

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

API 47-069-00176 County Ohio District Triadelphia
Quad Valley Grove Pad Name Roy Ferrell OHI Field/Pool Name _____
Farm name Roy Ferrell OHI 6H Well Number 838879
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 4432658.27 Easting 540007.01
Landing Point of Curve Northing 4432365.63 Easting 539693.29
Bottom Hole Northing 4430045.84 Easting 540686.56

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 9-26-2013 Date drilling commenced 10-15-2013 Date drilling ceased 10-29-2013
Date completion activities began 5/8/2014 Date completion activities ceased 5/16/2014
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 340' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 797' Void(s) encountered (Y/N) depths Y 691'
Coal depth(s) ft 691' Cavern(s) encountered (Y/N) depths N

Is coal being mined in area (Y/N) N

APPROVED

NAME: Eric Blend
DATE: 9.22.11

RECEIVED
Office of Oil and Gas

JUN 21 2016

WV Department of
Environmental Protection

Reviewed by:

10/28/2016

API 47-069 00176 Farm name Roy Ferrell OHI 6H Well number 838879

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"	738'	New	J-55 54.5#		Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	2,197'	New	J-55 40#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" / 8 1/2"	5 1/2"	15,495'	New	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	A	180	15.60	1.20	216	Surface	8
Surface	A	222 / 387	15.60	1.20	730.8	Surface	8
Coal							
Intermediate 1	A	756	15.60	1.24	937.44	Surface	8
Intermediate 2							
Intermediate 3							
Production	A	935 / 2,145	15.80	1.36 / 1.16	3759.8	220'	8
Tubing							

Drillers TD (ft) 15,495' Loggers TD (ft) _____

Deepest formation penetrated Marcellus Plug back to (ft) _____

Plug back procedure _____

Kick off depth (ft) 6,161.2

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 it 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 _____

RECEIVED
Office of Oil and Gas

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

JUN 21 2016

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

WV Department of
Environmental Protection

API 47-069-00176 Farm name Roy Ferrell OHI 6H Well number 838879

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	Attached				

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
	Attached							

RECEIVED
Office of Oil and Gas
JUN 21 2016
WV Department of Environmental Protection

Please insert additional pages as applicable.

10/28/2016

API 47- 069 - 00176 Farm name Roy Ferrell OHI 6H Well number 838879

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6,749'	TVD	15,495' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface 1,400 psi Bottom Hole 4,355 psi DURATION OF TEST 96 hrs
 OPEN FLOW Gas 2,516 mcfpd Oil 80 bpd NGL bpd Water 286 bpd GAS MEASURED BY 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 ₂ S, ETC)
See attached	0		0		

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. RECEIVED
 Office of Oil and Gas
 Completed by Jessica Greathouse Telephone 304-353-5240 JUN 21 2016
 Signature  Title Manager - Regulatory Operations Date 6/14/2016

LATERAL WELLBORE

Maximum TVD of wellbore: 6749 ft TVD @ 15495 ft MD

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SLTSTN/LS	0	0	260	260
SS/SLTSTN	260	260	380	380
LS/SLTSTN	380	380	440	440
SS/LS	440	440	500	500
SLTSTN/LS	500	500	530	530
LS/SLTSTN	530	530	560	560
SS/SLTSTN	560	560	590	590
LS/SLTSTN	590	590	620	620
NO SAMPLES	620	620	752	752
SHALE	752	752	770	770
SLTSTN/LS	770	770	800	800
SS/SLTSTN	800	800	830	830
SS	830	830	860	860
SS/SHALE	860	860	890	890
SLTSTN/SS	890	890	980	980
SHALE/SLTSTN	980	980	1010	1010
SHALE/SS	1010	1010	1040	1040
SHALE	1040	1040	1100	1100
SS/SHALE	1100	1100	1160	1160
SHALE/SLTSTN	1160	1160	1340	1340
SS/SHALE	1340	1340	1730	1730
LS/SS	1730	1730	1755	1755
BIG INJUN	1755	1755	2065	2065
SHALE/SS	2065	2065	2120	2120
SHALE	2120	2120	6669	6454
GENESEO	6669	6454	6708	6480
TULLY	6708	6480	6756	6509
HAMILTON	6756	6509	7060	6631
MARCELLUS	7060	6631	15495	6749
TD	15495	6749		0

