

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

API 47-51-01596 County Marshall District Clay  
Quad Businessburg 7.5' Pad Name Conner Field/Pool Name Fort Beeler  
Farm name Conner Well Number 2H  
Operator (as registered with the OOG) Chevron Appalachia, LLC  
Address 800 Mountain View Drive City Smithfield State PA Zip 15478

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 505327.06 Easting 1617496.30  
Landing Point of Curve Northing 504416.11 Easting 1617409.88  
Bottom Hole Northing 499056.52 Easting 1622426.65

Elevation (ft) 1,220' 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)  
Oil base mud, base oil, emulsifier, water, barite, lime.

Date permit issued 2-19-2013 Date drilling commenced 4-12-2013 Date drilling ceased 10-23-2013  
Date completion activities began 11-7-2013 Date completion activities ceased 2-1-2014  
Verbal plugging (Y/N) 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 223' Open mine(s) (Y/N) depths \_\_\_\_\_  
Salt water depth(s) ft None noted on Mudlogs Void(s) encountered (Y/N) depths \_\_\_\_\_  
Coal depth(s) ft 758' Cavern(s) encountered (Y/N) depths \_\_\_\_\_  
Is coal being mined in area (Y/N) N

RECEIVED  
Office of Oil and Gas  
MAR 28 2014  
Reviewed by:  
WV Department of  
Environmental Protection  
04/18/2014

API 47- 51 - 01596 Farm name Conner 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	36	30	65	New			
Surface	26	20	336'	New	J-55, 94 lb/ft		Y
Coal	17-1/2"	13-3/8"	878'	New	J-55, 54.5 lb/ft	720'	Y
Intermediate 1	12 -1/4"	9-5/8"	2,542'	New	N-80, 40 lb/ft		Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	14,145'	New	P-110, 20 lb/ft		N
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Ready Mix					0	
Surface	Class A	705	15.6	1.2	845	0	8
Coal	Class A	711	15.6	1.2	854	0	8
Intermediate 1	Class A	860	15.6	1.2	1033	0	8
Intermediate 2							
Intermediate 3							
Production	Class A	2178	15.2	1.21/1.82	3335	2300	8
Tubing							

Drillers TD (ft) 14,178' Loggers TD (ft) \_\_\_\_\_  
 Deepest formation penetrated Point Pleasant Plug back to (ft) n/a  
 Plug back procedure n/a

Kick off depth (ft) 5,001'

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 \_\_\_\_\_  
On the water string, coal string, and intermediate there was a bow spring centralizer installed every two joints. The production string had one centralizer per joint in the lateral and curve and one every two joints from KOP to surface.

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 \_\_\_\_\_

API 47- 51 - 01596 Farm name Conner Well number 2H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	11-29-2013	14008	14010	36	Marcellus Shale
2	11-30-2013	13862	13864	36	Marcellus Shale
3	11-30-2013	13562	13564	36	Marcellus Shale
4	11-30-2013	13562	13265	36	Marcellus Shale
5	11-30-2013	12962	12964	36	Marcellus Shale
6	12-1-2013	12662	12664	36	Marcellus Shale
7	12-1-2013	12362	12364	36	Marcellus Shale
8	12-2-2013	12062	12064	36	Marcellus Shale
9	12-2-2013	11762	11764	36	Marcellus Shale
10	12-2-2013	11462	11464	36	Marcellus Shale
11	12-2-2013	11162	11165	36	Marcellus Shale
12	12-3-2013	10862	10864	36	Marcellus Shale
13	12-3-2013	10562	10564	36	Marcellus Shale
14	12-3-2013	10262	10264	36	Marcellus Shale
15	12-4-2013	9962	9964	36	Marcellus Shale
16	12-4-2013	9662	9664	36	Marcellus Shale

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	11-20-13	79.6	7313	7684	4050	303,462	7848	0
2	11-30-13	90.9	7823	8499	4386	392,404	7268	0
3	11-30-13	91.1	7688	8210	4367	300,894	7581	0
4	11-30-13	90.8	7865	8234	4214	301,018	7396	0
5	11-30-13	90.5	7845	8042	4339	301,952	8046	0
6	12-1-13	90.2	8000	8541	4462	300,450	7505	0
7	12-1-13	90.9	7736	8696	4339	301,952	8046	0
8	12-2-13	91.2	7253	8248	4396	302,376	7462	0
9	12-2-13	90.9	8349	7894	4116	303,085	7555	0
10	12-2-13	91.3	7477	7968	4405	301,452	7595	0
11	12-2-13	90.7	7362	7968	4346	301,659	7416	0
12	12-3-13	91.8	7454	8062	4338	302,226	7529	0
13	12-4-13	89	7687	8930	4377	302,226	7524	0
14	12-4-13	90	8064	9327	4280	301,225	7563	0
15	12-4-13	90.2	7693	8964	4283	301,687	7489	0
16	12-4-13	90.1	7302	8401	4179	303,384	7403	0

Please insert additional pages as applicable.

WV Department of Environmental Protection  
RECEIVED  
Office of Oil and Gas  
APR 18 2014

API 47- 51 - 01596 Farm name Conner Well number 2H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	12-4-2013	9362	9367	36	Marcellus Shale
18	12-4-2013	9062	9064	36	Marcellus Shale
19	12-5-2013	8762	8764	36	Marcellus Shale
20	12-5-2013	8462	8464	36	Marcellus Shale
21	12-5-2013	8162	9164	36	Marcellus Shale
22	12-5-2013	7862	7864	36	Marcellus Shale
23	12-5-2013	7562	7564	36	Marcellus Shale
24	12-5-2013	7262	7264	36	Marcellus Shale
25	12-6-2013	5962	6964	36	Marcellus Shale

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)
17	12-4-13	89.5	7714	8416	4349	300,804	7391	0
18	12-4-13	85.9	7468	8787	4414	302,358	7807	0
19	12-5-13	92.2	7456	8248	4416	302,230	7388	0
20	12-5-13	90.5	6874	7635	4227	301,350	7391	0
21	12-5-13	88.2	7605	8824	4449	301,971	7382	0
22	12-5-13	90.8	6805	8206	4328	301,042	7411	0
23	12-5-13	90.6	6963	7603	4638	302,047	7455	0
24	12-5-13	91.3	6737	7458	4342	300,871	8573	0
25	12-6-13	91.2	6914	7421	4309	338,907	7526	0

RECEIVED  
Office of Oil and Gas  
MAR 28 2014

Please insert additional pages as applicable.

