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

July 30, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706502, issued to EQT PRODUCTION COMPANY, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: 513154
Farm Name: HENDERSON, JUSTIN L.
API Well Number: 47-1706502
Permit Type: Horizontal 6A Well
Date Issued: 07/30/2014

API Number: 4701706502

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.

2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations,* 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

WW - 6B
(9/13)

4701706502

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: EQT Production Company | Operator ID | 017 County | 7 District | 526 Quadrangle

2) Operator's Well Number: 513154 Well Pad Name: OXF159

3) Farm Name/Surface Owner : Henderson Public Road Access: CR 13

4) Elevation, current ground: 1,270.0 Elevation, proposed post-construction: 1,252.0

5) Well Type: (a) Gas • Oil _____ Underground Storage _____

Other _____

(b) If Gas: Shallow • Deep _____

Horizontal •

DCW
5-12-2014

6) Existing Pad? Yes or No: no

7) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):

Target formation is Marcellus at a depth of 6686' with the anticipated thickness to be 36 feet and anticipated target pressure of 4488 PSI

8) Proposed Total Vertical Depth: 6,686

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth 13,520

11) Proposed Horizontal Leg Length 4,070

12) Approximate Fresh Water Strata Depths: 261, 322, & 398

13) Method to Determine Fresh Water Depth: By offset wells

14) Approximate Saltwater Depths: 1309 & 1376

15) Approximate Coal Seam Depths: 243, 310, 471, 316, 729, & 732

16) Approximate Depth to Possible Void (coal mine, karst, other): None reported

17) Does proposed well location contain coal seams directly overlying or adjacent to an active mine?

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

WW - 6B
(3/13)

4701706502

CASING AND TUBING PROGRAM

18)

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: for Drilling	INTERVALS: Left in Well	CEMENT: Fill- up (Cu.Ft.)
Conductor	20	New	MC-50	81	40	40	38 C.T.S.
Fresh Water	13 3/8	New	MC-50	54	1,099	1,099	951 C.T.S.
Coal							
Intermediate	9 5/8	New	MC-50	40	5,277	5,277	2,070 C.T.S.
Production	5 1/2	New	P-110	20	13,520	13,520	See Note 1
Tubing	2 3/8		J-55	4.6			May not be run, if run will be set 100' less than TD
Liners							

DCW
5-12-2014

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20	24	0.375	-	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,480	* See Note 2	1.21
Coal						
Intermediate	9 5/8	12 3/8	0.395	3,590	* See Note 2	1.21
Production	5 1/2	8 1/2	0.361	12,640	-	1.27/1.86
Tubing						
Liners						

Packers

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.
Note 2: Reference Variance 2014-17.

17-06502

EQT

July 28, 2014

Mr. Gene Smith
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: Casing on OXF159(47-01706502, 06503, 06504, 06505, 06506, 06507)

Dear Mr. Smith,

EQT is requesting the 13 3/8" surface casing to be set 50' below the deepest red rock show to cover potential red rock issues. The proposed casing set depth is above ground elevation (1,252'elevation). The reason for this is the red rock swells during drilling of the intermediate section causing many drilling problems such as, but not limited to, lost drilling assemblies and casing running issues.

EQT is reviewing the OXF159, we would like to request to set the surface casing deeper on each well. The 13 3/8" casing will be set at a depth of approximately 1099' KB (50' below the anticipated red rock show).

If you have any questions, please do not hesitate to contact me at (304) 848-0076.

Sincerely,

Vicki Roark
Permitting Supervisor-WV

Enc.

RECEIVED
Office of Oil and Gas
JUL 29 2014
WV Department of
Environmental Protection

EQT Production 115 Professional Place I P.O. Box 280 I Bridgeport, WV 26330
T 304.848.0000 I F 304.848.0040 I www.eqt.com

WW - 6B

(3/13)

4701706502

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and complete a new horizontal well in the marcellus formation. The vertical drill to go down to an approximate depth of 4117'. Then kick Off the horizontal leg into the marcellus using a stick water frac.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Hydraulic fracturing is completed in accordance with state regulations using water recycled from previously fractured wells and obtained from freshwater sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid, gelling agent, gel breaker, friction reducer, biocide, and scale inhibitor), referred to in the industry as a "slickwater" completion. Maximum anticipated treating pressures are expected to average approximately 8500 psi, maximum anticipated treating rates are expected to average approximately 100 bpm. Stage lengths vary from 150 to 300 feet. Average approximately 200,000 barrels of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000 pounds of sand per stage.

21) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): ± 25.80 Ac.

22) Area to be disturbed for well pad only, less access road (acres): ± 6.0 Ac.

23) Describe centralizer placement for each casing string.

• Surface: Bow spring centralizers – One at the shoe and one spaced every 500'.

• Intermediate: Bow spring centralizers– One cent at the shoe and one spaced every 500'.

• Production: One spaced every 1000' from KOP to Int csg shoe

24) Describe all cement additives associated with each cement type. **Surface (Type 1 Cement):** 0-3% Calcium Chloride Used to speed the setting of cement slurries.

0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of the cement slurry to a thief zone.

Intermediate (Type 1 Cement): 0-3% Calcium Chloride. Salt is used in shallow, low temperature formations to speed the setting of cement slurries. 0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of whole drilling fluid or cement slurry (not filtrate) to a thief zone.

Production:

Lead (Type 1 Cement): 0.2-0.7% Lignosulfonate (Retarder). Lengthens thickening time.

0.3% CFR (dispersant). Makes cement easier to mix.

Tail (Type H Cement): 0.25-0.40% Lignosulfonate (Retarder). Lengthens thickening time.

0.2-0.3% CFR (dispersant). This is to make the cement easier to mix.

60 % Calcuim Carbonate. Acid solubility.

0.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.

25) Proposed borehole conditioning procedures. **Surface:** Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. To ensure that there is no fill, short trip two stands with no circulation. If there is fill, bring compressors back on and circulate hole clean. A constant rate of higher than expected cuttings volume likely indicates washouts that will not clean up.

Intermediate: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. If foam drilling, to enhance hole cleaning use a soap sweep or increase injection rate & foam concentration.

