

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

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JUL 17 2015

WV Department of
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API 47-051-01718 County Marshall District Clay
Quad Glen Easton Pad Name Francis Field/Pool Name _____
Farm name Francis Well Number 11H
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 4413726.167 Easting 526315.706
Landing Point of Curve Northing 4413725.8 Easting 526389.4
Bottom Hole Northing 4412372.1 Easting 527445.2

Elevation (ft) 1283 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)
None Aqueous Fluid containing weighting agent, fluid loss additive, emulsifier, Viscosity and Rheological Control agent,
Oil-Wetting Agent, fluid rheology conditioner

Date permit issued 3/20/2014 Date drilling commenced 4/22/2014 Date drilling ceased 8/8/2014
Date completion activities began 3/13/2015 Date completion activities ceased 7/13/2015
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 619 - 648 Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1890' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 105-145', 490-520', 700-840', 1080-1190', 1475-1585', 1640-1660' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No but not sealed

Reviewed by:

API 47-051 - 01718 Farm name Francis Well number 11H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	36	30	45	New	X-56; 118.6		
Surface	17 1/2	13 3/8	651	New	J-55; 54.50		
Coal							
Intermediate 1	12 1/4	9 5/8	2583	New	L-80; 40		
Intermediate 2							
Intermediate 3							
Production	8 1/2	5 1/2	12459	New	P-110; 20		
Tubing							
Packer type and depth set							

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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	Bulk Cement	Bulk Cement	Bulk Cement	Bulk Cement	Bulk Cement	Surface	8.0
Surface	Class A	677	15.6	1.21	817	Surface	8.0
Coal							
Intermediate 1	Class A	937	15.6	1.18	1108	Surface	8.0
Intermediate 2							
Intermediate 3							
Production	Class A	2416	15.2	1.31	3015	Surface	Well TD'd
Tubing							

Drillers TD (ft) 12617 Loggers TD (ft) 12617
 Deepest formation penetrated Burkett Shale Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 4689

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 _____
One bow spring centralizer every two jts on the Surface string and intermediate. Two centralizer every jt in the lateral and curve, then one every two jts from KOP to surface

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS SEE ATTACHED PERFORATION/STIMULATION REPORT

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API: 47-051-01718	Well Name: Francis	Well Number: 11H
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PERFORATION RECORD					
Stage No.	Perforation Date	Perforated From TMD Ft.	Perforated To TMD Ft.	Number of Perforations	Formation(s)
1	4/13/2015	12429.5	12527	45	Upper Devonian
2	4/14/2015	12380	12277	45	Upper Devonian
3	4/14/2015	12230	12132	45	Upper Devonian
4	4/14/2015	12080	11975	45	Upper Devonian
5	4/14/2015	11930	11827	45	Upper Devonian
6	4/15/2015	11780	11678	45	Upper Devonian
7	4/15/2015	11625	11527	45	Upper Devonian
8	4/15/2015	11480	11373	45	Upper Devonian
9	4/16/2015	11330	11227	45	Upper Devonian
10	4/16/2015	11182	11077	45	Upper Devonian
11	4/16/2015	11030	10930	45	Upper Devonian
12	4/16/2015	10879	10777	45	Upper Devonian
13	4/17/2015	10730	10627	50	Upper Devonian
14	4/17/2015	10580	10477	45	Upper Devonian
15	4/17/2015	10436	10327	45	Upper Devonian
16	4/18/2015	10280	10171	45	Upper Devonian
17	4/18/2015	10130	10027	45	Upper Devonian
18	4/18/2015	9980	9877	45	Upper Devonian
19	4/18/2015	9830	9730	45	Upper Devonian
20	4/19/2015	9680	9577	45	Upper Devonian
21	4/19/2015	9530	9427	45	Upper Devonian
22	4/19/2015	9380	9277	45	Upper Devonian
23	4/19/2015	9233	9127	45	Upper Devonian
24	4/19/2015	9080	8982	45	Upper Devonian
25	4/20/2015	8930	8827	45	Upper Devonian
26	4/20/2015	8780	8677	45	Upper Devonian
27	4/20/2015	8630	8527	45	Upper Devonian
28	4/20/2015	8475	8377	45	Upper Devonian
29	4/21/2015	8330	8227	45	Upper Devonian
30	4/21/2015	8180	8080	45	Upper Devonian
31	4/21/2015	8032	7927	45	Upper Devonian
32	4/21/2015	7880	7781	45	Upper Devonian
33	4/21/2015	7730	7627	45	Upper Devonian
34	4/22/2015	7580	7477	45	Upper Devonian
35	4/22/2015	7430	7327	45	Upper Devonian
36	4/22/2015	7275	7177	45	Upper Devonian
37	4/22/2015	7130	7024	45	Upper Devonian
38	4/22/2015	6980	6877	45	Upper Devonian
39	4/22/2015	6832	6727	45	Upper Devonian
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Please insert additional copies of this page if additional rows/stages are needed.