WV Department of Environmental Protection  
04/18/2014

API 47- 51 - 01596 Farm name Conner Well number 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	6311	TVD	6710 MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface \_\_\_\_\_ psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas \_\_\_\_\_ mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ bpd GAS MEASURED BY  
 Estimated  Orifice  Pilot

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, H <sub>2</sub> S, ETC)
	0		0		
Pittsburgh Coal	758	762	758	762	Coal
Big Lime	1800	1810	1800	1810	Limestone: brn, dkbrn, ltbrn, dns, crpxln
Burgoon (Big Injun)	1850	2107	1850	2107	SS:gy, grngy, hrd, vt-cmt, rnd, sbrnd, ang
Weir Sand	2252	2276	2252	2276	SLTST: gy, mgy, hrd, t-cmt, slty. SS: off wh, gy, hrd, t-cmt, md, sbrnd, ang
Berea Sand	2449	2549	2450	2550	SH: gy, mgy, sbblky, frm, v-slty, non calc, tr pyr. tr SLTST: brn, gy, mgy, hrd, t-cmt, slty
Burket Shale	6194	6222	6415	6468	SH: drkgy, v.drkgy, frm, slty, grty, sbblky-sbfiss, modcalc, embd calc, lse calct
Tully Limestone	6222	6261	6468	6558	SH: drkgy, v.drkgy, frm, slty, grty, sbblky-sbfiss, carb, v.calc, lse xls calct, w/LS: lty, gy, mgy, frm- hrd, dns, cln, mic, fxl, v. arg
Hamilton Shale	6261	6311	6558	6710	SH: drkgy, v.drkgy, frm, slty, grty, sbblky-sbfiss, carb, modv. calc, lse calct, w/LS
Marcellus Shale	6311		6710		SH: drkgy, v.drkgy, frm, slty, grty, sbblky-sbfiss, non calc, lse calct, lse pyr, w/LS: gy, lty, hrd, mott, mic, fxl, v. arg

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling, USA  
 Address 380 Southpointe Boulevard, Suite 210 City Canonsburg State PA Zip 15317

Logging Company Schlumberger  
 Address 4600 JBarry Court, Suite 200 City Canonsburg State PA Zip 15317

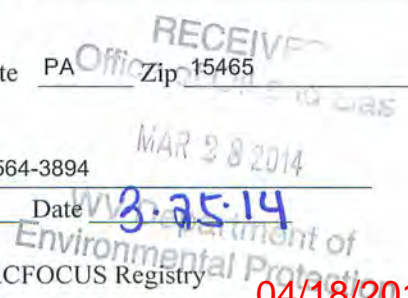
Cementing Company Schlumberger & Halliburton (301 Lucerne Road, Homer City, PA 15748)  
 Address 4600 JBarry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Universal  
 Address 730 Braddock View Drive/P.O. Box 130 City Mt. Braddock State PA Zip 15465

Please insert additional pages as applicable.

Completed by Jenny Butchko Telephone 725-564-3894  
 Signature Jenny Butchko Title Regulatory Reporting Team Leader Date 3-25-14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry **04/18/2014**





Marshall County, WV  
 Conner Pad  
 Conner 2H  
 GL 1220' & KB 32' @ 1252.00ft (Nabors X7)  
 As Drilled

