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**west virginia** department of environmental protection

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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

November 14, 2013

**WELL WORK PERMIT**


**Horizontal 6A Well**

This permit, API Well Number: 47-10302931, issued to STATOIL USA ONSHORE PROPERTIES, 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: JOE JOLLIFFE UNIT 1 5H  
Farm Name: JOLLIFFE, NANCY E. , EXC. JOE

**API Well Number: 47-10302931**

**Permit Type: Horizontal 6A Well**

Date Issued: 11/14/2013

**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

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

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**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION**

103 01 438

1) Well Operator: Statoil USA Onshore Properties Inc. 494505083 Wetzel Center Littleton 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Joe Jolliffe Unit I 5H Well Pad Name: Jolliffe Unit I

3 Elevation, current ground: 1336' Elevation, proposed post-construction: 1336' \*\*already built\*\*

4) Well Type: (a) Gas  Oil   
Other   
(b) If Gas: Shallow  Deep   
Horizontal

5) Existing Pad? Yes or No: Yes

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7-2-13

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):  
Marcellus Shale; Formation Top - 7304' TVD, 50' Thick, 0.67 psi/ft

7) Proposed Total Vertical Depth: 7330'

8) Formation at Total Vertical Depth: Marcellus Shale

9) Proposed Total Measured Depth: 13,671'

10) Approximate Fresh Water Strata Depths: 130' - 320'

11) Method to Determine Fresh Water Depth: Local water well data

12) Approximate Saltwater Depths: 2150'

13) Approximate Coal Seam Depths: 755'

14) Approximate Depth to Possible Void (coal mine, karst, other): N/A

15) Does land contain coal seams tributary or adjacent to, active mine? No

16) Describe proposed well work: Drill and stimulate a horizontal well in the Marcellus Shale.

17) Describe fracturing/stimulating methods in detail:  
The well will be stimulated by multi-stage fracturing using a slickwater fluid.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 4.79 ac \*\*pad already built\*\*

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19) Area to be disturbed for well pad only, less access road (acres): 1.94 ac \*\*pad already built\*\*

20)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill -up (Cu. Ft.)</u>
Conductor	20"	New	H-40	94#	80'	80'	Grouted to surface 120 cu. ft.
Fresh Water	13-3/8"	New	J-55	54.5#	500'	500'	Cement to surface 350 cu. ft.
Coal	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate	9-5/8"	New	J-55	36#	2,606'	2,606'	Cement to surface 860 cu. ft.
Production	5-1/2"	New	P-110	20#	13,671'	13,671'	Cement to 2000 ft, 3150 cu. ft.
Tubing							
Liners							

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<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20"	26"	.876"	1530 psi	Class "A"	1.3 cuft/sk
Fresh Water	13-3/8"	17-1/2"	.76"	2730 psi	Class "A"	1.29 cuft/sk
Coal	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate	9-5/8"	12-1/4"	.704"	3520 psi	Class "A"	1.29 cuft/sk
Production	5-1/2"	8-1/2"	.722"	12,640 psi	Class "A"	2.42 cuft/sk
Tubing						
Liners						

PACKERS

Kind:				<b>Received</b>
Sizes:				
Depths Set:				

21) Describe centralizer placement for each casing string.

Conductor - None

Fresh Water - 1 bow spring centralizer 10' from shoe, 1 bow spring centralizer every 4 joints to surface

Intermediate - 1 bow spring centralizer 10' from shoe, 1 bow spring centralizer every 3 joints to surface

Production - 1 spiroglide centralizer 10' from shoe, 1 spiroglide centralizer mid joint on second joint

1 spiroglide centralizer every joint to 45 deg, 1 bowspring centralizer every other joint to KOP, double bow spring centralizers every fourth joint to 2000'.

22) Describe all cement additives associated with each cement type.

Conductor - None

Fresh Water - Class A Cement with 3% Calcium Chloride

Intermediate - Accelerator (CaCl2), Expansion / Thixotropic (W-60), Retarder (HR-7)

Production (lead) - Gel / Extender (Bentonite), Fluid Loss / Gas Migration (CFL-117), Retarder (HR-7), Defoamer

Production (tail) - Gel / Extender (Bentonite), Fluid Loss / Gas Migration (CFL-117), Retarder (HR-7), solubility enhancer (for acid solubility)

\*\*Note\*\* Names and types of additives may vary depending on vendor availability

23) Proposed borehole conditioning procedures.

\*\*Note\*\* Names and types of additives may vary depending on vendor availability

Fresh Water - Circ. hole clean at TD, Fill casing with water, Pump 20 bbl water, 25 bbl gel spacer, and 5 bbl water.

Fresh Water - Circ. hole clean at TD, Fill casing with water, Pump 20 bbl water, 25 bbl gel spacer, and 5 bbl water.

