740.00	91.020	150.500	8123.61	4931.37	-4690.03	1748.20	1786663.19	434612.05	39°41'29.186"N	80°08'46.262"W	5005.26	159.557	0.22
12803.00	91.000	150.380	8122.54	4994.35	-4744.70	1779.38	1786694.36	434557.38	39°41'28.648"N	80°08'45.858"W	5067.43	159.443	0.19
12866.00	90.890	148.360	8121.54	5057.34	-4798.97	1811.46	1786726.45	434503.12	39°41'28.114"N	80°08'45.443"W	5129.47	159.320	3.22
12930.00	90.830	147.560	8120.37	5121.30	-4853.22	1845.40	1786760.39	434448.87	39°41'27.581"N	80°08'45.004"W	5192.23	159.181	1.22
12993.00	90.990	148.030	8119.37	5184.26	-4906.53	1878.96	1786793.95	434395.57	39°41'27.056"N	80°08'44.569"W	5254.00	159.046	0.76
13056.00	90.920	148.380	8118.32	5247.23	-4960.06	1912.15	1786827.13	434342.03	39°41'26.529"N	80°08'44.140"W	5315.88	158.918	0.57
13119.00	90.920	150.080	8117.31	5310.22	-5014.19	1944.27	1786859.26	434287.92	39°41'25.997"N	80°08'43.725"W	5377.98	158.805	2.70
13184.00	90.850	149.870	8116.30	5375.21	-5070.46	1976.89	1786891.87	434231.65	39°41'25.445"N	80°08'43.301"W	5442.21	158.700	0.34
13247.00	91.050	149.810	8115.25	5438.20	-5124.92	2008.54	1786923.52	434177.19	39°41'24.907"N	80°08'42.892"W	5504.46	158.599	0.32
13310.00	90.220	150.110	8114.55	5501.19	-5179.46	2040.08	1786955.05	434122.66	39°41'24.370"N	80°08'42.483"W	5566.75	158.502	1.40
13373.00	90.120	151.460	8114.37	5564.18	-5234.44	2070.83	1786985.80	434067.68	39°41'23.829"N	80°08'42.085"W	5629.18	158.415	2.15
13437.00	89.660	151.600	8114.69	5628.15	-5290.70	2100.63	1787015.61	434011.42	39°41'23.275"N	80°08'41.689"W	5692.72	158.338	0.75

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Actual Wellpath Report

Beach 2H AWP Proj: 15322'

BAKER HUGHES

REFERENCE WELLPATH IDENTIFICATION			
Operator	NORTHEAST NATURAL ENERGY, LLC	Slot	02
Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

WELLPATH DATA (211 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
13501.00	89.170	150.780	8115.14	5692.12	-5346.77	2132.17	1787047.15	433955.35	39°41'22.723"N	80°08'41.290"W	5756.23	158.259	1.49
13564.00	89.140	150.870	8116.07	5755.10	-5401.78	2162.88	1787077.85	433900.35	39°41'22.182"N	80°08'40.892"W	5818.70	158.179	0.15
13627.00	89.110	150.100	8117.04	5818.09	-5456.59	2193.92	1787108.88	433845.54	39°41'21.642"N	80°08'40.490"W	5881.13	158.097	1.22
13690.00	89.260	150.120	8117.98	5881.08	-5511.21	2225.31	1787140.27	433790.92	39°41'21.105"N	80°08'40.083"W	5943.52	158.012	0.24
13753.00	89.170	149.340	8118.79	5944.07	-5565.61	2256.06	1787172.02	433736.52	39°41'20.569"N	80°08'39.682"W	6005.86	157.926	1.25
13816.00	89.170	149.090	8119.71	6007.07	-5619.73	2289.30	1787204.26	433682.41	39°41'20.037"N	80°08'39.255"W	6068.14	157.836	0.40
13880.00	89.140	148.770	8120.65	6071.05	-5674.54	2322.53	1787237.29	433627.60	39°41'19.498"N	80°08'38.827"W	6131.37	157.743	0.50
13943.00	89.170	148.910	8121.58	6134.04	-5728.45	2354.92	1787269.88	433573.70	39°41'18.967"N	80°08'38.405"W	6193.61	157.653	0.23
14006.00	89.200	147.810	8122.48	6197.01	-5782.08	2387.97	1787302.92	433520.07	39°41'18.440"N	80°08'37.978"W	6255.78	157.560	1.75
14069.00	89.690	149.290	8123.09	6260.00	-5835.82	2420.54	1787335.49	433466.33	39°41'17.911"N	80°08'37.555"W	6318.01	157.470	2.47
14132.00	89.630	150.140	8123.45	6323.00	-5890.22	2452.61	1787367.56	433411.94	39°41'17.375"N	80°08'37.141"W	6380.43	157.394	1.35
14195.00	89.660	150.620	8123.85	6385.99	-5944.98	2483.74	1787398.69	433357.17	39°41'16.836"N	80°08'36.738"W	6442.97	157.325	0.76
14258.00	89.750	151.030	8124.18	6448.98	-5999.99	2514.45	1787429.40	433302.17	39°41'16.295"N	80°08'36.340"W	6505.56	157.263	0.67
14321.00	89.690	151.380	8124.48	6511.95	-6055.20	2544.80	1787459.74	433246.96	39°41'15.751"N	80°08'35.947"W	6568.21	157.205	0.56
14384.00	89.450	152.430	8124.95	6574.92	-6110.52	2574.95	1787489.89	433191.65	39°41'15.207"N	80°08'35.556"W	6630.89	157.150	0.85
14447.00	89.720	152.020	8125.41	6637.88	-6166.00	2604.79	1787519.74	433136.18	39°41'14.661"N	80°08'35.169"W	6693.61	157.099	1.03
14511.00	89.690	152.110	8125.74	6701.83	-6222.54	2634.77	1787549.71	433079.64	39°41'14.104"N	80°08'34.781"W	6757.37	157.051	0.15
14574.00	89.910	152.230	8125.96	6764.77	-6278.25	2664.19	1787579.12	433023.93	39°41'13.555"N	80°08'34.399"W	6820.14	157.006	0.40
14637.00	89.660	152.240	8126.20	6827.71	-6334.00	2693.53	1787608.47	432968.19	39°41'13.007"N	80°08'34.019"W	6882.92	156.962	0.40
14700.00	90.740	150.250	8125.96	6890.66	-6388.29	2723.56	1787638.29	432912.70	39°41'12.452"N	80°08'33.652"W	6945.66	156.915	2.33
14764.00	91.850	149.830	8124.53	6954.64	-6445.20	2754.82	1787669.76	432856.99	39°41'11.912"N	80°08'33.225"W	7009.25	156.857	2.82
14827.00	91.350	150.150	8122.77	7017.61	-6499.73	2786.32	1787701.25	432802.46	39°41'11.375"N	80°08'32.817"W	7071.78	156.796	0.94
14890.00	91.320	150.070	8121.30	7080.59	-6554.33	2817.71	1787732.64	432747.86	39°41'10.838"N	80°08'32.410"W	7134.34	156.737	0.14
14954.00	91.390	147.220	8119.79	7144.56	-6608.97	2851.00	1787765.92	432693.23	39°41'10.300"N	80°08'31.979"W	7197.68	156.665	4.45
15016.00	91.290	145.470	8118.34	7206.43	-6660.56	2885.54	1787800.27	432641.64	39°41'09.792"N	80°08'31.535"W	7258.67	156.578	2.83
15079.00	91.350	146.760	8116.89	7269.29	-6712.84	2920.45	1787835.38	432589.36	39°41'09.279"N	80°08'31.081"W	7320.61	156.488	2.05
15142.00	91.420	147.400	8115.37	7332.21	-6765.71	2954.69	1787869.61	432536.50	39°41'08.759"N	80°08'30.639"W	7382.75	156.408	1.02
15205.00	91.320	147.940	8113.86	7395.15	-6818.93	2988.37	1787903.29	432483.28	39°41'08.235"N	80°08'30.203"W	7445.01	156.335	0.87
15269.00	91.320	147.830	8112.39	7459.10	-6873.12	3022.38	1787937.30	432429.09	39°41'07.702"N	80°08'29.763"W	7508.30	156.263	0.17
15296.00	91.260	147.550	8111.78	7485.08	-6895.94	3036.82	1787951.73	432406.28	39°41'07.478"N	80°08'29.577"W	7535.00	156.232	1.06

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Beach 2H AWP Proj: 15322'

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Operator	NORTHEAST NATURAL ENERGY, LLC	Slot	02
Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

WELLPATH DATA (211 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]
15322.00	91.260	147.550	8111.21	7512.05	-6917.87	3050.76	1787965.68	432384.35	39°41'07.262"N	80°08'29.396"W	7560.69	156.203	0.00

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Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Beach 2H BHL Rev-2		8036.73	-6918.84	3048.71	1787963.63	432383.28	39°41'07.252"N	80°08'29.422"W	point
Beach 2H LP Rev-1		8150.00	-1318.31	-228.70	1784686.41	437983.57	39°42'02.366"N	80°09'11.864"W	point
Beach 2H HL Pt 01		8215.00	-8.68	-1653.63	1783261.57	439293.12	39°42'15.206"N	80°09'30.217"W	point
Beach 2H HL Pt 02		8215.00	-320.98	-589.57	1784325.57	438960.84	39°42'12.197"N	80°09'16.574"W	point
Beach 2H HL Pt 03		8215.00	-417.72	-555.99	1784359.14	438884.10	39°42'11.243"N	80°09'16.135"W	point
Beach 2H HL Pt 04		8215.00	-969.74	-556.22	1784358.91	438332.12	39°42'05.788"N	80°09'16.087"W	point
Beach 2H HL Pt 05		8215.00	-1219.93	-840.51	1784074.64	438081.94	39°42'03.295"N	80°09'19.700"W	point
Beach 2H HL Pt 06		8215.00	-1957.01	-811.27	1784103.88	437344.91	39°41'56.013"N	80°09'19.257"W	point
Beach 2H HL Pt 07		8215.00	-2094.02	-665.40	1784249.74	437207.91	39°41'54.669"N	80°09'17.378"W	point
Beach 2H HL Pt 08		8215.00	-2394.74	-1020.33	1783894.83	436907.20	39°41'51.671"N	80°09'21.891"W	point
Beach 2H HL Pt 09		8215.00	-4276.43	101.01	1785016.10	435025.63	39°41'33.156"N	80°09'07.371"W	point

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Beach 2H HL Pt 10		8215.00	-4014.34	244.94	1785160.03	435287.70	39°41'35.757"N	80°09'05.554"W	point
Beach 2H HL Pt 11		8215.00	-3477.00	289.72	1785204.80	435825.01	39°41'41.070"N	80°09'05.031"W	point
Beach 2H HL Pt 12		8215.00	-3521.62	534.77	1785449.84	435780.39	39°41'40.647"N	80°09'01.892"W	point
Beach 2H HL Pt 13		8215.00	-3975.98	800.32	1785715.37	435326.06	39°41'36.176"N	80°08'58.453"W	point
Beach 2H HL Pt 14		8215.00	-4361.41	1025.10	1785940.14	434940.65	39°41'32.382"N	80°08'55.542"W	point
Beach 2H HL Pt 15		8215.00	-4804.70	1025.31	1785940.35	434497.39	39°41'28.002"N	80°08'55.498"W	point
Beach 2H HL Pt 16		8215.00	-4928.04	1312.10	1786227.12	434374.06	39°41'26.803"N	80°08'51.818"W	point
Beach 2H HL Pt 17		8215.00	-7084.74	1419.84	1786334.85	432217.49	39°41'05.497"N	80°08'50.242"W	point
Beach 2H HL Pt 18		8215.00	-7211.31	1727.35	1786642.35	432090.93	39°41'04.268"N	80°08'46.297"W	point
Beach 2H HL Pt 19		8215.00	-7435.86	2294.28	1787209.24	431866.39	39°41'02.089"N	80°08'39.025"W	point
Beach 2H HL Pt 20		8215.00	-7580.14	2595.57	1787510.51	431722.12	39°41'00.685"N	80°08'35.158"W	point

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TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Beech 2H HL Pt 21		8215.00	-7618.34	3236.82	1788151.72	431683.92	39°41'00.352"N	80°08'26.952"W	point
Beech 2H HL Pt 22		8215.00	-7655.08	3808.65	1788723.52	431647.18	39°41'00.030"N	80°08'19.635"W	point
Beech 2H HL Pt 23		8215.00	-7571.12	4290.35	1789205.19	431731.14	39°41'00.893"N	80°08'13.482"W	point
Beech 2H HL Pt 24		8215.00	-7633.36	4659.52	1789574.34	431668.90	39°41'00.304"N	80°08'08.754"W	point
Beech 2H HL Pt 25		8215.00	-7605.48	5268.94	1790183.72	431696.78	39°41'00.622"N	80°08'00.962"W	point

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Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

WELLPATH COMPOSITION - Ref Wellbore: Beach 2H AWB - Ref Wellpath: Beach 2H AWP Proj: 15322'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
18.00	6013.00	Generic gyro - northseeking (Standard)	01_VES Gyro (100'-5995')	Beach 2H AWB
6013.00	6368.00	NaviTrak (AT Curve Short Spaced)	02_BHI AT Curve 8.75in Section 6057'-6368'	Beach 2H AWB
6368.00	15296.00	NaviTrak (AT Curve Short Spaced)	03_BH AT Curve 8.5in Section 6431'-15296'	Beach 2H AWB
15296.00	15322.00	Blind Drilling (std)	Projection to bit	Beach 2H AWB

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Area	Monongalia County, WV	Well	Beach 2H
Field	Monongalia	Wellbore	Beach 2H AWB
Facility	Beach Pad		

COMMENTS

Wellpath general comments
API: 47-061-01665-0000
Rig: Pioneer 63
BHI Job #: 6692462
Duration: 09.26.2014 – 10.06.2014
VES Gyro (100'-5995')
BHI AT Curve 8.75in Section 6057'-6368'
BH AT Curve 8.5in Section 6431'-15296'
TD Projected: 15322'

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	12/5/2014
Job End Date:	12/28/2014
State:	West Virginia
County:	Monongalia
API Number:	47-061-01665-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Beach 2H
Longitude:	-80.15251700
Latitude:	39.70428100
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	8,142
Total Base Water Volume (gal):	13,953,485
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Interstate Oil & Gas Compact Commission

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
Proppant Transport	Schlumberger	Corrosion Inhibitor, AntiFoam Agent, Acid, Breaker, Gelling Agent, Friction Reducer, Iron Control Agent, Accelerator, Fluid Loss Additive , Propping					
			Water (Including Mix Water Supplied by Client)*	NA		86.90651	
			Crystalline silica	14808-60-7	98.63668	12.91498	
			Hydrochloric acid	7647-01-0	0.73463	0.09619	
			Guar gum	9000-30-0	0.31886	0.04175	
			Ammonium sulfate	7783-20-2	0.15214	0.01992	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.11229	0.01470	
			Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01203	0.00158	
			Diammonium peroxidisulphate	7727-54-0	0.00785	0.00103	
			Urea	57-13-6	0.00739	0.00097	
			Calcium chloride	10043-52-4	0.00267	0.00035	
			Sodium erythorbate	6381-77-7	0.00249	0.00033	

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			Methanol	67-56-1	0.00244	0.00032	
			Non-crystalline silica (impurity)	7631-86-9	0.00234	0.00031	
			Sodium sulfate	7757-82-6	0.00172	0.00023	
			Fatty acids, tall-oil	61790-12-3	0.00170	0.00022	
			Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00140	0.00018	
			Alcohols, C14-15, ethoxylated (7EO)	68951-67-7	0.00066	0.00009	
			Polypropylene glycol	25322-69-4	0.00048	0.00006	
			Propargyl alcohol	107-19-7	0.00044	0.00006	
			2-propenamid	79-06-1	0.00037	0.00005	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00019	0.00003	
			Hexadec-1-ene	629-73-2	0.00015	0.00002	
			Potassium chloride	7447-40-7	0.00016	0.00002	
			1-Octadecene (C18)	112-88-9	0.00007	0.00001	
			Sodium chloride	7647-14-5	0.00005	0.00001	
			Dimethyl siloxanes and silicones	63148-62-9	0.00011	0.00001	
			Formaldehyde	50-00-0	0.00001		
			Decamethyl cyclopentasiloxane	541-02-6	0.00001		
			Dodecamethylcyclohexasiloxane	540-97-6			
			Copper(II) sulfate	7758-98-7			
			Octamethylcyclotetrasiloxane	556-67-2	0.00001		
			Siloxanes and Silicones, di-Me, reaction products with silica	67762-90-7	0.00001		
SC-30	X-Chem	Scale Inhibitor					
			Sodium Polyacrylate	2594-41-5	14.71000		
			Water	7732-18-5	85.29000		
Chlorine Dioxide	X-Chem	Microbial Control					
			ClO2	10049-04-4	100.00000		Gas

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.

* 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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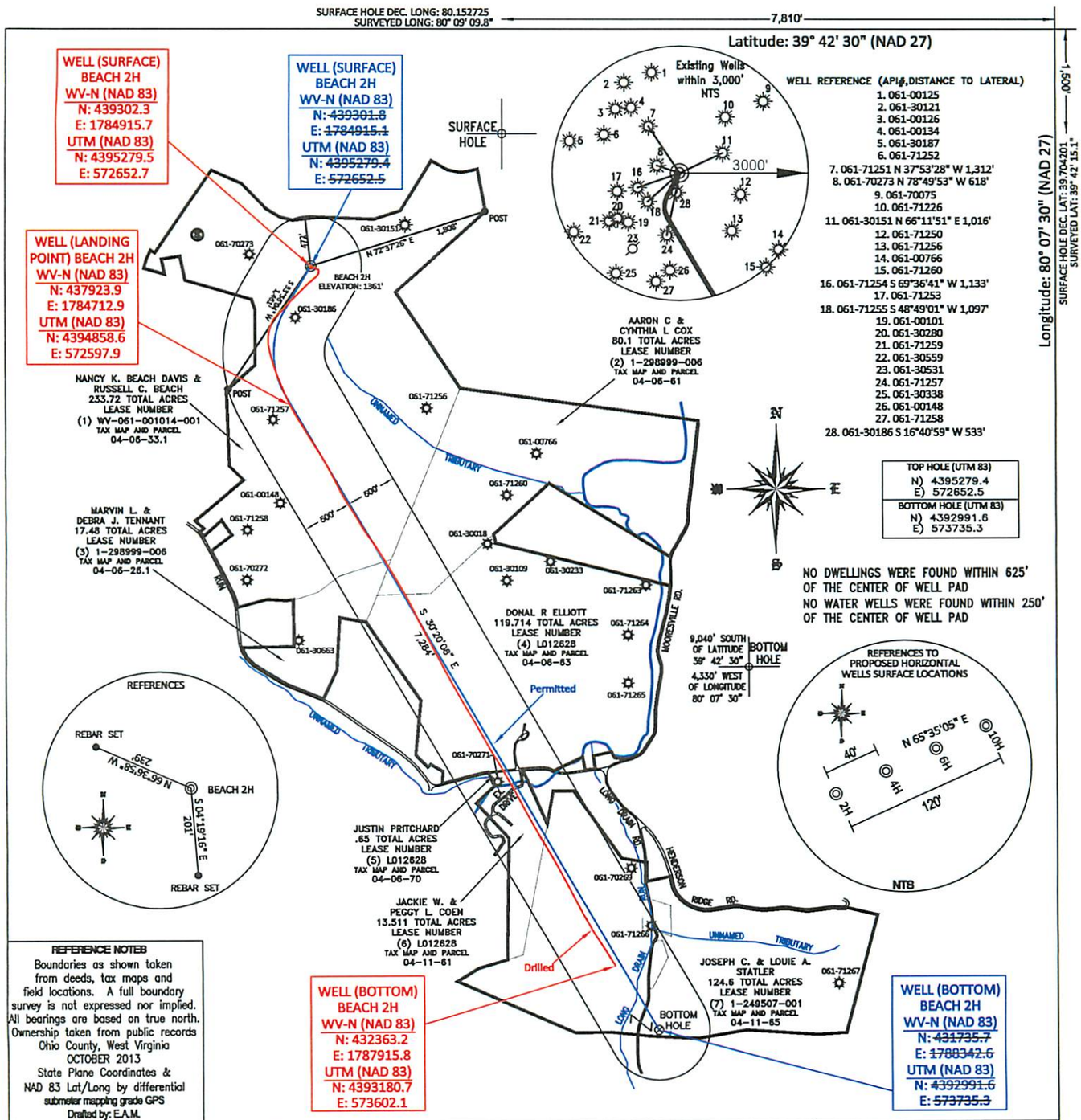

REFERENCE NOTES
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Ohio County, West Virginia OCTOBER 2013 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
Drafted by: E.A.M.

FILE #: NNE009
DRAWING #: 2293
SCALE: PLAT = (1"=1400') TICK MARK = (1"=2000')
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III LICENSED No. 2124 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: APRIL 3, 2015
OPERATOR'S WELL #: BEACH 2H AS-DRILLED PLAT
API WELL #: 47 (STATE) 61 (COUNTY) ____ (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☒ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☐ Shallow

WATERSHED: DUNKARD CREEK
ELEVATION : 1361'
COUNTY/DISTRICT: MONONGALIA / CLAY
QUADRANGLE: BLACKSVILLE, WV.
SURFACE OWNER: NANCY K. BEACH DAVIS & RUSSELL C. BEACH
ACREAGE: 233.72 +/-
OIL & GAS ROYALTY OWNER: TED K. MOORE , ET AL
ACREAGE: 589.77 +/-
LEASE NUMBERS:

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 8,111' TMD:15,322'
WELL OPERATOR : NORTHEAST NATURAL ENERGY LLC
DESIGNATED AGENT : JOHN ADAMS
ADDRESS: 707 VIRGINIA STREET SUITE 1200
ADDRESS: 707 VIRGINIA STREET SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301
CITY: CHARLESTON STATE: WV ZIP CODE: 25301

WR-35
Rev. 8/23/13

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

API 47 - 061 - 01666 County Monongalia District Clay
Quad Blacksville, WV Pad Name Beach Field/Pool Name Blacksville
Farm name Nancy Kay Beach Davis and Russell C. Beach Well Number 4H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia Street E., Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4395284.5	Easting 572663.6
Landing Point of Curve	Northing 4395139.5	Easting 572707.1
Bottom Hole	Northing 4393303.2	Easting 573815.0

Elevation (ft) 1361 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion □ Single ■ Multiple Fluids Produced ■ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Based Mud for horizontal section

BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-SEAL PLUS, HRP, LIME, M-I WATE (BARITE), M-I-X II MEDIUM, MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUI

Date permit issued 3-13-14 Date drilling commenced 7-23-14 Date drilling ceased 10-17-14
Date completion activities began 12/7/2014 Date completion activities ceased 12/28/2014
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 1,206' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,550' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 300',800' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
AC 6/3/15 ✓
W.S. 6/3/15
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API 47- 061 - 01666 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 4H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30	24	52'	N	N/A	N/A	Y to surface
Surface	17.5	13 3/8	1,276'	N	54.5	N/A	Y 50 BBL return
Coal							
Intermediate 1	12.25	9 5/8	2,378'	N	40	N/A	Y 17 BBL return
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15,597'	N	20	N/A	N TOC @ 650'
Tubing							
Packer type and depth set							

Comment Details All casing and cement jobs went with out issue.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	4,500 psi ready mix	36.4		.75	27.27	CTS	48
Surface	Class A	1004	15.2	1.27	1,271	CTS	8
Coal							
Intermediate 1	Class A	807	15.2	1.26	1,074	CTS	8
Intermediate 2							
Intermediate 3							
Production	50/50 Prem Ne-1	3005	14.5	1.17	3,510	650'	48
Tubing							

Drillers TD (ft) 15,624' Loggers TD (ft) 15,599'
Deepest formation penetrated Marcellus Plug back to (ft) N/A
Plug back procedure

Kick off depth (ft) 6,500'

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction
☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
Surface: bow spring centralizers every 3rd joint or aprox 120'
Intermediate: bow spring centralizers every 3rd joint or aprox 120'
Production: Hard bodied spiral centralizers every other joint or aprox 80' from TD to KOP then bow spring from KOP to 9 5/8" every forth joint or aprox 140'

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					*See Attached

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS			
Marcellus	8108.5'	TVD	15,624'	MD

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown ■ Open Flow OIL TEST □ Flow □ Pump

SHUT-IN PRESSURE Surface 4140 psi Bottom Hole _____ psi DURATION OF TEST 48 hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	5,688 mcfpd	_____ bpd	_____ bpd	_____ bpd	□ Estimated ■ Orifice □ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		See Attachment

Please insert additional pages as applicable.

Drilling Contractor Pioneer 63
Address 1250 NE Loop 410 Suite 1000 City San Antonio State TX Zip 78209

Logging Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Cementing Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Schlumberger
Address 1080 US-33 City Weston State WV Zip 26452

Please insert additional pages as applicable.

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Completed by Zack Arnold Telephone 304-203-8059
Signature _____ Title General Manager - Operations Date 4/29/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Beach 4H

Lithology/Formation	Top Depth in FT Name TVD	Bottom Depth in FT TVD	Top Depth in FT MD	Bottom Depth in FT MD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Sand/Shale	0	50	0		sand/shale
Red Rock	50	142			red rock
Sand/Shale	142	845			sand/shale
Red Rock	845	855			red rock
Sand/Shale	855	1950			sand/shale
Red Rock	1950	1980			red rock
Sand/Shale	1980	2130			sand/shale
Little Lime	2130	2150			limestone
Big Lime	2150	2180			limestone
Sand/Shale	2180	7917			sand/shale
Geneseo	7917	7959	7943	7990	shale
Tully	7959	8005	7990	8058	limestone
Hamilton	8005	8120	8058	8239	shale
Marcellus	8120	8178	8239	8368	shale
Cherry Valley	8178	8180	8368	8382	limestone
Lower Marcellus	8180		8382		shale

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NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV
Field: Monongalia
Facility: Beach Pad

Slot: 04
Well: Beach 4H
Wellbore: Beach 4H PWB

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Plot reference wellpath is Beach 4H PWB Rev-B.0	
True vertical depths are referenced to Pioneer 63 (RKB)	Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Pioneer 63 (RKB)	North Reference: Grid north
Pioneer 63 (RKB) to Mean Sea Level: 1376.7 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: 04): -1358.7 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: slewdenk on 10/08/2014

Location Information

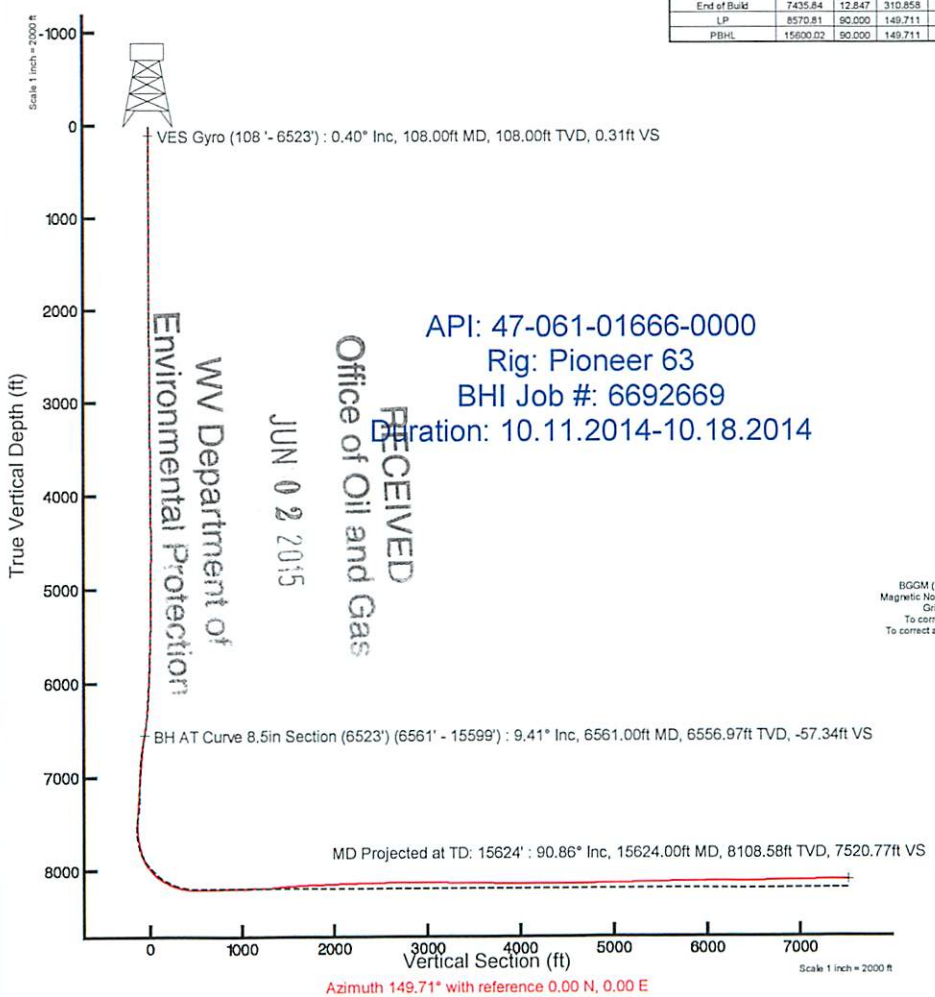
Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Beach Pad			1784915.100	439301.800	39°42'15.411"N	80°09'09.060"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
04	16.50	36.40	1784951.500	439318.300	39°42'15.577"N	80°09'08.596"W
Pioneer 63 (RKB) to Mud line (At Slot: 04)					18ft	
Mean Sea Level to Mud line (At Slot: 04)					-1358.7ft	
Pioneer 63 (RKB) to Mean Sea Level					1376.7ft	

Well Data

Slot	Well	Wellbore	Wellpath
04	Beach 4H	Beach 4H AWB	Beach 4H AWP Proj: 15624'
04	Beach 4H	Beach 4H PWB	Beach 4H PWB Rev-B.0

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	6523.00	10.430	313.470	6519.54	36.32	-38.94	0.00	-51.01
Projection	6623.00	10.430	313.470	6617.88	48.78	-52.08	0.00	-68.39
End of Drop	7144.50	0.000	310.858	7136.51	81.34	-86.43	2.00	-113.83
KOP	7275.19	0.000	310.858	7267.20	81.34	-86.43	0.00	-113.83
End of Build	7435.84	12.847	310.858	7426.51	93.08	-100.00	8.00	-130.81
LP	8570.81	90.000	149.711	8195.00	-472.90	164.99	9.00	491.56
PBHL	15600.02	90.000	149.711	8195.00	-6542.59	3710.22	0.00	7520.77



API: 47-061-01666-0000
Rig: Pioneer 63
BHI Job #: 6692669
Duration: 10.11.2014-10.18.2014

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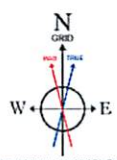
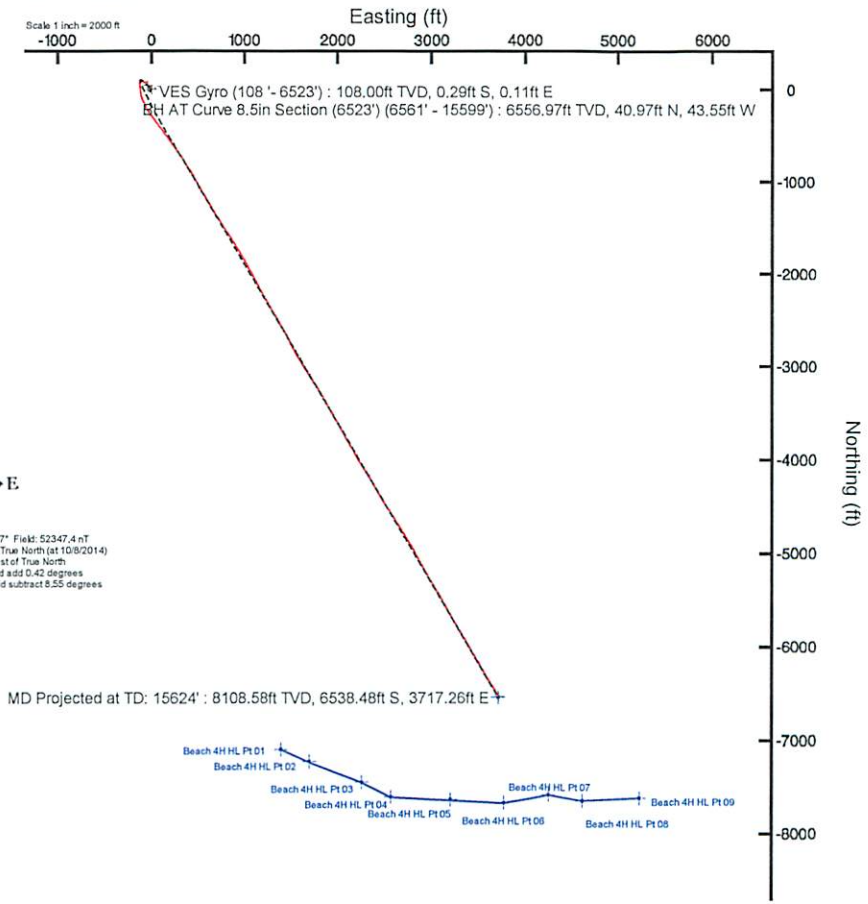


BGGM (1945.0 to 2016.0) Dip: 67.07° Field: 52347.4 nT
Magnetic North is 8.97 degrees West of True North (at 10/8/2014)
Grid North is 0.42 degrees West of True North
To correct azimuth from True to Grid add 0.42 degrees
To correct azimuth from Magnetic to Grid subtract 8.55 degrees



Perforation Record					
Stage Number	Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12/7/2014	15,525	15,377	40	Marcellus Shale
2	12/7/2014	15,325	15,175	40	Marcellus Shale
3	12/8/2014	15,125	14,977	40	Marcellus Shale
4	12/8/2014	14,925	14,777	40	Marcellus Shale
5	12/9/2014	14,725	14,577	40	Marcellus Shale
6	12/9/2014	14,525	14,377	40	Marcellus Shale
7	12/10/2014	14,325	14,177	40	Marcellus Shale
8	12/10/2014	14,125	13,977	40	Marcellus Shale
9	12/11/2014	13,925	13,777	40	Marcellus Shale
10	12/11/2014	13,725	13,577	40	Marcellus Shale
11	12/12/2014	13,525	13,377	40	Marcellus Shale
12	12/13/2014	13,325	13,177	40	Marcellus Shale
13	12/13/2014	13,125	12,977	40	Marcellus Shale
14	12/14/2014	12,925	12,777	40	Marcellus Shale
15	12/14/2014	12,725	12,577	40	Marcellus Shale
16	12/15/2014	12,525	12,377	40	Marcellus Shale
17	12/15/2014	12,325	12,177	40	Marcellus Shale
18	12/15/2014	12,125	11,977	40	Marcellus Shale
19	12/16/2014	11,925	11,777	40	Marcellus Shale
20	12/16/2014	11,725	11,579	40	Marcellus Shale
21	12/17/2014	11,525	11,377	40	Marcellus Shale
22	12/17/2014	11,325	11,177	40	Marcellus Shale
23	12/18/2014	11,125	10,977	40	Marcellus Shale
24	12/19/2014	10,925	10,777	40	Marcellus Shale
25	12/19/2014	10,725	10,577	40	Marcellus Shale
26	12/19/2014	10,525	10,377	40	Marcellus Shale
27	12/20/2014	10,325	10,177	40	Marcellus Shale
28	12/20/2014	10,125	9,977	40	Marcellus Shale
29	12/21/2014	9,925	9,777	40	Marcellus Shale
30	12/22/2014	9,725	9,577	40	Marcellus Shale
31	12/22/2014	9,725	9,577	40	Marcellus Shale
32	12/23/2014	9,325	9,177	40	Marcellus Shale
33	12/26/2014	9,125	8,977	40	Marcellus Shale
34	12/26/2014	8,925	8,777	40	Marcellus Shale
35	12/27/2014	8,725	8,577	40	Marcellus Shale
36	12/27/2014	8,510	8,317	40	Marcellus Shale

Stimulation Record							
Stage Number	Date	Average Treating Rate (BPM)	Average Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Propant Amount (lbs)	Total Clean Fluid (Bbls)
1	12/7/2014	74	8,821	8,452	4,905	400,620	7,642
2	12/7/2014	74	8,885	8,826	6,357	404,720	7,631
3	12/8/2014	71	8,939	7,429	5,312	400,420	7,044
4	12/8/2014	75	8,583	6,507	5,980	398,560	7,943
5	12/9/2014	80	8,733	6,579	5,893	398,320	7,458
6	12/9/2014	74	8,715	7,239	6,471	403,800	9,106
7	12/10/2014	75	8,689	7,496	6,384	333,600	7,351
8	12/10/2014	81	8,482	6,613	5,835	404,300	8,041
9	12/11/2014	79	8,653	7,172	6,472	405,260	8,565
10	12/11/2014	80	8,525	6,670	6,040	403,500	7,834
11	12/12/2014	80	8,558	6,589	4,443	399,180	7,741
12	12/13/2014	79	8,652	7,729	6,356	404,080	7,567
13	12/13/2014	76	8,634	7,635	6,386	398,900	7,204
14	12/14/2014	83	8,651	6,883	6,147	396,040	7,614
15	12/14/2014	81	8,496	6,826	5,980	398,890	7,728
16	12/15/2014	90	8,741	6,876	5,980	398,340	7,753
17	12/15/2014	82	8,670	7,151	6,124	403,240	7,387
18	12/15/2014	79	8,815	8,815	5,753	399,800	8,857
19	12/16/2014	71	8,912	8,153	5,179	401,620	7,137
20	12/16/2014	74	8,949	8,613	6,160	400,160	8,234
21	12/17/2014	83	8,780	8,516	5,655	399,180	7,260
22	12/17/2014	89	8,600	9,031	5,560	401,200	6,887
23	12/18/2014	86	8,568	9,261	5,686	376,794	7,222
24	12/19/2014	86	8,868	8,989	5,466	393,320	7,111
25	12/19/2014	85	8,805	8,273	6,036	398,480	6,959
26	12/19/2014	86	8,782	9,010	6,098	396,800	6,826
27	12/20/2014	89	8,747	8,962	6,004	401,400	6,821
28	12/20/2014	89	8,786	8,789	6,036	398,660	6,883
29	12/21/2014	90	8,765	8,495	5,750	[illegible]	[illegible]133
30	12/22/2014	90	8,670	8,154	5,466	401,080	7,111
31	12/22/2014	87	8,386	7,069	6,986	399,420	7,117
32	12/23/2014	88	8,695	7,616	6,162	400,060	7,590
33	12/26/2014	86	8,730	7,676	6,384	399,840	7,251
34	12/26/2014	86	8,332	7,313	6,797	399,480	6,977
35	12/27/2014	87	8,432	7,491	6,036	399,260	7,221
36	12/27/2014	88	8,071	7,327	6,068	[illegible]	7,269

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 19-OCT-14	F.R. # 10011110222	SERV. SUPV. Scott J Carson
LEASE & WELL NAME BEACH 4H - API 47061016660000	LOCATION BLACKSVILLE		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PERFORMANCE 1		TYPE OF JOB Long String

SIZE & TYPE OF PLUGS	LIST CSG HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
Latch Down Plug & Assembly, 5-1/2	Guide Shoe, Cement Nose, 5-1/2 I	NONE			NONE		
	Float Collar, Al Flap, 5-1/2 - 8rd						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
ULTRA-FLUSH HV			13				100	
50/50 PREMIUM NE-1 .3% R-3 .3% MPA-170	189101233	3,005	14.6	1.17	5.19	07:49	626	371.23
50# SUGAR /H2O			8.34				6	
H2O			8.34				346	
100# SUGAR			0				0	
Available Mix Water 750 Bbl. Available Displ. Fluid 750 Bbl.						TOTAL	1078	371.23

HOLE SIZE	% EXCESS	DEPTH	TBG CSG D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
8.5	10	15624	4.778	5.5	20	CSG	15615	8108	J-55	15615	15602	1

LAST CASING ID	OD	WGT.	TYPE	MD	TVD	PKR CMT RET BR PL LINER BRAND & TYPE	DEPTH	PERF DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
8.8	9.625	40	CSG	2386	2386					5.5	BUTT	SYNTHETIC MUD	12.5
12.	12.25		OPEN HOLE	2440	2440								
8.8	8.75		OPEN HOLE	6529	6529								

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
346	BBLS	H2O	8.34	2600	0	0	0	0	7352	6000	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 7200 PSI
						CIRCULATING WELL - RIG [X] BJ [X]
00:20						ARRIVE AT LOCATION 10-19-2014
01:00						PRE-JOB RIG-IN SAFETY MEETING
01:15						RIG-IN
02:00						FOUND OUT CEMENT HEAD TOO SMALL FOR PLUG
03:00						NEW CEMENT HEAD ARRIVED
04:00						PRE-JOB SAFETY MEETING
05:10	700		5	5	H2O	LINE-FILL
05:14	0				H2O	PRESSURE TEST FOUND LEAK
05:25	700		5	2	H2O	LINE-FILL
05:26	0				H2O	PRESSURE TEST 7200#
05:30	800		5	100	ULTRAFLU	PRE-FLUSH 13.0#
05:50	1100		5.9	616	SLURRY	14.5# 50/50 PREMIUM NE-1 .3% R-3 .3% MPA-170
07:34	0		5	10	H2O	SHUT-DOWN WASH-OUT LINES
07:42	400		1	3	SUGAR/H2	SUGAR WATER
07:44	0					SHUT-DOWN RELEASE PLUG + 2 WIPER PLUGS
07:45	1000		3	1	H2O/HALIE	DISPLACEMENT

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CEMENT JOB REPORT

BAKER HUGHES

PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 7200 PSI
						CIRCULATING WELL - RIG [X] BJ [X]
07:46	2200		5.2	348	H2O	START DISPLACEMENT
08:52	5200					SHUT-DOWN
08:54	670					BLEED-OFF PRESSURE 10BBL RETURN
08:59	1986					CLOSE-IN BUILT PRESSURE BACK-UP
09:02	3500		4.5	10	H2O	RE-BUMP PLUG
09:05	5060				H2O	SHUT-DOWN
09:07	0					BLEED-OFF PRESSURE 5BBL. RETURN
09:10	2000		2.5	5	H2O	RE-BUMP FOR BLEED-OFF VERIFICATION
09:12	5300				H2O	SHUT-DOWN
09:14	0					BLEED-OFF 5BBL. RETURN
09:15						POST-JOB RIG-OUT SAFETY MEETING
09:30						RIG-OUT

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE:
[Y] N	2600	[Y] N	0	1060	0	Y [N]	

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 29-JUL-14	F.R. # 10011086457	SERV. SUPV. Brian Lough
LEASE & WELL NAME BEACH 4H - API 47061016660000	LOCATION CLAY		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG #		TYPE OF JOB Intermediate

SIZE & TYPE OF PLUGS	LIST CSG HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
9-5/8" Top Cem Plug, Nitri cvr, Phen	Guide Shoe, Cement Nose, 9-5/8 I Float Collar, Al Flap, 9-5/8 - 8rd	NONE			NONE		

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
PROCESS H2O			8.34				150	
6% GEL W/ FLAKE			8.5				25	
PREM NE-1+1.5%CACL		807	15.2	1.26	5.76	03:23	181	110.62
H2O			8.34				177	
Available Mix Water 300 Bbl.	Available Displ. Fluid 500 Bbl.					TOTAL	533	110.62

HOLE SIZE	% EXCESS	DEPTH	TBG CSG D.P. ID	OD	WGT	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
17.5	30	2432	8.835	9.625	40	CSG	2378	2378	J-55	2378	2337	

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT
13.	13.38	55.	CSG	1276	1276	NO PACKER				9.625	8 RD	OTHER	0

DISPL VOLUME VOLUME	UOM	DISPL FLUID TYPE	WGT	CAL PSI BUMP PLUG	CAL MAX PSI TO REV	OP MAX SQ PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
177	BBLS	H2O	8.34	834	0	0	0	0	3160	2000	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 3450 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
05:50						ARRIVE ON LOC. JOB TIME 0600 HRS
06:00						STAGE TRUCKS. WAIT ON RIG
08:10						PRE JOB SAFETY MEETING
08:30						SPOT EQUIPMENT
08:50						RIG IN TO WELL
09:50						SAFETY MEETING WITH RIG CREW
10:15	90		6	3	H2O	LINE FILL
10:16					H2O	PRESSURE TEST TO 3000 PSI
10:18	117		6	100	H2O	PUMP PROCESSED H2O
10:39	119		5.6	25	GEL	PUMP 6% GEL W/FLAKE
10:50	102		5.8	10	H2O	PUMP H2O
10:53	210		5.7	176	CMT	807 SKS OF PREM-NE+1.5% CACL
10:59	228		5.5		CMT	CIRCULATE WELL 222 BBL INTO JOB
11:24						SHUT DOWN / DROP PLUG
11:25	840		5.7	177	H2O	PUMP DISPLACEMENT
11:56	1280		2.5		H2O	LAND PLUG / HOLD 5 MIN
12:01	0					RELEASE PRESS. CHECK FLOAT

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CEMENT JOB REPORT

BAKER HUGHES

PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X] TEST LINES 3450 PSI CIRCULATING WELL - RIG [ ] BJ [X]
BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT
[Y] N	834	[Y] N	17	491	0	Y [N]

SERVICE SUPERVISOR SIGNATURE:

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 25-JUL-14	F.R. # 10011085771	SERV. SUPV. Jason H Matheny
LEASE & WELL NAME BEACH #4H - API 47061016660000	LOCATION CLAY		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PERFORMANCE 2		TYPE OF JOB Surface

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
BJ Cement Plug, Rubber, Top 13-3/8	Guide Shoe, Cement Nose 13-3/8 in						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
WATER AHEAD		0	8.34	0	0	00:00	190	
GEL/FLAKE		0	8.56	0	0	00:00	25	
H2O		0	8.34	0	0	00:00	10	
PNE-1 2% CACL2		1,004	15.2	1.27	5.77	04:12	227.1	137.94
H2O		0	8.34	0	0	00:00	190.7	
500# GEL		0	0	0	0	00:00	0	
200# SUGAR		0	0	0	0	00:00	0	
200# FLAKE		0	0	0	0	00:00	0	
1 13.375 TRP		0	0	0	0	00:00	0	

Available Mix Water 400 Bbl. Available Displ. Fluid 400 Bbl. TOTAL 642.8 137.94

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
17.5	30	1364	12.62	13.375	54.5	CSG	1279	1279	J-55	1279	1235	

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
23.	24	94.6	CSG	50	50	NO-PACKER	0	0	0	13.375	8RD	OTHER	0

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
190.7	BBLS	H2O	8.34	481	0	0	0	0	2711	750	TANKS

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 2200 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
14:00	0	0	0	0	0	ARRIVED ON LOCATION
18:22	181	0	7.4	190	H2O	WATER AHEAD
19:00	200	0	5	25	GEL/FLAKI	PRE-FLUSH
19:18	250	0	5	10	H2O	SPACER
19:20	340	0	5	224	SLURRY	PNE-1 + 2% CACL2
20:04	0	0	0	0	H2O	S/D RELEASE PLUG
20:06	200	0	7	0	H2O	START DISPLACEMENT
20:46	700	0	0	190.4	H2O	ENDISPLACEMENT
20:50	0	0	0	0	N/A	BLEED OFF/RIG OUT

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE
[Y] N	500	[Y] N	50	654.2	0	Y [N]	Jason Matheny

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ACTUAL WELLPATH REPORT (CSV version)
Prepared by Baker Hughes
Software System: WellArchitect® 4.0.1

REFERENCE WELLPATH IDENTIFICATION

Operator	NORTHEAST NATURAL ENERGY, LLC
Area	Monongalia County, WV
Field	Monongalia
Facility	Beach Pad
Slot	4
Well	Beach 4H
Wellbore	Beach 4H AWB
Wellpath	Beach 4H AWP Proj: 15624'
Sidetrack	(none)

REPORT SETUP INFORMATION

Projection	NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
North Refe	Grid
Scale	0.999942
Convergen	0.42° West
Software S	WellArchitect® 4.0.1
User	Hareluk
Report Ger	21/Oct/2014 at 11:37:41 AM
DataBase/S	WellArchitectEasternDB/ev1415.xml

WELLPATH	Local Nortl [ft]	Local East [ft]	Easting [US ft]	Northing [US ft]	Latitude	Longitude
Slot Locatic	16.5	36.4	1784952	439318.3	39°42'15.5	80°09'08.596"W
Facility Ref			1784915	439301.8	39°42'15.4	80°09'09.060"W
Field Refer			1777686	440640.7	39°42'28.1	80°10'41.690"W

WELLPATH DATUM

Calculation	Minimum curvature
Horizontal	Slot
Vertical Re	Pioneer 63 (RKB)
MD Refere	Pioneer 63 (RKB)
Field Vertic	Mean Sea Level
Pioneer 63	18.00ft
Pioneer 63	1376.70ft
Pioneer 63	18.00ft
Section Ori	N 0.00, E 0.00 ft
Section Azi	149.71°

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WELLPATH DATA † = interpolated/extrapolated station

MD [ft]	Course Len [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]