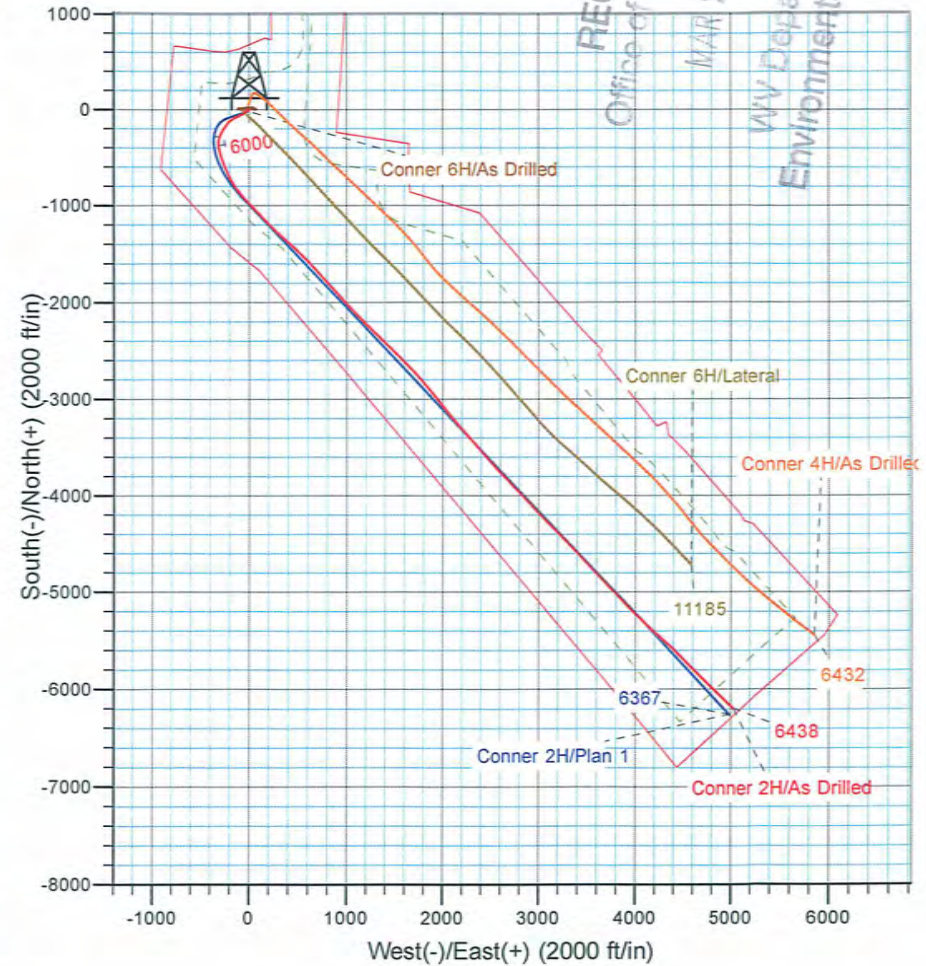
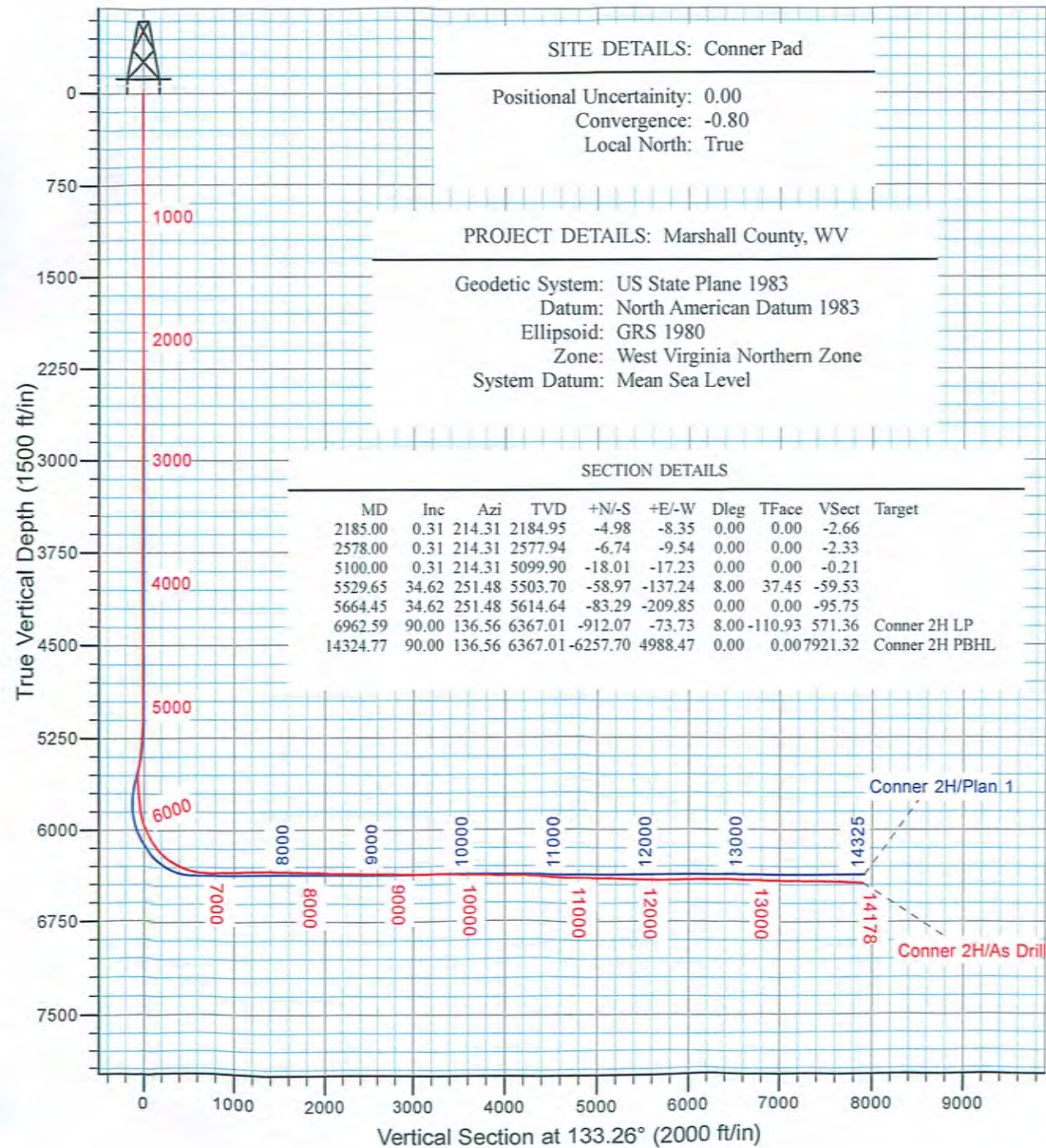


Azimuths to True North  
 Magnetic North: -8.63°  
 Magnetic Field  
 Strength: 52630.65nT  
 Dip Angle: 67.36°  
 Date: 10/2/2013  
 Model: BGM2013

RECEIVED  
 Office of Oil and Gas  
 MAR 28 2014  
 WV Department  
 Environmental Protection

WELL DETAILS: Conner 2H

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	505327.06	1617496.30	39° 52' 50.394 N	80° 45' 2.819 W



LEGEND

- Conner 2H, OH, Plan 1 V0
- Conner 4H, OH, As Drilled V0
- △ Conner 6H, Lateral, Lateral V0
- ⊕ Conner 6H, Pilot, As Drilled V0
- As Drilled

Robert Ebbecke  
 12:57, October 30 2013

Scientific Drilling International  
 3475 Washington Ave  
 Finleyville, PA 15332

51-01596



# **Chevron Appalachia, LLC**

**Marshall County, WV**

**Conner Pad**

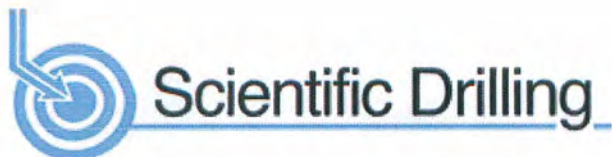
**Conner 2H**

**OH**

**Design: As Drilled**

## **Standard Survey Report**

**30 October, 2013**



[www.scientificdrilling.com](http://www.scientificdrilling.com)

04/18/2014



**Scientific Drilling International**  
Survey Report

51-01596

<b>Company:</b>	Chevron Appalachia, LLC	<b>Local Co-ordinate Reference:</b>	Well Conner 2H
<b>Project:</b>	Marshall County, WV	<b>TVD Reference:</b>	GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Site:</b>	Conner Pad	<b>MD Reference:</b>	GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Well:</b>	Conner 2H	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Northeast District

