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

January 09, 2014

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

Re: Permit Modification Approval for API Number 6900114 , Well #: ROY FERRELL OHI 10H
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,

For Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas

69-00114 MOD

Chesapeake ENERGY

Danielle Southall
Regulatory Analyst II

August 23, 2013

VIA UPS

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

Re: Modification to Roy Ferrell OHI 10H. API# 47-069-00114

Dear Ms. Cooper:

Attached please find a revised WW-6B for the above captioned well. We would like to modify the 13 3/8" and 20" casing in order to be consistent with the other Roy Ferrell well and the 5 ½" casing due to directional work. The BHL will remain the same. This well is situated on the Roy Ferrell property, in Triadelphia District, Wetzel County, West Virginia.

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

Sincerely,

Chesapeake Appalachia, LLC

Dee Southall

Enclosure(s)

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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

WW - 6B
(3/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator:	Chesapeake Appalachia, LLC	49447757	69- Ohio	7- Triadelphia	648-Valley Grove
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Roy Ferrell OHI 10H Well Pad Name: Roy Ferrell OHI Pad

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

4) Well Type: (a) Gas ■ Oil _____ Underground Storage _____

Other _____

(b) If Gas: Shallow _____ Deep _____

Horizontal ■

5) Existing Pad? Yes or No: Yes

JJK 8/22/2013

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: 6,640'

8) Formation at Total Vertical Depth: Marcellus

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9) Proposed Total Measured Depth: 14,400'

10) Approximate Fresh Water Strata Depths: 326'

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11) Method to Determine Fresh Water Depth: Form a water well~4000' WNW of the pad

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12) Approximate Saltwater Depths: 800'

13) Approximate Coal Seam Depths: 646'

14) Approximate Depth to Possible Void (coal mine, karst, other): 646' void abandoned mine

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of 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

WW - 6B
(3/13)

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#	741'	741'	680'sx/CTS
Coal	9 5/8"	New	J-55	40#	2200'	2200'	820 sx/CTS
Intermediate	7"	New	P-110	20#	If Needed	If Needed	If needed/As Possible
Production	5 1/2"	New	P-110	20#	14,400'	14,400'	Lead 1050 sx Tail 1440 sx/100' inside intermediate
Tubing	2 3/8"	New	N-80	4.7#	Approx. 7,181'	Approx. 7,181'	
Liners							

