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

September 03, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706527, 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: 514073
Farm Name: HARPER, LUCY E.
API Well Number: 47-1706527
Permit Type: Horizontal 6A Well
Date Issued: 09/03/2014

Promoting a healthy environment.

09/05/2014

API Number: 4701706527

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.

09/05/2014

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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: 514073 Well Pad Name: OXF149

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

4) Elevation, current ground: 1240 Elevation, proposed post-construction: 1242.5

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 6589' with the anticipated thickness to be 38' and anticipated target pressure of 4431 PSI

8) Proposed Total Vertical Depth: 6589

9) Formation at Total Vertical Depth: Geneseo

10) Proposed Total Measured Depth: 10207

11) Proposed Horizontal Leg Length: 2630

12) Approximate Fresh Water Strata Depths: 274, 313, 380, 425

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

14) Approximate Saltwater Depths: 1380, 1415, 1462

15) Approximate Coal Seam Depths: 629

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: _____

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(3/13)

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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	905	905	789 C.T.S.
Coal							
Intermediate	9 5/8	New	MC-50	40	3,103	3,103	1,215 C.T.S.
Production	5 1/2	New	P-110	20	10,207	10,207	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							

DCN
6-12-14

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.

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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 5610 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

25) Proposed borehole conditioning procedures:

see attached

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WV Department of
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*Note: Attach additional sheets as needed.

09/05/2014

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 spped 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 theif 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 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

4701706527

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 OXF149

Dear Mr. Smith,

EQT is requesting the 13-3/8" surface casing be set at 905' KB, approximately 50' below the problematic red rock zones that cause issues while drilling the intermediate section. We will set the 9-5/8" intermediate string at 3103' 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,

Vicki Roark
Permitting Supervisor

Enc.

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

09/05/2014

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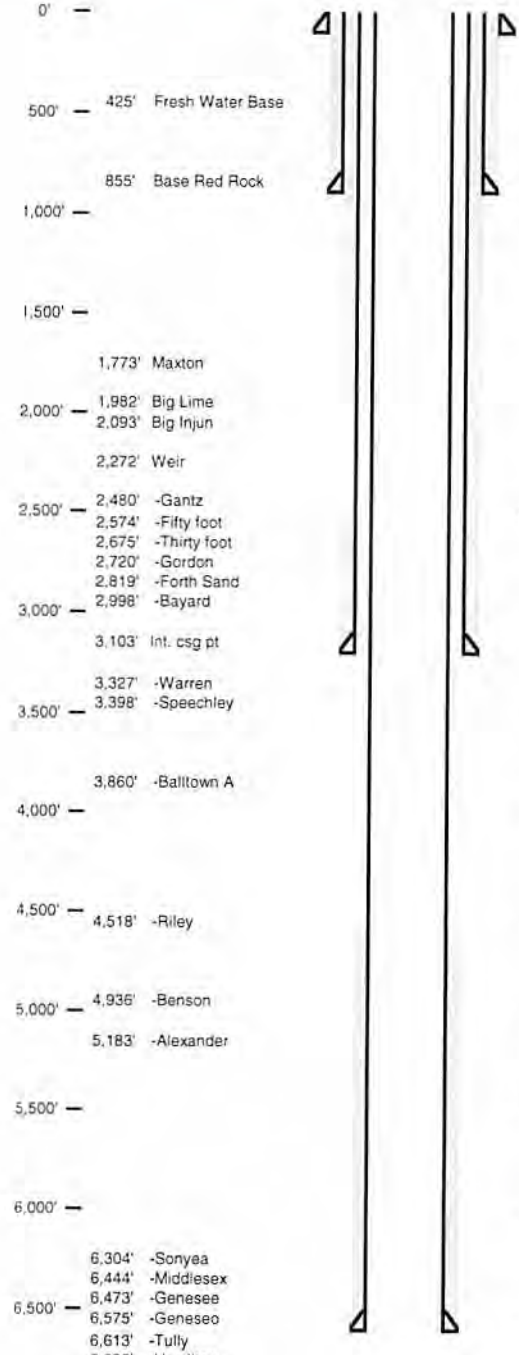
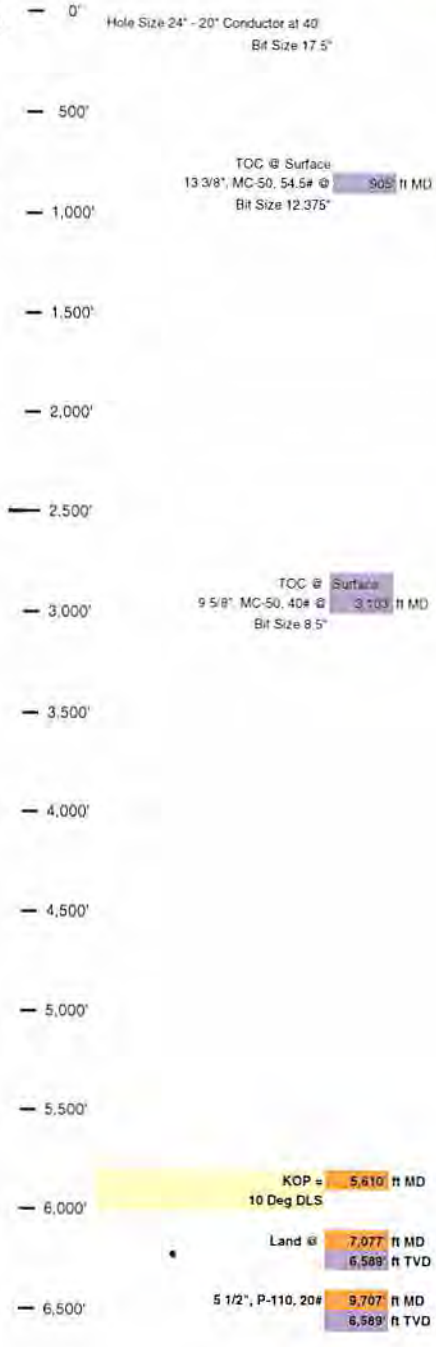
Well Schematic
EQT Production

