west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

February 21, 2014

CHESAPEAKE APPALACHIA, L.L.C.
POST OFFICE BOX 6070
CHARLESTON, WV 25362

Re: Permit Modification Approval for API Number 6900159 , Well #: ROY FERRELL OHI 205H
Modified casing

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

Ashley [signature]
for

Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas

MOD

069 00159

Chesapeake ENERGY

Danielle Southall
Regulatory Analyst II

November 15, 2013

Ms. Laura Cooper
Office of Oil & Gas
601 57th Street
Charleston, WV 25304

Re: Modification for Roy Ferrell OHI 205H API# 47-069-00159

Dear Ms. Cooper:

Enclosed please find a modification request for the above captioned well. We would like to modify the 5 ½" casing, for directional work only. The bottom hole will not move. This well is situated on the Ferrell property, in Triadelphia District, Ohio County, West Virginia.

If you have any questions or require additional information, please contact me at 304-517-1416 ext 86024.

Sincerely,

Dee Southall

Enclosure(s)

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Office of Oil and Gas

NOV 18 2013

WV Department of
Environmental Protection

Chesapeake Energy Corporation
P.O. Box 1300 • 179 Chesapeake Drive • Jane Lew, WV 26378
304-517-1416 x86024 • fax 304-471-2497 • danielle.southall@chk.com

MOD

WW - 6B
(1/12)

069 00159

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Chesapeake Appalachia, LLC

Operator ID	County	District	Quadrangle
494477557	69- Ohio	7- Triadelphia	648- Valley Grove

2) Operator's Well Number: Roy Ferrell OHI 205H Well Pad Name: Roy Ferrell OHI Pad

3 Elevation, current ground: 1196' Elevation, proposed post-construction: 1196'

4) Well Type: (a) Gas ■ Oil _____
Other _____
(b) If Gas: Shallow _____ Deep _____
Horizontal ■

MJK 11/14/2013

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target formation-Marcellus, Target top TVD- 6630', Target base TVD- 6690', Anticipated thickness- 60', Associated Pressure -4177

7) Proposed Total Vertical Depth: 6,660'
8) Formation at Total Vertical Depth: Marcellus
9) Proposed Total Measured Depth: 17,100'
10) Approximate Fresh Water Strata Depths: 340'
11) Method to Determine Fresh Water Depth: from a water well~4000' WNW of the pad
12) Approximate Saltwater Depths: 800'
13) Approximate Coal Seam Depths: 691'
14) Approximate Depth to Possible Void (coal mine, karst, other): 691' void abandoned mine
15) Does land contain coal seams tributary or adjacent to, active mine? No.
16) Describe proposed well work:
Drill and stimulate any potential zones between and including the Benson to the Marcellus. **If we should encounter a void, place basket above and below void area - balance cement to bottom of void and grout from basket to surface. Run casing not less than 20' below void nor more than 50' below void.
(*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts)

17) Describe fracturing/stimulating methods in detail:
Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface.
The well is produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 11

19) Area to be disturbed for well pad only, less access road (acres): 7

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WW - 6B
(1/12)

069 00159 MOD

20) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	J-55	94#	100'	100'	CTS
Fresh Water	13 3/8"	New	J-55	54.5#	740'	740'	690 SX/CTS
Coal	9 5/8"	New	J-55	40#	2210'	2210'	860 SX/CTS
Intermediate	7"	New	P-110	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	P-110	20#	16,500'	17,100'	Lead 988 sx Tail 2442 sx/100' inside Intermediate
Tubing	2 3/8"	New	N-80	4.7#	Approx. 7,329'	Approx. 7,329'	
Liners							

MAK 11/14/2013

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	30"	0.25"	2120	15.6 ppg	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	15.6 ppg	1.19/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	15.6 ppg	1.19/50% Excess
Intermediate	7"	8 3/4"	.0317	4360	15.6 ppg	1.19/50% Excess
Production	5 1/2"	8 3/4"	0.361	12360	15.6 ppg	1.20/15% Excess
Tubing	2 3/8"	4.778"	0.190			
Liners						

PACKERS

Kind:	10K Arrowset AS1-X			
Sizes:	5 1/2"			
Depths Set:	Approx. 6,197'			