<b>Project</b>	Marshall County, WV		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	West Virginia Northern Zone		

<b>Site</b>	Conner Pad				
<b>Site Position:</b>		<b>Northing:</b>	505,327.06 usft	<b>Latitude:</b>	39° 52' 50.394 N
<b>From:</b>	Map	<b>Easting:</b>	1,617,496.30 usft	<b>Longitude:</b>	80° 45' 2.819 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.80 °

<b>Well</b>	Conner 2H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	505,327.06 usft	<b>Latitude:</b>	39° 52' 50.394 N
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,617,496.30 usft	<b>Longitude:</b>	80° 45' 2.819 W
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,220.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2013	10/2/2013	-8.63	67.36	52,631

<b>Design</b>	As Drilled				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	133.26	

<b>Survey Program</b>	<b>Date</b>	10/30/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
100.00	2,481.00	Gyro Data Survey #3 (OH)	GYD_CT	Gyrodata continuous	
2,596.01	14,178.03	SDI MWD Survey #4 (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.26	213.55	100.00	-0.19	-0.13	0.04	0.26	0.26	0.00	
<b>First Gyro Data Gyro Survey</b>										
200.00	0.41	209.17	200.00	-0.69	-0.43	0.16	0.15	0.15	-4.38	
300.00	0.75	219.53	299.99	-1.51	-1.02	0.29	0.35	0.34	10.36	
400.00	0.61	213.16	399.99	-2.46	-1.72	0.43	0.16	-0.14	-6.37	
500.00	0.24	196.84	499.98	-3.10	-2.08	0.62	0.39	-0.37	-16.32	
600.00	0.29	244.55	599.98	-3.41	-2.36	0.62	0.22	0.05	47.71	
700.00	0.04	313.03	699.98	-3.50	-2.62	0.49	0.28	-0.25	68.48	
800.00	0.16	83.40	799.98	-3.46	-2.51	0.55	0.19	0.12	130.37	





# Scientific Drilling International

## Survey Report

<b>Company:</b> Chevron Appalachia, LLC	<b>Local Co-ordinate Reference:</b> Well Conner 2H
<b>Project:</b> Marshall County, WV	<b>TVD Reference:</b> GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Site:</b> Conner Pad	<b>MD Reference:</b> GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Well:</b> Conner 2H	<b>North Reference:</b> True
<b>Wellbore:</b> OH	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> As Drilled	<b>Database:</b> Northeast District

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
900.00	0.26	294.77	899.98	-3.35	-2.57	0.42	0.41	0.10	-148.63	
1,000.00	0.18	254.27	999.98	-3.30	-2.93	0.12	0.17	-0.08	-40.50	
1,100.00	0.31	321.38	1,099.98	-3.13	-3.25	-0.22	0.29	0.13	67.11	
1,200.00	0.26	329.58	1,199.98	-2.72	-3.53	-0.71	0.06	-0.05	8.20	
1,300.00	0.27	322.75	1,299.98	-2.34	-3.79	-1.16	0.03	0.01	-6.83	
1,400.00	0.25	322.37	1,399.98	-1.98	-4.07	-1.61	0.02	-0.02	-0.38	
1,500.00	0.24	316.31	1,499.98	-1.65	-4.35	-2.03	0.03	-0.01	-6.06	
1,600.00	0.08	341.35	1,599.97	-1.43	-4.51	-2.30	0.17	-0.16	25.04	
1,700.00	0.19	264.63	1,699.97	-1.38	-4.70	-2.47	0.19	0.11	-76.72	
1,800.00	0.55	224.32	1,799.97	-1.74	-5.20	-2.59	0.42	0.36	-40.31	
1,900.00	0.42	198.90	1,899.97	-2.43	-5.65	-2.45	0.25	-0.13	-25.42	
2,000.00	0.31	219.82	1,999.97	-2.99	-5.95	-2.28	0.17	-0.11	20.92	
2,100.00	0.22	192.70	2,099.97	-3.38	-6.16	-2.17	0.15	-0.09	-27.12	
2,200.00	0.13	227.22	2,199.97	-3.65	-6.29	-2.08	0.13	-0.09	34.52	
2,300.00	0.23	269.36	2,299.97	-3.73	-6.57	-2.23	0.16	0.10	42.14	
2,400.00	0.29	314.72	2,399.96	-3.55	-6.95	-2.63	0.21	0.06	45.36	
2,481.00	0.26	291.85	2,480.96	-3.34	-7.27	-3.01	0.14	-0.04	-28.23	
<b>Last Gyro Data Gyro Survey</b>										
2,596.01	0.15	273.21	2,595.97	-3.23	-7.66	-3.36	0.11	-0.10	-16.21	
<b>First SDI MWD Survey</b>										
2,691.01	0.50	273.42	2,690.97	-3.20	-8.20	-3.78	0.37	0.37	0.22	
2,786.01	0.59	268.09	2,785.96	-3.19	-9.10	-4.44	0.11	0.09	-5.61	
2,880.01	0.84	285.78	2,879.95	-3.02	-10.25	-5.39	0.35	0.27	18.82	
2,975.01	0.91	281.31	2,974.94	-2.68	-11.66	-6.65	0.10	0.07	-4.71	
3,070.01	0.75	302.41	3,069.93	-2.20	-12.92	-7.90	0.36	-0.17	22.21	
3,165.01	0.98	301.92	3,164.92	-1.44	-14.14	-9.31	0.24	0.24	-0.52	
3,259.01	1.11	290.69	3,258.91	-0.69	-15.67	-10.94	0.26	0.14	-11.95	
3,354.01	0.47	265.22	3,353.90	-0.40	-16.92	-12.05	0.75	-0.67	-26.81	
3,449.01	0.55	246.79	3,448.90	-0.61	-17.73	-12.49	0.19	0.08	-19.40	
3,543.01	0.65	254.70	3,542.89	-0.93	-18.66	-12.95	0.14	0.11	8.41	
3,638.01	0.94	267.84	3,637.88	-1.10	-19.95	-13.78	0.36	0.31	13.83	
3,733.01	0.52	234.28	3,732.87	-1.38	-21.08	-14.41	0.61	-0.44	-35.33	
3,828.01	0.38	226.17	3,827.87	-1.85	-21.66	-14.50	0.16	-0.15	-8.54	
3,922.01	0.56	234.68	3,921.87	-2.33	-22.26	-14.61	0.20	0.19	9.05	
4,017.01	0.32	262.67	4,016.87	-2.64	-22.90	-14.87	0.33	-0.25	29.46	
4,112.01	0.98	169.87	4,111.86	-3.47	-23.02	-14.39	1.10	0.69	-97.68	
4,206.01	0.68	180.75	4,205.85	-4.82	-22.89	-13.37	0.36	-0.32	11.57	
4,301.01	0.38	171.94	4,300.85	-5.69	-22.85	-12.74	0.33	-0.32	-9.27	
4,396.01	1.15	184.22	4,395.84	-6.96	-22.88	-11.89	0.82	0.81	12.93	
4,490.01	0.86	180.32	4,489.82	-8.60	-22.95	-10.82	0.32	-0.31	-4.15	
4,585.01	0.94	187.49	4,584.81	-10.09	-23.06	-9.88	0.15	0.08	7.55	
4,680.01	0.74	225.12	4,679.80	-11.29	-23.59	-9.44	0.60	0.21	39.61	
4,775.01	0.57	251.83	4,774.80	-11.87	-24.48	-9.69	0.36	-0.18	28.12	