Production - Circ. hole clean at TD, Pump 50 bbl tuned spacer, 5 bbl water

\*\*Note\*\* tuned spacer is a combination gelled / weighted mud flush spacer, can be substituted with alternating gelled spacers and weighted mud flushes. Borehole conditioning will be dictated by hole conditions.

\*Note: Attach additional sheets as needed.

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OCT 25 2013  
F- WARD

**Cement Additives**

Freshwater – Class A Cement with 3% Calcium Chloride

Intermediate - Accelerator (CaCl<sub>2</sub>), Expansion / Thixotropic (W-60), Retarder (HR-7)

Production (Lead) – Gel / Extender (Bentonite), Fluid Loss / Gas Migration (CFL-117), Retarder (HR-7), Defoamer

Production (Tail) – Gel / Extender (Bentonite), Fluid Loss / Gas Migration (CFL-117), Retarder (HR-7), solubility enhancer (for acid solubility)

NOTE: Names and types of additives may vary depending on vendor availability

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OCT 25 2013  
WV Department of  
Environmental Protection



# Marcellus - Drilling Well Schematic

Well Name: Jolliffe 5H  
 Field Name: Marcellus  
 County: Wetzel  
 API #: \_\_\_\_\_

H2S: No  
 GLE (ft): 1,336  
 Op Area: \_\_\_\_\_  
 RKB (ft): 22  
 BHL: X = 1769195.61 Y = 14393877.71  
 SHL: X = 1765415.76 Y = 14398511.89

103 02931  
 TMD (ft): 7,330  
 TMD (ft): 13,671  
 Profile: Horizontal  
 AFE No.: 00000000

Formations & Csg Points	Depth, ft			Form. Temp. (F)	Pore Press. (EMW)	Frac Gradient (EMW)	Planned MW	Measure Depth (ft)	Program	Details
	MD	TVD	SS							
Conductor	80	80	1,278	-	-	-	-	80		20" Conductor
										17 1/2" Surface
Casing Point	500	500	858	65	-	-	Air/Mist	500		
Approximate fresh water strata 208'										
Red Rocks	1,536			-	-	-				
Big Injun	2,348			-	-	-				
Big Injun (Base)	2,551			-	-	-				
Casing Point	2,606	2,606	-1,248	82	-	>15	10.0	2,606		
FIT/LOT: 15.0 ppg EMW 12 1/4" Intermediate										
Gordon Sand	3,127									
FIT/LOT: 16.0 ppg EMW 8 1/2" Production										
KOP1	3,200	3,200								
Genesee Shale	7,153	-5,795		105	-	-	12.0			
Tully	7,176	-5,818		105	-	-				
Hamilton	7,180	-5,822		117	-	-	12.0			
Marcellus	7,304	-5,946		118	-	-	12.0			
Target Top	7,325	-5,967		118	-	-	12.0			
Landing point	8,376	7,330								
Target Btm	7,335	-5,977		119	-	-				

Profile: Vertical  
 Bit Type: Flat bottom hammer bit  
 BHA: Air Hammer  
 Mud: Air  
 Surveys: Singel shot  
 Logging: none  
 Casing: 13 3/8 in 54.5 # J-55 BTC set @ ~ 500 MD/500 TVD  
 1 every 4 joints  
 Centralizers:  
 Cement: 15.8 ppg Halliburton BondCem™ with 0.35% HR-7 (retarder) ~230 sks  
 Potential Drilling Problems:

FIT/LOT: 15.0 ppg EMW 12 1/4" Intermediate  
 Profile: Nudge for anticollision  
 Bit Type: PDC  
 BHA: Directional  
 Mud: Air and load hole with 10 ppg SOB from 1350' TVD  
 Surveys: MWD/EM  
 Logging:  
 Casing/Liner: 9 5/8 in 36# J-55 LTC/BTC set at 2606ft MD/2606 ft TVD.  
 Liner Hanger: N/A  
 1 every 3 joints  
 Centralizers:  
 Cement: 15.8 ppg Halliburton BondCem™ with 0.35% HR-7 (retarder) ~400 sks  
 Potential Drilling Problems:

FIT/LOT: 16.0 ppg EMW 8 1/2" Production  
 Profile: Horizontal; KOP@ 3200' with a 3 deg/100 ft build/turn  
 Bit Type: 8 1/2" PDC  
 BHA: Directional Assembly (Steerable Motor) + MWD w/ GR  
 Mud: Air/Mist to KOP and SOB to TD  
 Surveys: MWD + GR  
 Logging: Mud Logging the whole interval  
 Casing/Liner: 5 1/2 in 20# P-110 Vam Top HT to 0' to TD @ 13671 ft MD  
 Liner Hanger:  
 Centralizers: 70% stand-off in OH section  
 Cement: Single slurry design: 15.0 ppg to 2,000' Halliburton ShaleCem™ ~ 2320 sks  
 Potential Drilling Problems:  
 Notes / Comments:

TMD: 13,671  
 TVD: 7,330

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Last Revision Date: 06/13/13  
 Revised by: KCN

Note: Depths are referenced to RKB  
 Note: Not Drawn to Scale

22  
 Cement Outside Casing

DMH  
 7-2-13

Office of Oil and Gas  
 WV Dept. of Environmental Protection

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

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM  
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name Statoil USA Onshore Properties Inc. OP Code 494505083

Watershed Tributary of Knob Fork Quadrangle Littleton 7.5'

Elevation 1336' County Wetzel District Center

Description of anticipated Pit Waste: All drilling will be done "closed loop", there will be no earthen pit or pit waste

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

Will a synthetic liner be used in the pit? N/A. If so, what mil.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number 3412123390, 3400922704, 3416727401, 4707302523, 3416729577, 3412123995, 3416729658, 3416729685 )
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air / Freshwater / Soap - Tophole, SOBM - from Red Rocks to TD of Lateral  
-If oil based, what type? Synthetic, petroleum, etc. Synthetic Oil Based Mud

Additives to be used? See Attached

Will closed loop system be used? Yes, throughout the entire drilling process

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

-If left in pit and plan to solidify what medium will be used? Cement, lime, N/A

-Landfill or offsite name/permit number? Meadowfill Landfill - ID# SWF-1032

DH  
7-2-13

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 Bekki Winfree

Company Official (Typed Name) Bekki Winfree

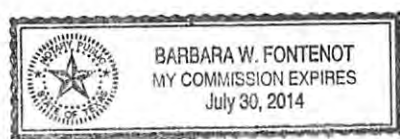
Company Official Title Sr. Regulatory Advisor - Marcellus

Subscribed and sworn before me this 12th day of June, 2013

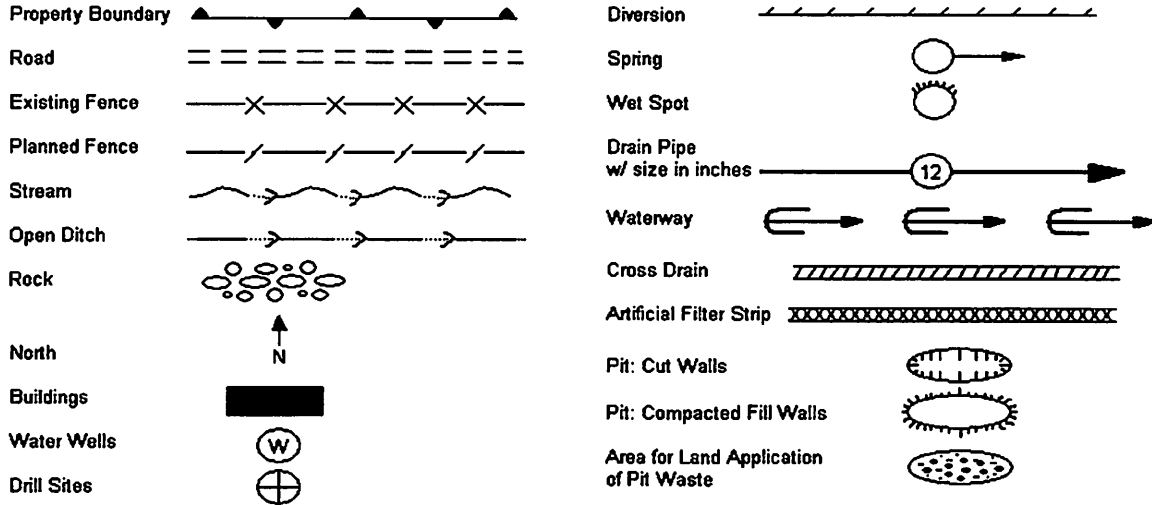
Barbara W. Fontenot Notary Public

My commission expires 7-30-14

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Proposed Revegetation Treatment: Acres Disturbed N/A Prevegetation pH 5.5

Lime 2 Tons/acre or to correct to pH \_\_\_\_\_

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

Seed Mixtures

Seed Type	Area I lbs/acre	Seed Type	Area II lbs/acre
67.29% Orchard Grass	40		
19.89% Timothy, 9.87% Kentucky Bluegrass			
2.95% Inert Matter			

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: \_\_\_\_\_

Title: Oil & Gas Inspector

Date: 7-2-13

Field Reviewed?  Yes  No

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## Joe Jolliffe Unit I 5H – Site Safety Plan

**Statoil USA Onshore Properties Inc.**

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7-2-17

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**JOE JOLLIFFE WELL PAD  
AS-CONSTRUCTED CONDITIONS  
and  
PROPOSED**

108 02931

**STORMWATER MANAGEMENT PLAN**

for

**WELL PAD ACTIVITIES  
JOE JOLLIFFE UNIT 1 WELLS  
4H and 5H**

June 2013

**1.0 INTRODUCTION**

The Joe Jolliffe Well Pad was constructed in 2010 for the drilling of Joe Jolliffe Unit 1 Well 1H. The original well pad was constructed for the drilling of the Joe Jolliffe Unit 1 1H well and multiple future wells.

