



---

**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

August 29, 2014

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-1706512, 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: 514076  
Farm Name: HARPER, LUCY E.  
**API Well Number: 47-1706512**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 08/29/2014

**Promoting a healthy environment.**

## 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)

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

1) Well Operator: EQT Production Company

	017	8	526
--	-----	---	-----

  
Operator ID County District Quadrangle

2) Operator's Well Number: 514076 Well Pad Name: OXF150

3) Farm Name/Surface Owner: Lucy E. Harper Public Road Access: CR 11/4

4) Elevation, current ground: 1259 Elevation, proposed post-construction: 1258

5) Well Type (a) Gas  Oil  Underground Storage   
Other

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Target formation is Geneseo at the depth of 6565' with the anticipated thickness to be 42' and anticipated target pressure of 4417 PSI

8) Proposed Total Vertical Depth: 6565

9) Formation at Total Vertical Depth: Geneseo

10) Proposed Total Measured Depth: 13379

11) Proposed Horizontal Leg Length: 5820

12) Approximate Fresh Water Strata Depths: 154, 252, 443, 513

13) Method to Determine Fresh Water Depths: by offset wells

14) Approximate Saltwater Depths: 1388, 1447

15) Approximate Coal Seam Depths: 337, 1323, 1363

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? Yes  No

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

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	MC-50	81	40	40	38 C.T.S.
Fresh Water	13 3/8	New	MC-50	54	1,028	1,028	892 C.T.S.
Coal							
Intermediate	9 5/8	New	MC-50	40	2,895	2,895	1,129 C.T.S.
Production	5 1/2	New	P-110	20	13,379	13,379	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  
5-20-2014*

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.

RECEIVED  
 Office of Oil and Gas  
 MAY 27 2014  
 WV Department of  
 Environmental Protection

WW-6B  
(9/13)

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

Drill and complete a new horizontal well in the Geneseo formation. The vertical drill to go down to an approximate depth of 5296 then kick off the horizontal into the Geneseo using a slick 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): no additional disturbance

22) Area to be disturbed for well pad only, less access road (acres): no additional disturbance

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:

see attached

**RECEIVED**  
Office of Oil and Gas  
AUG 22 2014  
WV Department of  
Environmental Protection

25) Proposed borehole conditioning procedures:

see attached

\*Note: Attach additional sheets as needed.

WW2B

**FROM CASING PLAN**

**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. (Attached)

**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 % Calcium 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 cutting deminish 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

RECEIVED  
Office of Oil and Gas  
AUG 22 2014  
WV Department of  
Environmental Protection



4701706512

---

west virginia department of environmental protection

---

Office of Oil and Gas  
601 57<sup>th</sup> 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  
Environmental Resources Specialist / Permitting



4701706512

west virginia department of environmental protection

Office of Oil and Gas  
601 57<sup>th</sup> 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



August 21, 2014

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

Re: Casing Plan on OXF150

Dear Mr. Smith,

EQT is requesting the 13-3/8" surface casing be set at 1028' KB. The previous wells drilled on this pad set the 13-3/8" casing at approximately 1028' KB. Based on the previous wells, the fresh water and the problematic red rock zones were covered and no drilling issues were seen while drilling the intermediate section. We will set the 9-5/8" intermediate string at 2895' KB, below the base of the Bayard formation.

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

Sincerely,

A handwritten signature in blue ink, appearing to read 'Vicki Roark'.

