

### 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

February 23, 2015

# WELL WORK PERMIT Horizontal 6A Well

This permit, API Well Number: 47-1706688, issued to NOBLE ENERGY, INC., 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: OXF 98 GHS

Farm Name: BRITTON, MICHAEL & PRATT, A

API Well Number: 47-1706688

Permit Type: Horizontal 6A Well

Date Issued: 02/23/2015

API Number: 4701706688

# **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. A toe bench shall be utilized on the construction of the excess spoil disposal fill located to the south of the well pad per Detail 18/22 Controlled Fill Embankment.
- 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.
- 3. 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.
- 4. 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.
- 5. 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.
- 6. 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.
- 7. 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.
- 8. 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.
- 9. 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.

API Number: 4701706688

# **PERMIT CONDITIONS**

10. 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.

## STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS WELL WORK PERMIT APPLICATION \$ 526

					D	
1) Well Operator:	Noble Energy	, Inc.	494501907	017-Doddridge	West Union	Oxford
			Operator ID	County	District	Quadrangle
2) Operator's Wel	Number: OX	F 98 GHS	Well Pad	Name: OXF	98	
3) Farm Name/Sur	face Owner:	Briton/Pratt	Public Road	d Access: Cou	inty Route	50/30
4) Elevation, curre	nt ground:	1150'	Elevation, proposed p	oost-constructio	on: 1119'	
5) Well Type (a	Gas	Oil _	Unde	rground Storag	е	
O	her					
(b	)If Gas Sha	llow _	Deep			
	Hor	rizontal _				
6) Existing Pad: Y	es or No No					
	2.5	), Depth(s), Ant 'Thick / 4400	icipated Thickness a psi	nd Associated I	Pressure(s):	;
8) Proposed Total	Vertical Dept	h: 6657'				
9) Formation at To	otal Vertical D	epth: Marcell	us			
10) Proposed Tota	l Measured D	epth: 13,912	,			
11) Proposed Hori	zontal Leg Le	ngth: 6,081'				
12) Approximate I	Fresh Water S	trata Depths:	213',363',419'			
13) Method to Det	ermine Fresh	Water Depths:	nearest offset well	s		
14) Approximate S	Saltwater Dep	ths: 1631'				
15) Approximate (	Coal Seam De	pths: None				
16) Approximate I	Depth to Possi	ble Void (coal i	mine, karst, other):	None		
17) Does Proposed directly overlying				No	V	
(a) If Yes, provid	le Mine Info:	Name: NA	<u>.                                    </u>			
		Depth:				
		Seam:				
	ad	Owner:				
Receiv Office of Oi	eu I & Gas			Received		
OF 23				e of Oil & Ga	as	

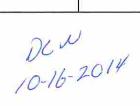
18)

# CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20"	New	LS	94	40'minimum or to the next component formation, but no deeper than 1st freshwater.	40'	fill/soil
Fresh Water	13 3/8"	New	J-55	54.5	569	569'	CTS 30% excess Yield =1.18
Coal		New					
Intermediate	9 5/8"	New	HCK-55	36.0	2716' or 250' below the 5th sand	2716'	CTS 20% excess Yield = 1,19
Production	5 1/2"	New	HCP-110	20.0	13,912'	13,912'	10% excess Yield = 1.27 TOC=200' above 9.625" shoe
Tubing							
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	24"	0.438	2730		CTS
Fresh Water	13 3/8"	17.5"	.380	2730	Type 1	30% excess Yield = 1.18
Coal						
Intermediate	9 5/8"	12 3/8"	.352	3520	Class A	20% excess Yield = 1.19 to surface
Production	5 1/2"	8.75" -8.5"	.361	12,640	Class A	10% excess Yield = 1.27 TOC=200' above 9.625" shoe
Tubing						
Liners						