†	0	0	0	158.83	0	0	0	0
	18	18	0	158.83	18	0	0	0
	108	90	0.4	158.83	108	0.31	-0.29	0.11
	208	100	0.25	128.64	208	0.86	-0.75	0.41
	308	100	0.22	129.39	308	1.24	-1.01	0.73
	408	100	0.23	136.55	408	1.62	-1.28	1.02
	508	100	0.3	199.37	508	1.98	-1.67	1.07
	608	100	0.17	206.56	607.99	2.23	-2.05	0.91
	708	100	0.18	233.94	707.99	2.33	-2.28	0.72
	808	100	0.3	223.67	807.99	2.42	-2.56	0.41
	908	100	0.24	241.27	907.99	2.48	-2.85	0.05
	1008	100	0.09	306.08	1007.99	2.41	-2.9	-0.2
	1108	100	0.33	296.69	1107.99	2.09	-2.73	-0.52
	1208	100	0.16	293.58	1207.99	1.74	-2.54	-0.91
	1308	100	0.47	301.72	1307.99	1.26	-2.27	-1.38
	1408	100	0.6	277.44	1407.98	0.58	-1.99	-2.25
	1508	100	0.45	294.86	1507.98	-0.06	-1.76	-3.13
	1608	100	0.84	271.35	1607.97	-0.77	-1.57	-4.22
	1708	100	0.91	241.87	1707.96	-1.18	-1.93	-5.65
	1808	100	0.79	251.69	1807.95	-1.36	-2.52	-7
	1908	100	1.13	236.89	1907.94	-1.45	-3.28	-8.48
	2008	100	1.1	215.83	2007.92	-1.01	-4.59	-9.87
	2108	100	1.22	209.99	2107.9	-0.1	-6.29	-10.97
	2208	100	1.52	195.2	2207.87	1.36	-8.5	-11.85
	2308	100	1.45	190.48	2307.84	3.25	-11.02	-12.42
	2408	100	1.34	182.7	2407.81	5.19	-13.43	-12.71
	2508	100	0.85	173.45	2507.79	6.85	-15.34	-12.68
	2608	100	0.68	181.52	2607.78	8.03	-16.67	-12.61
	2708	100	0.52	220.37	2707.77	8.69	-17.61	-12.92
	2808	100	0.31	221.93	2807.77	8.92	-18.15	-13.39
	2908	100	0.66	201.53	2907.77	9.36	-18.89	-13.79
	3008	100	0.45	222.95	3007.76	9.83	-19.71	-14.27
	3108	100	0.26	225.83	3107.76	9.99	-20.16	-14.7
	3208	100	0.56	237.53	3207.76	10.07	-20.58	-15.27
	3308	100	0.3	206.2	3307.76	10.23	-21.08	-15.8
	3408	100	0.63	189.39	3407.75	10.8	-21.85	-16
	3508	100	0.45	175.36	3507.75	11.58	-22.79	-16.06
	3608	100	0.76	165.62	3607.74	12.57	-23.82	-15.87
	3708	100	0.62	164.85	3707.74	13.73	-24.99	-15.56
	3808	100	0.7	167.92	3807.73	14.83	-26.11	-15.29
	3908	100	0.38	160.31	3907.72	15.74	-27.01	-15.05
	4008	100	0.53	165.72	4007.72	16.51	-27.78	-14.82
	4108	100	0.3	178.43	4107.72	17.18	-28.48	-14.7
	4208	100	0.12	189.5	4207.72	17.49	-28.85	-14.71
	4308	100	0.35	156.64	4307.72	17.87	-29.23	-14.61
	4408	100	0.15	164	4407.72	18.3	-29.64	-14.45
	4508	100	0.07	89.77	4507.72	18.46	-29.77	-14.36

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4608	100	0.06	33.07	4607.72	18.47	-29.72	-14.27
4708	100	0.38	349.06	4707.71	18.13	-29.35	-14.3
4808	100	0.45	339.51	4807.71	17.43	-28.66	-14.5
4908	100	0.44	359.6	4907.71	16.71	-27.91	-14.64
5008	100	0.61	8.09	5007.7	15.96	-27	-14.57
5108	100	0.77	27.31	5107.7	15.19	-25.87	-14.18
5208	100	1.05	39.12	5207.68	14.5	-24.56	-13.3
5308	100	1.52	37.87	5307.66	13.69	-22.81	-11.91
5408	100	2.18	27.04	5407.61	12.17	-20.06	-10.23
5508	100	2.32	18.37	5507.53	9.8	-16.45	-8.72
5608	100	2.51	16.32	5607.44	6.96	-12.43	-7.47
5708	100	2.46	13.14	5707.35	3.9	-8.24	-6.37
5808	100	2.59	11.64	5807.25	0.66	-3.93	-5.42
5908	100	2.4	356.98	5907.16	-2.88	0.37	-5.08
6008	100	2.53	340.64	6007.07	-6.91	4.54	-5.92
6108	100	2.88	316.18	6106.96	-11.52	8.44	-8.39
6208	100	3.39	314.15	6206.81	-16.81	12.31	-12.25
6308	100	4.86	312.48	6306.55	-23.71	17.23	-17.5
6408	100	7.54	310.75	6405.95	-33.96	24.38	-25.6
6508	100	10.01	312.32	6504.77	-48.46	34.51	-36.99
6523	15	10.43	313.47	6519.54	-51.01	36.32	-38.94
6561	38	9.41	317.08	6556.97	-57.34	40.97	-43.55
6624	63	8.61	317.62	6619.19	-66.98	48.22	-50.24
6687	63	7.33	316.3	6681.58	-75.5	54.61	-56.2
6750	63	5.75	313.04	6744.17	-82.43	59.67	-61.28
6813	63	4.95	309.93	6806.89	-88.01	63.57	-65.67
6876	63	4.86	306.89	6869.66	-93.03	66.91	-69.89
6938	62	5	302.7	6931.43	-97.86	69.95	-74.26
7001	63	4.83	299.6	6994.2	-102.6	72.74	-78.88
7065	64	5	296.58	7057.97	-107.26	75.32	-83.72
7127	62	4.98	292.34	7119.73	-111.67	77.55	-88.62
7190	63	4.72	291.78	7182.51	-115.88	79.56	-93.56
7254	64	5.02	293.24	7246.27	-120.21	81.64	-98.58
7317	63	5	294.16	7309.03	-124.66	83.85	-103.61
7380	63	5.03	295.28	7371.79	-129.17	86.15	-108.62
7443	63	4.98	293.37	7434.55	-133.65	88.42	-113.62
7506	63	4.08	268.78	7497.36	-136.95	89.45	-118.38
7569	63	4.7	195.61	7560.22	-136.24	86.92	-121.31
7632	63	7.79	181.18	7622.84	-130.8	80.16	-122.1
7696	64	11.23	182.24	7685.95	-121.84	69.59	-12[illegible]
7758	62	14.17	181.1	7746.43	-110.27	55.97	-122.81
7821	63	19.68	179.02	7806.68	-94.43	37.64	-122.78
7884	63	25.57	175.52	7864.81	-72.92	13.46	-121.53
7948	64	32.02	172.82	7920.87	-44.85	-17.18	-118.33
8011	63	38.63	168.77	7972.24	-10.86	-53.08	-112.4
8074	63	44.27	163.09	8019.46	29.17	-93.46	-102.17
8136	62	50.61	158.68	8061.39	73.94	-136.53	-87.14

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8200	64	56.25	153.79	8099.52	124.97	-183.5	-66.37
8262	62	62.39	147.79	8131.16	178.22	-229.94	-40.31
8325	63	68.09	144.87	8157.54	235.3	-277.51	-8.58
8389	64	73.56	144.03	8178.55	295.47	-326.67	26.56
8452	63	76.84	143.21	8194.64	356.03	-375.7	62.68
8516	64	83.31	143.44	8205.67	418.64	-426.23	100.32
8579	63	88.92	143.81	8209.94	481.12	-476.82	137.58
8598	19	89.97	143.94	8210.12	500.02	-492.17	148.78
8642	44	90.06	144.6	8210.11	543.82	-527.89	174.47
8705	63	90.06	144.66	8210.04	606.57	-579.26	210.94
8768	63	90.86	145.51	8209.54	669.37	-630.92	247
8831	63	91.02	146.25	8208.5	732.22	-683.06	282.33
8895	64	91.57	146.78	8207.06	796.1	-736.43	317.63
8958	63	91.23	147.45	8205.52	859.02	-789.32	351.83
9022	64	91.38	147.83	8204.06	922.96	-843.36	386.07
9084	62	91.2	149.15	8202.66	984.93	-896.21	418.47
9147	63	91.02	150.93	8201.44	1047.91	-950.78	449.92
9210	63	91.17	151.62	8200.24	1110.88	-1006.01	480.2
9273	63	91.17	149.56	8198.95	1173.85	-1060.88	511.13
9336	63	91.91	149.88	8197.26	1236.83	-1115.26	542.88
9399	63	92.49	149.33	8194.84	1299.78	-1169.57	574.73
9463	64	96.42	150.71	8189.87	1363.57	-1224.82	606.61
9526	63	94.75	149.6	8183.74	1426.27	-1279.2	637.81
9590	64	92.92	148.24	8179.46	1490.12	-1333.89	670.78
9653	63	93.29	148.05	8176.05	1553	-1387.32	703.98
9717	64	93.29	148.57	8172.37	1616.87	-1441.69	737.54
9778	61	93.17	148.13	8168.94	1677.76	-1493.53	769.5
9841	63	92.18	147.04	8166	1740.65	-1546.66	803.23
9905	64	91.75	145.79	8163.8	1804.5	-1599.94	838.62
9967	62	92.71	146.3	8161.39	1866.33	-1651.33	873.22
10030	63	92.37	148.97	8158.6	1929.22	-1704.49	906.91
10093	63	92.52	149.46	8155.91	1992.16	-1758.56	939.12
10157	64	92.43	149.62	8153.15	2056.1	-1813.68	971.53
10220	63	91.88	151.12	8150.78	2119.05	-1868.4	1002.66
10283	63	91.66	151.68	8148.83	2181.99	-1923.68	1032.8
10346	63	91.48	152.25	8147.1	2244.92	-1979.27	1062.4
10409	63	91.38	152.1	8145.53	2307.84	-2034.97	1091.8
10472	63	91.45	151.31	8143.98	2370.78	-2090.42	1121.65
10535	63	91.48	151.76	8142.37	2433.73	-2145.79	1151.67
10599	64	90.86	151.24	8141.06	2497.68	-2202.02	1182.2
10662	63	90.89	150.41	8140.1	2560.66	-2257.02	1212.91
10725	63	90.95	149.86	8139.09	2623.65	-2311.65	1244.28
10788	63	90.71	149.12	8138.17	2686.65	-2365.92	1276.26
10851	63	90.49	149.12	8137.51	2749.64	-2419.99	1308.59
10914	63	90.74	150.13	8136.84	2812.63	-2474.33	1340.44
10977	63	89.85	150.41	8136.51	2875.63	-2529.04	1371.68
11040	63	89.72	150.79	8136.75	2938.62	-2583.93	1402.61

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11104	64	90.03	151.77	8136.89	3002.6	-2640.05	1433.36
11167	63	89.29	153.33	8137.26	3065.52	-2695.96	1462.4
11230	63	88.68	153.35	8138.38	3128.38	-2752.25	1490.67
11293	63	88.92	152.31	8139.7	3191.27	-2808.28	1519.43
11357	64	88.92	149.69	8140.9	3255.24	-2864.24	1550.45
11420	63	88.95	148.53	8142.08	3318.22	-2918.3	1582.79
11483	63	89.48	148.35	8142.94	3381.2	-2971.97	1615.76
11546	63	89.51	148.77	8143.49	3444.19	-3025.72	1648.62
11608	62	89.48	148.53	8144.04	3506.17	-3078.67	1680.87
11671	63	89.48	147.57	8144.61	3569.14	-3132.12	1714.21
11734	63	88.98	146.71	8145.46	3632.07	-3185.04	1748.39
11797	63	88.95	147.8	8146.6	3695	-3238.02	1782.46
11860	63	88.95	149.51	8147.75	3757.98	-3291.81	1815.22
11924	64	89.54	150.88	8148.59	3821.97	-3347.34	1847.03
11986	62	89.38	150.38	8149.18	3883.96	-3401.37	1877.44
12049	63	89.38	150.37	8149.86	3946.95	-3456.13	1908.58
12112	63	89.45	151.2	8150.5	4009.94	-3511.11	1939.33
12175	63	89.42	151.44	8151.12	4072.91	-3566.38	1969.56
12238	63	89.38	151.27	8151.78	4135.88	-3621.66	1999.76
12300	62	89.35	150.64	8152.47	4197.86	-3675.86	2029.86
12363	63	90	150.54	8152.83	4260.85	-3730.74	2060.79
12426	63	90.31	150.09	8152.66	4323.85	-3785.48	2091.99
12489	63	90.46	149.85	8152.24	4386.85	-3840.02	2123.52
12552	63	90.74	149.76	8151.58	4449.84	-3894.47	2155.2
12615	63	90.68	150.69	8150.79	4512.83	-3949.14	2186.49
12678	63	90.71	150.15	8150.03	4575.82	-4003.93	2217.58
12741	63	90.8	149.12	8149.2	4638.82	-4058.28	2249.43
12804	63	90.71	147.9	8148.37	4701.8	-4112	2282.33
12868	64	90.74	147.65	8147.56	4765.76	-4166.13	2316.46
12931	63	90.74	149.07	8146.75	4828.73	-4219.76	2349.5
12993	62	90.89	150.23	8145.86	4890.72	-4273.26	2380.82
13057	64	90.92	150.64	8144.85	4954.71	-4328.92	2412.4
13120	63	91.14	148.92	8143.72	5017.7	-4383.35	2444.1
13183	63	90.98	148.92	8142.56	5080.68	-4437.3	2476.62
13246	63	91.08	147.27	8141.42	5143.64	-4490.77	2509.91
13309	63	90.95	146.1	8140.31	5206.55	-4543.41	2544.51
13372	63	91.01	147.82	8139.23	5269.46	-4596.21	2578.85
13436	64	91.02	149.28	8138.1	5333.44	-4650.8	2612.23
13499	63	90.92	148.19	8137.03	5396.42	-4704.64	2644.93
13562	63	90.92	148.35	8136.02	5459.39	-4758.22	2678.05
13625	63	90.74	147.86	8135.11	5522.36	-4811.7	2711.34
13688	63	90.86	148.32	8134.23	5585.33	-4865.17	2744.64
13751	63	90.98	149.65	8133.21	5648.31	-4919.16	2777.09
13815	64	91.02	151.17	8132.1	5712.3	-4974.8	2808.69
13878	63	90.95	152.05	8131.01	5775.25	-5030.21	2838.64
13940	62	91.02	152.29	8129.95	5837.18	-5085.03	2867.58
14003	63	91.02	151.99	8128.83	5900.12	-5140.72	2897.01

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14066	63	91.02	150.02	8127.71	5963.09	-5195.82	2927.55
14129	63	91.08	148.53	8126.55	6026.07	-5249.96	2959.73
14192	63	90.98	148.96	8125.42	6089.06	-5303.81	2992.41
14255	63	90.34	149.57	8124.69	6152.05	-5357.96	3024.61
14318	63	90.4	149.18	8124.29	6215.05	-5412.17	3056.7
14382	64	90.4	150.4	8123.84	6279.04	-5467.47	3088.9
14445	63	90.31	151.22	8123.45	6342.03	-5522.47	3119.62
14508	63	90.4	150.99	8123.06	6405.01	-5577.63	3150.07
14571	63	90.46	150.86	8122.59	6467.99	-5632.69	3180.68
14634	63	90.37	150.64	8122.13	6530.98	-5687.65	3211.46
14697	63	91.23	149.62	8121.25	6593.97	-5742.28	3242.83
14761	64	91.02	148.78	8119.99	6657.96	-5797.24	3275.6
14824	63	90.95	148.38	8118.91	6720.94	-5850.99	3308.44
14888	64	90.55	149.53	8118.07	6784.92	-5905.82	3341.44
14951	63	90.65	149.68	8117.41	6847.92	-5960.16	3373.31
15014	63	90.58	150.03	8116.74	6910.92	-6014.64	3404.95
15077	63	90.52	150.17	8116.13	6973.91	-6069.25	3436.35
15140	63	90.55	149.37	8115.54	7036.91	-6123.68	3468.07
15203	63	90.83	149.62	8114.78	7099.9	-6177.95	3500.05
15267	64	90.95	150.34	8113.79	7163.89	-6233.36	3532.06
15330	63	90.83	149.48	8112.81	7226.89	-6287.86	3563.64
15393	63	90.83	148.34	8111.9	7289.87	-6341.81	3596.17
15456	63	90.83	147.64	8110.99	7352.84	-6395.22	3629.56
15519	63	90.77	147.96	8110.11	7415.8	-6448.53	3663.13
15582	63	90.86	149.16	8109.21	7478.77	-6502.27	3695.99
15599	17	90.86	149.66	8108.96	7495.77	-6516.9	3704.64
15624	25	90.86	149.66	8108.58	7520.77	-6538.48	3717.26

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude
Beach 4H LP Rev-1	8195	-472.9	164.99	1785116	438845.4	39°42'10.9	80°09'06.4	
Beach 4H PBHL Rev-1	8195	-6542.59	3710.22	1788662	432776.1	39°41'11.1	80°08'20.5	
Beach 4H HL Pt 01	8215	-7101.25	1383.4	1786335	432217.5	39°41'05.4	80°08'50.2	
Beach 4H HL Pt 02	8215	-7228.01	1690.95	1786642	432090.7	39°41'04.2	80°08'46.2	
Beach 4H HL Pt 03	8215	-7450.4	2253.58	1787205	431868.4	39°41'02.1	80°08'39.0	
Beach 4H HL Pt 04	8215	-7606.95	2563.75	1787515	431711.8	39°41'00.5	80°08'35.0	
Beach 4H HL Pt 05	8215	-7634.03	3198.53	1788150	431684.7	39°41'00.3	80°08'26.9	
Beach 4H HL Pt 06	8215	-7670.78	3770.37	1788722	431648	39°41'00.0	80°08'19.6	
Beach 4H HL Pt 07	8215	-7586.81	4252.07	1789203	431732	39°41'00.9	80°08'13.5	
Beach 4H HL Pt 08	8215	-7649.05	4621.24	1789572	431669.7	39°41'00.3	80°08'08.7	
Beach 4H HL Pt 09	8215	-7621.17	5230.66	1790182	431697.6	39°41'00.6	80°08'00.9	

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WELLPATH COMPOSITION Ref Wellbore: Beach 4H AWB Ref Wellpath: Beach 4H AWP Proj: 15624'

Log Name/	Start MD [ft]	End MD [ft]	Pos Unc Model
01_VES Gy	18	6523	Generic gyro - northseeking (Standard)

02_BH AT (	6523	15599	NaviTrak (AT Curve Short Spaced)
Projection	15599	15624	Blind Drilling (std)

COMMENTS

Wellpath general comments
API: 47-061-01666-0000
Rig: Pioneer 63
BHI Job #: 6692669
Duration: 10.11.2014 – 10.18.2014
VES Gyro (108 '- 6523')
BH AT Curve 8.5in Section (6523') (6561' - 15599')
MD Projected at TD: 15624'

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Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dis [ft]	Closure Dir [°]	DLS [°/100ft]

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1784952	439318.3	39°42'15.5	80°09'08.5	0	0	0
1784952	439318.3	39°42'15.5	80°09'08.5	0	0	0
1784952	439318	39°42'15.5	80°09'08.5	0.31	158.83	0.44
1784952	439317.6	39°42'15.5	80°09'08.5	0.86	151.491	0.22
1784952	439317.3	39°42'15.5	80°09'08.5	1.25	144.264	0.03
1784953	439317	39°42'15.5	80°09'08.5	1.63	141.59	0.03
1784953	439316.6	39°42'15.5	80°09'08.5	1.98	147.488	0.28
1784952	439316.3	39°42'15.5	80°09'08.5	2.25	156.018	0.13
1784952	439316	39°42'15.5	80°09'08.5	2.39	162.463	0.08
1784952	439315.7	39°42'15.5	80°09'08.5	2.59	170.854	0.13
1784952	439315.5	39°42'15.5	80°09'08.5	2.85	179.042	0.1
1784951	439315.4	39°42'15.5	80°09'08.5	2.91	183.929	0.22
1784951	439315.6	39°42'15.5	80°09'08.6	2.78	190.795	0.24
1784951	439315.8	39°42'15.5	80°09'08.6	2.7	199.598	0.17
1784950	439316	39°42'15.5	80°09'08.6	2.66	211.32	0.31
1784949	439316.3	39°42'15.5	80°09'08.6	3	228.538	0.26
1784948	439316.5	39°42'15.5	80°09'08.6	3.59	240.682	0.22
1784947	439316.7	39°42'15.5	80°09'08.6	4.5	249.534	0.46
1784946	439316.4	39°42'15.5	80°09'08.6	5.97	251.132	0.45
1784945	439315.8	39°42'15.5	80°09'08.6	7.44	250.2	0.19
1784943	439315	39°42'15.5	80°09'08.7	9.09	248.883	0.42
1784942	439313.7	39°42'15.5	80°09'08.7	10.89	245.046	0.41
1784941	439312	39°42'15.5	80°09'08.7	12.64	240.146	0.17
1784940	439309.8	39°42'15.4	80°09'08.7	14.58	234.351	0.46
1784939	439307.3	39°42'15.4	80°09'08.7	16.61	228.426	0.14
1784939	439304.9	39°42'15.4	80°09'08.7	18.49	223.415	0.22
1784939	439303	39°42'15.4	80°09'08.7	19.9	219.58	0.52
1784939	439301.6	39°42'15.4	80°09'08.7	20.9	217.111	0.2
1784939	439300.7	39°42'15.4	80°09'08.7	21.84	216.272	0.43
1784938	439300.2	39°42'15.3	80°09'08.7	22.56	216.422	0.21
1784938	439299.4	39°42'15.3	80°09'08.7	23.39	216.123	0.38
1784937	439298.6	39°42'15.3	80°09'08.7	24.33	215.892	0.29
1784937	439298.1	39°42'15.3	80°09'08.7	24.95	216.092	0.19
1784936	439297.7	39°42'15.3	80°09'08.7	25.63	216.578	0.31
1784936	439297.2	39°42'15.3	80°09'08.7	26.34	216.855	0.34
1784936	439296.5	39°42'15.3	80°09'08.7	27.09	216.216	0.35
1784935	439295.5	39°42'15.3	80°09'08.8	27.88	215.178	0.22
1784936	439294.5	39°42'15.3	80°09'08.7	28.62	213.664	0.33
1784936	439293.3	39°42'15.3	80°09'08.7	29.43	211.911	0.14
1784936	439292.2	39°42'15.3	80°09'08.7	30.25	210.358	0.09
1784936	439291.3	39°42'15.3	80°09'08.7	30.92	209.123	0.33
1784937	439290.5	39°42'15.3	80°09'08.7	31.48	208.09	0.16
1784937	439289.8	39°42'15.2	80°09'08.7	32.06	207.302	0.25
1784937	439289.5	39°42'15.2	80°09'08.7	32.39	207.021	0.18
1784937	439289.1	39°42'15.2	80°09'08.7	32.68	206.553	0.26
1784937	439288.7	39°42'15.2	80°09'08.7	32.98	205.994	0.2
1784937	439288.5	39°42'15.2	80°09'08.7	33.05	205.747	0.15

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1784937	439288.6	39°42'15.2	80°09'08.7	32.97	205.64	0.06
1784937	439289	39°42'15.2	80°09'08.7	32.65	205.975	0.34
1784937	439289.6	39°42'15.2	80°09'08.7	32.12	206.838	0.1
1784937	439290.4	39°42'15.3	80°09'08.7	31.51	207.682	0.16
1784937	439291.3	39°42'15.3	80°09'08.7	30.68	208.353	0.19
1784937	439292.4	39°42'15.3	80°09'08.7	29.51	208.735	0.28
1784938	439293.7	39°42'15.3	80°09'08.7	27.93	208.431	0.34
1784940	439295.5	39°42'15.3	80°09'08.7	25.73	207.568	0.47
1784941	439298.2	39°42'15.3	80°09'08.7	22.52	207.009	0.74
1784943	439301.9	39°42'15.4	80°09'08.7	18.62	207.941	0.37
1784944	439305.9	39°42'15.4	80°09'08.6	14.5	211.015	0.21
1784945	439310.1	39°42'15.4	80°09'08.6	10.41	217.713	0.15
1784946	439314.4	39°42'15.5	80°09'08.6	6.7	234.056	0.15
1784946	439318.7	39°42'15.5	80°09'08.6	5.09	274.173	0.66
1784946	439322.8	39°42'15.6	80°09'08.6	7.46	307.502	0.71
1784943	439326.7	39°42'15.6	80°09'08.7	11.9	315.159	1.2
1784939	439330.6	39°42'15.6	80°09'08.7	17.37	315.135	0.52
1784934	439335.5	39°42'15.7	80°09'08.8	24.56	314.558	1.47
1784926	439342.7	39°42'15.8	80°09'08.9	35.35	313.603	2.69
1784915	439352.8	39°42'15.9	80°09'09.0	50.59	313.012	2.48
1784913	439354.6	39°42'15.9	80°09'09.0	53.25	313.007	3.11
1784908	439359.3	39°42'15.9	80°09'09.1	59.79	313.245	3.14
1784901	439366.5	39°42'16.0	80°09'09.2	69.64	313.825	1.28
1784895	439372.9	39°42'16.1	80°09'09.3	78.36	314.18	2.05
1784890	439378	39°42'16.1	80°09'09.3	85.53	314.237	2.58
1784886	439381.9	39°42'16.2	80°09'09.4	91.4	314.068	1.35
1784882	439385.2	39°42'16.2	80°09'09.4	96.76	313.754	0.44
1784877	439388.3	39°42'16.2	80°09'09.5	102.02	313.287	0.62
1784873	439391	39°42'16.2	80°09'09.6	107.3	312.683	0.5
1784868	439393.6	39°42'16.3	80°09'09.6	112.61	311.979	0.48
1784863	439395.9	39°42'16.3	80°09'09.7	117.76	311.19	0.6
1784858	439397.9	39°42'16.3	80°09'09.8	122.81	310.376	0.42
1784853	439399.9	39°42'16.3	80°09'09.8	127.99	309.63	0.51
1784848	439402.1	39°42'16.3	80°09'09.9	133.29	308.981	0.13
1784843	439404.5	39°42'16.4	80°09'09.9	138.63	308.421	0.16
1784838	439406.7	39°42'16.4	80°09'10.0	143.97	307.888	0.28
1784833	439407.8	39°42'16.4	80°09'10.1	148.37	307.077	3.36
1784830	439405.2	39°42'16.4	80°09'10.1	149.24	305.621	8.34
1784829	439398.5	39°42'16.3	80°09'10.1	146.06	303.287	5.46
1784829	439387.9	39°42'16.2	80°09'10.1	140.83	299.616	5.38
1784829	439374.3	39°42'16.1	80°09'10.1	134.96	294.501	4.76
1784829	439355.9	39°42'15.9	80°09'10.1	128.42	287.044	8.8
1784830	439331.8	39°42'15.7	80°09'10.1	122.27	276.319	9.59
1784833	439301.1	39°42'15.3	80°09'10.1	119.57	261.739	10.28
1784839	439265.2	39°42'15.0	80°09'10.0	124.31	244.721	11.13
1784849	439224.9	39°42'14.6	80°09'09.8	138.46	227.549	10.75
1784864	439181.8	39°42'14.2	80°09'09.6	161.97	212.548	11.49

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1784885	439134.8	39°42'13.7	80°09'09.4	195.14	199.886	10.73
1784911	439088.4	39°42'13.3	80°09'09.0	233.45	189.942	12.93
1784943	439040.8	39°42'12.8	80°09'08.6	277.64	181.771	9.98
1784978	438991.7	39°42'12.3	80°09'08.2	327.75	175.352	8.64
1785014	438942.6	39°42'11.8	80°09'07.7	380.89	170.528	5.36
1785052	438892.1	39°42'11.3	80°09'07.2	437.88	166.756	10.12
1785089	438841.5	39°42'10.8	80°09'06.7	496.27	163.905	8.92
1785100	438826.2	39°42'10.7	80°09'06.6	514.16	163.18	5.57
1785126	438790.5	39°42'10.3	80°09'06.3	555.97	161.711	1.51
1785162	438739.1	39°42'09.8	80°09'05.8	616.47	159.99	0.1
1785198	438687.4	39°42'09.3	80°09'05.3	677.54	158.62	1.85
1785234	438635.3	39°42'08.8	80°09'04.9	739.11	157.543	1.2
1785269	438581.9	39°42'08.3	80°09'04.4	802.01	156.669	1.19
1785303	438529	39°42'07.8	80°09'04.0	864.18	155.976	1.19
1785338	438475	39°42'07.2	80°09'03.5	927.53	155.403	0.64
1785370	438422.2	39°42'06.7	80°09'03.1	989.09	154.971	2.15
1785401	438367.6	39°42'06.2	80°09'02.7	1051.86	154.676	2.84
1785432	438312.4	39°42'05.6	80°09'02.3	1114.74	154.484	1.12
1785463	438257.5	39°42'05.1	80°09'01.9	1177.59	154.276	3.27
1785494	438203.1	39°42'04.5	80°09'01.5	1240.38	154.044	1.28
1785526	438148.8	39°42'04.0	80°09'01.1	1303.15	153.83	1.27
1785558	438093.6	39°42'03.5	80°09'00.7	1366.81	153.652	6.51
1785589	438039.2	39°42'02.9	80°09'00.3	1429.39	153.499	3.18
1785622	437984.5	39°42'02.4	80°08'59.8	1493.05	153.303	3.56
1785655	437931.1	39°42'01.9	80°08'59.4	1555.71	153.095	0.66
1785689	437876.7	39°42'01.3	80°08'59.0	1619.39	152.907	0.81
1785721	437824.9	39°42'00.8	80°08'58.6	1680.11	152.742	0.75
1785755	437771.7	39°42'00.3	80°08'58.1	1742.8	152.556	2.34
1785790	437718.5	39°41'59.8	80°08'57.7	1806.4	152.339	2.06
1785825	437667.1	39°41'59.3	80°08'57.2	1867.99	152.13	1.75
1785858	437613.9	39°41'58.7	80°08'56.8	1930.74	151.984	4.27
1785891	437559.9	39°41'58.2	80°08'56.4	1993.61	151.897	0.81
1785923	437504.7	39°41'57.7	80°08'55.9	2057.5	151.823	0.29
1785954	437450	39°41'57.1	80°08'55.5	2120.43	151.78	2.53
1785984	437394.7	39°41'56.6	80°08'55.2	2183.4	151.769	0.95
1786014	437339.2	39°41'56.0	80°08'54.8	2246.38	151.775	0.95
1786043	437283.5	39°41'55.5	80°08'54.4	2309.35	151.786	0.29
1786073	437228	39°41'54.9	80°08'54.0	2372.33	151.783	1.26
1786103	437172.6	39°41'54.4	80°08'53.6	2435.31	151.777	0.72
1786134	437116.4	39°41'53.9	80°08'53.2	2499.3	151.77	1.26
1786164	437061.4	39°41'53.3	80°08'52.8	2562.28	151.747	1.32
1786196	437006.8	39°41'52.8	80°08'52.4	2625.25	151.708	0.88
1786228	436952.5	39°41'52.2	80°08'52.0	2688.2	151.656	1.23
1786260	436898.5	39°41'51.7	80°08'51.6	2751.13	151.598	0.35
1786292	436844.1	39°41'51.2	80°08'51.2	2814.09	151.554	1.65
1786323	436789.4	39°41'50.6	80°08'50.8	2877.07	151.526	1.48
1786354	436734.5	39°41'50.1	80°08'50.4	2940.07	151.506	0.64

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1786385	436678.4	39°41'49.5	80°08'50.0	3004.06	151.501	1.61
1786414	436622.5	39°41'49.0	80°08'49.6	3067.05	151.523	2.74
1786442	436566.2	39°41'48.4	80°08'49.2	3130.01	151.559	0.97
1786471	436510.2	39°41'47.9	80°08'48.8	3192.98	151.584	1.69
1786502	436454.2	39°41'47.3	80°08'48.4	3256.96	151.573	4.09
1786534	436400.2	39°41'46.8	80°08'48.0	3319.89	151.526	1.84
1786567	436346.5	39°41'46.3	80°08'47.6	3382.79	151.469	0.89
1786600	436292.8	39°41'45.7	80°08'47.2	3445.71	151.415	0.67
1786632	436239.8	39°41'45.2	80°08'46.8	3507.64	151.367	0.39
1786666	436186.4	39°41'44.7	80°08'46.3	3570.53	151.308	1.52
1786700	436133.5	39°41'44.2	80°08'45.9	3633.36	151.236	1.58
1786734	436080.5	39°41'43.7	80°08'45.4	3696.2	151.168	1.73
1786767	436026.7	39°41'43.1	80°08'45.0	3759.13	151.126	2.71
1786798	435971.2	39°41'42.6	80°08'44.6	3823.11	151.11	2.33
1786829	435917.1	39°41'42.0	80°08'44.2	3885.11	151.103	0.85
1786860	435862.4	39°41'41.5	80°08'43.8	3948.1	151.091	0.02
1786891	435807.4	39°41'41.0	80°08'43.4	4011.09	151.086	1.32
1786921	435752.1	39°41'40.4	80°08'43.0	4074.09	151.09	0.38
1786951	435696.9	39°41'39.9	80°08'42.6	4137.09	151.094	0.28
1786981	435642.7	39°41'39.3	80°08'42.2	4199.08	151.092	1.02
1787012	435587.8	39°41'38.8	80°08'41.8	4262.08	151.085	1.04
1787043	435533.1	39°41'38.3	80°08'41.4	4325.07	151.073	0.87
1787075	435478.5	39°41'37.7	80°08'41.0	4388.06	151.058	0.45
1787107	435424.1	39°41'37.2	80°08'40.6	4451.04	151.04	0.47
1787138	435369.4	39°41'36.7	80°08'40.2	4514.03	151.028	1.48
1787169	435314.6	39°41'36.1	80°08'39.8	4577.02	151.02	0.86
1787201	435260.3	39°41'35.6	80°08'39.4	4640	151.001	1.64
1787234	435206.6	39°41'35.1	80°08'39.0	4702.93	150.968	1.94
1787268	435152.4	39°41'34.5	80°08'38.5	4766.83	150.925	0.39
1787301	435098.8	39°41'34.0	80°08'38.1	4829.76	150.892	2.25
1787332	435045.3	39°41'33.5	80°08'37.7	4891.74	150.876	1.89
1787364	434989.6	39°41'32.9	80°08'37.3	4955.73	150.87	0.64
1787395	434935.2	39°41'32.4	80°08'36.9	5018.7	150.856	2.75
1787428	434881.3	39°41'31.9	80°08'36.5	5081.66	150.832	0.25
1787461	434827.8	39°41'31.3	80°08'36.0	5144.57	150.799	2.62
1787496	434775.2	39°41'30.8	80°08'35.6	5207.4	150.749	1.87
1787530	434722.4	39°41'30.3	80°08'35.1	5270.25	150.704	2.73
1787564	434667.8	39°41'29.8	80°08'34.7	5334.2	150.678	2.28
1787596	434614	39°41'29.2	80°08'34.3	5397.15	150.656	1.74
1787629	434560.4	39°41'28.7	80°08'33.8	5460.09	150.628	0.25
1787663	434506.9	39°41'28.2	80°08'33.4	5523.02	150.599	0.83
1787696	434453.4	39°41'27.6	80°08'33.0	5585.96	150.571	0.75
1787728	434399.4	39°41'27.1	80°08'32.6	5648.92	150.553	2.12
1787760	434343.8	39°41'26.6	80°08'32.2	5712.91	150.552	2.38
1787790	434288.4	39°41'26.0	80°08'31.8	5775.89	150.563	1.4
1787819	434233.6	39°41'25.5	80°08'31.4	5837.86	150.58	0.4
1787848	434177.9	39°41'24.9	80°08'31.0	5900.82	150.597	0.48

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1787879	434122.8	39°41'24.4	80°08'30.6	5963.81	150.601	3.13
1787911	434068.7	39°41'23.9	80°08'30.2	6026.78	150.587	2.37
1787944	434014.8	39°41'23.3	80°08'29.8	6089.74	150.568	0.7
1787976	433960.7	39°41'22.8	80°08'29.4	6152.72	150.555	1.4
1788008	433906.5	39°41'22.3	80°08'28.9	6215.7	150.543	0.63
1788040	433851.2	39°41'21.7	80°08'28.5	6279.69	150.535	1.91
1788071	433796.2	39°41'21.2	80°08'28.1	6342.69	150.538	1.31
1788101	433741	39°41'20.6	80°08'27.7	6405.69	150.544	0.39
1788132	433686	39°41'20.1	80°08'27.3	6468.68	150.547	0.23
1788163	433631	39°41'19.5	80°08'26.9	6531.68	150.549	0.38
1788194	433576.4	39°41'19.0	80°08'26.5	6594.67	150.545	2.12
1788227	433521.4	39°41'18.5	80°08'26.1	6658.64	150.532	1.35
1788260	433467.7	39°41'17.9	80°08'25.7	6721.6	150.514	0.64
1788293	433412.8	39°41'17.4	80°08'25.3	6785.57	150.499	1.9
1788325	433358.5	39°41'16.9	80°08'24.8	6848.56	150.491	0.29
1788356	433304	39°41'16.3	80°08'24.4	6911.55	150.485	0.57
1788388	433249.4	39°41'15.8	80°08'24.0	6974.54	150.482	0.24
1788419	433195	39°41'15.3	80°08'23.6	7037.54	150.475	1.27
1788451	433140.7	39°41'14.7	80°08'23.2	7100.52	150.467	0.6
1788483	433085.3	39°41'14.2	80°08'22.8	7164.51	150.462	1.14
1788515	433030.8	39°41'13.6	80°08'22.4	7227.5	150.458	1.38
1788547	432976.9	39°41'13.1	80°08'22.0	7290.47	150.444	1.81
1788581	432923.5	39°41'12.6	80°08'21.5	7353.41	150.423	1.11
1788614	432870.2	39°41'12.1	80°08'21.1	7416.33	150.401	0.52
1788647	432816.4	39°41'11.5	80°08'20.7	7479.29	150.385	1.91
1788656	432801.8	39°41'11.4	80°08'20.6	7496.29	150.383	2.94
1788669	432780.2	39°41'11.2	80°08'20.4	7521.29	150.381	0

Shape	Comment
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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	12/7/2014
Job End Date:	12/28/2014
State:	West Virginia
County:	Monongalia
API Number:	47-061-01666-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Beach 4H
Longitude:	-80.15238800
Latitude:	39.70432700
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	8,147
Total Base Water Volume (gal):	11,027,335
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Interstate Oil & Gas Compact Commission

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
Proppant Transport	Schlumberger	Corrosion Inhibitor, AntiFoam Agent, Acid, Breaker, Gelling Agent, Friction Reducer, Iron Control Agent, Fluid Loss Additive , Propping Agent					
			Water (Including Mix Water Supplied by Client)*	NA		86.38252	
			Crystalline silica	14808-60-7	98.64778	13.43334	
			Hydrochloric acid	7647-01-0	0.76318	0.10393	
			Guar gum	9000-30-0	0.27309	0.03719	
			Ammonium sulfate	7783-20-2	0.15742	0.02144	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.11619	0.01582	
			Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01245	0.00170	
			Urea	57-13-6	0.00764	0.00104	
			Diammonium peroxidisulphate	7727-54-0	0.00669	0.00091	
			Sodium erythorbate	6381-77-7	0.00258	0.00035	
			Methanol	67-56-1	0.00254	0.00035	

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			Non-crystalline silica (impurity)	7631-86-9	0.00227	0.00031	
			Fatty acids, tall-oil	61790-12-3	0.00177	0.00024	
			Sodium sulfate	7757-82-6	0.00178	0.00024	
			Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00146	0.00020	
			Alcohols, C14-15, ethoxylated (7EO)	68951-67-7	0.00069	0.00009	
			Propargyl alcohol	107-19-7	0.00046	0.00006	
			2-propenamid	79-06-1	0.00038	0.00005	
			Polypropylene glycol	25322-69-4	0.00035	0.00005	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00020	0.00003	
			Hexadec-1-ene	629-73-2	0.00015	0.00002	
			Dimethyl siloxanes and silicones	63148-62-9	0.00011	0.00001	
			1-Octadecene (C18)	112-88-9	0.00008	0.00001	
			Formaldehyde	50-00-0	0.00001		
			Decamethyl cyclopentasiloxane	541-02-6	0.00001		
			Octamethylcyclotetrasiloxane	556-67-2	0.00001		
			Dodecamethylcyclohexasiloxane	540-97-6			
			Copper(II) sulfate	7758-98-7			
			Siloxanes and Silicones, di-Me, reaction products with silica	67762-90-7	0.00002		
SC-30	X-Chem	Scale Inhibitor					
			Sodium Polyacrylate	2594-41-5	14.71000		
			Water	7732-18-5	85.29000		
Chlorine Dioxide	X-Chem	Microbial Control					
			ClO2	10049-04-4	100.00000		Gas

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.

* 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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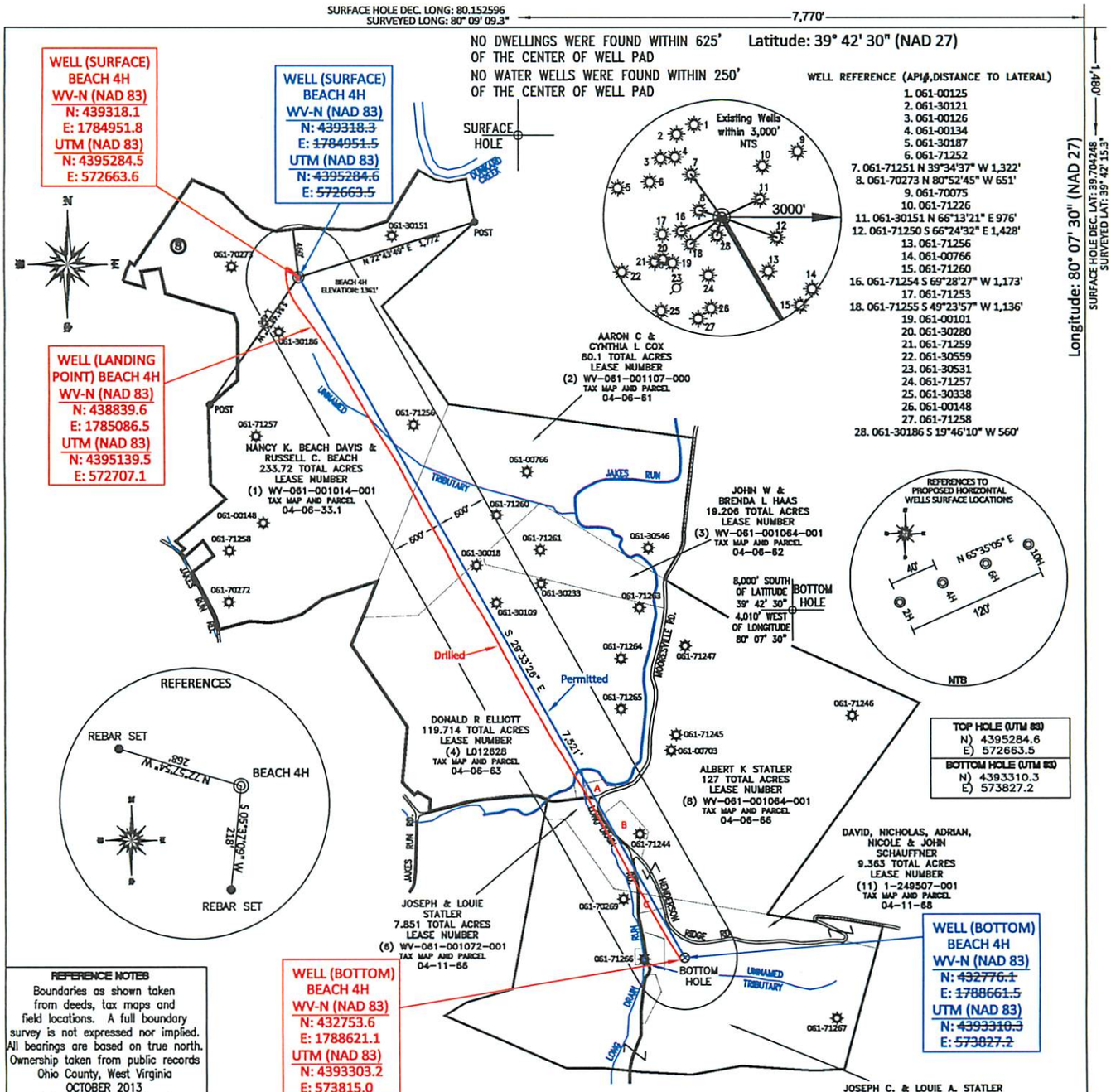

A	BRENDA K. & BILLY R. TENNANT	04-06-65	LEASE NUMBER (5) L012628	0.641 AC
B	ALBERT K. STATLER	04-11-67	LEASE NUMBER (7) WV-061-001072-001	1.00 AC
C	SHELLY K. WEBER	04-11-65.2	LEASE NUMBER (9) 1-249507-001	0.65 AC

FILE #: NNE009

DRAWING #: 2294

SCALE: PLAT = (1"=1400') TICK MARK = (1"=2000')

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III LICENSED No. 2124 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: APRIL 3, 2015

OPERATOR'S WELL #: BEACH 4H AS-DRILLED PLAT

API WELL #: 47 (STATE) 61 (COUNTY) (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: DUNKARD CREEK ELEVATION : 1361'

COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE, WV.

SURFACE OWNER: NANCY K. BEACH DAVIS & RUSSELL C. BEACH ACREAGE: 233.72 +/-

OIL & GAS ROYALTY OWNER: TED K. MOORE, ET AL ACREAGE: 723.85 +/-

LEASE NUMBERS:

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 8,109' TMD: 15,624'

WELL OPERATOR : NORTHEAST NATURAL ENERGY LLC DESIGNATED AGENT : JOHN ADAMS

ADDRESS: 707 VIRGINIA STREET SUITE 1200 ADDRESS: 707 VIRGINIA STREET SUITE 1200

CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

WR-35
Rev. 8/23/13

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

API 47 - 061 - 01668 County Monongalia District Clay
Quad Blacksville, WV Pad Name Beach Field/Pool Name Blacksville
Farm name Nancy Kay Beach Davis and Russell C. Beach Well Number 6H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia Street E., Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4395290.1	Easting 572674.6
Landing Point of Curve	Northing 4395234.3	Easting 572939.8
Bottom Hole	Northing 4393434.2	Easting 574011.1

Elevation (ft) 1361 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion □ Single ■ Multiple Fluids Produced ■ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine

Mud Type(s) and Additive(s)
Synthetic Based Mud for horizontal section

BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-SEAL PLUS, HRP, LIME, M-I WATE (BARITE), M-I-X II MEDIUM, MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUI

Date permit issued 5-16-14 Date drilling commenced 8-4-14 Date drilling ceased 10-27-14
Date completion activities began 12/30/2014 Date completion activities ceased 1/25/2015
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 1,206' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,550' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 300',800' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
AL 6/3/15 ✓
W.S. 6/3/15

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API 47- 061 - 01668 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 6H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30	24	52'	N	N/A	N/A	Y to surface
Surface	17.5	13 3/8	1,323'	N	54.5	N/A	Y 32 BBL return
Coal							
Intermediate 1	12.25	9 5/8	2,370'	N	40	N/A	Y 19 BBL return
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15,661'	N	20	N/A	Y 5 BBL return
Tubing							
Packer type and depth set							

Comment Details All casing and cement jobs went with out issue.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	4,500 psi ready mix	36.4		.75	27.27	CTS	48
Surface	Class A	953	15.2	1.27	911	CTS	8
Coal							
Intermediate 1	Class A	753	15.2	1.26	682	CTS	8
Intermediate 2							
Intermediate 3							
Production	50/50 Premium NE-1.3% R-3.3% MPA170	3033	14.5	1.17	2,661	CTS	48
Tubing							

Drillers TD (ft) 15,710' Loggers TD (ft) 15,686'
Deepest formation penetrated Marcellus Plug back to (ft) N/A
Plug back procedure

Kick off depth (ft) 7,189'

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction
☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
Surface: bow spring contralizers every 3rd joint or aprox 120'
Intermediate: bow spring centralizers every 3rd joint or aprox 120'
Production: Hard bodied spiral centralizers every other joint or aprox 80' from TD to KOP then bow spring from KOP to 9 5/8" every forth joint or aprox 140'

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WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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Rev. 8/23/13

API 47- 061 - 01668 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 6H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					*See Attached

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

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Please insert additional pages as applicable.

WR-35
Rev. 8/23/13

API 47- 061 - 01668 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 6H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	8125'	TVD	15,710'	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface 4,391 psi Bottom Hole _____ psi DURATION OF TEST 48 hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	5,640 mcfpd	_____ bpd	_____ bpd	_____ bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		See Attachment

Please insert additional pages as applicable.

Drilling Contractor Pioneer 63
Address 1250 NE Loop 410 Suite 1000 City San Antonio State TX Zip 78209

Logging Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Cementing Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Schlumberger
Address 1080 US-33 City Weston State WV Zip 26452

Please insert additional pages as applicable.