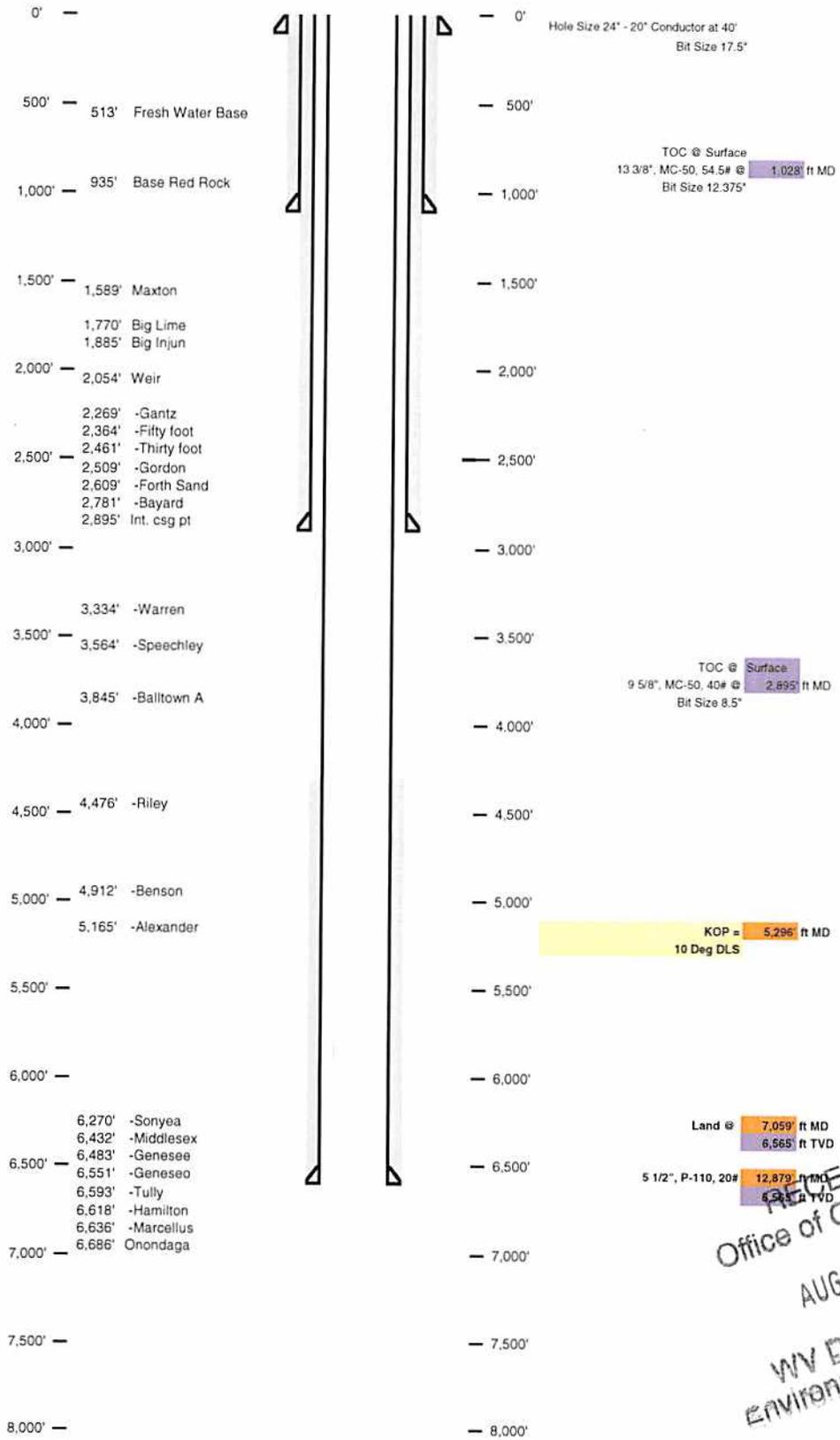
Vicki Roark  
Permitting Supervisor

Enc.

Well Schematic  
EQT Production

Well Name 514076(OXF150H8)  
County Doddridge  
State West Virginia

Elevation KB: 1269  
Target Prospect Genesee  
Azimuth 335  
Vertical Section 6145

