

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

DATE: 12-12-2013  
API #: 47-009-00107

Farm name: Thomas Parkinson BRK 3H Operator Well No.: 833623

LOCATION: Elevation: 1,160' Quadrangle: Bethany

District: Buffalo County: Brooke  
Latitude: 6,270' Feet South of 40 Deg. 15 Min. 00 Sec.  
Longitude 13,540' 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"	118'	118'	224 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	380'	380'	426 Cu. Ft.
Inspector: Bill Hendershot / Derek Haught	9 5/8"	1,775'	1,775'	797 Cu. Ft.
Date Permit Issued: 9-7-2011	5 1/2"	12,026'	12,026'	2,840 Cu. Ft.
Date Well Work Commenced: 2-19-2013				
Date Well Work Completed: 8-8-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 6,006'				
Total Measured Depth (ft): 12,033'				
Fresh Water Depth (ft.): 64', 300'				
Salt Water Depth (ft.): 1,132'				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): 318'				
Void(s) encountered (N/Y) Depth(s) Y 318'				

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

Producing formation Marcellus Pay zone depth (ft) 6,190-11,841  
Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d  
Final open flow 3,170\* MCF/d Final open flow 320 Bbl/d  
Time of open flow between initial and final tests 24 Hours  
Static rock Pressure 3,904\* psig (surface pressure) after 24 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.

Markus Weiler  
Signature

12-12-13  
Date

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PERFORATION RECORD ATTACHMENT

Well Number and Name: 833623 Thomas Parkinson BRK 3H

PERFORATION RECORD			STIMULATION RECORD							
Date	Interval Perforated		Date	Interval Treated		Fluid		Propping Agent		Average Injection
	From	To		Type	Amount	Type	Amount			
7/1/2013	11,501	11,841	7/1/2013	11,501	11,841	Sik wtr	9,708	Sand	599,840	80
7/1/2013	11,093	11,442	7/1/2013	11,093	11,442	Sik wtr	9,863	Sand	596,520	72
7/1/2013	10,684	11,030	7/1/2013	10,684	11,030	Sik wtr	9,744	Sand	598,640	79
7/1/2013	10,276	10,625	7/1/2013	10,276	10,625	Sik wtr	10,054	Sand	600,920	76
7/2/2013	9,867	10,217	7/2/2013	9,867	10,217	Sik wtr	9,735	Sand	606,540	80
7/2/2013	9,459	9,808	7/2/2013	9,459	9,808	Sik wtr	9,654	Sand	594,680	80
7/2/2013	9,050	9,400	7/8/2013	9,050	9,400	Sik wtr	9,806	Sand	602,700	80
7/8/2013	8,641	8,991	7/8/2013	8,641	8,991	Sik wtr	10,456	Sand	417,100	70
7/8/2013	8,233	8,582	7/8/2013	8,233	8,582	Sik wtr	9,716	Sand	596,740	80
7/8/2013	7,824	8,174	7/9/2013	7,824	8,174	Sik wtr	9,726	Sand	600,800	78
7/8/2013	7,416	7,765	7/9/2013	7,416	7,765	Sik wtr	9,597	Sand	601,448	79
7/9/2013	7,007	7,357	7/9/2013	7,007	7,357	Sik wtr	9,555	Sand	599,320	79
7/9/2013	6,599	6,948	7/9/2013	6,599	6,948	Sik wtr	9,747	Sand	603,080	79
7/9/2013	6,190	6,533	7/9/2013	6,190	6,533	Sik wtr	9,845	Sand	600,900	79.8

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

**Maximum TVD of wellbore: 6006 ft TVD @ 6267 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
LS/SILT	0	0	318	318
PITTSBURG COAL	318	318	322	322
LS/SILT	322	322	440	440
SHALE	440	440	880	880
SS/SILT/SHALE	880	880	1090	1090
SHALE	1090	1090	1150	1150
SS	1150	1150	1240	1240
SHALE/SS	1240	1240	1330	1330
BIG LIME	1330	1330	1394	1394
BIG INJUN (SS)	1394	1394	1638	1638
SHALE	1638	1638	5810	5787
GENESEO (SH)	5810	5787	5826	5800
TULLY (LS)	5826	5800	5894	5856
HAMILTON (SH)	5894	5856	6059	5960
MARCELLUS (SH)	6059	5960		
TD OF LATERAL			12033	5934