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Completed by Zack Arnold Telephone 304-203-8059
Signature _____ Title General Manager - Operations Date 4/29/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Beach 6H

Lithology/Formation	Top Depth in FT Name TVD	Bottom Depth in FT TVD	Top Depth in FT MD	Bottom Depth in FT MD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Sand/Shale	0	245	0		sand/shale
Red Rock	245	262			red rock
Sand/Shale	262	1210			sand/shale
Red Rock	1210	1225			red rock
Sand/Shale	1225	2070			sand/shale
Red Rock	2070	2083			red rock
Shale	2083	2137			shale
Big Lime	2137	2210			limestone
Injun	2210	2380			sandstone
Sand/Shale	2380	3300			sand/shale
Geneseo	7910	7953	8034	8097	shale
Tully	7953	8003	8097	8170	limestone
Hamilton	8003	8119	8170	8382	shale
Marcellus	8119	8171	8382	8533	shale
Cherry Valley	8171	8174	8533	8554	limestone
Lower Marcellus	8174		8554		shale

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Perforation Record					
Stage Number	Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12/30/2014	15,600	15,482	40	Marcellus Shale
2	12/30/2014	15,450	15,332	40	Marcellus Shale
3	12/30/2014	15,300	15,187	40	Marcellus Shale
4	1/1/2015	15,150	15,032	40	Marcellus Shale
5	1/1/2015	15,000	14,882	40	Marcellus Shale
6	1/1/2015	14,848	14,732	40	Marcellus Shale
7	1/2/2015	14,700	14,582	40	Marcellus Shale
8	1/2/2015	14,550	14,432	40	Marcellus Shale
9	1/3/2015	14,398	14,282	40	Marcellus Shale
10	1/3/2015	14,250	14,132	40	Marcellus Shale
11	1/4/2015	14,100	13,982	40	Marcellus Shale
12	1/4/2015	13,950	13,832	40	Marcellus Shale
13	1/5/2015	13,800	13,682	40	Marcellus Shale
14	1/6/2015	13,646	13,532	40	Marcellus Shale
15	1/7/2015	13,496	13,382	40	Marcellus Shale
16	1/7/2015	13,346	13,232	40	Marcellus Shale
17	1/7/2015	13,190	13,082	40	Marcellus Shale
18	1/7/2015	13,048	12,932	40	Marcellus Shale
19	1/9/2015	12,900	12,782	40	Marcellus Shale
20	1/9/2015	12,750	12,632	40	Marcellus Shale
21	1/9/2015	12,590	12,482	40	Marcellus Shale
22	1/13/2015	12,440	12,332	40	Marcellus Shale
23	1/14/2015	12,300	12,332	40	Marcellus Shale
24	1/14/2015	12,150	12,032	40	Marcellus Shale
25	1/14/2015	12,000	11,882	40	Marcellus Shale
26	1/16/2015	11,846	11,732	40	Marcellus Shale
27	1/19/2015	11,689	11,582	40	Marcellus Shale
28	1/19/2015	11,550	11,432	40	Marcellus Shale
29	1/19/2015	11,390	11,284	40	Marcellus Shale
30	1/20/2015	11,250	11,132	40	Marcellus Shale
31	1/20/2015	11,100	10,982	40	Marcellus Shale
32	1/21/2015	10,952	10,832	40	Marcellus Shale
33	1/21/2015	10,800	10,682	40	Marcellus Shale
34	1/21/2015	10,650	10,534	40	Marcellus Shale
35	1/21/2015	10,500	10,382	40	Marcellus Shale
36	1/22/2015	10,347	10,232	40	Marcellus Shale
37	1/22/2015	10,200	10,082	40	Marcellus Shale
38	1/22/2015	10,050	9,932	40	Marcellus Shale
39	1/23/2015	9,900	9,782	40	Marcellus Shale
40	1/23/2015	9,748	9,632	40	Marcellus Shale
41	1/23/2015	9,600	9,482	40	Marcellus Shale
42	1/23/2015	9,450	9,332	40	Marcellus Shale
43	1/24/2015	9,296	9,182	40	Marcellus Shale
44	1/24/2015	9,146	9,032	40	Marcellus Shale
45	1/24/2015	9,000	8,882	40	Marcellus Shale
46	1/24/2015	8,850	8,732	40	Marcellus Shale
47	1/25/2015	8,680	8,478	40	Marcellus Shale

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Stimulation Record							
Stage Number	Date	Average Treating Rate (BPM)	Average Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Propant Amount (lbs)	Total Clean Fluid (Bbls)
1	12/30/2014	72	8,821	7,286	6,005	403680	8,188
2	12/30/2014	82	8,838	7,406	6,320	396720	7,658
3	12/30/2014	78	8,800	6,265	6,797	401320	7,771
4	1/1/2015	79	8,763	6,989	6,448	399260	7,419
5	1/1/2015	82	8,935	7,212	6,541	402980	7,502
6	1/1/2015	83	8,903	7,751	6,359	400300	7,289
7	1/2/2015	83	8,846	7,900	6,320	397500	7,388
8	1/2/2015	54	9,111	7,795	6,574	249234	8,680
9	1/3/2015	66	8,839	7,520	6,098	405100	7,308
10	1/3/2015	82	8,677	7,277	6,194	400000	7,221
11	1/4/2015	80	8,533	8,848	6,130	400980	7,367
12	1/4/2015	83	8,708	8,582	6,227	404740	7,431
13	1/5/2015	82	8,559	8,188	6,448	402011	7,987
14	1/6/2015	83	8,656	7,701	6,214	388800	7,028
15	1/7/2015	81	8,607	6,736	6,068	402660	7,238
16	1/7/2015	83	8,682	7,433	6,438	400140	6,970
17	1/7/2015	78	8,582	7,792	0	404920	7,451
18	1/7/2015	81	8,646	7,900	6,480	402060	7,297
19	1/9/2015	80	8,423	6,296	6,416	398220	7,114
20	1/9/2015	83	8,209	7,267	6,154	403400	7,307
21	1/9/2015	86	8,300	6,525	6,352	398140	7,212
22	1/13/2015	82	8,361	6,834	6,258	400160	7,850
23	1/14/2015	86	8,728	7,426	6,606	410480	6,896
24	1/14/2015	80	8,352	7,606	6,340	400420	7,299
25	1/14/2015	86	8,578	8,343	6,220	401360	7,179
26	1/16/2015	85	8,508	7,243	6,348	398720	7,228
27	1/19/2015	84	8,549	7,358	6,480	395600	7,041
28	1/19/2015	85	8,496	8,505	6,922	397720	7,114
29	1/19/2015	84	8,756	8,275	6,480	396720	7,029
30	1/20/2015	88	8,796	7,672	0	405460	8,211
31	1/20/2015	74	8,935	8,861	5,240	345660	7,770
32	1/21/2015	82	8,737	8,962	5,950	399940	7,054
33	1/21/2015	88	8,525	7,310	6,796	399780	7,021
34	1/21/2015	86	8,688	7,648	6,732	395820	7,026
35	1/21/2015	76	8,937	8,388	6,510	403000	9,053
36	1/22/2015	86	8,831	7,136	6,448	401500	7,501
37	1/22/2015	87	8,547	7,012	6,480	402680	6,982
38	1/22/2015	88	8,683	7,818	6,715	408620	7,093
39	1/23/2015	88	8,641	9,173	6,943	405300	6,995
40	1/23/2015	81	8,627	7,771	6,828	400360	6,859
41	1/23/2015	88	8,479	8,971	6,480	399040	6,897
42	1/23/2015	88	8,516	7,081	6,320	402880	6,978
43	1/24/2015	89	8,323	8,347	1	401160	6,919
44	1/24/2015	90	8,280	9,040	6,461	402960	7,071
45	1/24/2015	85	8,209	8,950	6,480	401420	7,055
46	1/24/2015	86	8,559	7,516	6,606	365240	6,765
47	1/25/2015	85	8,399	8,023	6,194	407900	7,103

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NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV
Field: Monongalia
Facility: Beach Pad

Slot: 06
Well: Beach 6H
Wellbore: Beach 6H PWB

BAKER HUGHES

Plot reference wellpath is Beach 6H PWB Rev-8.0	
True vertical depths are referenced to Pioneer 53 (RKB)	Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Pioneer 53 (RKB)	North Reference: Grid north
Pioneer 53 (RKB) to Mean Sea Level: 1376.7 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: 06) = -1358.7 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by steedek on 10/26/2014

Location Information

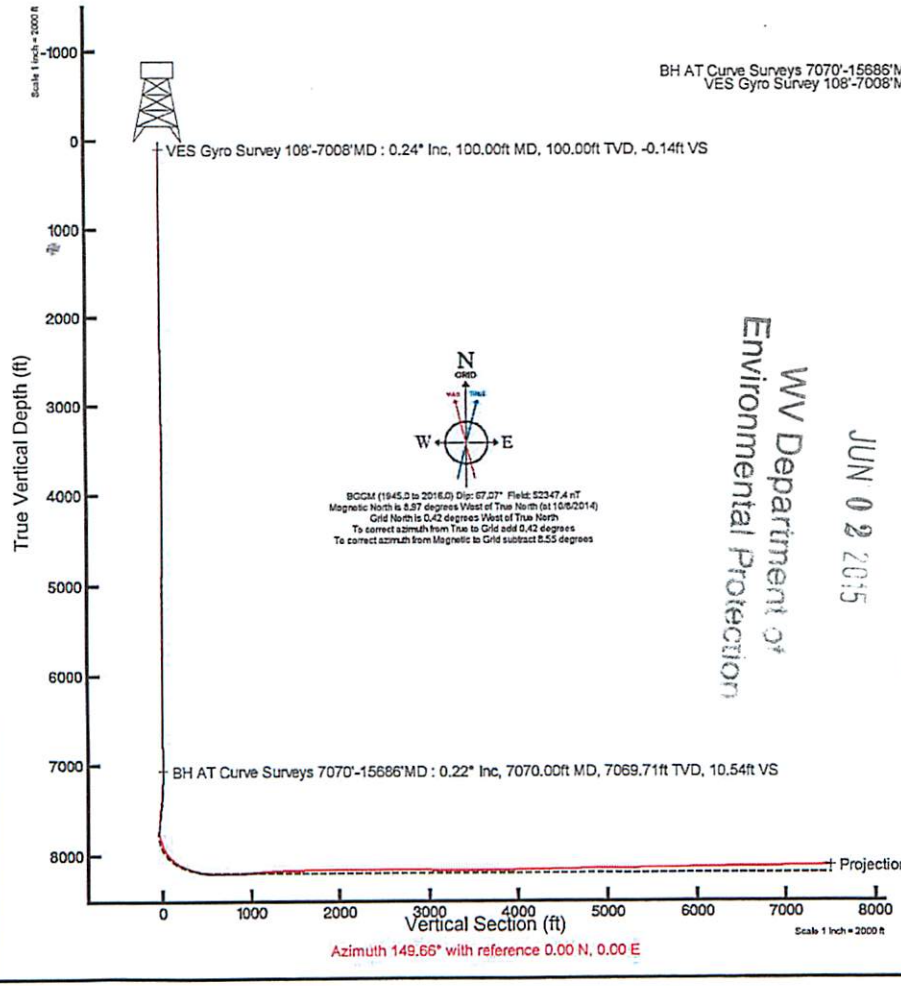
Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Beach Pad			1784915.100	439301.800	39°42'15.411"N	80°09'09.068"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
06	33.00	72.80	1784987.900	439334.800	39°42'15.743"N	80°09'08.132"W
Pioneer 53 (RKB) to Mud line (At Slot: 06)					18ft	
Mean Sea Level to Mud line (At Slot: 06)					-1358.7ft	
Pioneer 53 (RKB) to Mean Sea Level					1376.7ft	

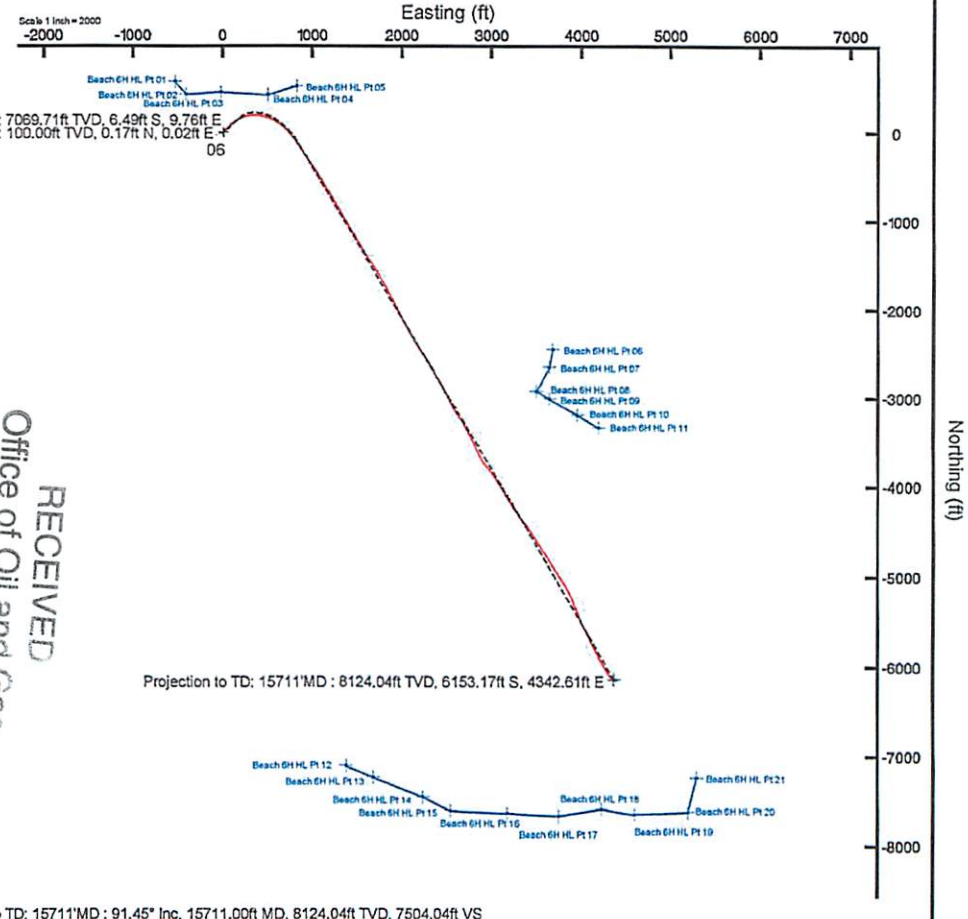
Well Data

Slot	Well	Wellbore	Wellpath
06	Beach 6H	Beach 6H AWB	Beach 6H AWP Proj15711'
06	Beach 6H	Beach 6H PWB	Beach 6H PWB Rev-8.0

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	7008.00	0.342	45.778	7007.71	-6.64	9.51	0.00	10.53
KOP	7158.00	0.342	45.778	7157.71	-6.01	10.15	0.00	10.32
End of 3D Arc	7761.78	42.601	46.408	7706.94	142.96	168.60	7.00	-39.23
LP	8750.85	90.000	149.560	8200.00	-122.51	833.35	10.00	526.68
PBHL	15729.78	90.000	149.560	8200.00	-6145.53	4358.62	0.00	7505.61





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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 28-OCT-14	F.R. # 10011112539	SERV. SUPV. Scott J Carson
LEASE & WELL NAME BEACH 6H - API 47061016680000	LOCATION MOORESVILLE		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PIONEER 63		TYPE OF JOB Long String

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
Latch Down Plug & Assembly, 5-1/2	Float Collar, Al Flap, 5-1/2 - 8rd	NONE			NONE		
	Guide Shoe, Cement Nose, 5-1/2 I						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
ULTRAFLUSH HV			13				100	
50/50 PREMIUM NE-1 .3% R-3 .3% MPA-170	189101269	3,033	14.5	1.17	5.19	10:02	632	374.79
50# SUGAR H2O			8.34				3	
H2O			8.34				347	
200# SUGAR ON SIDE			0				0	
						TOTAL	1082	374.79

Available Mix Water 750 Bbl. Available Displ. Fluid 750 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
8.5	10	15710	4.778	5.5	20	CSG	15661	8125	J-55	15661	15658	1

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
8.8	9.625	40	CSG	2382	2382	NO PACKER				5.5	BUTT	SYNTHETIC MUD	12.5
12.	12.25		OPEN HOLE	2435	2435								
8.8	8.75		OPEN HOLE	7108	7108								

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
347	BBLS	H2O	8.34	2600	0	0	0	0	10112	6500	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 7950 PSI
						CIRCULATING WELL - RIG [X] BJ [X]
09:15						ARRIVE AT LOCATION 10-27-2014 LOCATION TIME 10:30
11:00						PRE-JOB RIG-IN SAFETY MEETING
11:15						RIG-IN
00:10						PRE-JOB SAFETY MEETING 10-28-2014
00:50	300		5	5	H2O	LINE-FILL
00:52	0				H2O	PRESSURE TEST 7950#
00:56	680		5.2	100	ULTRA-FL	13.0# PRE-FLUSH
01:14	1210		5.2	617	SLURRY	14.5# 50/50 PREMIUM NE-1 .3% R-3 .3% MPA-170
03:12	0		5	10	H20	SHUT-DOWN WASH-OUT LINES
03:17	500		2.5	2	SUGAR/H2	PUMP SUGAR WATER
03:18	0					SHUT-DOWN RELEASE-PLUG
03:19	1400		5	1	SUGAR/H2	PUMP SUGAR WATER
03:20	2800		5.9	351	H2O	DISPLACEMENT
04:19	4400					SHUT-DOWN
04:24	0					BLEED-OFF PRESSURE 5 BARREL RETURN
04:26	4490		2.6	5	H2O	RE-PUMP TO VERIFY

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CEMENT JOB REPORT

BAKER HUGHES

PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 7950 PSI
						CIRCULATING WELL - RIG [X] BJ [X]
04:29	4490					SHUT-DOWN
04:31	0					BLEED-OFF PRESSURE 5 BARREL RETURN
04:35						POST-JOB RIG-OUT SAFETY MEETING
04:45						RIG-OUT

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE:
[Y] N	2600	[Y] N	0	1078	0	Y [N]	

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CEMENT JOB REPORT

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CUSTOMER NORTHEAST NATURAL ENER	DATE 09-AUG-14	F.R. # 10011089832	SERV. SUPV. Brian Lough
LEASE & WELL NAME BEACH 6H - API 47061016680000	LOCATION CLAY		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG #		TYPE OF JOB Intermediate

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
9-5/8" Top Cem Plug, Nitri cvr, Phen	Guide Shoe, Cement Nose, 9-5/8 I	NONE			NONE		
	Float Collar, Al Flap, 9-5/8 - 8rd						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
6% GEL W/FLAKE			8.5				25	
FRESH WATER			8.34				10	
PREM NE-1+1.5%CACL		753	15.2	1.26	5.76	03:23	162	99.00
H2O			8.34				177	
						TOTAL	374	99.00

Available Mix Water 500 Bbl. Available Displ. Fluid 500 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
12.25	30	2430	8.835	9.625	40	CSG	2370	2370	J-55	2370	2326	

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
13.	13.38	55.	CSG	1300	1300					9.625	8 RD	OTHER	0

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
175	BBLS	H2O	8.34	838	0	0	0	0	3160	3000	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 3400 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
03:00						ARRIVE ON LOCATION. JOB TIME 0300
03:01						STAGE EQUIPMENT. WAIT ON RIG
06:15						PRE JOB SAFETY MEETING
06:35						SPOT EQUIPMENT / RIG INTO WELL
08:50						SAFETY MEETING WITH RIG CREW
09:54	180		4	5	H2O	LINE FILL
09:55					H2O	PRESSURE TEST BHI IRON TO 3400 PSI
09:56	200		5.8	150	H2O	PUMP PROCESSED H2O AHEAD
10:22	200		5.8	25	GEL	PUMP 6% GEL W/ CELLO FLAKE
10:27	200		5.8	10	H2O	PUMP 10 BBL H2O SPACER
10:30	400		5.8	162	CEMENT	PUMP 753 SKS PREM NE-1+1.5% CACL
10:37	410		5.8		CEMENT	CIRCULATE WELL AT 43 BBLS INTO CMT.
10:57	0		0			SHUT DOWN / DROP PLUG
10:59	200		6.2	178	H2O	DISPLACE W/ PROCESSED H2O
11:29	850		2.5		H2O	CEMENT RETURNS AT 164 BBLS IN DISPL.
11:37	1440		2		H2O	LAND PLUG 500 PSI OVER W.P.
11:43	0					RELEASE PRESSURE / CHECK FLOATS
11:43						END JOB
11:44						SAFETY MEETING / CLEAN PUMPER

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CEMENT JOB REPORT

BAKER HUGHES

PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X] TEST LINES 3400 PSI CIRCULATING WELL - RIG [ ] BJ [X]
BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT SERVICE SUPERVISOR SIGNATURE:
Y N	838	Y [N]	19	530	0	Y [N] BK Lough

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER	DATE	F.R. #	SERV. SUPV.
NORTHEAST NATURAL ENER	06-AUG-14	10011089043	

LEASE & WELL NAME	LOCATION	COUNTY-PARISH-BLOCK
BEACH 6H - API 47061016680000	MORGANTOWN	Monongalia West Virginia
DISTRICT	**DRILLING CONTRACTOR RIG #**	**TYPE OF JOB**
Clarksburg		Surface

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
BJ Cement Plug, Rubber, Top 13-3/i	Guide Shoe, Cement Nose 13-3/8 I						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
500#GEL+25#FLAKE			8.6				25	
PREMIUM NE-1+3%CALCIUM		953	15.2	1.27	5.78	04:31	216.4	131.66
H20			8.34				197.7	
200# SUGAR			0				0	
						TOTAL	439.1	131.66

Available Mix Water 500 Bbl. Available Displ. Fluid 500 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
17.5	30	1361	12.62	13.38	54.5	CSG	1323		J-55	1323	1279	

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
23.	24	101	CSG	40	40					13.375	8RD	OTHER	0

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
197.7	BBLS	H20	8.34	456	0	0	0	0	2184	816	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

PRESSURE/RATE DETAIL TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 2800 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
06:40						ARRIVE@LOCATION/LOCATION TIME 7:00
09:38	121		6	140	H20	AHEAD
10:01	127		5	25	GEL	6%GEL&FLAKE/PRE-FLUSH
10:06	143		5.6	39	H20	SPACER
10:13	260		5.1	215	SLURRY	PREMIUM NE-1+3%CALCIUM
10:55	0					SHUT DOWN/DROP PLUG
10:56	188		7.2		H20	START DISPLACEMENT
11:29	550		3	193.5	H20	END DISPLACEMENT
11:29	816					PLUG DOWN
11:32	693					BLEED OFF PRESSURE
11:32	0					FLOAT HOLDING
11:33						SHUT IN HEAD

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT
[Y] N	550	Y [N]	32	612.5	0	Y [N]

SERVICE SUPERVISOR SIGNATURE: [signature]

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ACTUAL WELLPATH REPORT (CSV version)
Prepared by Baker Hughes
Software System: WellArchitect® 4.0.1

REFERENCE WELLPATH IDENTIFICATION

Operator	NORTHEAST NATURAL ENERGY, LLC
Area	Monongalia County, WV
Field	Monongalia
Facility	Beach Pad
Slot	6
Well	Beach 6H
Wellbore	Beach 6H AWB
Wellpath	Beach 6H AWP Proj:15711'
Sidetrack	(none)

REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
North Reference	Grid
Scale	0.999942
Convergence at slot	0.42° West
Software System	WellArchitect® 4.0.1
User	Stewdenk
Report Generated	10/28/2014 at 5:11:49 PM
DataBase/Source file	WA_Eastern/ev01.xml

WELLPATH LOCATION

	Local Nort [ft]	Local East [ft]	Easting [US ft]	Northing [US ft]	Latitude	Longitude
Slot Location	33	72.8	1784988	439334.8	39°42'15.7	80°09'08.132"W
Facility Reference Pt			1784915	439301.8	39°42'15.4	80°09'09.060"W
Field Reference Pt			1777686	440640.7	39°42'28.1	80°10'41.690"W

WELLPATH DATUM

Calculation method	Minimum curvature
Horizontal Reference Point	Slot
Vertical Reference Point	Pioneer 63 (RKB)
MD Reference Point	Pioneer 63 (RKB)
Field Vertical Reference	Mean Sea Level
Pioneer 63 (RKB) to GL	18.00ft
Pioneer 63 (RKB) to Mean Sea Level	1376.70ft
Pioneer 63 (RKB) to Mud Line at Slot (06)	18.00ft
Section Origin	N 0.00, E 0.00 ft
Section Azimuth	149.66°

WELLPATH DATA † = Interpolated/extrapolated station

	MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Di [ft]	Closure Di [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
†	0	0	7.106	0	0	0	0	1784987.9	439334.8	39°42'15.743"N	80°09'08.132"W	0	0	0	0	0
	18	0	7.106	18	0	0	0	1784987.9	439334.8	39°42'15.743"N	80°09'08.132"W	0	0	0	0	0
	108	0.267	7.106	108	-0.17	0.21	0.03	1784987.93	439335.01	39°42'15.745"N	80°09'08.132"W	0.21	7.106	0.3	0.3	0
	208	0.13	45.873	208	-0.38	0.52	0.14	1784988.04	439335.32	39°42'15.748"N	80°09'08.130"W	0.54	14.723	0.18	-0.14	38.77
	308	0.315	132.265	308	-0.14	0.41	0.42	1784988.32	439335.21	39°42'15.747"N	80°09'08.127"W	0.59	45.595	0.33	0.19	86.39
	408	0.312	152.616	408	0.39	-0.01	0.75	1784988.65	439334.79	39°42'15.742"N	80°09'08.122"W	0.75	91.088	0.11	0	20.35
	508	0.168	185.458	508	0.78	-0.4	0.86	1784988.76	439334.4	39°42'15.739"N	80°09'08.121"W	0.95	115.025	0.19	-0.14	32.84

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608	0.113	228.676	608	0.92	-0.61	0.77	1784988.67	439334.19	39°42'15.737"N	80°09'08.122"W	0.99	128.415	0.12	-0.06	43.22
708	0.085	317.022	708	0.87	-0.62	0.65	1784988.55	439334.18	39°42'15.736"N	80°09'08.124"W	0.9	133.895	0.14	-0.03	88.35
808	0.084	254.195	808	0.78	-0.59	0.53	1784988.43	439334.21	39°42'15.737"N	80°09'08.125"W	0.79	138.191	0.09	0	-62.83
908	0.083	347.613	908	0.69	-0.54	0.44	1784988.34	439334.26	39°42'15.737"N	80°09'08.126"W	0.7	140.685	0.12	0	93.42
1008	0.022	24.529	1008	0.61	-0.45	0.43	1784988.33	439334.35	39°42'15.738"N	80°09'08.126"W	0.63	136.096	0.07	-0.06	36.92
1108	0.076	300.13	1108	0.54	-0.4	0.38	1784988.28	439334.4	39°42'15.739"N	80°09'08.127"W	0.55	136.136	0.08	0.05	-84.4
1208	0.137	314.459	1208	0.37	-0.28	0.24	1784988.14	439334.52	39°42'15.740"N	80°09'08.129"W	0.37	139.494	0.07	0.06	14.33
1308	0.065	312.217	1308	0.2	-0.16	0.11	1784988.01	439334.64	39°42'15.741"N	80°09'08.131"W	0.2	144.634	0.07	-0.07	-2.24
1408	0.318	282.612	1407.99	-0.05	-0.06	-0.2	1784987.7	439334.74	39°42'15.742"N	80°09'08.135"W	0.21	252.607	0.26	0.25	-29.6
1508	0.31	277.159	1507.99	-0.4	0.03	-0.74	1784987.16	439334.83	39°42'15.743"N	80°09'08.141"W	0.74	272.491	0.03	-0.01	-5.45
1608	0.419	268.324	1607.99	-0.74	0.06	-1.37	1784986.53	439334.86	39°42'15.743"N	80°09'08.150"W	1.37	272.301	0.12	0.11	-8.84
1708	0.546	251.258	1707.99	-1.01	-0.11	-2.19	1784985.71	439334.69	39°42'15.741"N	80°09'08.160"W	2.19	267.157	0.19	0.13	-17.07
1808	0.423	239.704	1807.98	-1.11	-0.45	-2.96	1784984.94	439334.35	39°42'15.738"N	80°09'08.170"W	2.99	261.389	0.16	-0.12	-11.55
1908	0.573	221.849	1907.98	-0.96	-1.01	-3.61	1784984.29	439333.79	39°42'15.732"N	80°09'08.178"W	3.75	254.421	0.21	0.15	-17.86
2008	0.688	208.736	2007.97	-0.49	-1.91	-4.23	1784983.67	439332.89	39°42'15.723"N	80°09'08.186"W	4.64	245.764	0.18	0.12	-13.11
2108	0.992	206.812	2107.96	0.28	-3.2	-4.91	1784982.99	439331.6	39°42'15.710"N	80°09'08.195"W	5.86	236.88	0.31	0.3	-1.92
2208	1.176	207.726	2207.95	1.3	-4.89	-5.78	1784982.12	439329.91	39°42'15.694"N	80°09'08.206"W	7.57	229.793	0.18	0.18	0.91
2308	1.183	196.528	2307.92	2.55	-6.78	-6.55	1784981.35	439328.02	39°42'15.675"N	80°09'08.215"W	9.43	224.001	0.23	0.01	-11.2
2408	1.223	179.024	2407.9	4.18	-8.84	-6.83	1784981.07	439325.96	39°42'15.655"N	80°09'08.219"W	11.17	217.676	0.37	0.04	-17.5
2508	1.145	179.14	2507.88	5.98	-10.91	-6.79	1784981.11	439323.89	39°42'15.634"N	80°09'08.218"W	12.85	211.918	0.08	-0.08	0.12
2608	0.81	198.242	2607.87	7.32	-12.58	-7	1784980.9	439322.22	39°42'15.618"N	80°09'08.220"W	14.39	209.098	0.46	-0.33	19.1
2708	0.596	219.7	2707.86	7.96	-13.65	-7.55	1784980.35	439321.15	39°42'15.607"N	80°09'08.227"W	15.6	208.961	0.34	-0.21	21.46
2808	0.362	213.463	2807.86	8.28	-14.31	-8.06	1784979.84	439320.49	39°42'15.600"N	80°09'08.234"W	16.43	209.385	0.24	-0.23	-6.24
2908	0.374	187.273	2907.85	8.68	-14.9	-8.28	1784979.63	439319.9	39°42'15.595"N	80°09'08.237"W	17.04	209.048	0.17	0.01	-26.19
3008	0.441	187.348	3007.85	9.24	-15.6	-8.37	1784979.53	439319.2	39°42'15.588"N	80°09'08.238"W	17.71	208.196	0.07	0.07	0.08
3108	0.38	224.599	3107.85	9.63	-16.22	-8.65	1784979.25	439318.58	39°42'15.582"N	80°09'08.241"W	18.38	208.061	0.27	-0.06	37.25
3208	0.184	213.775	3207.85	9.79	-16.59	-8.97	1784978.93	439318.21	39°42'15.578"N	80°09'08.245"W	18.86	208.396	0.2	-0.2	-10.82
3308	0.297	160.676	3307.85	10.11	-16.97	-8.97	1784978.93	439317.83	39°42'15.574"N	80°09'08.245"W	19.2	207.869	0.24	0.11	-53.1
3408	0.254	176.195	3407.85	10.57	-17.44	-8.87	1784979.03	439317.37	39°42'15.570"N	80°09'08.244"W	19.56	206.971	0.09	-0.04	15.52
3508	0.27	91.628	3507.85	10.89	-17.66	-8.62	1784979.28	439317.14	39°42'15.567"N	80°09'08.241"W	19.66	206.019	0.35	0.02	-84.57
3608	0.47	87.709	3607.84	11.21	-17.65	-7.98	1784979.92	439317.15	39°42'15.567"N	80°09'08.232"W	19.37	204.317	0.2	0.2	-3.92
3708	0.532	95.893	3707.84	11.67	-17.69	-7.11	1784980.79	439317.12	39°42'15.567"N	80°09'08.221"W	19.06	201.889	0.09	0.06	8.18
3808	0.339	128.456	3807.84	12.22	-17.92	-6.41	1784981.49	439316.88	39°42'15.565"N	80°09'08.212"W	19.03	199.691	0.31	-0.19	32.56
3908	0.313	93.205	3907.83	12.65	-18.12	-5.91	1784981.99	439316.69	39°42'15.563"N	80°09'08.206"W	19.05	198.061	0.2	-0.03	-35.25
4008	0.245	44.215	4007.83	12.74	-17.98	-5.49	1784982.41	439316.82	39°42'15.564"N	80°09'08.201"W	18.8	196.969	0.24	-0.07	-48.99
4108	0.193	78.949	4107.83	12.74	-17.79	-5.17	1784982.73	439317.01	39°42'15.566"N	80°09'08.197"W	18.53	196.207	0.14	-0.05	34.73
4208	0.093	125.019	4207.83	12.87	-17.81	-4.94	1784982.96	439316.99	39°42'15.566"N	80°09'08.194"W	18.48	195.504	0.14	-0.1	46.07
4308	0.136	293.533	4307.83	12.85	-17.81	-4.98	1784982.92	439317	39°42'15.566"N	80°09'08.194"W	18.49	195.631	0.23	0.04	168.51
4408	0.16	332.036	4407.83	12.62	-17.64	-5.16	1784982.74	439317.17	39°42'15.568"N	80°09'08.196"W	18.37	196.298	0.1	0.02	38.5
4508	0.313	3.467	4507.83	12.25	-17.24	-5.21	1784982.7	439317.56	39°42'15.572"N	80°09'08.197"W	18.01	196.801	0.2	0.15	31.43
4608	0.402	0.75	4607.83	11.72	-16.62	-5.18	1784982.72	439318.19	39°42'15.578"N	80°09'08.197"W	17.41	197.328	0.09	0.09	-2.72
4708	0.403	1.528	4707.83	11.12	-15.91	-5.17	1784982.73	439318.89	39°42'15.585"N	80°09'08.197"W	16.73	197.999	0.01	0	0.78
4808	0.532	9.061	4807.82	10.47	-15.1	-5.09	1784982.81	439319.7	39°42'15.593"N	80°09'08.196"W	15.94	198.616	0.14	0.13	7.53
4908	0.738	12.25	4907.82	9.63	-14.02	-4.88	1784983.02	439320.79	39°42'15.604"N	80°09'08.193"W	14.84	199.19	0.21	0.21	3.19
5008	0.9	18.42	5007.81	8.64	-12.64	-4.49	1784983.41	439322.16	39°42'15.617"N	80°09'08.188"W	13.42	199.567	0.18	0.16	6.17
5108	0.95	31.707	5107.79	7.73	-11.19	-3.81	1784984.09	439323.61	39°42'15.632"N	80°09'08.180"W	11.82	198.798	0.22	0.05	13.29
5208	0.856	29.188	5207.78	6.97	-9.83	-3.01	1784984.89	439324.97	39°42'15.645"N	80°09'08.170"W	10.28	197.016	0.1	-0.09	-2.52
5308	0.764	49.754	5307.77	6.47	-8.75	-2.14	1784985.76	439326.05	39°42'15.656"N	80°09'08.159"W	9.01	193.719	0.3	-0.09	20.57
5408	0.606	63.663	5407.77	6.4	-8.09	-1.15	1784986.75	439326.72	39°42'15.663"N	80°09'08.146"W	8.17	188.118	0.23	-0.16	13.91
5508	0.39	54.679	5507.76	6.4	-7.65	-0.4	1784987.5	439327.15	39°42'15.667"N	80°09'08.136"W	7.66	183.005	0.23	-0.22	-8.98
5608	0.356	41.811	5607.76	6.28	-7.23	0.08	1784987.98	439327.57	39°42'15.671"N	80°09'08.130"W	7.23	179.341	0.09	-0.03	-12.87
5708	0.436	39.722	5707.76	6.05	-6.7	0.53	1784988.43	439328.1	39°42'15.676"N	80°09'08.125"W	6.72	175.45	0.08	0.08	-2.09
5808	0.359	36.044	5807.75	5.8	-6.16	0.96	1784988.86	439328.64	39°42'15.682"N	80°09'08.119"W	6.23	171.128	0.08	-0.08	-3.68
5908	0.202	29.695	5907.75	5.58	-5.75	1.23	1784989.13	439329.05	39°42'15.686"N	80°09'08.116"W	5.88	167.9	0.16	-0.16	-6.35

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6008	0.184	63.465	6007.75	5.51	-5.52	1.46	1784989.36	439329.28	39°42'15.688"N	80°09'08.113"W	5.71	165.162	0.11	-0.02	33.77
6108	0.272	48.779	6107.75	5.47	-5.3	1.79	1784989.69	439329.5	39°42'15.690"N	80°09'08.109"W	5.59	161.367	0.1	0.09	-14.69
6208	0.365	109.673	6207.75	5.67	-5.25	2.26	1784990.16	439329.55	39°42'15.691"N	80°09'08.103"W	5.71	156.659	0.33	0.09	60.89
6308	0.616	98.18	6307.75	6.25	-5.43	3.1	1784991	439329.37	39°42'15.689"N	80°09'08.092"W	6.25	150.311	0.27	0.25	-11.49
6408	0.461	102.356	6407.74	6.86	-5.59	4.02	1784991.92	439329.21	39°42'15.688"N	80°09'08.080"W	6.89	144.285	0.16	-0.15	4.18
6508	0.432	108.304	6507.74	7.41	-5.8	4.77	1784992.67	439329	39°42'15.686"N	80°09'08.070"W	7.51	140.542	0.05	-0.03	5.95
6608	0.56	97.033	6607.74	7.99	-5.98	5.62	1784993.51	439328.82	39°42'15.684"N	80°09'08.060"W	8.2	136.783	0.16	0.13	-11.27
6708	0.728	116.753	6707.73	8.82	-6.32	6.67	1784994.57	439328.48	39°42'15.681"N	80°09'08.046"W	9.19	133.475	0.28	0.17	19.72
6808	0.712	106.31	6807.72	9.81	-6.78	7.83	1784995.73	439328.02	39°42'15.676"N	80°09'08.031"W	10.36	130.895	0.13	-0.02	-10.44
6908	0.502	82.598	6907.72	10.43	-6.9	8.86	1784996.76	439327.9	39°42'15.675"N	80°09'08.018"W	11.23	127.906	0.32	-0.21	-23.71
7008	0.342	45.778	7007.71	10.53	-6.64	9.51	1784997.41	439328.16	39°42'15.678"N	80°09'08.010"W	11.6	124.905	0.31	-0.16	-36.82
7070	0.22	84.05	7069.71	10.54	-6.49	9.76	1784997.66	439328.31	39°42'15.679"N	80°09'08.007"W	11.72	123.637	0.35	-0.2	61.73
7126	0.33	87.01	7125.71	10.65	-6.47	10.03	1784997.93	439328.33	39°42'15.679"N	80°09'08.003"W	11.94	122.846	0.2	0.2	5.29
7189	2.78	45.1	7188.68	10.35	-5.39	11.29	1784999.19	439329.41	39°42'15.690"N	80°09'07.987"W	12.51	115.501	4.04	3.89	-66.52
7252	7.8	34.47	7251.4	8.15	-0.78	14.8	1785002.7	439334.02	39°42'15.736"N	80°09'07.943"W	14.82	93.02	8.08	7.97	-16.87
7316	11.67	37.55	7314.46	3.86	7.93	21.2	1785009.1	439342.73	39°42'15.822"N	80°09'07.861"W	22.64	69.481	6.1	6.05	4.81
7378	15.37	42.65	7374.74	-0.9	18.95	30.59	1785018.49	439353.75	39°42'15.932"N	80°09'07.742"W	35.99	58.221	6.26	5.97	8.23
7442	19.57	45.06	7435.77	-6.09	32.77	43.93	1785031.83	439367.57	39°42'16.070"N	80°09'07.573"W	54.81	53.281	6.66	6.56	3.77
7505	24.6	46.13	7494.13	-11.82	49.32	60.87	1785048.76	439384.12	39°42'16.234"N	80°09'07.358"W	78.34	50.982	8.01	7.98	1.7
7568	29.32	47.51	7550.27	-18.14	68.84	81.71	1785069.6	439403.63	39°42'16.429"N	80°09'07.093"W	106.84	49.885	7.56	7.49	2.19
7631	32.87	49.94	7604.21	-24.27	90.27	106.17	1785094.07	439425.06	39°42'16.642"N	80°09'06.782"W	139.36	49.629	5.98	5.63	3.86
7694	37.5	52.35	7655.69	-29.6	113	134.46	1785122.35	439447.79	39°42'16.869"N	80°09'06.422"W	175.64	49.956	7.67	7.35	3.83
7757	41.51	55.38	7704.29	-33.6	136.58	166.84	1785154.73	439471.38	39°42'17.104"N	80°09'06.010"W	215.62	50.694	7.06	6.37	4.81
7821	40.53	67.93	7752.66	-32.19	156.48	203.63	1785191.51	439491.27	39°42'17.304"N	80°09'05.541"W	256.81	52.459	12.95	-1.53	19.61
7884	41.12	77.26	7800.38	-22.98	168.75	242.84	1785230.72	439503.54	39°42'17.428"N	80°09'05.041"W	295.72	55.204	9.72	0.94	14.81
7947	41.56	79.83	7847.68	-9.51	177.01	283.62	1785271.5	439511.8	39°42'17.512"N	80°09'04.520"W	334.32	58.031	2.78	0.7	4.08
8010	42.93	84.37	7894.33	6.67	182.81	325.55	1785313.43	439517.6	39°42'17.572"N	80°09'03.984"W	373.36	60.684	5.31	2.17	7.21
8073	45.46	92.84	7939.54	27.95	183.8	369.37	1785357.25	439518.59	39°42'17.585"N	80°09'03.423"W	412.57	63.545	10.19	4.02	13.44
8136	48	100.01	7982.75	55.42	178.62	414.89	1785402.76	439513.4	39°42'17.537"N	80°09'02.840"W	451.7	66.707	9.21	4.03	11.38
8198	51.13	105.36	8022.97	87.63	168.21	460.88	1785448.75	439503	39°42'17.438"N	80°09'02.251"W	490.62	69.949	8.28	5.05	8.63
8262	55.91	110.56	8061.03	126.07	152.29	509.77	1785497.63	439487.08	39°42'17.284"N	80°09'01.624"W	532.03	73.367	9.92	7.47	8.12
8325	61.69	116.77	8093.67	169.67	130.6	559.03	1785546.89	439465.39	39°42'17.073"N	80°09'00.992"W	574.08	76.85	12.45	9.17	9.86
8388	67.26	122.87	8120.83	218.96	102.3	608.27	1785596.13	439437.09	39°42'16.797"N	80°09'00.359"W	616.81	80.453	12.43	8.84	9.68
8452	72.05	128.95	8143.09	273.86	67.1	656.8	1785644.66	439401.89	39°42'16.453"N	80°08'59.735"W	660.21	84.167	11.63	7.48	9.5
8515	72.75	135.08	8162.16	331.06	26.92	701.38	1785689.24	439361.72	39°42'16.059"N	80°08'59.161"W	701.9	87.802	9.34	1.11	9.73
8578	74.13	139.78	8180.12	390.05	-17.54	742.21	1785730.07	439317.26	39°42'15.622"N	80°08'58.634"W	742.42	91.354	7.48	2.19	7.46
8641	77.41	142.8	8195.61	450.46	-65.19	780.38	1785768.24	439269.62	39°42'15.154"N	80°08'58.142"W	783.1	94.775	6.98	5.21	4.79
8705	82.25	144.64	8206.91	513.09	-115.96	817.64	1785805.49	439218.85	39°42'14.655"N	80°08'57.660"W	825.82	98.072	8.07	7.56	2.87
8767	88.46	146.8	8211.93	574.71	-166.99	852.42	1785840.27	439167.82	39°42'14.153"N	80°08'57.210"W	868.63	101.084	10.6	10.02	3.48
8800	90.06	146.71	8212.35	607.66	-194.59	870.51	1785858.36	439140.22	39°42'13.882"N	80°08'56.976"W	892	102.601	4.86	4.85	-0.27
8831	90.65	147.69	8212.16	638.63	-220.65	887.3	1785875.15	439114.17	39°42'13.625"N	80°08'56.759"W	914.33	103.965	3.69	1.9	3.16
8894	89.82	146.73	8211.9	701.57	-273.61	921.42	1785909.27	439061.21	39°42'13.105"N	80°08'56.318"W	961.19	106.538	2.01	-1.32	-1.52
8955	89.57	146.42	8212.23	762.48	-324.52	955.02	1785942.87	439010.3	39°42'12.604"N	80°08'55.883"W	1008.65	108.768	0.65	-0.41	-0.51
9019	91.82	146.37	8211.45	826.37	-377.81	990.44	1785978.28	438957.01	39°42'12.080"N	80°08'55.425"W	1060.05	110.88	3.52	3.52	-0.08
9083	93.11	146.44	8208.7	890.21	-431.07	1025.82	1786013.66	438903.75	39°42'11.556"N	80°08'54.968"W	1112.71	112.793	2.02	2.02	0.11
9146	94.13	146.6	8204.72	952.99	-483.51	1060.5	1786048.34	438851.31	39°42'11.040"N	80°08'54.519"W	1165.53	114.51	1.64	1.62	0.25
9210	94.25	148.82	8200.04	1016.77	-537.47	1094.6	1786082.43	438797.36	39°42'10.509"N	80°08'54.078"W	1219.43	116.152	3.46	0.19	3.47
9272	93.66	149.38	8195.77	1078.62	-590.54	1126.36	1786114.19	438744.29	39°42'09.987"N	80°08'53.666"W	1271.78	117.668	1.31	-0.95	0.9
9336	94.13	149.21	8191.42	1142.47	-645.44	1158.97	1786146.8	438689.4	39°42'09.447"N	80°08'53.244"W	1326.57	119.114	0.78	0.73	-0.27
9399	93.88	149.32	8187.02	1205.32	-699.46	1191.08	1786178.91	438635.38	39°42'08.915"N	80°08'52.828"W	1381.28	120.423	0.43	-0.4	0.17
9463	92.46	149.28	8183.48	1269.22	-754.41	1223.71	1786211.53	438580.44	39°42'08.375"N	80°08'52.406"W	1437.56	121.654	2.22	-2.22	-0.06
9526	92.31	148.31	8180.86	1332.15	-808.24	1256.32	1786244.14	438526.6	39°42'07.845"N	80°08'51.984"W	1493.85	122.755	1.56	-0.24	-1.54
9589	92.46	152.42	8178.24	1395.08	-862.94	1287.44	1786275.26	438471.91	39°42'07.306"N	80°08'51.581"W	1549.89	123.833	6.52	0.24	6.52
9652	91.26	152.65	8176.19	1457.97	-918.81	1316.48	1786304.3	438416.04	39°42'06.756"N	80°08'51.204"W	1605.41	124.912	1.94	-1.9	0.37

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9715	91.14	150.87	8174.87	1520.91	-974.3	1346.28	1786334.1	438360.56	39°42'06.210"N	80°08'50.817"W	1661.85	125.893	2.83	-0.19	-2.83
9778	91.29	150.34	8173.54	1583.89	-1029.18	1377.19	1786365.01	438305.69	39°42'05.670"N	80°08'50.417"W	1719.26	126.771	0.87	0.24	-0.84
9842	90.86	148.84	8172.34	1647.87	-1084.36	1409.58	1786397.4	438250.5	39°42'05.127"N	80°08'49.997"W	1778.42	127.57	2.44	-0.67	-2.34
9905	89.29	146.34	8172.25	1710.83	-1137.54	1443.35	1786431.16	438197.33	39°42'04.604"N	80°08'49.561"W	1837.73	128.243	4.69	-2.49	-3.97
9969	89.88	149.54	8172.72	1774.79	-1191.77	1477.31	1786465.12	438143.1	39°42'04.070"N	80°08'49.121"W	1898.1	128.894	5.08	0.92	5
10031	89.78	150.73	8172.9	1836.78	-1245.54	1508.19	1786495.99	438089.34	39°42'03.541"N	80°08'48.721"W	1956.01	129.552	1.93	-0.16	1.92
10094	90.4	152.91	8172.8	1899.73	-1301.07	1537.93	1786525.74	438033.81	39°42'02.995"N	80°08'48.335"W	2014.45	130.231	3.6	0.98	3.46
10158	90.31	149.52	8172.41	1963.7	-1357.15	1568.75	1786556.55	437977.73	39°42'02.442"N	80°08'47.936"W	2074.32	130.864	5.3	-0.14	-5.3
10221	90.34	145.46	8172.05	2026.64	-1410.26	1602.6	1786590.4	437924.62	39°42'01.920"N	80°08'47.498"W	2134.75	131.347	6.44	0.05	-6.44
10285	90.22	142.94	8171.73	2090.34	-1462.17	1640.03	1786627.83	437872.72	39°42'01.410"N	80°08'47.014"W	2197.19	131.719	3.94	-0.19	-3.94
10348	90.46	146.76	8171.36	2153.11	-1513.67	1676.3	1786664.09	437821.22	39°42'00.903"N	80°08'46.546"W	2258.58	132.082	6.08	0.38	6.06
10412	90.34	148.66	8170.91	2217.07	-1567.77	1710.48	1786698.28	437767.13	39°42'00.371"N	80°08'46.103"W	2320.27	132.507	2.97	-0.19	2.97
10475	90.46	149.56	8170.47	2280.06	-1621.83	1742.82	1786730.62	437713.07	39°41'59.839"N	80°08'45.685"W	2380.71	132.94	1.44	0.19	1.43
10539	90.09	150.97	8170.17	2344.06	-1677.4	1774.57	1786762.36	437657.5	39°41'59.292"N	80°08'45.273"W	2441.88	133.388	2.28	-0.58	2.2
10602	90.4	151.24	8169.9	2407.04	-1732.56	1805.01	1786792.8	437602.35	39°41'58.749"N	80°08'44.879"W	2501.96	133.827	0.65	0.49	0.43
10665	89.6	152.21	8169.9	2469.99	-1788.04	1834.85	1786822.64	437546.87	39°41'58.203"N	80°08'44.492"W	2561.98	134.26	2	-1.27	1.54
10728	89.35	152.89	8170.47	2532.91	-1843.94	1863.89	1786851.68	437490.97	39°41'57.653"N	80°08'44.115"W	2621.87	134.692	1.15	-0.4	1.08
10791	89.97	152.82	8170.85	2595.81	-1900	1892.63	1786880.42	437434.91	39°41'57.101"N	80°08'43.742"W	2681.8	135.111	0.99	0.98	-0.11
10855	90.15	152.63	8170.78	2659.72	-1956.89	1921.96	1786909.75	437378.03	39°41'56.541"N	80°08'43.362"W	2742.87	135.516	0.41	0.28	-0.3
10918	89.57	152.87	8170.94	2722.63	-2012.89	1950.81	1786938.59	437322.03	39°41'55.989"N	80°08'42.988"W	2803.11	135.897	1	-0.92	0.38
10981	89.69	154.25	8171.34	2785.48	-2069.3	1978.86	1786966.64	437265.62	39°41'55.434"N	80°08'42.624"W	2863.2	136.28	2.2	0.19	2.19
11044	88.77	152.51	8172.19	2848.34	-2125.62	2007.08	1786994.86	437209.31	39°41'54.879"N	80°08'42.258"W	2923.46	136.643	3.12	-1.46	-2.76
11107	89.91	153.12	8172.91	2911.24	-2181.65	2035.86	1787023.64	437153.28	39°41'54.327"N	80°08'41.884"W	2984.02	136.98	2.05	1.81	0.97
11170	90.06	152.3	8172.93	2974.15	-2237.64	2064.75	1787052.52	437097.3	39°41'53.776"N	80°08'41.510"W	3044.7	137.301	1.32	0.24	-1.3
11233	89.75	150.67	8173.04	3037.11	-2293	2094.82	1787082.6	437041.94	39°41'53.231"N	80°08'41.120"W	3105.82	137.586	2.63	-0.49	-2.59
11297	90.03	149.66	8173.16	3101.11	-2348.51	2126.66	1787114.43	436986.43	39°41'52.685"N	80°08'40.707"W	3168.31	137.838	1.64	0.44	-1.58
11360	89.26	148.34	8173.55	3164.1	-2402.51	2159.11	1787146.88	436932.43	39°41'52.154"N	80°08'40.287"W	3230.14	138.054	2.43	-1.22	-2.1
11422	89.26	146.8	8174.35	3226.05	-2454.84	2192.35	1787180.12	436880.11	39°41'51.639"N	80°08'39.857"W	3291.3	138.233	2.48	0	-2.48
11485	90.15	145.56	8174.67	3288.93	-2507.17	2227.42	1787215.18	436827.78	39°41'51.124"N	80°08'39.404"W	3353.7	138.382	2.42	1.41	-1.97
11548	89.97	146.82	8174.61	3351.82	-2559.52	2262.47	1787250.23	436775.44	39°41'50.609"N	80°08'38.950"W	3416.13	138.525	2.02	-0.29	2
11612	90.03	149.84	8174.61	3415.79	-2613.98	2296.07	1787283.83	436720.98	39°41'50.073"N	80°08'38.516"W	3479.2	138.705	4.72	0.09	4.72
11675	89.35	149.5	8174.95	3478.79	-2668.36	2327.88	1787315.64	436666.6	39°41'49.538"N	80°08'38.104"W	3541.07	138.898	1.21	-1.08	-0.54
11739	90.62	152.3	8174.97	3542.77	-2724.27	2359	1787346.76	436610.69	39°41'48.988"N	80°08'37.700"W	3603.69	139.11	4.8	1.98	4.38
11802	89.69	152.5	8174.8	3605.7	-2780.1	2388.19	1787375.95	436554.87	39°41'48.438"N	80°08'37.322"W	3665.03	139.336	1.51	-1.48	0.32
11865	89.14	149.92	8175.44	3668.66	-2835.31	2418.53	1787406.28	436499.66	39°41'47.895"N	80°08'36.929"W	3726.69	139.536	4.19	-0.87	-4.1
11927	90.12	150.13	8175.84	3730.66	-2889.01	2449.5	1787437.26	436445.96	39°41'47.366"N	80°08'36.528"W	3787.67	139.706	1.62	1.58	0.34
11990	90.68	152.38	8175.4	3793.63	-2944.24	2479.8	1787467.55	436390.73	39°41'46.823"N	80°08'36.135"W	3849.41	139.894	3.68	0.89	3.57
12054	90.15	152.75	8174.94	3857.55	-3001.04	2509.28	1787497.03	436333.94	39°41'46.263"N	80°08'35.753"W	3911.88	140.1	1.01	-0.83	0.58
12117	91.48	154.96	8174.04	3920.37	-3057.59	2537.04	1787524.79	436277.4	39°41'45.706"N	80°08'35.392"W	3973.09	140.316	4.09	2.11	3.51
12180	90.74	153.12	8172.82	3983.17	-3114.22	2564.61	1787552.36	436220.77	39°41'45.149"N	80°08'35.034"W	4034.3	140.528	3.15	-1.17	-2.92
12243	90.28	146.37	8172.26	4046.13	-3168.6	2596.33	1787584.08	436166.39	39°41'44.614"N	80°08'34.624"W	4096.46	140.669	10.74	-0.73	-10.71
12306	89.94	146.82	8172.14	4109.04	-3221.19	2631.02	1787618.76	436113.8	39°41'44.096"N	80°08'34.175"W	4159.13	140.759	0.9	-0.54	0.71
12369	92.09	150.33	8171.02	4172	-3274.93	2663.85	1787651.59	436060.06	39°41'43.567"N	80°08'33.750"W	4221.53	140.875	6.53	3.41	5.57
12432	91.26	150.93	8169.18	4234.97	-3329.81	2694.74	1787682.48	436005.19	39°41'43.027"N	80°08'33.350"W	4283.6	141.018	1.63	-1.32	0.95
12495	90.83	152.17	8168.03	4297.92	-3385.19	2724.75	1787712.48	435949.81	39°41'42.482"N	80°08'32.961"W	4345.55	141.169	2.08	-0.68	1.97
12558	91.63	153.78	8166.68	4360.8	-3441.3	2753.36	1787741.1	435893.71	39°41'41.930"N	80°08'32.590"W	4407.22	141.337	2.85	1.27	2.56
12622	91.57	154.11	8164.89	4424.59	-3498.77	2781.46	1787769.2	435836.24	39°41'41.364"N	80°08'32.225"W	4469.67	141.516	0.52	-0.09	0.52
12685	91.23	156.46	8163.35	4487.27	-3555.98	2807.79	1787795.53	435779.03	39°41'40.800"N	80°08'31.883"W	4530.86	141.705	3.77	-0.54	3.73
12748	91.17	154.81	8162.03	4549.91	-3613.35	2833.78	1787821.51	435721.66	39°41'40.235"N	80°08'31.545"W	4592.02	141.895	2.62	-0.1	-2.62
12812	90.95	152.88	8160.85	4613.72	-3670.79	2861.98	1787849.71	435664.23	39°41'39.669"N	80°08'31.179"W	4654.64	142.058	3.03	-0.34	-3.02
12875	90.58	147.09	8160.01	4676.69	-3725.31	2893.48	1787881.21	435609.71	39°41'39.133"N	80°08'30.771"W	4717.01	142.163	9.21	-0.59	-9.19
12938	90.58	139.85	8159.37	4739.28	-3775.9	2930.96	1787918.68	435559.13	39°41'38.635"N	80°08'30.287"W	4779.95	142.18	11.49	0	-11.49
13001	90.65	142.91	8158.69	4801.61	-3825.11	2970.27	1787957.99	435509.92	39°41'38.152"N	80°08'29.780"W	4842.93	142.17	4.86	0.11	4.86
13065	90.49	145.12	8158.05	4865.29	-3876.89	3007.87	1787995.59	435458.14	39°41'37.643"N	80°08'29.294"W	4906.89	142.194	3.46	-0.25	3.45