RECEIVED  
Office of Oil and Gas  
MAR 28 2014



## Scientific Drilling International Survey Report

<b>Company:</b>	Chevron Appalachia, LLC	<b>Local Co-ordinate Reference:</b>	Well Conner 2H
<b>Project:</b>	Marshall County, WV	<b>TVD Reference:</b>	GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Site:</b>	Conner Pad	<b>MD Reference:</b>	GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Well:</b>	Conner 2H	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Northeast District

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,869.01	0.65	263.55	4,868.79	-12.08	-25.45	-10.26	0.16	0.09	12.47	
4,964.01	0.59	262.44	4,963.79	-12.21	-26.47	-10.91	0.06	-0.06	-1.17	
5,001.01	0.91	259.16	5,000.78	-12.29	-26.95	-11.21	0.87	0.86	-8.86	
5,095.01	12.56	226.39	5,093.98	-19.50	-35.11	-12.20	12.56	12.39	-34.86	
5,190.01	15.49	232.50	5,186.15	-34.35	-52.66	-14.81	3.45	3.08	6.43	
5,285.01	20.29	240.15	5,276.54	-50.29	-77.03	-21.63	5.62	5.05	8.05	
5,379.01	23.46	242.42	5,363.76	-67.07	-107.76	-32.51	3.49	3.37	2.41	
5,474.01	27.78	245.34	5,449.41	-85.07	-144.66	-47.05	4.74	4.55	3.07	
5,568.01	30.66	236.03	5,531.48	-107.61	-184.47	-60.59	5.72	3.06	-9.90	
5,662.01	33.54	216.34	5,611.32	-142.03	-219.84	-62.77	11.50	3.06	-20.95	
5,756.01	28.79	215.25	5,691.73	-181.45	-248.31	-56.48	5.09	-5.05	-1.16	
5,850.01	28.14	208.90	5,774.39	-219.35	-272.09	-47.83	3.29	-0.69	-6.76	
5,943.01	33.25	205.78	5,854.34	-261.54	-293.79	-34.72	5.75	5.49	-3.35	
6,037.01	40.78	193.42	5,929.44	-314.76	-312.18	-11.64	11.23	8.01	-13.15	
6,131.01	41.80	171.28	6,000.45	-375.91	-314.57	28.53	15.52	1.09	-23.55	
6,225.01	43.35	169.11	6,069.68	-438.57	-303.72	79.37	2.27	1.65	-2.31	
6,320.01	47.65	160.49	6,136.31	-503.77	-285.81	137.10	7.89	4.53	-9.07	
6,415.01	56.99	158.14	6,194.32	-573.99	-259.20	204.60	10.02	9.83	-2.47	
6,509.01	64.35	156.05	6,240.34	-649.40	-227.27	279.53	8.07	7.83	-2.22	
6,603.01	69.21	152.27	6,277.40	-727.08	-189.60	360.20	6.35	5.17	-4.02	
6,698.01	73.82	147.54	6,307.53	-804.96	-144.40	446.49	6.77	4.85	-4.98	
6,792.01	77.06	140.99	6,331.18	-878.74	-91.27	535.74	7.57	3.45	-6.97	
6,887.01	86.30	136.08	6,344.92	-949.05	-29.08	629.21	10.99	9.73	-5.17	
6,982.01	88.59	137.18	6,349.15	-1,018.03	36.08	723.95	2.67	2.41	1.16	
7,077.01	91.61	136.01	6,348.99	-1,087.04	101.36	818.77	3.41	3.18	-1.23	
7,171.01	91.01	136.06	6,346.84	-1,154.68	166.59	912.64	0.64	-0.64	0.05	
7,266.01	90.50	135.68	6,345.59	-1,222.86	232.74	1,007.53	0.67	-0.54	-0.40	
7,360.01	91.37	131.52	6,344.05	-1,287.66	300.78	1,101.50	4.52	0.93	-4.43	
7,455.02	91.24	131.59	6,341.89	-1,350.67	371.86	1,196.43	0.16	-0.14	0.07	
7,550.02	88.83	132.38	6,341.83	-1,414.21	442.47	1,291.40	2.67	-2.54	0.83	
7,645.02	89.40	134.51	6,343.30	-1,479.52	511.43	1,386.38	2.32	0.60	2.24	
7,739.02	89.13	135.37	6,344.50	-1,545.92	577.96	1,480.33	0.96	-0.29	0.91	
7,833.02	89.13	137.03	6,345.93	-1,613.75	643.01	1,574.19	1.77	0.00	1.77	
7,928.02	88.99	137.75	6,347.49	-1,683.66	707.32	1,668.93	0.77	-0.15	0.76	
8,022.02	88.96	138.11	6,349.17	-1,753.43	770.29	1,762.61	0.38	-0.03	0.38	
8,117.02	88.52	138.44	6,351.26	-1,824.31	833.50	1,857.22	0.58	-0.46	0.35	
8,211.02	88.82	137.92	6,353.44	-1,894.35	896.16	1,950.85	0.64	0.32	-0.55	
8,305.02	87.99	138.01	6,356.06	-1,964.14	959.08	2,044.49	0.89	-0.88	0.10	
8,400.02	90.54	137.66	6,357.28	-2,034.54	1,022.84	2,139.18	2.71	2.68	-0.37	
8,495.02	90.17	136.81	6,356.69	-2,104.28	1,087.34	2,233.95	0.98	-0.39	-0.89	
8,589.02	89.16	134.92	6,357.24	-2,171.74	1,152.79	2,327.84	2.28	-1.07	-2.01	
8,682.02	88.29	134.11	6,359.31	-2,236.93	1,219.09	2,420.79	1.28	-0.94	-0.87	
8,776.02	90.67	134.82	6,360.16	-2,302.76	1,286.17	2,514.76	2.64	2.53	0.76	
8,869.02	89.87	134.73	6,359.72	-2,368.27	1,352.19	2,607.73	0.87	-0.86	-0.10	