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STIMULATION INFORMATION / STAGE								
Complete a separate record for each stimulation stage. (Please insert additional lines for additional stages or additional pages as applicable).								
Stg No.	Stimulation 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	4/13/2015	83.7	8680	7107	3613	251740	6962	
2	4/14/2015	91.1	8249	9480	3607	225000	6017	
3	4/14/2015	98.4	8434	8918	3629	224660	6016	
4	4/14/2015	97	8202	7762	3899	226120	6501	
5	4/14/2015	96.4	7877	8356	4196	220520	6703	
6	4/15/2015	90.4	7477	8405	3989	227900	5885	
7	4/15/2015	88.3	7690	6097	3836	224720	6031	
8	4/15/2015	89	7518	7028	3989	225340	5931	
9	4/16/2015	87.2	7313	6743	3850	219480	6000	
10	4/16/2015	90.7	7494	6782	4041	225360	5839	
11	4/16/2015	91	7232	6484	3945	225320	5990	
12	4/16/2015	91.6	6838	6863	4162	235360	6018	
13	4/17/2015	88.3	7325	5794	3885	229000	6225	
14	4/17/2015	90.9	7773	6469	3943	227040	5966	
15	4/17/2015	88	7730	6190	3927	228420	5942	
16	4/18/2015	90.3	7409	6310	3824	222080	5695	
17	4/18/2015	91	7140	7747	3801	224280	5868	
18	4/18/2015	90	7233	8272	3810	224980	5777	
19	4/18/2015	91.1	7643	7254	3789	220940	6364	
20	4/19/2015	92.6	7015	7095	3616	226140	5893	
21	4/19/2015	92.5	6992	6298	3891	222380	5508	
22	4/19/2015	90	7237	6787	4201	225780	5810	
23	4/19/2015	90.4	7182	6659	4448	225140	5778	
24	4/19/2015	93.1	7499	6629	4170	224080	5882	
25	4/20/2015	90.3	7631	6638	3789	223800	6329	
26	4/20/2015	90.3	7163	5997	3451	226120	6273	
27	4/20/2015	90.5	7582	5601	3777	225660	5890	
28	4/20/2015	93	6781	6478	3754	227940	6217	
29	4/21/2015	91.5	7208	5991	3482	231720	7672	
30	4/21/2015	93.4	7340	6683	3712	225640	6683	
31	4/21/2015	94.4	7279	5774	3671	225600	5840	
32	4/21/2015	94.1	7279	6425	3859	226850	5669	
33	4/21/2015	99.9	7236	5875	3719	221040	5690	
34	4/22/2015	100.3	7144	5782	3789	226640	5740	
35	4/22/2015	100.1	7345	6059	3684	224260	5762	
36	4/22/2015	93.9	7177	7288	4016	223620	6451	
37	4/22/2015	97.2	7127	6520	3628	224200	5755	
38	4/22/2015	96.9	7355	6331	3635	223700	5702	
39	4/22/2015	100.1	7160	6355	3859	225780	6062	
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JUL 17 2015

WV Department of
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API 47- 051 - 01718 Farm name Francis Well number 11H

PRODUCING FORMATION(S)	DEPTHS	
	TVD	MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