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13128	90.52	146.58	8157.5	4928.15	-3929.03	3043.23	1788030.95	435406.01	39°41'37.130"N	80°08'28.837"W	4969.76	142.24	2.32	0.05	2.32
13191	90.62	148.15	8156.87	4991.09	-3982.08	3077.21	1788064.92	435352.96	39°41'36.608"N	80°08'28.398"W	5032.51	142.304	2.5	0.16	2.49
13254	90.58	149.02	8156.21	5054.08	-4035.84	3110.04	1788097.75	435299.21	39°41'36.079"N	80°08'27.973"W	5095.13	142.382	1.38	-0.06	1.38
13317	90.49	148.92	8155.62	5117.07	-4089.82	3142.52	1788130.23	435245.23	39°41'35.548"N	80°08'27.552"W	5157.72	142.462	0.21	-0.14	-0.16
13380	90.62	149.48	8155.01	5180.07	-4143.93	3174.77	1788162.48	435191.12	39°41'35.016"N	80°08'27.135"W	5220.28	142.543	0.91	0.21	0.89
13443	90.55	148.91	8154.37	5243.06	-4198.04	3207.03	1788194.74	435137.01	39°41'34.483"N	80°08'26.717"W	5282.86	142.622	0.91	-0.11	-0.9
13506	90.62	148.4	8153.73	5306.05	-4251.84	3239.8	1788227.51	435083.21	39°41'33.954"N	80°08'26.293"W	5345.51	142.693	0.82	0.11	-0.81
13570	90.74	147.91	8152.97	5370.02	-4306.21	3273.57	1788261.27	435028.85	39°41'33.419"N	80°08'25.856"W	5409.22	142.758	0.79	0.19	-0.77
13633	90.06	143.65	8152.53	5432.86	-4358.29	3308.99	1788296.69	434976.78	39°41'32.907"N	80°08'25.398"W	5472.12	142.793	6.85	-1.08	-6.76
13696	89.69	140.66	8152.67	5495.31	-4408.03	3347.64	1788335.34	434927.04	39°41'32.418"N	80°08'24.899"W	5535.11	142.785	4.78	-0.59	-4.75
13759	89.91	142.96	8152.88	5557.72	-4457.54	3386.59	1788374.28	434877.53	39°41'31.931"N	80°08'24.397"W	5598.09	142.774	3.67	0.35	3.65
13822	91.72	146.79	8151.99	5620.48	-4509.05	3422.82	1788410.52	434826.02	39°41'31.425"N	80°08'23.928"W	5661.03	142.798	6.72	2.87	6.08
13885	91.23	147.8	8150.37	5683.4	-4562.05	3456.85	1788444.54	434773.03	39°41'30.903"N	80°08'23.488"W	5723.82	142.847	1.78	-0.78	1.6
13948	90.52	147.68	8149.4	5746.36	-4615.31	3490.47	1788478.16	434719.76	39°41'30.379"N	80°08'23.053"W	5786.58	142.9	1.14	-1.13	-0.19
14011	90.98	146.16	8148.58	5809.28	-4668.1	3524.86	1788512.54	434666.99	39°41'29.860"N	80°08'22.609"W	5849.42	142.944	2.52	0.73	-2.41
14075	91.05	145.16	8147.45	5873.11	-4720.93	3560.95	1788548.64	434614.15	39°41'29.341"N	80°08'22.142"W	5913.34	142.973	1.57	0.11	-1.56
14138	91.98	147.05	8145.78	5935.97	-4773.2	3596.07	1788583.75	434561.88	39°41'28.826"N	80°08'21.688"W	5976.22	143.006	3.34	1.48	3
14202	91.48	149.47	8143.85	5999.91	-4827.6	3629.72	1788617.4	434507.49	39°41'28.291"N	80°08'21.253"W	6039.92	143.062	3.86	-0.78	3.78
14264	90.74	147.48	8142.65	6061.88	-4880.44	3662.13	1788649.81	434454.65	39°41'27.771"N	80°08'20.833"W	6101.63	143.117	3.42	-1.19	-3.21
14327	91.02	147.25	8141.68	6124.83	-4933.49	3696.1	1788683.78	434401.61	39°41'27.249"N	80°08'20.394"W	6164.45	143.16	0.58	0.44	-0.37
14390	90.62	147.13	8140.78	6187.76	-4986.43	3730.24	1788717.91	434348.67	39°41'26.729"N	80°08'19.953"W	6227.29	143.201	0.66	-0.63	-0.19
14453	90.4	145.31	8140.22	6250.64	-5038.79	3765.26	1788752.93	434296.31	39°41'26.214"N	80°08'19.500"W	6290.2	143.231	2.91	-0.35	-2.89
14517	90.4	146.88	8139.77	6314.51	-5091.91	3800.96	1788788.63	434243.2	39°41'25.691"N	80°08'19.038"W	6354.12	143.26	2.45	0	2.45
14580	90.49	150.63	8139.28	6377.49	-5145.76	3833.63	1788821.3	434189.35	39°41'25.161"N	80°08'18.615"W	6416.82	143.314	5.95	0.14	5.95
14644	90.52	155.31	8138.72	6441.37	-5202.75	3862.71	1788850.37	434132.36	39°41'24.600"N	80°08'18.238"W	6479.9	143.408	7.31	0.05	7.31
14707	90.4	157.27	8138.21	6503.94	-5260.43	3888.04	1788875.7	434074.69	39°41'24.032"N	80°08'17.909"W	6541.32	143.531	3.12	-0.19	3.11
14770	90.37	157.81	8137.79	6566.34	-5318.65	3912.11	1788899.77	434016.47	39°41'23.458"N	80°08'17.596"W	6602.47	143.664	0.86	-0.05	0.86
14833	90.52	158.79	8137.3	6628.63	-5377.18	3935.4	1788923.06	433957.95	39°41'22.881"N	80°08'17.293"W	6663.44	143.801	1.57	0.24	1.56
14897	90.77	157.63	8136.58	6691.91	-5436.6	3959.15	1788946.81	433898.53	39°41'22.296"N	80°08'16.983"W	6725.44	143.936	1.85	0.39	-1.81
14960	90.74	156.34	8135.75	6754.39	-5494.58	3983.78	1788971.44	433840.55	39°41'21.725"N	80°08'16.663"W	6786.82	144.056	2.05	-0.05	-2.05
15023	90.74	153.49	8134.93	6817.11	-5551.63	4010.49	1788998.14	433783.51	39°41'21.163"N	80°08'16.316"W	6848.69	144.156	4.52	0	-4.52
15086	90.58	151.6	8134.21	6880.03	-5607.53	4039.53	1789027.19	433727.61	39°41'20.612"N	80°08'15.940"W	6911.02	144.232	3.01	-0.25	-3
15149	90.65	153.93	8133.53	6942.93	-5663.53	4068.36	1789056.01	433671.61	39°41'20.061"N	80°08'15.566"W	6973.32	144.309	3.7	0.11	3.7
15213	90.55	154.04	8132.86	7006.74	-5721.05	4096.43	1789084.08	433614.1	39°41'19.494"N	80°08'15.202"W	7036.41	144.396	0.23	-0.16	0.17
15276	91.29	153.32	8131.85	7069.58	-5777.51	4124.36	1789112.01	433557.64	39°41'18.938"N	80°08'14.839"W	7098.59	144.478	1.64	1.17	-1.14
15340	91.05	152.68	8130.54	7133.45	-5834.52	4153.41	1789141.05	433500.63	39°41'18.377"N	80°08'14.462"W	7161.87	144.554	1.07	-0.38	-1
15402	91.05	152.83	8129.41	7195.35	-5889.63	4181.78	1789169.43	433445.52	39°41'17.834"N	80°08'14.094"W	7223.23	144.624	0.24	0	0.24
15466	90.46	151.31	8128.56	7259.29	-5946.17	4211.76	1789199.4	433388.99	39°41'17.278"N	80°08'13.706"W	7286.69	144.69	2.55	-0.92	-2.38
15529	90.58	147.57	8127.99	7322.27	-6000.41	4243.78	1789231.43	433334.75	39°41'16.744"N	80°08'13.291"W	7349.46	144.73	5.94	0.19	-5.94
15591	91.26	147.75	8127	7384.23	-6052.78	4276.94	1789264.59	433282.38	39°41'16.229"N	80°08'12.862"W	7411.37	144.755	1.13	1.1	0.29
15654	91.48	146.84	8125.49	7447.16	-6105.78	4310.97	1789298.61	433229.39	39°41'15.707"N	80°08'12.422"W	7474.29	144.776	1.49	0.35	-1.44
15686	91.45	146.05	8124.67	7479.09	-6132.44	4328.66	1789316.29	433202.73	39°41'15.445"N	80°08'12.194"W	7506.27	144.783	2.47	-0.09	-2.47
15711	91.45	146.05	8124.04	7504.04	-6153.17	4342.61	1789330.25	433182	39°41'15.241"N	80°08'12.013"W	7531.25	144.787	0	0	0

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape	Comment
Beach 6H BHL Rev2		8200	-6145.63	4358.62	1789346	433189.5	39°41'15.5	80°08'11.809"	point	
Beach 6H LP Rev		8200	-122.51	833.35	1785821	439212.3	39°42'14.5	80°08'57.459"	point	
Beach 6H HL Pt 01		8215	562.74	-530.86	1784457	439897.5	39°42'21.2	80°09'14.976"	point	
Beach 6H HL Pt 02		8215	418.95	-405.91	1784582	439753.7	39°42'19.8	80°09'13.364"	point	
Beach 6H HL Pt 03		8215	445.1	-20.55	1784967	439779.9	39°42'20.1	80°09'08.436"	point	
Beach 6H HL Pt 04		8215	415.35	499.39	1785487	439750.1	39°42'19.8	80°09'01.781"	point	
Beach 6H HL Pt 05		8215	508.59	820.88	1785809	439843.4	39°42'20.8	80°08'57.676"	point	

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Beach 6H HL Pt 06	8215	-2460.11	3674.69	1788662	436874.8	39°41'51.6	80°08'20.893"	point
Beach 6H HL Pt 07	8215	-2661.39	3633.03	1788621	436673.6	39°41'49.6	80°08'21.408"	point
Beach 6H HL Pt 08	8215	-2935.9	3493.09	1788481	436399.1	39°41'46.5	80°08'23.173"	point
Beach 6H HL Pt 09	8215	-3017.12	3635.97	1788624	436317.9	39°41'46.1	80°08'21.338"	point
Beach 6H HL Pt 10	8215	-3200.67	3944.29	1788932	436134.3	39°41'44.3	80°08'17.377"	point
Beach 6H HL Pt 11	8215	-3345.45	4185.96	1789174	435989.6	39°41'42.9	80°08'14.272"	point
Beach 6H HL Pt 12	8215	-7117.75	1347	1786335	432217.5	39°41'05.4	80°08'50.242"	point
Beach 6H HL Pt 13	8215	-7244.51	1654.55	1786642	432090.7	39°41'04.2	80°08'46.296"	point
Beach 6H HL Pt 14	8215	-7466.9	2217.17	1787205	431868.4	39°41'02.1	80°08'39.080"	point
Beach 6H HL Pt 15	8215	-7623.45	2527.35	1787515	431711.8	39°41'00.5	80°08'35.098"	point
Beach 6H HL Pt 16	8215	-7650.53	3162.13	1788150	431684.7	39°41'00.3	80°08'26.977"	point
Beach 6H HL Pt 17	8215	-7687.28	3733.97	1788722	431648	39°41'00.0	80°08'19.659"	point
Beach 6H HL Pt 18	8215	-7603.31	4215.66	1789203	431732	39°41'00.9	80°08'13.506"	point
Beach 6H HL Pt 19	8215	-7665.55	4584.84	1789572	431669.7	39°41'00.3	80°08'08.778"	point
Beach 6H HL Pt 20	8215	-7637.67	5194.25	1790182	431697.6	39°41'00.6	80°08'00.986"	point
Beach 6H HL Pt 21	8215	-7245.41	5290.84	1790278	432089.8	39°41'04.5	80°07'59.786"	point
Beach 6H LP Plat	8215	-118.81	831.25	1785819	439216	39°42'14.6	80°08'57.486"	point

WELLPATH COMPOSITION Ref Wellbore: Beach 6H AWB Ref Wellpath: Beach 6H AWP Proj:15711'

Log Name/Comment	Start MD [ft]	End MD [ft]	Pos Unc Model
02_VES Gyro (100'-7000') GRID NORTH	18	7008	Generic gyro - northseeking (Standard)
03_BH AT Curve 8.5in Section 7070'-15686'	7008	15686	NaviTrak (AT Curve Short Spaced)
Projection to bit	15686	15711	Blind Drilling (std)

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	12/30/2014
Job End Date:	1/25/2015
State:	West Virginia
County:	Monongalia
API Number:	47-061-01668-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Beach 6H
Longitude:	-80.15225900
Latitude:	39.70437300
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	8,164
Total Base Water Volume (gal):	14,492,467
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Interstate Oil & Gas Compact Commission

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
Proppant Transport	Schlumberger	Corrosion Inhibitor, AntiFoam Agent, Acid, Breaker, Gelling Agent, Friction Reducer, Rheology Modifier, Iron Control Agent, Accelerator, Propping Agen					
			Water (Including Mix Water Supplied by Client)*	NA		86.55014	
			Crystalline silica	14808-60-7	98.83650	13.29337	
			Hydrochloric acid	7647-01-0	0.71362	0.09598	
			Ammonium sulfate	7783-20-2	0.16801	0.02260	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.12400	0.01668	
			Guar gum	9000-30-0	0.04830	0.00650	
			Calcium chloride	10043-52-4	0.03642	0.00490	
			Erucic amidopropyl dimethyl betaine	149879-98-1	0.01705	0.00229	
			Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01329	0.00179	
			Propan-2-ol	67-63-0	0.01277	0.00172	

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			Urea	57-13-6	0.00816	0.00110	
			Sodium chloride	7647-14-5	0.00295	0.00040	
			Polypropylene glycol	25322-69-4	0.00289	0.00039	
			Sodium erythorbate	6381-77-7	0.00216	0.00029	
			Methanol	67-56-1	0.00210	0.00028	
			Sodium sulfate	7757-82-6	0.00190	0.00026	
			Non-crystalline silica (impurity)	7631-86-9	0.00182	0.00024	
			Potassium chloride	7447-40-7	0.00169	0.00023	
			Fatty acids, tall-oil	61790-12-3	0.00146	0.00020	
			Diammonium peroxidisulphate	7727-54-0	0.00127	0.00017	
			Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00121	0.00016	
			Alcohols, C14-15, ethoxylated (7EO)	68951-67-7	0.00057	0.00008	
			2-propenamid	79-06-1	0.00041	0.00005	
			Propargyl alcohol	107-19-7	0.00038	0.00005	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00021	0.00003	
			Sodium chloroacetate	3926-62-3	0.00022	0.00003	
			Hexadec-1-ene	629-73-2	0.00013	0.00002	
			Dimethyl siloxanes and silicones	63148-62-9	0.00012	0.00002	
			Polyvinyl acetate, partially hydrolyzed	304443-60-5	0.00005	0.00001	
			1-Octadecene (C18)	112-88-9	0.00006	0.00001	
			Copper(II) sulfate	7758-98-7			
			Siloxanes and Silicones, di-Me, reaction products with silica	67762-90-7	0.00002		
			Decamethyl cyclopentasiloxane	541-02-6	0.00001		
			Octamethylcyclotetrasiloxane	556-67-2	0.00001		
			Dodecamethylcyclohexasiloxane	540-97-6			
			Formaldehyde	50-00-0	0.00001		
SC-30	X-Chem	Scale Inhibitor					
			Sodium Polyacrylate	2594-41-5	14.71000		
			Water	7732-18-5	85.29000		
Chlorine Dioxide	X-Chem	Microbial Control					
			ClO2	10049-04-4	100.00000		Gas

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.

* 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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SURFACE HOLE DEC. LONG: 80.152467
SURVEYED LONG: 80° 09' 08.9"

7,730'

Latitude: 39° 42' 30" (NAD 27)

TOP HOLE (UTM 83)
N) 4395289.8
E) 572674.5

BOTTOM HOLE (UTM 83)
N) 4393022.0
E) 574287.4

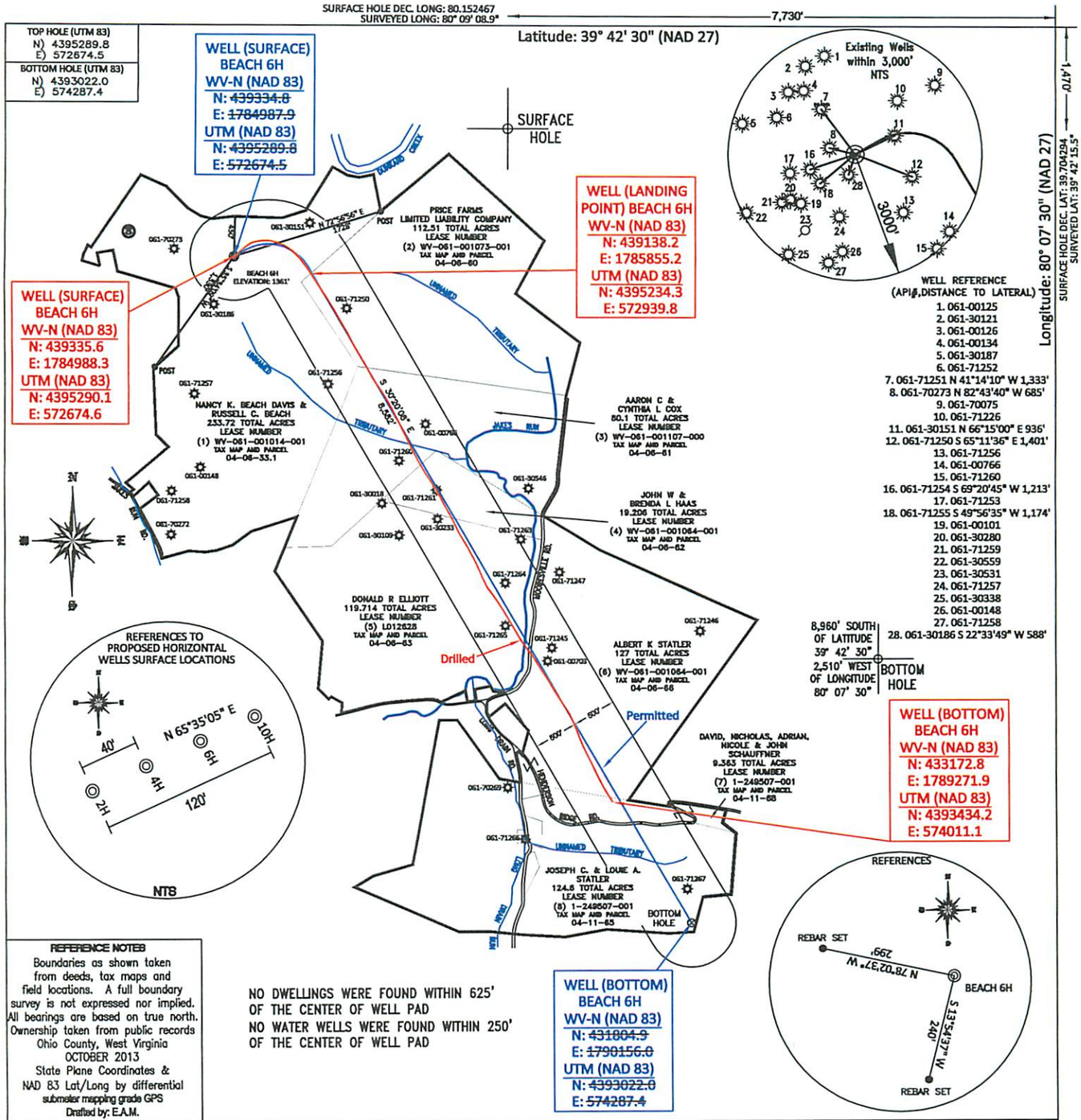
WELL (SURFACE)
BEACH 6H
WV-N (NAD 83)
N: ~~439334.8~~
E: ~~1784987.9~~
UTM (NAD 83)
N: ~~4395289.8~~
E: ~~572674.5~~

WELL (SURFACE)
BEACH 6H
WV-N (NAD 83)
N: 439335.6
E: 1784988.3
UTM (NAD 83)
N: 4395290.1
E: 572674.6

WELL (LANDING POINT) BEACH 6H
WV-N (NAD 83)
N: 439138.2
E: 1785855.2
UTM (NAD 83)
N: 4395234.3
E: 572939.8

WELL (BOTTOM)
BEACH 6H
WV-N (NAD 83)
N: 433172.8
E: 1789271.9
UTM (NAD 83)
N: 4393434.2
E: 574011.1

WELL (BOTTOM)
BEACH 6H
WV-N (NAD 83)
N: ~~431804.9~~
E: ~~1790156.0~~
UTM (NAD 83)
N: ~~4393022.0~~
E: ~~574287.4~~



REFERENCE NOTES
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Ohio County, West Virginia OCTOBER 2013 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS Drafted by: E.A.M.

NO DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF WELL PAD
NO WATER WELLS WERE FOUND WITHIN 250' OF THE CENTER OF WELL PAD

FILE #: NNE009
DRAWING #: 2295
SCALE: PLAT = (1"=1600') TICK MARK = (1"=2000')
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: APRIL 3, 2015

OPERATOR'S WELL #: BEACH 6H AS-DRILLED PLAT

API WELL #: 47 (STATE) 61 (COUNTY) ____ (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: DUNKARD CREEK
ELEVATION : 1361'
COUNTY/DISTRICT: MONONGALIA / CLAY
QUADRANGLE: BLACKSVILLE, WV.
SURFACE OWNER: NANCY K. BEACH DAVIS & RUSSELL C. BEACH
ACREAGE: 233.72 +/-
OIL & GAS ROYALTY OWNER: (SEE ATTACHMENT)
ACREAGE: 826.21 +/-
LEASE NUMBERS:

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 8,125' TMD: 15,710'
WELL OPERATOR : NORTHEAST NATURAL ENERGY LLC
DESIGNATED AGENT : JOHN ADAMS
ADDRESS: 707 VIRGINIA STREET SUITE 1200
ADDRESS: 707 VIRGINIA STREET SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301
CITY: CHARLESTON STATE: WV ZIP CODE: 25301

WR-35
Rev. 8/23/13

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

API 47 - 061 - 01669 County Monongalia District Clay
Quad Blacksville, WV Pad Name Beach Field/Pool Name Blacksville
Farm name Nancy Kay Beach Davis and Russell C. Beach Well Number 10H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia Street E., Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4395295.1	Easting 572685.5
Landing Point of Curve	Northing 4395366.3	Easting 573144.2
Bottom Hole	Northing 4393558.7	Easting 574227.9

Elevation (ft) 1361 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion □ Single ■ Multiple Fluids Produced ■ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Based Mud for horizontal section

BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-SEAL PLUS, HRP, LIME, M-I WATE (BARITE), M-I-X II MEDIUM, MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUI

Date permit issued 5-16-14 Date drilling commenced 8-23-14 Date drilling ceased 11-9-14
Date completion activities began 12/30/2014 Date completion activities ceased 1/25/2014
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 1,206' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,550' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 300',800' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
AL 6/3/15 ✓
W.S. 6/3/15

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API 47- 061 - 01669 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 10H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30	24	52'	N	N/A	N/A	Y to surface
Surface	17.5	13 3/8	1,305'	N	54.5	N/A	Y 32 BBL return
Coal							
Intermediate 1	12.25	9 5/8	2,366'	N	40	N/A	Y 19 BBL return
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15,961'	N	20	N/A	Y 5 BBL return
Tubing							
Packer type and depth set							

Comment Details All casing and cement jobs went with out issue.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	4,500 psi ready mix	36.4		.75	27.27	CTS	48
Surface	Class A	1004	15.2	1.27	1,271	CTS	8
Coal							
Intermediate 1	Class A	852	15.2	1.26	1,074	CTS	8
Intermediate 2							
Intermediate 3							
Production	50/50 Premium NE- 1.3% R-3 3% MPA 170	3,192	14.5	1.17	2,661	CTS	48
Tubing							

Drillers TD (ft) 15,961' Loggers TD (ft) 15,936'
Deepest formation penetrated Marcellus Plug back to (ft) N/A
Plug back procedure

Kick off depth (ft) 6,423'

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction
☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
Surface: bow spring centralizers every 3rd joint or aprox 120'
Intermediate: bow spring centralizers every 3rd joint or aprox 120'
Production: Hard bodied spiral centralizers every other joint or aprox 80' from TD to KOP then bow spring from KOP to 9 5/8" every forth joint or aprox 140'

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 061 - 01669 Farm name Nancy Kay Beach Davis and Russell C. Beach Well number 10H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					*See Attachment

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS			
Marcellus	8,119'	TVD	15,961'	MD

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown ■ Open Flow OIL TEST □ Flow □ Pump

SHUT-IN PRESSURE Surface 3950 psi Bottom Hole _____ psi DURATION OF TEST 48 hrs

OPEN FLOW Gas 6,450 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY □ Estimated ■ Orifice □ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		See Attachment

Please insert additional pages as applicable.

Drilling Contractor Pioneer 63
Address 1250 NE Loop 410 Suite 1000 City San Antonio State TX Zip 78209

Logging Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Cementing Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Schlumberger
Address 1080 US-33 City Weston State WV Zip 26452

Please insert additional pages as applicable.

Completed by Zack Arnold Telephone 304-203-8059
Signature _____ Title General Manager - Operations Date 4/29/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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Beach 10H

Lithology/Formation	Top Depth in FT Name TVD	Bottom Depth in FT TVD	Top Depth in FT MD	Bottom Depth in FT MD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Sand/Shale	0	50	0		sand/shale
Red Rock	50	350			red rock
Sand/shale	350	2125			sand/shale
Big Lime	2125	2280			limestone
Injun	2280	2398			sandstone
Sand/Shale	2398	3480			sand/shale
Shale	3480	6400			shale
Geneseo	7886	7913	8315	8377	shale
Tully	7913	7976	8377	8450	limestone
Hamilton	7976	8054	8450	8637	shale
Marcellus	8054	8147	8637	8764	shale
Cherry Valley	8147	8156	8764	8779	limestone
Lower Marcellus	8156		8779		shale

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Perforation Record					
Stage Number	Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12/30/2014	15,890	15,732	40	Marcellus Shale
2	12/30/2014	15,690	15,332	40	Marcellus Shale
3	12/30/2014	15,490	15,332	40	Marcellus Shale
4	1/1/2015	15,290	15,132	40	Marcellus Shale
5	1/1/2015	15,090	14,932	40	Marcellus Shale
6	1/2/2015	14,890	14,733	40	Marcellus Shale
7	1/2/2015	14,690	14,532	40	Marcellus Shale
8	1/3/2015	14,490	14,332	40	Marcellus Shale
9	1/3/2015	14,290	14,132	40	Marcellus Shale
10	1/4/2015	14,090	13,932	40	Marcellus Shale
11	1/4/2015	13,890	13,732	40	Marcellus Shale
12	1/5/2015	13,690	13,532	40	Marcellus Shale
13	1/6/2015	13,490	13,332	40	Marcellus Shale
14	1/8/2015	13,290	13,132	40	Marcellus Shale
15	1/9/2015	13,090	12,932	40	Marcellus Shale
16	1/15/2015	12,890	12,732	40	Marcellus Shale
17	1/15/2015	12,690	12,532	40	Marcellus Shale
18	1/15/2015	12,490	12,332	40	Marcellus Shale
19	1/16/2015	12,290	12,132	40	Marcellus Shale
20	1/16/2015	12,090	11,942	40	Marcellus Shale
21	1/16/2015	11,890	11,734	40	Marcellus Shale
22	1/17/2015	11,690	11,532	40	Marcellus Shale
23	1/19/2015	11,484	11,332	40	Marcellus Shale
24	1/19/2015	11,290	11,132	40	Marcellus Shale
25	1/20/2015	11,090	10,932	40	Marcellus Shale
26	1/20/2015	10,890	10,732	40	Marcellus Shale
27	1/21/2015	10,690	10,532	40	Marcellus Shale
28	1/21/2015	10,940	10,336	40	Marcellus Shale
29	1/21/2015	10,290	10,132	40	Marcellus Shale
30	1/22/2015	10,090	9,930	40	Marcellus Shale
31	1/22/2015	9,890	9,730	40	Marcellus Shale
32	1/22/2015	9,690	9,532	40	Marcellus Shale
33	1/23/2015	9,490	9,332	40	Marcellus Shale
34	1/24/2015	9,290	9,132	40	Marcellus Shale
35	1/24/2015	9,090	8,932	40	Marcellus Shale
36	1/25/2015	8,884	8,702	40	Marcellus Shale

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Stimulation Record							
Stage Number	Date	Average Treating Rate (BPM)	Average Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Propant Amount (lbs)	Total Clean Fluid (Bbls)
1	12/30/2014	77	8,870	7,159	5,817	399400	7,588
2	12/30/2014	78	8,735	6,867	5,876	394120	7,487
3	12/30/2014	80	8,672	6,604	6,355	400480	7,440
4	1/1/2015	82	8,939	7,813	6,352	399400	7,533
5	1/1/2015	84	8,972	7,221	5,718	403140	7,427
6	1/2/2015	80	8,804	7,900	6,194	399400	7,519
7	1/2/2015	83	8,876	7,671	6,346	403920	7,359
8	1/3/2015	83	8,780	7,871	6,068	405666	7,389
9	1/3/2015	80	8,869	7,277	8,940	391343	8,389
10	1/4/2015	82	8,789	7,572	6,068	399180	7,261
11	1/4/2015	79	8,761	8,642	0	401890	7,154
12	1/5/2015	83	8,612	7,704	6,514	398380	7,256
13	1/6/2015	83	8,650	7,585	6,480	401060	7,226
14	1/8/2015	82	8,685	7,700	5,908	396460	7,272
15	1/9/2015	80	8,470	8,431	6,542	399620	7,237
16	1/15/2015	76	8,440	6,655	0	401600	10,367
17	1/15/2015	88	8,603	8,499	6,670	396800	7,103
18	1/15/2015	85	8,729	8,404	6,130	380440	6,954
19	1/16/2015	87	8,552	7,614	6,701	399320	7,102
20	1/16/2015	85	8,307	7,482	6,574	398500	7,264
21	1/16/2015	89	8,789	7,167	5,972	397080	7,914
22	1/17/2015	90	8,565	6,652	6,068	403240	7,078
23	1/19/2015	84	8,520	8,407	6,448	399560	6,954
24	1/19/2015	90	8,710	8,143	6,320	400640	7,018
25	1/20/2015	84	8,565	7,259	0	397920	6,983
26	1/20/2015	88	8,675	7,684	6,542	385540	6,934
27	1/21/2015	90	8,525	8,253	5,940	404060	7,099
28	1/21/2015	88	8,622	8,005	0	402840	6,599
29	1/21/2015	88	8,663	8,532	6,216	380180	6,856
30	1/22/2015	80	8,643	7,859	6,828	366720	7,316
31	1/22/2015	82	8,636	8,198	6,384	401540	7,374
32	1/22/2015	88	8,485	8,605	6,384	401560	6,989
33	1/23/2015	88	8,358	6,903	6,447	403120	6,921
34	1/24/2015	88	8,318	8,184	6,130	397040	7,123
35	1/24/2015	90	8,583	8,540	6,195	391340	8,292
36	1/25/2015	79	8,394	9,038	5,593	393420	7,070

NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV
Field: Monongalia
Facility: Beach Pad

Slot: 10
Well: Beach 10H
Wellbore: Beach 10H PWB

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Plot reference wellpath is Beach 10H PWB Rev-A.0	
True vertical depths are referenced to Pioneer 63 (RKB)	Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Pioneer 63 (RKB)	North Reference: Grid north
Pioneer 63 (RKB) to Mean Sea Level: 1376.7 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: 10): -1358.7 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: steedenk on 11/11/2014

Location Information

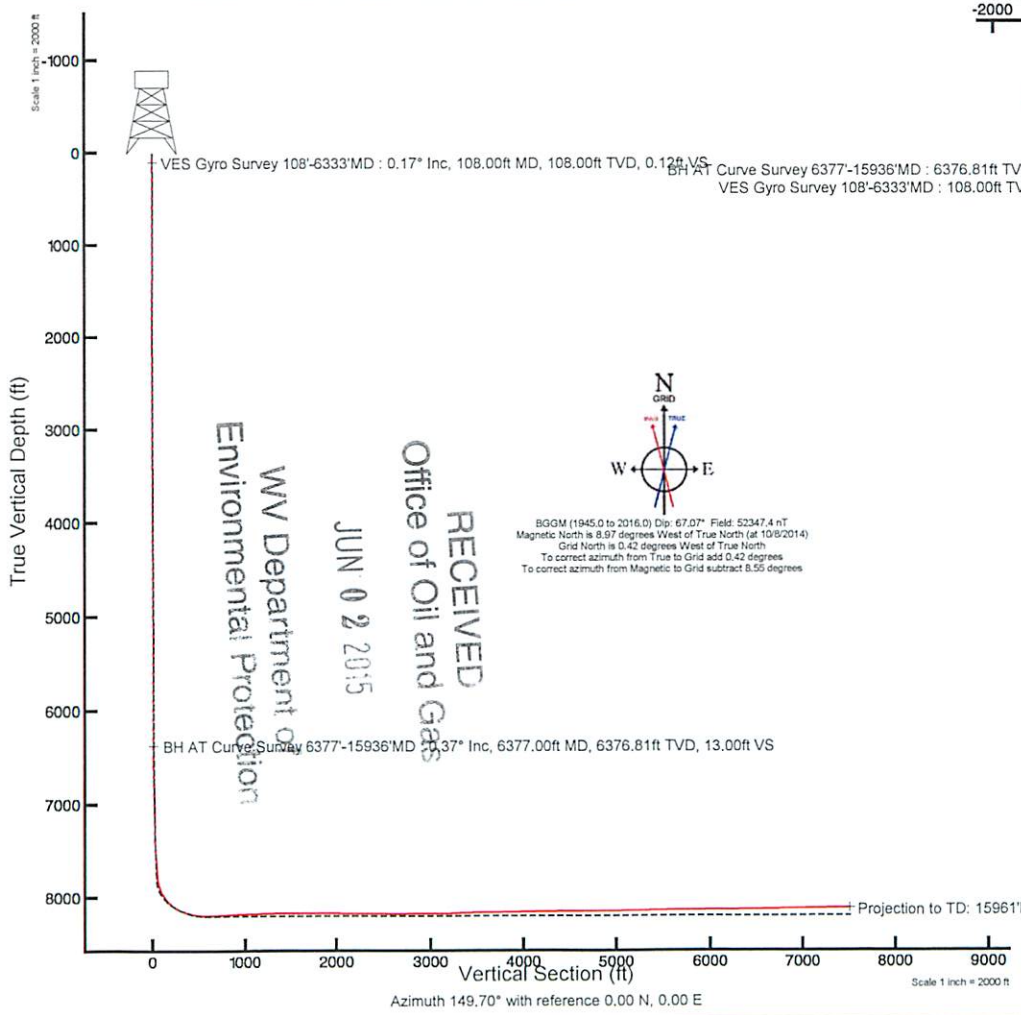
Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Beach Pad			1784915.100	439301.800	39°42'15.411"N	80°09'09.060"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
10	49.60	109.31	1785024.400	439351.400	39°42'15.909"N	80°09'07.667"W
Pioneer 63 (RKB) to Mud line (At Slot: 10)					18ft	
Mean Sea Level to Mud line (At Slot: 10)					-1358.7ft	
Pioneer 63 (RKB) to Mean Sea Level					1376.7ft	

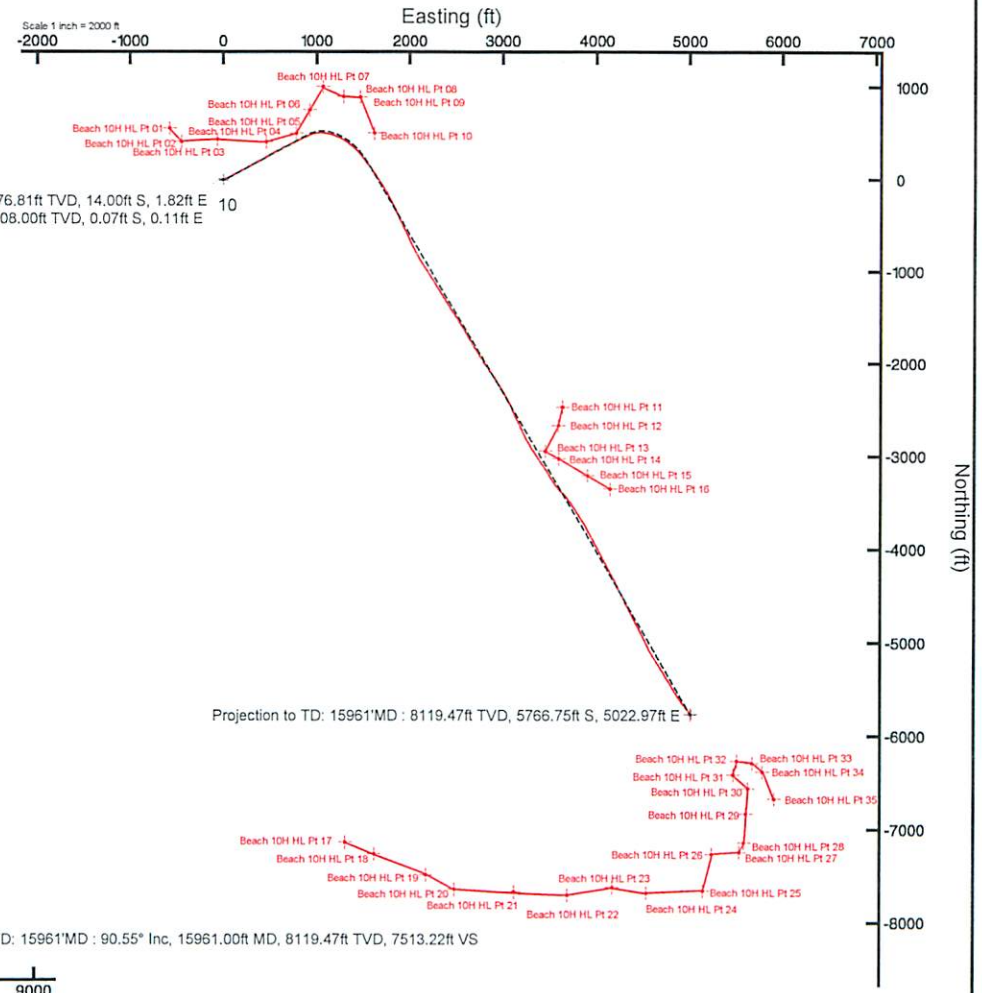
Well Data

Slot	Well	Wellbore	Wellpath
10	Beach 10H	Beach 10H AWB	Beach 10H AWP Proj: 15961'
10	Beach 10H	Beach 10H PWB	Beach 10H PWB Rev-A.0

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Surface	6333.00	0.330	125.210	6332.82	-13.87	1.58	0.00	12.77
KOP	6433.00	0.330	125.210	6432.81	-14.20	2.05	0.00	13.30
3D Arc (XS)	6979.73	43.882	61.188	6927.47	80.88	178.00	8.00	19.98
EoH_SoB&T	8189.47	43.882	61.188	7799.40	485.01	912.76	0.00	41.75
LP	9079.15	90.000	149.700	8205.00	187.14	1538.46	10.00	614.62
PBHL	15978.10	90.000	149.700	8205.00	-5769.38	5019.17	0.00	7513.57





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CEMENT JOB REPORT

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CUSTOMER NORTHEAST NATURAL ENER	DATE 08-NOV-14	F.R. # 10011116588	SERV. SUPV. Scott J Carson
LEASE & WELL NAME BEACH 10H - API 47061016690000	LOCATION BLACKSVILLE		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PERFORMANCE #1		TYPE OF JOB Long String

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
Latch Down Plug & Assembly, 5-1/2	Float Collar, Al Flap, 5-1/2 - 8rd	NONE			NONE		
	Guide Shoe, Cement Nose, 5-1/2 i						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
ULTRA-FLUSH HV			13				100	
50/50 PREM NE-1 .25% R-3 .3% MPA-170	189101286	3,095	14.5	1.17	5.2	06:04	645	383.23
50# SUGAR+H2O			8.34				4	
H2O			8.34				352	
200# SUGAR ON SIDE			0				0	
						TOTAL	1101	383.23

Available Mix Water 750 Bbl. Available Displ. Fluid 750 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
8.5	10	15961	4.778	5.5	20	CSG	15935	8119	J-55	15935	15923	1

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
8.8	9.625	40	CSG	2374	2374	NO PACKER				5.5	BUTT	SYNTHETIC MUD	12.5
12.	12.25		OPEN HOLE	2438	2438								
8.8	8.75		OPEN HOLE	6408	6408								

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
353	BBLS	H2O	8.34	2600	0	0	0	0	10112	6000	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW X CO. REP. X
						TEST LINES 7900 PSI
						CIRCULATING WELL - RIG X BJ X
04:05						ARRIVE AT LOCATION 11-08-2014
04:30						PRE-JOB RIG-IN SAFETY MEETING
04:45						RIG-IN
07:30						PRE-JOB SAFETY MEETING
08:03	250		5	5	H2O	LINE-FILL
08:05	0				H2O	PRESSURE TEST 7900#
08:09	500		5	100	ULTRA-FL	PRE-FLUSH 13.0#
08:29	700		5	630	SLURRY	14.5# 50/50 PREMIUM NE-1 .25% R-3 .3% MPA-170
10:33	0		5	10	H2O	SHUT-DOWN WASH-OUT LINES
10:39	500		2	3	SUGAR/H2	PUMP SUGAR WATER
10:40	0					SHUT-DOWN RELEASE-PLUG
10:41	600		2	1	SUGAR/W	START DISPLACEMENT 1BBL. SUGAR WATER
10:42	2500		5.1	352	H2O	DISPLACEMENT
11:45	5000					SHUT-DOWN
11:50	0					BLEED-OFF PRESSURE
11:55						POST-JOB RIG-OUT SAFETY MEETING

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CEMENT JOB REPORT

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PRESSURE/RATE DETAIL						EXPLANATION
TIME HR:MIN.	PRESSURE - PSI		RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW [X] CO. REP. [X]
	PIPE	ANNULUS				TEST LINES 7900 PSI
						CIRCULATING WELL - RIG [X] BJ [X]
12:05						RIG-OUT

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE:
[Y] N	2600	[Y] N	0	1044	0	Y [N]	

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CALFRAC WELL SERVICES

JOB SUMMARY

Customer Rep:	Jim Cover	Calfrac Rep:	James Dreves	Version: 5.9

LSD: Beach 10H WV
Customer: Northeast Natural Energy
6240 Mid Atlantic Drive
Morgantown, WV
26508

Calfrac Service Line: CEMENT
Job Date: 27-Aug-14
Job Type: Intermediate
Program Number: CAEH2024JH
Service Order #: 180450

Open Hole Information

	OH Diameter (in)	OH Depth Top (ft)	OH Depth Bottom (ft)	Excess (%)	Capacity (bbl/ft)	Volume (bbl)	Vol + XS (bbl)
1	17.50	1310	1350	30%	0.2975	11.9	15.5
2	12.25	1350	2406	30%	0.1458	153.9	200.1

Pipe Information

	Description OD/Wt/Grade	Pipe MD Top (ft)	Pipe MD Bottom (ft)	Pipe TVD Top (ft)	Pipe TVD Bottom (ft)	Capacity (bbl/ft)	ID (in)
1	13.375in - 54.5LB - J-55	0	1310	0	1310	0.1546	12.615
2	9.625in - 40LB - J-55	0	2366	0	2366	0.0758	8.835

Slurry Blend Information

Slurry 1					
Blend Name	0:1 Class A Intermediate Lead (15.6 ppg)		Lead	Amount	460 sks
Constituent 1	Class A Cement	94.00	#/sk	Yield	1.18 ft3/sk
Constituent 2			#/sk	Density	15.60 ppg
Constituent 3			#/sk	Water	5.22 gal/sk
Add 1	Celloflake	0.25	#/sk	Slurry	542 ft3
Add 2					

Slurry 2					
Blend Name	0:1 Class A Intermediate Tail (15.6 ppg)		Tail	Amount	356 sks
Constituent 1	Class A Cement	94.00	#/sk	Yield	1.20 ft3/sk
Constituent 2			#/sk	Density	15.61 ppg
Constituent 3			#/sk	Water	5.27 gal/sk
Add 1	Calcium Chloride (CaCl2, 94%)	2.00	%bwob	Slurry	427 ft3
Add 2					

Top of Cement Information

Top of Cement	Designed (ft)	Actual / Est. (ft)
Tail	1366	

1366

Spacer Information

	Description	Weight (ppg)	Volume (bbls)	Purpose
Spacer 1	Viscous Spacer		25	
Spacer 2	Water		176	

Misc Information

Mud Type:	Air	Ambient Temperature (°F)	68	pH	6
Yield Point:		Mix Water Temperature (°F)	72	Sodium (ppm)	
Density (ppg):	NA	Cement Temperature (°F)	68	Chlorides (ppm)	
		Slurry Temperature (°F)	75		

Cement Returns:	YES	10	bbls	Stg 2 - Cement Returns:	
Spacer Returns:	YES	25	bbls	Stg 2 - Spacer Returns:	

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CEMENT JOB REPORT

BAKER HUGHES

CUSTOMER NORTHEAST NATURAL ENER	DATE 24-AUG-14	F.R. # 941810047	SERV. SUPV. Bobby L Conrad
LEASE & WELL NAME BEACH 10H - API 47061016690000	LOCATION CLAY		COUNTY-PARISH-BLOCK Monongalia West Virginia
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # PERFORMANCE		TYPE OF JOB Surface

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
BJ 13.375 INCH TRP	Float Shoe 13-3/8 - 8rd						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
500#GEL+25#FLAKE			8.6				25	
PREM NE-1+3CALCIUM		982	15.2	1.27	5.78	04:31	223	135.68
H20			8.34				195.4	
200# SUGAR			0				0	
						TOTAL	443.4	135.68

Available Mix Water 400 Bbl. Available Displ. Fluid 450 Bbl.

