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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

February 28, 2014

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-5101731, issued to GASTAR EXPLORATION USA, 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: SIMMS NO. U-5H  
Farm Name: SIMMS, TERRY E. & DEBORAH  
**API Well Number: 47-5101731**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 02/28/2014

## 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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west virginia department of environmental protection

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Oil and Gas Conservation Commission  
601 57<sup>th</sup> Street, SE Charleston, WV 25304  
(304)926-0499, Ext 1656

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
dep.wv.org

January 24, 2014

Department of Environmental Protection  
Office of Oil and Gas  
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-051-01735

COMPANY: Gastar Exploration USA, Inc.

FARM: Terry and Deborah Simms - Simms #U-5H

COUNTY: Marshall DISTRICT: Franklin QUAD: New Martinsville

The deep well review of the application for the above company is **APPROVED FOR TRENTON – Point Pleasant completion.** If operator wishes to drill deeper than the Trenton, additional approval must be obtained from the OGCC.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners; Yes
2. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells, well name, and the name and address of the operator; none
3. Provided a plat showing that the proposed location is a distance of 400+ top hole, 400' lateral, 430' at bottom hole feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Cindy Raines  
Executive Assistant

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

051 01731

5' 03 509

1) Well Operator: Gastar Exploration USA, Inc. 494487685 Marshall Franklin New Martinsville 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: U-5H Well Pad Name: Simms

3) Farm Name/Surface Owner: Simms, Terry E. & Deborah L. Public Road Access: County Route 76 (Rines Ridge Road)

4) Elevation, current ground: 1220' Elevation, proposed post-construction: 1220'

5) Well Type (a) Gas  Oil  Underground Storage

Other

(b) If Gas Shallow  Deep

Horizontal

*He*  
*12-11-13*  
*DMH*  
*12-11-17*

6) Existing Pad: Yes or No Yes

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

The Point Pleasant is the target formation at at depth of 11,060' (top of formation), an anticipated thickness of 100' and an estimated pressure of 7900 psi.

8) Proposed Total Vertical Depth: 11,245'

9) Formation at Total Vertical Depth: Trenton Limestone

10) Proposed Total Measured Depth: 15,800'

11) Proposed Horizontal Leg Length: 4200'

12) Approximate Fresh Water Strata Depths: 60'

13) Method to Determine Fresh Water Depths: Gastar has drilled several wells in this area

14) Approximate Saltwater Depths: 2000'

15) Approximate Coal Seam Depths: 848' & 1001'

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

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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DEC 17 2014  
Office of Oil and Gas  
WV Dept. of Environmental Protection

WW-6B  
(9/13)

051 01731

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	26"	New	PE/A252	85.68 #/ft		120'	Cement to Surface
Fresh Water	20"	New	H-40	94 #/ft		1060'	Cement to Surface
Coal	13 3/8"	New	J-55	61 #/ft		3000'	Cement to Surface
Intermediate	9 5/8"	New	HCP-110	47 #/ft		10,200'	Cement to Surface
Production	5 1/2"	New	P-110	23 #/ft		15,800'	1645 cuft (1500' In 9 5/8')
Tubing	2 3/8"	New	N-80	4.7 #/ft		11,402'	
Liners							

DMH 12-16-13  
JIN 12-16-13

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	26"	30"	.312"	740 psi	See #24	1.21
Fresh Water	20"	24"	.33"	1530 psi	See #24	1.21
Coal	13 3/8"	17 1/2"	.4285"	3090 psi	See #24	1.2
Intermediate	9 5/8"	12 3/8" & 12 1/4"	.472"	9440 psi	See #24	1.32 & 1.18
Production	5 1/2"	8 1/2"	.4775"	12,360 psi	See #24	1.21
Tubing	2 3/8"		.19"	11,200 psi		
Liners						

PACKERS

Kind:	n/a			
Sizes:	n/a			
Depths Set:	n/a			

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02/28/2014

WW-6B  
(9/13)

DMH 12-16-13  
JIN 12-16-13

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

Drill through the Point Pleasant tagging less than One Hundred (100') feet from the top of the Trenton Limestone to get depths and log data. Then, set a solid cement plug from TD (11,245') to proposed kick off point (10,624'). Drill the curve and horizontal section to planned and proposed TD (15,800'). Run casing and cement. Run a bond log on part of the curve and vertical section, pressure test casing and set a master valve. Prep the well for stimulation.