Well Name	514073 (OXF149HS)
County	Doddridge
State	West Virgina

Elevation KB:	1250
Target	Geneseo
Prospect	
Azimuth	335
Vertical Section	315#





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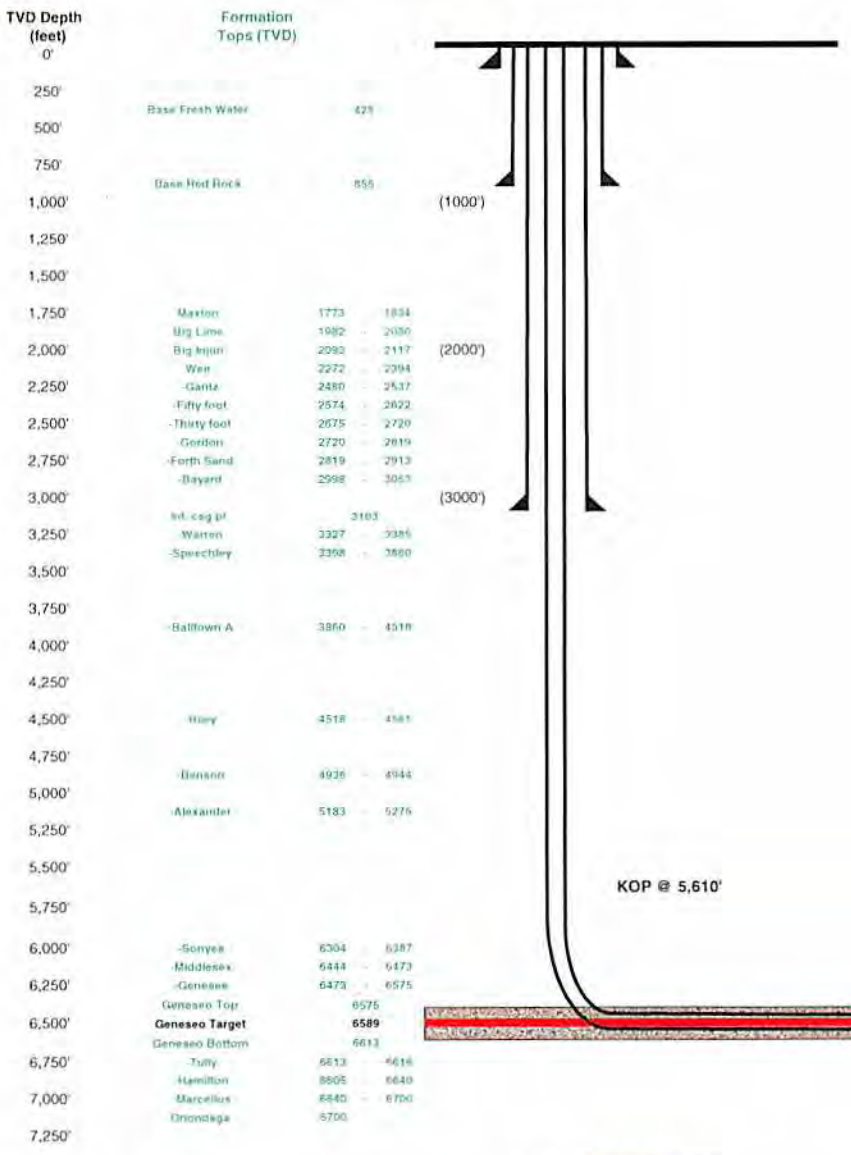
Well 514073 (OXF149H8)
EQT Production
Oxford
Doddridge West Virgina