**PACKERS** 



Received Office of Oil & Gas 0CT 2 3 2014

Received
Office of Oil & Gas
NOV 1 0 2014

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:
Drill the vertical depth to the Marcellus at an estimated total vertical depth of approximately 6657 feet. Drill Horizontal leg - stimulate and produce the Marcellus Formation. Should we encounter Red Rock, we would sit 13 3/8 into next component formation, but not deeper than elevation. Should we encounter a unanticipated void we will install a minimum of 20' of casing below the void but not more than 100' below the void, set a basket and grout to surface.
g color and color and not make the color and color and great to color and co
20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:
The stimulation will be multiple stages divided over the lateral length of the well. Stage spacing is dependent upon engineering design. Slickwater fracturing technique will be utilized on each stage using sand, water, and chemicals. our maximum pressure is not to exceed 10,000 lbs. Please refer to attached list.
21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres):
22) Area to be disturbed for well pad only, less access road (acres):
23) Describe centralizer placement for each casing string:
Conductor - No centralizers used. Fresh Water/Surface - Bow spring centralizers on first two joints then every third joint to 100' from surface. Intermediate - Bow Springs centralizers every third joint to 100' from Surface. Production - Rigid bow
springs every third joint from KOP to TOC, rigid bow springs every joint to KOP.
springs every third joint from KOP to TOC, rigid bow springs every joint to KOP.
springs every third joint from KOP to TOC, rigid bow springs every joint to KOP.
24) Describe all cement additives associated with each cement type:

25) Proposed borehole conditioning procedures:

Conductor - The hole is drilled w/ air and casing is run in air. Apart from insuring the hole is clean via air circulation at TD, there are no other conditioning procedures. Fresh Water/Surface -The hole is drilled w/air and casing is run in air. Once casing is at setting depth, circulate a minimum of one hole volume prior to pumping cement. Intermediate - Once surface casing is set and cemented Intermediate hole is drilled either on air or SOBM and filled w/ KCI water once filled w/ KCI water once drilled to TD. The well is conditioned with KCI circulation prior to running casing. Once casing is at setting depth, the well is circulated a minimum of one hole volume prior to pumping cement. Production - The hole is drilled with synthetic oil base mud and once at TD the hole is circulated at maximum allowable drilling pump rate for at least 6X bottoms up. Once on bottom with casing, circulate a minimum of one hole volume prior to pumping cement.

Received

Office of Oil & Gas

OCT 23 2014

\*Note: Attach additional sheets as needed.

Received
Office of Oil & Gas

	Fresh Water Protetcion String:	Cement Additives	
Allied Material Name	Additive (Material) Type	Additive (Material) Description	CAS#
CCAC (Class A Common)	Base Cement	Grey powder	65997-15-1
			10043-52-4
	200	White flake	7447-40-7
CA-100	Accelerator	VVIIICO, II dano	7732-18-5
			7647-14-5
CLC-CPF (Cellophane Flakes)	Lost Circulation Aid	White and colored flake	Non-Hazardous
			Section 1 to 1