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

Gastar Exploration plans to fracture the well using a typical slickwater fracture design. Gastar will pump roughly 7000bbbls of water and 400,000 lbs of sand per stage. There will be approximately 21 stages on the fracturing job.

Anticipated maximum surface pressure while fracing will be approximately 12,500 psi with an anticipated maximum rate of 90 bbbls/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 11.64

22) Area to be disturbed for well pad only, less access road (acres): 5.32

23) Describe centralizer placement for each casing string:

Gastar will run 3 Centralizers on the Surface casing (20" casing) at an equal distance apart. The Intermediate casing (13 3/8" casing) will have 7 Centralizers at 300' spacing. The second Intermediate casing (9 5/8" casing) will have 40 Centralizers at 260' spacing. The production casing will have one centralizer every joint in the lateral, one centralizer per joint through the curve and one centralizer every other joint in the the vertical section.

24) Describe all cement additives associated with each cement type:

See attached.

25) Proposed borehole conditioning procedures:

Gastar will circulate the hole a minnimum of 3 hours upon TD. We will then pull out to the bottom of the curve and circulate for another 2 hours. Then come out of the hole.

\*Note: Attach additional sheets as needed.

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Office of Oil and Gas  
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WW6B Attachment (2<sup>nd</sup> Revision for #24)

## #24. Conductor and Surface Casing Cement: Class A + 2% CaCl

- CaCl – Calcium Chloride

Intermediate Casing: Class A + 1% EC-1 + .5% SMS + .55%BA-10A + .25#/sack Cello Flake + .75 gals/100 sacks FP-12L.

- EC-1 – Bonding Agent
- SMS – Sodium Metasilicate
- BA-10A – Bonding Agent
- Cello Flake – Cellophane Flakes
- FP-12L – Foam Preventer

Intermediate Casing #2: Lead Cement – 50:50 (Poz:Class A) + .15% R-3 + 3.9% KCl + 1.5% FL-25 + .2% ASA-301 + .75 gals/100 sack FP-12L

- R-3 – Retarder
- KCl – Potassium Chloride
- FL-25 – Fluid Loss
- ASA-301 – Free Water Additive
- FP-12L – Foam Preventer

Intermediate #2 Tail Cement – 50:50 (Poz:ClassH) + .1% R-3 + .2% CD-32 + 1.2% FL-62 + .1% ASA-301 + .4% SMS

- R-3 – Retarder
- CD-32 – Cement Dispersant
- FL-62 – Fluid Loss
- ASA-301 – Free Water Additive
- SMS – Sodium Metasilicate

Kick Off Plug Cement: Class H + .3% R-3 + .7% SMS + 1% CD-32

- R-3 – Retarder
- SMS – Sodium Metasilicate
- CD-32 – Cement Dispersant

Production Casing Cement: 50:50 (Poz:Class H) + .25% MPA-170 + 3 #/sack BA-90 + .35% R-3 + .75 gal/100 sacks FP-12L

- BA-90 – Bonding Agent
- R-3 – Retarder
- FP-12L – Foam Preventer

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Office of Oil and Gas

FEB 28 2014

WV Department of  
Environmental Protection



# GASTAR EXPLORATION USA, INC.

Location: Marshall County, WV  
 Field: Marshall  
 Facility: Simms Unit

Slot: Slot #5  
 Well: Simms 5H  
 Wellbore: Simms 5H (PWB)