Production: Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume. Perform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across the shakers every 15 minutes.

*Note: Attach additional sheets as needed.

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4701706502

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
dep.wv.gov

March 18, 2014

Nabors Completion & Production Services Company
1380 Route 286 Hwy E #121
Indiana PA 15701

Re: Cement Variance Request

Dear Sir or Madam,

This agency is approving a variance request for the cement blend listed below to be used on surface and coal protection strings for the drilling of oil and gas wells in the state of West Virginia. The variance cannot be used without requesting its use on a permit application and approval by this agency:

- Type 1 (2% Calcium Chloride-Accelerator, 0.25% Super Flake-Lost Circulation, 5.2% Water, 94% Type "1" Cement)

If you have any questions regarding this matter feel free to contact me at 304-926-0499, ext. 1653.

Sincerely,

James Peterson by GCS

James Peterson
Environmental Resources Specialist / Permitting

4701706502

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
dep.wv.gov

BEFORE THE OFFICE OF OIL AND GAS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF WEST VIRGINIA

IN THE MATTER OF A VARIANCE FROM	)	**ORDER NO. 2014 - 17**
REGULATION 35 CSR § 4-11.4/11.5/14.1	)	
AND 35 CSR § 8-9.2.h. 4/5/6/8 OF THE	)	
THE OPERATIONAL	)	
REGULATIONS OF CEMENTING OIL	)	
AND GAS WELLS	)	

REPORT OF THE OFFICE

Nabors Completion & Production Services Co. requests approval of a different cement blend for use in cementing surface and coal protection casing of oil and gas wells.

FINDINGS OF FACT

1.) Nabors Completion & Production Services Co. proposes the following cement blend:

- 2% Calcium Chloride (Accelerator)
- 0.25 % Super Flake (Lost Circulation)
- 94% Type "1" Cement
- 5.20 % Water

2.) Laboratory testing results indicate that the blend listed in Fact No.1 will achieve a 500 psi compressive strength within 6 hours and a 2,435 psi compressive strength within 24 hours.

CONCLUSIONS OF LAW

Pursuant to Articles 6 and 6A, Chapter 22 of the Code of West Virginia, the Office of Oil and Gas has jurisdiction over the subject matter embraced in said notice, and the persons interested therein, and jurisdiction to promulgate the hereinafter prescribed Order.

Pursuant to 35 CSR § 4-11.5 and 35 CSR § 8-9.2.h.8 the Chief of the Office of Oil and Gas may approve different cement blends upon the well operator providing satisfactory proof that different cement types are adequate.

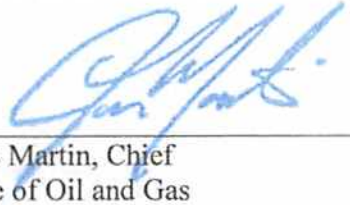
ORDER

It is ordered that Nabors Completion & Production Services Co. may use the cement blend listed in Findings of Fact No.1 for the cementing of surface and coal protection casing of oil and gas wells in the State as may be requested by oil and gas operators. The waiting time on the cement blend shall be **8** hours. The cement blend shall be mixed in strict accordance with the specifications for each blend and weight measurements made on-site to assure the cement slurries meet the minimum weight specifications. A sample shall be collected and, if after **8** hours the cement is not set up, additional time will be required. Nabors Completion & Production Services Co. shall keep a record of cement blend jobs in which the cement blend approved under this order is to be used and made available to the Office of Oil and Gas upon request.

Dated this, the 18th day of March, 2014.