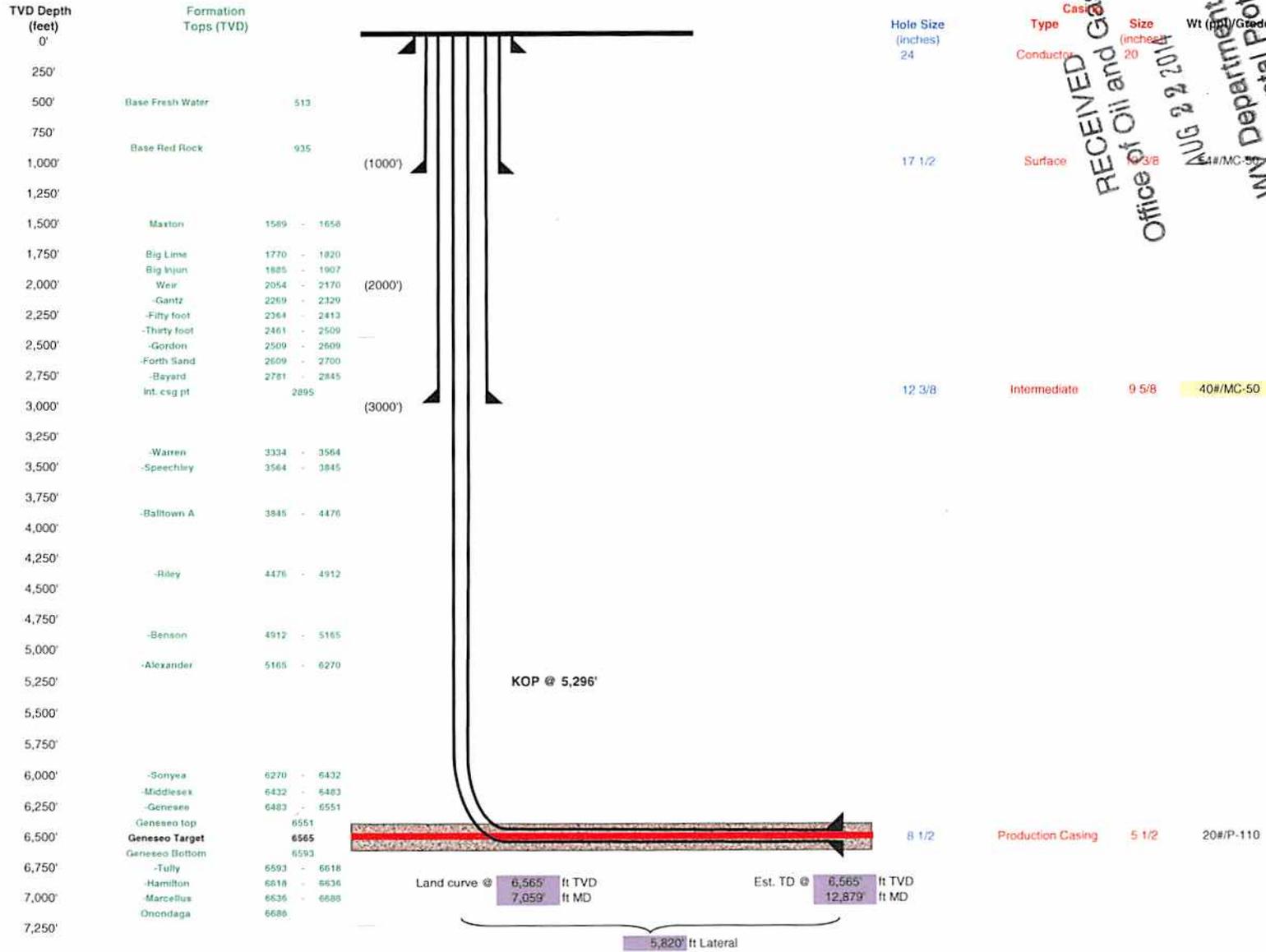


RECEIVED  
Office of Oil and Gas  
AUG 22 2014  
WV Department of  
Environmental Protection

4701706512

Well 514076(OXF150H8)  
 EQT Production  
 Oxford  
 Doddridge West Virginia

Azimuth 335  
 Vertical Section 6145



RECEIVED  
 Office of Oil and Gas  
 AUG 22 2014  
 Environmental Protection  
 Department of

Proposed Well Work:  
 Drill and complete a new horizontal well in the Genesee formation.  
 The vertical drill to go down to an approximate depth of 5296'.  
 Then kick off the horizontal leg into the Genesee using a slick water frac.