RECEIVED
Office of Oil and Gas

JUN 21 2016

WV Department of
Environmental Protection

10/28/2016

PERFORATION RECORD ATTACHMENT

Well Name and Number: Roy Ferrell OHI 6H

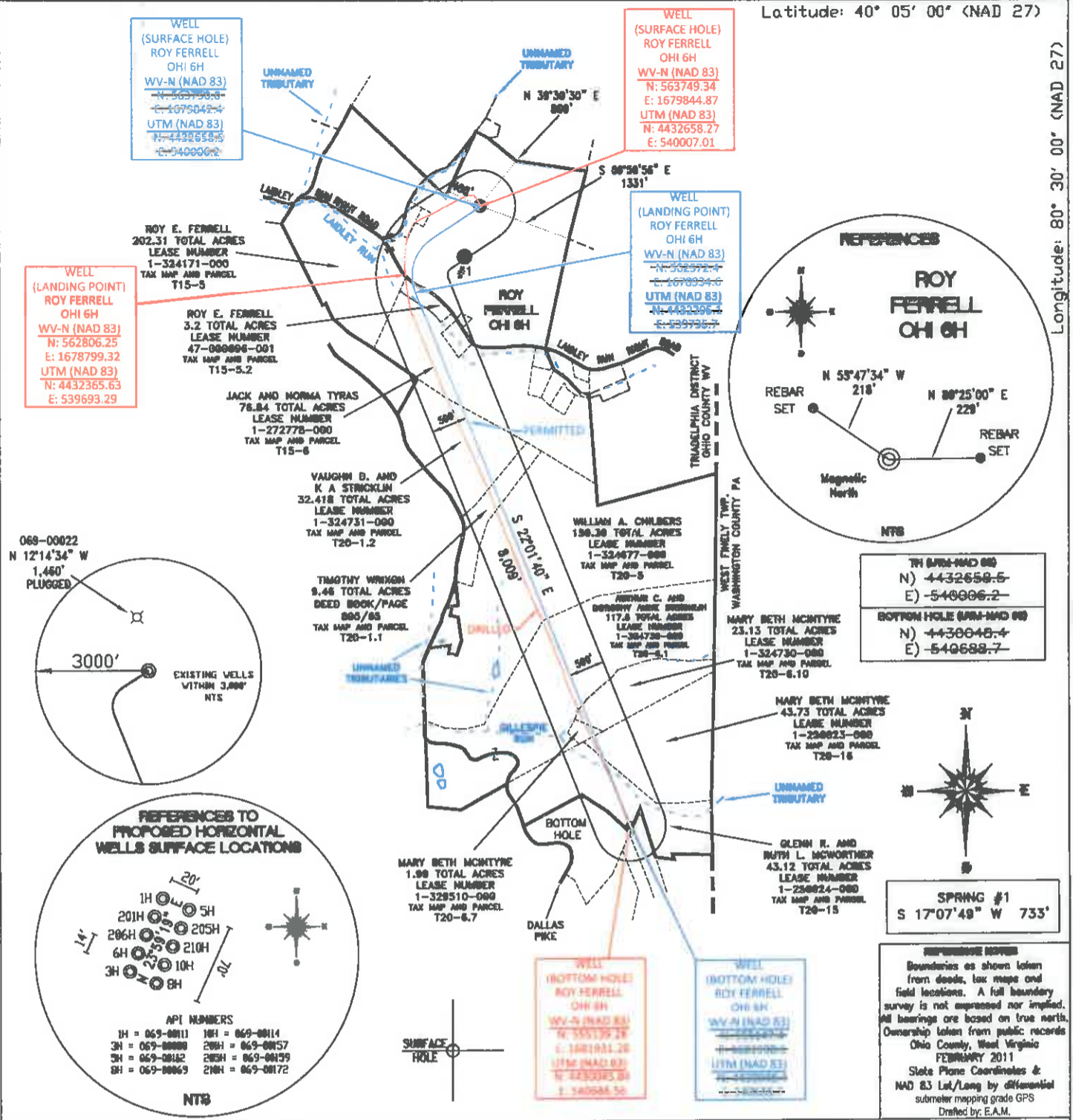
API No. 47-069-00176

RECEIVED
Office of Oil and Gas

21716

Stage	PERFORATION RECORD				STIMULATION RECORD							
	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	5/8/2014	15126	15313	35	5/8/2014	15126	15313	SLK Wtr	3631	Sand	350240	85
2	5/8/2014	14876	15077	35	5/8/2014	14876	15077	SLK Wtr	7882	Sand	350320	80
3	5/8/2014	14612	14827	35	5/8/2014	14612	14827	SLK Wtr	7900	Sand	350280	80
4	5/9/2014	14376	14569	35	5/9/2014	14376	14569	SLK Wtr	7974	Sand	350760	85
5	5/9/2014	14119	14327	35	5/9/2014	14119	14327	SLK Wtr	7870	Sand	350760	85
6	5/9/2014	13869	14077	35	5/9/2014	13869	14077	SLK Wtr	7880	Sand	350380	85
7	5/9/2014	13626	13827	35	5/9/2014	13626	13827	SLK Wtr	8615	Sand	351380	84
8	5/10/2014	13394	13581	35	5/10/2014	13394	13581	SLK Wtr	8710	Sand	350140	85
9	5/10/2014	13099	13350	41	5/10/2014	13099	13350	SLK Wtr	9619	Sand	420620	89.3
10	5/10/2014	12776	13035	42	5/10/2014	12776	13035	SLK Wtr	1692	Sand	3680	84
11	5/10/2014	12526	12727	35	5/10/2014	12526	12727	SLK Wtr	7144	Sand	607640	85
12	5/11/2014	12276	12477	35	5/11/2014	12276	12477	SLK Wtr	8066	Sand	350080	85.2
13	5/11/2014	12026	12227	35	5/11/2014	12026	12227	SLK Wtr	7900	Sand	2555360	84.7