IN THE NAME OF THE STATE OF WEST VIRGINIA

OFFICE OF OIL AND GAS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OF THE STATE OF WEST VIRGINIA

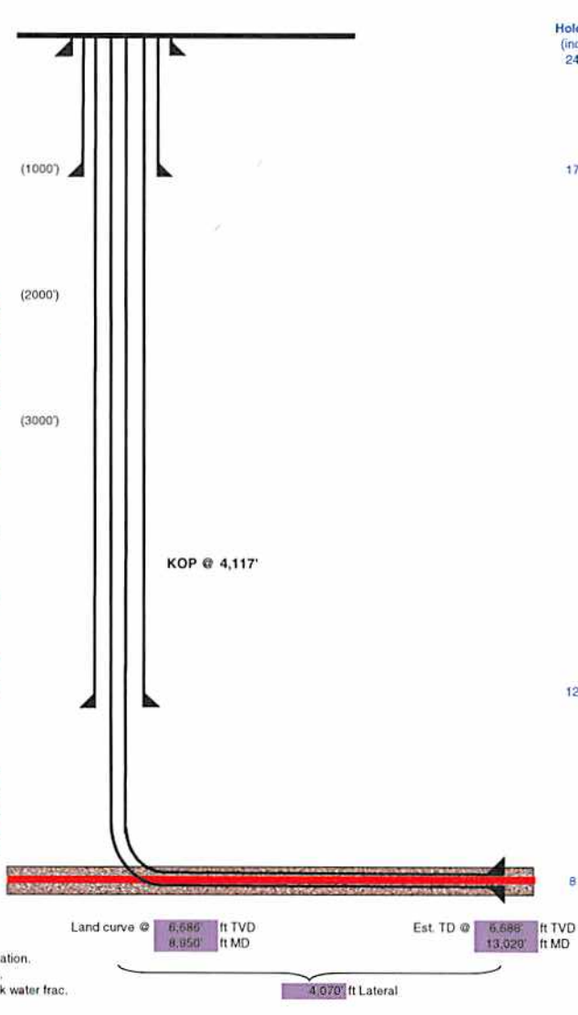


James Martin, Chief
Office of Oil and Gas

4701706502

Well 513154 (OXF159H2)
EQT Production
Oxford
Doddridge West Virgina

Azimuth 335
Vertical Section 4490



TVD Depth (feet)	Formation Tops (TVD)			Hole Size (inches)	Casing Type	Size (inches)	Wt (ppf)/Grade
0'				24	Conductor	20	81#/MC-50
250'							
	Base Fresh Water	398					
500'							
750'							
1,000'				17 1/2	Surface	13 3/8	54#/MC-50
1,250'							
1,500'							
1,750'							
	Base Red Rock	1856					
2,000'	Big Lime	1908	- 1962				
	Weir	2196	- 2293				
2,250'	-Gantz	2409	- 2447				
	-Fifty foot	2494	- 2540				
2,500'	-Thirty foot	2602	- 2621				
	-Gordon	2647	- 2684				
2,750'	-Forth Sand	2748	- 2801				
	-Bayard	2922	- 2973				
3,000'							
3,250'	-Warren	3249	- 3303				
	-Speechley	3318	- 3426				
3,500'							
3,750'							
	-Balltown A	3835	- 3902				
4,000'							
4,250'							
	-Riley	4453	- 4479				
4,500'							
4,750'							
	-Benson	4884	- 4909				
5,000'							
	-Alexander	5146	- 5227	12 3/8	Intermediate	9 5/8	40#/MC-50
5,250'	Int. csg pt	5277					
5,500'							
5,750'	-Sonyea	6298	- 6450				
	-Middlesex	6450	- 6507				
6,000'	-Genesee	6507	- 6577				
	-Geneseo	6577	- 6620				
6,250'	-Tully	6620	- 6640				
	-Hamilton	6640	- 6663				
6,500'	Marcellus top	6663					
	Target Inside Marcellus	**6686**		8 1/2	Production Casing	5 1/2	20#/P-110
6,750'	Marcellus Bottom	6699					

Proposed Well Work:
Drill and complete a new horizontal well in the Marcellus formation.
The vertical drill to go down to an approximate depth of 4117'.
Then kick off the horizontal leg into the Marcellus using a slick water frac.

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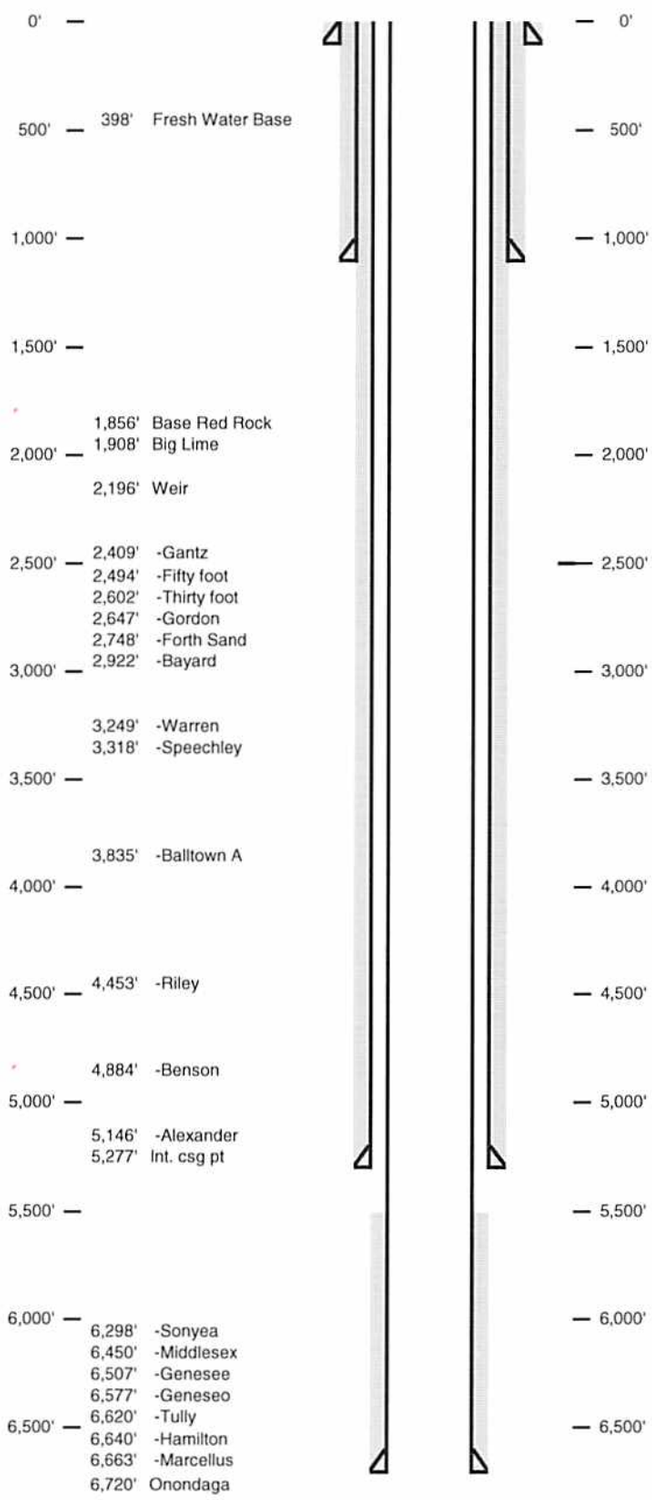
Office of Oil and Gas
MAY 06 2014
WV Department of
Environmental Protection

4701706502

Well Schematic
EQT Production

Well Name	513154 (OXF159H2)
County	Doddridge
State	West Virgina

Elevation KB:	1262
Target	Marcellus
Prospect	
Azimuth	335
Vertical Section	4490



Hole Size 24" - 20" Conductor at 40'
Bit Size 17.5"

TOC @ Surface
13 3/8", MC-50, 54.5# @ 1,099' ft MD
Bit Size 12.375"

KOP = 4,117' ft MD
3 Deg DLS, then 10 Deg DLS

TOC @ Surface
9 5/8", MC-50, 40# @ 5,277' ft MD
Bit Size 8.5"

Land @ 8,950' ft MD
6,686' ft TVD

5 1/2", P-110, 20# 13,020' ft MD
6,686' ft TVD

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MAY 06 2014
WV Department of
Environmental Protection

4701706502

WW-9
(5/13)

Page _____ of _____
API No. 47 - 017 - 0
Operator's Well No. 513154

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

Fluids/Cuttings Disposal & Reclamation Plan

Operator Name EQT Production Co. OP Code _____

Watershed (HUC10) Bluestone Creek Quadrangle Oxford 7.5'

Elevation 1252.0 County Doddridge District Southwest

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes x No ___

Will a pit be used ? Yes: _____ No: X

If so please describe anticipated pit waste: _____

Will a synthetic liner be used in the pit? Yes _____ No X If so, what ml.? 60

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
▪ Underground Injection (UIC Permit Number 0014, 8462, 4037)
_____ Reuse (at API Number _____)
▪ Off Site Disposal (Supply form WW-9 for disposal location)
_____ Other (Explain _____)

Will closed loop system be used ? Yes, The closed loop system will remove drill cuttings from the drilling fluid. The drill cuttings are then prepared for transportation to an off-site disposal facility.