Plot reference wellpath is Simms 5H (PWB) Rev-A.0

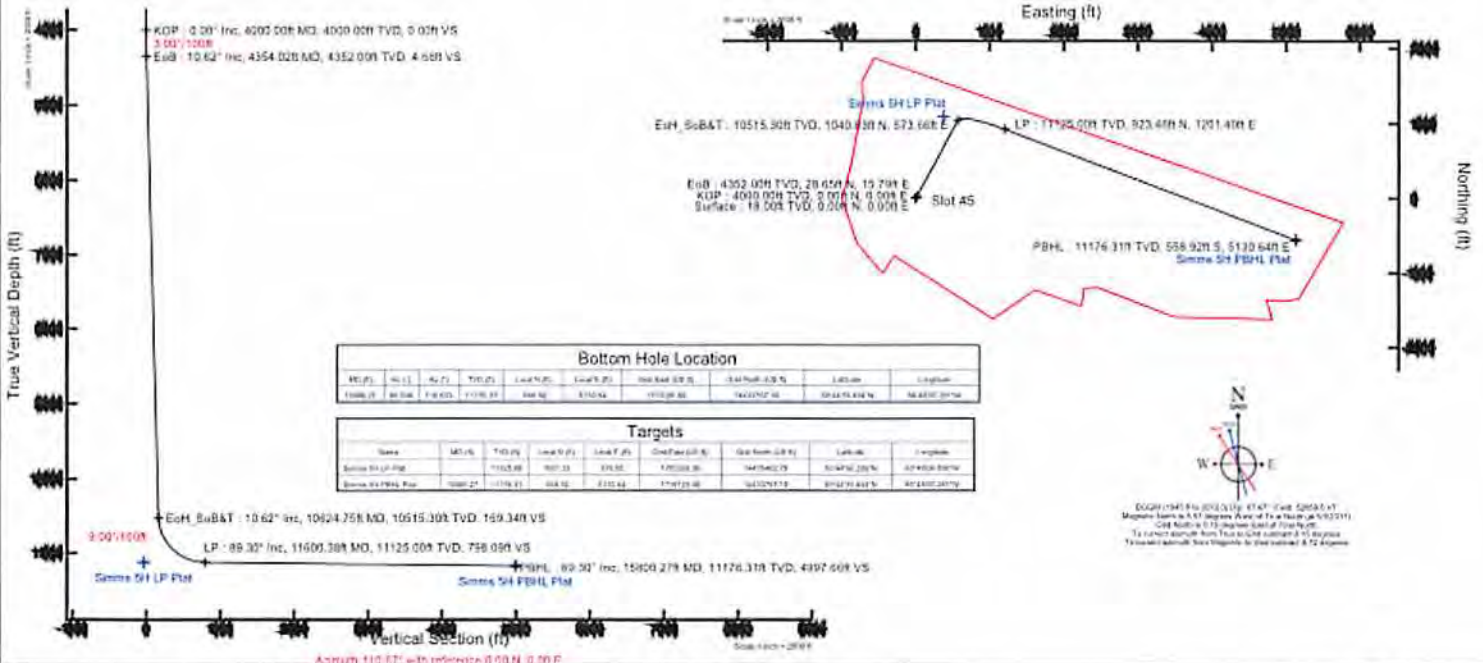
True vertical depth, see reference to US 21 2611	US 21 2611 (US 21 2611) (US 21 2611)
Measured depth, see reference to US 21 2611	US 21 2611 (US 21 2611) (US 21 2611)
US 21 2611 to Mean Sea Level 7253 feet	Mean Sea Level
Mean Sea Level to Mean Sea Level 7253 feet	Mean Sea Level
Coordinate system information, see	Coordinate system information, see

Location Information

Field Name	Geo Tag (U.S. Ft)	Geo Name (U.S. Ft)	Latitude	Longitude
Simms 5H	115405.650	11474718.034	38.4445167N	80.9411201W
Slot	0000.00	0000.00	00.00	00.00
Slot #5	2.25	20.25	115405.650	11474718.034
US 21 2611 to Mean Sea Level (US 21 2611)				
Mean Sea Level to Mean Sea Level (US 21 2611)				
US 21 2611 to Mean Sea Level				

Well Profile Data

Design Comment	MD (ft)	Inc. (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (1000ft)	VS (ft)
Surface	18.00	0.000	28.562	18.00	0.00	0.00	0.00	0.00
KQP	4000.00	0.000	28.562	4000.00	0.00	0.00	0.00	0.00
ECB	4354.02	10.621	28.662	4352.00	28.65	15.78	3.00	4.56
End SuB&T	10624.75	10.621	28.662	10515.30	1040.83	573.69	0.00	169.34
LP	11600.38	89.300	110.570	11125.00	923.48	1201.40	0.00	758.08
PEHL	15800.27	89.300	110.570	11176.31	-558.52	1130.84	0.00	497.68