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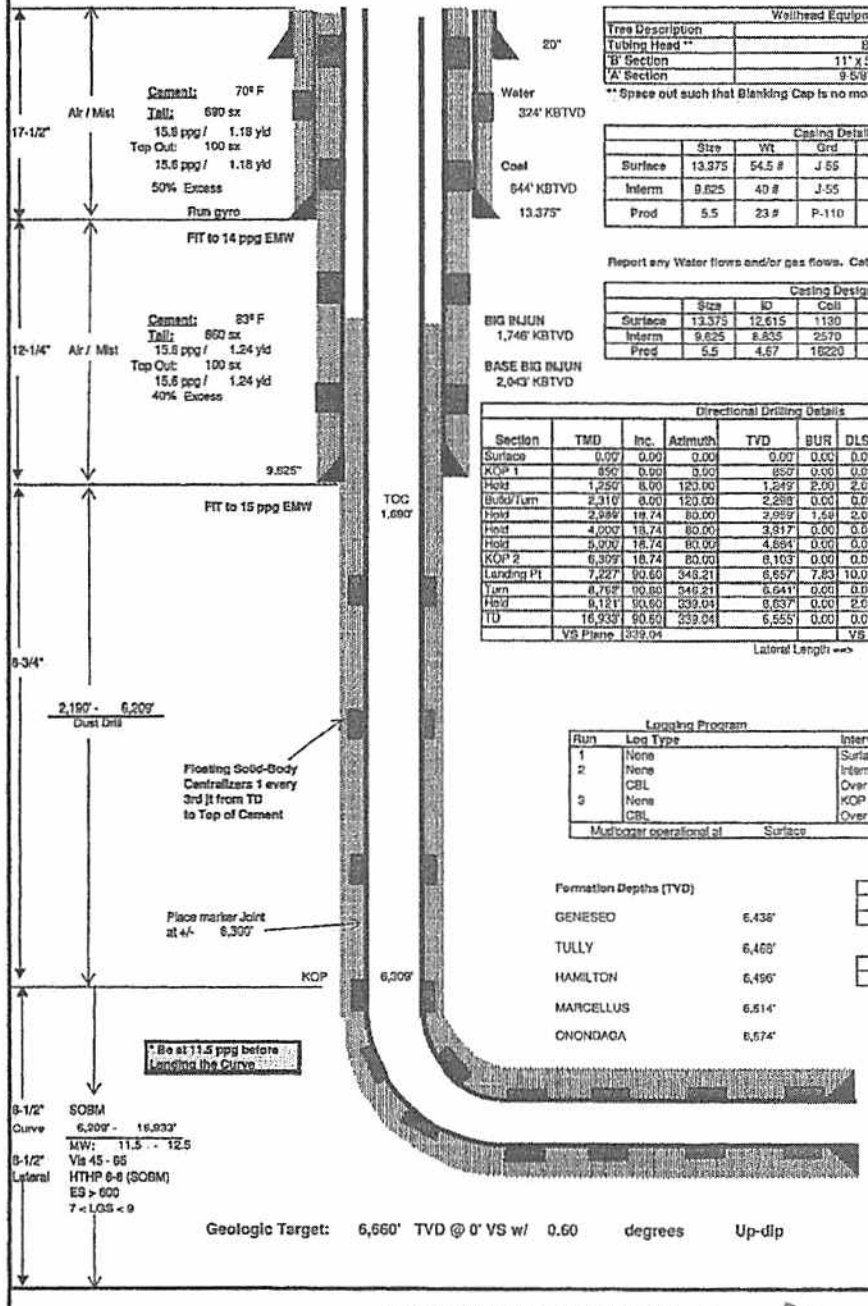
069 00159

MOD

Chesapeake Energy

Well Name:	Roy Ferrell OHI 205H			Drilling Rig:	Nomac 37
				Directional Drilling:	Cathedral
Drilling Engineer:	Chase Dwiggins	Formation:	Marcellus	Drilling Mud:	MI Swaco
Superintendent:	R. Harless / J. Melville	County, State:	Ohio, WV	Cement Surface:	Schlumberger
Asset Manager:	Garrett Smith	Surface Latitude:	40.043165	Surface Longitude: -80.531128	Cement Longstrings: Schlumberger
Geologist:	Milton Smith	BH Latitude:	40.070098	BH Longitude: -80.53823	Wellhead: PVS
Land:	Bryan Lohoff	KB Elevation:	1214'	Ground Elevation: 1195'	AFE #: 173677 Well #: 837094



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

** Space out such that Blanking Cap is no more than 30" above grade.

Casing Detail	Size	Wt	Grd	Conn.	From	To:
Surface	13.375	54.5 #	J 55	STC	0'	740'
Interm	9.625	40 #	J-55	LTC	0'	2,190'
Prod	5.5	23 #	P-110	TXP	0'	16,933'

Report any Water flows and/or gas flows. Catch liquid sample if possible.