## Scientific Drilling International Survey Report

<b>Company:</b>	Chevron Appalachia, LLC	<b>Local Co-ordinate Reference:</b>	Well Conner 2H
<b>Project:</b>	Marshall County, WV	<b>TVD Reference:</b>	GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Site:</b>	Conner Pad	<b>MD Reference:</b>	GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Well:</b>	Conner 2H	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Northeast District

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,961.02	88.69	133.24	6,360.88	-2,432.15	1,418.38	2,699.71	2.07	-1.28	-1.62	
9,054.02	88.32	134.25	6,363.31	-2,496.43	1,485.54	2,792.67	1.16	-0.40	1.09	
9,148.02	89.63	135.49	6,364.99	-2,562.73	1,552.14	2,886.62	1.92	1.39	1.32	
9,241.02	88.89	134.37	6,366.19	-2,628.41	1,617.98	2,979.57	1.44	-0.80	-1.20	
9,335.02	90.00	137.99	6,367.10	-2,696.22	1,683.05	3,073.43	4.03	1.18	3.85	
9,427.02	89.26	136.00	6,367.69	-2,763.49	1,745.79	3,165.22	2.31	-0.80	-2.16	
9,520.02	89.56	139.85	6,368.65	-2,832.50	1,808.10	3,257.89	4.15	0.32	4.14	
9,613.02	88.79	140.19	6,369.99	-2,903.76	1,867.84	3,350.24	0.91	-0.83	0.37	
9,707.02	88.32	141.70	6,372.36	-2,976.73	1,927.05	3,443.36	1.68	-0.50	1.61	
9,800.02	87.88	141.18	6,375.44	-3,049.41	1,984.99	3,535.36	0.73	-0.47	-0.56	
9,893.02	90.50	140.21	6,376.76	-3,121.36	2,043.89	3,627.56	3.00	2.82	-1.04	
9,986.02	90.23	140.09	6,376.17	-3,192.76	2,103.48	3,719.89	0.32	-0.29	-0.13	
10,079.02	89.13	139.09	6,376.69	-3,263.56	2,163.76	3,812.32	1.60	-1.18	-1.08	
10,172.02	88.42	137.96	6,378.67	-3,333.23	2,225.34	3,904.90	1.43	-0.76	-1.22	
10,266.02	90.60	139.20	6,379.48	-3,403.71	2,287.52	3,998.49	2.67	2.32	1.32	
10,359.02	90.10	138.81	6,378.91	-3,473.90	2,348.53	4,091.02	0.68	-0.54	-0.42	
10,452.02	90.00	138.71	6,378.83	-3,543.83	2,409.83	4,183.59	0.15	-0.11	-0.11	
10,546.02	88.96	137.50	6,379.68	-3,613.80	2,472.60	4,277.25	1.70	-1.11	-1.29	
10,641.02	88.39	137.08	6,381.88	-3,683.58	2,537.02	4,371.99	0.75	-0.60	-0.44	
10,736.02	87.78	136.90	6,385.05	-3,753.01	2,601.79	4,466.73	0.67	-0.64	-0.19	
10,830.02	87.32	137.02	6,389.07	-3,821.65	2,665.88	4,560.45	0.51	-0.49	0.13	
10,924.02	88.05	136.65	6,392.87	-3,890.16	2,730.14	4,654.19	0.87	0.78	-0.39	
11,019.02	87.72	137.17	6,396.37	-3,959.49	2,794.99	4,748.93	0.65	-0.35	0.55	
11,113.02	90.44	137.07	6,397.88	-4,028.35	2,858.94	4,842.70	2.90	2.89	-0.11	
11,208.02	90.17	136.87	6,397.38	-4,097.80	2,923.77	4,937.50	0.35	-0.28	-0.21	
11,302.02	90.30	137.15	6,396.99	-4,166.56	2,987.86	5,031.30	0.33	0.14	0.30	
11,397.02	88.42	134.74	6,398.05	-4,234.82	3,053.91	5,126.17	3.22	-1.98	-2.54	
11,491.02	88.32	134.88	6,400.73	-4,301.04	3,120.57	5,220.10	0.18	-0.11	0.15	
11,585.02	87.99	136.03	6,403.75	-4,368.00	3,186.47	5,313.98	1.27	-0.35	1.22	
11,680.02	87.58	135.84	6,407.43	-4,436.21	3,252.49	5,408.81	0.48	-0.43	-0.20	
11,774.02	87.52	136.52	6,411.44	-4,503.97	3,317.52	5,502.60	0.73	-0.06	0.72	
11,869.02	89.60	136.21	6,413.83	-4,572.70	3,383.05	5,597.43	2.21	2.19	-0.33	
11,963.02	89.30	137.14	6,414.73	-4,641.08	3,447.54	5,691.25	1.04	-0.32	0.99	
12,058.02	91.51	137.49	6,414.06	-4,710.90	3,511.94	5,786.01	2.36	2.33	0.37	
12,152.02	91.01	137.22	6,412.00	-4,780.03	3,575.61	5,879.74	0.60	-0.53	-0.29	
12,245.02	91.01	136.86	6,410.36	-4,848.08	3,638.98	5,972.53	0.39	0.00	-0.39	
12,340.02	90.94	136.86	6,408.74	-4,917.39	3,703.93	6,067.33	0.07	-0.07	0.00	
12,435.03	90.17	136.25	6,407.82	-4,986.36	3,769.25	6,162.16	1.03	-0.81	-0.64	
12,530.03	90.17	136.60	6,407.54	-5,055.18	3,834.73	6,257.02	0.37	0.00	0.37	
12,625.03	89.30	135.72	6,407.98	-5,123.70	3,900.53	6,351.90	1.30	-0.92	-0.93	
12,719.03	88.86	135.20	6,409.49	-5,190.69	3,966.46	6,445.81	0.72	-0.47	-0.55	
12,814.03	89.50	134.13	6,410.85	-5,257.47	4,034.02	6,540.77	1.31	0.67	-1.13	
12,909.03	89.23	133.12	6,411.90	-5,323.01	4,102.78	6,635.76	1.10	-0.28	-1.06	