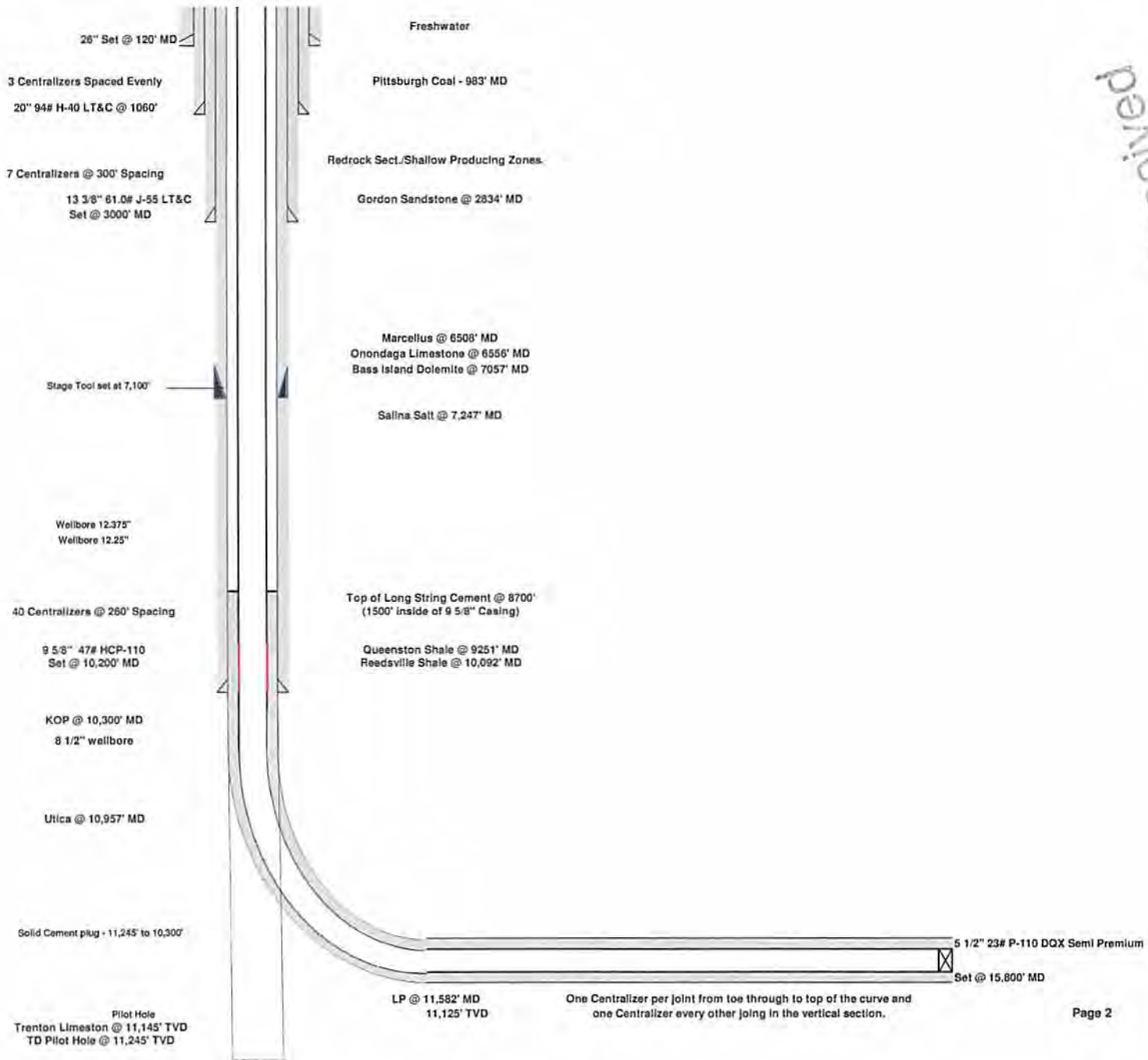


Received  
 DEC 17 2013  
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 West Virginia Department of Environmental Protection  
 02/28/2014



051 01731

Simms U-5H  
Marshall County, WV



One Centralizer per joint from toe through to top of the curve and one Centralizer every other joint in the vertical section.