This Stormwater Management Plan will provide the procedures to be employed for the well pad's stormwater management and spill control measures for the drilling and completion of wells 4H and 5H.

**2.0 EXISTING WELL PAD**

The Joe Jolliffe Unit 1 Well Pad was constructed in 2010 for the drilling of Joe Jolliffe Well 1H and multiple future wells. The existing well pad is shown by drawing 13-230-1 which provides the following information:

- Location of the existing Joe Jolliffe Unit 1 Well 1H and the related well 1H production equipment, piping and diked fluid collection tanks.
- The well pads production pipeline is buried along the south side of the well pad's southern limits of disturbance and is identified as 6-inch steel Jolliffe Pipeline.
- The well pad access road enters the well pad from the northeast.
- The well pad slopes and toe of well pad slopes are shown by Drawing 13-230-1. These slopes have been reclaimed and seeded with a good catch of grass established. Further Drawing 13-230-1 provides the as-constructed contours of the well pad's slopes as well as the well pad itself.

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- The present well pad surface is covered with a layer of stone. The effective area of the well pad surfaces is 1.94 acres (limits of stone).

### 3.0 STORMWATER MANAGEMENT PLAN

At present, two (2) additional wells are planned for the Joe Jolliffe Unit 1 Well Pad, wells 4H and 5H. Existing well 1H, which is in production, will be removed from production during the drilling operation and completion of planned wells 4H and 5H.

Joe Jolliffe Unit 1 Well 1H will receive a temporary plug with the above ground well head equipment removed leaving the well's tubing head below ground level. The below grade well's tubing head will be blind flanged after the temporary plug is placed. The top of the tubing head blind flange(s) will be marked allowing the location of the well's tubing/piping to be located during the drilling and completion of planned wells 4H and 5H.

With the well's tubing head blind flanged and the well head and associated piping removed above ground level, the Joe Jolliffe Unit 1 well's 1H cellar will be backfilled covered with a grate and marked to prevent placement of any loads on the blind flanged well head.

With the Joe Jolliffe Unit 1 1H well temporarily plugged and the well tubing head blind flanged, the on-site production equipment will be isolated and blown down. The on-site production equipment may be moved, if necessary.

Drawing 13-230-2 provides a graphic illustration of the existing Joe Jolliffe Unit 1 Well Pad after the site is prepared for drilling of planned wells 4H and 5H.

#### 3.01 Site Preparation

The existing crush stone surface of the Joe Jolliffe Unit 1 Well Pad will remain. The limits of the stone are shown by Drawing 13-230-2. A silt fence will be placed along the outer edge of the stone at the crest of the well pad and through the stone pad to isolate existing features on the well pad. The silt fence's location is shown by Drawing 13-230-2.

#### 3.02 Drilling Rig and Support Equipment Liner

The setting of the drill rig and other direct drill rig support equipment will be placed inside a lined area of High Density Polyethylene Liner (HDPE). The area that will typically be lined is graphically illustrated by Drawing 13-230-2. The lined area will depend on type of rig and support equipment available at the time of drilling.

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Before the liner is placed over the existing crush stone surface of the well pad, the area to be lined will be proof rolled by a smooth drum roller. Any soft spots will be stabilized before the placement of the liner.

With the stone surface stabilized, a layer of heavy filter fabric will be placed atop of the stone base to cushion and protect the liner. With the fabric in place, the HDPE Liner will be placed.

At the outer limits of the lined area, the liner will form a barrier wall. This barrier wall will serve to insulate the drilling rig and associated equipment and operation to the area inside of this lined area. The liner limits barrier wall will be of sufficient height and stability to be self-standing and capable of serving as barrier to:

- Prevent meteorological water or other fluids and equipment from entering the lined area of the drilling rig and its inner liner support equipment.
- Prevent meteorological water that falls within the lined area and any release of fluids within the lined area from exiting the area. The waters and fluids that may accumulate will be removed from the inner liner area for proper disposal in accordance with West Virginia Waste Management Regulations.

The HDPE liner will be heat seamed to insure a structural strong joining of the liner sheets as well as being fluid tight.

