

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

API 47-069-00112 County Ohio District Triadelphia  
Quad Valley Grove Pad Name Roy Ferrell OHI Field/Pool Name \_\_\_\_\_  
Farm name Roy Ferrell OHI 5H Well Number 834914  
Operator (as registered with the OOG) Chesapeake Appalachia, L.L.C.  
Address P.O. Box 18496 City Oklahoma City State OK Zip 73154-0496

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4432667.74 Easting 540017.64  
Landing Point of Curve Northing 4432928.83 Easting 540197.76  
Bottom Hole Northing 4435320.92 Easting 539219.11

Elevation (ft) 1,196' 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)  
SOBM

Date permit issued 3-16-2012 Date drilling commenced 8-24-2013 Date drilling ceased 12-5-2013  
Date completion activities began 4/1/2014 Date completion activities ceased 4/20/2014  
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 326' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 800' Void(s) encountered (Y/N) depths Y 643'  
Coal depth(s) ft 643' Cavern(s) encountered (Y/N) depths N

**APPROVED**

NAME: Eric Blend  
DATE: 9-23-16

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Reviewed by: ES  
**10/28/2016**

API 47-069 - 00112 Farm name Roy Ferrell OHI 5H Well number 834914

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	118'	New	J-55 / 94#		Y
Surface	17 1/2"	13 3/8"	740'	New	J-55 / 54.5#	614', 594'	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	2,205'	New	J-55 / 40#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" / 8 1/2"	5 1/2"	15,785'	New	P-110 / 20#		Y
Tubing		2 3/8"	7,373'	New	N-80 / 4.7		
Packer type and depth set		10K Arrowset AS1-X 5 1/2" , 6,197'					

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	A	180	15.60	1.20	216	Surface	8
Surface	A	514	15.60	1.20	616.8	Surface	8
Coal							
Intermediate 1	A	741	15.60	1.24	918.84	Surface	8
Intermediate 2							
Intermediate 3							
Production	A	845 / 2,180	15.80	1.36 / 1.23	3,830.6	739'	8
Tubing							

Drillers TD (ft) 15,847' Loggers TD (ft) 15,847'

Deepest formation penetrated Marcellus Plug back to (ft) \_\_\_\_\_

Plug back procedure \_\_\_\_\_

Kick off depth (ft) 6,321'

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 \_\_\_\_\_

Surface / Coal - Run centralizers in the middle and top of the first joint, top of the third joint and every 4th joint to surface.

Production - Run 1st centralizer 3' from Shoe, 2nd at top of the first joint and then one every 3rd joint to TOC.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

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API 47- 069 - 00112 Farm name Roy Ferrell OHI 5H Well number 834914

PRODUCING FORMATION(S)                      DEPTHS  
Marcellus                                      6,639'                      TVD                      15847 MD

Please insert additional pages as applicable.

GAS TEST     Build up     Drawdown     Open Flow                      OIL TEST     Flow     Pump

SHUT-IN PRESSURE    Surface 1,300                      psi                      Bottom Hole 4,292                      psi                      DURATION OF TEST 144                      hrs

OPEN FLOW                      Gas                      Oil                      NGL                      Water                      GAS MEASURED BY  
2,532                      mcfpd                      109                      bpd                      \_\_\_\_\_                      bpd                      313                      bpd                       Estimated     Orifice     Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	0		0		
Ls/Sltst/Ss	200	560	200	560	
Ss/Ls/Coal	560	590	560	590	
Ls/Sltst/Ss	590	662	590	662	
Pittsburgh Coal	662	680	662	680	
Ls/Ss/Sltst	680	710	680	710	
Shale/Sltst	710	1775	710	1775	
Big Injun	1775	2069	1775	2069	
Shale	2069	6822	2069	6800	
Geneseo	6480	6496	6822	6861	gas 1100u
Tully	6496	6522	6861	6925	gas 800u
Hamilton	6522	6639	6925	7284	gas 1900u
Marcellus	6639	6646	7284	7790	gas 1980u
TD		6558			