MJK 8/22/2013

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	1.20/15% 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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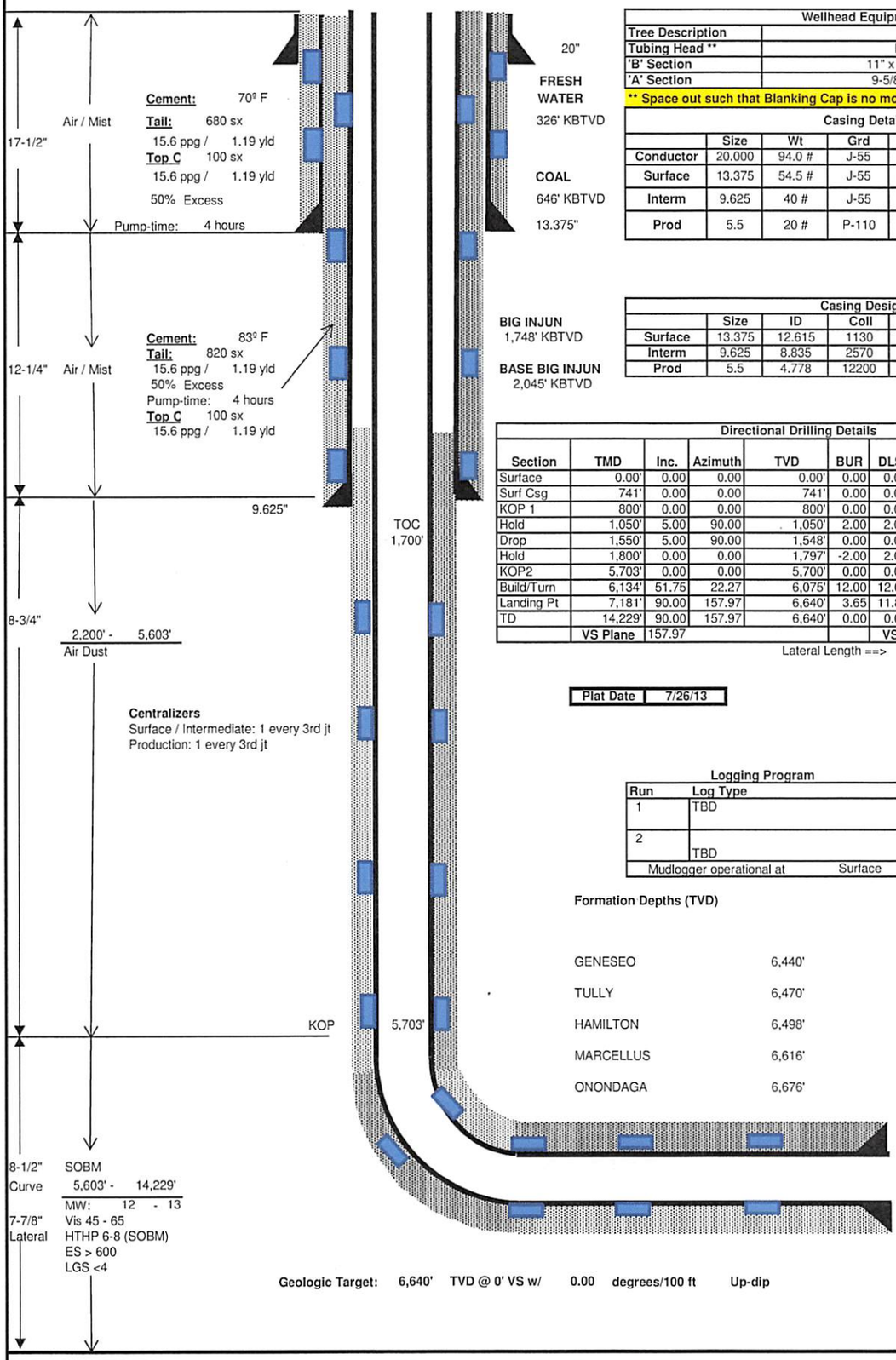
Chesapeake Energy	Well Name:	Roy Ferrell OHI 10H			Drilling Rig:	N/A
					Directional Drilling:	N/A
Drilling Engineer:	N/A	Formation:	Marcellus		Drilling Mud:	N/A
Superintendent:	N/A	County, State:	Ohio, WV		Cement Surface:	N/A
Asset Manager:	N/A	Surface Latitude:	40.043114	Surface Longitude: -80.531168	Cement Longstrings:	N/A
Geologist:	N/A	BH Latitude:	40.026513	BH Longitude: -80.519479	Wellhead:	N/A
Land:	N/A	KB Elevation:	1216'	Ground Elevation: 1196'	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

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

Casing Detail	Size	Wt	Grd	Conn.	From:	To:
Conductor	20.000	94.0 #	J-55	STC	0'	100'
Surface	13.375	54.5 #	J-55	STC	0'	741'
Interm	9.625	40 #	J-55	LTC	0'	2,200'
Prod	5.5	20 #	P-110	GBCD	0'	14,229'

Casing Design	Size	ID	Coll	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

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'
Surf Csg	741'	0.00	0.00	741'	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	1,050'	5.00	90.00	1,050'	2.00	2.00	0.0'	10.9'
Drop	1,550'	5.00	90.00	1,548'	0.00	0.00	0.0'	54.5'
Hold	1,800'	0.00	0.00	1,797'	-2.00	2.00	0.0'	65.4'
KOP2	5,703'	0.00	0.00	5,700'	0.00	0.00	0.0'	65.4'
Build/Turn	6,134'	51.75	22.27	6,075'	12.00	12.00	168.3'	134.3'
Landing Pt	7,181'	90.00	157.97	6,640'	3.65	11.86	-14.4'	748.3'
TD	14,229'	90.00	157.97	6,640'	0.00	0.00	-6,547.6'	3,391.8'
	VS Plane	157.97				VS Length	7,341.78'	

Lateral Length ==> 7,047.70'

Plat Date	7/26/13

Logging Program

Run	Log Type	Interval
1	TBD	TBD
2	TBD	TBD
Mudlogger operational at	Surface	

Formation Depths (TVD)

GENESEO	6,440'
TULLY	6,470'
HAMILTON	6,498'
MARCELLUS	6,616'
ONONDAGA	6,676'

Cement: 122º F
Lead: 1,050 sx
15.6 ppg / 1.20 yld
Tail: 1,440 sx
15.6 ppg / 1.20 yld
15% Excess
Pump-time: 5 hours