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air is used to drill the top-hole sections of the wellbore, Surface, Intermediate, and Pilot hole sections, water based mud is used to drill the curve and lateral.

If oil based, what type? Synthetic, petroleum, etc _____

Additives to be used in drilling medium? MILBAR, Viscosifer, Alkalinity Control, Lime, Chloride Salts,Rate Filtration Control, Deflocculant, Lubricant, Detergent, Defoaming, Walnut Shell, X-Cide, SOLTEX Terra. Of the listed chemicals the following are generally used when drilling on air: lubricant, detergent, defoaming. Water based fluids use the following chemicals: MILBAR, viscosifer, alkalinity control, lime, chloride salts, rate filtration control, deflocculant, lubricant, detergent, defoaming, walnut shell, x-cide, SOLTEX terra

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

- If left in pit and plan to solidify what medium will be used? (Cement, Line, sawdust) n/a
- Landfill or offsite name/permit number? See Attached List

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto 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. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature _____
Company Official (Typed Name) Victoria J. Roark
Company Official Title Permitting Supervisor

Subscribed and sworn before me this 1 day of MAY , 20 14

_____ Notary Public

My commission expires 6/27/2018

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Office of Oil and Gas

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Nicholas L. Bumgardner
Rt. 1, Box 4
Liberty, WV 25124
My Commission Expires July 27, 2018

4701706502

WW-9

Operator's Well No. 513154

Proposed Revegetation Treatment: Acres Disturbed ± 25.80 Ac. Prevegetation pH 6.2

Lime 3 Tons/acre or to correct to pH 6.5

Fertilize type

Fertilizer Amount 1/3 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
KY-31	40	Orchard Grass	15
Alsike Clover	5	Alsike Clover	5
Annual Rye	15		

Attach:
Drawing(s) of road, location,pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Douglas Newlon

Comments: Preseed + Mulch install E+S to WV Dep regulations

Title: Oil + Gas inspector Date: 5-12-2014

Field Reviewed? (/) Yes ( ) No

4701706502

EQT Production Water plan
Offsite disposals for Marcellus wells

CWS TRUCKING INC.
P.O. Box 391
Williamstown, WV 26187
740-516-3586
Noble County/Noble Township
Permit # 3390

LAD LIQUID ASSETS DISPOSAL INC.
226 Rankin Road
Washington, PA 15301
724-350-2760
724-222-6080
724-229-7034 fax
Ohio County/Wheeling
Permit # USEPA WV 0014

TRI COUNTY WASTE WATER MANAGEMENT, INC.
1487 Toms Run Road
Holbrook, PA 15341
724-627-7178 Plant
724-499-5647 Office
Greene County/Waynesburg
Permit # TC-1009

Waste Management - Meadowfill Landfill
Rt. 2, Box 68 Dawson Drive
Bridgeport, WV 26330
304-326-6027
Permit #SWF-1032-98
Approval #100785WV

Waste Management - Northwestern Landfill
512 E. Dry Road
Parkersburg, WV 26104
304-428-0602
Permit #SWF-1025 WV-0109400
Approval #100833WV

BROAD STREET ENERGY LLC
37 West Broad Street
Suite 1100
Columbus, Ohio 43215
740-516-5381
Washington County/Belpre Twp.
Permit # 8462

TRIAD ENERGY
P.O. Box 430
Reno, OH 45773
740-516-6021 Well
740-374-2940 Reno Office Jennifer
Nobel County/Jackson Township
Permit # 4037

KING EXCAVATING CO.
Advanced Waste Services
101 River Park Drive
New Castle, Pa. 16101
Facility Permit# PAR000029132

4701706502

EQT

Where energy meets innovation.℠

Site Specific Safety Plan

EQT OXF159 Pad

Oxford

Doddridge County, WV

For Wells:

_513153___ _513154___ __513155__ __513700__ __513701__ __514095__ _____

_____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____

Date Prepared: **April 11, 2014**

[signature]
EQT Production

Permitting Supervisor
Title

5-1-14
Date

Douglas Newlan
WV Oil and Gas Inspector

_____
Title

5-12-2014
Date

Section V: BOP and Well Control 4701706502

BOP equipment and assembly installation schedule:

BOP Equipment

Size (in)	Operation	Hole Section	Type	Pressure Class	Test Pressure (psi)	Testing Frequency
13-5/8"	Drilling	Intermediate	Annular	3M	2100	Initial
13-5/8"	Drilling	Pilot	Annular	3M	2100	Initial, Weekly, Trip
13-5/8"	Drilling	Production	Annular	5M	3500	Initial,Weekly, Trip
13-5/8"	Drilling	Production	Blind	5M	4000	Initial,Weekly, Trip
13-5/8"	Drilling	Production	Pipe	5M	4000	Initial,Weekly, Trip
7-1/16"	Completions	Production	Cameron U's	5M	5000	Initial
13-5/8"	Drilling	Pilot (Onondaga Tag)	Annular	5M	4000	Initial,Weekly, Trip

Wellhead Detail

Size (in)	Type	M.A.W.P. (psi)
13-3/8" SOW x 13-5/8" 5M	Multi-bowl Well Head	5,000
13-5/8" 5M x 7-1/16 10M	Tubing Head	10,000
2-1/16" 5M	Christmas Tree	5,000

Well Control Trained Personnel:

- Drilling
  - EQT On-Site Specialist – 2 on rotating hitches.
  - Contract Group's – Tool Pusher & Drillers
- Completions & Production
  - EQT On-Site Specialist

DCN 5-12-2014

Notification Procedure

Significant Event Notifications

- A detailed record of significant drilling events will be recorded in the EQT Production Well Log Book.
- In addition to the record above, the local inspector of the WV DEP Office of Oil and Gas and Supervisor of EH&S will be notified by the EQT On-Site Specialist for the following events:
  - Lost Circulation
  - Encounter of Hydrogen Sulfide Gas
    - *Immediate notification is required of any reading of Hydrogen Sulfide Gas greater than 10ppm*
  - Fluid Entry
  - Abnormal Pressures
  - Blow-outs
  - Significant kicks
- Contact information can be found in Section II

Emergency Notifications

- In the event emergency response personnel and residents surrounding the work site are affected by specific events during the operation they must be notified as soon as possible by the On-site Specialist or their designee.

Flaring Notifications

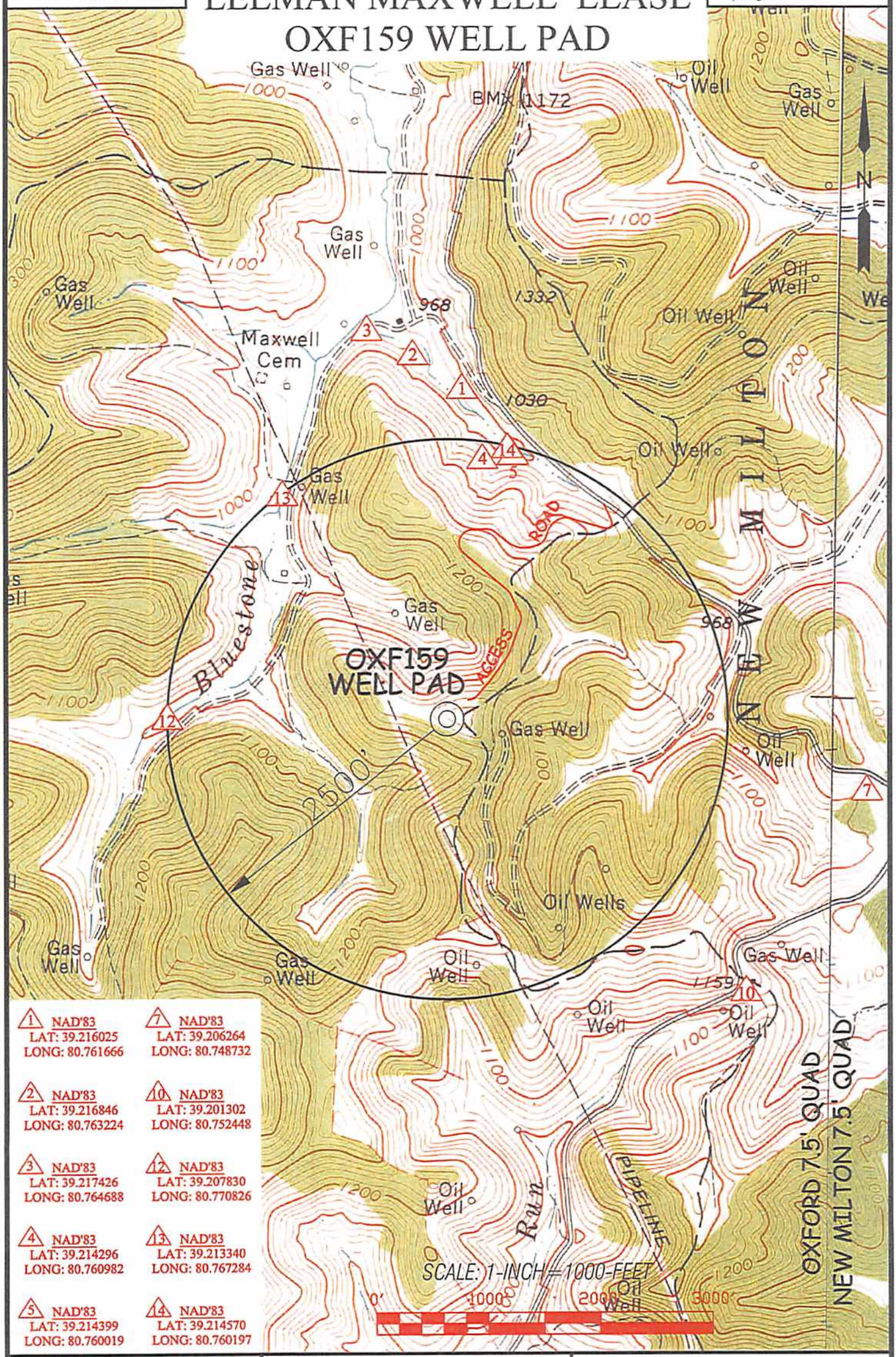
- The local fire department(s) and/or county dispatch centers must be notified immediately prior to the ignition of a flare.

4701706502

WATER SAMPLES

LEEMAN MAXWELL LEASE
OXF159 WELL PAD

page of



1 NAD'83 LAT: 39.216025 LONG: 80.761666	7 NAD'83 LAT: 39.206264 LONG: 80.748732
2 NAD'83 LAT: 39.216846 LONG: 80.763224	10 NAD'83 LAT: 39.201302 LONG: 80.752448
3 NAD'83 LAT: 39.217426 LONG: 80.764688	12 NAD'83 LAT: 39.207830 LONG: 80.770826
4 NAD'83 LAT: 39.214296 LONG: 80.760982	13 NAD'83 LAT: 39.213340 LONG: 80.767284
5 NAD'83 LAT: 39.214399 LONG: 80.760019	14 NAD'83 LAT: 39.214570 LONG: 80.760197

Professional Energy Consultants
A DIVISION OF SMITH LAND SURVEYING, INC.
SLS
SURVEYORS ENGINEERS ENVIRONMENTAL PROJECT MGMT.
(304) 462-5634 WWW.SLSSURVEYS.COM

DRAWN BY	FILE NO.	DATE	CADD FILE:
K.D.W.	7889	04/18/14	7889WSOXF159

TOPO SECTION OF:
OXFORD, WV 7.5' QUAD.