**WEST VIRGINIA GEOLOGICAL PROGNOSIS**

Horizontal Well  
514076(OXF15018)

**4701706512**

**Drilling Objectives:** Geneseo  
**County:** Doddridge  
**Quad:** Oxford  
**Elevation:** 1269 KB 1259 GL  
**Surface location** Northing: 266059.2 Easting: 1634159.7  
**Landing Point** Northing: 266536.7 Easting: 1634486.5  
**Toe location** Northing: 271811.4 Easting: 1632026.8  
**Recommended Azimuth** 335 Degrees Recommended LP to TD:

TVD: 6565  
 TVD: 6565  
 5,820'

**Proposed Logging Suite:**

**Formation top depths based on pilot hole log run on well 512473**  
 @ **Intermediate Casing Point:** The open hole logs need to consist of Gamma Ray, Neutron, Density, Induction and Dipole Sonic. **CONTACT LUKE SCHANKEN PRIOR TO LOGGING (412.580.8016)**  
 Mudloggers to be on location at kickoff point to run samples and measure gas thru both the curve and lateral sections.

**Recommended Gas Tests:**

1800, 2050, 2600, Intm Csg. Pt., 3400, 4900, 5250, KOP. (Gas test at any mine void)  
 Gas test during any trip or significant downtime while drilling the lateral section.

Possible red rock at: 251,333,426,481,552,683,773,869,902,935, ...

**ESTIMATED FORMATION TOPS**

Formation	Top (TVD)	Base (TVD)	Lithology	Comments
Fresh Water Zone	1	513		FW @ 154,252,443,513, .....
Coal	337	343	Coal	
Coal	1323	1328	Coal	Red Rock Possible @ 251,333,426,481,552,683,773,869,902,935, ...
Coal	1363	1369	Coal	
Maxton	1589	1658	Sandstone	SW @ 1388,1447,
Big Lime	1770	1820	Limestone	
Big Injun	1885	1907	Sandstone	
Weir	2054	2170	Sandstone	
Top Devonian	2269			
-Gantz	2269	2329	Silty Sand	
-Fifty foot	2364	2413	Silty Sand	
-Thirty foot	2461	2509	Silty Sand	
-Gordon	2509	2609	Silty Sand	
-Forth Sand	2609	2700	Silty Sand	
-Bayard	2781	2845	Silty Sand	
Int. csg pt	2895			
-Warren	3334	3564	Silty Sand	
-Speechley	3564	3845	Silty Sand	
-Balltown A	3845	4476	Silty Sand	
-Riley	4476	4912	Silty Sand	
-Benson	4912	5165	Silty Sand	
-Alexander	5165	6270	Silty Sand	
-Elks	6270	6270	Gray Shales and Silts	
-Sonyea	6270	6432	Gray shale	
-Middlesex	6432	6483	Shale	
-Genesee	6483	6551	with black shale	
-Genesee	6551	6593	Black Shale	
<b>-Lateral Zone</b>	<b>6565</b>	<b>6565</b>		Start Lateral at 6565 ft, drill to 6565 ft
-Tully	6593	6618	Limestone	
-Hamilton	6618	6636	calcareous shales	
-Marcellus	6636	6686	Black Shale	
-Purcell	6643	6646	Limestone	
-Cherry Valley	6671	6674	Limestone	
Onondaga	6686		Limestone	

Base RR  
935

Target Thickness	42 feet
Anticipated Target Pressure	4417 PSI

**Comments:** Note that this is a TVD prog for a horizontal well. **All measurements taken from estimated KB elevation.** Water and coal information estimated from surrounding well data. Intermediate casing point is recommended 50' beneath the Bayard to shut off any water production from the upper Devonian sands. Intermediate casing should be cemented into the surface string, per WV regulations. The estimated TD is the TVD landing point for the horizontal section of well, with the plan to then drill to a final TVD of 6565' at the toe of the lateral. The geologic structure is unknown at this time.

**LATERAL DRILLING TOLERANCES**

**Mapview - Left of borehole:** Deviate as little as possible left to avoid planned lateral 512483.  
**Mapview - Right of borehole:** Deviate as little as possible right to avoid planned lateral 512476.  
**Mapview - TD:** **DO NOT EXTEND** beyond recommended wellbore to avoid lease line.