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. ID	OD	WGT.	TYPE	MD	TVD	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
17.5	30	1364	12.62	13.38	54.5	CSG	1305		J-55	1305	1264	

LAST CASING ID	OD	WGT	TYPE	MD	TVD	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
23.	24	95.	CSG	40	40					9.625	8RD	OTHER	0

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER
195.4	BBLS	H20	8.34	451	0	0	0	0	2184	700	TANK

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

PRESSURE/RATE DETAIL TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 2600 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
05:00						PUMP TRUCK @ LOCATION 8;24;2014
06:16						BULK TRUCKS ON LOCATION
13:10	114		6.4	180	H20	AHEAD
13:38	159		6.3	25	GEL	6%GEL&FLAKE/PRE-FLUSH
13:42	139		5.9	10	H20	SPACER
13:44	256		5.2	218	SLURRY	PREMIUM NE-1+3%CALCIUM
14:26	0					SHUT DOWN/DROP PLUG
14:27	177		7.2		H20	START DISPLACEMENT
15:00	444		2.5	203	H20	END DISPLACEMENT
15:00	655					PLUG DOWN
15:02	0					BLEED OFF 1 BARREL BACK
15:03	0					COMING BACK JUST LITTLE TRICKLE/SHUT IN HEAD

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT
Y [N]	444	Y [N]	40	636	0	Y [N]

SERVICE SUPERVISOR SIGNATURE: BJ Conrad

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ACTUAL WELLPATH REPORT (CSV version)
Prepared by Baker Hughes
Software System: WellArchitect® 4.0.1

REFERENCE WELLPATH IDENTIFICATION

Operator	NORTHEAST NATURAL ENERGY, LLC
Area	Monongalia County, WV
Field	Monongalia
Facility	Beach Pad
Slot	10
Well	Beach 10H
Wellbore	Beach 10H AWB
Wellpath	Beach 10H AWP Proj: 15961'
Sidetrack	(none)

REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet
North Reference	Grid
Scale	0.999942
Convergence at slot	0.42° West
Software System	WellArchitect® 4.0.1
User	Stewdenk
Report Generated	11/11/2014 at 2:05:52 PM
DataBase/Source file	WA_Eastern/ev12.xml

WELLPATH LOCATION	Local Nort [ft]	Local East [ft]	Easting [US ft]	Northing [US ft]	Latitude	Longitude
Slot Location	49.6	109.31	1785024	439351.4	39°42'15.9	80°09'07.667"W
Facility Reference Pt			1784915	439301.8	39°42'15.4	80°09'09.060"W
Field Reference Pt			1777686	440640.7	39°42'28.1	80°10'41.690"W

WELLPATH DATUM

Calculation method	Minimum curvature
Horizontal Reference Point	Slot
Vertical Reference Point	Pioneer 63 (RKB)
MD Reference Point	Pioneer 63 (RKB)
Field Vertical Reference	Mean Sea Level
Pioneer 63 (RKB) to GL	18.00ft
Pioneer 63 (RKB) to Mean Sea Level	1376.70ft
Pioneer 63 (RKB) to Mud Line at Slot (10)	18.00ft
Section Origin	N 0.00, E 0.00 ft
Section Azimuth	149.70°

WELLPATH DATA † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Di [ft]	Closure Di [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
0	0	123.08	0	0	0	0	1785024.4	439351.4	39°42'15.909"N	80°09'07.667"W	0	0	0	0	0
18	0	123.08	18	0	0	0	1785024.4	439351.4	39°42'15.909"N	80°09'07.667"W	0	0	0	0	0
108	0.17	123.08	108	0.12	-0.07	0.11	1785024.51	439351.33	39°42'15.908"N	80°09'07.665"W	0.13	123.08	0.19	0.19	0
208	0.31	131.06	208	0.51	-0.33	0.44	1785024.84	439351.07	39°42'15.906"N	80°09'07.661"W	0.55	126.988	0.14	0.14	7.98
308	0.33	141.33	308	1.05	-0.73	0.82	1785025.22	439350.67	39°42'15.902"N	80°09'07.656"W	1.1	131.694	0.06	0.02	10.27
408	0.28	177.3	408	1.55	-1.2	1.02	1785025.42	439350.2	39°42'15.897"N	80°09'07.653"W	1.57	139.83	0.19	-0.05	35.97
508	0.41	185.17	507.99	2.06	-1.8	0.99	1785025.39	439349.6	39°42'15.891"N	80°09'07.654"W	2.06	151.118	0.14	0.13	7.87

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608	0.3	176.61	607.99	2.58	-2.42	0.98	1785025.38	439348.98	39°42'15.885"N	80°09'07.654"W	2.61	158.003	0.12	-0.11	-8.56
708	0.46	183.04	707.99	3.15	-3.08	0.97	1785025.37	439348.32	39°42'15.879"N	80°09'07.654"W	3.23	162.499	0.17	0.16	6.43
808	0.28	187.49	807.99	3.68	-3.73	0.92	1785025.32	439347.67	39°42'15.872"N	80°09'07.654"W	3.84	166.145	0.18	-0.18	4.45
908	0.28	321.79	907.99	3.63	-3.78	0.74	1785025.14	439347.62	39°42'15.872"N	80°09'07.657"W	3.85	168.971	0.52	0	134.3
1008	0.2	327.02	1007.99	3.22	-3.44	0.49	1785024.89	439347.96	39°42'15.875"N	80°09'07.660"W	3.47	171.89	0.08	-0.08	5.23
1108	0.39	314.49	1107.99	2.71	-3.05	0.15	1785024.55	439348.35	39°42'15.879"N	80°09'07.664"W	3.06	177.147	0.2	0.19	-12.53
1208	0.55	318.74	1207.98	1.91	-2.45	-0.41	1785023.99	439348.95	39°42'15.885"N	80°09'07.672"W	2.49	189.42	0.16	0.16	4.25
1308	0.56	281.4	1307.98	1.12	-2	-1.2	1785023.2	439349.4	39°42'15.889"N	80°09'07.682"W	2.33	211.063	0.36	0.01	-37.34
1408	0.57	270.82	1407.97	0.53	-1.89	-2.18	1785022.22	439349.51	39°42'15.890"N	80°09'07.694"W	2.89	229.02	0.1	0.01	-10.58
1508	0.64	272.02	1507.97	-0.02	-1.87	-3.23	1785021.17	439349.53	39°42'15.891"N	80°09'07.708"W	3.73	240.018	0.07	0.07	1.2
1608	0.05	289.47	1607.96	-0.35	-1.83	-3.83	1785020.57	439349.57	39°42'15.891"N	80°09'07.715"W	4.25	244.461	0.59	-0.59	17.45
1708	0.44	266.3	1707.96	-0.56	-1.84	-4.26	1785020.14	439349.56	39°42'15.891"N	80°09'07.721"W	4.64	246.606	0.39	0.39	-23.17
1808	0.69	255.59	1807.96	-0.89	-2.02	-5.22	1785019.18	439349.38	39°42'15.889"N	80°09'07.733"W	5.6	248.893	0.27	0.25	-10.71
1908	0.21	241.79	1907.96	-1.07	-2.25	-5.97	1785018.43	439349.15	39°42'15.886"N	80°09'07.743"W	6.38	249.32	0.49	-0.48	-13.8
2008	0.76	221.16	2007.95	-0.86	-2.84	-6.57	1785017.83	439348.56	39°42'15.881"N	80°09'07.750"W	7.15	246.62	0.57	0.55	-20.63
2108	0.9	196.01	2107.94	-0.11	-4.09	-7.22	1785017.18	439347.31	39°42'15.868"N	80°09'07.759"W	8.3	240.45	0.39	0.14	-25.15
2208	1.04	223.1	2207.93	0.69	-5.51	-8.06	1785016.34	439345.89	39°42'15.854"N	80°09'07.769"W	9.76	235.628	0.47	0.14	27.09
2308	0.68	227.36	2307.92	1.08	-6.58	-9.11	1785015.29	439344.82	39°42'15.844"N	80°09'07.783"W	11.24	234.189	0.37	-0.36	4.26
2408	0.64	222.75	2407.91	1.37	-7.39	-9.93	1785014.47	439344.01	39°42'15.835"N	80°09'07.793"W	12.38	233.35	0.07	-0.04	-4.61
2508	0.2	237.39	2507.91	1.54	-7.89	-10.46	1785013.95	439343.51	39°42'15.830"N	80°09'07.800"W	13.1	232.954	0.45	-0.44	14.64
2608	0.23	260.15	2607.91	1.48	-8.02	-10.8	1785013.6	439343.38	39°42'15.829"N	80°09'07.804"W	13.45	233.402	0.09	0.03	22.76
2708	0.17	269	2707.91	1.33	-8.06	-11.15	1785013.25	439343.34	39°42'15.829"N	80°09'07.808"W	13.75	234.139	0.07	-0.06	8.85
2808	0.33	262.4	2807.9	1.15	-8.1	-11.58	1785012.82	439343.3	39°42'15.828"N	80°09'07.814"W	14.13	235.035	0.16	0.16	-6.6
2908	0.06	226.38	2907.9	1.05	-8.17	-11.9	1785012.5	439343.23	39°42'15.828"N	80°09'07.818"W	14.44	235.529	0.28	-0.27	-36.02
3008	0.49	210.45	3007.9	1.27	-8.58	-12.16	1785012.24	439342.82	39°42'15.824"N	80°09'07.821"W	14.88	234.799	0.43	0.43	-15.93
3108	0.83	204.87	3107.9	1.89	-9.6	-12.68	1785011.72	439341.8	39°42'15.813"N	80°09'07.828"W	15.91	232.862	0.35	0.34	-5.58
3208	0.1	192.04	3207.89	2.37	-10.34	-13	1785011.4	439341.06	39°42'15.806"N	80°09'07.832"W	16.62	231.493	0.73	-0.73	-12.83
3308	0.49	183.42	3307.89	2.79	-10.86	-13.05	1785011.35	439340.54	39°42'15.801"N	80°09'07.832"W	16.97	230.232	0.39	0.39	-8.62
3408	0.73	177.41	3407.88	3.71	-11.92	-13.04	1785011.36	439339.48	39°42'15.790"N	80°09'07.832"W	17.67	227.574	0.25	0.24	-6.01
3508	0.44	168.99	3507.88	4.64	-12.93	-12.94	1785011.46	439338.47	39°42'15.780"N	80°09'07.831"W	18.3	225.015	0.3	-0.29	-8.42
3608	0.17	126.94	3607.88	5.14	-13.4	-12.75	1785011.65	439338	39°42'15.776"N	80°09'07.828"W	18.5	223.573	0.33	-0.27	-42.05
3708	0.49	80.03	3707.88	5.42	-13.41	-12.21	1785012.19	439337.99	39°42'15.776"N	80°09'07.821"W	18.14	222.305	0.39	0.32	-46.91
3808	0.38	60.72	3807.87	5.58	-13.18	-11.5	1785012.9	439338.22	39°42'15.778"N	80°09'07.812"W	17.49	221.105	0.18	-0.11	-19.31
3908	0.47	68.03	3907.87	5.64	-12.86	-10.83	1785013.57	439338.54	39°42'15.781"N	80°09'07.804"W	16.81	220.093	0.1	0.09	7.31
4008	0.34	71.55	4007.87	5.76	-12.62	-10.17	1785014.23	439338.79	39°42'15.784"N	80°09'07.795"W	16.2	218.865	0.13	-0.13	3.52
4108	0.53	68.74	4107.86	5.9	-12.35	-9.45	1785014.95	439339.05	39°42'15.786"N	80°09'07.786"W	15.56	217.427	0.19	0.19	-2.81
4208	0.48	154.47	4207.86	6.39	-12.56	-8.84	1785015.56	439338.84	39°42'15.784"N	80°09'07.779"W	15.36	215.138	0.69	-0.05	85.73
4308	0.17	144.24	4307.86	6.95	-13.06	-8.58	1785015.82	439338.34	39°42'15.779"N	80°09'07.775"W	15.63	213.285	0.31	-0.31	-10.23
4408	0.46	138.87	4407.86	7.49	-13.49	-8.22	1785016.18	439337.92	39°42'15.775"N	80°09'07.771"W	15.8	211.38	0.29	0.29	-5.37
4508	0.54	119.08	4507.86	8.29	-14.02	-7.55	1785016.85	439337.38	39°42'15.770"N	80°09'07.762"W	15.92	208.306	0.19	0.08	-19.79
4608	0.47	112.95	4607.85	9.03	-14.41	-6.76	1785017.64	439337	39°42'15.766"N	80°09'07.752"W	15.91	205.137	0.09	-0.07	-6.13
4708	0.29	100.56	4707.85	9.52	-14.61	-6.13	1785018.27	439336.79	39°42'15.764"N	80°09'07.744"W	15.85	202.769	0.2	-0.18	-12.39
4808	0.33	34.9	4807.85	9.57	-14.42	-5.72	1785018.68	439336.98	39°42'15.766"N	80°09'07.738"W	15.52	201.632	0.34	0.04	-65.66
4908	0.52	86.11	4907.85	9.65	-14.16	-5.1	1785019.3	439337.25	39°42'15.769"N	80°09'07.731"W	15.05	199.821	0.41	0.19	51.21
5008	0.46	131.56	5007.84	10.23	-14.39	-4.35	1785020.05	439337.01	39°42'15.767"N	80°09'07.721"W	15.03	196.815	0.38	-0.06	45.45
5108	0.45	150.99	5107.84	11	-15	-3.86	1785020.54	439336.4	39°42'15.761"N	80°09'07.715"W	15.49	194.424	0.15	-0.01	19.43
5208	0.11	142.21	5207.84	11.49	-15.42	-3.61	1785020.79	439335.98	39°42'15.757"N	80°09'07.711"W	15.84	193.173	0.34	-0.34	-8.78
5308	0.11	116.22	5307.84	11.67	-15.54	-3.46	1785020.94	439335.86	39°42'15.755"N	80°09'07.709"W	15.92	192.568	0.05	0	-25.99
5408	0.28	99.54	5407.84	11.9	-15.62	-3.14	1785021.26	439335.78	39°42'15.755"N	80°09'07.705"W	15.93	191.355	0.18	0.17	-16.68
5508	0.72	71.78	5507.83	12.19	-15.47	-2.3	1785022.1	439335.94	39°42'15.756"N	80°09'07.695"W	15.64	188.456	0.49	0.44	-27.76
5608	0.04	63.5	5607.83	12.33	-15.25	-1.67	1785022.73	439336.15	39°42'15.758"N	80°09'07.687"W	15.34	186.252	0.68	-0.68	-8.28
5708	0.49	51.11	5707.83	12.26	-14.97	-1.31	1785023.09	439336.43	39°42'15.761"N	80°09'07.682"W	15.03	184.99	0.45	0.45	-12.39
5808	0.5	46.24	5807.82	12.1	-14.4	-0.66	1785023.74	439337	39°42'15.767"N	80°09'07.674"W	14.41	182.621	0.04	0.01	-4.87
5908	0.52	29.27	5907.82	11.77	-13.7	-0.12	1785024.28	439337.7	39°42'15.774"N	80°09'07.667"W	13.7	180.51	0.15	0.02	-16.97

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6008	0.21	101.54	6007.82	11.66	-13.34	0.28	1785024.68	439338.06	39°42'15.777"N	80°09'07.662"W	13.34	178.8	0.5	-0.31	72.27
6108	0.04	112.72	6107.82	11.81	-13.39	0.49	1785024.89	439338.01	39°42'15.777"N	80°09'07.659"W	13.4	177.9	0.17	-0.17	11.18
6208	0.36	100.38	6207.82	12.04	-13.46	0.83	1785025.23	439337.94	39°42'15.776"N	80°09'07.655"W	13.49	176.462	0.32	0.32	-12.34
6308	0.45	128.8	6307.82	12.61	-13.76	1.45	1785025.85	439337.64	39°42'15.773"N	80°09'07.647"W	13.84	173.997	0.22	0.09	28.42
6333	0.33	125.21	6332.82	12.77	-13.87	1.58	1785025.98	439337.53	39°42'15.772"N	80°09'07.645"W	13.96	173.489	0.49	-0.48	-14.36
6377	0.37	112.39	6376.81	13	-14	1.82	1785026.22	439337.41	39°42'15.771"N	80°09'07.642"W	14.11	172.6	0.2	0.09	-29.14
6423	2.71	66.45	6422.8	13.25	-13.62	2.95	1785027.35	439337.78	39°42'15.775"N	80°09'07.628"W	13.93	167.768	5.36	5.09	-99.87
6486	7.83	60.28	6485.51	13.46	-10.89	8.05	1785032.45	439340.51	39°42'15.802"N	80°09'07.563"W	13.54	143.543	8.16	8.13	-9.79
6549	12.55	59.83	6547.5	13.52	-5.32	17.7	1785042.1	439346.08	39°42'15.858"N	80°09'07.440"W	18.48	106.737	7.49	7.49	-0.71
6613	16.23	61.15	6609.48	13.77	2.49	31.55	1785055.95	439353.89	39°42'15.936"N	80°09'07.263"W	31.65	85.486	5.77	5.75	2.06
6676	20.82	62.59	6669.2	14.55	11.9	49.21	1785073.6	439363.3	39°42'16.030"N	80°09'07.038"W	50.63	76.407	7.32	7.29	2.29
6739	25.38	62.99	6727.13	15.89	23.19	71.19	1785095.58	439374.59	39°42'16.143"N	80°09'06.758"W	74.87	71.957	7.24	7.24	0.63
6802	29.62	62.06	6783	17.31	36.62	96.98	1785121.38	439388.02	39°42'16.278"N	80°09'06.429"W	103.67	69.312	6.76	6.73	-1.48
6865	34.31	62	6836.43	18.66	52.26	126.43	1785150.82	439403.66	39°42'16.435"N	80°09'06.054"W	136.81	67.542	7.44	7.44	-0.1
6928	39.56	61.69	6886.77	20.08	70.12	159.79	1785184.18	439421.52	39°42'16.614"N	80°09'05.629"W	174.5	66.306	8.34	8.33	-0.49
6992	43.26	62	6934.77	21.66	90.09	197.11	1785221.5	439441.49	39°42'16.814"N	80°09'05.153"W	216.72	65.437	5.79	5.78	0.48
7055	43.24	61.43	6980.65	23.18	110.55	235.12	1785259.51	439461.94	39°42'17.019"N	80°09'04.669"W	259.81	64.819	0.62	-0.03	-0.9
7119	43.23	61.7	7027.28	24.61	131.42	273.67	1785298.06	439482.81	39°42'17.228"N	80°09'04.177"W	303.59	64.349	0.29	-0.02	0.42
7182	43.17	61.11	7073.21	25.89	152.06	311.54	1785335.92	439503.45	39°42'17.434"N	80°09'03.695"W	346.67	63.983	0.65	-0.1	-0.94
7245	43.34	61	7119.09	26.91	172.95	349.32	1785373.7	439524.34	39°42'17.643"N	80°09'03.213"W	389.79	63.659	0.3	0.27	-0.17
7308	43.3	60.6	7164.92	27.74	194.04	387.05	1785411.42	439545.43	39°42'17.855"N	80°09'02.733"W	432.96	63.374	0.44	-0.06	-0.63
7371	43.23	60.18	7210.8	28.26	215.38	424.59	1785448.96	439566.76	39°42'18.068"N	80°09'02.254"W	476.09	63.103	0.47	-0.11	-0.67
7434	43.21	59.84	7256.71	28.5	236.94	461.95	1785486.33	439588.33	39°42'18.284"N	80°09'01.778"W	519.17	62.846	0.37	-0.03	-0.54
7498	43.22	60.25	7303.35	28.76	258.82	499.92	1785524.29	439610.21	39°42'18.503"N	80°09'01.294"W	562.95	62.628	0.44	0.02	0.64
7561	43.36	60.63	7349.21	29.32	280.13	537.5	1785561.87	439631.52	39°42'18.716"N	80°09'00.816"W	606.12	62.472	0.47	0.22	0.6
7624	43.22	61.38	7395.07	30.3	301.07	575.28	1785599.65	439652.45	39°42'18.926"N	80°09'00.334"W	649.3	62.375	0.85	-0.22	1.19
7687	43.61	62.35	7440.83	31.94	321.49	613.46	1785637.83	439672.87	39°42'19.130"N	80°08'59.847"W	692.6	62.343	1.23	0.62	1.54
7750	43.65	63.25	7486.43	34.29	341.36	652.13	1785676.49	439692.74	39°42'19.329"N	80°08'59.355"W	736.07	62.37	0.99	0.06	1.43
7813	43.72	64.66	7531.99	37.52	360.46	691.22	1785715.58	439711.84	39°42'19.521"N	80°08'58.856"W	779.56	62.458	1.55	0.11	2.24
7877	43.68	64.79	7578.26	41.39	379.34	731.2	1785755.56	439730.72	39°42'19.710"N	80°08'58.346"W	823.75	62.58	0.15	-0.06	0.2
7940	43.64	64.29	7623.84	45.06	398.04	770.47	1785794.83	439749.41	39°42'19.898"N	80°08'57.846"W	867.21	62.678	0.55	-0.06	-0.79
8003	43.7	64.02	7669.41	48.44	417	809.62	1785833.97	439768.38	39°42'20.088"N	80°08'57.347"W	910.7	62.749	0.31	0.1	-0.43
8066	43.7	63.57	7714.95	51.55	436.22	848.67	1785873.02	439787.6	39°42'20.281"N	80°08'56.849"W	954.22	62.797	0.49	0	-0.71
8128	43.74	63.95	7759.76	54.58	455.17	887.11	1785911.46	439806.54	39°42'20.471"N	80°08'56.359"W	997.07	62.838	0.43	0.06	0.61
8191	42.86	66.93	7805.62	58.89	473.13	926.39	1785950.74	439824.5	39°42'20.651"N	80°08'55.858"W	1040.22	62.946	3.53	-1.4	4.73
8255	41.83	76.36	7852.97	67.76	486.71	967.2	1785991.54	439838.08	39°42'20.788"N	80°08'55.337"W	1082.76	63.288	10.05	-1.61	14.73
8318	42.58	84.1	7899.67	82.6	493.86	1008.85	1786033.19	439845.23	39°42'20.862"N	80°08'54.805"W	1123.24	63.917	8.34	1.19	12.29
8381	44.49	91.69	7945.37	103.11	495.4	1052.15	1786076.48	439846.77	39°42'20.880"N	80°08'54.251"W	1162.94	64.787	8.83	3.03	12.05
8445	46.81	97.59	7990.12	129.34	491.65	1097.71	1786122.05	439843.02	39°42'20.846"N	80°08'53.667"W	1202.79	65.873	7.52	3.62	9.22
8508	50.84	102.8	8031.61	160.15	483.2	1144.34	1786168.67	439834.57	39°42'20.766"N	80°08'53.070"W	1242.17	67.108	8.92	6.4	8.27
8570	56.7	108.49	8068.26	196.12	469.64	1192.41	1786216.74	439821.01	39°42'20.636"N	80°08'52.454"W	1281.57	68.503	12	9.45	9.18
8633	61.34	115.77	8100.71	238.93	449.24	1242.35	1786266.68	439800.61	39°42'20.438"N	80°08'51.813"W	1321.08	70.12	12.34	7.37	11.56
8696	65.5	122.31	8128.91	287.38	421.87	1291.53	1786315.86	439773.24	39°42'20.171"N	80°08'51.181"W	1358.69	71.911	11.39	6.6	10.38
8759	70.75	126.9	8152.39	340.3	388.65	1339.6	1786363.92	439740.03	39°42'19.846"N	80°08'50.563"W	1394.84	73.821	10.73	8.33	7.29
8822	75.13	130.76	8170.87	396.56	350.89	1386.48	1786410.79	439702.27	39°42'19.476"N	80°08'49.960"W	1430.19	75.798	9.09	6.95	6.13
8886	79.26	135.57	8185.06	456.36	308.2	1431.96	1786456.27	439659.58	39°42'19.057"N	80°08'49.374"W	1464.75	77.853	9.76	6.45	7.52
8949	83.68	140.2	8194.41	517.32	262	1473.71	1786498.02	439613.38	39°42'18.604"N	80°08'48.836"W	1496.82	79.919	10.1	7.02	7.35
9013	89.57	143.76	8198.18	580.59	211.7	1513.03	1786537.34	439563.08	39°42'18.109"N	80°08'48.328"W	1527.77	82.035	10.75	9.2	5.56
9076	91.29	144.3	8197.71	643.28	160.71	1550.03	1786574.34	439512.1	39°42'17.608"N	80°08'47.850"W	1558.34	84.081	2.86	2.73	0.86
9138	92.34	144.58	8195.74	704.98	110.3	1586.07	1786610.37	439461.69	39°42'17.113"N	80°08'47.384"W	1589.9	86.022	1.75	1.69	0.45
9201	92.43	145.78	8193.12	767.73	58.63	1622.01	1786646.31	439410.02	39°42'16.604"N	80°08'46.919"W	1623.07	87.93	1.91	0.14	1.9
9264	93.08	146.83	8190.09	830.55	6.27	1656.92	1786681.22	439357.67	39°42'16.089"N	80°08'46.468"W	1656.93	89.783	1.96	1.03	1.67
9327	93.11	145.73	8186.69	893.34	-46.05	1691.84	1786716.14	439305.35	39°42'15.575"N	80°08'46.016"W	1692.47	91.559	1.74	0.05	-1.75
9390	92.22	148.04	8183.76	956.19	-98.76	1726.22	1786750.52	439252.65	39°42'15.056"N	80°08'45.572"W	1729.04	93.274	3.93	-1.41	3.67

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9453	90.92	150.9	8182.03	1019.16	-153	1758.21	1786782.5	439198.41	39°42'14.523"N	80°08'45.157"W	1764.85	94.973	4.99	-2.06	4.54
9516	91.05	152.46	8180.95	1082.11	-208.45	1788.09	1786812.38	439142.97	39°42'13.977"N	80°08'44.770"W	1800.2	96.649	2.48	0.21	2.48
9580	91.42	153.7	8179.57	1145.98	-265.5	1817.06	1786841.35	439085.92	39°42'13.415"N	80°08'44.394"W	1836.35	98.313	2.02	0.58	1.94
9643	91.42	155.44	8178.01	1208.74	-322.37	1844.1	1786868.39	439029.05	39°42'12.855"N	80°08'44.043"W	1872.07	99.916	2.76	0	2.76
9706	91.48	155.13	8176.42	1271.42	-379.58	1870.43	1786894.72	438971.84	39°42'12.291"N	80°08'43.701"W	1908.56	101.472	0.5	0.1	-0.49
9769	90.89	154.6	8175.11	1334.15	-436.61	1897.19	1786921.47	438914.82	39°42'11.730"N	80°08'43.353"W	1946.78	102.96	1.26	-0.94	-0.84
9832	90.37	153.25	8174.42	1396.97	-493.19	1924.88	1786949.16	438858.24	39°42'11.173"N	80°08'42.994"W	1987.05	104.371	2.3	-0.83	-2.14
9895	90.09	154.39	8174.17	1459.81	-549.72	1952.67	1786976.95	438801.71	39°42'10.616"N	80°08'42.633"W	2028.58	105.723	1.86	-0.44	1.81
9958	90.06	154.5	8174.09	1522.59	-606.56	1979.85	1787004.13	438744.88	39°42'10.056"N	80°08'42.280"W	2070.68	107.033	0.18	-0.05	0.17
10021	90.09	155.49	8174	1585.32	-663.66	2006.48	1787030.76	438687.78	39°42'09.494"N	80°08'41.934"W	2113.38	108.302	1.57	0.05	1.57
10085	90.09	154.43	8173.9	1649.05	-721.64	2033.56	1787057.84	438629.8	39°42'08.923"N	80°08'41.582"W	2157.81	109.538	1.66	0	-1.66
10148	90	152.1	8173.85	1711.92	-777.9	2061.9	1787086.18	438573.55	39°42'08.369"N	80°08'41.214"W	2203.76	110.67	3.7	-0.14	-3.7
10211	89.94	152.19	8173.89	1774.87	-833.6	2091.34	1787115.61	438517.85	39°42'07.820"N	80°08'40.833"W	2251.35	111.732	0.17	-0.1	0.14
10275	89.94	148.84	8173.95	1838.85	-889.3	2122.84	1787147.11	438462.15	39°42'07.272"N	80°08'40.425"W	2301.58	112.73	5.23	0	-5.23
10337	89.54	146.4	8174.23	1900.8	-941.66	2156.04	1787180.31	438409.8	39°42'06.757"N	80°08'39.995"W	2352.7	113.594	3.99	-0.65	-3.94
10401	89.6	146.98	8174.71	1964.71	-995.14	2191.18	1787215.45	438356.32	39°42'06.231"N	80°08'39.541"W	2406.57	114.426	0.91	0.09	0.91
10464	89.54	148.13	8175.19	2027.67	-1048.31	2224.98	1787249.24	438303.16	39°42'05.708"N	80°08'39.103"W	2459.57	115.228	1.83	-0.1	1.83
10526	89.01	147.88	8175.97	2089.63	-1100.88	2257.83	1787282.09	438250.58	39°42'05.191"N	80°08'38.678"W	2511.92	115.993	0.95	-0.85	-0.4
10589	89.23	147.85	8176.94	2152.59	-1154.23	2291.33	1787315.59	438197.24	39°42'04.666"N	80°08'38.245"W	2565.63	116.736	0.35	0.35	-0.05
10652	89.94	149.22	8177.4	2215.58	-1207.96	2324.22	1787348.48	438143.51	39°42'04.137"N	80°08'37.819"W	2619.38	117.462	2.45	1.13	2.17
10715	90.06	148.75	8177.4	2278.57	-1261.95	2356.68	1787380.93	438089.52	39°42'03.606"N	80°08'37.399"W	2673.28	118.168	0.77	0.19	-0.75
10779	89.97	146.97	8177.38	2342.54	-1316.14	2390.72	1787414.98	438035.34	39°42'03.073"N	80°08'36.958"W	2729.06	118.834	2.78	-0.14	-2.78
10842	89.78	147.69	8177.52	2405.48	-1369.18	2424.73	1787448.98	437982.31	39°42'02.551"N	80°08'36.518"W	2784.59	119.452	1.18	-0.3	1.14
10905	89.54	147.95	8177.89	2468.45	-1422.5	2458.28	1787482.53	437928.99	39°42'02.026"N	80°08'36.084"W	2840.18	120.056	0.56	-0.38	0.41
10968	88.8	146.3	8178.8	2531.37	-1475.4	2492.47	1787516.72	437876.09	39°42'01.506"N	80°08'35.642"W	2896.42	120.623	2.87	-1.17	-2.62
11032	89.94	147.26	8179.51	2595.29	-1528.94	2527.53	1787551.78	437822.56	39°42'00.979"N	80°08'35.188"W	2953.99	121.17	2.33	1.78	1.5
11094	89.97	148.53	8179.56	2657.25	-1581.45	2560.48	1787584.73	437770.04	39°42'00.463"N	80°08'34.762"W	3009.5	121.701	2.05	0.05	2.05
11158	90.71	149.96	8179.18	2721.25	-1636.45	2593.21	1787617.45	437715.05	39°41'59.922"N	80°08'34.338"W	3066.38	122.254	2.52	1.16	2.23
11221	91.11	149.79	8178.18	2784.24	-1690.93	2624.82	1787649.07	437660.57	39°41'59.385"N	80°08'33.929"W	3122.33	122.79	0.69	0.63	-0.27
11284	90.86	150.04	8177.09	2847.23	-1745.44	2656.4	1787680.64	437606.07	39°41'58.849"N	80°08'33.520"W	3178.52	123.308	0.56	-0.4	0.4
11347	89.66	148.64	8176.81	2910.23	-1799.63	2688.53	1787712.76	437551.88	39°41'58.316"N	80°08'33.104"W	3235.25	123.797	2.93	-1.9	-2.22
11410	89.94	149.01	8177.03	2973.22	-1853.53	2721.14	1787745.37	437497.98	39°41'57.785"N	80°08'32.682"W	3292.44	124.261	0.74	0.44	0.59
11473	90.65	149.83	8176.7	3036.22	-1907.77	2753.19	1787777.42	437443.75	39°41'57.252"N	80°08'32.267"W	3349.57	124.719	1.72	1.13	1.3
11535	89.45	148.97	8176.65	3098.21	-1961.13	2784.75	1787808.98	437390.39	39°41'56.726"N	80°08'31.858"W	3406	125.155	2.38	-1.94	-1.39
11598	90.12	147.08	8176.88	3161.18	-2014.57	2818.11	1787842.34	437336.95	39°41'56.201"N	80°08'31.427"W	3464.13	125.56	3.18	1.06	-3
11662	91.69	146.61	8175.87	3225.09	-2068.14	2853.1	1787877.33	437283.38	39°41'55.674"N	80°08'30.974"W	3523.83	125.937	2.56	2.45	-0.73
11725	93.26	146.51	8173.15	3287.94	-2120.66	2887.79	1787912.01	437230.87	39°41'55.157"N	80°08'30.525"W	3582.81	126.292	2.5	2.49	-0.16
11788	91.08	147.94	8170.77	3350.83	-2173.59	2921.86	1787946.09	437177.94	39°41'54.636"N	80°08'30.085"W	3641.67	126.646	4.14	-3.46	2.27
11852	91.2	148.46	8169.49	3414.79	-2227.97	2955.58	1787979.8	437123.56	39°41'54.101"N	80°08'29.648"W	3701.26	127.01	0.83	0.19	0.81
11916	90.58	149.11	8168.5	3478.78	-2282.7	2988.75	1788012.96	437068.84	39°41'53.563"N	80°08'29.219"W	3760.76	127.371	1.4	-0.97	1.02
11979	90.58	149.35	8167.86	3541.77	-2336.83	3020.97	1788045.19	437014.71	39°41'53.030"N	80°08'28.802"W	3819.3	127.723	0.38	0	0.38
12041	90.65	152.43	8167.2	3603.75	-2390.99	3051.13	1788075.35	436960.56	39°41'52.497"N	80°08'28.411"W	3876.37	128.084	4.97	0.11	4.97
12104	90.52	155.19	8166.55	3666.58	-2447.51	3078.93	1788103.15	436904.04	39°41'51.940"N	80°08'28.050"W	3933.21	128.482	4.39	-0.21	4.38
12167	90.62	155.68	8165.93	3729.26	-2504.81	3105.12	1788129.33	436846.75	39°41'51.376"N	80°08'27.710"W	3989.46	128.892	0.79	0.16	0.78
12230	90.8	155.64	8165.15	3791.91	-2562.2	3131.08	1788155.3	436789.35	39°41'50.811"N	80°08'27.373"W	4045.81	129.294	0.29	0.29	-0.06
12293	90.68	155.2	8164.33	3854.59	-2619.49	3157.29	1788181.5	436732.07	39°41'50.246"N	80°08'27.032"W	4102.46	129.681	0.72	-0.19	-0.7
12356	91.2	154.4	8163.3	3917.33	-2676.48	3184.11	1788208.32	436675.08	39°41'49.685"N	80°08'26.684"W	4159.58	130.05	1.51	0.83	-1.27
12420	91.2	155.16	8161.96	3981.07	-2734.37	3211.37	1788235.58	436617.2	39°41'49.115"N	80°08'26.330"W	4217.78	130.413	1.19	0	1.19
12482	91.2	155.02	8160.66	4042.78	-2790.59	3237.48	1788261.68	436560.98	39°41'48.561"N	80°08'25.991"W	4274.19	130.76	0.23	0	-0.23
12545	91.08	150.8	8159.41	4105.65	-2846.65	3266.16	1788290.36	436504.92	39°41'48.009"N	80°08'25.619"W	4332.58	131.074	6.7	-0.19	-6.7
12608	90.8	148.02	8158.37	4168.64	-2900.87	3298.21	1788322.41	436450.7	39°41'47.476"N	80°08'25.204"W	4392.41	131.333	4.43	-0.44	-4.41
12671	90.8	146.87	8157.49	4231.58	-2953.97	3332.11	1788356.31	436397.61	39°41'46.953"N	80°08'24.765"W	4452.96	131.558	1.83	0	-1.83
12734	90.86	148.6	8156.58	4294.54	-3007.23	3365.73	1788389.93	436344.35	39°41'46.429"N	80°08'24.330"W	4513.49	131.78	2.75	0.1	2.75
12797	90.86	147.47	8155.63	4357.5	-3060.67	3399.08	1788423.28	436290.91	39°41'45.903"N	80°08'23.899"W	4574	132.001	1.79	0	-1.79

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12859	90.71	146.66	8154.78	4419.43	-3112.7	3432.79	1788456.98	436238.88	39°41'45.392"N	80°08'23.463"W	4633.89	132.2	1.33	-0.24	-1.31
12922	90.71	147.75	8154	4482.37	-3165.66	3466.91	1788491.1	436185.93	39°41'44.871"N	80°08'23.021"W	4694.77	132.399	1.73	0	1.73
12985	90.62	148.53	8153.27	4545.34	-3219.16	3500.16	1788524.35	436132.43	39°41'44.344"N	80°08'22.591"W	4755.43	132.605	1.25	-0.14	1.24
13048	90.55	148.16	8152.63	4608.32	-3272.79	3533.22	1788557.41	436078.81	39°41'43.817"N	80°08'22.163"W	4816.1	132.809	0.6	-0.11	-0.59
13111	90.71	141.26	8151.94	4671.04	-3324.18	3569.59	1788593.78	436027.43	39°41'43.311"N	80°08'21.693"W	4877.72	132.961	10.95	0.25	-10.95
13175	90.62	138.27	8151.19	4734.06	-3373.02	3610.92	1788635.11	435978.58	39°41'42.831"N	80°08'21.160"W	4941.26	133.049	4.67	-0.14	-4.67
13237	90.4	138.29	8150.64	4794.83	-3419.3	3652.18	1788676.36	435932.31	39°41'42.377"N	80°08'20.628"W	5003	133.114	0.36	-0.35	0.03
13301	90.25	140.33	8150.28	4857.78	-3467.82	3693.9	1788718.08	435883.79	39°41'41.900"N	80°08'20.090"W	5066.63	133.192	3.2	-0.23	3.19
13364	90.09	145.94	8150.09	4920.34	-3518.21	3731.69	1788755.86	435833.41	39°41'41.405"N	80°08'19.602"W	5128.67	133.313	8.91	-0.25	8.9
13427	90.58	147.46	8149.72	4983.25	-3570.86	3766.27	1788790.44	435780.76	39°41'40.887"N	80°08'19.155"W	5189.98	133.474	2.53	0.78	2.41
13490	90.68	147.14	8149.03	5046.19	-3623.87	3800.31	1788824.48	435727.75	39°41'40.366"N	80°08'18.715"W	5251.17	133.639	0.53	0.16	-0.51
13553	90.4	147.88	8148.44	5109.14	-3677.01	3834.14	1788858.31	435674.61	39°41'39.843"N	80°08'18.277"W	5312.35	133.802	1.26	-0.44	1.17
13617	90.46	149.53	8147.96	5173.13	-3731.69	3867.39	1788891.55	435619.93	39°41'39.305"N	80°08'17.847"W	5374.22	133.977	2.58	0.09	2.58
13679	90.34	150.74	8147.52	5235.13	-3785.46	3898.26	1788922.42	435566.17	39°41'38.776"N	80°08'17.447"W	5433.79	134.159	1.96	-0.19	1.95
13742	91.2	151.7	8146.68	5298.1	-3840.67	3928.59	1788952.75	435510.96	39°41'38.232"N	80°08'17.054"W	5494.05	134.352	2.05	1.37	1.52
13805	90.98	151.86	8145.48	5361.04	-3896.17	3958.37	1788982.53	435455.46	39°41'37.686"N	80°08'16.668"W	5554.17	134.546	0.43	-0.35	0.25
13869	91.08	151.96	8144.33	5424.99	-3952.62	3988.5	1789012.66	435399.02	39°41'37.130"N	80°08'16.277"W	5615.28	134.741	0.22	0.16	0.16
13932	91.2	151.87	8143.07	5487.93	-4008.19	4018.15	1789042.31	435343.45	39°41'36.583"N	80°08'15.893"W	5675.49	134.929	0.24	0.19	-0.14
13996	90.68	152.79	8142.02	5551.85	-4064.87	4047.87	1789072.03	435286.78	39°41'36.025"N	80°08'15.508"W	5736.58	135.12	1.65	-0.81	1.44
14059	90.31	151.82	8141.48	5614.78	-4120.65	4077.15	1789101.3	435231	39°41'35.476"N	80°08'15.128"W	5796.8	135.304	1.65	-0.59	-1.54
14121	90.31	152.13	8141.14	5676.73	-4175.38	4106.28	1789130.43	435176.28	39°41'34.937"N	80°08'14.750"W	5856.22	135.478	0.5	0	0.5
14184	90.34	151.91	8140.79	5739.68	-4231.01	4135.84	1789159.99	435120.65	39°41'34.389"N	80°08'14.367"W	5916.64	135.652	0.35	0.05	-0.35
14247	90.34	151.45	8140.41	5802.64	-4286.47	4165.72	1789189.87	435065.19	39°41'33.843"N	80°08'13.980"W	5977.21	135.818	0.73	0	-0.73
14311	90.68	153.84	8139.84	5866.55	-4343.31	4195.13	1789219.27	435008.36	39°41'33.284"N	80°08'13.599"W	6038.49	135.994	3.77	0.53	3.73
14374	91.02	153.91	8138.91	5929.37	-4399.86	4222.86	1789247.01	434951.8	39°41'32.727"N	80°08'13.239"W	6098.47	136.176	0.55	0.54	0.11
14437	90.89	151.82	8137.86	5992.27	-4455.92	4251.59	1789275.74	434895.75	39°41'32.175"N	80°08'12.866"W	6158.83	136.344	3.32	-0.21	-3.32
14500	90.31	152.83	8137.2	6055.2	-4511.71	4280.85	1789304.99	434839.97	39°41'31.625"N	80°08'12.487"W	6219.42	136.504	1.85	-0.92	1.6
14563	90.37	152.3	8136.83	6118.11	-4567.62	4309.88	1789334.02	434784.06	39°41'31.075"N	80°08'12.110"W	6279.98	136.663	0.85	0.1	-0.84
14625	90.37	152.9	8136.42	6180.03	-4622.66	4338.41	1789362.55	434729.02	39°41'30.533"N	80°08'11.740"W	6339.62	136.817	0.97	0	0.97
14688	90.4	153.88	8136	6242.9	-4678.99	4366.63	1789390.76	434672.69	39°41'29.978"N	80°08'11.374"W	6400.03	136.978	1.56	0.05	1.56
14752	90.49	151.99	8135.5	6306.79	-4735.97	4395.74	1789419.88	434615.71	39°41'29.417"N	80°08'10.997"W	6461.58	137.134	2.96	0.14	-2.95
14814	90.55	151.77	8134.94	6368.75	-4790.65	4424.97	1789449.1	434561.03	39°41'28.879"N	80°08'10.618"W	6521.56	137.272	0.37	0.1	-0.35
14878	90.68	152.69	8134.25	6432.68	-4847.28	4454.78	1789478.91	434504.41	39°41'28.321"N	80°08'10.231"W	6583.4	137.416	1.45	0.2	1.44
14941	90.68	152.7	8133.51	6495.59	-4903.26	4483.68	1789507.81	434448.44	39°41'27.770"N	80°08'09.857"W	6644.19	137.559	0.02	0	0.02
15004	91.38	153.46	8132.37	6558.47	-4959.42	4512.2	1789536.33	434392.28	39°41'27.217"N	80°08'09.487"W	6704.91	137.703	1.64	1.11	1.21
15068	91.02	154.28	8131.03	6622.29	-5016.86	4540.38	1789564.5	434334.84	39°41'26.651"N	80°08'09.121"W	6766.39	137.854	1.4	-0.56	1.28
15131	91.11	150.75	8129.86	6685.19	-5072.74	4569.44	1789593.57	434278.97	39°41'26.101"N	80°08'08.744"W	6827.33	137.988	5.6	0.14	-5.6
15194	90.68	150.3	8128.88	6748.17	-5127.57	4600.44	1789624.56	434224.13	39°41'25.561"N	80°08'08.343"W	6888.84	138.102	0.99	-0.68	-0.71
15258	90.74	146.81	8128.09	6812.15	-5182.16	4633.82	1789657.94	434169.55	39°41'25.024"N	80°08'07.911"W	6951.77	138.197	5.45	0.09	-5.45
15321	90.12	146.79	8127.61	6875.06	-5234.88	4668.31	1789692.43	434116.84	39°41'24.506"N	80°08'07.465"W	7014.06	138.274	0.98	-0.98	-0.03
15385	90.89	147.54	8127.05	6939	-5288.65	4703.01	1789727.13	434063.07	39°41'23.977"N	80°08'07.016"W	7077.3	138.354	1.68	1.2	1.17
15448	91.08	148.28	8125.97	7001.96	-5342.02	4736.48	1789760.59	434009.71	39°41'23.452"N	80°08'06.583"W	7139.42	138.438	1.21	0.3	1.17
15511	90.8	148.38	8124.93	7064.93	-5395.63	4769.55	1789793.66	433956.1	39°41'22.924"N	80°08'06.155"W	7201.49	138.524	0.47	-0.44	0.16
15574	90.86	148.81	8124.02	7127.91	-5449.39	4802.37	1789826.49	433902.34	39°41'22.395"N	80°08'05.731"W	7263.52	138.611	0.69	0.1	0.68
15637	90.83	149.36	8123.09	7190.9	-5503.44	4834.74	1789858.85	433848.3	39°41'21.863"N	80°08'05.312"W	7325.47	138.701	0.87	-0.05	0.87
15700	90.83	147.15	8122.18	7253.87	-5557	4867.88	1789891.99	433794.73	39°41'21.336"N	80°08'04.883"W	7387.59	138.782	3.51	0	-3.51
15763	90.77	145.3	8121.3	7316.75	-5609.36	4902.9	1789927	433742.38	39°41'20.821"N	80°08'04.430"W	7450.06	138.845	2.94	-0.1	-2.94
15826	90.43	142.24	8120.64	7379.4	-5660.17	4940.13	1789964.23	433691.57	39°41'20.322"N	80°08'03.950"W	7512.82	138.886	4.89	-0.54	-4.86
15890	90.49	141.63	8120.12	7442.81	-5710.56	4979.58	1790003.68	433641.19	39°41'19.826"N	80°08'03.440"W	7576.72	138.912	0.96	0.09	-0.95
15936	90.55	142.66	8119.71	7488.41	-5746.88	5007.81	1790031.91	433604.87	39°41'19.469"N	80°08'03.076"W	7622.65	138.931	2.24	0.13	2.24
15961	90.55	142.66	8119.47	7513.22	-5766.75	5022.97	1790047.07	433585	39°41'19.274"N	80°08'02.880"W	7647.59	138.943	0	0	0

TARGETS

Name	MD	TVD	North	East	Grid East	Grid North	Latitude	Longitude	Shape	Comment

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	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]			
Beach 10H BHL Rev-2		8205	-5769.38	5019.17	1790043	433582.4	39°41'19.2	80°08'02.929"W	point
Beach 10H LP Rev-2		8205	187.14	1538.46	1786563	439538.5	39°42'17.8	80°08'48.000"W	point
Beach 10H HL Pt 01		8215	546.14	-567.36	1784457	439897.5	39°42'21.2	80°09'14.976"W	point
Beach 10H HL Pt 02		8215	402.34	-442.42	1784582	439753.7	39°42'19.8	80°09'13.364"W	point
Beach 10H HL Pt 03		8215	428.5	-57.05	1784967	439779.9	39°42'20.1	80°09'08.436"W	point
Beach 10H HL Pt 04		8215	398.74	462.89	1785487	439750.1	39°42'19.8	80°09'01.781"W	point
Beach 10H HL Pt 05		8215	491.99	784.38	1785809	439843.4	39°42'20.8	80°08'57.676"W	point
Beach 10H HL Pt 06		8215	742.71	927.2	1785952	440094.1	39°42'23.3	80°08'55.872"W	point
Beach 10H HL Pt 07		8215	993.45	1070	1786094	440344.8	39°42'25.8	80°08'54.068"W	point
Beach 10H HL Pt 08		8215	886.22	1288.31	1786313	440237.6	39°42'24.7	80°08'51.265"W	point
Beach 10H HL Pt 09		8215	880.57	1468.36	1786493	440231.9	39°42'24.7	80°08'48.961"W	point
Beach 10H HL Pt 10		8215	492.92	1619.02	1786643	439844.3	39°42'20.8	80°08'46.998"W	point
Beach 10H HL Pt 11		8215	-2476.71	3638.19	1788662	436874.8	39°41'51.6	80°08'20.893"W	point
Beach 10H HL Pt 12		8215	-2677.99	3596.53	1788621	436673.6	39°41'49.6	80°08'21.408"W	point
Beach 10H HL Pt 13		8215	-2952.5	3456.59	1788481	436399.1	39°41'46.9	80°08'23.173"W	point
Beach 10H HL Pt 14		8215	-3033.72	3599.47	1788624	436317.9	39°41'46.1	80°08'21.338"W	point
Beach 10H HL Pt 15		8215	-3217.27	3907.79	1788932	436134.3	39°41'44.3	80°08'17.377"W	point
Beach 10H HL Pt 16		8215	-3362.05	4149.46	1789174	435989.6	39°41'42.9	80°08'14.272"W	point
Beach 10H HL Pt 17		8215	-7134.35	1310.5	1786335	432217.5	39°41'05.4	80°08'50.242"W	point
Beach 10H HL Pt 18		8215	-7261.11	1618.05	1786642	432090.7	39°41'04.2	80°08'46.296"W	point
Beach 10H HL Pt 19		8215	-7483.5	2180.67	1787205	431868.4	39°41'02.1	80°08'39.080"W	point
Beach 10H HL Pt 20		8215	-7640.05	2490.85	1787515	431711.8	39°41'00.5	80°08'35.098"W	point
Beach 10H HL Pt 21		8215	-7667.13	3125.63	1788150	431684.7	39°41'00.3	80°08'26.977"W	point
Beach 10H HL Pt 22		8215	-7703.88	3697.46	1788722	431648	39°41'00.0	80°08'19.659"W	point
Beach 10H HL Pt 23		8215	-7619.91	4179.16	1789203	431732	39°41'00.9	80°08'13.506"W	point
Beach 10H HL Pt 24		8215	-7682.15	4548.33	1789572	431669.7	39°41'00.3	80°08'08.778"W	point
Beach 10H HL Pt 25		8215	-7654.27	5157.75	1790182	431697.6	39°41'00.6	80°08'00.986"W	point
Beach 10H HL Pt 26		8215	-7262.01	5254.34	1790278	432089.8	39°41'04.5	80°07'59.786"W	point
Beach 10H HL Pt 27		8215	-7237.89	5553	1790577	432114	39°41'04.7	80°07'55.968"W	point
Beach 10H HL Pt 28		8215	-7137.04	5604.6	1790629	432214.8	39°41'05.7	80°07'55.317"W	point
Beach 10H HL Pt 29		8215	-6830.26	5624.49	1790649	432521.6	39°41'08.8	80°07'55.090"W	point
Beach 10H HL Pt 30		8215	-6560.47	5646.72	1790671	432791.3	39°41'11.4	80°07'54.830"W	point
Beach 10H HL Pt 31		8215	-6413.85	5485.81	1790510	432937.9	39°41'12.9	80°07'56.902"W	point
Beach 10H HL Pt 32		8215	-6265.29	5523.18	1790547	433086.5	39°41'14.3	80°07'56.437"W	point
Beach 10H HL Pt 33		8215	-6288.28	5689.29	1790713	433063.5	39°41'14.1	80°07'54.310"W	point
Beach 10H HL Pt 34		8215	-6380.26	5799.83	1790824	432971.5	39°41'13.2	80°07'52.888"W	point
Beach 10H HL Pt 35		8215	-6668.52	5926.97	1790951	432683.3	39°41'10.4	80°07'51.236"W	point

WELLPATH COMPOSITION Ref Wellbore: Beach 10H AWB Ref Wellpath: Beach 10H AWP Proj: 15961'

Log Name/Comment	Start MD [ft]	End MD [ft]	Pos Unc Model
01_VES Gyro (100'-6325')	18	6333	Generic gyro - northseeking (Standard)
02_BHI AT Curve <8-1/2"> (6377'-15936')	6333	15936	NaviTrak (AT Curve Short Spaced)
Projection to bit	15936	15961	Blind Drilling (std)

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	12/30/2014
Job End Date:	1/25/2015
State:	West Virginia
County:	Monongalia
API Number:	47-061-01669-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Beach 10H
Longitude:	-80.15213000
Latitude:	39.70441900
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	8,158
Total Base Water Volume (gal):	11,085,035
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
Proppant Transport	Schlumberger	Corrosion Inhibitor, AntiFoam Agent, Acid, Breaker, Gelling Agent, Friction Reducer, Rheology Modifier, Iron Control Agent, Accelerator, Propping Agen					
			Water (Including Mix Water Supplied by Client)*	NA		86.50125	
			Crystalline silica	14808-60-7	98.09168	13.24115	
			Hydrochloric acid	7647-01-0	0.66834	0.09022	
			Ceramic materials and wares, chemicals	66402-68-4	0.62745	0.08470	
			Ammonium sulfate	7783-20-2	0.16717	0.02257	
			Calcium chloride	10043-52-4	0.16209	0.02188	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.12339	0.01666	
			Guar gum	9000-30-0	0.07654	0.01033	
			Erucic amidopropyl dimethyl betaine	149879-98-1	0.01725	0.00233	
			Propan-2-ol	67-63-0	0.01323	0.00179	

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			Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01322	0.00178	
			Potassium chloride	7447-40-7	0.00956	0.00129	
			Urea	57-13-6	0.00812	0.00110	
			Sodium chloride	7647-14-5	0.00528	0.00071	
			Sodium erythorbate	6381-77-7	0.00204	0.00027	
			Methanol	67-56-1	0.00200	0.00027	
			Sodium sulfate	7757-82-6	0.00189	0.00026	
			Non-crystalline silica (impurity)	7631-86-9	0.00188	0.00025	
			Diammonium peroxidisulphate	7727-54-0	0.00177	0.00024	
			Polypropylene glycol	25322-69-4	0.00145	0.00020	
			Fatty acids, tall-oil	61790-12-3	0.00140	0.00019	
			Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00115	0.00016	
			Alcohols, C14-15, ethoxylated (7EO)	68951-67-7	0.00055	0.00007	
			2-propenamid	79-06-1	0.00040	0.00005	
			Propargyl alcohol	107-19-7	0.00036	0.00005	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00021	0.00003	
			Sodium chloroacetate	3926-62-3	0.00022	0.00003	
			Hexadec-1-ene	629-73-2	0.00012	0.00002	
			Dimethyl siloxanes and silicones	63148-62-9	0.00012	0.00002	
			Polyvinyl acetate, partially hydrolyzed	304443-60-5	0.00005	0.00001	
			1-Octadecene (C18)	112-88-9	0.00006	0.00001	
			Octamethylcyclotetrasiloxane	556-67-2	0.00001		
			Dodecamethylcyclohexasiloxane	540-97-6			
			Decamethyl cyclopentasiloxane	541-02-6	0.00001		
			Formaldehyde	50-00-0	0.00001		
			Siloxanes and Silicones, di-Me, reaction products with silica	67762-90-7	0.00002		
			Copper(II) sulfate	7758-98-7			
Chlorine Dioxide	X-Chem	Microbial Control					
			ClO2	10049-04-4	100.00000		Gas
SC-30	X-Chem	Scale Inhibitor					
			Water	7732-18-5	85.29000		
			Sodium Polyacrylate	2594-41-5	14.71000		

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.