DISTRICT	COUNTY	TAX MAP–PARCEL NO.
SOUTHWEST	DODDRIDGE	06–01

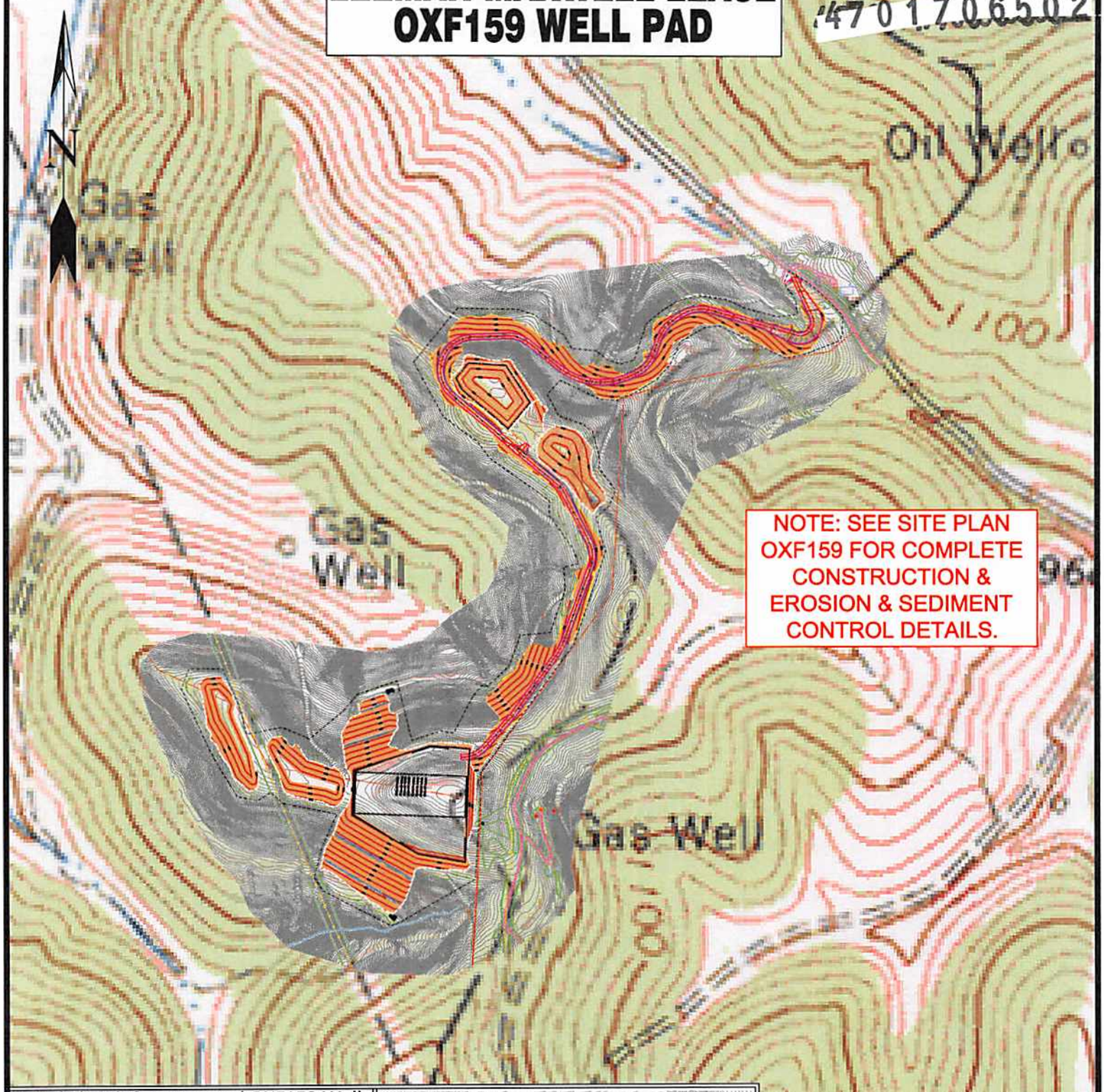
OPERATOR:
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
P.O. BOX 280
BRIDGEPORT, WV 26330