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051 01731 050  
MARSHALL COUNTY, WV

WW-9  
(9/13)

051 01731

API Number 47 - 051 - \_\_\_\_\_  
Operator's Well No. U-5H \_\_\_\_\_

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Gastar Exploration USA, Inc. OP Code 494487685

Watershed (HUC 10) Fish Creek (Undefined) Quadrangle New Martinsville 7.5'

Elevation 1220' County Marshall District Franklin

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

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: Fresh water for frac and flow back water

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number 3416729685 )
- Reuse (at API Number \_\_\_\_\_ )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

DMH 12-16-13  
JIN 12-16-13

Will closed loop system be used? If so, describe: Yes, For Vertical and Horizontal Drilling

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air for vertical / Oil for Horizontal  
Note on Vertical: \*If a pocket of gas is hit. The gas flow will be diverted to the flare and SOBM (that is previously prepared) will be pumped into the well to kill the well if necessary.

-If oil based, what type? Synthetic, petroleum, etc. Synthetic oil base

Additives to be used in drilling medium? Barite for weight

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings will be disposed of in Wetzel County Landfill (Permit SWF-1021)

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) \_\_\_\_\_

-Landfill or offsite name/permit number? Wetzel County Landfill (SWF-1021) WV0109165, Northwestern Landfill (SWF-1025), Arden Landfill in Washington, PA (SWF-100172)

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.

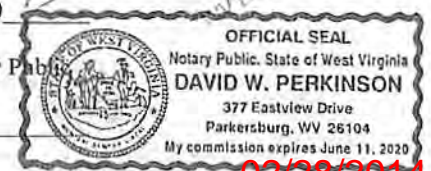
Company Official Signature Michael McCown  
Company Official (Typed Name) Michael McCown  
Company Official Title Senior VP and COO

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Office of Oil and Gas  
Dept. of Environmental Protection

Subscribed and sworn before me this 16th day of October, 2013

David W. Perkinson Notary Public

My commission expires 6-11-2020



02/28/2014

Form WW-9

Operator's Well No. U-5H

Proposed Revegetation Treatment: Acres Disturbed 11.64 Prevegetation pH 7.0

Lime 3 Tons/acre or to correct to pH 6.5 to 7.0

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 1/3 ton lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

**Temporary**

**Permanent**

Seed Type lbs/acre  
Annual Ryegrass 40/acre

Seed Type lbs/acre  
Fox Tail / Grassy 40/acre

Perennial Rye 30/acre

Crown Vetch 20/acre

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *[Signature]*

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Title: *Oil - Gas Inspector*

