

Farm name: State of WV DNR A BRK 3H Operator Well No.: 835521

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

District: Cross Creek County: Brooke
Latitude: 9,860' Feet South of 40 Deg. 20 Min. 00 Sec.
Longitude 4,500' Feet West of 80 Deg. 30 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"	138'	138'	443 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	750'	750'	825 Cu. Ft.
Inspector: Bill Hendershot	9 5/8"	1,566'	1,566'	643 Cu. Ft.
Date Permit Issued: 8-28-2012	5 1/2"	13,476'	13,476'	1061 Cu. Ft.
Date Well Work Commenced: 10-17-2012				
Date Well Work Completed: 6-11-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 5,705'				
Total Measured Depth (ft): 13,476'				
Fresh Water Depth (ft.): 330'				
Salt Water Depth (ft.): 1,210'				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): N/A				
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) 5,870-13,345
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow 1,154* MCF/d Final open flow 582 Bbl/d
Time of open flow between initial and final tests 48 Hours *Calculated
Static rock Pressure 3,708* psig (surface pressure) after 48 Hours

Second producing formation _____ Pay zone depth (ft) _____
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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.

Markus Williams
Signature

2-26-15
Date

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

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

Maximum TVD of wellbore: 5705 ft TVD @ 5943 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	5520	5500
GENESEO (SH)	5520	5500	5540	5517
TULLY (LS)	5540	5517	5617	5578
HAMILTON (SH)	5617	5578	5739	5656
MARCELLUS (SH)	5739	5656		
TD OF LATERAL			13476	5597

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

WR-35
Rev (9-11)

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

DATE: 2-26-2015
API #: 47-009-00147

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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

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	5/2/2013
State:	WEST VIRGINIA
County:	BROOKE
API Number:	4700900147
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	STATE OF WV DNR A BRK 3H
Longitude:	-80.535331
Latitude:	40.320994
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	5,706
Total Water Volume (gal)**:	6,923,532

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	100.000000%	74.36702%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.000000%	11.00719%	
EC6486A	NALCO	Scale Inhibitor	Ethylene Glycol	000107-21-1	30.000000%	0.00189%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol	000064-17-5	5.000000%	0.00137%	
			Glutaraldehyde (Pentanediol)	000111-30-8	60.000000%	0.01639%	
			Quaternary Ammonium Compounds	NA	10.000000%	0.00273%	
			Crystalline silica	14808-60-7	98.73571%	14.22614%	
			Hydrogen chloride	7647-01-0	0.85826%	0.12366%	
			Water	007732-18-5	1.48638%	0.21749%	
			Distillates (petroleum), hydrotreated light	64742-47-8	0.12498%	0.01801%	
			Acrylamide/ammonium acrylate copolymer	26100-47-0	0.10415%	0.01501%	
			Guar gum	9000-30-0	0.09296%	0.01339%	
Acid, Hydrochloric 15pct, A264, B315, D047, J218, J475, J580, J610, L058, 100 Mesh Sand, Northern White Sand	SCHLUMBERGER	Acid, Breaker, Corrosion Inhibitor, Cross Linker, Deforming Agent, Friction Reducer, Gelling Agent, Iron Control Agent, Proppant - Natural					

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MORGANTOWN, WV

			Ammonium chloride	12125-02-9	0.05989%	0.00863%	
			Ethoxylated oleic acid	9004-96-0	0.01042%	0.00150%	
			Sorbitan monooleate	1338-43-8	0.00911%	0.00131%	
			Diammonium peroxidisulphate	7727-54-0	0.00668%	0.00096%	
			Sorbitol Tetraoleate	61723-83-9	0.00651%	0.00094%	
			Alcohol, C12-C16, ethoxylated	68551-12-2	0.00542%	0.00078%	
			Alcohol, C12-C14, ethoxylated	68439-50-9	0.00536%	0.00077%	
			Alcohol, C10-C16, ethoxylated	68002-97-1	0.00536%	0.00077%	
			Sodium erythorbate	6381-77-7	0.00332%	0.00048%	
			Methanol	67-56-1	0.00317%	0.00046%	
			C14 alpha olefin ethoxylate	84133-50-6	0.00286%	0.00041%	
			2-Propenoic acid, ammonium salt	10604-69-0	0.00260%	0.00038%	
			Fatty acids, tall-oil	61790-12-3	0.00233%	0.00034%	
			Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00192%	0.00028%	
			Alcohol, C14-15, ethoxylated (ZEO)	68951-67-7	0.00089%	0.00013%	
			Polypropylene glycol	25322-69-4	0.00087%	0.00013%	
			Prop-2-yn-1-ol	107-19-7	0.00059%	0.00009%	
			Alkenes, C>10 a-	64743-02-8	0.00040%	0.00006%	
			Potassium borate	1332-77-0	0.00029%	0.00004%	
			Non-crystalline silica	7631-86-9	0.00025%	0.00004%	
			Glycerol	56-81-5	0.00009%	0.00001%	
			Potassium hydroxide	1310-58-3	0.00009%	0.00001%	
			Vinylidene chloride/methylacrylate copolymer	25038-72-6	0.00006%	0.00001%	
			Magnesium silicate hydrate (talc)	14807-96-6	0.00001%	0.00001%	

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Additional Ingredients Not Listed on MSDS							
EC6110A, EC6486A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Diethylene Glycol	000111-46-6		0.00007%	
			Proprietary Inorganic Phosphate	TRADE SECRET		0.00073%	
			Proprietary Organic Acid Derivatives	TRADE SECRET		0.00219%	
			Water	007732-18-5		0.02466%	

* 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.