

Farm name: State of WV DNR A BRK 8H Operator Well No.: 834376

LOCATION: Elevation: 1,140' Quadrangle: Steubenville East, WV

District: Cross Creek County: Brooke
Latitude: 9,790' Feet South of 40 Deg. 20 Min. 00 Sec.
Longitude 4,480' Feet West of 80 Deg. 32 Min. 00 Sec.

Company: Chesapeake Appalachia, L.L.C.

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
P.O. Box 18496 Oklahoma City, OK 73154-0496	20"	120'	120'	392 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	750'	750'	819 Cu. Ft.
Inspector: Bill Hendershot	9 5/8"	1,541'	1,541'	656 Cu. Ft.
Date Permit Issued: 3-20-2012	5 1/2"	9,746'	9,746'	1167 Cu. Ft.
Date Well Work Commenced: 10-4-2012				
Date Well Work Completed: 6-5-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 5,759'				
Total Measured Depth (ft): 9,746'				
Fresh Water Depth (ft.): 80', 300'				
Salt Water Depth (ft.): 1210'				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): 656'				
Void(s) encountered (N/Y) Depth(s) N				

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

Producing formation Marcellus Pay zone depth (ft) 5,950-9,652

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow 1,250* MCF/d Final open flow 278 Bbl/d

Time of open flow between initial and final tests 120 Hours *Calculated

Static rock Pressure 3,743* psig (surface pressure) after 120 Hours

Second producing formation _____ Pay zone depth (ft) _____

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

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

Marlene Williams
Signature

2-26-15
Date

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Were core samples taken? Yes _____ No N

Were cuttings caught during drilling? Yes Y No _____

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list GR, neutron, density, and resistivity
Open hole logs run from 0-1555' MD; LWD GR from 5041-9696' MD.

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

Perforated Intervals, Fracturing, or Stimulating:

See attached

Plug Back Details Including Plug Type and Depth(s):

<u>Formations Encountered:</u>	<u>Top Depth</u>	<u>/</u>	<u>Bottom Depth</u>
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Surface:

See attached

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

PERFORATION RECORD ATTACHMENT

Well Name and Number: State of WV DNR A BRK 8H

API No. 47-009-00125

Stage	Date	Interval Perforated		Total Number Of Shots	Date	Interval Treated		Fluid		Propping Agent		Average Injection Rate
		From	To			Type	Amount	Type	Amount			
1	5/4/2013	9348	9652	40	5/4/2013	9348	9652	SLK Wtr	8111	Sand	521920	80
2	5/4/2013	8971	9274	40	5/4/2013	8971	9274	SLK Wtr	8191	Sand	525520	80
3	5/5/2013	8669	8894	32	5/5/2013	8669	8894	SLK Wtr	8322	Sand	526900	80.2
4	5/5/2013	8216	8517	40	5/5/2013	8216	8517	SLK Wtr	8291	Sand	524100	79.7
5	5/5/2013	7838	8141	40	5/5/2013	7838	8141	SLK Wtr	8263	Sand	521820	80
6	5/5/2013	7460	7764	40	5/5/2013	7460	7764	SLK Wtr	8180	Sand	526180	80
7	5/6/2013	7085	7386	40	5/6/2013	7085	7386	SLK Wtr	8300	Sand	527920	80.4
8	5/6/2013	6710	7008	40	5/6/2013	6710	7008	SLK Wtr	8309	Sand	525320	80.1
9	5/6/2013	6325	6631	40	5/6/2013	6325	6631	SLK Wtr	8029	Sand	521740	80
10	5/6/2013	5950	6253	40	5/6/2013	5950	6253	SLK Wtr	7976	Sand	527700	80

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LATERAL WELLBORE (no vertical pilot hole associated with this well)

Maximum TVD of wellbore: 5759 ft TVD @ 9501 ft MD

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SS/SH	0	0	656	656
KITTANING COAL	656	656	664	664
SS/SH	664	664	880	880
SHALE	880	880	1000	1000
SS	1000	1000	1120	1120
BIG LIME	1120	1120	1210	1210
BIG INJUN (SS)	1210	1210	1385	1385
SHALE	1385	1385	5554	5502
GENESEO (SH)	5554	5502	5578	5519
TULLY (LS)	5578	5519	5676	5579
HAMILTON (SH)	5676	5579	5913	5666
MARCELLUS (SH)	5913	5666		
TD OF LATERAL			9746	5756