Date: *12-11-12*

Field Reviewed? (  ) Yes (  ) No

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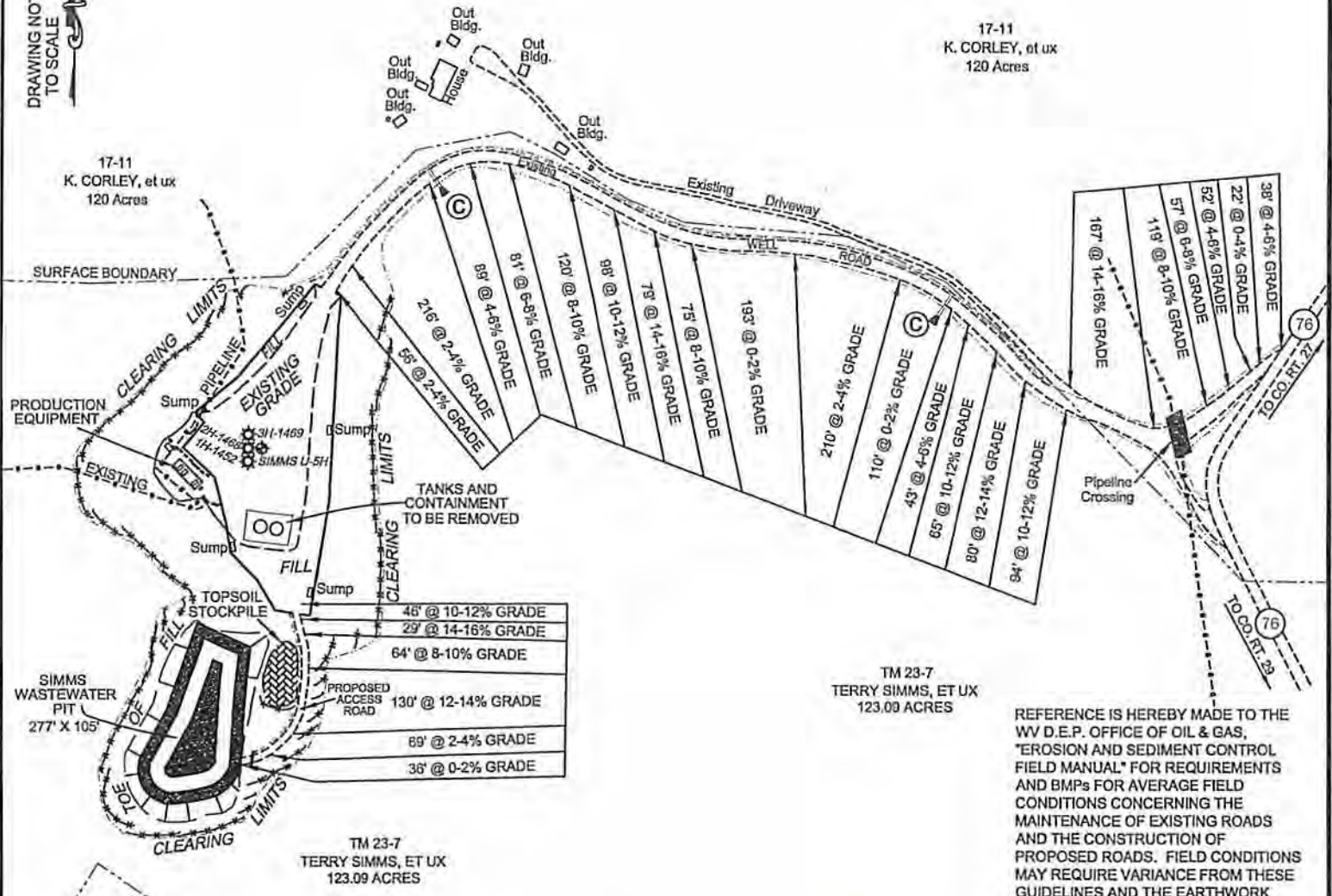
Office of Oil and Gas  
WV Dept. of Environmental Protection

02/28/2014

ALL TREES 6-INCHES AND ABOVE  
ARE TO BE CUT AND STACKED.  
BRUSH SLASHINGS ARE TO  
UTILIZED DOWN SLOPE OF SITE  
AND STRUCTURES TO ACT AS A  
CONTROL BARRIER IF  
AVAILABLE.



DRAWING NOT  
TO SCALE



17-11  
K. CORLEY, et ux  
120 Acres

17-11  
K. CORLEY, et ux  
120 Acres

TM 23-7  
TERRY SIMMS, ET UX  
123.09 ACRES

TM 23-7  
TERRY SIMMS, ET UX  
123.09 ACRES

23-8.1  
W. ROUPE  
34 Acres

REFERENCE IS HEREBY MADE TO THE  
WV D.E.P. OFFICE OF OIL & GAS,  
"EROSION AND SEDIMENT CONTROL  
FIELD MANUAL" FOR REQUIREMENTS  
AND BMPs FOR AVERAGE FIELD  
CONDITIONS CONCERNING THE  
MAINTENANCE OF EXISTING ROADS  
AND THE CONSTRUCTION OF  
PROPOSED ROADS. FIELD CONDITIONS  
MAY REQUIRE VARIANCE FROM THESE  
GUIDELINES AND THE EARTHWORK  
CONTRACTOR IS RESPONSIBLE FOR  
NOTIFICATION TO THE INSPECTOR AND  
THE OPERATOR SHOULD THESE  
CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON  
RECLAMATION PLAN OR AS FIELD  
CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS  
SHALL BE CONSTRUCTED OR  
MAINTAINED IN ACCORDANCE WITH WV  
D.O.T. REGULATIONS. ADDITIONAL  
PERMITS MAY BE REQUIRED.