**RECOMMENDED CASING POINTS**

**Fresh Water/Coal** CSG OD 13 3/8 CSG DEPTH: 1028  
**Intermediate I:** CSG OD 9 5/8 CSG DEPTH: 2895  
**Production:** CSG OD 5 1/2 CSG DEPTH: @ TD

J. Dereume/ E. Glick Author Date Created Plat Date  
 Prog created: EVG 3/26/2014 3/3/2014  
 changed from UD to geneseo EVG 8/20/2014 7/15/2014

RECEIVED  
 Office of Oil and Gas  
 AUG 22 2014  
 WV Department of  
 Environmental Protection

4701706512

Well Number: 514076(OXF150H8)

Casing and Cementing		Deepest Fresh Water: 513'			
Type	Conductor	Mine Protection	Surface	Intermediate	Production
Hole Size, In.	24		17 1/2	12 3/8	8 1/2
Casing Size, OD In.	20	-	13 3/8	9 5/8	5 1/2
Casing Wall Thickness, In.	0.375	-	0.380	0.395	0.361
Depth, MD	40'	-	1,028'	2,895'	13,379'
Depth, TVD	40'	-	1,028'	2,895'	6,565'
Centralizers Used	Yes	-	Yes	Yes	Yes
Weight/Grade	81#/MC-50	-	54#/MC-50	40#/MC-50	20#/P-110
New or Used	New	-	New	New	New
Pressure Testing	-	-	20% Greater than exp. Pressure	20% Greater than exp. Pressure	20% greater than exp. fracture pressure
After Fracture Pressure Testing	-	-	-	-	20% greater than exp. shut pressure
ID, in	19.25	-	12.615	8.835	4.778
Burst (psi)	-	-	2,480	3,590	12,640
Collapse (psi)	-	-	1,110	2,470	11,100
Tension (mlbs)	-	-	455	456	587
Cement Class	-	-	-	-	H
Cement Type	Construction	-	1	1	-
Cement Yield	1.18	-	1.21	1.21	1.27/1.86
Meets API Standards	-	-	Yes	Yes	Yes
WOC Time	-	-	Min. 8 hrs	Min. 8 hrs	Min. 8 hrs
Top of Cement (Planned)	Surface	-	Surface	Surface	4,296'
Fill (ft.)	40'	-	1,028'	2,895'	8,583'
Percent Excess	-	-	20	20	10
Est. Volume (cu ft)	38	-	892	1,129	2,189
Est. Volume (BBLs)	7	-	159	201	390

RECEIVED  
Office of Oil and Gas  
AUG 28 2014  
WV Department of  
Environmental Protection

WW-9  
(5/13)

Page \_\_\_\_\_ of \_\_\_\_\_  
API No. 47 - 017 - 0  
Operator's Well No. 514076

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) Lefr Fork Arnold Creek Quadrangle Oxford 7.5

Elevation 1258.0 County Doddridge District West Union

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 \_\_\_\_\_ )

*DCW  
5-20-2014*

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, Lime, 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.

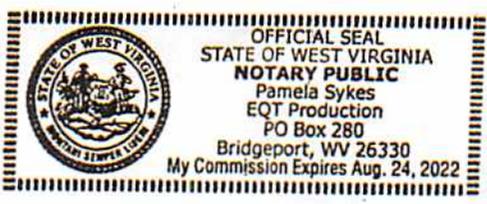
Company Official Signature *Victoria J. Roark*  
Company Official (Typed Name) Victoria J. Roark  
Company Official Title Permitting Supervisor

Subscribed and sworn before me this 15 day of May, 20 14

*Pamela Sykes* Notary Public

My commission expires 8-24-22 Office of Oil and Gas

RECEIVED  
Office of Oil and Gas  
MAY 27 2014



WV Department of Environmental Protection

Proposed Revegetation Treatment: Acres Disturbed no additional disturbance Prevegetation pH 6.8

Lime 3 Tons/acre or to correct to pH 6.5

Fertilize type \_\_\_\_\_

Fertilizer Amount 13 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: seed + mulch any disturbed areas. Maintain ERS To WV Dep regulations

Title: Oil & Gas inspector

Date: 5-20-2014

Field Reviewed? ( / ) Yes ( \_\_\_\_\_ ) No

RECEIVED  
Office of Oil and Gas  
MAY 27 2014  
WV Department of  
Environmental Protection

**EQT Production Water plan**  
**Offsite disposals for Marcellus wells**

4701706512

**CWS TRUCKING INC.**

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

**BROAD STREET ENERGY LLC**

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

**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

**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

**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

**KING EXCAVATING CO.**

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

**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



4701706512

Where energy meets innovation.™

# Site Specific Safety Plan

EQT OXF150Pad

Oxford

Doddridge County, WV

For Wells:

514075 514076 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date Prepared:

April 11, 2014

[Signature]  
EQT Production  
Permitting Supervisor  
Title  
4-24-14  
Date

[Signature]  
WV Oil and Gas Inspector  
Title  
5-20-2014  
Date

RECEIVED  
Office of Oil and Gas  
MAY 27 2014  
WV Department of  
Environmental Protection

# Section V: BOP and Well Control

4701706512

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

DCW  
5-20-2014

## 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

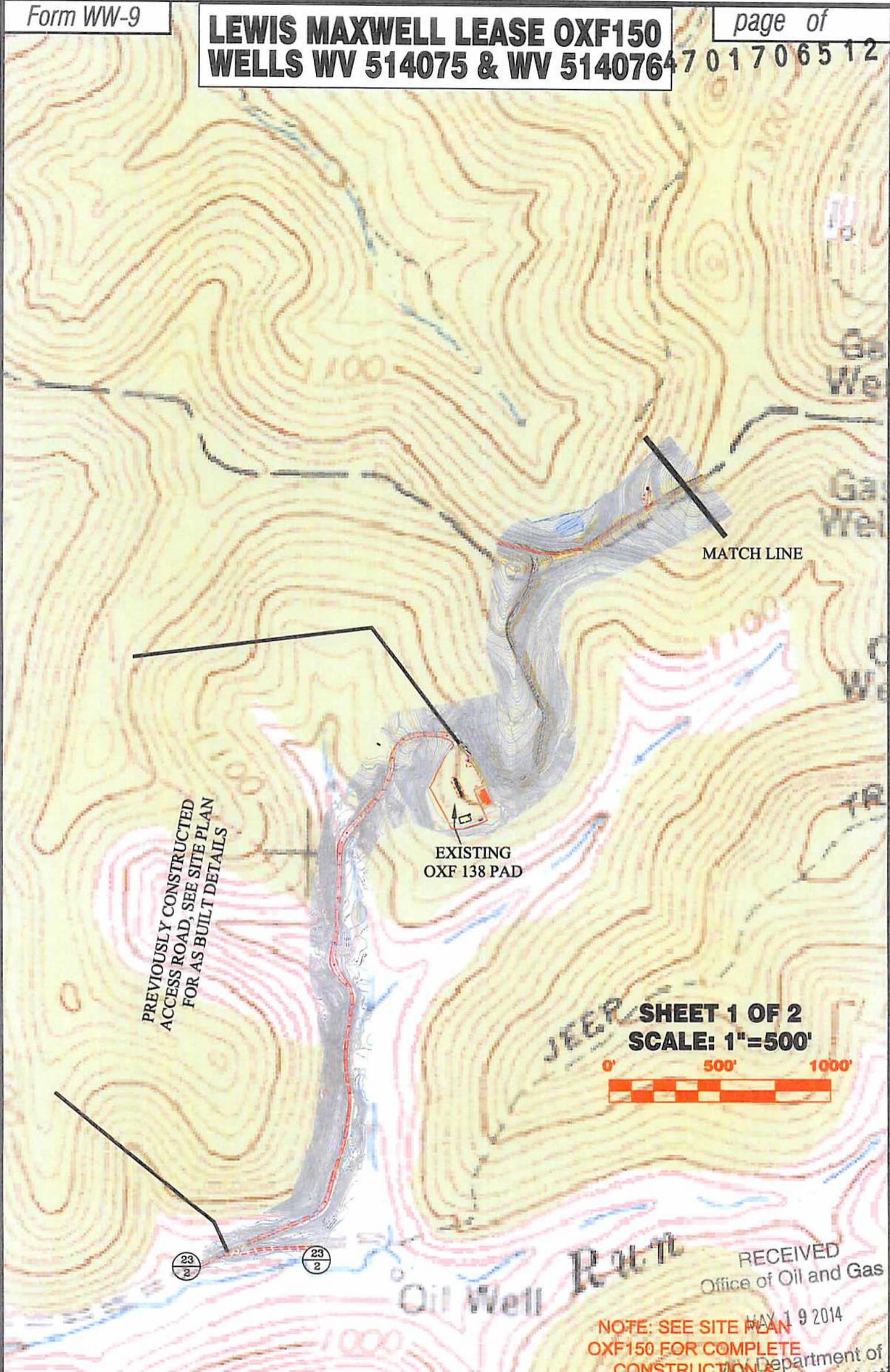
- In the event emergency response personnel and residents surrounding the work site are affected by specific events during the operation they must be notified as soon as possible by the On-site Specialist or their designee.