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API No. 47-009-00125

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		From	To					Type	Amount	Type	Amount	
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BIG LIME	1120	1120	1210	1210
BIG INJUN (SS)	1210	1210	1385	1385
SHALE	1385	1385	5554	5502
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TULLY (LS)	5578	5519	5676	5579
HAMILTON (SH)	5676	5579	5913	5666
MARCELLUS (SH)	5913	5666		
TD OF LATERAL			9746	5756

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	5/4/2013
State:	WEST VIRGINIA
County:	BROOKE
API Number:	4700900125
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	STATE OF WV DNR A BRK 8H
Longitude:	-80.535296
Latitude:	40.320966
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	5,760
Total Water Volume (gal)*:	3,611,580

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by Mass)**	Maximum Ingredient Concentration in HF Fluid (% by Mass)**	Comments
Fresh Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00000%	74.35452%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00000%	10.08339%	
EC6486A	NALCO	Scale Inhibitor	Ethylene Glycol	000107-21-1	30.00000%	0.00159%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol	000064-17-5	5.00000%	0.00136%	
			Glutaraldehyde (Pentanediol)	000111-30-8	60.00000%	0.01635%	
			Quaternary Ammonium Compounds	NA	10.00000%	0.00273%	
Acid, Hydrochloric 15pct, A264, B315, J218, J580, L058, 100 Mesh Sand, Northern White Sand	SCHLUMBERGER	Acid, Breaker, Corrosion Inhibitor, Friction Reducer, Gelling Agent, Iron Control Agent, Proppant - Natural	Crystalline silica	14808-60-7	98.79234%	14.99287%	
			Hydrogen chloride	7647-01-0	0.93101%	0.14129%	
			Water	007732-18-5	2.47925%	0.38595%	
			Distillates (petroleum), hydrotreated light	64742-47-8	0.09618%	0.01460%	
			Acrylamide/ammonium acrylate copolymer	26100-47-0	0.08015%	0.01216%	
			Ammonium chloride	12125-02-9	0.04609%	0.00699%	

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Guar gum	9000-30-0	0.03526%	0.00535%	
Ethoxylated oleic acid	9004-96-0	0.00801%	0.00122%	
Sorbital monooleate	1338-43-8	0.00701%	0.00106%	
Sorbitol Tetraoleate	61723-83-9	0.00501%	0.00076%	
Alcohols, C12-C16, ethoxylated	68551-12-2	0.00417%	0.00063%	
Alcohols, C12-C14, ethoxylated	68439-50-9	0.00413%	0.00063%	
Alcohols, C10-C16, ethoxylated	68002-97-1	0.00413%	0.00063%	
Sodium erythorbate	6381-77-7	0.00361%	0.00055%	
Methanol	67-56-1	0.00332%	0.00050%	
Diammonium peroxidisulphate	7727-54-0	0.00290%	0.00044%	
Fatty acids, tall-oil	61790-12-3	0.00244%	0.00037%	
C14 alpha olefin ethoxylate	84133-50-6	0.00220%	0.00033%	
Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00201%	0.00030%	
2-Propenoic acid, ammonium salt	10604-69-0	0.00200%	0.00030%	
Alcohols, C14-15, ethoxylated (ZEO)	68951-67-7	0.00093%	0.00014%	
Prop-2-yn-1-ol	107-19-7	0.00062%	0.00009%	
Alkenes, C>10 a-	64743-02-8	0.00041%	0.00006%	
Non-crystalline silica	7631-86-9	0.00010%	0.00001%	

Additional Ingredients Not Listed on MSDS

EC6110A, EC6486A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Diethylene Glycol	000111-46-6		0.00006%	
			Proprietary Inorganic Phosphate	TRADE SECRET		0.00062%	
			Proprietary Organic Acid Derivatives	TRADE SECRET		0.00186%	
			Water	007732-18-5		0.02413%	

* 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%

"Additional Ingredients Not Listed on MSDS" component information were obtained directly from the supplier. As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of this information should be directed to the supplier who provided it.

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