RECEIVED
Office of Oil and Gas

JAN 27 2015

WV Department of Environmental Protection

02/27/2015

5 5 7 7	0CT 2	3 20	14			OXFD-98G-HS	XFD-98G-HS (Marcellus HZ)
ener	-					Macellus Shal	e Horizontal
	(					Doddrid	je, WV
			OXFD-9	8G SHL	(Lat/Long)	(27697	(276976.56N, 1631986.02E) (NAD27)
1119	•		OXFD-	98G LP	(Lat/Long)	(27721	(277211.44N, 1632881.72E) (NAD27)
335.4	9°		OXFD-9	8G BHL	(Lat/Long)	(28308	(283086.96N, 1630206.57E) (NAD27)
E CASING	GEOLOGY	MD	TVD	MUD	CEMENT	CENTRALIZERS	CONDITIONING
20" 94#	Conductor		40	AIR	To Surface	N/A	Ensure the hole is clean at TD.
				AIR	15.6 ppg Type 1 + 2% CaCl, 0.25# Lost Circ 30% Excess	Bow Spring on first 2 joints then every third joint to 100' form	Fill with KCI water once drilled to TD. Once casing is at setting depth, circulate a minimum of one hole
	Surface Casing		569		Yield = 1.18	surface	volume prior to pumping cement.
	Maxton		1968		15.6ppg Class A +0.4% Ret, 0.15% Disp,		Fill with KCl water once
	Cig injun (Cirior)		107		0.2% AntiFoam,	Bow spring centralizers	is at setting depth, circulate
-	Weir		2308	AIR	0.125#/sk Lost Circ 20% Excess	every third joint to 100' feet from surface.	a minimum of one hole
	70,00		10 10		Yield=1.19		cement.
	Int. Casing		2716		To Surface		
	Speechlev		3371	9.0ppg -	14.8ppg Class A 25:75:0	Rigid Bow Spring every third joint from KOP to	
ertical	Riley		4453	SOBM	+2.6% Cement	ТОС	
	Benson		4983		Loss additive, 0.45%		Once at TD, circulate at max allowable pump rate
5-1/2"	Alexander		5227	12.0ppg-	high temp retarder, 0.2% friction reducer		for at least 6x bottoms up.
	Tully Ls		6585	SOBM Edde:71		,	Once on bottom with casing, circulate a minimum
IXPBIC	Hamilton		6604		10% Excess Yield=1.27	every	of one hole volume prior to
	Marcellus		6612	19 0000-	100	John to Ron	pumping cement.
7al 8.5	TD	13912	6657	12.5ppg	above 9.625" shoe		
	Onondaga		6667	COM			
7831'	8.75 / 8.1	5 Hole - 0	Cemented Lo	ng String	>	+/-608	+/-6081' ft Lateral
		1119' 335.49° CASING GEOLOGY  CASING GEOLOGY  20"94#  COnductor  335.45#  J-55 BTC  Surface Casin  Maxton  Big Injun (Gmt  9-5/8" 36# HCK-55 LTC Berea Ss Int. Casing Bayard Speechley Riley Benson 5-1/2" HCP-110 TVP BTC Hamilton Marcellus TD Onondaga	1119' 335.49° CASING GEOLOGY  CASING GEOLOGY  335.49°  CASING GEOLOGY  13-3/8" 54.5#  1-55 BTC  Surface Casin  Maxton  Big Injun (Gmt  9-5/8" 36#  HCK-55 LTC  Surface Casin  Maxton  Big Injun (Gmt  9-5/8" 36#  Weir  Berea Ss  Int. Casing  Bayard  Speechley  Riley  Benson  5-1/2" Alexander  Tully Ls  TD  Onondaga  A.575	1119' 335.49° CASING GEOLOGY MD  20" 94#  13-3/8" 54.5#  1-55 BTC  Surface Casing Maxton Big Injun (Gmbr) 9-5/8" 36# HCK-55 LTC Berea Ss Int. Casing Bayard Speechley Riley Benson 5-1/2" Berea Ss Int. Casing HCP-110 TXP BTC  Alexander HCP-110 TXP BTC  Onondaga  X. Surface Casing  Maxton  Big Injun (Gmbr)  9-5/8" 36# Weir  Berea Ss Int. Casing Bayard Speechley Riley Benson  Marcellus TD 13912  Onondaga	DICT 23 2014	CT 2 3 2014   CXFD-98G SHL (Lat/Long)	OXFD-98G SHL (Lat/Long)

API Number 47 - 017 - 010 0XF 98 GHS

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

## FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Nabla Facery Inc.	70.70.100
Operator Name Noble Energy, Inc.	OP Code 494501907
Watershed (HUC 10) Headwaters Middle Island Creek	Quadrangle Oxford
Elevation 1119' County 017-Doddridge	District_ West Union
Do you anticipate using more than 5,000 bbls of water to complete will a pit be used? Yes No	p-no utilization of a pit  Description of a
Will closed loop system be used? If so, describe: yes	
Drilling medium anticipated for this well (vertical and horizontal)?	Air, freshwater, oil based, etc. Air/water based must through intermediate string then
-If oil based, what type? Synthetic, petroleum, etc.Synthetic	DECEIVED
Additives to be used in drilling medium? Please see attached shee	211100 01 01
Drill cuttings disposal method? Leave in pit, landfill, removed offs	ite, etc
-If left in pit and plan to solidify what medium will be used	1? (cement, lime, sawdust)
-Landfill or offsite name/permit number? please see attac	thed sheet Environmental Protection
on August 1, 2005, by the Office of Oil and Gas of the West Virgin provisions of the permit are enforceable by law. Violations of any law or regulation can lead to enforcement action.	amined and am familiar with the information submitted on this a my inquiry of those individuals immediately responsible for accurate, and complete. I am aware that there are significant
Subscribed and sworn before me this 24 day of 2	, 20_15
July 1	Notary Public
My commission expires 09/19/2023	02/27/2015

Form WW-9

Operator's Well No.\_\_\_\_

Noble Energy, Inc.			**************************************
Proposed Revegetation Treatment: Acres Disturbed Lime 2-3 Tons/acre or to correct 10-20-20 or equal Fertilizer type	to pH		H 6.0
Fertilizer amount 500			
Mulch_ Hay or Straw at 2	Tons/acre		
	Seed Mixture	<u>es</u>	
Temporary		Perma	nnent
Seed Type lbs/acre		Seed Type	lbs/acre
Tall Fescue 40	Tall	Fescue	40
Ladino Clover 5	Lad	ino Clover	5
Attach:  Drawing(s) of road, location, pit and proposed area for lar provided)  Photocopied section of involved 7.5' topographic sheet.	nd application (	unless engineered plans in	cluding this info have been
Plan Approved by: Asugas Asular Comments: Pre seed and mulch all cut area, maintain	all E & S duri	ng operation.	
		Office	Received e of Oil & Gas CT 2 3 2014
Title: Oil and Gas Inspector Field Reviewed? ( ✓ ) Yes (	_ Date:	10-16-2014	Received Office of Oil & G