* 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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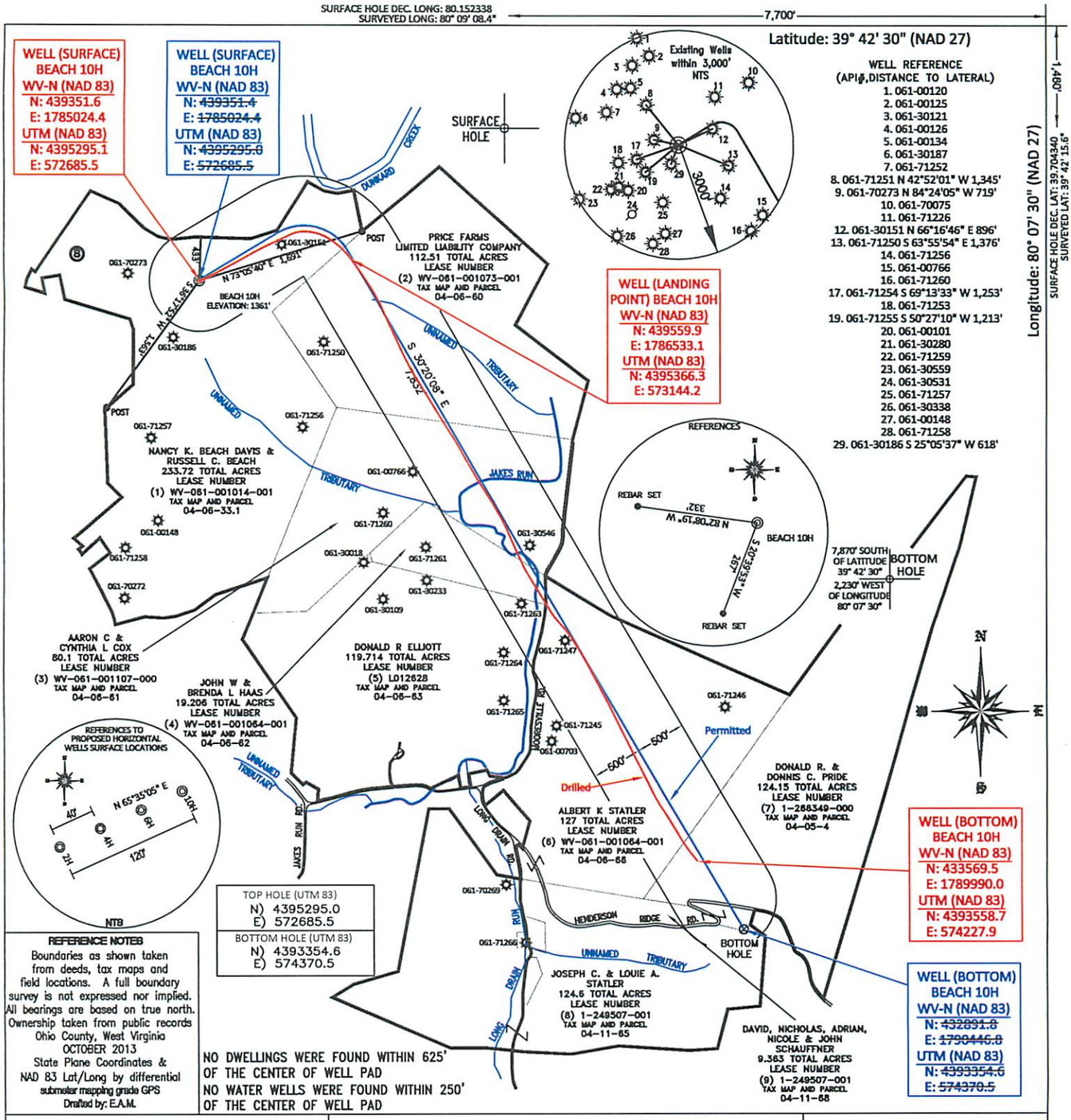

FILE #: NNE009

DRAWING #: 2296

SCALE: PLAT = (1"=1400') TICK MARK = (1"=2000')

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III LICENSED No. 2124 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: APRIL 3, 2015

OPERATOR'S WELL #: BEACH 10H AS DRILLED PLAT

API WELL #: 47 (STATE) 61 (COUNTY) ___ (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: DUNKARD CREEK ELEVATION: 1361'

COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE, WV.

SURFACE OWNER: NANCY K. BEACH DAVIS & RUSSELL C. BEACH ACREAGE: 233.72 +/-

OIL & GAS ROYALTY OWNER: (SEE ATTACHMENT) ACREAGE: 860.63 +/-

LEASE NUMBERS:

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 8,119' TMD: 15,961'

WELL OPERATOR : NORTHEAST NATURAL ENERGY LLC DESIGNATED AGENT : JOHN ADAMS

ADDRESS: 707 VIRGINIA STREET SUITE 1200 ADDRESS: 707 VIRGINIA STREET SUITE 1200

CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

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Rev. 8/23/13

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

API 47 - 085 - 10017 County Ritchie District Union
Quad Pullman 7.5' Pad Name Yolanda Field/Pool Name ---
Farm name Williamson, Andrew, et al Well Number Allstate Unit 2H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing	4338478m	Easting	510003m
Landing Point of Curve	Northing	4338748.12m	Easting	510092.39m
Bottom Hole	Northing	4340217m	Easting	509447m

Elevation (ft) 1144' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas ■ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL ■ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 1/31/2013 Date drilling commenced 12/7/2013 Date drilling ceased 1/25/2014
Date completion activities began 4/1/2014 Date completion activities ceased 5/15/2014
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 112', 114' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1987', 1989' Void(s) encountered (Y/N) depths No
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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Reviewed by:
5/27/15

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API 47- 085 - 10017 Farm name Williamson, Andrew, et al Well number Allstate Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	28"	20"	40'	New	51# H-40	N/A	Y
Surface	17-1/2"	13-3/8"	357'	New	48# J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2538'	New	40# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	12355'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6762'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	127 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	414 sx	15.6	1.18	248	0'	8 Hrs.
Coal							
Intermediate 1	Class A	734sx	15.6	1.18	795	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	901 sx (Lead), 928 sx (Tail)	Lead: 13.5, Tail: 15.2	Lead: 1.44, Tail: 1.80	2,363	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 12355' MD, 6617' TVD (BHL) Loggers TD (ft) 12303' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6310'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Nicholson Unit 2H API# 47-085-09960). Please reference the wireline logs submitted with Form WR-35 for the Nicholson Unit 2H. A Cement Bond Log has been included with this submittal.

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ☐ gamma ray ☐ temperature

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ☐ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

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WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ■ Yes ☐ No TYPE OF TRACER(S) USED Chemical + Radioactive

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API 47- 085 - 10017 Farm name Williamson, Andrew, et al Well number Allstate Unit 2H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
			SEE ATTACHED EXHIBIT 1		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
				SEE ATTACHED EXHIBIT 2				

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Please insert additional pages as applicable.

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API 47- 085 - 10017 Farm name Williamson, Andrew, et al Well number Allstate Unit 2H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6,553' (TOP)	TVD	6,831' (TOP)	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	7288 mcfpd	44 bpd	--- bpd	0 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling, LLC
Address 562 Spring Run Rd. City Pennsboro State WV Zip 26415

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company U.S. Well Services
Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permit Representative Date 1/8/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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API 47-085-10017 Farm Name Williamson, Andrew, et al Well Number Allstate Unit 2H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1-Apr-14	12,097	12,266	60	Marcellus
2	9-Apr-14	11,952	12,074	60	Marcellus
3	9-Apr-14	11,806	11,929	60	Marcellus
4	10-Apr-14	11,661	11,784	60	Marcellus
5	10-Apr-14	11,516	11,639	60	Marcellus
6	10-Apr-14	11,371	11,494	60	Marcellus
7	10-Apr-14	11,226	11,349	60	Marcellus
8	10-Apr-14	11,081	11,204	60	Marcellus
9	11-Apr-14	10,936	11,059	60	Marcellus
10	11-Apr-14	10,791	10,914	60	Marcellus
11	11-Apr-14	10,646	10,769	60	Marcellus
12	11-Apr-14	10,501	10,624	60	Marcellus
13	12-Apr-14	10,356	10,479	60	Marcellus
14	12-Apr-14	10,211	10,334	60	Marcellus
15	12-Apr-14	10,066	10,189	60	Marcellus
16	26-Apr-14	9,921	10,044	60	Marcellus
17	28-Apr-14	9,776	9,899	60	Marcellus
18	29-Apr-14	9,631	9,754	60	Marcellus
19	29-Apr-14	9,486	9,609	60	Marcellus
20	29-Apr-14	9,341	9,463	60	Marcellus
21	29-Apr-14	9,196	9,318	60	Marcellus
22	29-Apr-14	9,051	9,173	60	Marcellus
23	30-Apr-14	8,905	9,028	60	Marcellus
24	30-Apr-14	8,760	8,883	60	Marcellus
25	30-Apr-14	8,615	8,738	60	Marcellus
26	30-Apr-14	8,470	8,593	60	Marcellus
27	1-May-14	8,325	8,448	60	Marcellus
28	1-May-14	8,180	8,303	60	Marcellus
29	1-May-14	8,035	8,158	60	Marcellus
30	1-May-14	7,890	8,013	60	Marcellus
31	2-May-14	7,745	7,868	60	Marcellus
32	2-May-14	7,600	7,723	60	Marcellus
33	2-May-14	7,455	7,578	60	Marcellus
34	2-May-14	7,310	7,433	60	Marcellus
35	2-May-14	7,165	7,288	60	Marcellus
36	3-May-14	7,202	7,143	60	Marcellus
37	3-May-14	6,875	6,998	60	Marcellus

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API 47-085-10017 **Farm Name** Williamson, Andrew, et al **Well Number** Allstate Unit 2H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	9-Apr-14	79.0	7,755	5,990	3,650	207,210	5,716	N/A
2	9-Apr-14	79.0	7,801	5,468	3,909	213,400	5,705	N/A
3	9-Apr-14	75.0	7,505	5,522	5,386	182,000	6,200	N/A
4	10-Apr-14	76.0	7,693	5,854	3,204	177,800	6,228	N/A
5	10-Apr-14	79.0	7,621	5,422	5,357	98,470	5,641	N/A
6	10-Apr-14	76.0	7,617	5,386	4,803	213,100	5,685	N/A
7	10-Apr-14	77.0	7,538	5,554	5,994	213,550	5,640	N/A
8	10-Apr-14	80.0	7,580	5,636	3,673	213,340	5,675	N/A
9	11-Apr-14	78.8	7,763	6,069	2,911	174,660	6,126	N/A
10	11-Apr-14	78.0	7,531	5,643	3,619	220,720	5,611	N/A
11	11-Apr-14	80.0	7,403	5,729	3,916	215,500	5,653	N/A
12	12-Apr-14	79.0	7,859	5,536	4,603	214,800	5,583	N/A
13	12-Apr-14	74.4	7,896	5,583	5,221	189,340	6,052	N/A
14	12-Apr-14	43.6	8,040	5,285	5,093	113,820	6,110	N/A
15	12-Apr-14	49.0	8,474	5,651	8,175	63,200	5,634	N/A
16	28-Apr-14	75.0	7,784	7,206	5,590	186,800	6,572	N/A
17	29-Apr-14	78.0	7,164	5,114	4,842	214,400	5,274	N/A
18	29-Apr-14	76.0	6,855	5,665	3,970	217,300	5,590	N/A
19	29-Apr-14	77.0	7,320	5,472	4,728	192,900	5,942	N/A
20	29-Apr-14	74.0	6,935	5,611	5,307	202,300	5,529	N/A
21	29-Apr-14	78.0	6,865	5,254	4,735	216,600	5,503	N/A
22	30-Apr-14	78.0	6,885	5,347	4,706	214,900	5,504	N/A
23	30-Apr-14	76.0	6,952	5,339	3,594	217,700	5,533	N/A
24	30-Apr-14	77.0	6,838	5,414	4,452	217,100	5,471	N/A
25	30-Apr-14	77.0	6,747	5,078	5,465	214,700	5,508	N/A
26	1-May-14	78.0	6,702	5,057	5,132	213,500	5,440	N/A
27	1-May-14	76.0	7,058	5,496	5,207	216,800	5,497	N/A
28	1-May-14	77.0	6,707	5,311	3,383	215,000	5,448	N/A
29	1-May-14	78.0	6,550	5,314	3,920	212,900	5,469	N/A
30	1-May-14	79.0	6,805	5,490	3,304	214,000	5,211	N/A
31	2-May-14	72.0	6,674	5,282	4,227	74,100	5,394	N/A
32	2-May-14	76.0	6,571	5,339	3,272	216,000	5,444	N/A
33	2-May-14	76.0	6,856	5,926	3,523	215,100	5,378	N/A
34	2-May-14	77.0	6,793	5,561	5,329	184,300	5,884	N/A
35	2-May-14	76.0	6,786	5,625	4,488	214,800	5,357	N/A
36	3-May-14	76.0	6,896	6,187	5,479	214,600	5,357	N/A
37	3-May-14	76.0	7,015	6,090	3,430	212,200	5,344	N/A
AVG=		**75**	**7,239**	**5,581**	**4,530**	**7,208,910**	**208,908**	**TOTAL**

API 47-085-10017 Farm Name Williamson, Andrew, et al Well Number Allstate Unit 2H

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	112'	N/A	112'	N/A
Fresh Water	114'	N/A	114'	N/A
Siltstone/Shale	0	216	0	216
Siltstone/Shale w/ trace coal	est. 216	236	est. 216	236
Siltstone/Shale	est. 236	616	est. 236	616
Siltstone and Coal	est. 616	636	est. 616	636
Siltstone/Limestone	est. 636	856	est. 636	856
Sandstone	est. 856	876	est. 856	876
Siltstone/Limestone	est. 876	1116	est. 876	1116
Sandstone and Coal	est. 1116	1156	est. 1116	1156
Siltstone/Shale	est. 1156	1656	est. 1156	1656
Sandstone	est. 1656	1756	est. 1656	1756
Siltstone/Shale w/ trace coal	est. 1756	1776	est. 1756	1776
Siltstone/Shale	est. 1776	2016	est. 1776	2016
Siltstone/Shale w/ trace coal	est. 2016	2120	est. 2016	2120
Big Lime	2120	2181	2120	2181
Big Injun	2181	2437	2181	2437
Gantz Sand	2437	2576	2437	2576
Fifty Foot Sandstone	2576	2682	2576	2682
Gordon	2682	3089	2682	3089
Fifth Sandstone	3089	3195	3089	3195
Bayard	3195	3517	3195	3517
Warren	3517	3956	3517	3956
Speechley	3956	4165	3956	4165
Baltown	4165	4639	4165	4639
Bradford	4639	5015	4639	5018
Benson	5015	5260	5018	5268
Alexander	5260	5463	5268	5477
Elk	5463	5875	5477	5914
Rhinestreet	5875	6225	5914	6302
Sycamore	6225	6390	6302	6509
Middlesex	6390	6,500	6509	6693
Burkett	6500	6531	6693	6765
Tully	6531	6553	6765	6831
Marcellus	6553	NA	6831	NA

*Please note Antero determines shallow formation tops based on mud and/or wireline logs that are only run on one well on a multi-well pad (Please reference Wireline Logs submitted for the Nicholson Unit 2H API# 47-085-09960). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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Antero Resources
Allstate Unit 2H
Ritchie County WV
Northing: 14233108.91
Easting: 1673186.80
As Drilled

WELL DETAILS: Allstate Unit 2H

Ground Level: 1142.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	14233108.91	1673186.80	39° 11' 43.492 N	80° 53' 3.603 W	

Scientific Drilling

PROJECT DETAILS: Ritchie County WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Allstate Unit 2H, Grid North
Vertical (TVD) Reference: Frontier 25: 1142' GL + 28' RKB @ 1170.0usft
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: Frontier 25: 1142' GL + 28' RKB @ 1170.0usft
Calculation Method: Minimum Curvature

LEGEND

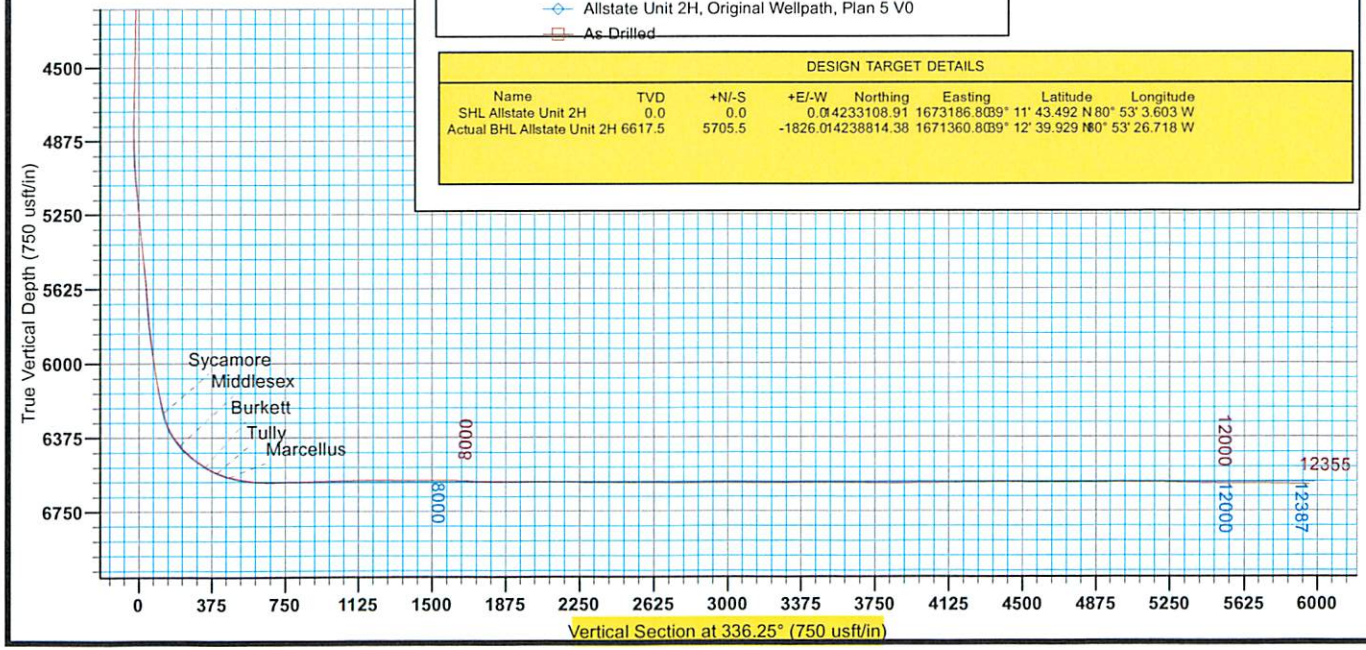
- Nicholson Unit 2H, Original Wellpath, As Drilled V0
- Nicholson Unit 1H, Original Wellpath, As Drilled V0
- O'Neil Unit 2H, Original Wellpath, As Drilled V0
- O'Neil Unit 1H, Original Wellpath, As Drilled V0
- Allstate Unit 2H, Original Wellpath, Plan 5 V0
- As Drilled

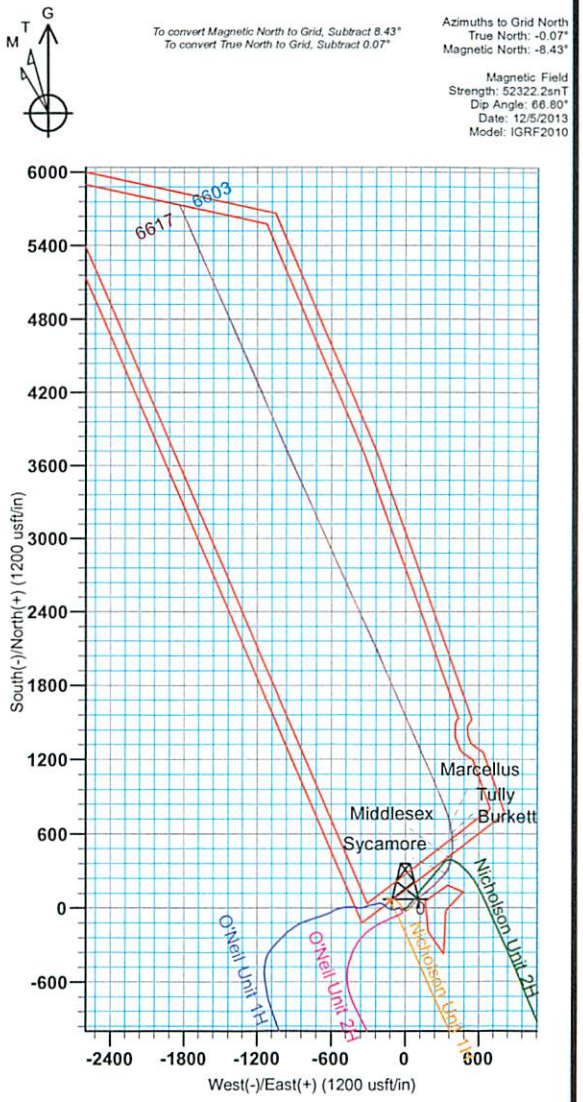
Genie Lightfoot
9:05, February 05 2014

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Allstate Unit 2H	0.0	0.0	0.0	14233108.91	1673186.80	39° 11' 43.492 N	80° 53' 3.603 W
Actual BHL Allstate Unit 2H	6617.5	5705.5	-1826.0	14238814.38	1671360.80	39° 12' 39.929 N	80° 53' 26.718 W





Antero Resources

Ritchie County WV
Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate
Allstate Unit 2H
Original Wellpath

Design: As Drilled

EOW Completion Report

05 February, 2014

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WV Department of
Environmental Protection

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Allstate Unit 2H
Project:	Ritchie County WV	**TVD Reference:**	Frontier 25: 1142' GL + 28' RKB @ 1170.0usft
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	Frontier 25: 1142' GL + 28' RKB @ 1170.0usft
Well:	Allstate Unit 2H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Project Ritchie County WV, Ritchie County WV, WV North

Map System:	Universal Transverse Mercator (US Survey Fee	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate

Site Position:		**Northing:**	14,233,110.41 usft	**Latitude:**	39° 11' 43.507 N
From:	Map	**Easting:**	1,673,156.78 usft	**Longitude:**	80° 53' 3.984 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.07 °

Well Allstate Unit 2H, Marcellus

Well Position	**+N/-S**	0.0 usft	**Northing:**	14,233,108.91 usft	**Latitude:**	39° 11' 43.492 N
	+E/-W	0.0 usft	**Easting:**	1,673,186.80 usft	**Longitude:**	80° 53' 3.603 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,170.0 usft	**Ground Level:**	1,142.0 usft

Wellbore Original Wellpath

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/5/2013	-8.36	66.80	52,322

Design As Drilled

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	336.25

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Survey Program **Date** 2/5/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	4,600.0	Survey #6 Definitive Survey to KOP (Origi	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
4,724.0	12,355.0	Survey #5 MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
100.0	0.06	272.10	100.0	0.0	-0.1	0.0	0.06
200.0	0.22	216.79	200.0	-0.1	-0.2	0.0	0.19
300.0	0.10	254.72	300.0	-0.3	-0.4	-0.1	0.15
400.0	0.34	191.79	400.0	-0.6	-0.6	-0.4	0.31
500.0	0.26	144.92	500.0	-1.1	-0.5	-0.8	0.25
600.0	0.42	141.39	600.0	-1.6	-0.1	-1.4	0.16
700.0	0.34	168.44	700.0	-2.2	0.2	-2.0	0.19
800.0	0.55	146.46	800.0	-2.9	0.5	-2.8	0.27
900.0	0.26	163.74	900.0	-3.5	0.8	-3.5	0.31
1,000.0	0.46	144.65	1,000.0	-4.0	1.1	-4.1	0.23

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1,100.0	0.49	159.65	1,100.0	-4.7	1.5	-4.9	0.13
1,200.0	0.53	148.33	1,200.0	-5.5	1.9	-5.8	0.11
1,300.0	0.35	168.17	1,300.0	-6.2	2.2	-6.6	0.23
1,400.0	0.49	162.58	1,400.0	-6.9	2.4	-7.3	0.15
1,500.0	0.72	163.91	1,500.0	-8.0	2.7	-8.4	0.23
1,600.0	0.61	169.48	1,600.0	-9.1	2.9	-9.5	0.13
1,700.0	0.53	167.49	1,700.0	-10.1	3.1	-10.5	0.08
1,800.0	0.66	168.60	1,800.0	-11.1	3.4	-11.5	0.13
1,900.0	0.65	155.94	1,899.9	-12.2	3.7	-12.6	0.14
2,000.0	0.58	178.51	1,999.9	-13.2	3.9	-13.7	0.25
2,100.0	0.60	173.65	2,099.9	-14.2	4.0	-14.6	0.05
2,200.0	0.71	184.75	2,199.9	-15.3	4.0	-15.7	0.17
2,300.0	0.38	184.69	2,299.9	-16.3	3.9	-16.5	0.33
2,400.0	0.61	207.93	2,399.9	-17.1	3.7	-17.1	0.30
2,500.0	0.34	219.68	2,499.9	-17.8	3.2	-17.6	0.29
2,600.0	0.37	247.79	2,599.9	-18.1	2.7	-17.7	0.17
2,700.0	0.37	257.45	2,699.9	-18.3	2.1	-17.6	0.06
2,800.0	0.32	262.78	2,799.9	-18.4	1.5	-17.5	0.06
2,900.0	0.48	266.11	2,899.9	-18.5	0.8	-17.3	0.16
3,000.0	0.51	259.67	2,999.9	-18.6	0.0	-17.0	0.06
3,100.0	0.47	259.88	3,099.9	-18.8	-0.9	-16.8	0.04
3,200.0	0.53	261.51	3,199.9	-18.9	-1.7	-16.6	0.06
3,300.0	0.43	268.84	3,299.9	-19.0	-2.6	-16.3	0.12
3,400.0	0.41	258.86	3,399.9	-19.1	-3.3	-16.1	0.08
3,500.0	0.37	264.57	3,499.9	-19.2	-3.9	-15.9	0.06
3,600.0	0.38	277.70	3,599.9	-19.1	-4.6	-15.7	0.09
3,700.0	0.30	261.84	3,699.9	-19.1	-5.2	-15.4	0.12
3,800.0	0.36	255.52	3,799.9	-19.2	-5.8	-15.3	0.07
3,900.0	0.39	251.80	3,899.9	-19.4	-6.4	-15.2	0.04
4,000.0	0.27	237.31	3,999.9	-19.7	-6.9	-15.2	0.15
4,100.0	0.36	202.56	4,099.9	-20.1	-7.2	-15.5	0.21
4,200.0	0.42	181.81	4,199.9	-20.7	-7.4	-16.0	0.15
4,300.0	0.48	156.41	4,299.9	-21.5	-7.2	-16.8	0.21
4,400.0	0.78	136.95	4,399.9	-22.4	-6.6	-17.8	0.36
4,500.0	1.18	137.12	4,499.8	-23.6	-5.4	-19.1	0.40
4,600.0	1.25	134.43	4,599.8	-25.1	-3.9	-21.4	0.09
4,724.0	3.19	93.13	4,723.7	-26.3	0.5	-24.3	1.93
4,819.0	4.86	75.08	4,818.5	-25.4	7.0	-26.1	2.19
4,915.0	8.22	56.80	4,913.9	-20.6	16.7	-25.6	4.08
5,008.0	10.59	44.68	5,005.6	-10.9	28.3	-21.3	3.31
5,101.0	11.66	40.68	5,096.9	2.3	40.4	-14.1	1.42
5,197.0	12.43	40.37	5,190.8	17.6	53.4	-5.4	0.80
5,293.0	13.80	42.47	5,284.3	33.9	67.8	3.7	1.51
5,387.0	13.75	41.49	5,375.6	50.5	82.8	12.9	0.25

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5,483.0	14.78	39.37	5,468.6	68.5	98.1	23.2	1.20
5,578.0	16.58	42.47	5,560.1	87.9	115.0	34.2	2.09
5,673.0	17.18	53.11	5,651.0	106.3	135.4	42.8	3.31
5,769.0	18.70	54.41	5,742.3	123.8	159.2	49.2	1.64
5,801.0	20.31	54.24	5,772.5	130.0	167.9	51.4	5.03
5,833.0	21.28	52.92	5,802.4	136.8	177.0	53.9	3.37
5,865.0	23.04	50.98	5,832.0	144.2	186.5	56.9	5.96
5,897.0	23.04	50.37	5,861.5	152.2	196.2	60.2	0.75
5,929.0	24.45	48.44	5,890.8	160.5	206.0	64.0	5.03
5,961.0	24.62	47.82	5,919.9	169.4	215.9	68.1	0.96
5,993.0	24.27	47.47	5,949.0	178.3	225.7	72.3	1.18
6,056.0	24.89	46.94	6,006.3	196.1	244.9	80.9	1.04
6,087.0	25.00	46.78	6,034.4	205.1	254.5	85.2	0.42
6,119.0	25.76	44.83	6,063.3	214.6	264.3	90.0	3.53
6,183.0	25.41	43.34	6,121.0	234.5	283.5	100.5	1.14
6,215.0	25.15	43.25	6,150.0	244.4	292.9	105.8	0.82
6,247.0	26.12	41.40	6,178.8	254.7	302.2	111.4	3.93
6,278.0	26.29	41.40	6,206.6	264.9	311.3	117.2	0.55
6,310.0	27.00	37.45	6,235.2	276.0	320.4	123.6	5.96
6,326.0	28.04	35.49	6,249.4	282.0	324.7	127.3	8.62
Sycamore							
6,342.0	29.11	33.67	6,263.5	288.3	329.1	131.3	8.62
6,373.0	30.95	32.88	6,290.3	301.2	337.6	139.8	6.07
6,404.0	33.85	28.31	6,316.5	315.6	346.0	149.5	12.24
6,436.0	37.28	23.39	6,342.5	332.3	354.1	161.5	13.95
6,468.0	40.98	19.70	6,367.4	351.1	361.5	175.8	13.66
6,499.0	44.05	15.92	6,390.2	371.0	367.9	191.4	12.88
6,531.0	46.20	12.53	6,412.8	393.0	373.4	209.3	10.07
6,533.0	46.36	12.34	6,414.2	394.4	373.7	210.5	10.38
Middlesex							
6,563.0	48.72	9.59	6,434.4	416.1	377.9	228.7	10.38
6,595.0	50.91	6.78	6,455.1	440.3	381.4	249.4	9.58
6,627.0	53.02	3.08	6,474.8	465.4	383.6	271.5	11.24
6,659.0	55.40	0.27	6,493.5	491.4	384.3	295.0	10.30
6,691.0	58.30	358.07	6,511.0	518.2	383.9	319.7	10.74
6,717.0	61.25	355.93	6,524.1	540.6	382.7	340.7	13.39
Burkett							
6,722.0	61.82	355.53	6,526.5	545.0	382.4	344.8	13.39
6,754.0	64.37	353.42	6,541.0	573.4	379.7	371.9	9.90
6,786.0	66.83	351.92	6,554.2	602.3	375.9	399.9	8.79
6,789.0	67.18	351.80	6,555.3	605.0	375.5	402.5	12.07
Tully							
6,818.0	70.52	350.69	6,565.8	631.7	371.4	428.6	12.07
6,850.0	74.66	349.20	6,575.4	661.8	366.1	458.3	13.68

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6,855.0	75.07	348.91	6,576.7	666.5	365.2	463.0	9.95
Marcellus							
6,882.0	77.29	347.35	6,583.1	692.2	359.8	488.7	9.95
6,914.0	79.67	345.42	6,589.5	722.6	352.4	519.5	9.50
6,946.0	81.60	343.75	6,594.7	753.1	344.0	550.8	7.93
6,978.0	83.54	341.46	6,598.9	783.4	334.5	582.3	9.33
7,025.0	88.22	338.04	6,602.3	827.3	318.3	629.1	12.32
7,089.0	90.40	336.89	6,603.0	886.4	293.8	693.0	3.85
7,120.0	91.10	338.03	6,602.6	915.1	281.9	724.0	4.32
7,215.0	91.54	338.03	6,600.4	1,003.1	246.4	819.0	0.46
7,311.0	91.28	335.22	6,598.1	1,091.2	208.3	914.9	2.94
7,405.0	91.36	334.87	6,595.9	1,176.4	168.6	1,008.9	0.38
7,502.0	91.80	334.87	6,593.2	1,264.2	127.5	1,105.8	0.45
7,597.0	90.84	335.13	6,591.0	1,350.3	87.3	1,200.8	1.05
7,693.0	89.34	337.24	6,590.9	1,438.1	48.6	1,296.7	2.70
7,787.0	88.99	335.93	6,592.3	1,524.3	11.2	1,390.7	1.44
7,882.0	89.87	337.24	6,593.2	1,611.5	-26.5	1,485.7	1.66
7,977.0	89.16	336.98	6,594.0	1,699.0	-63.5	1,580.7	0.80
8,072.0	87.41	335.93	6,596.8	1,786.1	-101.4	1,675.7	2.15
8,168.0	88.64	336.80	6,600.2	1,874.0	-139.9	1,771.6	1.57
8,264.0	89.34	338.21	6,601.8	1,962.6	-176.6	1,867.6	1.64
8,359.0	88.99	338.03	6,603.2	2,050.8	-212.0	1,962.5	0.41
8,454.0	89.60	335.66	6,604.4	2,138.1	-249.4	2,057.5	2.58
8,549.0	90.22	335.57	6,604.6	2,224.7	-288.6	2,152.5	0.66
8,644.0	90.75	335.49	6,603.7	2,311.1	-327.9	2,247.5	0.56
8,739.0	89.08	334.43	6,603.9	2,397.2	-368.1	2,342.4	2.08
8,834.0	89.16	334.43	6,605.3	2,482.9	-409.1	2,437.4	0.08
8,929.0	89.43	335.49	6,606.5	2,568.9	-449.3	2,532.3	1.15
9,025.0	89.60	337.51	6,607.3	2,657.0	-487.6	2,628.3	2.11
9,121.0	89.69	337.51	6,607.9	2,745.7	-524.3	2,724.3	0.09
9,216.0	89.60	336.63	6,608.5	2,833.2	-561.3	2,819.3	0.93
9,310.0	89.96	336.54	6,608.9	2,919.4	-598.7	2,913.3	0.39
9,404.0	90.13	336.19	6,608.8	3,005.5	-636.4	3,007.3	0.41
9,497.0	90.22	336.10	6,608.5	3,090.6	-674.0	3,100.3	0.14
9,591.0	90.22	335.22	6,608.2	3,176.2	-712.7	3,194.3	0.94
9,686.0	89.96	336.10	6,608.0	3,262.8	-751.9	3,289.3	0.97
9,780.0	89.78	335.31	6,608.2	3,348.5	-790.6	3,383.3	0.86
9,874.0	89.96	335.05	6,608.4	3,433.8	-830.0	3,477.3	0.34
9,969.0	90.13	334.43	6,608.4	3,519.7	-870.6	3,572.2	0.68
10,063.0	89.16	336.89	6,608.9	3,605.3	-909.3	3,666.2	2.81
10,158.0	89.16	336.63	6,610.3	3,692.6	-946.8	3,761.2	0.27
10,252.0	90.31	337.77	6,610.8	3,779.3	-983.2	3,855.2	1.72
10,346.0	90.22	335.84	6,610.3	3,865.7	-1,020.2	3,949.2	2.06
10,441.0	90.04	337.33	6,610.1	3,952.8	-1,058.0	4,044.2	1.58
10,534.0	92.07	339.35	6,608.4	4,039.2	-1,092.3	4,137.1	3.08

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10,630.0	90.92	338.30	6,605.9	4,128.7	-1,127.0	4,232.9	1.62
10,724.0	90.04	336.72	6,605.1	4,215.6	-1,162.9	4,326.9	1.92
10,818.0	89.69	336.10	6,605.3	4,301.7	-1,200.5	4,420.9	0.76
10,912.0	89.78	336.10	6,605.8	4,387.6	-1,238.6	4,514.9	0.10
11,007.0	89.87	336.28	6,606.1	4,474.6	-1,277.0	4,609.9	0.21
11,101.0	89.69	336.10	6,606.4	4,560.6	-1,314.9	4,703.9	0.27
11,195.0	90.04	335.93	6,606.6	4,646.4	-1,353.1	4,797.9	0.41
11,290.0	90.13	335.49	6,606.5	4,733.0	-1,392.2	4,892.9	0.47
11,385.0	90.57	335.05	6,605.9	4,819.3	-1,431.9	4,987.9	0.65
11,480.0	90.92	335.75	6,604.7	4,905.7	-1,471.5	5,082.9	0.82
11,575.0	88.90	335.49	6,604.8	4,992.2	-1,510.7	5,177.9	2.14
11,665.0	88.20	336.45	6,607.1	5,074.4	-1,547.3	5,267.8	1.32
11,755.0	88.55	336.19	6,609.7	5,156.8	-1,583.5	5,357.8	0.48
11,845.0	88.99	336.54	6,611.6	5,239.2	-1,619.5	5,447.8	0.62
11,935.0	89.43	336.63	6,612.8	5,321.8	-1,655.3	5,537.8	0.50
12,026.0	90.31	336.37	6,613.0	5,405.2	-1,691.6	5,628.8	1.01
12,116.0	89.25	336.54	6,613.4	5,487.7	-1,727.5	5,718.8	1.19
12,207.0	89.16	335.84	6,614.7	5,571.0	-1,764.3	5,809.7	0.78
12,297.0	88.81	335.13	6,616.2	5,652.9	-1,801.6	5,899.7	0.88
12,355.0	88.81	335.13	6,617.5	5,705.5	-1,826.0	5,957.7	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
6,326.0	6,249.4	282.0	324.7	Sycamore
6,533.0	6,414.2	394.4	373.7	Middlesex
6,717.0	6,524.1	540.6	382.7	Burkett
6,789.0	6,555.3	605.0	375.5	Tully
6,855.0	6,576.7	666.5	365.2	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/9/2014
Job End Date:	5/3/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10017-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Allstate Unit 2H
Longitude:	-80.88433300
Latitude:	39.19541400
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,618
Total Base Water Volume (gal):	8,774,136
Total Base Non Water Volume:	366,383

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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
Water	Antero Resources	Base Fluid					
			Water	7732-18-5	100.00000	90.71704	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	8.93692	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.10619	
			Hydrogen Chloride	7641-01-1	18.00000	0.02537	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.05549	
			Petroleum Distillates	64742-47-8	60.00000	0.05255	
			Suspending agent (solid)	14808-60-7	3.00000	0.00849	
			Surfactant	68439-51-0	3.00000	0.00333	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			Anionic Polyacrylamide	Proprietary		0.02416	
			Water	7732-18-5	40.00000	0.02416	
			Petroleum Distillates	64742-47-8	22.00000	0.01945	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00302	

			Crystalline Salt	12125-02-9	5.00000	0.00302	
SI-1000	U.S. Well Services, LLC	Scale Inhibitor					
			Anionic Copolymer	Proprietary		0.00420	
			Ethylene Glycol	107-21-1	20.00000	0.00380	
			Water	7732-18-5	30.00000	0.00317	
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00448	
			Deionized Water	7732-18-5	28.00000	0.00256	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00196	
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Ethylene Glycol	107-21-1	31.00000	0.00028	
			N,N-Dimethylformamide	68-12-2	15.00000	0.00009	
			Cinnamaldehyde	104-55-2	5.00000	0.00008	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	13.00000	0.00007	
			2-Butoxyethanol	111-76-2	7.00000	0.00007	
			Water	7732-18-5	20.00000	0.00003	
			Ethoxylated Nonylphenol	68412-54-4	5.00000	0.00002	
			Triethyl Phosphate	78-40-0	3.00000	0.00001	
			Isopropyl Alcohol	67-63-0	3.00000	0.00001	

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.

* 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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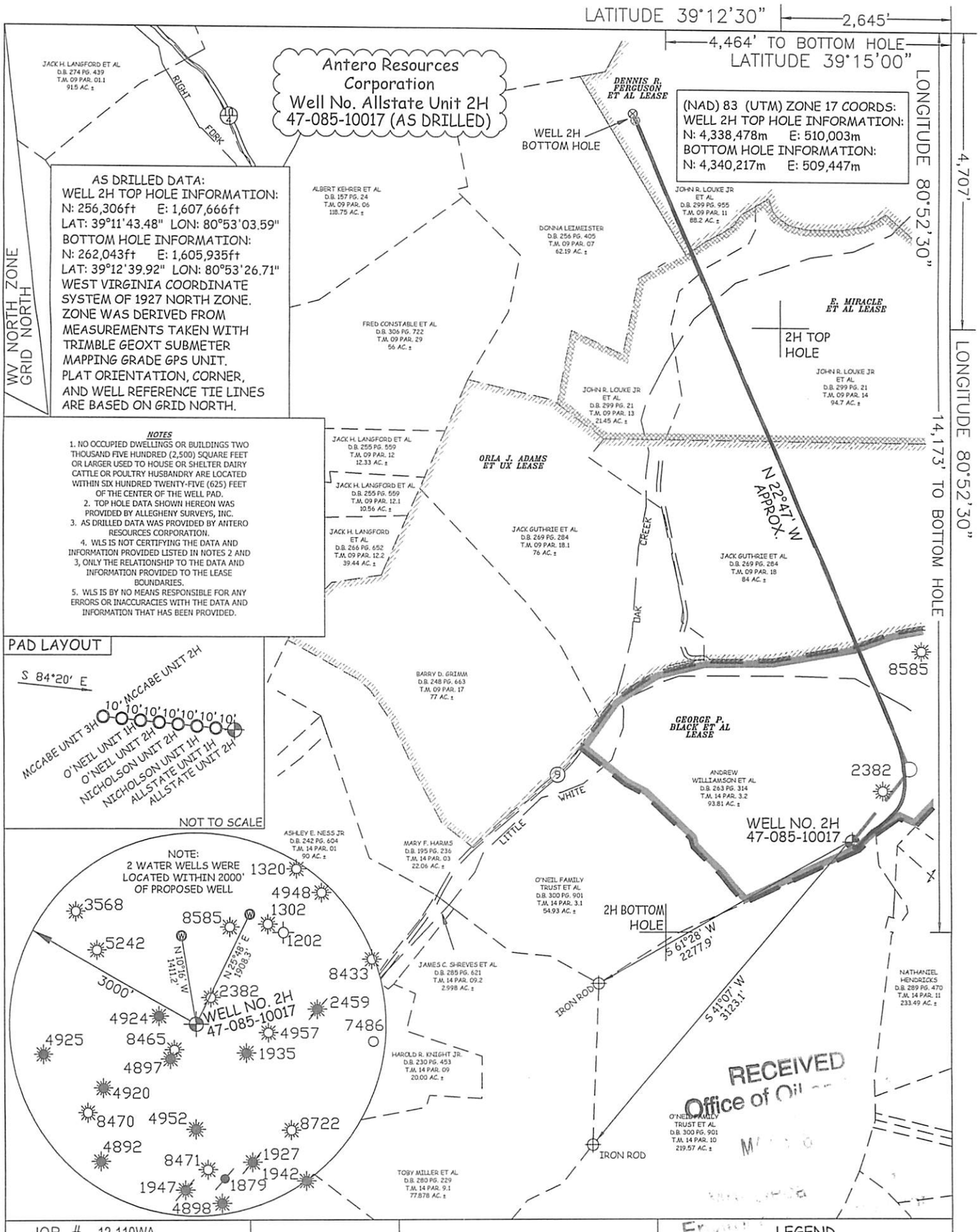

JOB # 12-110WA
DRAWING # ALLSTATE2HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

LEGEND
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE 04/14/15
OPERATOR'S WELL# ALLSTATE UNIT #2H
API WELL # 47 – 085 – 10017
STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,153' ORIGINAL - 1,144' AS-DRILLED WATERSHED SOUTH FORK HUGHES RIVER
QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE
SURFACE OWNER ANDREW WILLIAMSON ET AL ACREAGE 93.81 ACRES +/-
OIL & GAS ROYALTY OWNER GEORGE P. BLACK ET AL; ORLA J. ADAMS ET UX; E. MIRACLE ET AL; DENNIS R. FERGUSON ET AL LEASE ACREAGE 93 ACRES±; 314 ACRES±; 116 ACRES±; 88 ACRES±
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,617' TVD 12,355' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

COUNTY NAME PERMIT

FORM WW-6

WR-35
Rev. 8/23/13

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

Received
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API 47 - 085 - 10019 County Ritchie District Union
Quad Pullman 7.5' Pad Name Yolanda Field/Pool Name ---
Farm name Williamson, Andrew, et al Well Number McCabe Unit 3H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4338479m	Easting 509982m
Landing Point of Curve	Northing 4338617.73m	Easting 509701.85m
Bottom Hole	Northing 4340396	Easting 508928m

Elevation (ft) 1144' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas ■ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL ■ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 2/19/2013 Date drilling commenced 12/7/2013 Date drilling ceased 3/7/2014
Date completion activities began 3/27/2014 Date completion activities ceased 5/21/2014
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 112', 114' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1987', 1989' Void(s) encountered (Y/N) depths No
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:
A.L. 5/26/15
W.S. 6/02/15

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API 47- 085 - 10019 Farm name Williamson, Andrew, et al Well number McCabe Unit 3H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	40'	New	94# H-40	N/A	Y
Surface	12-1/4	13-3/8"	360'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	8-3/4	9-5/8"	2531'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2	5-1/2"	13841'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6543'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	127 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	418 sx	15.6	1.18	250	0'	8 Hrs.
Coal							
Intermediate 1	Class A	988 sx	15.6	1.18	793	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	874 sx lead 1178 sx tail	13.5 lead 15.2 tail	1.44 lead 1.8 tail	2623	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 13841' MD, 6621' TVD (BHL); 6621' TVD (Deepest point drilled) Loggers TD (ft) 13796' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5918'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Nicholson Unit 2H API# 47-085-09960). Please reference the wireline logs submitted with Form WR-35 for the Nicholson Unit 2H. A Cement Bond Log has been included with this submittal.