09/19/2014

## Hydraulic Fracturing Fluid Product Component Information Disclosure

9-00107	Fracture Date:	7/1/2013
	State:	WEST VIRGINIA
	County:	BROOKE
	API Number:	4700900107
	Operator Name:	CHESAPEAKE APPALACHIA LLC
	Well Name and Number:	THOMAS PARKINSON BRK 3H
	Longitude:	-80.564297
	Latitude:	40.212767
	Long/Lat Projection:	NAD27
	Production Type:	GAS
True Vertical Depth (TVD):	6,007	
Total Water Volume (gal)*:	5,872,608	

### 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%	75.98760%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	9.27127%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol	000064-17-5	5.00%	0.00137%	
			Glutaraldehyde (Pentanediol)	000111-30-8	60.00%	0.01640%	
			Quaternary Ammonium Compounds	N/A	10.00%	0.00273%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components	NONE		0.00000%	
A264, L058, J218, J580, J609, Acid Hydrochloric 15pct, 100 Mesh Sand, Northern White Sand	SCHLUMBERGER	Corrosion Inhibitor, Iron Control Agent, Breaker, Gelling Agent, Friction Reducer, Acid, Proppant - Natural	Crystalline silica	14808-60-7	98.59234%	13.97917%	
			Hydrogen chloride	7647-01-0	0.90013%	0.12763%	
			Guar gum	9000-30-0	0.15779%	0.02237%	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.12395%	0.01758%	
			Ammonium sulfate	7783-20-2	0.11715%	0.01661%	

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Sodium sulfate	7757-82-6	0.05064%	0.00718%
Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01328%	0.00188%
Diammonium peroxodisulphate	7727-54-0	0.00952%	0.00135%
Potassium borate	1332-77-0	0.00846%	0.00120%
Urea	57-13-6	0.00816%	0.00116%
Sodium erythorbate	6381-77-7	0.00396%	0.00056%
Potassium hydroxide	1310-58-3	0.00313%	0.00044%
Methanol	67-56-1	0.00309%	0.00044%
Glycerol	56-81-5	0.00276%	0.00039%
Fatty acids, tall-oil	61790-12-3	0.00227%	0.00032%
Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00187%	0.00027%
Non-crystalline silica	7631-86-9	0.00161%	0.00023%
Alcohols, C14-15, ethoxylated (7EO)	68951-67-7	0.00087%	0.00012%
Prop-2-yn-1-ol	107-19-7	0.00058%	0.00008%
Vinylidene chloride/methylacrylate copolymer	25038-72-6	0.00045%	0.00006%
Alkenes, C>10 a-	64743-02-8	0.00039%	0.00005%
Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00026%	0.00004%
Dimethyl siloxanes and silicones	63148-62-9	0.00012%	0.00002%
Siloxanes and Silicones, di-Me, reaction products with silica	67762-90-7	0.00002%	< 0.00001%
Magnesium silicate hydrate (talc)	14807-96-6	0.00001%	< 0.00001%
Octamethylcyclotetrasiloxane	556-67-2	0.00001%	< 0.00001%
Sodium hydroxide	1310-73-2	0.00001%	< 0.00001%
Decamethyl cyclopentasiloxane	541-02-6	0.00001%	< 0.00001%
poly(tetrafluoroethylene)	9002-84-0	0.00001%	< 0.00001%
Dodecamethylcyclohexasiloxane	540-97-6	< 0.00001%	< 0.00001%

#### Additional Ingredients Not Listed on MSDS

EC6110A, EC6629A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Methanol (Methyl Alcohol)	000067-56-1	0.00615%
			Proprietary Acrylate Polymer	TRADE SECRET	0.00615%
			Proprietary Quaternary Ammonium Salt	TRADE SECRET	0.00615%
			Water	007732-18-5	0.02653%

\* 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%