14	5/11/2014	11726	11977	42	5/11/2014	11726	11977	SLK Wtr	9334	Sand	420940	91
15	5/11/2014	11426	11677	42	5/11/2014	11426	11677	SLK Wtr	9303	Sand	420620	90
16	5/12/2014	11126	11377	42	5/12/2014	11126	11377	SLK Wtr	9378	Sand	420980	91
17	5/12/2014	10926	11077	42	5/12/2014	10926	11077	SLK Wtr	6258	Sand	280920	73
18	5/13/2014	10726	10877	42	5/13/2014	10726	10877	SLK Wtr	6351	Sand	280900	75
19	5/14/2014	10476	10677	35	5/14/2014	10476	10677	SLK Wtr	7808	Sand	352000	80
20	5/14/2014	10181	10433	42	5/14/2014	10181	10433	SLK Wtr	9250	Sand	420920	87
21	5/14/2014	9876	10127	42	5/14/2014	9876	10127	SLK Wtr	10407	Sand	420860	86.5
22	5/14/2014	9626	9827	42	5/14/2014	9626	9827	SLK Wtr	7631	Sand	349880	80.1
23	5/14/2014	9431	9577	35	5/14/2014	9431	9577	SLK Wtr	6349	Sand	281660	65.8
24	5/15/2014	9126	9377	43	5/15/2014	9126	9377	SLK Wtr	9686	Sand	420060	80
25	5/15/2014	8826	9070	43	5/15/2014	8826	9070	SLK Wtr	8930	Sand	420440	91.5
26	5/15/2014	8626	8777	35	5/15/2014	8626	8777	SLK Wtr	6288	Sand	280360	65.3
27	5/15/2014	8376	8577	42	5/15/2014	8376	8577	SLK Wtr	7621	Sand	351100	80
28	5/16/2014	8126	8327	42	5/16/2014	8126	8327	SLK Wtr	7742	Sand	350420	85
29	5/16/2014	7876	8077	42	5/16/2014	7876	8077	SLK Wtr	7918	Sand	350180	85

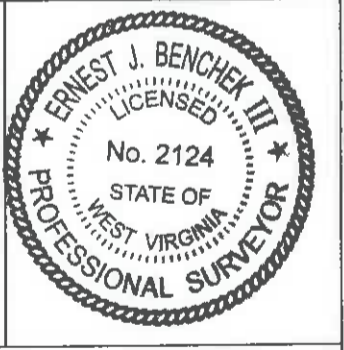
10/28/2016



FILE #: CHE 034
 DRAWING #: 1855
 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 Disposal Production Deep
 Gas Liquid Injection Storage Shallow