Form WW-9

page of

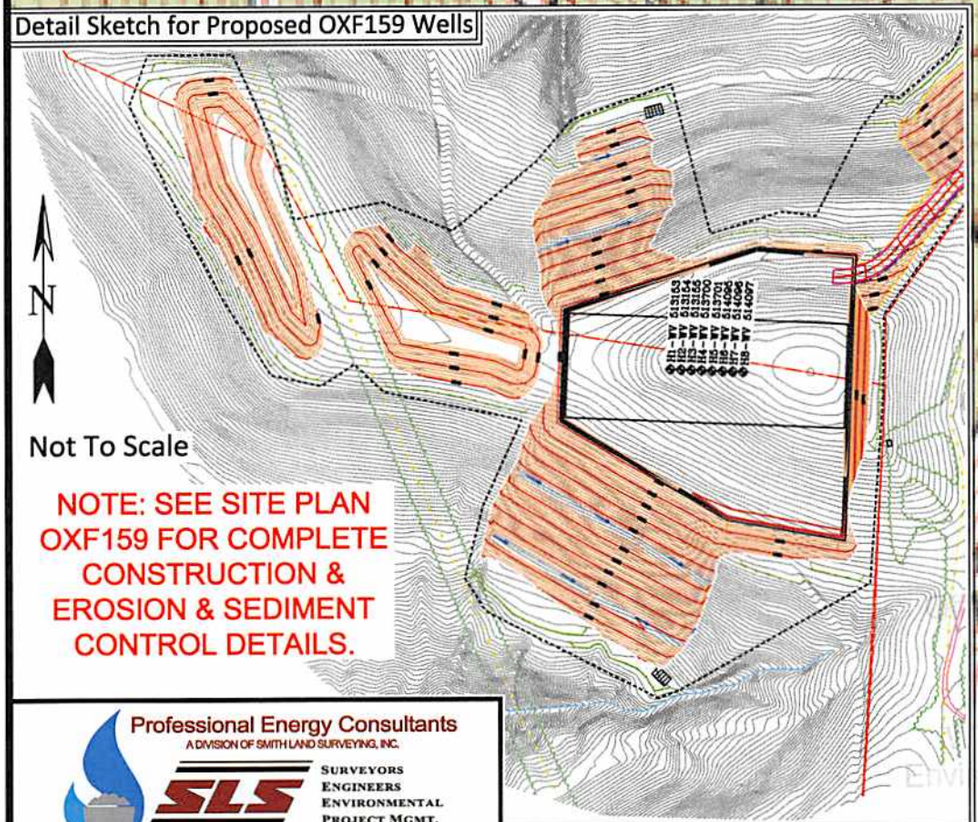
LEEMAN MAXWELL LEASE
OXF159 WELL PAD

4701706502



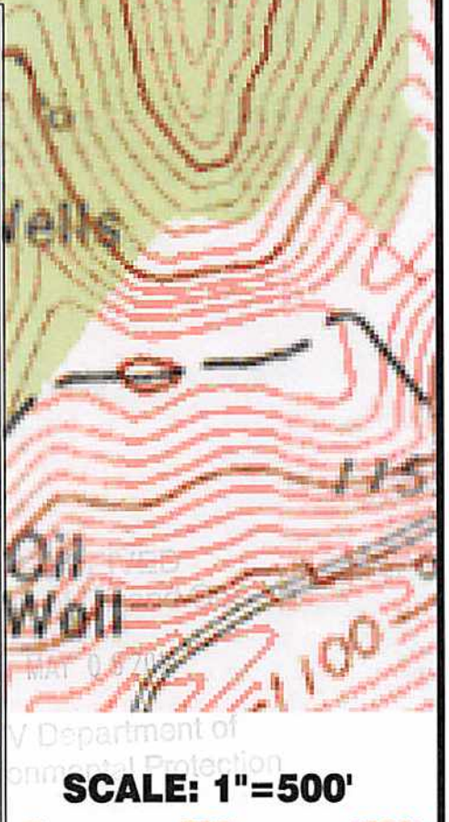
NOTE: SEE SITE PLAN OXF159 FOR COMPLETE CONSTRUCTION & EROSION & SEDIMENT CONTROL DETAILS.

Detail Sketch for Proposed OXF159 Wells



Not To Scale

NOTE: SEE SITE PLAN OXF159 FOR COMPLETE CONSTRUCTION & EROSION & SEDIMENT CONTROL DETAILS.



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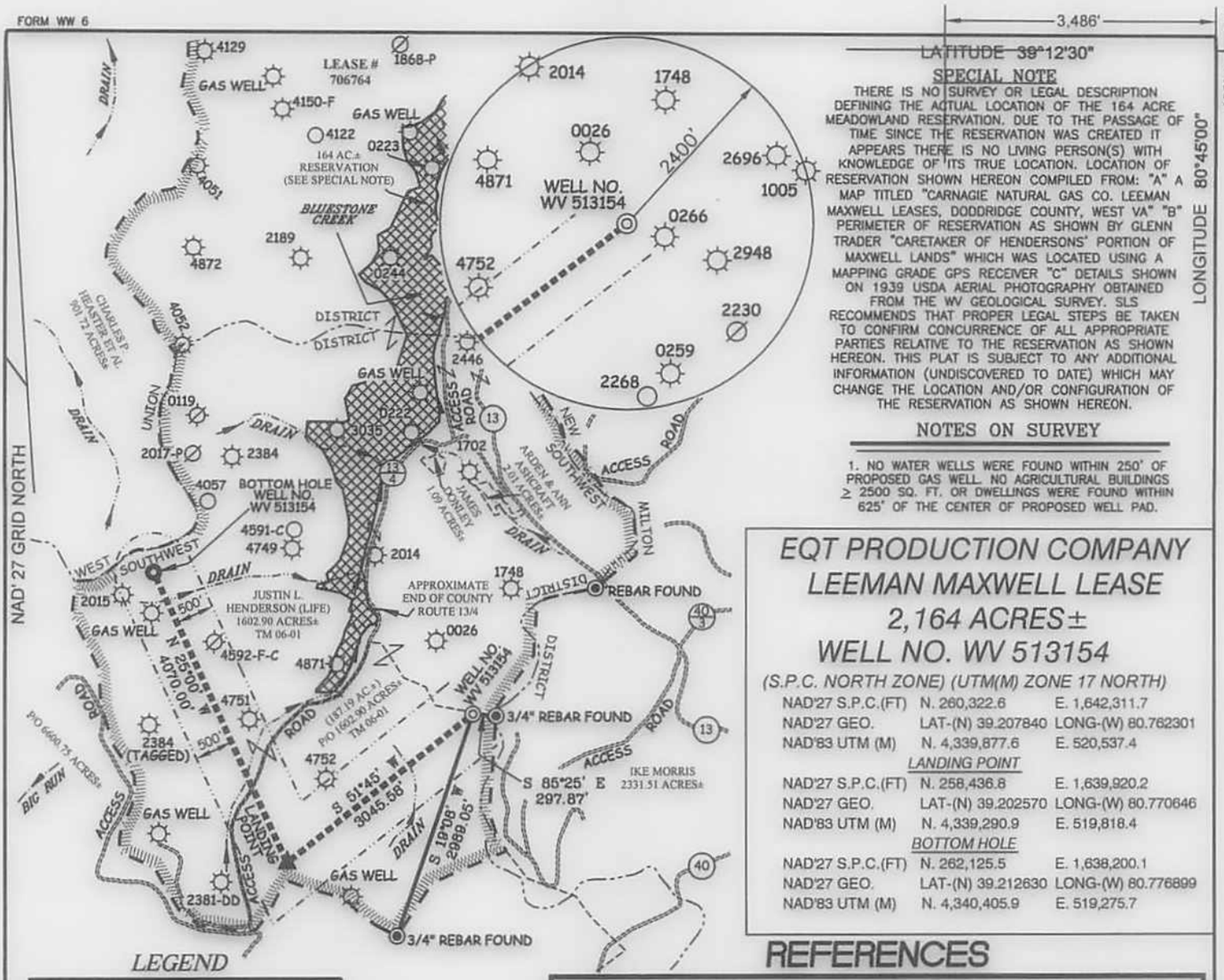
DRAWN BY	FILE NO.	DATE	CADD FILE:
K.D.W.	7889	04-03-14	7889REC159.dwg