The entrance and exits of the lined area will be at multiple points in the liner system. These entrance and exit points of the lined area will be constructed of collapsible foam of sufficient strength to withstand the loading of items crossing the barrier wall. Thus allowing the equipment to enter and exit the liner without impacting the integrity of the barrier wall.

### 3.03 Drilling Rig and Support Equipment Placement

The drilling rig and support equipment will be placed on the liner with the drill rig set and rigged and the support equipment set and connected. After these operations, the liner will be inspected for damage before any drilling operations are undertaken. This inspection includes both the liner and barrier wall. Any damages found will be repaired in accordance with liner and barrier wall manufacturer's specifications before drilling is started.



Any potential western well pad limit's "run-on" will be low in volume with this existing ditch and the placement of the type 2 silt fence as shown by Drawing 13-230-2. As an additional precaution to contain "run-on" as well as any potential "run-off", a Filterxx Siltsoxx will be installed at the inter base of the type 2 silt fence. This type of silt fence installation will be along the entire western edge of the existing well pad gravel limits to the east side of the existing interceptor ditch (Drawing 13-230-2).

The southern and eastern limits of the existing well pad will be protected from "run-off" by placement of a type 1 silt fence along the pad's outer limits along the gravel edge (Drawing 13-230-2). The southern and eastern limits of the well pad have no upland drainage other than the well pad area.

The potential for "run-on" will be low in volume with the planned type 2 silt fence and well pad liner barrier wall preventing this stormwater from entering the pad area and will serve as a diversion to direct any stormwater flows to stable grassed areas to the west and southwest.

To prevent "run-off", a water diversion ditch will be placed across the access road at the point the road enters the pad. This diversion ditch will capture any pad road water and divert this water away from the pad to safe and stable outlet. To further control erosion and the resulting sedimentation, the diversion ditch will be lined with filter fabric and the filter fabric layered with a minimum of 6-inches of No. 57 stone. The outlet of the access road diversion ditch will be passed through a Filterxx Siltsoxx at the ditch's outlet. In addition to lining the "run-off" diversion ditch, a rock base entrance and exit pad will be constructed at the point the well pad access road intersects the existing well pad (Drawing 13-230-2).

The well pad's perimeter silt fences, the pad's stone base, the "run-off" diversion ditch and rock base entrance and exit pad will be visually inspected daily to insure proper operation. Also, these same items will be visually inspected after a one year or larger rainfall event.

Any impairment noted will be repaired returning these structures to their original condition and proper operation.

At the exit of every surface water ditch at the perimeter of the well pad and each drainage ditch from the well pad, a rock rip-rap apron will be constructed, maintained, and inspected to control the discharge of these ditches. At the head of the eastern surface water ditch, a Filterxx Siltsoxx will be placed at the ditch(s) inlet.



#### 4.01 Run-On Control

The placement of the silt fences in the western limits near the well pad's edge will serve as a filter strip and diversion of any potential stormwater flows from the less than 1.56-acre upland drainage shed. In addition, the pad's gravel area is next to the silt fence and will have a barrier next to the interior of the planned silt fence (Drawing 13-230-2). Both of these measures and the topographic conditions at the remaining perimeter of this well pad will prevent any "run-on" of stormwater.

#### 4.02 Run-Off Control

The placement of a perimeter silt fence at the edge of the stone well pad cover and the fact that the well pad is covered by a stone layer jointly serve to control the "run-off" from the well pad.

Further, the control of possible releases from the drilling area is controlled by the lined drill rig area and the liner edge barrier wall. This liner and its barrier wall prevents the "run-on" of waters from the well pad support areas and "run-off" of waters and fluids from the lined drill rig area.

#### 5.0 WELL PAD RESTORATION

With wells 4H and 5H completed and ready for the on-site production equipment and tie-in with the well pad's production pipeline, the following actions will be undertaken:

- The drill rig and support equipment area liner and barrier wall will be cleaned of any accumulated fluids and waste. With the liner cleaned, the liner will be removed from the well pad and disposed in an approved State of West Virginia Waste Management Facility.
- The well pad's stone surface will be inspected and any areas containing waste materials will be cleaned and the stone surface re-established.
- The pad access road diversion ditch will be retained with any needed repairs instituted.
- With the liner material removed, well pad stone re-established/repared, and pad access road diversion ditch repairs (if needed) completed, the well pad silt fence can be removed.





- Before removing the silt fence, any accumulated sediment debris at the silt fence will be removed and properly disposed of offsite as approved by the State of West Virginia Waste Management regulations. The silt fence will be removed and if the silt fence's condition allows, the fence will be used at other sites. If the silt fence cannot be reused, then the fence will be disposed of in an approved State of West Virginia Waste Management Facility.