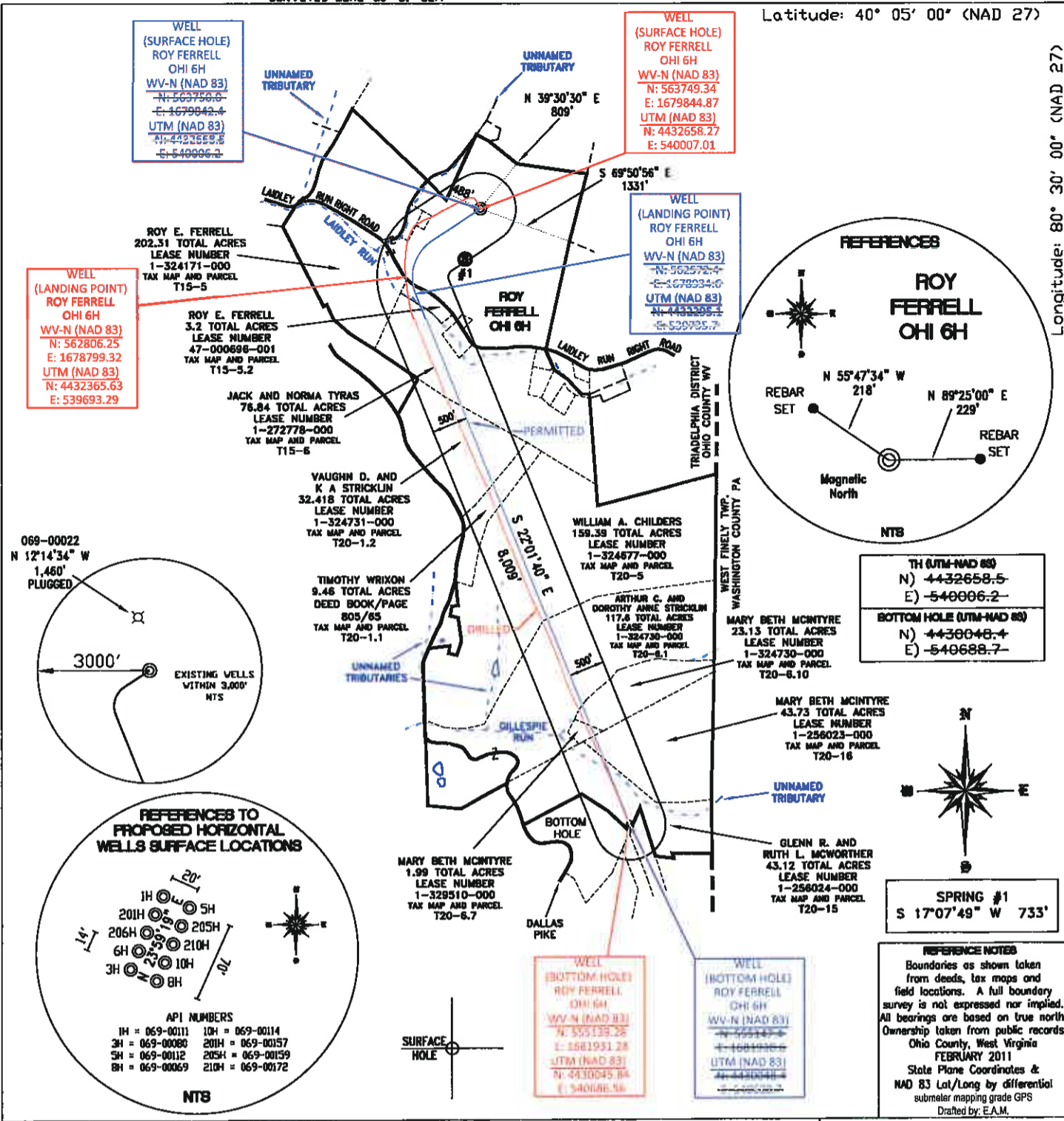
WATERSHED: WHEELING CREEK
 COUNTY/DISTRICT: OHIO/TRIADELPHIA
 SURFACE OWNER: ROY E. FERRELL
 OIL & GAS ROYALTY OWNER: ROY E. FERRELL
 LEASE NUMBERS:

DATE: MAY 10, 2016
 OPERATOR'S WELL #: ROY FERRELL OHI 6H AS-DRILLED
 API WELL #: 47 69 00176
 STATE COUNTY PERMIT
 AS-BUILT
 ELEVATION : 1196.0'

QUADRANGLE: VALLEY GROVE WV.
 ACREAGE: 202.31 +/-
 ACREAGE: 581.28 +/- **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: 6,748.552' TMD: 15,495'
 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

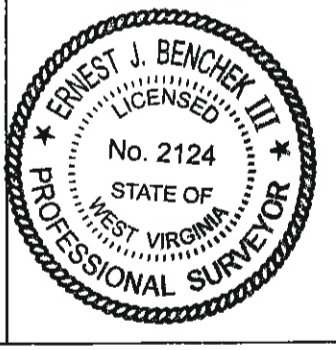
SURFACE HOLE DEC. LAT: 40° 05' 00" SURVEYED LAT: 40° 05' 00"



FILE #: CHE 034
DRAWING #: 1855
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

DATE: MAY 10, 2016
OPERATOR'S WELL #: ROY FERRELL OHI 6H AS-DRILLED
API WELL #: 47 69 00176
STATE COUNTY PERMIT
AS-BUILT
ELEVATION : 1196.0'

WATERSHED: WHEELING CREEK
COUNTY/DISTRICT: OHIO/TRIADELPHIA
SURFACE OWNER: ROY E. FERRELL
OIL & GAS ROYALTY OWNER: ROY E. FERRELL
LEASE NUMBERS: _____

QUADRANGLE: VALLEY GROVE WV.
ACREAGE: 202.31 +/-
ACREAGE: 581.28 +/- 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
WELL OPERATOR : CHESAPEAKE APPALACHIA, LLC.
ADDRESS: PO BOX 18496
CITY: OKLAHOMA CITY STATE: OK ZIP CODE: 73154-0496

AS-DRILLED DEPTH: TVD: 6,748.552' TMD: 15,495'
DESIGNATED AGENT : JESSICA GREATHOUSE
ADDRESS: Po Box 6070
CITY: CHARLESTON STATE: WV ZIP CODE: 25301



Well Name: Roy Ferrell OHI 6H

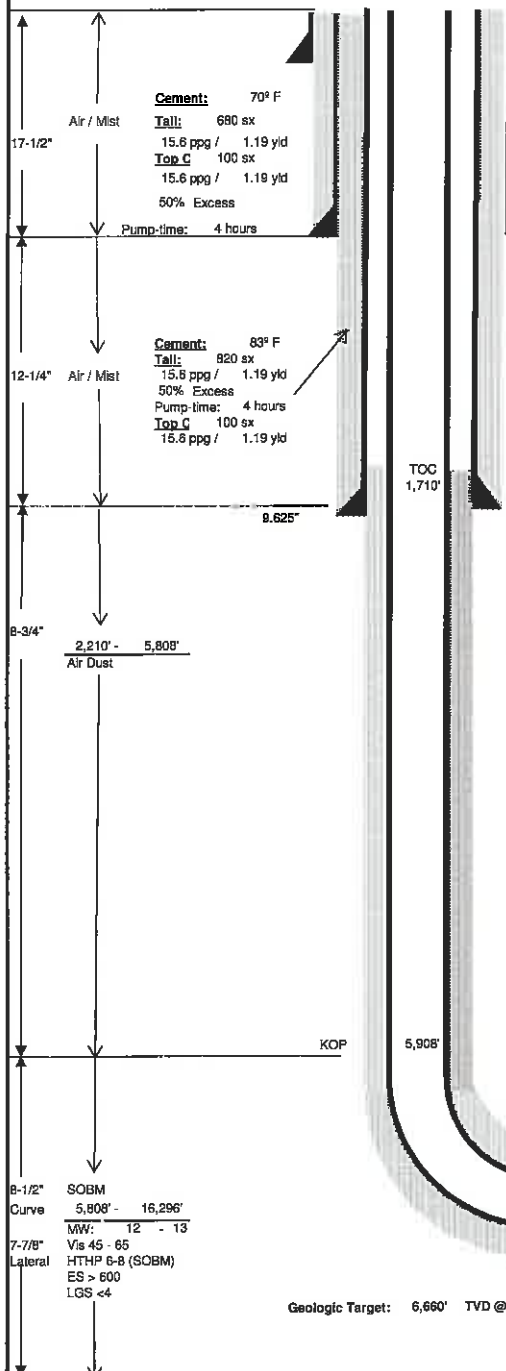
Drilling Rig: N/A

Directional Drilling: N/A

Drilling Engineer: TBD
 Superintendent: N/A
 Asset Manager: N/A
 Geologist: N/A
 Land: N/A