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Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling  
Address 171 Locust Ave Extension                      City Mt. Morris                      State PA                      Zip 15349

Logging Company Nomac Drilling  
Address 171 Locust Ave Extension                      City Mt. Morris                      State PA                      Zip 15349

Cementing Company Schlumberger  
Address 1080 U.S. 33                      City Weston                      State WV                      Zip 26452

Stimulating Company Weatherford, Artificial Lift Systems  
Address 286 Weatherford BLVD                      City Buckhannon                      State WV                      Zip 26201

Please insert additional pages as applicable.

Completed by Jessica Greathouse                      Telephone (304) 353-5240  
Signature [Signature]                      Title Manager - Regulatory Operations                      Date 6/14/2016

# PERFORATION RECORD ATTACHMENT

API No. 47-069-00112

Well Name and Number: Roy Ferrell OHI 5H

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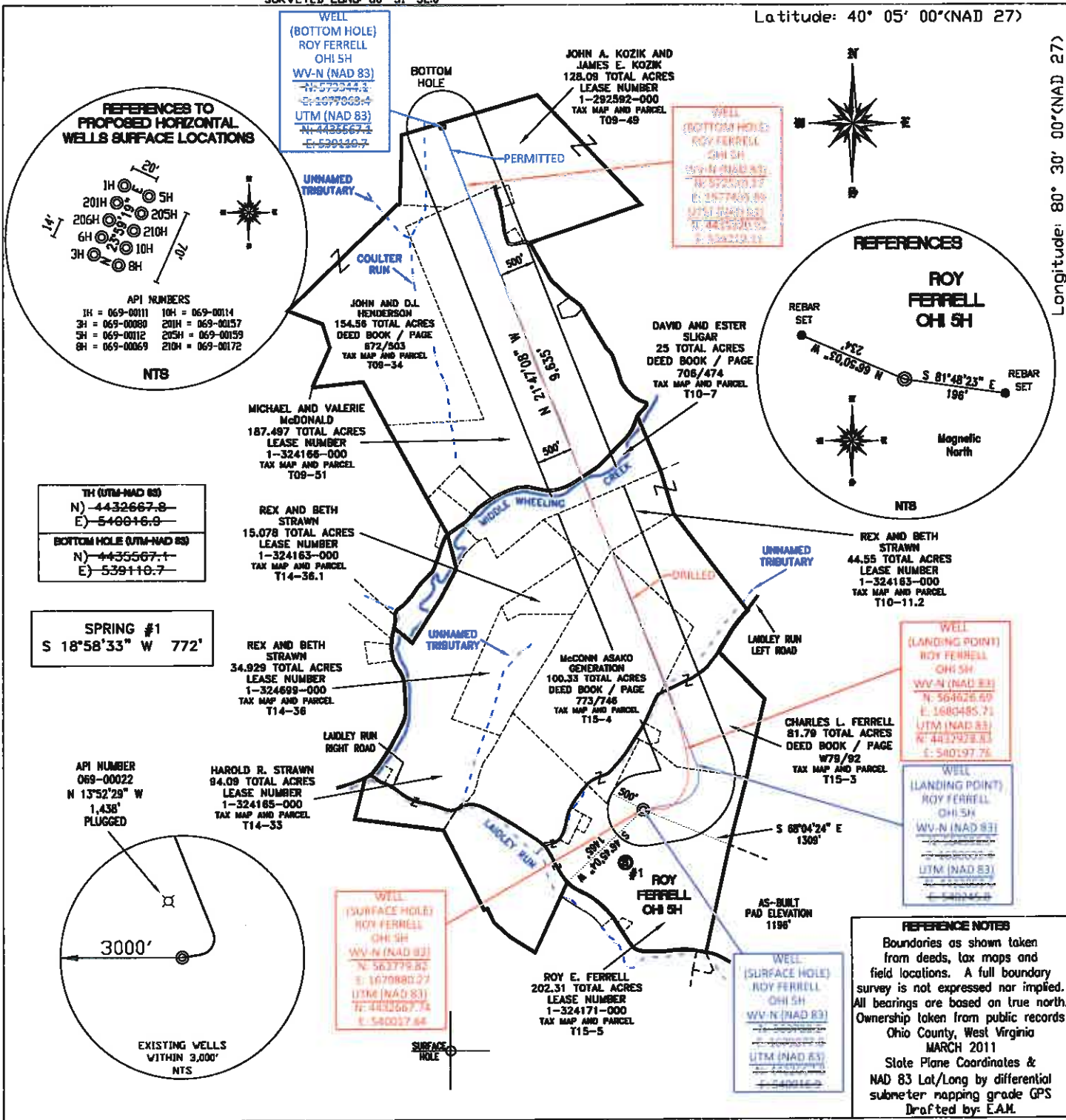
PERFORATION RECORD		STIMULATION RECORD										
Stage	Date	Interval Perforated		Total Number Of Shots	Date	Interval Treated		Fluid		Propping Agent		Average Injection Rate
		From	To			Type	Amount	Type	Amount	Type	Amount	
1	4/1/2014	15426	15628	35	4/1/2014	15426	15628	SLK Wtr	1652	Sand	353480	76
2	4/2/2014	15174	15376	35	4/2/2014	15174	15376	SLK Wtr	6744	Sand	318400	79
3	4/2/2014	14923	15125	35	4/2/2014	14923	15125	SLK Wtr	5139	Sand	353140	90
4	4/2/2014	14672	14874	35	4/2/2014	14672	14874	SLK Wtr	5135	Sand	352920	89.4
5	4/2/2014	14421	14623	35	4/2/2014	14421	14623	SLK Wtr	5225	Sand	353860	81.9