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ☐ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ☐ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

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WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ■ Yes ☐ No TYPE OF TRACER(S) USED Chemical + Radioactive

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API 47- 085 - 10019 Farm name Williamson, Andrew, et al Well number McCabe Unit 3H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
			SEE ATTACHED EXHIBIT 1		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
				SEE ATTACHED EXHIBIT 2				

Please insert additional pages as applicable.

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API 47- 085 - 10019 Farm name Williamson, Andrew, et al Well number McCabe Unit 3H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6548' (TOP)	TVD	7059' (TOP)	MD

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Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	8817 mcfpd	54 bpd	--- bpd	305 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company, LLC
Address 207 Carlton Dr. City Eighty Four State PA Zip 15330

Logging Company Rush Well Site Services
Address 600 Alpha drive City Canonsburg State PA Zip 15317

Cementing Company Allied Oil & Gas Services, LLC
Address 1036 East Main St. City Bridgeport State WV Zip 26330

Stimulating Company US Well Services
Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permit Representative Date 2/10/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-085-10019 Farm Name Williamson, Andrew, et al Well Number McCabe Unit 3H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	27-Mar-14	13,583	13,754	60	Marcellus
2	16-Apr-14	13,435	13,560	60	Marcellus
3	16-Apr-14	13,288	13,413	60	Marcellus
4	17-Apr-14	13,141	13,266	60	Marcellus
5	17-Apr-14	12,994	13,118	60	Marcellus
6	17-Apr-14	12,846	12,971	60	Marcellus
7	17-Apr-14	12,699	12,824	60	Marcellus
8	17-Apr-14	12,552	12,677	60	Marcellus
9	18-Apr-14	12,405	12,529	60	Marcellus
10	18-Apr-14	12,257	12,382	60	Marcellus
11	18-Apr-14	12,110	12,235	60	Marcellus
12	18-Apr-14	11,963	12,088	60	Marcellus
13	18-Apr-14	11,816	11,940	60	Marcellus
14	19-Apr-14	11,668	11,793	60	Marcellus
15	19-Apr-14	11,521	11,646	60	Marcellus
16	19-Apr-14	11,374	11,498	60	Marcellus
17	19-Apr-14	11,226	11,351	60	Marcellus
18	19-Apr-14	11,079	11,204	60	Marcellus
19	20-Apr-14	10,932	11,057	60	Marcellus
20	20-Apr-14	10,785	10,909	60	Marcellus
21	20-Apr-14	10,637	10,762	60	Marcellus
22	20-Apr-14	10,490	10,615	60	Marcellus
23	21-Apr-14	10,343	10,468	60	Marcellus
24	21-Apr-14	10,196	10,320	60	Marcellus
25	21-Apr-14	10,048	10,173	60	Marcellus
26	21-Apr-14	9,901	10,026	60	Marcellus
27	22-Apr-14	9,754	9,878	60	Marcellus
28	22-Apr-14	9,606	9,731	60	Marcellus
29	22-Apr-14	9,459	9,584	60	Marcellus
30	23-Apr-14	9,312	9,437	60	Marcellus
31	23-Apr-14	9,165	9,289	60	Marcellus
32	27-Apr-14	9,017	9,142	60	Marcellus
33	4-May-14	8,870	8,995	60	Marcellus
34	4-May-14	8,723	8,848	60	Marcellus
35	4-May-14	8,576	8,700	60	Marcellus
36	4-May-14	8,428	8,553	60	Marcellus
37	4-May-14	8,281	8,406	60	Marcellus
38	5-Jan-14	8,134	8,258	60	Marcellus
39	5-Jan-14	7,986	8,111	60	Marcellus
40	5-Jan-14	7,839	7,964	60	Marcellus
41	5-Jan-14	7,692	7,817	60	Marcellus
42	5-Jan-14	7,545	7,669	60	Marcellus
43	6-May-14	7,397	7,522	60	Marcellus
44	6-May-14	7,250	7,375	60	Marcellus
45	6-May-14	7,103	7,228	60	Marcellus

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API 47-085-10019 Farm Name Williamson, Andrew, et al Well Number McCabe Unit 3H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	15-Apr-14	67.0	8,252	5,697	4,967	119,900	5,995	N/A
2	16-Apr-14	79.0	7,670	6,237	3,448	213,800	5,811	N/A
3	16-Apr-14	72.0	7,572	6,230	4,874	69,400	6,356	N/A
4	17-Apr-14	82.0	7,988	5,597	5,822	201,600	6,331	N/A
5	17-Apr-14	78.0	7,491	6,026	5,189	130,800	5,747	N/A
6	17-Apr-14	75.0	7,096	5,547	3,633	217,600	5,758	N/A
7	17-Apr-14	72.0	7,446	5,729	3,984	170,900	6,295	N/A
8	18-Apr-14	74.0	7,096	5,372	5,794	217,900	5,723	N/A
9	18-Apr-14	77.0	7,213	5,729	5,826	185,600	6,196	N/A
10	18-Apr-14	76.0	7,162	5,497	4,821	216,800	5,743	N/A
11	18-Apr-14	73.0	7,078	5,636	3,998	217,000	5,693	N/A
12	18-Apr-14	77.0	7,341	5,375	3,805	215,900	5,735	N/A
13	19-Apr-14	81.0	7,516	5,268	3,026	217,200	5,690	N/A
14	19-Apr-14	81.0	7,843	5,429	4,781	216,400	5,690	N/A
15	19-Apr-14	80.0	7,304	5,490	5,046	218,600	5,695	N/A
16	19-Apr-14	79.0	7,188	5,718	4,599	217,000	5,646	N/A
17	19-Apr-14	81.0	7,334	5,153	3,201	217,400	5,641	N/A
18	19-Apr-14	81.0	7,269	5,318	3,190	217,000	5,635	N/A
19	20-Apr-14	79.0	7,407	5,450	4,020	218,200	5,681	N/A
20	20-Apr-14	79.0	7,610	5,779	4,960	159,900	5,601	N/A
21	20-Apr-14	76.0	7,826	5,457	4,449	173,300	6,133	N/A
22	20-Apr-14	79.0	7,780	5,375	4,392	178,100	6,131	N/A
23	21-Apr-14	79.0	7,124	5,636	4,853	215,300	5,613	N/A
24	21-Apr-14	79.0	7,448	6,126	4,052	218,000	5,565	N/A
25	21-Apr-14	80.0	7,911	5,450	5,136	187,000	6,245	N/A
26	22-Apr-14	79.0	7,375	5,658	5,758	203,000	6,068	N/A
27	22-Apr-14	79.0	7,491	5,686	5,025	129,300	5,708	N/A
28	22-Apr-14	79.0	7,048	5,218	4,975	205,200	6,090	N/A
29	22-Apr-14	78.0	6,905	5,693	3,973	216,800	5,523	N/A
30	23-Apr-14	77.0	7,086	5,537	5,211	220,200	5,545	N/A
31	23-Apr-14	62.0	7,932	5,296	7,739	94,100	5,644	N/A
32	3-May-14	76.0	6,753	N/A	4,631	220,400	5,504	N/A
33	4-May-14	77.0	6,645	5,318	4,714	219,600	5,492	N/A
34	4-May-14	75.0	6,843	5,659	3,072	220,800	5,482	N/A
35	4-May-14	76.0	6,755	5,959	2,815	219,600	5,465	N/A
36	4-May-14	74.0	7,047	5,568	3,962	169,500	5,929	N/A
37	4-May-14	75.0	6,895	5,561	3,909	220,200	5,567	N/A
38	5-May-14	75.0	6,834	5,425	4,724	199,200	5,946	N/A
39	5-May-14	76.0	6,716	5,411	4,106	220,800	5,457	N/A
40	5-May-14	76.0	6,921	5,865	4,070	221,500	5,458	N/A
41	5-May-14	76.0	6,936	5,826	3,562	220,000	5,449	N/A
42	5-May-14	75.0	7,088	5,833	3,265	220,000	5,462	N/A
43	6-May-14	62.0	7,751	5,794	5,035	12,900	5,466	N/A
44	6-May-14	78.0	6,550	5,590	3,372	219,700	5,378	N/A
45	6-May-14	76.0	6,894	6,201	3,358	251,100	5,829	N/A
	AVG =	**76.4**	**7,276**	**5,623**	**4,425**	**8,734,500**	**258,811**	**TOTAL**

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API 47-085-10019 Farm Name Williamson, Andrew, et al Well Number McCabe Unit 3H

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	112'	N/A	112'	N/A
Fresh Water	114'	N/A	114'	N/A
Siltstone/Shale	0	216	0	216
Siltstone/Shale w/ trace coal	216	236	216	236
Siltstone/Shale	236	616	236	616
Siltstone and Coal	616	636	616	636
Siltstone/Limestone	636	856	636	856
Sandstone	856	876	856	876
Siltstone/Limestone	876	1116	876	1116
Sandstone and Coal	1116	1156	1116	1156
Siltstone/Shale	1156	1656	1156	1656
Sandstone	1656	1756	1656	1756
Siltstone/Shale w/ trace coal	1756	1776	1756	1776
Siltstone/Shale	1776	2016	1776	2016
Siltstone/Shale w/ trace coal	2016	2118	2016	2118
Big Lime	2118	2181	2118	2181
Big Injun	2181	2432	2181	2432
Gantz Sand	2432	2570	2432	2570
Fifty Foot Sandstone	2570	2688	2570	2688
Gordon	2688	3085	2688	3085
Fifth Sandstone	3085	3189	3085	3189
Bayard	3189	3521	3189	3521
Warren	3521	3954	3521	3954
Speechley	3954	4168	3954	4168
Baltown	4168	4637	4168	4637
Bradford	4637	5024	4637	5025
Benson	5024	5262	5025	5263
Alexander	5262	5470	5263	5470
Elk	5470	5875	5470	5876
Rhinestreet	5875	6214	5876	6234
Sycamore	6214	6386	6234	6500
Middlesex	6386	6,495	6500	6832
Burkett	6495	6527	6832	6952
Tully	6527	6548	6952	7059
Marcellus	6548	NA	7059	NA

*Please note Antero determines shallow formation tops based on mud and/or wireline logs that are only run on one well on a multi-well pad (Please reference Wireline Logs submitted for the Nicholson Unit 2H API# 47-085-09960). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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McCabe Unit 3H
Ritchie County WV
Northing: 14233113.76
Easting: 1673117.74
As Drilled

Antero Resources

Scientific Drilling

To convert Magnetic North to Grid, Subtract 8.44°
To convert True North to Grid, Subtract 0.07°

Azimuths to Grid North
True North: -0.07°
Magnetic North: -8.44°

Magnetic Field
Strength: 52306.8snT
Dip Angle: 66.79°
Date: 1/20/2014
Model: IGRF2010

McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0usft
Gr: 1142.0

WELL DETAILS McCabe Unit 3H
Ground Level: 1142.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14233113.76	1673117.74	39° 11' 43.540 N	80° 53' 4.481 W

SITE DETAILS: Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate

Site Center: Nicholson Unit 2H

Site Centre Northing: 14233110.41
Easting: 1673156.78

Positional Uncertainity: 2.0
Convergence: 0.07
Local North: Grid

Genie Lightfoot
15:56, March 05 2014

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK 73128

LEGEND

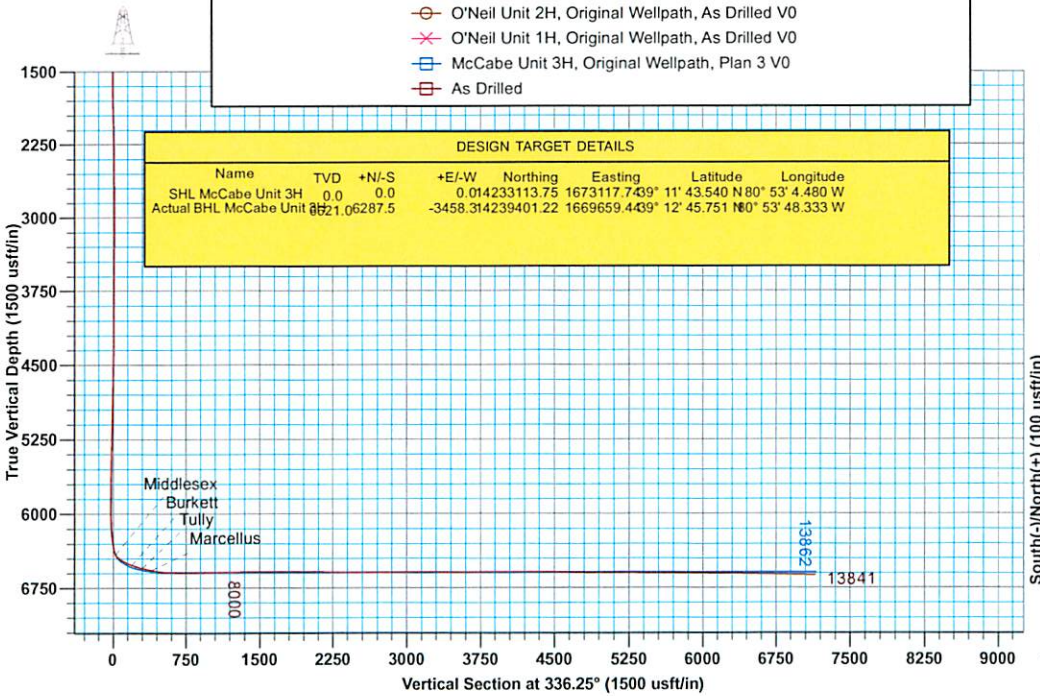
- Nicholson Unit 2H, Original Wellpath, As Drilled V0
- Allstate Unit 2H, Original Wellpath, As Drilled V0
- Nicholson Unit 1H, Original Wellpath, As Drilled V0
- O'Neil Unit 2H, Original Wellpath, As Drilled V0
- O'Neil Unit 1H, Original Wellpath, As Drilled V0
- McCabe Unit 3H, Original Wellpath, Plan 3 V0
- As Drilled

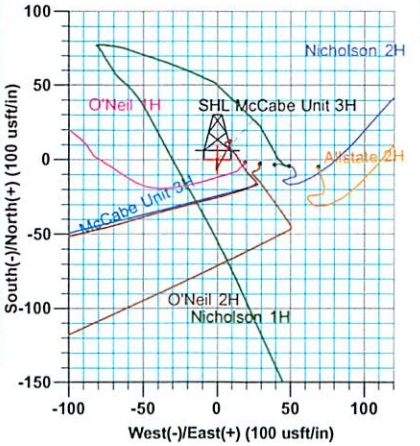
DESIGN TARGET DETAILS

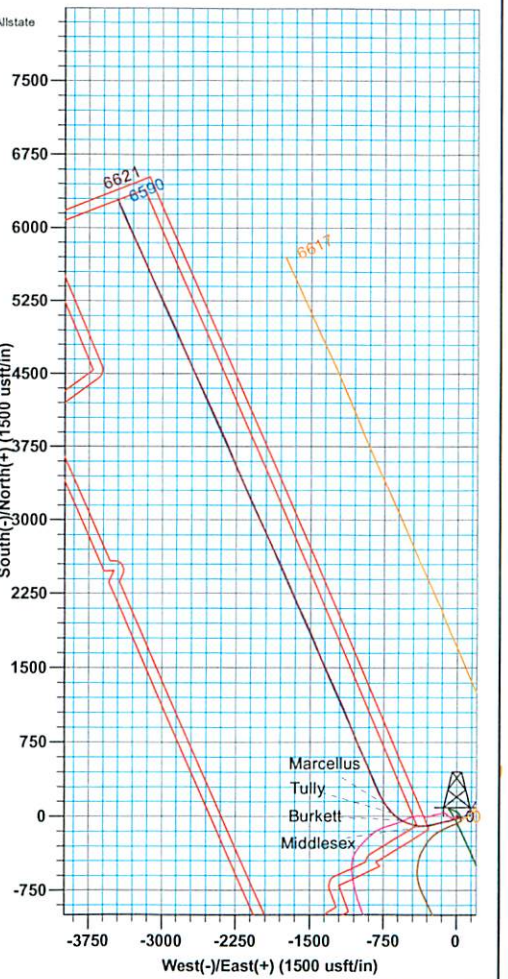
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL McCabe Unit 3H	0.0	0.0	0.0	14233113.75	1673117.74	39° 11' 43.540 N	80° 53' 4.480 W
Actual BHL McCabe Unit 3H	6621.0	6287.5	-3458.31	14239401.22	1669659.44	39° 12' 45.751 N	80° 53' 48.333 W

PROJECT DETAILSRitchie County WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level







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Antero Resources

Ritchie County WV
Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate
McCabe Unit 3H
Original Wellpath

Design: As Drilled

EOW Completion Report

05 March, 2014

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Antero Resources

EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well McCabe Unit 3H
Project:	Ritchie County WV	**TVD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Well:	McCabe Unit 3H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Project Ritchie County WV, Ritchie County WV, WV North

Map System:	Universal Transverse Mercator (US Survey Fee	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate

Site Position:		**Northing:**	14,233,110.41 usft	**Latitude:**	39° 11' 43.507 N
From:	Map	**Easting:**	1,673,156.78 usft	**Longitude:**	80° 53' 3.984 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.07 °

Well McCabe Unit 3H, Marcellus

Well Position	**+N/-S**	0.0 usft	**Northing:**	14,233,113.76 usft	**Latitude:**	39° 11' 43.540 N
	+E/-W	0.0 usft	**Easting:**	1,673,117.74 usft	**Longitude:**	80° 53' 4.481 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,170.0 usft	**Ground Level:**	1,142.0 usft

Wellbore Original Wellpath

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/20/2014	-8.37	66.79	52,307

Design As Drilled

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	336.25

Survey Program **Date** 3/5/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,710.0	Survey #2 Gyro (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
1,810.0	5,833.0	Survey #4 Gyro to 5833 (Original Wellpath	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
5,887.0	13,841.0	Survey #5 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
100.0	0.67	196.35	100.0	-0.6	-0.2	-0.4	0.67
200.0	0.46	183.96	200.0	-1.5	-0.4	-1.2	0.24
300.0	0.32	175.72	300.0	-2.2	-0.4	-1.9	0.15
400.0	0.32	195.49	400.0	-2.7	-0.4	-2.3	0.11
500.0	0.25	179.48	500.0	-3.2	-0.5	-2.8	0.11
600.0	0.22	181.73	600.0	-3.6	-0.5	-3.1	0.03
700.0	0.18	180.44	700.0	-4.0	-0.5	-3.5	0.04
800.0	0.08	158.98	800.0	-4.2	-0.5	-3.7	0.11
900.0	0.18	193.63	900.0	-4.4	-0.5	-3.9	0.12

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well McCabe Unit 3H
Project:	Ritchie County WV	**TVD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Well:	McCabe Unit 3H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,000.0	0.14	190.83	1,000.0	-4.7	-0.5	-4.1	0.04
1,100.0	0.14	162.39	1,100.0	-4.9	-0.5	-4.3	0.07
1,200.0	0.28	188.48	1,200.0	-5.3	-0.5	-4.6	0.17
1,300.0	0.14	172.15	1,300.0	-5.7	-0.6	-5.0	0.15
1,400.0	0.36	186.33	1,400.0	-6.1	-0.6	-5.4	0.23
1,500.0	0.12	186.96	1,500.0	-6.5	-0.6	-5.7	0.24
1,600.0	0.21	169.66	1,600.0	-6.8	-0.6	-6.0	0.10
1,700.0	0.31	178.08	1,700.0	-7.2	-0.6	-6.4	0.11
1,710.0	0.32	167.20	1,710.0	-7.3	-0.5	-6.5	0.60
1,810.0	2.62	24.89	1,810.0	-5.5	0.5	-5.2	2.88
1,910.0	3.37	26.86	1,909.8	-0.8	2.8	-1.9	0.76
2,010.0	2.59	27.93	2,009.7	3.8	5.2	1.4	0.78
2,110.0	2.00	27.51	2,109.6	7.4	7.0	3.9	0.59
2,210.0	1.20	28.97	2,209.6	9.8	8.3	5.6	0.80
2,310.0	0.85	23.45	2,309.6	11.4	9.1	6.8	0.36
2,410.0	0.59	26.47	2,409.6	12.6	9.7	7.6	0.26
2,510.0	0.16	0.91	2,509.6	13.2	9.9	8.1	0.45
2,610.0	0.05	294.47	2,609.6	13.3	9.8	8.2	0.15
2,710.0	0.10	256.26	2,709.6	13.3	9.7	8.3	0.07
2,810.0	0.17	288.00	2,809.6	13.3	9.5	8.4	0.10
2,910.0	0.25	277.45	2,909.6	13.4	9.1	8.6	0.09
3,010.0	0.16	250.81	3,009.6	13.4	8.8	8.7	0.13
3,110.0	0.27	246.90	3,109.6	13.3	8.4	8.7	0.11
3,210.0	0.30	234.70	3,209.6	13.0	8.0	8.7	0.07
3,310.0	0.30	220.16	3,309.6	12.7	7.6	8.5	0.08
3,410.0	0.25	198.79	3,409.6	12.3	7.4	8.2	0.11
3,510.0	0.24	258.54	3,509.6	12.0	7.1	8.1	0.24
3,610.0	0.22	255.19	3,609.6	11.9	6.7	8.2	0.02
3,710.0	0.19	239.13	3,709.5	11.8	6.4	8.2	0.06
3,810.0	0.16	256.97	3,809.5	11.7	6.1	8.2	0.06
3,910.0	0.18	235.64	3,909.5	11.5	5.9	8.2	0.07
4,010.0	0.23	213.69	4,009.5	11.3	5.6	8.1	0.09
4,110.0	0.42	189.70	4,109.5	10.8	5.4	7.7	0.23
4,210.0	0.55	155.59	4,209.5	10.0	5.6	6.9	0.31
4,310.0	0.75	132.87	4,309.5	9.1	6.3	5.8	0.32
4,410.0	0.99	129.08	4,409.5	8.1	7.4	4.4	0.25
4,510.0	1.24	127.82	4,509.5	6.9	8.9	2.7	0.25
4,610.0	1.32	133.67	4,609.5	5.4	10.6	0.7	0.15
4,710.0	1.47	141.93	4,709.5	3.6	12.2	-1.6	0.25
4,810.0	1.56	146.77	4,809.4	1.5	13.8	-4.2	0.16
4,910.0	1.63	147.74	4,909.4	-0.9	15.3	-7.0	0.08
5,010.0	1.44	148.93	5,009.3	-3.2	16.7	-9.6	0.19
5,110.0	1.43	147.81	5,109.3	-5.3	18.0	-12.1	0.03
5,210.0	1.29	142.08	5,209.3	-7.2	19.4	-14.4	0.20
5,310.0	1.13	141.38	5,309.3	-8.9	20.7	-16.5	0.16

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well McCabe Unit 3H
Project:	Ritchie County WV	**TVD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Well:	McCabe Unit 3H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,410.0	0.94	134.07	5,409.2	-10.2	21.9	-18.2	0.23
5,510.0	1.05	136.56	5,509.2	-11.5	23.1	-19.8	0.12
5,610.0	1.01	137.64	5,609.2	-12.8	24.3	-21.5	0.04
5,710.0	0.92	138.24	5,709.2	-14.0	25.4	-23.1	0.09
5,810.0	0.67	142.13	5,809.2	-15.1	26.3	-24.4	0.26
5,833.0	0.69	129.41	5,832.2	-15.3	26.5	-24.7	0.66
5,887.0	0.53	188.57	5,886.2	-15.7	26.7	-25.2	1.14
5,918.0	3.78	235.95	5,917.1	-16.5	25.9	-25.5	11.11
5,950.0	6.95	241.84	5,949.0	-18.0	23.3	-25.8	10.04
5,982.0	11.43	249.92	5,980.6	-20.0	18.6	-25.8	14.54
6,014.0	13.45	253.88	6,011.8	-22.1	12.1	-25.1	6.85
6,045.0	13.37	254.41	6,042.0	-24.0	5.1	-24.1	0.47
6,076.0	15.04	255.37	6,072.0	-26.0	-2.2	-22.9	5.44
6,108.0	18.64	255.72	6,102.6	-28.3	-11.2	-21.4	11.25
6,140.0	21.90	255.72	6,132.7	-31.1	-21.9	-19.6	10.19
6,172.0	24.36	255.46	6,162.1	-34.2	-34.1	-17.6	7.69
6,203.0	26.73	254.49	6,190.1	-37.7	-47.0	-15.5	7.76
6,235.0	29.72	253.79	6,218.2	-41.8	-61.6	-13.5	9.40
6,267.0	33.24	255.64	6,245.5	-46.2	-77.7	-11.0	11.41
6,298.0	36.84	258.01	6,270.9	-50.2	-95.0	-7.7	12.41
6,330.0	40.54	258.54	6,295.9	-54.3	-114.6	-3.5	11.61
6,362.0	44.58	257.57	6,319.4	-58.8	-135.8	0.9	12.79
6,394.0	48.98	256.34	6,341.4	-64.1	-158.5	5.2	14.03
6,426.0	53.55	255.46	6,361.4	-70.1	-182.7	9.4	14.44
6,457.0	58.12	255.11	6,378.8	-76.7	-207.5	13.4	14.77
6,489.0	62.43	254.76	6,394.6	-83.9	-234.3	17.6	13.50
6,521.0	65.69	257.31	6,408.6	-90.8	-262.2	22.5	12.45
6,524.0	65.77	257.79	6,409.9	-91.4	-264.9	23.0	14.86
Middlesex							
6,553.0	66.65	262.40	6,421.6	-96.0	-291.0	29.4	14.86
6,585.0	67.88	267.32	6,433.9	-98.6	-320.4	38.8	14.69
6,616.0	70.00	271.72	6,445.1	-98.8	-349.3	50.2	14.91
6,648.0	70.79	274.71	6,455.8	-97.1	-379.4	63.9	9.14
6,679.0	71.49	277.87	6,465.9	-93.9	-408.6	78.6	9.91
6,711.0	72.11	281.48	6,475.9	-88.8	-438.5	95.3	10.89
6,743.0	72.55	284.46	6,485.6	-82.0	-468.2	113.6	8.98
6,775.0	72.63	289.12	6,495.1	-73.2	-497.5	133.4	13.90
6,807.0	73.07	293.60	6,504.6	-62.0	-525.9	155.0	13.45
6,839.0	73.42	297.91	6,513.8	-48.7	-553.5	178.3	12.94
6,856.0	73.41	300.51	6,518.7	-40.8	-567.7	191.3	14.69
Burkett							
6,870.0	73.42	302.66	6,522.7	-33.7	-579.2	202.4	14.69
6,901.0	73.60	307.67	6,531.5	-16.6	-603.5	227.8	15.51
6,933.0	74.34	311.18	6,540.3	2.9	-627.2	255.3	10.79

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well McCabe Unit 3H
Project:	Ritchie County WV	**TVD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Well:	McCabe Unit 3H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
6,964.0	76.00	313.52	6,548.2	23.1	-649.4	282.7	9.05
6,976.0	76.64	314.86	6,551.1	31.2	-657.7	293.5	12.08
Tully							
6,996.0	77.73	317.07	6,555.5	45.2	-671.3	311.8	12.08
7,028.0	79.14	319.44	6,561.9	68.6	-692.1	341.6	8.49
7,060.0	79.23	322.08	6,567.9	93.0	-712.0	371.9	8.11
7,083.0	79.68	325.02	6,572.2	111.2	-725.5	393.9	12.71
Marcellus							
7,091.0	79.84	326.04	6,573.6	117.7	-729.9	401.7	12.71
7,123.0	80.37	328.67	6,579.1	144.2	-746.9	432.8	8.26
7,155.0	82.04	329.82	6,584.0	171.4	-763.1	464.2	6.31
7,186.0	83.54	330.78	6,587.9	198.1	-778.3	494.8	5.73
7,215.0	85.47	331.66	6,590.6	223.4	-792.2	523.5	7.31
7,248.0	87.32	333.42	6,592.7	252.6	-807.4	556.4	7.73
7,311.0	87.41	336.85	6,595.6	309.7	-833.9	619.3	5.44
7,405.0	89.78	337.90	6,597.9	396.4	-870.0	713.2	2.76
7,500.0	90.13	336.93	6,598.0	484.1	-906.5	808.2	1.09
7,596.0	90.75	336.93	6,597.2	572.5	-944.1	904.2	0.65
7,686.0	91.36	336.76	6,595.6	655.2	-979.5	994.2	0.70
7,777.0	91.10	336.76	6,593.6	738.8	-1,015.4	1,085.2	0.29
7,867.0	90.84	337.02	6,592.1	821.6	-1,050.7	1,175.2	0.41
7,957.0	91.98	337.99	6,589.9	904.7	-1,085.1	1,265.1	1.66
8,047.0	89.52	336.93	6,588.7	987.8	-1,119.6	1,355.1	2.98
8,137.0	89.69	337.29	6,589.3	1,070.7	-1,154.6	1,445.1	0.44
8,238.0	90.48	336.93	6,589.2	1,163.8	-1,193.9	1,546.0	0.86
8,319.0	89.78	336.32	6,589.0	1,238.1	-1,226.1	1,627.0	1.15
8,410.0	89.34	334.65	6,589.7	1,320.9	-1,263.8	1,718.0	1.90
8,500.0	90.57	334.39	6,589.8	1,402.1	-1,302.5	1,808.0	1.40
8,591.0	89.87	335.09	6,589.4	1,484.4	-1,341.4	1,898.9	1.09
8,682.0	90.04	336.93	6,589.5	1,567.6	-1,378.4	1,989.9	2.03
8,776.0	89.87	337.55	6,589.6	1,654.3	-1,414.7	2,083.9	0.68
8,871.0	89.16	337.37	6,590.4	1,742.0	-1,451.1	2,178.9	0.77
8,966.0	88.99	337.29	6,591.9	1,829.6	-1,487.7	2,273.9	0.20
9,062.0	89.78	335.53	6,592.9	1,917.6	-1,526.2	2,369.9	2.01
9,157.0	90.40	335.62	6,592.8	2,004.1	-1,565.4	2,464.9	0.66
9,251.0	89.34	336.06	6,593.0	2,089.9	-1,603.9	2,558.9	1.22
9,345.0	90.04	335.88	6,593.5	2,175.7	-1,642.2	2,652.8	0.77
9,440.0	90.22	335.97	6,593.3	2,262.5	-1,680.9	2,747.8	0.21
9,536.0	91.10	336.23	6,592.2	2,350.2	-1,719.8	2,843.8	0.96
9,630.0	89.78	335.62	6,591.5	2,436.0	-1,758.2	2,937.8	1.55
9,725.0	89.78	336.06	6,591.8	2,522.7	-1,797.1	3,032.8	0.46
9,820.0	90.31	336.23	6,591.8	2,609.6	-1,835.5	3,127.8	0.59
9,915.0	89.16	335.79	6,592.2	2,696.4	-1,874.1	3,222.8	1.30
10,011.0	89.96	335.26	6,592.9	2,783.8	-1,913.9	3,318.8	1.00
10,105.0	89.34	333.59	6,593.5	2,868.5	-1,954.5	3,412.8	1.90

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Antero Resources

EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well McCabe Unit 3H
Project:	Ritchie County WV	**TVD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Well:	McCabe Unit 3H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
10,200.0	91.19	335.53	6,593.1	2,954.3	-1,995.3	3,507.7	2.82
10,296.0	89.34	336.06	6,592.6	3,041.9	-2,034.6	3,603.7	2.00
10,391.0	90.75	337.29	6,592.6	3,129.1	-2,072.2	3,698.7	1.97
10,486.0	91.10	337.02	6,591.0	3,216.6	-2,109.1	3,793.7	0.47
10,582.0	89.16	336.76	6,590.8	3,304.9	-2,146.8	3,889.7	2.04
10,676.0	89.52	337.20	6,591.9	3,391.4	-2,183.5	3,983.6	0.60
10,771.0	89.96	337.46	6,592.3	3,479.1	-2,220.2	4,078.6	0.54
10,866.0	90.57	337.55	6,591.9	3,566.9	-2,256.5	4,173.6	0.65
10,962.0	90.66	337.55	6,590.8	3,655.6	-2,293.2	4,269.6	0.09
11,057.0	89.16	337.64	6,591.0	3,743.4	-2,329.4	4,364.5	1.58
11,152.0	89.34	336.67	6,592.2	3,831.0	-2,366.2	4,459.5	1.04
11,247.0	88.29	335.26	6,594.2	3,917.7	-2,404.9	4,554.5	1.85
11,341.0	88.64	334.39	6,596.7	4,002.7	-2,444.9	4,648.4	1.00
11,434.0	89.25	334.82	6,598.4	4,086.7	-2,484.8	4,741.4	0.80
11,528.0	90.48	337.20	6,598.7	4,172.6	-2,523.0	4,835.4	2.85
11,623.0	89.43	335.35	6,598.7	4,259.6	-2,561.2	4,930.4	2.24
11,717.0	90.04	335.62	6,599.2	4,345.1	-2,600.2	5,024.4	0.71
11,811.0	89.08	335.44	6,599.9	4,430.7	-2,639.1	5,118.3	1.04
11,905.0	88.99	336.41	6,601.5	4,516.5	-2,677.5	5,212.3	1.04
12,000.0	89.52	335.00	6,602.7	4,603.0	-2,716.6	5,307.3	1.59
12,094.0	90.57	337.55	6,602.6	4,689.1	-2,754.4	5,401.3	2.93
12,188.0	89.69	337.81	6,602.4	4,776.0	-2,790.1	5,495.3	0.98
12,282.0	90.22	338.16	6,602.5	4,863.2	-2,825.3	5,589.2	0.68
12,377.0	89.25	335.88	6,602.9	4,950.6	-2,862.4	5,684.2	2.61
12,471.0	89.60	335.88	6,603.9	5,036.4	-2,900.8	5,778.2	0.37
12,565.0	90.04	335.79	6,604.2	5,122.2	-2,939.3	5,872.2	0.48
12,660.0	88.64	335.35	6,605.3	5,208.7	-2,978.6	5,967.2	1.54
12,754.0	88.90	335.44	6,607.3	5,294.1	-3,017.7	6,061.2	0.29
12,793.0	89.69	335.97	6,607.8	5,329.7	-3,033.8	6,100.1	2.44
12,943.0	89.16	335.44	6,609.3	5,466.4	-3,095.5	6,250.1	0.50
13,037.0	89.34	336.49	6,610.5	5,552.2	-3,133.8	6,344.1	1.13
13,132.0	89.78	336.76	6,611.2	5,639.4	-3,171.4	6,439.1	0.54
13,225.0	90.22	335.88	6,611.2	5,724.6	-3,208.8	6,532.1	1.06
13,319.0	88.55	334.65	6,612.2	5,810.0	-3,248.1	6,626.1	2.21
13,414.0	88.11	334.03	6,615.0	5,895.6	-3,289.2	6,721.0	0.80
13,508.0	88.72	335.35	6,617.6	5,980.5	-3,329.4	6,814.9	1.55
13,603.0	88.90	337.02	6,619.6	6,067.4	-3,367.8	6,909.9	1.77
13,698.0	89.52	337.20	6,620.9	6,154.9	-3,404.7	7,004.9	0.68
13,786.0	90.13	338.34	6,621.2	6,236.3	-3,438.0	7,092.8	1.47
13,841.0	90.13	338.34	6,621.0	6,287.5	-3,458.3	7,147.8	0.00

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well McCabe Unit 3H
Project:	Ritchie County WV	**TVD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Site:	Yolanda Pad / Nicholson/O'Neil/McCabe/Allstate	**MD Reference:**	McCabe Unit 3H 1142' GL + 28' RKB @ 1170.0us
Well:	McCabe Unit 3H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
6,524.0	6,409.9	-91.4	-264.9	Middlesex
6,856.0	6,518.7	-40.8	-567.7	Burkett
6,976.0	6,551.1	31.2	-657.7	Tully
7,083.0	6,572.2	111.2	-725.5	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/15/2014
Job End Date:	5/6/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10019-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	McCabe Unit 3H
Longitude:	-80.88458100
Latitude:	39.19542800
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,621
Total Base Water Volume (gal):	10,870,062
Total Base Non Water Volume:	445,910

FracFocus Chemical Disclosure Registry

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GROUNDWATER PROTECTION COUNCIL

Interstate Oil & Gas Compact Commission

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
Water	Antero Resources	Base Fluid					
			Water	7732-18-5	100.00000	90.88872	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	8.75689	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.06463	
			Petroleum Distillates	64742-47-8	60.00000	0.06121	
			Suspending agent (solid)	14808-60-7	3.00000	0.00989	
			Surfactant	68439-51-0	3.00000	0.00388	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.09684	
			Hydrogen Chloride	7641-01-1	18.00000	0.02313	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			Anionic Polyacrylamide	Proprietary		0.02411	
			Water	7732-18-5	40.00000	0.02411	
			Petroleum Distillates	64742-47-8	22.00000	0.01941	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00301	

			Crystalline Salt	12125-02-9	5.00000	0.00301	
SI-1000	U.S. Well Services, LLC	Scale Inhibitor					
			Anionic Copolymer	Proprietary		0.00423	
			Ethylene Glycol	107-21-1	20.00000	0.00383	
			Water	7732-18-5	30.00000	0.00319	
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00462	
			Deionized Water	7732-18-5	28.00000	0.00264	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00205	
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Ethylene Glycol	107-21-1	31.00000	0.00025	
			N,N-Dimethylformamide	68-12-2	15.00000	0.00008	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	13.00000	0.00007	
			Cinnamaldehyde	104-55-2	5.00000	0.00007	
			2-Butoxyethanol	111-76-2	7.00000	0.00006	
			Ethoxylated Nonylphenol	68412-54-4	5.00000	0.00002	
			Water	7732-18-5	20.00000	0.00002	
			Triethyl Phosphate	78-40-0	3.00000	0.00001	
			Isopropyl Alcohol	67-63-0	3.00000	0.00001	

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.

* 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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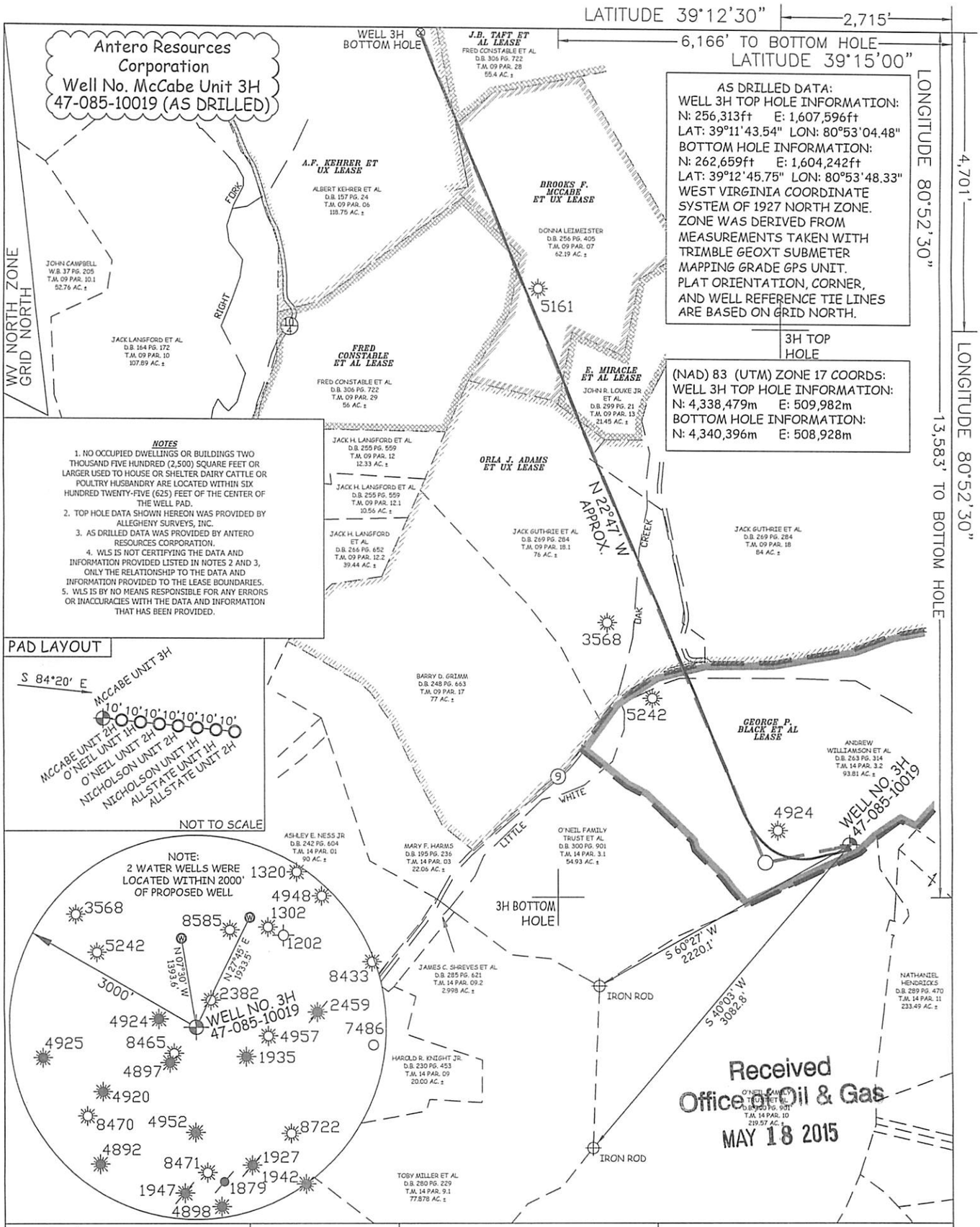

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JOB # 12-074WA
DRAWING # MCCABE3HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

LEGEND
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE 04/14/15
OPERATOR'S WELL# MCCABE UNIT #3H
API WELL # 47 – 085 – 10019
STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,153' ORIGINAL - 1,144' AS-DRILLED WATERSHED SOUTH FORK HUGHES RIVER
QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE
SURFACE OWNER ANDREW WILLIAMSON ET AL ACREAGE 93.81 ACRES +/-
OIL & GAS ROYALTY OWNER GEORGE P. BLACK ET AL; ORLA J. ADAMS ET UX; E. MIRACLE ET AL; BROOKS F. MCCABE ET UX; FRED CONSTABLE ET AL; J.B. TAFT ET AL; A.F. KEHRER ET UX
LEASE ACREAGE 93 ACRES±; 314 ACRES±; 21.45 ACRES±; 63ACRES±; 56 ACRES±; 57 ACRES±; 118.75 ACRES±
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,621' TVD 13,841' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
DENVER, CO 80202 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

COUNTY NAME PERMIT

FORM WW-6

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

API 47 - 085 - 10044 County Ritchie District Union
Quad Pullman 7.5' Pad Name Ness Pad Field/Pool Name ---
Farm name Ness, Ashley E., Jr. Well Number Langford Unit 1H
Operator (as registered with the OOG) Antero Resources
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4338466m	Easting 508529m
Landing Point of Curve	Northing 4338383.09m	Easting 507958.28m
Bottom Hole	Northing 4341173m	Easting 506806m

Elevation (ft) 1076' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas ■ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL ■ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine

Mud Type(s) and Additive(s)
Air- Foam & 4% KCL
Mud- Polymer

Date permit issued 7/30/2013 Date drilling commenced 10/28/2013 Date drilling ceased 1/21/2014
Date completion activities began 4/13/2014 Date completion activities ceased 1/11/2015
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 62' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1620', 1838' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 456' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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Reviewed by:
AL 5/27/15 ✓
W.S. 6/3/15

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API 47- 085 - 10044 Farm name Ness, Ashley E., Jr. Well number Langford Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	40'	New	51# H-40	N/A	Yes
Surface	17- 1/2"	13- 3/8"	445'	New	48# J-55	N/A	Yes
Coal							
Intermediate 1	12-1/4"	9-5/8"	2536'	New	36# J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	17252'	New	23# P-110	N/A	Yes
Tubing		2-3/8"	6812'		5.95# N-80	N/A	
Packer type and depth set		N/A					

Comment Details SIDETRACK: Fish in hole at 7259'. Unable to POOH, set cement plug from 6168' - 6804' using 250 sacks of Class A cement. Inspector Dave Cowan was notified at 2300 on 12/21/2013.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	100	15.6	1.18	38	0	8 Hrs.
Surface	Class A	515	15.6	1.18	309	0	8 Hrs.
Coal							
Intermediate 1	Class A	983	15.6	1.18	794	0	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	697 sx (Lead) 1221 sx (Tail)	14.5 Lead 15.2 Tail	1.44 Lead 1.8 Tail	3486	~500' Into Intermediate Casing	
Tubing							

Drillers TD (ft) 17252' MD, 6433' TVD (BHL), 6487' TVD (Deepest Point Drilled) Loggers TD (ft) 17196'

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6400'

** This is a subsequent well. Antero only runs wireline logs on the first well on a multi-well pad (Rufus Unit 1H API#47-085-10046). Please reference the wireline logs submitted with Form WR-35 for the Rufus Unit 1H.

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ☐ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ■ No ☐ Conventional ☐ Sidewall Were cuttings collected ☐ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Conductor- 0

Surface- 1 above guide shoe, 1 aboce insert float, 1 every 4th joint to surface

Intermediate- 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production- 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 085 - 10044 Farm name Ness, Ashley E., Jr. Well number Langford Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

*** PLEASE SEE EXHIBIT 1**

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

*** PLEASE SEE EXHIBIT 2**

Please insert additional pages as applicable.