### Flaring Notifications

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

RECEIVED  
Office of Oil and Gas  
MAY 27 2014  
WV Department of  
Environmental Protection

# LEWIS MAXWELL LEASE OXF150 WELLS WV 514075 & WV 514076



PREVIOUSLY CONSTRUCTED  
ACCESS ROAD, SEE SITE PLAN  
FOR AS BUILT DETAILS

EXISTING  
OXF 138 PAD

MATCH LINE

**SHEET 1 OF 2**  
**SCALE: 1"=500'**



RECEIVED  
Office of Oil and Gas

NOTE: SEE SITE PLAN  
OXF150 FOR COMPLETE  
CONSTRUCTION &  
EROSION & SEDIMENT  
CONTROL DETAILS.

MAY 19 2014

Professional Energy Consultants  
A DIVISION OF SMITHLAND SURVEYING, INC

**SLS**  
SURVEYORS  
ENGINEERS  
ENVIRONMENTAL  
PROJECT MGMT.  
(304) 462-5634  
WWW.SLSURVEYS.COM

DRAWN BY K.D.W.	FILE NO. 6980	DATE 03/20/14	CADD FILE: 6980RECLANOXF150.DWG
--------------------	------------------	------------------	------------------------------------

TOPO SECTION OF USGS  
OXFORD 7.5' QUADRANGLE

4701706512

NOTE: SEE SITE PLAN OXF150 FOR COMPLETE CONSTRUCTION & EROSION & SEDIMENT CONTROL DETAILS.

Gas Well

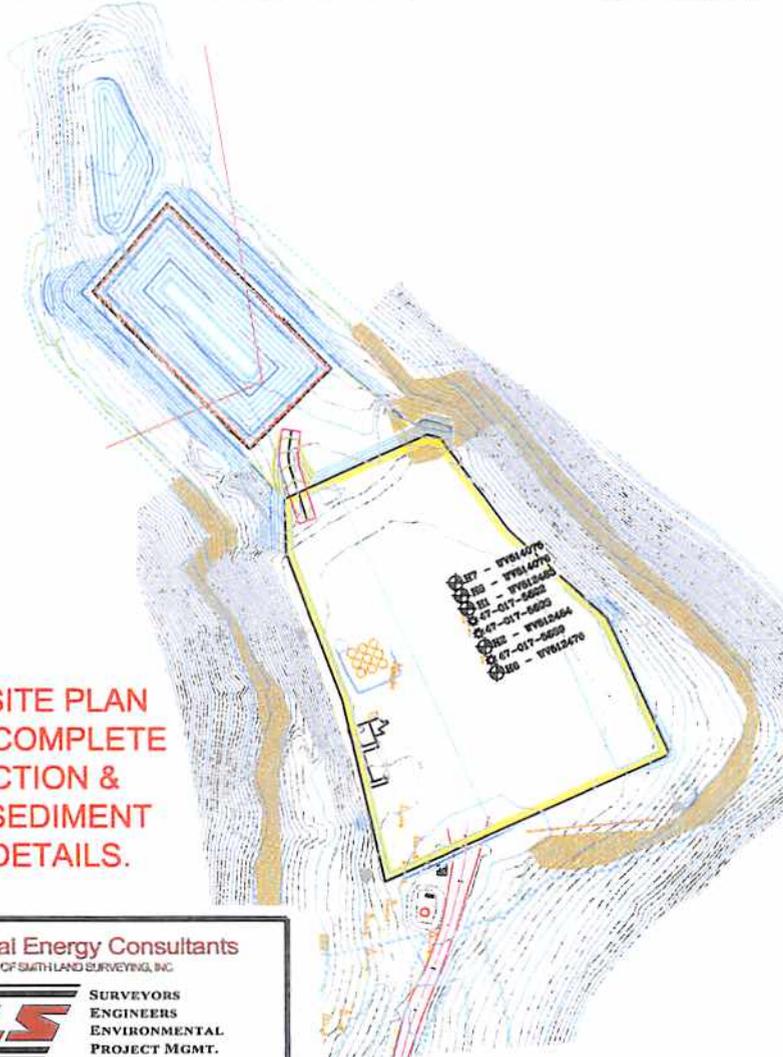
SHEET 2 OF 2  
SCALE: 1"=500'