Azimuth 335
Vertical Section 3156



Hole Size (inches)	Casing Type	Size (inches)	Wt (ppf)/Grade
24	Conductor	20	
17 1/2	Surface	13 3/8	54#/MC-50
12 3/8	Intermediate	9 5/8	40#/MC-50
8 1/2	Production Casing	5 1/2	20#/P-110

Land curve @ 6,589' ft TVD
7,077' ft MD

Est. TD @ 6,589' ft TVD
9,707' ft MD

2,630' ft Lateral

Proposed Well Work:
Drill and complete a new horizontal well in the Geneseo formation.
The vertical drill to go down to an approximate depth of 5610'.
Then kick off the horizontal leg into the Geneseo using a slick water frac.

WEST VIRGINIA GEOLOGICAL PROGNOSIS

Horizontal Well

514073 (OXF149H8)

4701706527

Drilling Objectives:	Geneseo					
County:	Doddridge					
Quad:	Oxford					
Elevation:	1250 KB			1240 GL		
Surface location	**Northing:**	265312.1	**Easting:**	1631380.5		
Landing Point	**Northing:**	265971.8	**Easting:**	1631656.6	**TVD:**	6589
Toe location	**Northing:**	268355.4	**Easting:**	1630545.1	**TVD:**	6589
Recommended Azimuth	335 Degrees			**Recommended LP to TD:**		2,630'

Proposed Logging Suite: 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 232,285,328,628,680,855, ... Base RR 855

ESTIMATED FORMATION TOPS

Formation	Top (TVD)	Base (TVD)	Lithology	Comments
Fresh Water Zone	1	425		FW @ 274,313,380,425, ...
Coal	629	632	Coal	Red Rock Possible @ 232,285,328,628,680,855, ...
Maxton	1773	1834	Sandstone	SW @ 1380,1415,1462
Big Lime	1982	2030	Limestone	
Big Injun	2093	2117	Sandstone	
Weir	2272	2394	Sandstone	
Top Devonian	2480			
-Gantz	2480	2537	Silty Sand	
-Fifty foot	2574	2622	Silty Sand	
-Thirty foot	2675	2720	Silty Sand	
-Gordon	2720	2819	Silty Sand	
-Forth Sand	2819	2913	Silty Sand	
-Bayard	2998	3053	Silty Sand	
Int. csg pt	3103			
-Warren	3327	3385	Silty Sand	
-Speechley	3398	3860	Silty Sand	
-Balltown A	3860	4518	Silty Sand	
-Riley	4518	4561	Silty Sand	
-Benson	4936	4944	Silty Sand	
-Alexander	5183	5275	Silty Sand	
-Elks	5275	6304	Gray Shales and Silts	
-Sonyea	6304	6387	Gray shale	
-Middlesex	6444	6473	Shale	
-Genesee	6473	6575	with black shale	
-Geneseo	6575	6613	Black Shale	
-Lateral Zone	**6589**	**6589**		**Start Lateral at 6589 ft, drill to 6589 ft**
-Tully	6613	6616	Limestone	
-Hamilton	6605	6640	calcareous shales	
-Marcellus	6640	6700	Black Shale	
-Purcell	6655	6663	Limestone	
-Cherry Valley	6680	6683	Limestone	
Onondaga	6700		Limestone	

Target Thickness	38 feet
Anticipated Target Pressure	4431 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 6589' 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 512478
Mapview - Right of borehole:	Deviate as little as possible right to avoid planned lateral 512482
Mapview - TD:	DO NOT EXTEND beyond recommended wellbore to avoid leaseline.