# Scientific Drilling International

## Survey Report

<b>Company:</b> Chevron Appalachia, LLC	<b>Local Co-ordinate Reference:</b> Well Conner 2H
<b>Project:</b> Marshall County, WV	<b>TVD Reference:</b> GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Site:</b> Conner Pad	<b>MD Reference:</b> GL 1220' & KB 32' @ 1252.00ft (Nabors X7)
<b>Well:</b> Conner 2H	<b>North Reference:</b> True
<b>Wellbore:</b> OH	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> As Drilled	<b>Database:</b> Northeast District

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,004.03	89.26	132.63	6,413.15	-5,387.64	4,172.39	6,730.75	0.52	0.03	-0.52
13,099.03	89.33	131.27	6,414.32	-5,451.14	4,243.04	6,825.72	1.43	0.07	-1.43
13,193.03	88.49	130.03	6,416.11	-5,512.36	4,314.34	6,919.60	1.59	-0.89	-1.32
13,288.03	88.46	132.37	6,418.64	-5,574.91	4,385.79	7,014.50	2.46	-0.03	2.46
13,382.03	89.40	135.68	6,420.39	-5,640.22	4,453.36	7,108.46	3.66	1.00	3.52
13,476.03	89.70	135.43	6,421.13	-5,707.32	4,519.18	7,202.38	0.42	0.32	-0.27
13,570.03	89.70	135.55	6,421.62	-5,774.36	4,585.07	7,296.31	0.13	0.00	0.13
13,664.03	89.40	134.52	6,422.36	-5,840.86	4,651.50	7,390.26	1.14	-0.32	-1.10
13,757.03	89.30	133.86	6,423.42	-5,905.68	4,718.18	7,483.24	0.72	-0.11	-0.71
13,851.03	88.42	133.04	6,425.29	-5,970.31	4,786.41	7,577.22	1.28	-0.94	-0.87
13,945.03	87.89	133.46	6,428.31	-6,034.69	4,854.84	7,671.17	0.72	-0.56	0.45
14,039.03	87.41	132.96	6,432.17	-6,098.99	4,923.29	7,765.10	0.74	-0.51	-0.53
14,122.03	87.38	133.23	6,435.94	-6,155.64	4,983.84	7,848.01	0.33	-0.04	0.33
<b>Last SDI MWD Survey</b>									
14,178.03	87.38	133.23	6,438.50	-6,193.96	5,024.60	7,903.95	0.00	0.00	0.00
<b>Projection to Bit</b>									

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Coal Target	0.00	0.00	784.00	0.00	0.00	505,327.06	1,617,496.30	39° 52' 50.394 N	80° 45' 2.819 W
- actual wellpath misses target center by 4.30ft at 784.02ft MD (784.00 TVD, -3.46 N, -2.55 E)									
- Circle (radius 7.66)									
Conner 2H LP	0.00	0.00	6,367.01	-912.07	-73.73	504,416.11	1,617,409.88	39° 52' 41.380 N	80° 45' 3.765 W
- actual wellpath misses target center by 29.37ft at 6833.46ft MD (6339.04 TVD, -909.86 N, -65.06 E)									
- Point									
Conner 2H PBHL	0.00	0.00	6,367.01	-6,257.70	4,988.47	499,000.53	1,622,397.15	39° 51' 48.544 N	80° 43' 58.843 W
- actual wellpath misses target center by 102.37ft at 14178.03ft MD (6438.50 TVD, -6193.96 N, 5024.60 E)									
- Point									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
100.00	100.00	-0.19	-0.13	First Gyro Data Gyro Survey
2,481.00	2,480.96	-3.34	-7.27	Last Gyro Data Gyro Survey
2,596.01	2,595.97	-3.23	-7.66	First SDI MWD Survey
14,122.03	6,435.94	-6,155.64	4,983.84	Last SDI MWD Survey
14,178.03	6,438.50	-6,193.96	5,024.60	Projection to Bit

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

# Hydraulic Fracturing Fluid Product Component Information Disclosure

51-015196

Job Start Date:	11/29/2013
Job End Date:	12/6/2013
State:	West Virginia
County:	Marshall
API Number:	47-051-01596-00-00
Operator Name:	Chevron USA Inc.
Well Name and Number:	Conner 2H
Longitude:	-80.75078300
Latitude:	39.88066500
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,438
Total Base Water Volume (gal):	7,938,172
Total Base Non Water Volume:	



## 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
Clean Volume	Chevron Appalachia, LLC	Carrier/Base Fluid					
			H2O	7732-18-5	100.00000	90.25791	
Proppant	US Sand Co	Proppant					
			Crystalline Silica	14808-60-7	100.00000	9.74209	
15% Hcl Acid	Reagent/PPG	Used to open perms					
			Hydrochloric Acid	7647-01-0	15.00000	0.09889	
Unislik ST 50	CESI	Friction Reducer					
			Hydrotreated Light Distillite	64742-47-8	30.00000	0.02746	
EC 6116a	Nalco	Biocide					
			Polyethylene Glycol	25322-68-3	60.00000	0.01533	
			1, 1-Dibromo-3-nitrilopropionamide	10222-01-2	30.00000	0.00767	
			Dibromoacetone nitrile	3252-43-5	5.00000	0.00128	
Scale Inhibitor A	Nalco	Scale Inhibitor					
			Ethylene Glycol	107-21-1	30.00000	0.00757	
Iron Control A	Nalco	Iron Control					
			Ethylene Glycol	107-21-1	30.00000	0.00709	
CMHPG	Ashland	Water Viscosifier					
			Carboxymethyl Hydroxypropoyl Guar Blend	68130-15-4	100.00000	0.00202	