Formation: Marcellus
 County, State: Ohio, WV
 Surface Latitude: 40.043136
 Surface Longitude: -80.531233
 BH Latitude: 40.019587
 BH Longitude: -80.523398
 KB Elevation: 1230'
 Ground Elevation: 1210'

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



Wellhead Equipment	
Tree Description	
Tubing Head **	Blanking Cap
'B' Section	11" x 5M x 7-1/16" 10M
'A' Section	9-5/8" SOW x 11" 5M

Casing Detail					
	Size	Wt	Grd	Conn.	From: To:
Surface	13.375	54.5 #	J-55	STC	0' 741'
Interm	9.625	40 #	J-55	LTC	0' 2,210'
Prod	5.5	20 #	P-110	GBCD	0' 16,296'

Casing Design						
	Size	ID	Coil	Burst	Tens	MU torq
Surface	13.375	12.615	1130	2740	514	5140
Interm	9.625	8.835	2570	3950	520	5200
Prod	5.5	4.778	12200	12360	641	8530

20" 100' KBTVD
 Water 340' KBTVD
 COAL (VOID) 691' KBTVD
 13.375"

Directional Drilling Details								
Section	TMD	Inc.	Azimuth	TVD	BUR	DLS	+N-S	+E-W
Surface	0.00'	0.00'	0.00'	0.00'	0.00'	0.00'	0.0'	0.0'
KOP 1	800'	0.00'	0.00'	800'	0.00'	0.00'	0.0'	0.0'
Hold	1,200'	8.00'	300.00'	1,199'	2.00'	2.00'	13.9'	-24.1'
Drop	1,800'	8.00'	300.00'	1,793'	0.00'	0.00'	55.7'	-96.5'
Hold	2,200'	0.00'	0.00'	2,192'	-2.00'	2.00'	69.6'	-120.6'
KOP2	5,908'	0.00'	0.00'	5,900'	0.00'	0.00'	69.6'	-120.6'
Tangent	6,515'	72.80'	224.36'	6,356'	12.00'	12.00'	-170.7'	-355.8'
Build/Turn	7,224'	72.80'	224.36'	6,566'	0.00'	0.00'	-654.4'	-829.1'
Landing Pt	7,786'	90.00'	157.97'	6,860'	3.06'	12.00'	-1,168.2'	-922.7'
TD	16,296'	90.00'	157.97'	6,860'	0.00'	0.00'	-9,056.8'	2,268.3'
VS Plane	157.97'						VS Length 9,246.51'	
							Lateral Length ==> 8,509.70'	

Plat date 7/23/13

Logging Program		
Run	Log Type	Interval
1	TBD	TBD
2	TBD	TBD

Mudlogger operational at Surface

Formation Depths (TVD)	
BASE BIG INJUN	2,059'
GENESEO	6,454'
TULLY	6,484'
HAMILTON	6,512'
MARCELLUS	6,630'
ONONDAGA	6,690'

Cement: 122° F
 Lead: 1,140 sx
 15.6 ppg / 1.20 yld
 Tall: 1,710 sx
 15.6 ppg / 1.20 yld
 15% Excess
 Pump-time: 8 hours

Geologic Target: 6,660' TVD @ 0° VS w/ 0.00 degrees/100 ft Up-dip

PBHL: 5.5'
 TMD: 16,296'
 TVD: 6,660'
 Inclination: 90.00 deg

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

Drawn by: TBD
 Date: 7/26/2013

RECEIVED Office of Oil and Gas

JUN 21 2016 10/28/2016

WV Department of Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	5/8/2014
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900176
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	ROY FERRELL OHI 6H
Longitude:	-80 531233
Latitude:	40 043136
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	6,749
Total Water Volume (gal)**:	11,466,462