RECOMMENDED CASING POINTS

Fresh Water/Coal	CSG OD	13 3/8	CSG DEPTH:	425	50' below red rock
Intermediate 1:	CSG OD	9 5/8	CSG DEPTH:	3103	
Production:	CSG OD	5 1/2	CSG DEPTH:	@ TD	

	Author	Date Created	Plat Date
J. Dereume/ E. Glick			
Prog created:	EVG	3/24/2014	2/28/2014
changed from UD to Geneseo	EVG	8/20/2014	7/15/2014

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WV Department of
Environmental Protection

SSP 09/05/2014

Well Number: 514073 (OXF149H8)

Casing and Cementing				Deepest Fresh Water: 425'	
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'**	-	**905'**	**3,103'**	**10,207'**
Depth, TVD	**40'**	-	**905'**	**3,103'**	**6,589'**
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	4,610'
Fill (ft.)	40'	-	905'	3,103'	5,097'
Percent Excess	-	-	20	20	10
Est. Volume (cu ft)	38	-	789	1,215	1,310
Est. Volume (BBLS)	7	-	141	216	233

4701706527

west virginia department of environmental protection

Office of Oil and Gas
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Charleston, WV 25304
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(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

09/05/2014

4701706527

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.

09/05/2014

4701706527

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

09/05/2014

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Page ____ of ____

WW-9
(5/13)

API No. 47 - 017 - 0
Operator's Well No. 514073

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) Left Fork Arnold Creek Quadrangle Oxford 7.5

Elevation 1242.5 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 _____)

UIC N 6-12-14

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 15 day of May, 20 14

_____ Notary Public

My commission expires 8.24.22

09/05/2014

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Pamela Sykes
EQT Production
PO Box 280
Bridgeport, WV 26330
My Commission Expires Aug. 24, 2022

WW-9

4701706527

Operator's Well No. 514073

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 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: Seed & Mulch any disturbed areas, maintain E&S

Title: Oil & Gas Inspector Date: 6-12-14

Field Reviewed? (✓) Yes ( ) No

09/05/2014

EQT Production Water plan
Offsite disposals for Marcellus wells

4701706527

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

09/05/2014

4701706527

EQT

Where energy meets innovation.™

Site Specific Safety Plan

EQT OXF149 Pad

Oxford

Doddridge County, WV

For Wells:

514073 514074

Date Prepared: April 11, 2014

EQT Production

Permitting Supervisor
Title

4-24-14
Date

Douglas Newlon
WV Oil and Gas Inspector

Title

6-12-14
Date

09/05/2014

Section V: BOP and Well Control 4701706527

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

DLW 6-12-14

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.