**LEWIS MAXWELL LEASE OXF150  
WELLS WV 514075 & WV 514076**

Detail Sketch for Proposed Wells WV 514075 & WV 514076

NOT TO SCALE



NOTE: SEE SITE PLAN OXF150 FOR COMPLETE CONSTRUCTION & EROSION & SEDIMENT CONTROL DETAILS.

MATCH LINE

RECEIVED  
Office of Oil and Gas

MAY 18 2014

WV Department of  
Environmental Protection

Professional Energy Consultants  
A DIVISION OF SMITH LAND SURVEYING, INC.



**SLS**  
SURVEYORS  
ENGINEERS  
ENVIRONMENTAL  
PROJECT MGMT.  
(304) 462-5634  
WWW.SLSURVEYS.COM

DRAWN BY K.D.W.	FILE NO. 6980	DATE 03/20/14	CADD FILE: 6980RECPLANOXF150.DWG
--------------------	------------------	------------------	-------------------------------------

TOPO SECTION OF USGS  
OXFORD 7.5' QUADRANGLE

**EQT PRODUCTION COMPANY  
LEWIS MAXWELL LEASE  
2,654 ACRES±  
WELL NO. WV 514076**

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

NAD'27 S.P.C.(FT) N. 266,059.2 E. 1,634,159.7  
 NAD'27 GEO. LAT-(N) 39.223270 LONG-(W) 80.791357  
 NAD'83 UTM (M) N. 4,341,583.8 E. 518,024.8

**LANDING POINT**

NAD'27 S.P.C.(FT) N. 266,536.7 E. 1,634,486.5  
 NAD'27 GEO. LAT-(N) 39.224594 LONG-(W) 80.790228  
 NAD'83 UTM (M) N. 4,341,730.9 E. 518,121.9

**BOTTOM HOLE**

NAD'27 S.P.C.(FT) N. 271,811.4 E. 1,632,026.8  
 NAD'27 GEO. LAT-(N) 39.238978 LONG-(W) 80.799178  
 NAD'83 UTM (M) N. 4,343,325.3 E. 517,345.8

**LEGEND**

LEASE LINE	---
SURFACE LINE	----
WELL LATERAL	-----
OFFSET LINE	- - - - -
TIE LINE	.....
CREEK	~~~~~
DISTRICT LINE	-----
ROAD	-----
COUNTY ROUTE	-----
PLUGGED WELL	⊙
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
TAX MAP-PARCEL	00-00

**REFERENCES**



**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.

NAD' 27 GRID NORTH



**Professional Energy Consultants**  
 A DIVISION OF SMITH LAND SURVEYING, INC.  
  
 SURVEYORS  
 ENGINEERS  
 ENVIRONMENTAL  
 PROJECT MGMT.  
 (304) 462-8834 WWW.SLSURVEYS.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. 849 *C. Victor Moyers*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE JANUARY 24, 20 14  
 REVISED 03/03/14, 07/15/14 & 08/26/14  
 OPERATORS WELL NO. WV 514076  
 API WELL NO. 47-017-06512  
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 6980P514076R3  
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2,000'

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 1,259' (GROUND) 1,258' (PROPOSED) WATERSHED LEFT FORK ARNOLD CREEK  
 DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE OXFORD 7.5'  
 SURFACE OWNER LUCY E. HARPER ACREAGE 442.6±  
 ROYALTY OWNER LEWIS MAXWELL HEIRS LEASE ACREAGE 2,654±  
 PROPOSED WORK:  
 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 GENESEO ESTIMATED DEPTH TVD 6542'

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY  
 ADDRESS 115 PROFESSIONAL PLACE BRIDGEPORT, WV 26330 P.O. BOX 280 ADDRESS 115 PROFESSIONAL PLACE BRIDGEPORT, WV 26330 P.O. BOX 280

COUNTY NAME PERMIT