Casing Design	Size	ID	Coll	Burst	Tens	MU long
Surface	13.375	12.615	1130	2740	514	5140
Interm	9.625	8.835	2570	3950	520	5200
Prod	5.5	4.67	16220	14520	729	14420

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	850'	0.00	0.00	850'	0.00	0.00	0.0'	0.0
Hold	1,250'	8.00	120.00	1,249'	2.00	2.00	-13.9'	24.1
Build/Turn	2,310'	8.00	120.00	2,298'	0.00	0.00	-87.7'	151.9
Hold	2,989'	18.74	80.00	2,959'	1.58	2.00	-92.4'	301.0'
Hold	4,000'	18.74	80.00	3,917'	0.00	0.00	-38.0'	620.8
Hold	5,000'	18.74	80.00	4,884'	0.00	0.00	19.8'	937.2
KOP 2	6,309'	18.74	80.00	6,103'	0.00	0.00	92.8'	1,351.4'
Landing Pt	7,227'	90.60	346.21	6,657'	7.83	10.00	699.8'	1,397.6'
Turn	8,757'	90.60	346.21	6,641'	0.00	0.00	2,190.4'	1,031.7'
Hold	9,121'	90.60	339.04	6,637'	0.00	2.00	2,532.3'	924.7'
TD	16,933'	90.60	339.04	6,555'	0.00	0.00	9,827.5'	-1,869.8'
	VS Plane	339.04					VS Length	19,648.07'

Lateral Length ==> 9,706.00'

Logging Program

Run	Log Type	Interval
1	None	Surface
2	None	Intermediate to Surf. Csg
	CBL	Over Surface Casing
3	None	KOP to Int. Csg
	CBL	Over Intermediate Casing

Mudlogger operational at Surface

Formation Depths (TVD)

GENESEO	6,438'
TULLY	6,468'
HAMILTON	6,496'
MARCELLUS	6,514'
ONONDAGA	6,574'

Plat Date	9/4/2013
Gplat Date	11/7/2013
AFE Date	9/16/2013

Permit VS. Actual
0'

Cement: 122° F
Lead: 968 sx
15.0 ppg / 1.34 yld
Tail: 2,442 sx
15.8 ppg / 1.18 yld
15% Excess
Pump time: 6 hours
Ensure Gas Block Additive is in Lead Slurry
PBHL 5.5"
TMD: 16,933'
TVD: 6,555'
Inclination: 90.60 deg