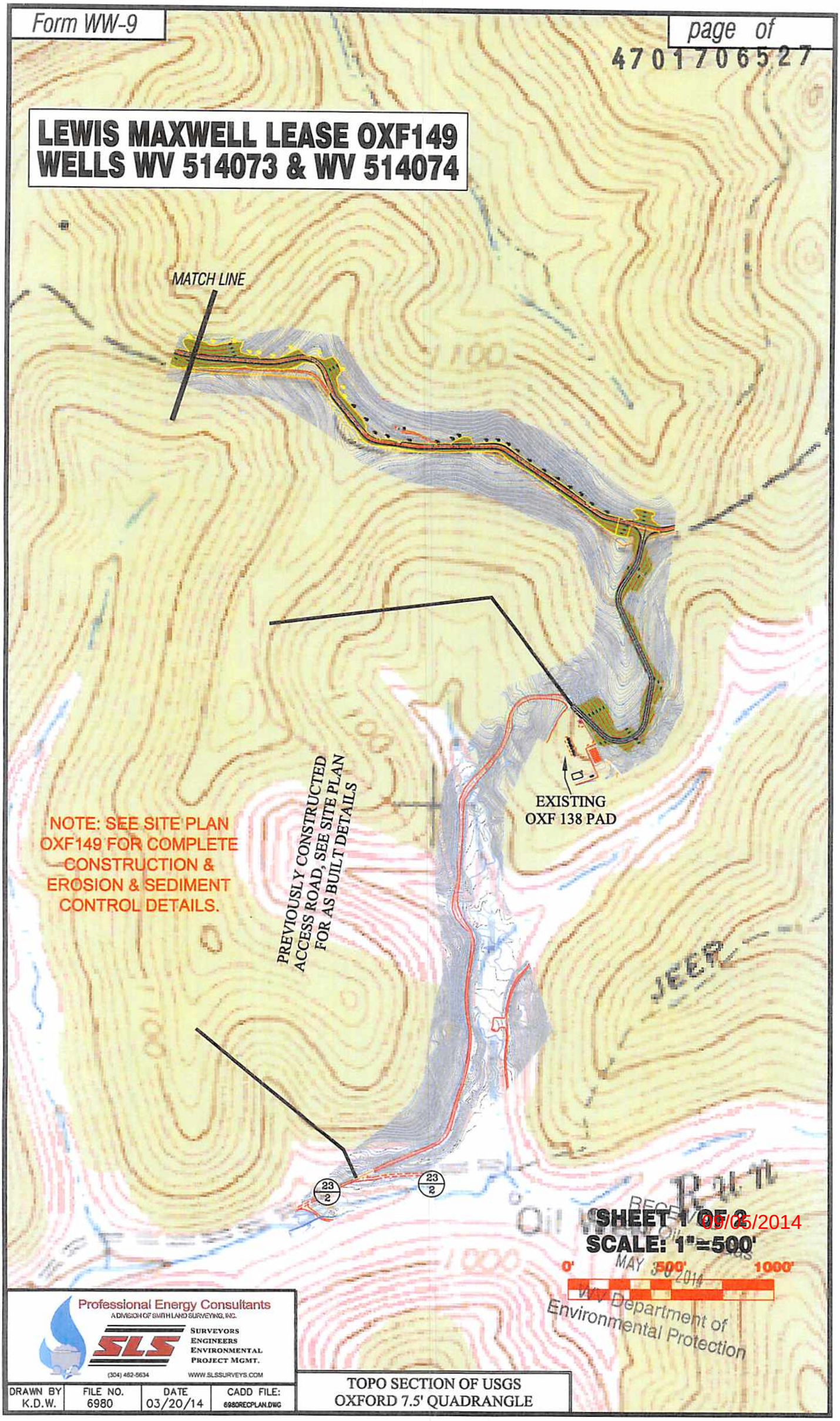
09/05/2014

Form WW-9

page of

4701706527

LEWIS MAXWELL LEASE OXF149
WELLS WV 514073 & WV 514074



09/05/2014

MAY 30 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.SLSSURVEYS.COM

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

TOPO SECTION OF USGS
OXFORD 7.5' QUADRANGLE

Form WW-9

page of

4701706527

LEWIS MAXWELL LEASE OXF149
WELLS WV 514073 & WV 514074

Detail Sketch for Proposed Wells
WV 514073 & WV 514074

NOT TO SCALE

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TOPO SECTION OF USGS
OXFORD 7.5' QUADRANGLE