6	4/3/2014	14170	14372	35	4/3/2014	14170	14372	SLK Wtr	5618	Sand	352500	90
7	4/3/2014	13919	14121	35	4/3/2014	13919	14121	SLK Wtr	8286	Sand	353200	90
8	4/6/2014	13660	13870	35	4/6/2014	13660	13870	SLK Wtr	7324	Sand	353960	72
9	4/6/2014	13417	13619	35	4/6/2014	13417	13619	SLK Wtr	0	Sand	0	0
10	4/7/2014	13166	13368	35	4/7/2014	13166	13368	SLK Wtr	6110	Sand	354780	84.6
11	4/7/2014	12915	13117	35	4/7/2014	12915	13117	SLK Wtr	7461	Sand	353440	84.7
12	4/7/2014	12664	12866	35	4/7/2014	12664	12866	SLK Wtr	6391	Sand	353900	84.9
13	4/8/2014	12413	12615	35	4/8/2014	12413	12615	SLK Wtr	5092	Sand	353120	82
14	4/8/2014	12162	12364	35	4/8/2014	12162	12364	SLK Wtr	5603	Sand	351600	85
15	4/8/2014	11911	12113	35	4/8/2014	11911	12113	SLK Wtr	5601	Sand	354640	85
16	4/8/2014	11660	11862	35	4/8/2014	11660	11862	SLK Wtr	5873	Sand	352500	84.9
17	4/8/2014	11409	11611	35	4/8/2014	11409	11611	SLK Wtr	6138	Sand	363001	82.9
18	4/8/2014	11158	11360	35	4/8/2014	11158	11360	SLK Wtr	6075	Sand	353670	85
19	4/17/2014	10907	11109	35	4/17/2014	10907	11109	SLK Wtr	6748	Sand	354020	82
20	4/17/2014	10656	10858	35	4/17/2014	10656	10858	SLK Wtr	5606	Sand	354040	83.5
21	4/18/2014	10405	10607	35	4/18/2014	10405	10607	SLK Wtr	5974	Sand	353960	85
22	4/18/2014	10154	10356	35	4/18/2014	10154	10356	SLK Wtr	6571	Sand	353760	85
23	4/18/2014	9903	10105	35	4/18/2014	9903	10105	SLK Wtr	5613	Sand	353960	85.1
24	4/19/2014	9652	9854	35	4/19/2014	9652	9854	SLK Wtr	5605	Sand	354220	85
25	4/19/2014	9401	9603	35	4/19/2014	9401	9603	SLK Wtr	6257	Sand	353740	85
26	4/19/2014	9150	9352	35	4/19/2014	9150	9352	SLK Wtr	5589	Sand	353880	84
27	4/19/2014	8899	9101	35	4/19/2014	8899	9101	SLK Wtr	5609	Sand	353500	85.1
28	4/19/2014	8648	8850	35	4/19/2014	8648	8850	SLK Wtr	5608	Sand	354160	85
29	4/19/2014	8397	8599	35	4/19/2014	8397	8599	SLK Wtr	5611	Sand	354160	84.6