Geologic Target: 6,660' TVD @ 0' VS w/ 0.60 degrees Up-dip

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

Drawn by: Chase
Date: 11/11/2013

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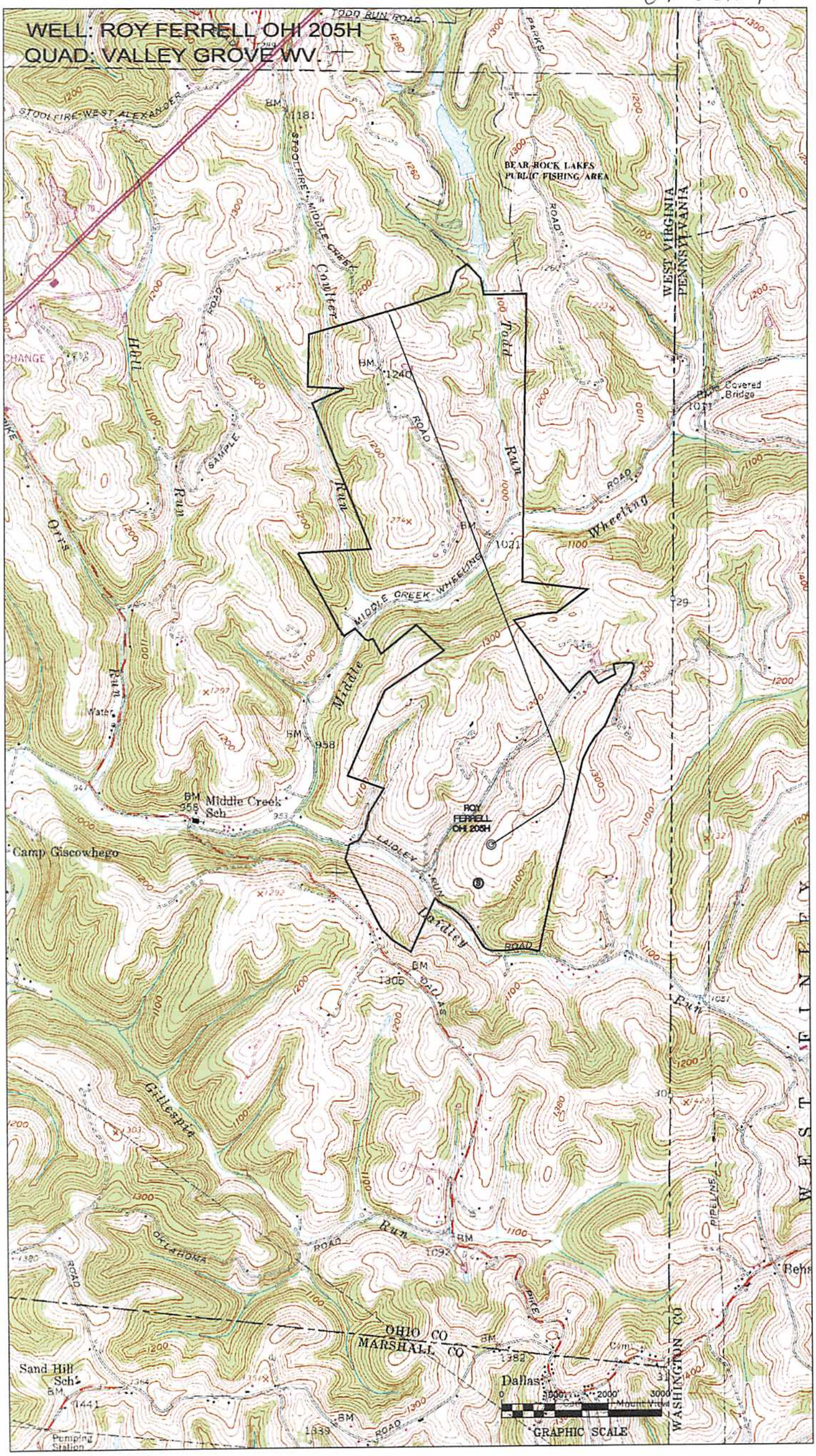
MDK 11/14/2013

69-00159 MOD

WELL: ROY FERRELL OHI 205H
QUAD: VALLEY GROVE WV.



SURFACE HOLE DEC. LONG: 80.531128
SURVEYED LONG: 80° 31' 52.1"

8,720'

Latitude: 40° 05' 00" (NAD 27)