6.1.1	Cleanwater	Gel Breaker	Ethylene Glycol	107-21-1	60.00000	0.00003
-------	------------	-------------	-----------------	----------	----------	---------

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

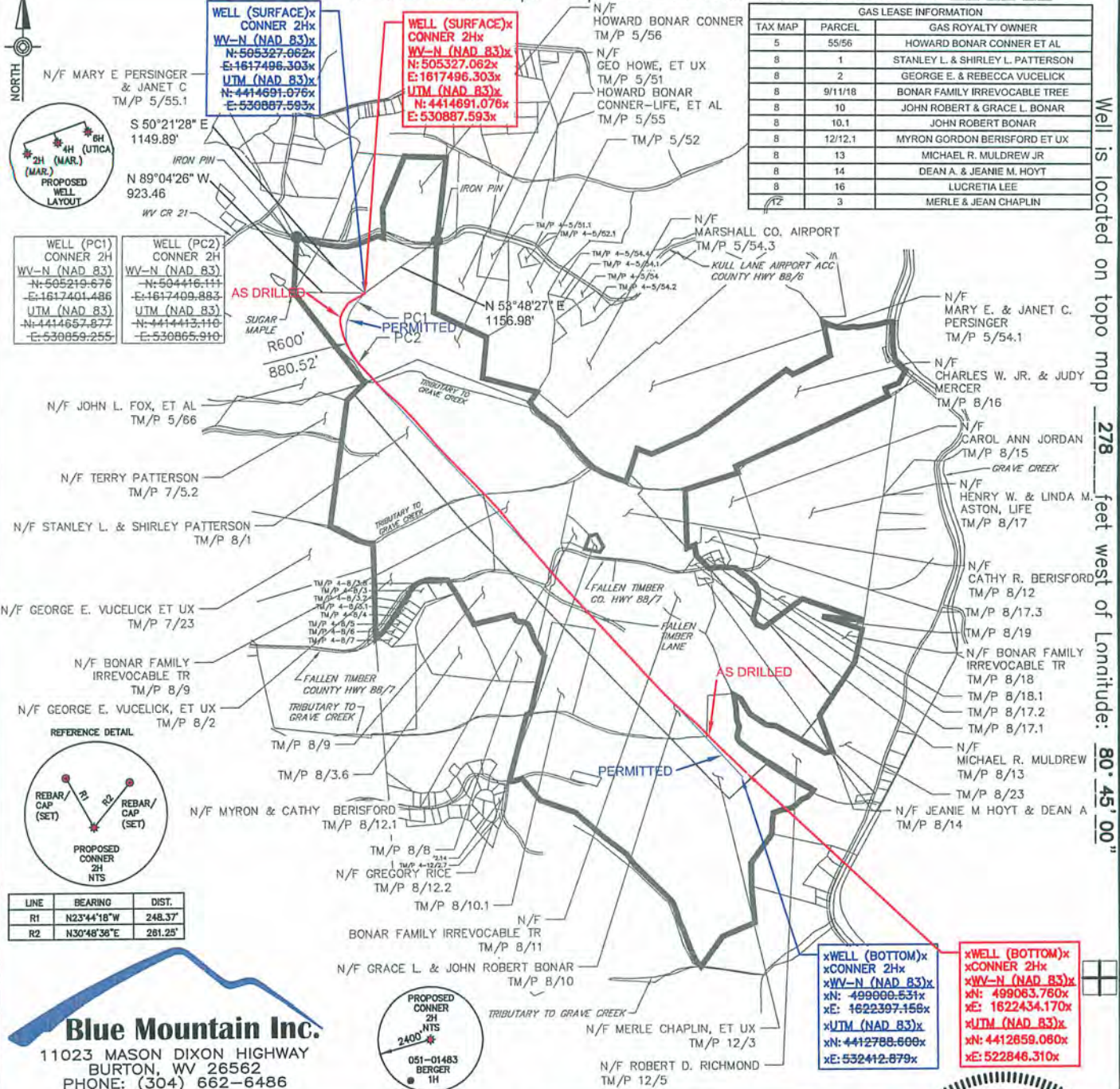
\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

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)

76510-15

51-01596

Well is located on topo map 13,129 feet south of Latitude: 39° 55' 00"



Well is located on topo map 278 feet west of Longitude: 80° 45' 00"

FILE #: CONNER 2H-AS DRILLED  
 DRAWING #: CONNER 2H-AS DRILLED  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1/2500  
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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: \_\_\_\_\_  
 R.P.E.: \_\_\_\_\_ L.L.S.: P.S. No. 2000



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304

DATE: JANUARY 23, 2014  
 OPERATOR'S WELL #: CONNER 2H-AS DRILLED  
 API WELL #: 47 51 01596  
 STATE COUNTY PERMIT

Well Type:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

WATERSHED: GRAVE CREEK ELEVATION: 1222.00'  
 COUNTY/DISTRICT: MARSHALL / CLAY QUADRANGLE: BUSINESSBURG, OH-WV 7.5'  
 SURFACE OWNER: HOWARD BONAR CONNER - LIFE ACREAGE: 81.72±  
 OIL & GAS ROYALTY OWNER: SEE ABOVE TABLE ACREAGE: 363.51±

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,351'  
 WELL OPERATOR CHEVRON APPALACHIA, LLC DESIGNATED AGENT KENNETH E. TAWNEY  
 Address 800 MOUNTAIN VIEW DRIVE Address 500 LEE STREET, EAST SUITE 1600  
 City SMITHFIELD State PA Zip Code 15478 City CHARLESTON State WV Zip Code 25301-3202



RECEIVED  
 Office of Oil & Gas  
 04/18/2014  
 MAR 2 2014  
 WV Department of Environmental Protection