10/28/2016





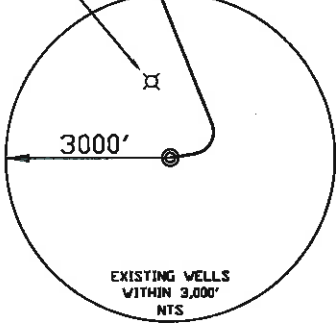




TH (UTM-NAD 83)  
N) -4432667.8  
E) -540016.9  
BOTTOM HOLE (UTM-NAD 83)  
N) -4435567.1  
E) -539110.7

SPRING #1  
S 18°58'33" W 772'

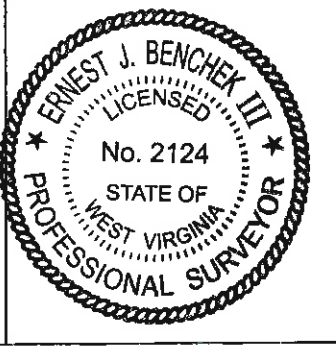
API NUMBER  
069-00022  
N 13°52'29" W  
1,438'  
PLUGGED



**REFERENCE NOTES**  
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Ohio County, West Virginia MARCH 2011  
State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS  
Drafted by: E.A.M.

FILE #: CHE 034  
DRAWING #: 1854  
PLAT = 1" - 2000'  
SCALE: TICK MARK = 1" - 2000'  
MINIMUM DEGREE OF ACCURACY: 1/200  
PROVEN SOURCE SUBMETER MAPPING OF ELEVATION: GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.  
Signed: *[Signature]*  
L.L.S. #2124 : Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25304  
Well Type:  Oil  Waste Diposal  Production  Deep  Gas  Liquid Injection  Storage  Shallow  
WATERSHED: WHEELING CREEK  
COUNTY/DISTRICT: OHIO/TRIADELPHIA  
SURFACE OWNER: ROY E. FERRELL  
OIL & GAS ROYALTY OWNER: ROY E. FERRELL  
LEASE NUMBERS: \_\_\_\_\_  
DATE: MAY 10, 2016  
OPERATOR'S WELL #: ROY FERRELL OHI 5H AS-DRILLED  
API WELL #: 47 69 00112  
STATE COUNTY PERMIT  
AS-BUILT  
ELEVATION : 1196.0'  
QUADRANGLE: VALLEY GROVE WV.  
ACREAGE: 202.31 +/-  
ACREAGE: 719.704 +/- **10/28/2016**  
DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
PLUG OFF FORMATION  PERFORATE NEW FORMATION  PLUG & ABANDON   
CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY): \_\_\_\_\_  
TARGET FORMATION: MARCELLUS  
AS-DRILLED DEPTH: TVD: 6,558.49' TMD: 15.847'  
WELL OPERATOR : CHESAPEAKE APPALACHIA, LLC.  
DESIGNATED AGENT : JESSICA GREATHOUSE  
ADDRESS: PO BOX 18496  
ADDRESS: Po Box 6070  
CITY: OKLAHOMA CITY STATE: OK ZIP CODE: 73154-0496  
CITY: CHARLESTON STATE: WV ZIP CODE: 25301