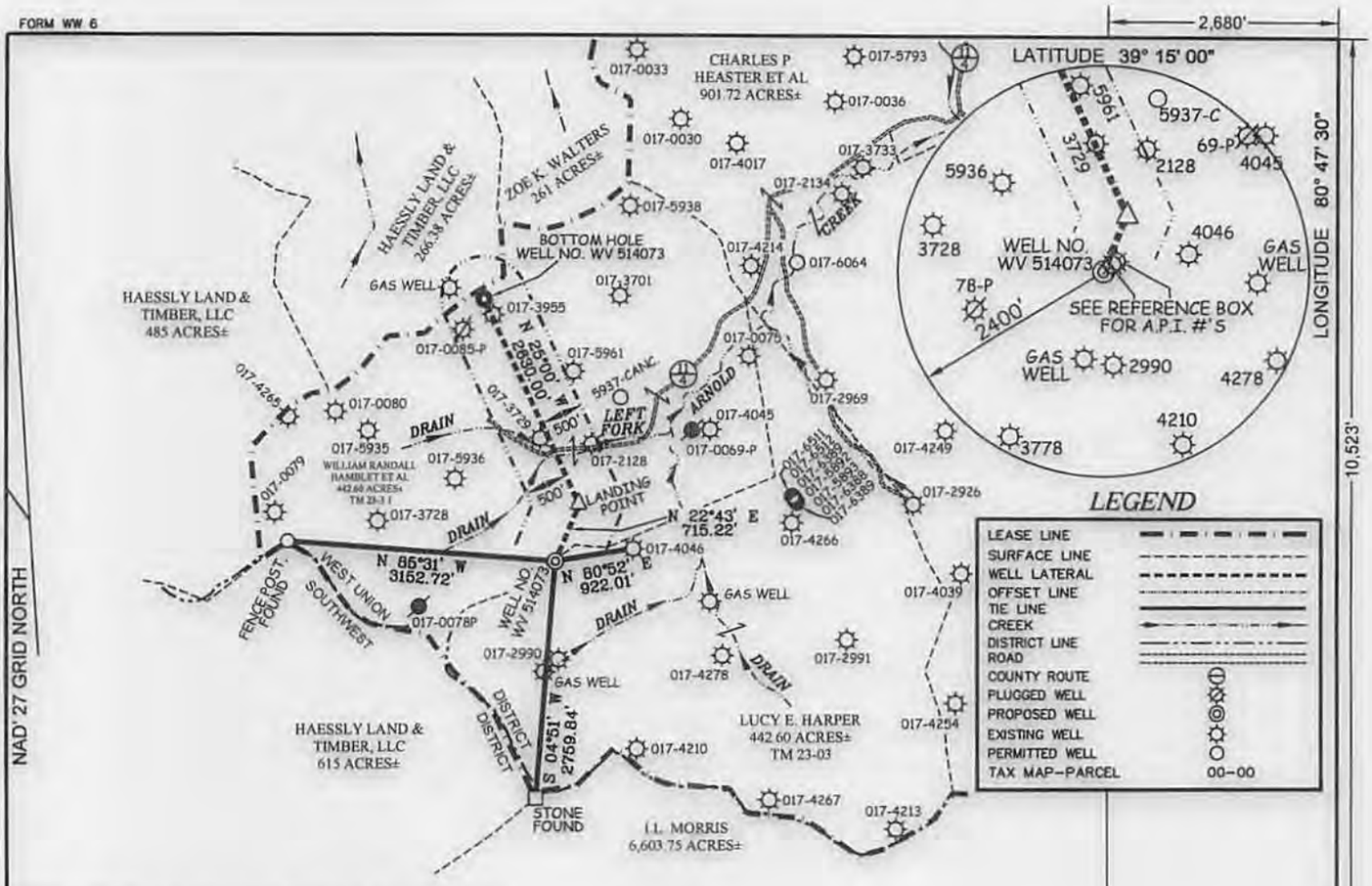
09/05/2014

RECEIVED
Office of Oil and Gas

MAY 30 2014

WV Department of
Environmental Protection

FORM WW 6



EQT PRODUCTION COMPANY
LEWIS MAXWELL LEASE
2,654 ACRES±
WELL NO. WV 514073

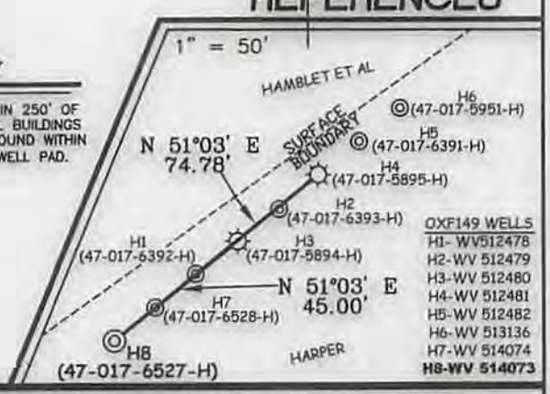
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 265,312.1	E. 1,631,380.5
NAD'27 GEO.	LAT-(N) 39.221109	LONG-(W) 80.801128
NAD'83 UTM (M)	N. 4,341,342.0	E. 517,181.9
LANDING POINT		
NAD'27 S.P.C.(FT)	N. 265,971.8	E. 1,631,656.6
NAD'27 GEO.	LAT-(N) 39.222931	LONG-(W) 80.800187
NAD'83 UTM (M)	N. 4,341,544.4	E. 517,262.7
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 268,355.4	E. 1,630,545.1
NAD'27 GEO.	LAT-(N) 39.229431	LONG-(W) 80.804232
NAD'83 UTM (M)	N. 4,342,264.9	E. 516,911.9

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.

REFERENCES



Professional Energy Consultants
A DIVISION OF SMITH LAND SURVEYING INC.
SLS SURVEYORS ENGINEERS ENVIRONMENTAL PROJECT MGMT.
(304) 462-8634 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 24 , 20 14

REVISED 02/28/14, 07/15/14 & 08/06/14

OPERATORS WELL NO. WV 514073

API WELL NO. 47 — 017 — 06527 H6A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200

FILE NO. 6980P514073R3

SCALE 1" = 2,000'

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

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 1,240' (GROUND) 1,242.5'(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± 09/05/2014

PROPOSED WORK : LEASE NO. 080616

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 6571'

COUNTY NAME

PERMIT

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY

ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280

BRIDGEPORT, WV 26330 BRIDGEPORT, WV 26330