## 6.0 SUPPORTING INFORMATION

The following drawings are provided and made part of this Joe Jolliffe Unit 1 Well Pad Stormwater Management Plan:

- Drawing 13-230-1 – Plan view of the existing conditions of the Joe Jolliffe Unit 1 Well Pad. This drawing provides the site topographics from the outer toe of the well pad. This drawing is signed and sealed by a West Virginia Professional Engineer.
- Drawing 13-230-2 – Plan view of the Joe Jolliffe Unit 1 Well Pad modifications for the drilling of one additional well on the existing pad. This drawing also shows the stormwater management and spill containment components. This drawing is signed and sealed by a West Virginia Professional Engineer.

Received



4.0 Pad Site Topo Map



- o Lease road entrance – Lat: 39.647620, Lon: -80.546980
- o Lease road entrance is 0.1 mi west of Knob Fork Rd. on WV 7



## Water Management Plan: Secondary Water Sources



WMP-01434

API/ID Number 047-103-02931

Operator: Statoil USA Onshore Properties Inc.

Joe Jolliffe Unit I 5H

**Important:**

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

### Multi-site impoundment

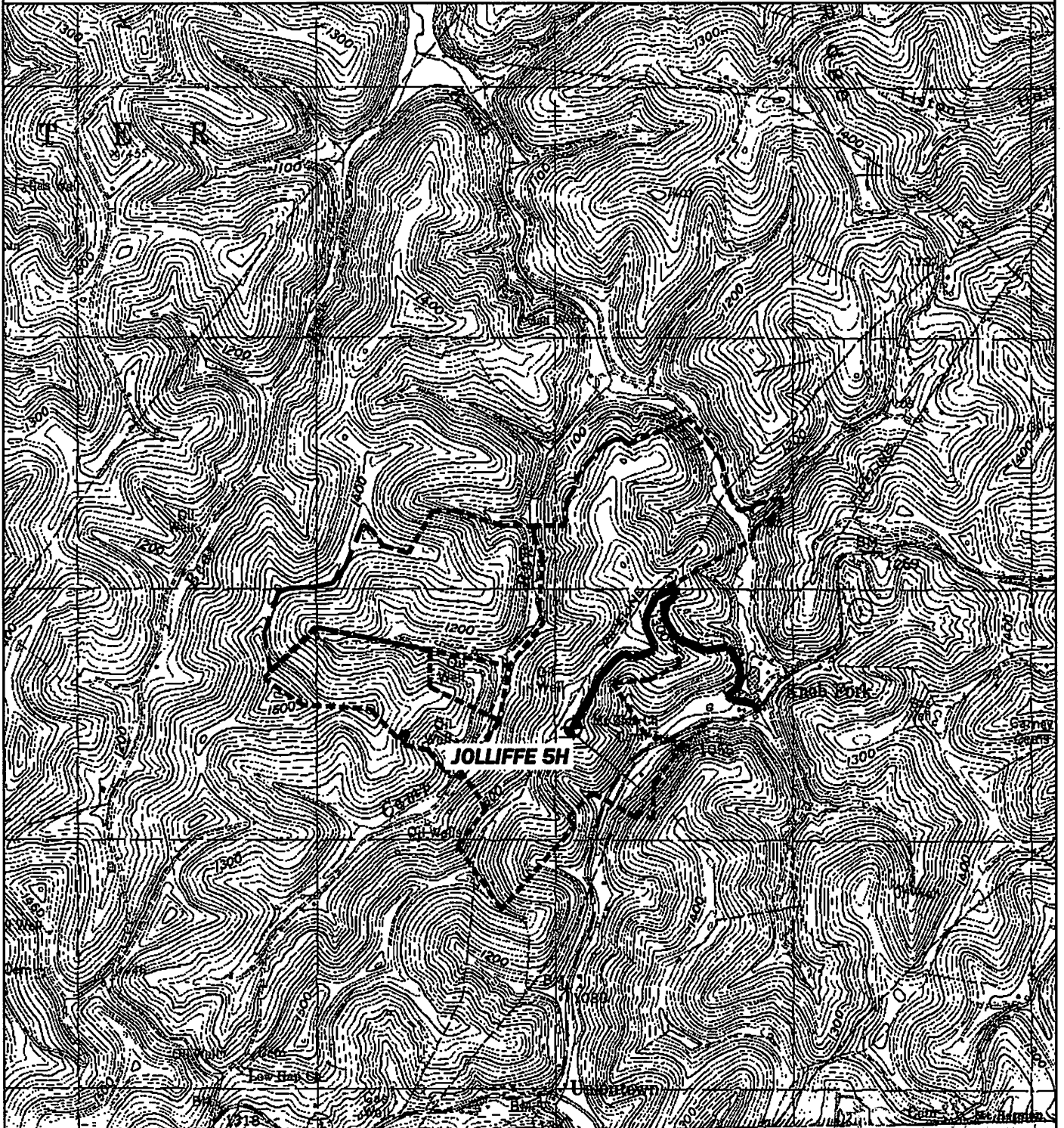
Source ID: 23946	Source Name	Jolliffe Centralized Freshwater Impoundment	Source start date:	11/1/2013	
			Source end date:	11/1/2014	
Source Lat:	39.656286	Source Long:	-80.551964	County	Wetzel
Max. Daily Purchase (gal)		Total Volume from Source (gal):	6,800,000		
DEP Comments:	103-FWC-00005				