# **Cuttings Disposal/Site Water**

### **Cuttings – Haul off Company:**

Eap Industries, Inc. DOT # 0876278 1575 Smith Two State Rd. Atlasburg, PA 15004 1-888-294-5227

Waste Management 200 Rangos Lane Washington, PA 15301 724-222-3272

Environmental Coordination Services & Recycling (ECS&R) 3237 US Highway 19 Cochranton, PA 16314 814-425-7773

### **Disposal Locations:**

Apex Environnemental, LLC Permit # 06-08438 11 County Road 78 Amsterdam, OH 43903 740-543-4389

Westmoreland Waste, LLC Permit # 100277 111 Conner Lane Belle Vernon, PA 15012 724-929-7694

Sycamore Landfill Inc. Permit #R30-079001 05-2010 4301 Sycamore Ridge Road Hurricane, WV 25526 304-562-2611

Max Environnemental Technologies, Inc. facility Permit # PAD004835146 / 301071 233 Max Lane Yukon, PA 25968 724-722-3500

Max Environnemental Technologies, Inc. Facility Permit # PAD05087072 / 301359 200 Max Drive Bulger, PA 15019 724-796-1571

Waste Management Kelly Run Permit # 100663 1901 Park Side Drive Elizabeth, PA 15037

Waste Management South Hills (Arnoni) Permit # 100592 3100 Hill Road Library, PA 15129 724-348-7013

Waste Management Arden Permit # 100172 200 Rangos Lane Washington, PA 15301 724-222-3272

Waste Management Meadowfill Permit # 1032 1488 Dawson Drive Bridgeport, WV 26330

Brooke County Landfill Permit # SWF-103-97 / WV 0109029 Rd 2 Box 410 Colliers, WV 26035 304-748-0014 Received
Office of Oil & Gas
OCT 23 2014

Received
Office of Oil & Gas
NOV 1 0 2014

02/27/2015

Wetzel County Landfill Permit # SWF-1021-97 / WV 0109185 Rt 1 Box 156A New Martinsville, WV 26035 304-455-3800

Energy Solutions, LLC Permit # UT 2300249 423 West 300 South Suite 200 Salt Lake City, UT 84101

Energy Solutions Services, Inc. Permit # R-73006-L24 1560 Bear Creek Road Oak Ridge, TN 37830

### **Water Haul off Companies:**

Dynamic Structures, Clear Creek DOT # 720485 3790 State Route 7 New Waterford, OH 44445 330-892-0164

### **Disposal Locations:**

Solidification Waste Management, Arden Landfill Permit # 100172 200 Rangos Lane Washington, PA 15301 724-225-1589

Solidification/Incineration Soil Remediation, Inc. Permit # 02-20753 6065 Arrel-Smith Road Lowelville, OH 44436 330-536-6825

Adams #1 Permit # 34-031-2-7177 23986 Airport Road Coshocton, OH 43812 740-575-4484

Adams #2 Permit # 34-031-2-7178 740-575-4484

Received
Office of Oil & Gas
OCT 2 3 2014

Received
Office of Oil & Gas
NOV 1 0 2014



Site Safety Plan Noble Energy, Inc. **OXF98 Well Pad Doddridge County, WV** October 2014: Version 1

For Submission to West Virginia Department of Environmental Protection, Daughas Newbo Office of Oil and Gas

Noble Energy, Inc. **Appalachia Offices** 

333 Technology Drive, Suite 116

Canonsburg, PA 15317-9504

Received Office of Oil & Gas OCT 23 2014

Received Office of Oil & Gas NOV 1 0 2014

4701706688 \*No Water Wells or Springs within 1,500'\* Received Office of Oil & Ga NOV 1 0 2014 Copyright © 2013 National Geographic Soc OXF 97 SITE SAFETY PLAN - SITE WELL LOCATION energy Projection: NAD 1927 StatePlane West Virginia North FIPS 4701 /27/2015 602