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API 47- 085 - 10044 Farm name Ness, Ashley E., Jr. Well number Langford Unit 1H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6426' (TOP)	TVD	6878' (TOP)	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	9007 mcfpd	77 bpd	--- bpd	2 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

*** PLEASE SEE EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company LLC
Address 207 Carlton Dr. City Eighty Four State PA Zip 15330

Logging Company Cased Hole Solutions
Address 100 Arentzen Blvd. City Charleroi State PA Zip 15022

Cementing Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

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Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permitting Agent Date 3/25/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-085-10044 Farm Name Ness, Ashley E., Jr Well Number Langford Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	13-Apr-14	17,034	17,161	60	Marcellus
2	5-Nov-14	16,883	17,010	60	Marcellus
3	5-Nov-14	16,732	16,860	60	Marcellus
4	6-Nov-14	16,581	16,709	60	Marcellus
5	7-Nov-14	16,430	16,558	60	Marcellus
6	8-Nov-14	16,279	16,407	60	Marcellus
7	8-Nov-14	16,128	16,256	60	Marcellus
8	8-Nov-14	15,977	16,105	60	Marcellus
9	9-Nov-14	15,826	15,954	60	Marcellus
10	9-Nov-14	15,675	15,803	60	Marcellus
11	9-Nov-14	15,524	15,652	60	Marcellus
12	9-Nov-14	15,374	15,501	60	Marcellus
13	10-Nov-14	15,223	15,350	60	Marcellus
14	10-Nov-14	15,072	15,199	60	Marcellus
15	10-Nov-14	14,921	15,049	60	Marcellus
16	11-Nov-14	14,770	14,898	60	Marcellus
17	11-Nov-14	14,619	14,747	60	Marcellus
18	11-Nov-14	14,468	14,596	60	Marcellus
19	11-Nov-14	14,317	14,445	60	Marcellus
20	12-Nov-14	14,166	14,294	60	Marcellus
21	12-Nov-14	14,015	14,143	60	Marcellus
22	12-Nov-14	13,864	13,992	60	Marcellus
23	12-Nov-14	13,713	13,841	60	Marcellus
24	13-Nov-14	13,563	13,690	60	Marcellus
25	13-Nov-14	13,412	13,539	60	Marcellus
26	13-Nov-14	13,261	13,388	60	Marcellus
27	14-Nov-14	13,110	13,238	60	Marcellus
28	14-Nov-14	12,959	13,087	60	Marcellus
29	14-Nov-14	12,808	12,936	60	Marcellus
30	14-Nov-14	12,657	12,785	60	Marcellus
31	14-Nov-14	12,506	12,634	60	Marcellus
32	15-Nov-14	12,355	12,483	60	Marcellus
33	15-Nov-14	12,204	12,332	60	Marcellus
34	15-Nov-14	12,053	12,181	60	Marcellus
35	15-Nov-14	11,902	12,030	60	Marcellus
36	16-Nov-15	11,752	11,879	60	Marcellus
37	16-Nov-15	11,601	11,728	60	Marcellus
38	16-Nov-15	11,450	11,577	60	Marcellus
39	16-Nov-15	11,299	11,427	60	Marcellus
40	17-Nov-14	11,148	11,276	60	Marcellus
41	17-Nov-14	10,997	11,125	60	Marcellus
42	17-Nov-14	10,846	10,974	60	Marcellus
43	17-Nov-14	10,695	10,823	60	Marcellus
44	18-Nov-14	10,544	10,672	60	Marcellus
45	18-Nov-14	10,393	10,521	60	Marcellus
46	18-Nov-14	10,242	10,370	60	Marcellus
47	18-Nov-14	10,091	10,219	60	Marcellus
48	19-Nov-14	9,940	10,068	60	Marcellus
49	19-Nov-14	9,790	9,917	60	Marcellus
50	19-Nov-14	9,639	9,766	60	Marcellus
51	20-Nov-14	9,488	9,615	60	Marcellus
52	20-Nov-14	9,337	9,465	60	Marcellus
53	20-Nov-14	9,186	9,314	60	Marcellus
54	20-Nov-14	9,035	9,163	60	Marcellus
55	20-Nov-14	8,884	9,012	60	Marcellus
56	21-Nov-14	8,733	8,861	60	Marcellus
57	21-Nov-14	8,582	8,710	60	Marcellus
58	21-Nov-14	8,431	8,559	60	Marcellus
59	21-Nov-14	8,280	8,408	60	Marcellus
60	22-Nov-14	8,129	8,257	60	Marcellus
61	22-Nov-14	7,979	8,106	60	Marcellus
62	22-Nov-14	7,828	7,955	60	Marcellus
63	22-Nov-14	7,677	7,804	60	Marcellus
64	22-Nov-14	7,526	7,654	60	Marcellus
65	23-Nov-14	7,375	7,503	60	Marcellus
66	23-Nov-14	7,224	7,352	60	Marcellus
67	23-Nov-14	7,073	7,201	60	Marcellus
68	23-Nov-14	6,922	7,050	60	Marcellus

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API 47-085-10044 Farm Name Ness, Ashley E., Jr. Well Number Langford Unit 1H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	4-Nov-14	63.1	7,530	6,109	5,018	185,100	6,041	N/A
2	5-Nov-14	64.9	7,747	5,988	4,921	116,600	6,066	N/A
3	6-Nov-14	67.8	7,271	5,912	5,193	167,400	5,533	N/A
4	7-Nov-14	68.5	7,288	5,684	5,233	172,900	5,573	N/A
5	8-Nov-14	66.9	7,247	5,896	3,957	214,700	6,084	N/A
6	8-Nov-14	67.9	7,316	5,655	4,512	175,700	6,566	N/A
7	8-Nov-14	68.2	7,448	5,544	5,135	214,600	6,153	N/A
8	9-Nov-14	68.7	7,441	5,698	6,120	210,600	5,940	N/A
9	9-Nov-14	63.6	7,205	5,566	5,760	216,600	5,959	N/A
10	9-Nov-14	65.0	7,124	5,449	5,246	214,200	5,951	N/A
11	9-Nov-14	67.6	7,046	5,290	5,290	211,500	5,946	N/A
12	10-Nov-14	66.9	6,849	5,309	5,355	213,300	5,934	N/A
13	10-Nov-14	64.9	7,091	5,558	5,113	167,200	6,458	N/A
14	10-Nov-14	64.9	7,077	5,515	4,943	212,900	5,900	N/A
15	10-Nov-14	64.3	7,072	5,272	4,661	211,400	5,895	N/A
16	11-Nov-14	64.3	6,964	5,414	4,716	213,500	5,880	N/A
17	11-Nov-14	63.5	6,931	5,105	5,076	214,400	5,856	N/A
18	11-Nov-14	62.3	6,147	5,347	5,242	132,200	4,749	N/A
19	12-Nov-14	66.3	6,791	5,272	5,518	211,100	5,818	N/A
20	12-Nov-14	66.9	6,705	5,332	5,215	215,200	5,868	N/A
21	12-Nov-14	67.5	6,677	5,405	5,347	214,600	5,836	N/A
22	12-Nov-14	67.1	6,945	5,422	5,272	213,500	5,810	N/A
23	13-Nov-14	66.7	6,848	5,515	5,191	211,400	5,773	N/A
24	13-Nov-14	66.8	6,688	5,534	4,938	214,300	5,776	N/A
25	13-Nov-14	66.0	6,982	5,376	4,705	214,300	5,758	N/A
26	13-Nov-14	66.4	7,133	5,347	5,328	213,300	5,729	N/A
27	14-Nov-14	67.3	6,882	5,309	5,639	213,800	5,875	N/A
28	14-Nov-14	68.1	6,680	5,317	5,278	213,100	5,697	N/A
29	14-Nov-14	64.5	6,850	5,625	5,460	204,500	5,574	N/A
30	14-Nov-14	65.8	7,458	5,612	5,861	213,700	5,807	N/A
31	15-Nov-14	65.3	7,089	5,698	5,944	210,400	5,696	N/A
32	15-Nov-14	67.0	7,173	5,881	5,332	191,200	5,445	N/A
33	15-Nov-14	62.7	7,904	5,772	5,529	97,800	6,185	N/A
34	15-Nov-14	64.7	7,134	5,473	5,386	215,300	5,631	N/A
35	16-Nov-14	64.6	6,754	5,264	5,412	215,400	5,640	N/A
36	16-Nov-14	66.9	6,666	5,154	5,594	214,300	5,626	N/A
37	16-Nov-14	67.5	6,728	5,317	5,968	214,400	5,691	N/A
38	16-Nov-14	64.6	6,618	5,742	5,133	212,300	5,573	N/A
39	16-Nov-14	64.3	6,801	5,742	5,088	214,000	5,572	N/A
40	17-Nov-14	66.9	6,648	5,251	5,515	214,600	5,664	N/A
41	17-Nov-14	67.1	7,154	5,632	5,538	211,000	5,756	N/A
42	17-Nov-14	64.7	6,707	5,620	5,268	212,400	5,544	N/A
43	17-Nov-14	64.6	7,013	5,735	4,998	207,700	5,550	N/A
44	18-Nov-14	66.1	7,395	5,590	5,281	129,500	5,893	N/A
45	18-Nov-14	65.6	6,948	5,966	4,536	212,800	5,518	N/A
46	18-Nov-14	67.9	6,829	5,741	4,455	210,900	5,469	N/A
47	19-Nov-14	65.9	6,513	5,309	4,906	213,100	5,469	N/A
48	19-Nov-14	68.2	6,457	5,159	5,463	210,500	5,970	N/A
49	19-Nov-14	67.5	6,256	5,212	5,287	206,900	5,586	N/A
50	19-Nov-14	66.6	6,818	5,253	4,545	213,400	5,332	N/A
51	20-Nov-14	67.1	6,690	5,309	5,086	213,900	5,516	N/A
52	20-Nov-14	67.6	6,588	5,272	5,505	210,800	5,445	N/A
53	20-Nov-14	67.7	6,802	5,684	5,508	212,400	5,396	N/A
54	20-Nov-14	68.3	6,581	5,816	5,191	213,600	5,440	N/A
55	20-Nov-14	64.2	6,889	5,228	5,366	190,800	5,166	N/A
56	21-Nov-14	70.7	7,626	5,703	5,496	95,300	5,800	N/A
57	21-Nov-14	68.9	6,653	5,494	4,864	213,600	5,329	N/A
58	21-Nov-14	68.8	6,791	5,501	5,398	216,800	5,461	N/A
59	21-Nov-14	30.4	8,193	5,497	5,091	20,400	4,854	N/A
60	22-Nov-14	65.3	6,400	5,553	5,646	211,600	5,271	N/A
61	22-Nov-14	67.3	6,611	5,701	5,405	211,200	5,412	N/A
62	22-Nov-14	72.5	6,431	5,313	5,889	208,000	5,193	N/A
63	22-Nov-14	67.3	6,060	5,696	4,856	214,400	5,351	N/A
64	22-Nov-14	67.1	6,102	6,182	5,592	214,400	5,292	N/A
65	23-Nov-14	67.5	6,351	5,295	5,540	213,200	5,251	N/A
66	23-Nov-14	68.2	6,174	5,590	5,616	211,900	5,210	N/A
67	23-Nov-14	68.5	6,228	6,014	5,721	209,600	5,162	N/A
68	23-Nov-14	67.1	5,685	5,625	3,365	213,400	5,225	N/A
	AVG=	66.0	6,881	5,535	5,229	13,540,800	384,389	TOTAL

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API 47-085-10044 Farm Name Ness, Ashley E., Jr. Well Number Langford Unit 1H

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	62	N/A	62	N/A
Siltstone	0	456	0	456
Coal	456	486	456	486
Sand	486	516	486	516
Shale	516	1266	516	1,266
Sandstone	1266	1296	1266	1296
Shale	1296	1356	1296	1356
Sandstone	1356	1386	1356	1386
Shale	1386	1506	1386	1506
Sandstone	1506	1906	1506	1906
Limestone	1906	1993	1906	1993
Big Lime	1993	2052	1993	2052
Big Injun	2052	2302	2052	2302
Gantz Sand	2302	2473	2302	2473
Fifty Foot Sandstone	2473	2688	2473	2688
Gordon	2688	2969	2688	2969
Fifth Sandstone	2969	3063	2969	3064
Bayard	3063	3435	3064	3447
Warren	3435	6816	3447	3861
Speechley	6816	4025	3861	4093
Baltown	4025	4518	4093	4643
Bradford	4518	4895	4643	5054
Benson	4895	5142	5054	5331
Alexander	5142	5360	5331	5573
Elk	5360	5745	5573	5997
Rhinestreet	5745	6107	5997	6397
Sycamore	6107	6271	6397	6583
Middlesex	6271	6375	6583	6741
Burkett	6375	6405	6741	6812
Tully	6405	6426	6812	6878
Marcellus	6426	NA	6878	17228

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Langford Unit 1H
Ritchie County WV
Northing: 14233072.19
Easting: 1668350.52
As Drilled ST1

Antero Resources

Scientific Drilling

WELL DETAILS Langford Unit 1H
Ground Level: 1075.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14233072.19	1668350.52	39° 11' 43.185 N	80° 54' 5.056 W

Genie Lightfoot
11:50, February 06 2014

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK 73128

PROJECT DETAILS: Ritchie County WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level

Langford 1H 1075 GL + 24 KB @ 1099.0usft
Gr: 1075.0

T G M

To convert Magnetic North to Grid, Subtract 8.41°
To convert True North to Grid, Subtract 0.06°

Azimuths to Grid North
True North: -0.06°
Magnetic North: -8.41°

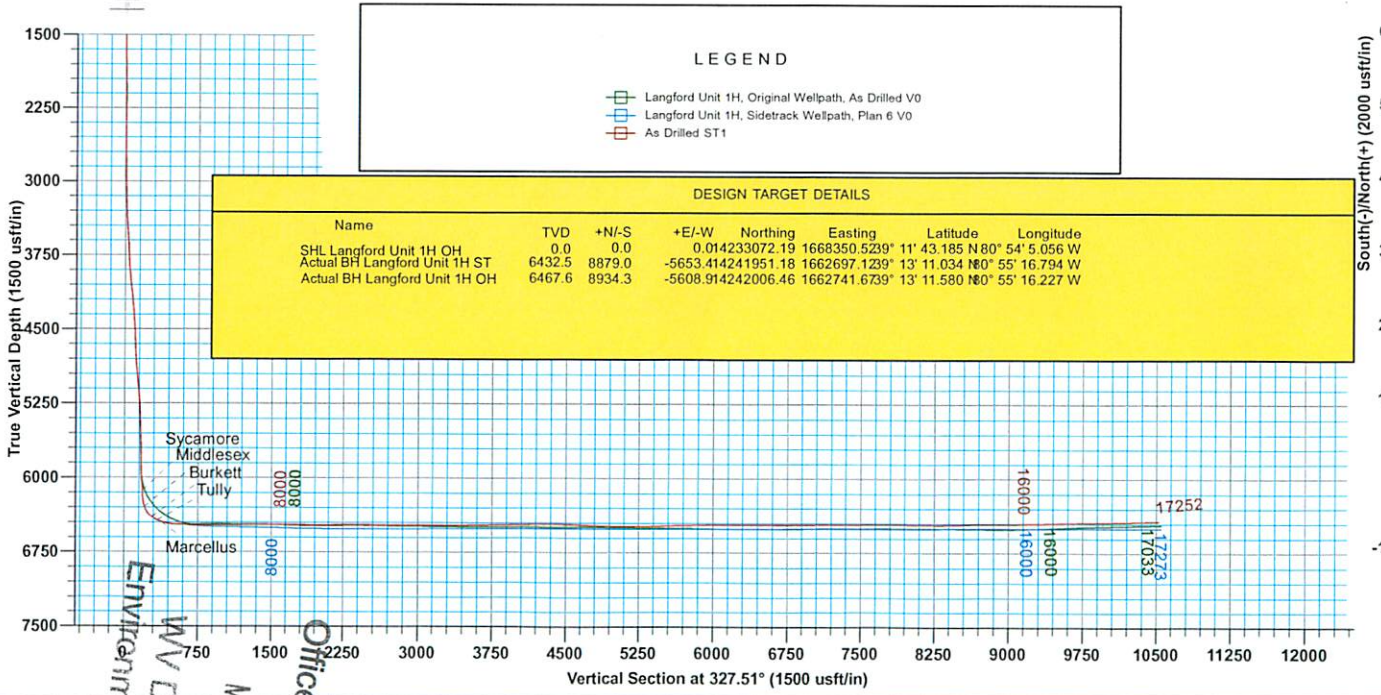
Magnetic Field
Strength: 52319.6snT
Dip Angle: 66.80°
Date: 12/20/2013
Model: IGRF2010

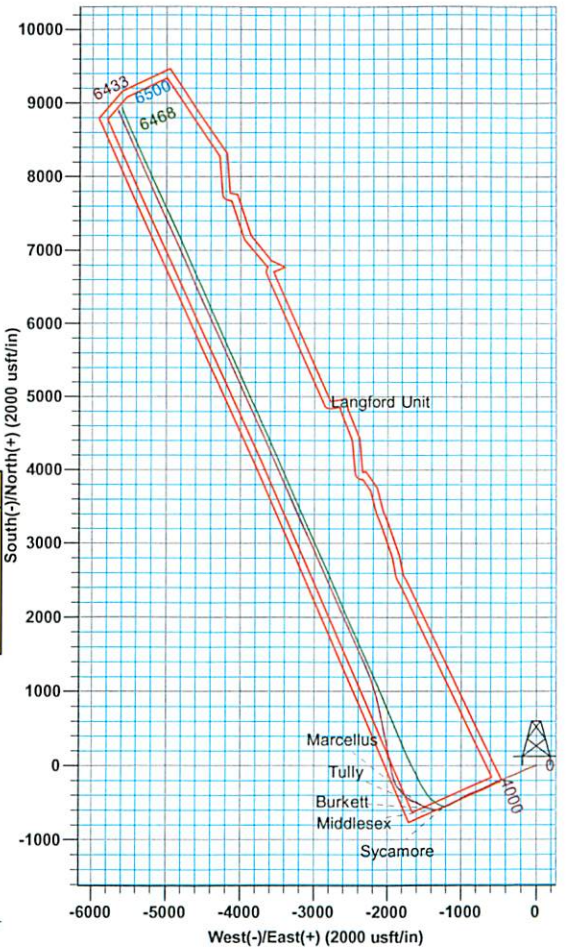
LEGEND

- Langford Unit 1H, Original Wellpath, As Drilled V0
- Langford Unit 1H, Sidetrack Wellpath, Plan 6 V0
- As Drilled ST1

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Langford Unit 1H OH	0.0	0.0	0.0	14233072.19	1668350.52	39° 11' 43.185 N	80° 54' 5.056 W
Actual BH Langford Unit 1H ST	6432.5	8879.0	-5653.4	14241951.18	1662697.12	39° 13' 11.034 N	80° 55' 16.794 W
Actual BH Langford Unit 1H OH	6467.6	8934.3	-5608.9	14242006.46	1662741.67	39° 13' 11.580 N	80° 55' 16.227 W





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Antero Resources

Ritchie County WV
DeBerry/Rufus/Langford
Langford Unit 1H
Sidetrack Wellpath

Design: As Drilled ST1

EOW Completion Report

06 February, 2014

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Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Langford Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Langford Unit 1H	**North Reference:**	Grid
Wellbore:	Sidetrack Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled ST1	**Database:**	Oklahoma District

Project Ritchie County WV, Ritchie County WV, WV North

Map System:	Universal Transverse Mercator (US Survey Fee	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site DeBerry/Rufus/Langford, Site Center: Deberry 1H

Site Position:		**Northing:**	14,233,087.17 usft	**Latitude:**	39° 11' 43.333 N
From:	Map	**Easting:**	1,668,409.26 usft	**Longitude:**	80° 54' 4.310 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.06 °

Well Langford Unit 1H, Marcellus

Well Position	**+N/-S**	0.0 usft	**Northing:**	14,233,072.19 usft	**Latitude:**	39° 11' 43.185 N
	+E/-W	0.0 usft	**Easting:**	1,668,350.52 usft	**Longitude:**	80° 54' 5.056 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,099.0 usft	**Ground Level:**	1,075.0 usft

Wellbore Sidetrack Wellpath

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	12/20/2013	-8.35	66.80	52,320

Design As Drilled ST1

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	6,190.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	327.51

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Survey Program **Date** 2/6/2014

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
100.0	5,355.1	Survey #4 Def Gyro to KOP (Original Well	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
5,531.0	6,190.0	Survey #5 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1
6,285.0	17,252.0	Survey #1 ST1 MWD (Sidetrack Wellpath)	MWD SDI	MWD - Standard ver 1.0.1

Survey

MD (usft)	**Inc (°)**	**Azi (azimuth) (°)**	**TVD (usft)**	**N/S (usft)**	**E/W (usft)**	**V. Sec (usft)**	**DLeg (°/100usft)**
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
100.0	0.22	85.53	100.0	0.0	0.2	-0.1	0.22
200.0	0.10	330.56	200.0	0.1	0.3	-0.1	0.28
300.0	0.09	228.90	300.0	0.1	0.2	0.0	0.15
400.0	0.09	226.15	400.0	0.0	0.1	0.0	0.00
500.0	0.15	221.60	500.0	-0.1	0.0	-0.1	0.06
600.0	0.03	197.06	600.0	-0.3	-0.1	-0.1	0.12
700.0	0.13	226.25	700.0	-0.4	-0.2	-0.2	0.10
800.0	0.09	302.16	800.0	-0.4	-0.4	-0.1	0.14
900.0	0.19	301.30	900.0	-0.3	-0.6	0.1	0.10

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Langford Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Langford Unit 1H	**North Reference:**	Grid
Wellbore:	Sidetrack Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled ST1	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,000.0	0.22	270.96	1,000.0	-0.2	-0.9	0.3	0.11
1,100.0	0.19	268.49	1,100.0	-0.2	-1.3	0.5	0.03
1,200.0	0.18	254.65	1,200.0	-0.2	-1.6	0.7	0.05
1,300.0	0.24	222.10	1,300.0	-0.4	-1.9	0.6	0.13
1,400.0	0.11	258.59	1,400.0	-0.6	-2.1	0.6	0.17
1,500.0	0.09	274.33	1,500.0	-0.6	-2.3	0.7	0.03
1,600.0	0.07	291.26	1,600.0	-0.6	-2.4	0.8	0.03
1,700.0	0.19	252.22	1,700.0	-0.6	-2.6	0.9	0.14
1,800.0	0.22	308.83	1,800.0	-0.5	-2.9	1.1	0.20
1,900.0	0.26	255.91	1,900.0	-0.5	-3.3	1.4	0.22
2,000.0	0.20	219.72	2,000.0	-0.7	-3.6	1.4	0.15
2,100.0	0.07	187.87	2,100.0	-0.9	-3.7	1.3	0.15
2,200.0	0.08	217.57	2,200.0	-1.0	-3.8	1.2	0.04
2,300.0	0.16	268.61	2,300.0	-1.0	-4.0	1.3	0.13
2,400.0	0.20	243.17	2,400.0	-1.1	-4.3	1.4	0.09
2,500.0	0.14	243.51	2,500.0	-1.2	-4.5	1.4	0.06
2,600.0	0.08	1.73	2,600.0	-1.2	-4.6	1.5	0.19
2,700.0	0.20	242.28	2,700.0	-1.2	-4.8	1.5	0.25
2,800.0	0.87	256.45	2,800.0	-1.5	-5.7	1.8	0.68
2,900.0	2.48	258.26	2,899.9	-2.1	-8.6	2.8	1.61
3,000.0	5.13	245.33	2,999.7	-4.4	-14.7	4.2	2.77
3,100.0	9.00	239.40	3,098.9	-10.3	-25.5	5.0	3.93
3,200.0	11.12	245.82	3,197.4	-18.2	-41.1	6.7	2.40
3,300.0	13.56	249.82	3,295.1	-26.2	-60.9	10.6	2.58
3,400.0	17.55	250.52	3,391.4	-35.3	-86.1	16.5	3.99
3,500.0	21.20	251.06	3,485.7	-46.2	-117.4	24.1	3.65
3,600.0	23.19	244.72	3,578.3	-60.5	-152.3	30.8	3.11
3,700.0	23.59	240.53	3,670.1	-78.7	-187.6	34.3	1.71
3,800.0	22.76	243.62	3,762.0	-97.2	-222.3	37.5	1.47
3,900.0	24.91	246.65	3,853.5	-114.1	-259.0	42.9	2.47
4,000.0	25.22	248.06	3,944.1	-130.4	-298.1	50.1	0.67
4,100.0	26.37	250.10	4,034.1	-145.9	-338.7	58.8	1.45
4,200.0	26.81	250.86	4,123.6	-160.9	-380.9	68.9	0.56
4,300.0	26.87	248.16	4,212.8	-176.7	-423.2	78.3	1.22
4,400.0	26.53	246.98	4,302.1	-193.8	-464.7	86.1	0.63
4,500.0	26.25	246.13	4,391.7	-211.5	-505.5	93.1	0.47
4,600.0	25.52	245.34	4,481.7	-229.4	-545.3	99.3	0.81
4,700.0	23.83	245.77	4,572.5	-246.7	-583.3	105.2	1.70
4,800.0	23.43	239.90	4,664.2	-265.0	-618.9	108.9	2.39
4,900.0	23.86	242.55	4,755.8	-284.3	-654.1	111.5	1.15
5,000.0	23.58	248.73	4,847.3	-300.9	-690.7	117.2	2.50
5,100.0	25.90	248.26	4,938.1	-316.2	-729.5	125.1	2.33
5,200.0	27.25	247.54	5,027.6	-333.0	-771.1	133.2	1.39
5,300.0	27.07	246.87	5,116.6	-350.7	-813.1	140.9	0.35
5,355.1	27.73	247.50	5,165.5	-360.6	-836.5	145.1	1.31

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Langford Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Langford Unit 1H	**North Reference:**	Grid
Wellbore:	Sidetrack Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled ST1	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,531.0	24.75	244.38	5,323.2	-392.1	-907.5	156.6	1.87
5,626.0	24.21	238.37	5,409.7	-411.0	-942.1	159.3	2.68
5,720.0	23.82	239.47	5,495.6	-430.7	-974.8	160.2	0.63
5,814.0	24.48	242.54	5,581.4	-449.3	-1,008.5	162.6	1.51
5,908.0	24.87	242.82	5,666.8	-467.4	-1,043.3	166.1	0.43
6,002.0	25.24	239.97	5,751.9	-486.4	-1,078.3	168.8	1.34
6,096.0	25.38	239.06	5,836.9	-506.8	-1,112.9	170.2	0.44
6,190.0	25.32	241.82	5,921.9	-526.6	-1,147.9	172.3	1.26
6,285.0	26.77	245.38	6,007.2	-545.2	-1,185.3	176.7	2.24
6,332.0	25.59	249.39	6,049.4	-553.1	-1,204.4	180.3	4.52
6,400.0	22.73	247.49	6,111.4	-563.3	-1,230.3	185.6	4.36
6,421.0	22.72	240.21	6,130.8	-566.9	-1,237.5	186.5	13.40
Sycamore							
6,430.0	22.81	237.09	6,139.1	-568.7	-1,240.5	186.5	13.40
6,476.0	24.88	236.61	6,181.2	-578.9	-1,256.1	186.3	4.52
6,523.0	27.56	251.21	6,223.4	-587.9	-1,274.6	188.7	14.82
6,570.0	30.66	260.88	6,264.5	-593.3	-1,296.8	196.1	11.97
6,607.0	33.70	267.07	6,295.8	-595.3	-1,316.4	204.9	12.11
Middlesex							
6,617.0	34.57	268.57	6,304.1	-595.5	-1,322.0	207.7	12.11
6,664.0	43.83	276.81	6,340.5	-593.9	-1,351.5	224.9	22.57
6,711.0	54.77	283.79	6,371.1	-587.4	-1,386.5	249.2	25.83
6,758.0	61.55	287.61	6,395.9	-576.5	-1,424.9	279.0	15.99
6,765.0	62.11	287.93	6,399.2	-574.6	-1,430.7	283.7	8.93
Burkett							
6,805.0	65.30	289.72	6,416.9	-563.1	-1,464.7	311.7	8.93
6,836.0	68.46	291.10	6,429.1	-553.1	-1,491.4	334.4	11.00
Tully							
6,852.0	70.10	291.79	6,434.7	-547.6	-1,505.3	346.5	11.00
6,899.0	74.00	294.20	6,449.2	-530.2	-1,546.5	383.4	9.62
6,902.0	74.28	294.32	6,450.0	-529.0	-1,549.1	385.8	10.02
Marcellus							
6,946.0	78.34	296.08	6,460.4	-510.8	-1,587.8	421.9	10.02
6,993.0	82.07	298.35	6,468.4	-489.6	-1,628.9	461.9	9.25
7,041.0	85.73	298.99	6,473.5	-466.7	-1,670.8	503.7	7.74
7,087.0	89.53	302.06	6,475.4	-443.4	-1,710.4	544.6	10.62
7,134.0	88.42	309.08	6,476.3	-416.0	-1,748.6	588.2	15.12
7,182.0	85.78	313.86	6,478.7	-384.3	-1,784.5	634.2	11.36
7,229.0	85.66	319.37	6,482.2	-350.3	-1,816.7	680.3	11.69
7,276.0	87.78	324.12	6,484.9	-313.4	-1,845.7	726.9	11.05
7,323.0	91.01	328.82	6,485.4	-274.3	-1,871.[illegible]	773.9	12.13
7,370.0	90.77	334.03	6,484.7	-233.0	-1,894.1	820.8	11.10
7,417.0	90.07	338.87	6,484.3	-189.9	-1,912.9	867.2	10.40
7,512.0	92.78	349.27	6,482.0	-98.8	-1,938.9	958.1	11.31
7,606.0	91.21	347.93	6,478.7	-6.7	-1,957.5	1,045.7	2.20

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Langford Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Langford Unit 1H	**North Reference:**	Grid
Wellbore:	Sidetrack Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled ST1	**Database:**	Oklahoma District

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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,700.0	92.28	349.95	6,475.8	85.5	-1,975.5	1,133.2	2.43
7,794.0	89.83	348.19	6,474.1	177.8	-1,993.3	1,220.6	3.21
7,888.0	89.70	348.50	6,474.5	269.9	-2,012.3	1,308.4	0.36
7,983.0	89.53	348.81	6,475.1	363.0	-2,031.0	1,397.0	0.37
8,077.0	88.82	348.71	6,476.5	455.2	-2,049.3	1,484.6	0.76
8,171.0	88.92	348.50	6,478.3	547.3	-2,067.9	1,572.3	0.25
8,265.0	91.04	348.30	6,478.4	639.4	-2,086.8	1,660.1	2.27
8,359.0	90.60	346.57	6,477.0	731.1	-2,107.3	1,748.5	1.90
8,453.0	89.53	345.20	6,476.9	822.3	-2,130.2	1,837.7	1.85
8,548.0	88.45	345.66	6,478.6	914.2	-2,154.1	1,928.1	1.24
8,642.0	89.26	342.45	6,480.5	1,004.6	-2,179.9	2,018.2	3.52
8,736.0	91.65	342.16	6,479.7	1,094.1	-2,208.5	2,109.1	2.56
8,830.0	91.58	341.80	6,477.1	1,183.5	-2,237.5	2,200.0	0.39
8,924.0	89.73	337.49	6,476.0	1,271.6	-2,270.2	2,291.9	4.99
9,018.0	89.40	335.02	6,476.7	1,357.6	-2,308.1	2,384.8	2.65
9,112.0	88.89	334.51	6,478.1	1,442.6	-2,348.1	2,478.0	0.77
9,206.0	88.62	335.43	6,480.2	1,527.8	-2,387.9	2,571.2	1.02
9,300.0	90.00	335.69	6,481.3	1,613.3	-2,426.8	2,664.3	1.49
9,394.0	90.47	336.57	6,480.9	1,699.3	-2,464.8	2,757.2	1.06
9,488.0	89.73	336.55	6,480.7	1,785.5	-2,502.2	2,850.1	0.79
9,582.0	90.27	335.63	6,480.7	1,871.5	-2,540.3	2,943.0	1.13
9,676.0	89.90	336.31	6,480.6	1,957.3	-2,578.6	3,036.0	0.82
9,770.0	89.90	335.40	6,480.8	2,043.1	-2,617.0	3,129.0	0.97
9,864.0	89.97	336.09	6,480.9	2,128.8	-2,655.6	3,222.0	0.74
9,958.0	91.14	335.15	6,480.0	2,214.4	-2,694.4	3,315.1	1.60
10,052.0	91.17	336.21	6,478.1	2,300.1	-2,733.1	3,408.1	1.13
10,143.0	91.04	335.81	6,476.3	2,383.2	-2,770.1	3,498.1	0.46
10,237.0	90.87	335.78	6,474.7	2,468.9	-2,808.7	3,591.1	0.18
10,331.0	90.00	334.59	6,474.0	2,554.2	-2,848.1	3,684.2	1.57
10,425.0	89.60	336.36	6,474.4	2,639.7	-2,887.1	3,777.3	1.93
10,519.0	90.37	337.92	6,474.4	2,726.3	-2,923.7	3,870.0	1.85
10,613.0	90.34	336.72	6,473.8	2,813.1	-2,959.9	3,962.6	1.28
10,707.0	91.38	336.75	6,472.4	2,899.4	-2,997.0	4,055.4	1.11
10,801.0	91.41	335.97	6,470.1	2,985.5	-3,034.7	4,148.3	0.83
10,895.0	90.13	333.92	6,468.8	3,070.6	-3,074.5	4,241.5	2.57
10,990.0	89.90	335.54	6,468.8	3,156.6	-3,115.1	4,335.7	1.72
11,084.0	89.83	335.14	6,469.0	3,242.0	-3,154.3	4,428.8	0.43
11,178.0	88.96	335.19	6,470.0	3,327.3	-3,193.8	4,522.0	0.93
11,269.0	87.76	335.07	6,472.6	3,409.8	-3,232.0	4,612.1	1.33
11,360.0	87.92	336.78	6,476.1	3,492.8	-3,269.1	4,702.1	1.89
11,451.0	87.48	336.47	6,479.7	3,576.3	-3,305.2	4,791.9	0.59
11,542.0	88.49	337.73	6,482.9	3,660.1	-3,340.6	4,881.5	1.77
11,633.0	88.46	337.83	6,485.3	3,744.3	-3,375.0	4,971.1	0.11
11,724.0	89.46	336.55	6,487.0	3,828.1	-3,410.2	5,060.7	1.78
11,814.0	90.10	336.51	6,487.3	3,910.7	-3,446.1	5,149.6	0.71

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Langford Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Langford Unit 1H	**North Reference:**	Grid
Wellbore:	Sidetrack Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled ST1	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
11,906.0	90.57	336.58	6,486.8	3,995.1	-3,482.7	5,240.5	0.52
11,997.0	90.57	336.90	6,485.9	4,078.7	-3,518.6	5,330.3	0.35
12,087.0	91.51	336.18	6,484.3	4,161.2	-3,554.5	5,419.2	1.32
12,178.0	90.92	335.16	6,482.3	4,244.1	-3,591.9	5,509.2	1.29
12,270.0	92.65	336.65	6,479.5	4,328.1	-3,629.5	5,600.2	2.48
12,364.0	92.86	336.51	6,474.9	4,414.2	-3,666.8	5,692.9	0.27
12,458.0	90.47	335.06	6,472.2	4,499.9	-3,705.3	5,785.9	2.97
12,551.0	90.75	334.72	6,471.2	4,584.1	-3,744.8	5,878.1	0.47
12,646.0	90.00	335.56	6,470.6	4,670.3	-3,784.7	5,972.3	1.19
12,740.0	90.07	335.80	6,470.5	4,756.0	-3,823.4	6,065.3	0.27
12,834.0	89.60	336.02	6,470.8	4,841.8	-3,861.8	6,158.3	0.55
12,928.0	90.50	336.23	6,470.7	4,927.7	-3,899.9	6,251.2	0.98
13,022.0	90.54	335.34	6,469.9	5,013.5	-3,938.4	6,344.3	0.95
13,116.0	89.93	336.93	6,469.5	5,099.4	-3,976.4	6,437.2	1.81
13,210.0	89.66	336.28	6,469.8	5,185.7	-4,013.8	6,530.0	0.75
13,304.0	89.13	336.04	6,470.8	5,271.7	-4,051.8	6,622.9	0.62
13,398.0	89.53	337.42	6,471.9	5,358.0	-4,088.9	6,715.7	1.53
13,493.0	90.20	337.71	6,472.1	5,445.8	-4,125.1	6,809.3	0.77
13,587.0	90.81	337.59	6,471.3	5,532.8	-4,160.9	6,901.8	0.66
13,681.0	91.07	335.91	6,469.8	5,619.1	-4,198.0	6,994.6	1.81
13,775.0	91.36	335.25	6,467.8	5,704.7	-4,236.8	7,087.6	0.77
13,869.0	89.19	335.92	6,467.3	5,790.3	-4,275.7	7,180.7	2.42
13,963.0	90.30	335.86	6,467.7	5,876.1	-4,314.1	7,273.7	1.18
14,057.0	90.91	336.18	6,466.8	5,961.9	-4,352.3	7,366.6	0.73
14,151.0	90.84	335.43	6,465.3	6,047.7	-4,390.8	7,459.6	0.80
14,245.0	90.10	334.39	6,464.5	6,132.8	-4,430.7	7,552.8	1.36
14,339.0	89.13	334.14	6,465.2	6,217.5	-4,471.5	7,646.2	1.07
14,433.0	89.43	337.11	6,466.4	6,303.1	-4,510.3	7,739.2	3.18
14,528.0	90.03	336.38	6,466.8	6,390.4	-4,547.8	7,833.0	0.99
14,621.0	90.07	335.56	6,466.7	6,475.3	-4,585.6	7,925.0	0.88
14,715.0	89.63	337.31	6,467.0	6,561.5	-4,623.2	8,017.8	1.92
14,809.0	89.36	338.07	6,467.8	6,648.4	-4,658.9	8,110.4	0.86
14,903.0	89.29	337.41	6,468.9	6,735.4	-4,694.5	8,202.9	0.71
14,997.0	89.60	338.19	6,469.8	6,822.4	-4,730.0	8,295.3	0.89
15,091.0	92.28	338.04	6,468.3	6,909.6	-4,765.1	8,387.7	2.86
15,185.0	91.71	334.98	6,465.0	6,995.8	-4,802.5	8,480.5	3.31
15,279.0	91.11	334.43	6,462.7	7,080.8	-4,842.7	8,573.7	0.87
15,373.0	90.03	334.69	6,461.8	7,165.6	-4,883.0	8,667.0	1.18
15,467.0	89.70	334.49	6,462.0	7,250.5	-4,923.4	8,760.3	0.41
15,561.0	89.80	335.70	6,462.4	7,335.8	-4,962.9	8,853.5	1.29
15,655.0	91.07	337.09	6,461.7	7,421.9	-5,000.6	8,946.3	2.00
15,749.0	91.14	336.14	6,459.9	7,508.2	-5,037.9	9,039.1	1.01
15,843.0	91.41	336.39	6,457.8	7,594.2	-5,075.7	9,132.0	0.39
15,937.0	91.28	335.69	6,455.6	7,680.1	-5,113.9	9,225.0	0.76

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Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Langford Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Langford 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Langford Unit 1H	**North Reference:**	Grid
Wellbore:	Sidetrack Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled ST1	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
16,031.0	90.97	337.17	6,453.7	7,766.2	-5,151.5	9,317.8	1.61
16,125.0	91.44	336.45	6,451.7	7,852.6	-5,188.5	9,410.5	0.91
16,219.0	91.01	335.98	6,449.7	7,938.6	-5,226.4	9,503.4	0.68
16,313.0	90.97	336.30	6,448.1	8,024.6	-5,264.4	9,596.4	0.34
16,407.0	91.08	336.40	6,446.4	8,110.7	-5,302.1	9,689.2	0.16
16,501.0	91.11	335.81	6,444.6	8,196.6	-5,340.2	9,782.2	0.63
16,595.0	91.24	335.78	6,442.7	8,282.3	-5,378.7	9,875.2	0.14
16,690.0	91.21	335.80	6,440.7	8,368.9	-5,417.6	9,969.1	0.04
16,784.0	91.31	335.40	6,438.6	8,454.5	-5,456.5	10,062.2	0.44
16,877.0	90.54	335.44	6,437.1	8,539.1	-5,495.1	10,154.3	0.83
16,971.0	91.18	334.94	6,435.7	8,624.4	-5,534.6	10,247.4	0.86
17,065.0	91.14	335.36	6,433.8	8,709.7	-5,574.1	10,340.6	0.45
17,159.0	90.27	334.56	6,432.6	8,794.8	-5,613.8	10,433.8	1.26
17,196.0	89.83	334.74	6,432.6	8,828.3	-5,629.7	10,470.5	1.28
17,252.0	90.34	335.17	6,432.5	8,879.0	-5,653.4	10,526.0	1.19

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
6,421.0	6,130.8	-566.9	-1,237.5	Sycamore
6,607.0	6,295.8	-595.3	-1,316.4	Middlesex
6,765.0	6,399.2	-574.6	-1,430.7	Burkett
6,836.0	6,429.1	-553.1	-1,491.4	Tully
6,902.0	6,450.0	-529.0	-1,549.1	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/5/2014
Job End Date:	11/23/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10044-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Langford Unit 1H
Longitude:	-80.90123100
Latitude:	39.19541400
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,487
Total Base Water Volume (gal):	16,144,338
Total Base Non Water Volume:	0

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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
Water	ANTERO RESOURCES	Water					
			Water	7732-18-5	100.00000	90.38442	
WV Specific 40/70 mesh Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia					
			Crystalline Silica, quartz	14808-60-7	99.90000	5.25889	
			Aluminum Oxide	1344-28-1	1.10000	0.05791	
			Iron Oxide	1309-37-1	0.10000	0.00526	
			Titanium Oxide	13463-67-7	0.10000	0.00526	
WV Specific 20/40 mesh Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia					
			Crystalline Silica, quartz	14808-60-7	99.90000	3.21345	
			Aluminum Oxide	1344-28-1	1.10000	0.03538	
			Titanium Oxide	13463-67-7	0.10000	0.00322	
			Iron Oxide	1309-37-1	0.10000	0.00322	
WV Local 100 mesh Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia					
			Crystalline Silica, quartz	14808-60-7	99.90000	0.60831	
			Aluminum Oxide	1344-28-1	1.10000	0.00670	

			Iron Oxide	1309-37-1	0.10000	0.00061	
			Titanium Oxide	13463-67-7	0.10000	0.00061	
HCl Acid (12.5-18.0%), 22 Baume	Nabors Completion and Production Services	Bulk Acid					
			Water	7732-18-5	87.50000	0.20060	
			Hydrochloric Acid	7647-01-0	18.00000	0.04127	
Calcium Chloride (CaCl2)	Nabors Completion and Production Services	Cement Accelerators					
			Calcium Chloride	10043-52-4	100.00000	0.09485	
WFR-6W	Nabors Completion and Production Services	Friction Reducer					
			Anionic Water-Soluble Polymer Emulsion	Proprietary	100.00000	0.07617	
LSG-100L	Nabors Completion and Production Services	Gelling Agents					
			Petroleum Distillates	64742-47-8	70.00000	0.06058	
Super TSC-LT	Nabors Completion and Production Services	Paraffin & Scale Additives					
			100% Non-Hazardous Mixture	Proprietary	100.00000	0.01806	
AQUCAR DB 20	Nabors Completion and Production Services	Biocides					
			Polyethylene glycol	25322-68-3	54.50000	0.00881	
			2,2-Dibromo-3-nitrilo-propionamide (DBNPA)	10222-01-2	20.00000	0.00323	
			Sodium bromide	7647-15-6	4.00000	0.00065	
			Dibromoacetonitrile	3252-43-5	3.00000	0.00049	
Super GREEN SOLV-M	Nabors Completion and Production Services	Paraffin & Scale Additives					
			Aliphatic Hydrocarbons	Proprietary	95.00000	0.00138	
			Dodecane	Proprietary	14.00000	0.00020	
			tetradecane	Proprietary	11.00000	0.00016	
			Tridecane	Proprietary	9.00000	0.00013	
			Undecane	Proprietary	8.00000	0.00012	
Potassium Chloride (KCl)	Nabors Completion and Production Services	Cement Accelerators					
			Potassium Chloride	7447-40-7	100.00000	0.00138	
OB-2 LT	Nabors Completion and Production Services	Gel Breakers					
			Ammonium Persulfate	7727-54-0	85.00000	0.00090	
			Crystalline Silica (in the form of quartz)	14808-60-7	10.00000	0.00011	
Acid Inhibitor 2 (AI-2)	Nabors Completion and Production Services	Acid Corrosion Inhibitors					

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			Propargyl Alcohol	107-19-7	40.00000	0.00017	
			Glycol Ethers	111-46-6	40.00000	0.00017	
			Isopropyl Alcohol	67-63-0	40.00000	0.00017	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	10.00000	0.00004	
EB-4L	Nabors Completion and Production Services	Gel Breakers					
			Ethylene Glycol	107-21-1	40.00000	0.00019	
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 Ingredients	Nabors Completion and Production Services	Other Ingredients					
			Copolymer	Proprietary	100.00000	0.07617	
			guar gum	9000-30-0	50.00000	0.04327	
			Water	7732-18-5	40.00000	0.03047	
			Isoparaffinic Solvent	64742-47-8	26.00000	0.01980	
			Water	7732-18-5	60.00000	0.01084	
			Proprietary	Proprietary	50.00000	0.00903	
			Water	7732-18-5	32.00000	0.00517	
			Sodium Chloride	7647-14-5	5.00000	0.00474	
			Potassium Chloride	7447-40-7	5.00000	0.00474	
			Ethoxylated alcohols	Proprietary	4.00000	0.00305	
			Ethylene Glycol	107-21-1	4.00000	0.00305	
			Proprietary	Proprietary	15.00000	0.00271	
			Proprietary	Proprietary	15.00000	0.00271	
			Proprietary	Proprietary	15.00000	0.00271	
			Surfactant Blend	Proprietary	3.00000	0.00229	
			Crystalline Silica (in the form of quartz)	14808-60-7	2.00000	0.00173	
			Surfactant	68439-51-0	2.00000	0.00173	
			Water	7732-18-5	1.00000	0.00095	
			Sugar	57-50-1	100.00000	0.00047	
			Proprietary	Proprietary	100.00000	0.00047	
			Water	7732-18-5	100.00000	0.00024	
			Water	7732-18-5	48.00000	0.00021	
			Monobromo-3-nitrilopropionamide	1113-55-9	1.00000	0.00016	
			2,2-Dibromomalonamide	73003-80-2	1.00000	0.00016	
			Alkali Chloride salt	Proprietary	15.00000	0.00016	
			2-Propenamide as residual	79-06-1	0.10000	0.00008	
			2-Butoxyethanol	111-76-2	13.00000	0.00006	
			Proprietary	Proprietary	10.00000	0.00004	
			Proprietary	Proprietary	1.00000	0.00001	
			Proprietary	Proprietary	1.00000	0.00001	
			Proprietary	Proprietary	1.00000	0.00001	
			Proprietary	Proprietary	1.00000	0.00001	
			Proprietary	Proprietary	0.99000	0.00000	

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			Proprietary	Proprietary	0.02000		
			Organophylic Clay	68953-58-2			

* 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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LATITUDE 39°12'30" — 7,483'

1,321' TO BOTTOM HOLE
LATITUDE 39°15'00"

LONGITUDE 80°55'00" — 11,026' TO BOTTOM HOLE — 4,738' — LONGITUDE 80°52'30"

WV NORTH ZONE GRID NORTH

Antero Resources Corporation
Well No. Langford Unit 1H
47-085-10044 (AS DRILLED)

AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 256,350ft E: 1,602,828ft
LAT: 39°11'43.17" LON: 80°54'05.05"
BOTTOM HOLE INFORMATION:
N: 265,325ft E: 1,597,321ft
LAT: 39°13'11.02" LON: 80°55'16.78"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 4,338,466m E: 508,529m
BOTTOM HOLE INFORMATION:
N: 4,341,173m E: 506,806m

NOTES
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

PAD LAYOUT — NOT TO SCALE
N 76°28' E
DEBERRY UNIT 2H
DEBERRY UNIT 1H
IRELAND UNIT 2H
IRELAND UNIT 1H
RUFUS UNIT 1H
RUFUS UNIT 2H
LANGFORD UNIT 2H
LANGFORD UNIT 1H
10' 10' 10' 10' 10' 10' 10'

WELL 1H BOTTOM HOLE
JACK H. LANGFORD ET AL D.B. 274 PG. 439 T.M. 40 PAR. 25 61.37 AC. ±
CLIFTON A. SAMPLES ET AL D.B. 265 PG. 916 T.M. 34 PAR. 37 22 AC. ±
JACK H. LANGFORD ET AL D.B. 274 PG. 439 T.M. 09 PAR. 06.2 22.25 AC. ±
JACK H. LANGFORD ET AL D.B. 274 PG. 439 T.M. 09 PAR. 06.3 22.5 AC. ±
JACK H. LANGFORD ET AL D.B. 274 PG. 439 T.M. 09 PAR. 01.2 43.64 AC. ±
JACK H. LANGFORD ET AL D.B. 274 PG. 439 T.M. 09 PAR. 01 126.5 AC. ±
7219
ROBERT GASTLER LEASE
JUDITH B. GASTLER D.B. 266 PG. 220 T.M. 09 PAR. 06.4 35 AC. ±
JACK H. LANGFORD ET AL LEASE
1H TOP HOLE
21
EDWIN DEEM LEASE
JACK H. LANGFORD ET AL D.B. 274 PG. 439 T.M. 09 PAR. 01.1 91.5 AC. ±
RICHARD L. WARD ET AL D.B. 297 PG. 607 T.M. 09 PAR. 06.1 92.13 AC. ±
DERNARD RICHARDS ET UX LEASE
JOHN W. RICHARDS D.B. 254 PG. 75 T.M. 08 PAR. 07 259 AC. ±
JACK H. LANGFORD LEASE
JACK H. LANGFORD ET AL D.B. 295 PG. 733 T.M. 08 PAR. 06 50.68 AC. ±
CHARLES P. HEASTER ET AL LEASE
JOHN CAMPBELL W.B. 37 PG. 205 T.M. 09 PAR. 10.1 52.76 AC. ±
8484
3778
BEE
JACK LANGFORD ET AL D.B. 164 PG. 172 T.M. 09 PAR. 10 107.89 AC. ±
FRED CONSTABLE ET AL D.B. 306 PG. 722 T.M. 09 PAR. 29 66 AC. ±
1H BOTTOM HOLE
FORK
KENNETH GODFREY ET UX LEASE
KENNETH L. GODFREY ET AL D.B. 161 PG. 144 T.M. 09 PAR. 07.1 77.13 AC. ±
N 22°58' W APPROX.
8496
JACK H. LANGFORD ET AL D.B. 255 PG. 559 T.M. 09 PAR. 12 12.33 AC. ±
JACK H. LANGFORD ET AL D.B. 250 PG. 559 T.M. 09 PAR. 12.1 12.36 AC. ±
JACK H. LANGFORD ET AL D.B. 256 PG. 652 T.M. 09 PAR. 12.2 39.44 AC. ±
RIGHT
JACK H. LANGFORD ET AL D.B. 266 PG. 652 T.M. 09 PAR. 12.3 2.6 AC. ±
KENNETH L. GODFREY ET AL D.B. 161 PG. 144 T.M. 13 PAR. 20.1 44.159 AC. ±
RUN
JACK LANGFORD ET UX LEASE
JACK H. LANGFORD ET AL D.B. 266 PG. 652 T.M. 14 PAR. 02.1 93.25 AC. ±
JACK H. LANGFORD ET AL D.B. 266 PG. 652 T.M. 14 PAR. 02.2 10 AC. ±
JASON S. HARSHBERGER ET UX LEASE
JASON S. HARSHBARGER ET AL D.B. 304 PG. 1066 T.M. 14 PAR. 02 8 AC. ±
MARTHA DEFRINO D.B. 279 PG. 651 T.M. 14 PAR. 02.2 11.713 AC. ±
MARK A. & SERENA L. RIDDLE D.B. 283 PG. 170 T.M. 14 PAR. 21 31.31 AC. ±
ALLEGHENY FORESTLANDS LLC D.B. 305 PG. 494 T.M. 13 PAR. 19.1 47.69 AC. ±
8444
N 68°04' W 237.7'
N 11°46' E 256.1'
5206
WELL NO. 1H 47-085-10044
HERBERT O. IRELAND ET AL LEASE
ASHLEY E. NESS JR D.B. 242 PG. 604 T.M. 14 PAR. 21 90 AC. ±
CHARLES HEASTER ET AL LEASE
8446
3781
8641
8546
2380
3782
8563
4939
8444
5206
4925
8447
4905
5199
4929
2645
2886
N 37°22' W 1915.5'
S 57°32' E 1585.2'
3000'

NOTE:
2 WATER WELLS WERE LOCATED WITHIN 2000' OF PROPOSED WELL

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JOB #	13-016WA
DRAWING #	LANGFORD1HAD
SCALE	1" = 1000'
MINIMUM DEGREE OF ACCURACY	SUBMETER
PROVEN SOURCE OF ELEV.	SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

LEGEND
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS

DATE 03/30/15
OPERATOR'S WELL# LANGFORD UNIT #1H
API WELL # 47 — 085 — 10044
STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X

LOCATION: ELEVATION 1,080' ORIGINAL - 1,076' AS DRILLED WATERSHED SOUTH FORK HUGHES RIVER
QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE
SURFACE OWNER ASHLEY E. NESS, JR. ACREAGE 90 ACRES +/-
OIL & GAS ROYALTY OWNER HERBERT O. IRELAND ET AL; CHARLIE HEASTER ET AL; LEASE ACREAGE 90 ACRES±; 234.49 ACRES±;
KENNETH GODFREY ET UX; JACK H. LANGFORD; BERNARD RICHARDS ET UX; EDWIN DEEM; ROBERT GASTLER; JACK H. LANGFORD ET AL 175.68 ACRES±; 50.68 ACRES±; 214.94 ACRES±; 92.13 ACRES±; 31.26 ACRES±; 448.5 ACRES±;
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,433' TVD 17,252' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
DENVER, CO 80202 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

COUNTY NAME PERMIT

FORM WW-6