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JUL 17 2015

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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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	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
Monongahela Group Sand	596	635	596	635	Fresh Water 619'-648'MD 2" stream
Pittsburgh Coal	816	820	816	820	Coal
Big Lime	1860	1940	1860	1940	Limestone: crm-wh, hd, crpxln (Brine @ 1890' 25bbbls/hr)
Burgoon (Big Injun)	1940	2130	1938	2128	SS: offwh, wh, cons, clr, trans, lcemt, fg-mg
Weir Sand	2290	2310	2288	2308	SLTST: ltgy-mgy, occ mgy, hrd, vf-fg, tcmt, bio, arg, sl calc
Berea Sand	2525	2550	2522	2547	SS: wh, clr, trans, ltgy-gy, cns, lcmt, mg-fg, sbang-ang, arg, msph, non calc, tr flor, exl fast cut, fnt odr, lse pyr
Burket Shale	6398		6720		SH: drkgy, v.drkgy, frm, slty, grty, sbblky-sbfiss, modcalc, embd calc, lse calct

Please insert additional pages as applicable.

Drilling Contractor SEE ATTACHED
Address _____ City _____ State _____ Zip _____

Logging Company Stratagraph NE Inc
Address 116 Ellsworth Avenue City Marietta State OH Zip 45750

Cementing Company Baker Hughes
Address 5373 West Alabama, Suite 300 City Houston State TX Zip 77056

Stimulating Company Schlumberger Technology Corp
Address Two Robinson Plaza, Suite 200 City Pittsburgh State PA Zip 15205

Please insert additional pages as applicable.

Completed by Jackie M. Scholier Telephone 724-564-3721
Signature [Signature] Title _____ Date _____

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DRILLING CONTRACTORS			
Driller	Driller	Driller	Driller
Name Rocky Mountain Drilling	Name Highlands Drilling LLC	Name Schlumberger Technology Corp	Name
Address 185 North Vernal Avenue, Suite 2	Address 900 Virginia Street East	Address Two Robinson Plaza, Suite 200	Address
City - State - Zip Vernal, UT 84078	City - State - Zip Charleston, WV 25301	City - State - Zip Pittsburgh, PA 15205	City - State - Zip

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/13/2015
Job End Date:	4/22/2015
State:	West Virginia
County:	Marshall
API Number:	47-051-01718-00-00
Operator Name:	Chevron USA Inc.
Well Name and Number:	Francis 11H
Longitude:	-80.69230200
Latitude:	39.87303800
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,445
Total Base Water Volume (gal):	9,926,070
Total Base Non Water Volume:	

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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
Base Fluid	Chevron	Carrier/Base Fluid	Water (Including Mix Water Supplied by Client)	7732-18-5	100.00000	89.86721	
Proppant	Schlumberger	Proppant	Crystalline Silica	14808-60-7	100.00000	9.85776	
J580	Schlumberger	Gelling Agent	Carbohydrate Polymer	Proprietary	100.00000	0.02747	
7.5% Acid	Schlumberger	Perf Cleanup	Hydrochloric Acid	7647-01-0	8.00000	0.01787	
J609W	Schlumberger	Friction Reducer	Ammonium Sulfate	7783-20-2	30.00000	0.00431	
M300	BASF Corporation	Biocide	Urea	57-13-6	5.00000	0.00072	
			Water	7732-18-5	75.00000	0.00171	
			Glutaral	111-30-8	25.00000	0.00057	
J042	Schlumberger	Iron Chelating Agent	Tetrasodium ethylenediaminetetraacetate	64-02-8	60.00000	0.00181	
			Trisodium nitrilotriacetate (im purity)	5064-31-3	10.00000	0.00030	
			Sodium hydroxide	1310-73-2	5.00000	0.00015	

Amended 6/24/15

J134	Schlumberger	Gel Breaker	Hemicellulase enzyme	9012-54-8	100.00000	0.00132
L058	Schlumberger	Iron Stabilizer	Sodium erythorbate	6381-77-7	100.00000	0.00087
B317	Schlumberger	Scale Inhibitor	Ethane-1,2-diol	107-21-1	5.00000	0.00011
A264	Schlumberger	Corrosion Inhibitor	Trisodium ortho phosphate	7601-54-9	5.00000	0.00011
			Methanol	67-56-1	40.00000	0.00006
			Aliphatic acids	Proprietary	30.00000	0.00005
			Aliphatic alcohols, ethoxylated #1	Proprietary	30.00000	0.00005
			Prop-2-yn-1-ol	107-19-7	10.00000	0.00002
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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