TOPO SECTION OF OXFORD 7.5'
USGS TOPO QUADRANGLE

SCALE: 1"=500'

0' 500' 1000'

FORM WW 6



SPECIAL NOTE

THERE IS NO SURVEY OR LEGAL DESCRIPTION DEFINING THE ACTUAL LOCATION OF THE 164 ACRE MEADOWLAND RESERVATION. DUE TO THE PASSAGE OF TIME SINCE THE RESERVATION WAS CREATED IT APPEARS THERE IS NO LIVING PERSON(S) WITH KNOWLEDGE OF ITS TRUE LOCATION. LOCATION OF RESERVATION SHOWN HEREON COMPILED FROM: "A" A MAP TITLED "CARNAGIE NATURAL GAS CO. LEEMAN MAXWELL LEASES, DODDRIDGE COUNTY, WEST VA" "B" PERIMETER OF RESERVATION AS SHOWN BY GLENN TRADER "CARETAKER OF HENDERSONS' PORTION OF MAXWELL LANDS" WHICH WAS LOCATED USING A MAPPING GRADE GPS RECEIVER "C" DETAILS SHOWN ON 1939 USDA AERIAL PHOTOGRAPHY OBTAINED FROM THE WV GEOLOGICAL SURVEY. SLS RECOMMENDS THAT PROPER LEGAL STEPS BE TAKEN TO CONFIRM CONCURRENCE OF ALL APPROPRIATE PARTIES RELATIVE TO THE RESERVATION AS SHOWN HEREON. THIS PLAT IS SUBJECT TO ANY ADDITIONAL INFORMATION (UNDISCOVERED TO DATE) WHICH MAY CHANGE THE LOCATION AND/OR CONFIGURATION OF THE RESERVATION AS SHOWN HEREON.

NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.

EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE
2,164 ACRES±
WELL NO. WV 513154

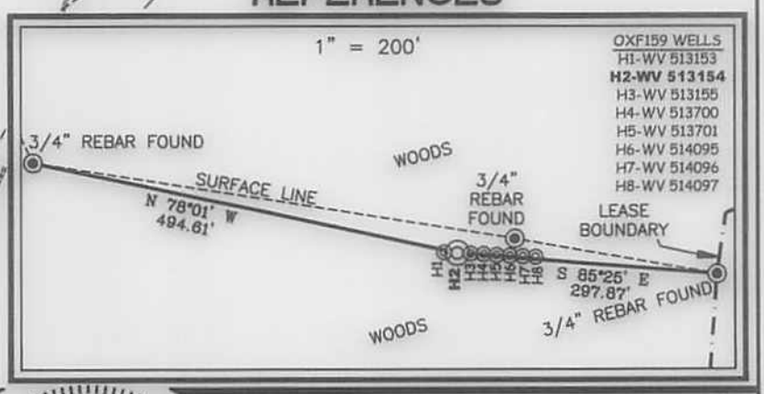
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 260,322.6	E. 1,642,311.7
NAD'27 GEO.	LAT-(N) 39.207840	LONG-(W) 80.762301
NAD'83 UTM (M)	N. 4,339,877.6	E. 520,537.4
	LANDING POINT	
NAD'27 S.P.C.(FT)	N. 258,436.8	E. 1,639,920.2
NAD'27 GEO.	LAT-(N) 39.202570	LONG-(W) 80.770646
NAD'83 UTM (M)	N. 4,339,290.9	E. 519,818.4
	BOTTOM HOLE	
NAD'27 S.P.C.(FT)	N. 262,125.5	E. 1,638,200.1
NAD'27 GEO.	LAT-(N) 39.212630	LONG-(W) 80.776899
NAD'83 UTM (M)	N. 4,340,405.9	E. 519,275.7

LEGEND

LEASE LINE	
SURFACE LINE	
WELL LATERAL	
OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
PLUGGED WELL	
TAX MAP–PARCEL	00–00

REFERENCES



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(304) 462-5634 WWW.SLSSURVEYS.COM

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 DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 Gregory A. Smith

GREGORY A. SMITH LICENSED No. 677 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

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

DATE JANUARY 06 , 20 14

REVISED 3/24/14 & 07/25/14

OPERATORS WELL NO. WV 513154

API WELL NO. 47 — 017 — 06502 H6A
STATE — COUNTY — PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200 FILE NO. 7889P513154R3

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL TYPE: OIL ____ GAS X LIQUID INJECTION ____ WASTE DISPOSAL ____ IF "GAS" PRODUCTION X STORAGE ____ DEEP ____ SHALLOW X

LOCATION :

ELEVATION 1,272'(GROUND) 1,252'(PROPOSED) WATERSHED BLUESTONE CREEK

DISTRICT SOUTHWEST COUNTY DODDRIDGE QUADRANGLE OXFORD 7.5'

SURFACE OWNER JUSTIN L. HENDERSON (LIFE) ACREAGE 187.19 OF 1,602.90±

ROYALTY OWNER LEEMAN MAXWELL HRS ACREAGE 2,164±

PROPOSED WORK : LEASE NO. 706764

DRILL X CONVERT ____ DRILL DEEPER ____ REDRILL ____ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ____ PERFORATE NEW FORMATION ____ PLUG AND ABANDON ____ CLEAN OUT AND REPLUG ____ OTHER ____

PHYSICAL CHANGE IN WELL (SPECIFY) ____ TARGET FORMATION MARCELLUS

ESTIMATED DEPTH TVD 6,663'

COUNTY NAME

PERMIT

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY

ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

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