

Farm name: Russell Hervey BRK 5H Operator Well No.: 835018

LOCATION: Elevation: 1,160' Quadrangle: Stuebenville East

District: Buffalo County: Brooke
Latitude: 4,260' Feet South of 40 Deg. 17 Min. 30 Sec.
Longitude 12,250' Feet West of 80 Deg. 32 Min. 30 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'	244 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	358'	358'	505 Cu. Ft.
Inspector: Gayne J. Knitowski	9 5/8"	1,701'	1,701'	836 Cu. Ft.
Date Permit Issued: 8-25-2012	5 1/2"	11,638'	11,638'	1,077 Cu. Ft.
Date Well Work Commenced: 12-9-2012				
Date Well Work Completed: 5-7-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 5,869'				
Total Measured Depth (ft): 11,638'				
Fresh Water Depth (ft.): 277'				
Salt Water Depth (ft.): 1100'				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): 245'				
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) 6,200-11,401
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow 2,464* MCF/d Final open flow 412 Bbl/d
Time of open flow between initial and final tests 240 Hours
Static rock Pressure 3,815* psig (surface pressure) after 240 Hours *Calculated

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

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

Maximum TVD of wellbore: 5869 ft TVD @ 6377 ft MD

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
LS/SILT	0	0	272	272
PITTSBURG COAL	272	272	282	282
LS/SHALE/SILT	282	282	380	380
SS	380	380	440	440
SHALE	440	440	590	590
LS/SILT/SHALE	590	590	856	856
KITTANNING COAL	856	856	862	862
SS/SILT	862	862	1267	1267
BIG LIME	1267	1267	1315	1315
BIG INJUN (SS)	1315	1315	1612	1612
SHALE	1612	1612	5731	5667
GENESECO (SH)	5731	5667	5751	5680
TULLY (LS)	5751	5680	5763	5688
HAMILTON (SH)	5763	5688	6116	5837
MARCELLUS (SH)	6116	5837		
TD OF LATERAL			11638	5826

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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 0-1713' MD; LWD GR from 5232-11638' 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):

Formations Encountered:	Top Depth	/	Bottom Depth
Surface:			

See attached

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MORGANTOWN, WV

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	4/4/2013
State:	WEST VIRGINIA
County:	BROOKE
API Number:	4700900144
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	RUSSELL HERVEY BRK 5H
Longitude:	-80.556929
Latitude:	40.258056
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	5,869
Total Water Volume (gal)*:	4,922,022

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	100.00%	81.83964%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	2.98005%	
Northern White Sand	FTS INTERNATIONAL	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	10.02584%	
100 Mesh Sand	FTS INTERNATIONAL	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	4.27413%	
10.1 - 15 HCL	FTS INTERNATIONAL	Acid	Hydrochloric Acid	007647-01-0	15.00%	0.11132%	
FRW-200	FTS INTERNATIONAL	Friction Reducer	Petroleum Distillate Hydro-treated Light	064742-47-8	26.00%	0.01827%	
FE-100L	FTS INTERNATIONAL	Iron Control Agent	Citric Acid	000077-92-9	55.00%	0.00669%	
HVG01 (TURQUOISE-1 BULK)	FTS INTERNATIONAL	Gelling Agent	Crystalline Silica (Quartz Sand, Silicon Dioxide) Guar Gum	014808-60-7 009000-30-0	2.00% 50.00%	0.00015% 0.00387%	

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MORGANTOWN, WV

CI-150	FTS INTERNATIONAL	Corrosion Inhibitor	Petroleum Distillate Hydrotreated Light	064742-47-8	55.00%	0.00425%
			Surfactant	068439-51-0	2.00%	0.00015%
			Dimethyl Formamide	000068-12-2	10.00%	0.00013%
			Isopropanol (Isopropyl Alcohol, Propan-2-ol)	000067-63-0	60.00%	0.00075%
			Proprietary Aromatic Aldehyde	TRADE SECRET	10.00%	0.00013%
			Proprietary Organic Amine Resin Salt	TRADE SECRET	30.00%	0.00038%
			Proprietary Quaternary Ammonium Compound	TRADE SECRET	10.00%	0.00013%
			Ammonium Persulfate	007727-54-0	100.00%	0.00011%
			Methanol (Methyl Alcohol)	000067-56-1	100.00%	0.00934%
			Sodium Hydroxide	001310-73-2	100.00%	0.00934%
B84	X CHEM	Anti-Bacterial Agent	Sodium Polyacrylate	009003-04-7	100.00%	0.00934%
			Didecyl Dimethyl Ammonium Chloride	007173-51-5	8.00%	0.00299%
			Ethanol	000064-17-5	4.00%	0.00149%
			Glutaraldehyde (Pentanediool)	000111-30-8	27.00%	0.01009%
			Quaternary Ammonium Compound	068424-85-1	6.00%	0.00205%
			Scale Inhibitor			
			Breaker			
			Breaker			

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MORGANTOWN, WV

Additional Ingredients Not Listed on MSDS						
APB01 (AMMONIUM PERSUFATE BREAKER), CI-150, FE-100L, FRW-200	FTS INTERNATIONAL	Breaker, Corrosion Inhibitor, Friction Reducer, Iron Control Agent	Proprietary Breaker (APB01) Additive	TRADE SECRET	0.00001%	
			Proprietary Corrosion Inhibitor Additive (CI-150)	TRADE SECRET	0.00066%	
			Proprietary Friction Reducer Additive (FRW-200 and FRW-200W)	TRADE SECRET	0.06755%	
			Water	007732-18-5	0.01419%	
			Water	007732-18-5	0.05450%	
B84, SC30W	X CHEM	Anti-Bacterial Agent, Scale Inhibitor	Water	007732-18-5		

* 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.