SURFACE HOLE DEC. LAT: 40° 05' 00" SURVEYED LAT: 40° 02' 35.6"





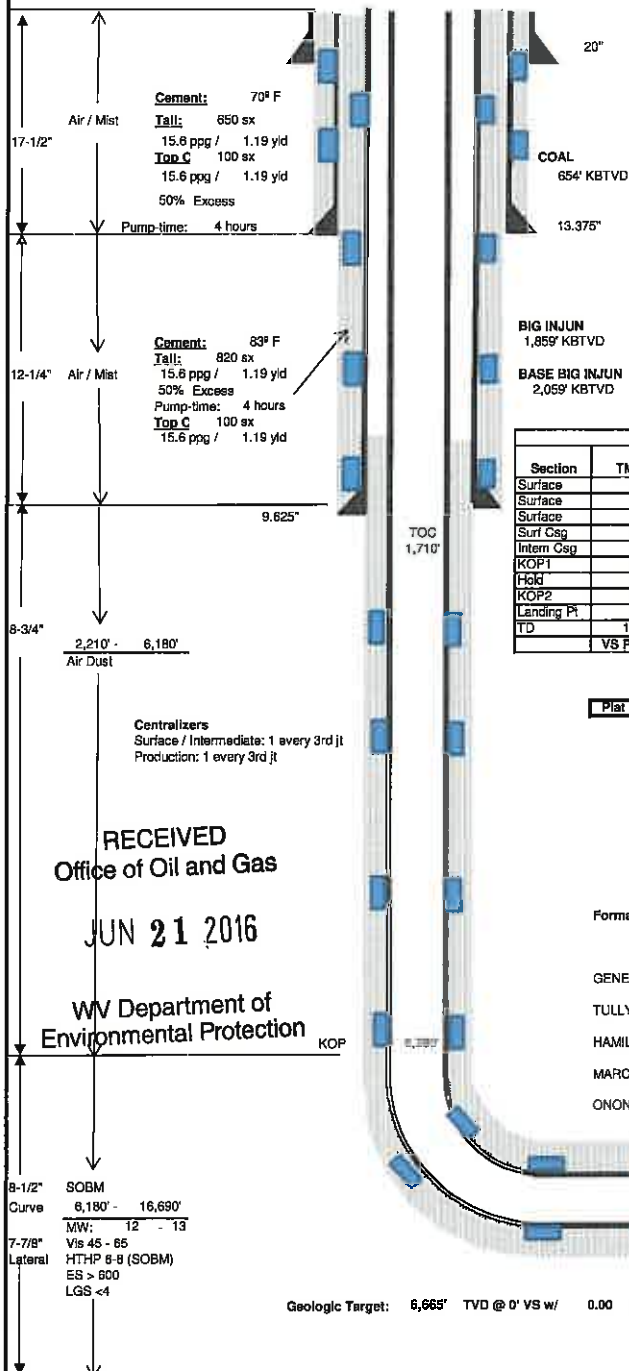
Well Name: **Roy Ferrel OHI 5H**

Drilling Engineer: Lacey Sharp  
 Superintendent: N/A  
 Asset Manager: N/A  
 Geologist: N/A  
 Land: N/A

Formation: Marcellus  
 County, State: Ohio, WV  
 Surface Latitude: 40.246384  
 BH Latitude: 40.236131  
 KB Elevation: 1230'

Surface Longitude: -80.632785  
 BH Longitude: -80.627183  
 Ground Elevation: 1210'

Drilling Rig: N/A  
 Directional Drilling: N/A  
 Drilling Mud: N/A  
 Cement Surface: N/A  
 Cement Longstrings: N/A  
 Wellhead: N/A  
 AFE #: N/A