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%	80.27276%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	6.11491%	
EC6734A	NALCO	Anti-Bacterial Agent	Acetic acid Hydrogen Peroxide Peracetic Acid	000064-19-7 007722-84-1 000079-21-0	60.00% 30.00% 30.00%	0.01382% 0.00691% 0.00691%	
EC6486A	NALCO	Scale Inhibitor	Ethylene Glycol Proprietary Amine Triphosphate	000107-21-1 TRADE_SECRET	30.00% 30.00%	0.00158% 0.00158%	
Northern White Sand	WEATHERFORD	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	9.22458%	
100 Mesh Sand	WEATHERFORD	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	2.98286%	
ACID	WEATHERFORD	Acid	Hydrochloric Acid	007647-01-0	15.00%	0.11557%	
HYDROCHLORIC, WGA015L	WEATHERFORD	Gelling Agent	Petroleum Distillate Hydrotreated Light	007732-18-5 064742-47-8	85.00% 70.00%	0.65490% 0.01389%	
WPS-84L	WEATHERFORD	pH Adjusting Agent	Potassium Carbonate	000584-08-7	60.00%	0.01353%	
WFR-65LA	WEATHERFORD	Friction Reducer	Potassium Hydroxide Ammonium Acetate Petroleum Distillate Hydrotreated Light	001310-58-3 000631-61-8 064742-47-8	40.00% 5.00% 40.00%	0.00902% 0.00467% 0.03735%	

WIC-641L	WEATHERFORD	Iron Control Agent	Citric Acid	000077-92-9	70.00%	0.00132%
WBK-134	WEATHERFORD	Breaker	Ammonium Persulfate	007727-54-0	80.00%	0.00015%
WBK-133 OXIDIZER	WEATHERFORD	Breaker	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	10.00%	0.00002%
WAI-251LC	WEATHERFORD	Corrosion Inhibitor	Ammonium Persulfate	007727-54-0	100.00%	0.00012%
			2-Butoxyethanol (Ethylene Glycol Monobutyl Ether)	000111-76-2	7.00%	0.000006%
			Branched-Ethoxylated Nonyl Phenol (Branched-Nonyl Phenol Ethoxylate)	068412-54-4	10.00%	0.000009%
			Cinnamaldehyde	000104-55-2	10.00%	0.000009%
			Dimethyl Formamide	000068-12-2	40.00%	0.00035%
			Ethylene Glycol	000107-21-1	60.00%	0.00052%
			Isopropanol (Isopropyl Alcohol, Propan-2-ol)	000067-63-0	7.00%	0.000006%
			Tar bases, quinoline derivs, benzyl chloride-gauternized	072480-70-7	13.00%	0.00011%
			Triethyl Phosphate	000078-40-0	7.00%	0.00006%
			Potassium Hydroxide	001310-58-3	13.00%	0.00005%
WXL-106L	WEATHERFORD	Cross Linker	Potassium Tetraborate	001332-77-0	40.00%	0.00017%

Additional Ingredients Not Listed on MSDS

EC6486A, EC6734A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Diethylene Glycol Proprietary Organic Acid Derivatives	000111-46-6 TRADE SECRET		0.00006% 0.00179%
WAI-251LC, WBK- 134, WFR-65LA, WGA-15L, WIC- 641L, WPB-584L, WXL-106L	WEATHERFORD	Breaker, Corrosion Inhibitor, Cross Linker, Friction Reducer, Gelling Agent, Iron Control Agent, pH Adjusting Agent	Proprietary Phosphonic Acid Ester Water Alcohols ethoxylated C12-16 Guar Gum Potassium Carbonate Proprietary Alcohol Proprietary Breaker Additive (WBK- 134) Proprietary Ethoxylated Nonylphenol Proprietary Friction Reducer Additive Sorbitan Water	TRADE SECRET TRADE SECRET 007732-18-5 068551-12-2 009000-30-0 000584-08-7 TRADE SECRET TRADE SECRET TRADE SECRET TRADE SECRET TRADE SECRET 008007-43-0 007732-18-5		0.00026% 0.01933% 0.01356% 0.01356% 0.01412% 0.00029% 0.00008% 0.00029% 0.08828% 0.01356% 0.00167%

10/28/2016

* 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(f) and Appendix D.

RECEIVED
Office of Oil and Gas

JUN 21 2016

WV Department of
Environmental Protection

10/28/2016