Geologic Target: 6,640' TVD @ 0' VS w/ 0.00 degrees/100 ft Up-dip

PBHL 5.5"
TMD: 14,229'
TVD: 6,640'
Inclination: 90.00 deg

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

Drawn by: N/A
Date: 8/21/2013

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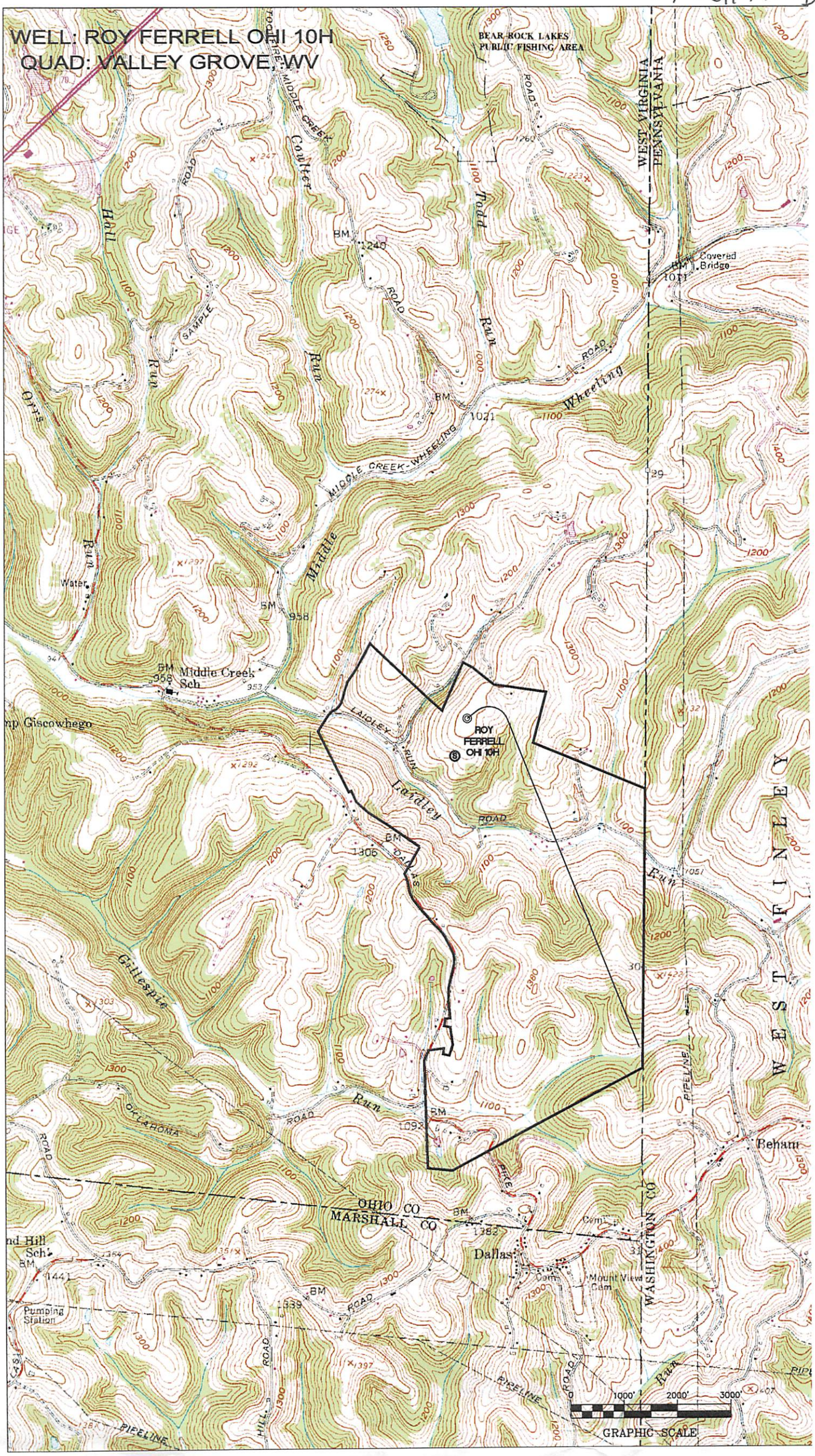


WELL: ROY FERRELL OHI 10H
QUAD: VALLEY GROVE, WV
BEAR ROCK LAKES PUBLIC FISHING AREA
WEST VIRGINIA
PENNSYLVANIA
Covered Bridge
Middle Creek Sch
Giscowhego
ROY FERRELL OHI 10H
Laidley Run
Gillespie Run
Wheeling Run
Middle Run
Todd Run
Coulter Run
Hall Run
Orrs Run
Laidley Run
Dallas
Mount View Cem
Behan
Pumping Station
OHIO CO
MARSHALL CO
WASHINGTON CO
WEST FINLEY
PIPELINE
GRAPHIC SCALE
0
1000'
2000'
3000'

SURFACE HOLE DEC. LONG: 80.531168
SURVEYED LONG: 80° 31' 52.2"