**Gyro the 1st well on the pad at KOP.  
 Ensure all Surveys are referenced to Grid North!!**

Drawn by: Lacey Sharp  
 Date: 11/30/2011

# Hydraulic Fracturing Fluid Product Component Information Disclosure

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Environmental Protection

Fracture Date:	4/1/2014
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900112
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	ROY FERRELL OHI 5H
Longitude:	-80.531108
Latitude:	40.04322
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	6,656
Total Water Volume (gal)**:	11,068,722

## 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%	85.24173%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	2.49565%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol Glutaraldehyde (Pentanediol) Quaternary Ammonium Compounds	000064-17-5 000111-30-8 NA	5.00% 60.00% 10.00%	0.00095% 0.01142% 0.00190%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components	NONE		0.00000%	
Northern White Sand	WEATHERFORD	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	10.34674%	
100 Mesh Sand	WEATHERFORD	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	0.33731%	
ACID	WEATHERFORD	Acid	Hydrochloric Acid	007647-01-0	15.00%	0.12191%	
HYDROCHLORIC, WGR015L	WEATHERFORD	Gelling Agent	Water	007732-18-5	85.00%	0.69083%	
WPR-384L	WEATHERFORD	pH Adjusting Agent	Petroleum Distillate Hydrotreated Light	064742-47-8	70.00%	0.08216%	
WFR-65LA	WEATHERFORD	Friction Reducer	Potassium Carbonate Potassium Hydroxide Ammonium Acetate Petroleum Distillate Hydrotreated Light	000584-08-7 001310-58-3 000631-61-8 064742-47-8	60.00% 40.00% 5.00% 40.00%	0.01576% 0.01051% 0.00494% 0.03949%	

WBK-133 OXIDIZER	WEATHERFORD	Breaker	Ammonium Persulfate	007727-54-0	100.00%	0.00250%
WIC-641L	WEATHERFORD	Iron Control Agent	Citric Acid	000077-92-9	70.00%	0.00167%
WAI-251LC	WEATHERFORD	Corrosion Inhibitor	2-Butoxyethanol (Ethylene Glycol Monobutyl Ether)	000111-76-2	7.00%	0.00003%
			Branched-Ethoxylated Nonyl Phenol (Branched-Nonyl Phenol Ethoxylate)	068412-54-4	10.00%	0.00005%
			Cinnamaldehyde	000104-55-2	10.00%	0.00005%
			Dimethyl Formamide	000068-12-2	40.00%	0.00018%
			Ethylene Glycol	000107-21-1	60.00%	0.00027%
			Isopropanol (Isopropyl Alcohol, Propan-2-ol)	000067-63-0	7.00%	0.00003%
			Tar bases, quinoline derivs, benzyl chloride-gauternized	072480-70-7	13.00%	0.00006%
			Triethyl Phosphate	000078-40-0	7.00%	0.00003%

**Additional Ingredients Not Listed on MSDS**

EC6110A, EC6629A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Methanol (Methyl Alcohol)	000067-56-1		0.00605%
			Proprietary Acrylate Polymer	TRADE SECRET		0.00605%
			Proprietary Quaternary Ammonium Salt	TRADE SECRET		0.00605%
			Water	007732-18-5		0.01969%
WAI-251LC, WFR-65LA, WGA-15L, WIC-641L, WPB-584L	WEATHERFORD	Corrosion Inhibitor, Friction Reducer, Gelling Agent, Iron Control Agent, pH Adjusting Agent	Alcohols ethoxylated C12-16	068551-12-2		0.07885%
			Guar Gum	009000-30-0		0.07885%
			Potassium Carbonate	000584-08-7		0.01618%
			Proprietary Alcohol	TRADE SECRET		0.00015%
			Proprietary Ethoxylated Nonylphenol	TRADE SECRET		0.00015%
			Proprietary Friction Reducer Additive	TRADE SECRET		0.09175%
			Sorbitan	008007-43-0		0.07885%
			Water	007732-18-5		0.00160%

\* 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.

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.