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.

Reference: WMP-1289

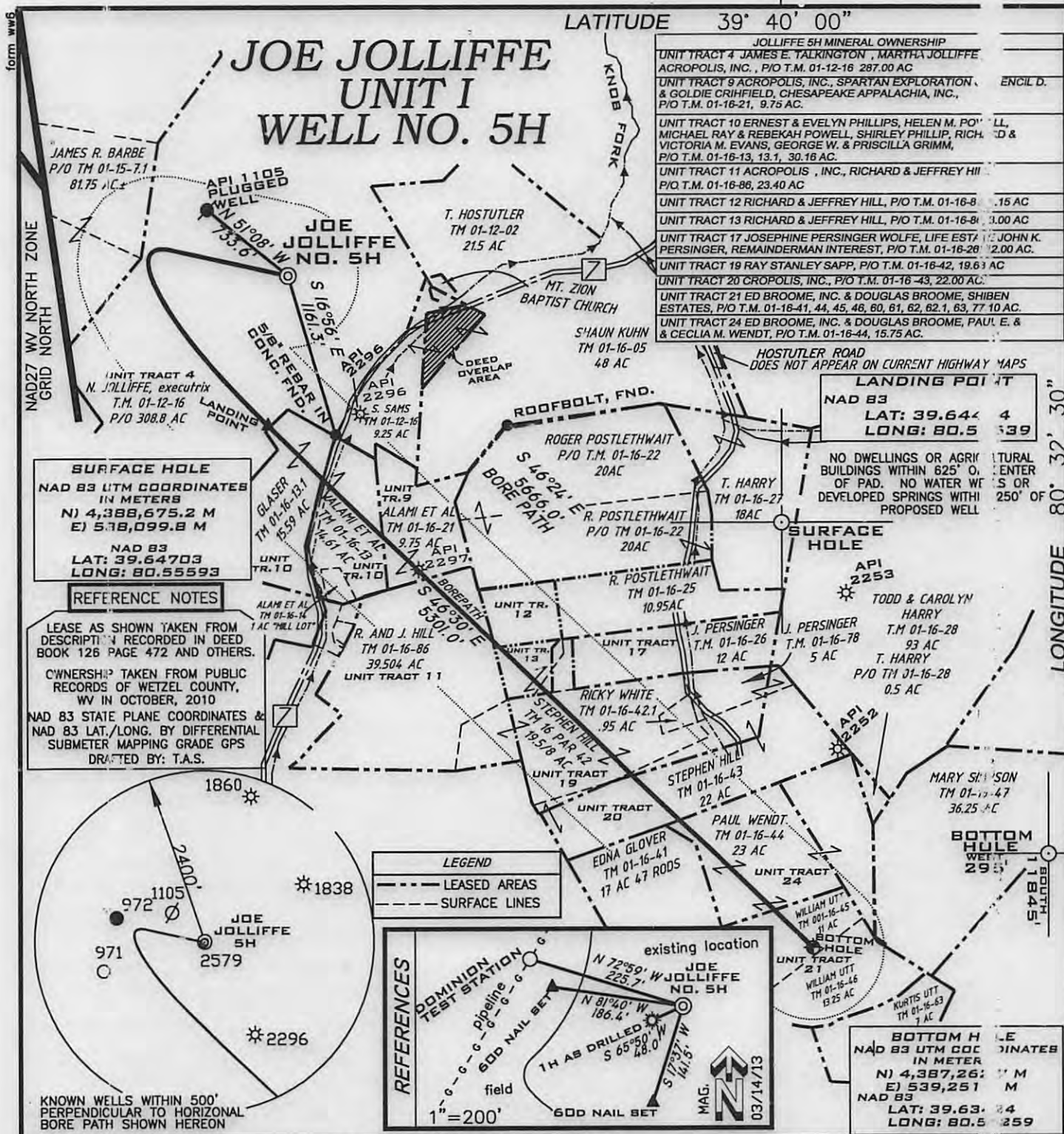
APPROVED SEP 20 2013

# JOLLIFFE 5H



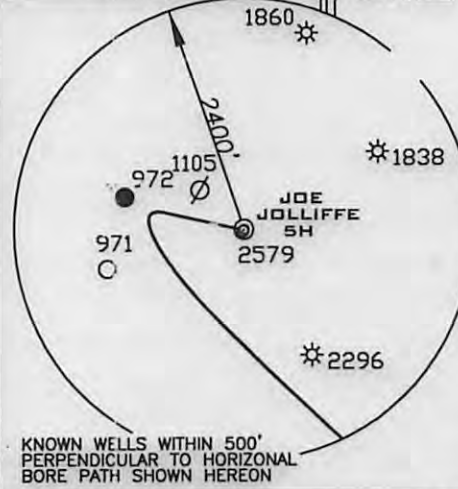
<b>PREPARED BY:</b> DMH 2-2-17	<b>OPERATOR</b>	<b>TOPO SECTION</b>	<b>WELL NAME</b>
<b>ANGLE RIGHT LAND SURVEYING, LLC</b> PO BOX 681 GRANTSVILLE, WV 26147 (304) 354-0068	STATOIL USA ONSHORE PROPERTIES INC. 2103 CITYWEST BLVD., STE. 800 HOUSTON, TX 77042	LITTLETON 7.5' <b>SCALE:</b> 1"=2000'	JOLLIFFE 5H <b>DATE:</b> 04/30/2013 Office of Oil and Gas WV Dept. of Environmental Protection

G100479

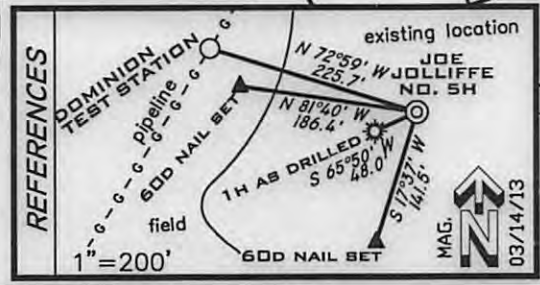


**SURFACE HOLE**  
 NAD 83 UTM COORDINATES  
 IN METERS  
 N) 4,388,675.2 M  
 E) 5,18,099.8 M  
 NAD 83  
 LAT: 39.64703  
 LONG: 80.55593

**REFERENCE NOTES**  
 LEASE AS SHOWN TAKEN FROM  
 DESCRIPTION RECORDED IN DEED  
 BOOK 126 PAGE 472 AND OTHERS.  
 OWNERSHIP TAKEN FROM PUBLIC  
 RECORDS OF WETZEL COUNTY,  
 WV IN OCTOBER, 2010  
 NAD 83 STATE PLANE COORDINATES &  
 NAD 83 LAT./LONG. BY DIFFERENTIAL  
 SUBMETER MAPPING GRADE GPS  
 DRAFTED BY: T.A.S.



**LEGEND**  
 - - - LEASED AREAS  
 - - - SURFACE LINES



FILE NUMBER G100479(WB9-74)  
 DRAWING NUMBER G100479WP5H.dwg  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY 1/2500  
 PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

I THE UNDERSIGNED HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. 1006  
*Terry A. Shreve*



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

REVISED DATE: NOVEMBER 4, 2013  
 DATE: JULY 8, 2013

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 OPERATORS WELL NO. JOE JOLLIFFE UNIT 1 WELL #5H  
 API WELL NO. 47-103-02931 H6A  
 STATE WV COUNTY WETZEL PERMIT SEE MINERAL OWNERSHIP TABLE

LOCATION ELEVATION 1336' WATERSHED TRIBUTARY OF KNOB FORK  
 DISTRICT CENTER COUNTY WETZEL  
 QUADRANGLE LITTLETON 7.5' LEASE NUMBER                     

SURFACE OWNER Nancy E. Jolliffe, Executrix of the estate of Joe Jolliffe ACREAGE P/O 308.8±  
 OIL & GAS ROYALTY OWNER Martha Jolliffe et al LEASE ACREAGE SEE MINERAL OWNERSHIP TABLE

PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION   
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY)                     

TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7330' + Horizontal Leg  
 PLUG & ABANDON  CLEAN OUT & REPLUG

WELL OPERATOR STATOIL USA ONSHORE PROPERTIES INC. DESIGNATED AGENT WILLIAM T. FAHEY II  
 ADDRESS 2103 CITYWEST BLVD., STE. 800 HOUSTON, TX 77042 ADDRESS FAHEY LAW OFFICE 2116 PENNSYLVANIA AVE., WEIRTON, WV 26062

form: wws

7,190'

LONGITUDE 80° 32' 30"

COUNTY NAME

PERMIT