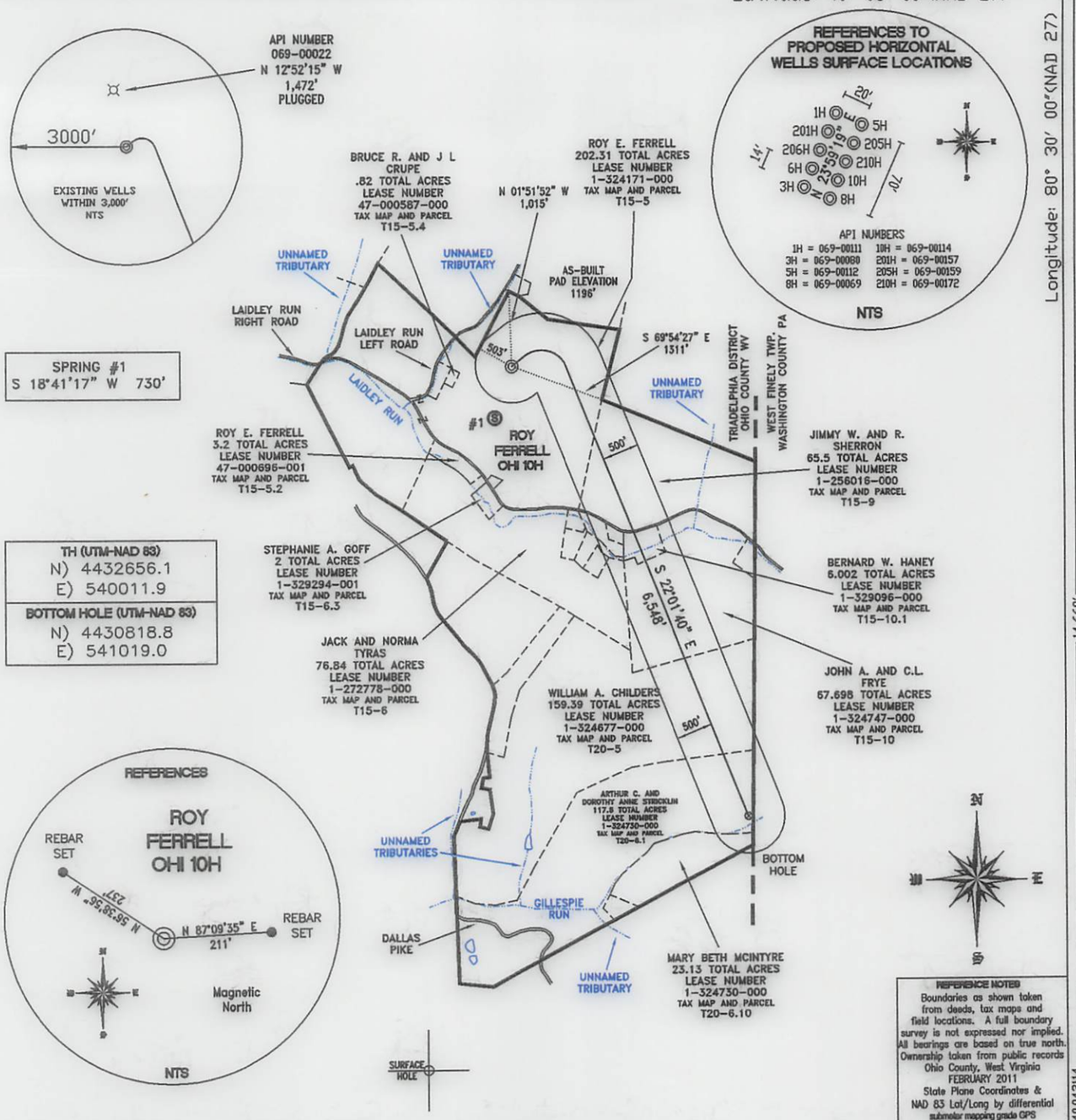
8,730'

Latitude: 40° 05' 00"(NAD 27)

Longitude: 80° 30' 00"(NAD 27)

14,660'

SURFACE HOLE DEC. LAT: 40.043114
SURVEYED LAT: 40° 02' 35.2"



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 FEBRUARY 2011 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS Drafted by: E.A.M.

FILE #: CHE 034
DRAWING #: 1856
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 10H

API WELL #: 47 (STATE) 69 (COUNTY) 00114H6A MOD (PERMIT)

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

WATERSHED: WHEELING CREEK
ELEVATION : 1196'
COUNTY/DISTRICT: OHIO/TRIADELPHIA
QUADRANGLE: VALLEY GROVE WV.
SURFACE OWNER: ROY E. FERRELL
ACREAGE: 202.31 +/-
OIL & GAS ROYALTY OWNER: ROY E. FERRELL
ACREAGE: 581.28 +/-
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: 6,665' TMD: 13,544'
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