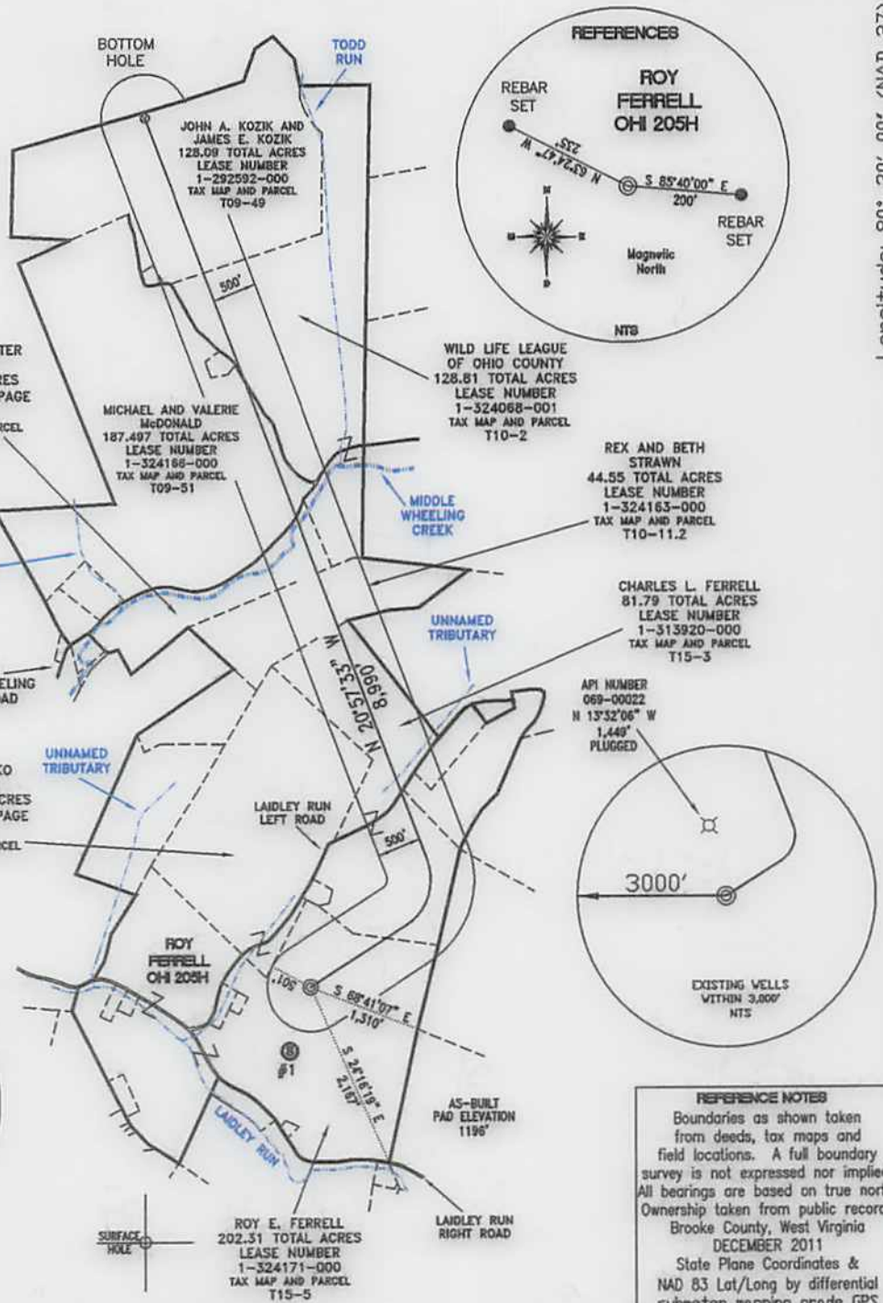
Longitude: 80° 30' 00" (NAD 27)

14,630'

SURFACE HOLE DEC. LAT: 40.043185
SURVEYED LAT: 40° 02' 35.5"

TH (UTM-NAD 83)
N) 4432663.9
E) 540015.2
BOTTOM HOLE (UTM-NAD 83)
N) 4435647.9
E) 539393.9

SPRING #1
S 18°53'01" W 758'



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 Brooke County, West Virginia
DECEMBER 2011
State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
Drafted by: E.A.M.

FILE #: CHE 034
DRAWING #: 1972
SCALE: PLAT = 1" - 2000'
TICK MARK = 1" - 2000'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING 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:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: JULY 26, 2013

OPERATOR'S WELL #: ROY FERRELL OHI 205H

API WELL #: 47 69 00159 H6A
STATE COUNTY PERMIT

MOD

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK
ELEVATION : 1,196'
COUNTY/DISTRICT: OHIO/TRIADELPHIA
QUADRANGLE: VALLEY GROVE WV.
SURFACE OWNER: ROY E. FERRELL
ACREAGE: 202.31 +/-
OIL & GAS ROYALTY OWNER: ROY E. FERRELL
ACREAGE: 814.117 +/-
LEASE NUMBERS:

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
ESTIMATED DEPTH: TVD: 6,660' TMD: 16,320'
WELL OPERATOR : CHESAPEAKE APPALACHIA, LLC.
DESIGNATED AGENT : ERIC B. GILLESPIE
ADDRESS: PO BOX 18496
ADDRESS: Po Box 6070
CITY: OKLAHOMA CITY STATE: OK ZIP CODE: 73154-0496
CITY: CHARLESTON STATE: WV ZIP CODE: 25301