Note:  
© — Denotes existing 12" Steel Culvert  
and apply appropriate sediment outlet control  
(Rip Rap splash pad).

----- Silt Fence or Sediment  
and Erosion Control Measure.

*Handwritten:* Pm 12/11-13

*Handwritten:* JN 12-11-13  
*Stamp:* Received

TEMPORARILY SEED AND MULCH  
ALL SLOPES UPON  
CONSTRUCTION OF LOCATION.  
ALL CUT AND FILL SLOPES ARE  
2H : 1V SLOPE.

DATE: 11/19/13

PROJECT NO: W0110295

DRAWN BY: J.N.W.

051082014



## Water Management Plan: Primary Water Sources

051 04731



WMP-01733

API/ID Number: 047-051-01731

Operator:

Gastar Exploration USA, Inc.

Simms No. U-5H

### Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

**DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.**

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at [DEP.water.use@wv.gov](mailto:DEP.water.use@wv.gov).

APPROVED DEC 30 2013

02/28/2014

Source Summary

051-01731

WMP-01733

API Number:

047-051-01731

Operator:

Gastar Exploration USA, Inc.

Simms No. U-5H

Purchased Water

Source: Bayer Material Science, LLC Marshall Owner: Bayer Material Science, LLC

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
5/1/2014	5/1/2015	4,704,000	649,800	39.7218	-80.830231

Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): Min. Gauge Reading (cfs): 6,468.00 Min. Passby (cfs)

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: <http://www.erh.noaa.gov/ohrfc//flows.shtml>

02/28/2014

## Source Detail

WMP- 01733

API/ID Number: 047-051-01731

Operator: **051-01731** Coastal Exploration USA, Inc

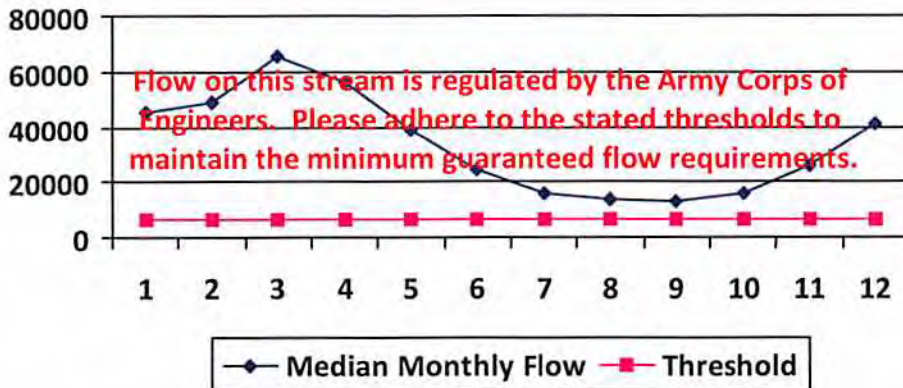
Simms No. U-5H

Source ID:	32860	Source Name:	Bayer Material Science, LLC Bayer Material Science, LLC	Source Latitude:	39.7218
				Source Longitude:	-80.830231
HUC-8 Code:	5030201				
Drainage Area (sq. mi.):	25000	County:	Marshall	Anticipated withdrawal start date:	5/1/2014
				Anticipated withdrawal end date:	5/1/2015
<input type="checkbox"/> Endangered Species?	<input type="checkbox"/> Mussel Stream?			Total Volume from Source (gal):	4,704,000
<input type="checkbox"/> Trout Stream?	<input type="checkbox"/> Tier 3?			Max. Pump rate (gpm):	
<input checked="" type="checkbox"/> Regulated Stream?	Ohio River Min. Flow			Max. Simultaneous Trucks:	
<input checked="" type="checkbox"/> Proximate PSD?	Grandview-Doolin PSD			Max. Truck pump rate (gpm):	
<input checked="" type="checkbox"/> Gauged Stream?					

Reference Gaug	9999999	Ohio River Station: Willow Island Lock & Dam
Drainage Area (sq. mi.)	25,000.00	Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

### Water Availability Profile



#### Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	-
Downstream Demand (cfs):	-
Pump rate (cfs):	-
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

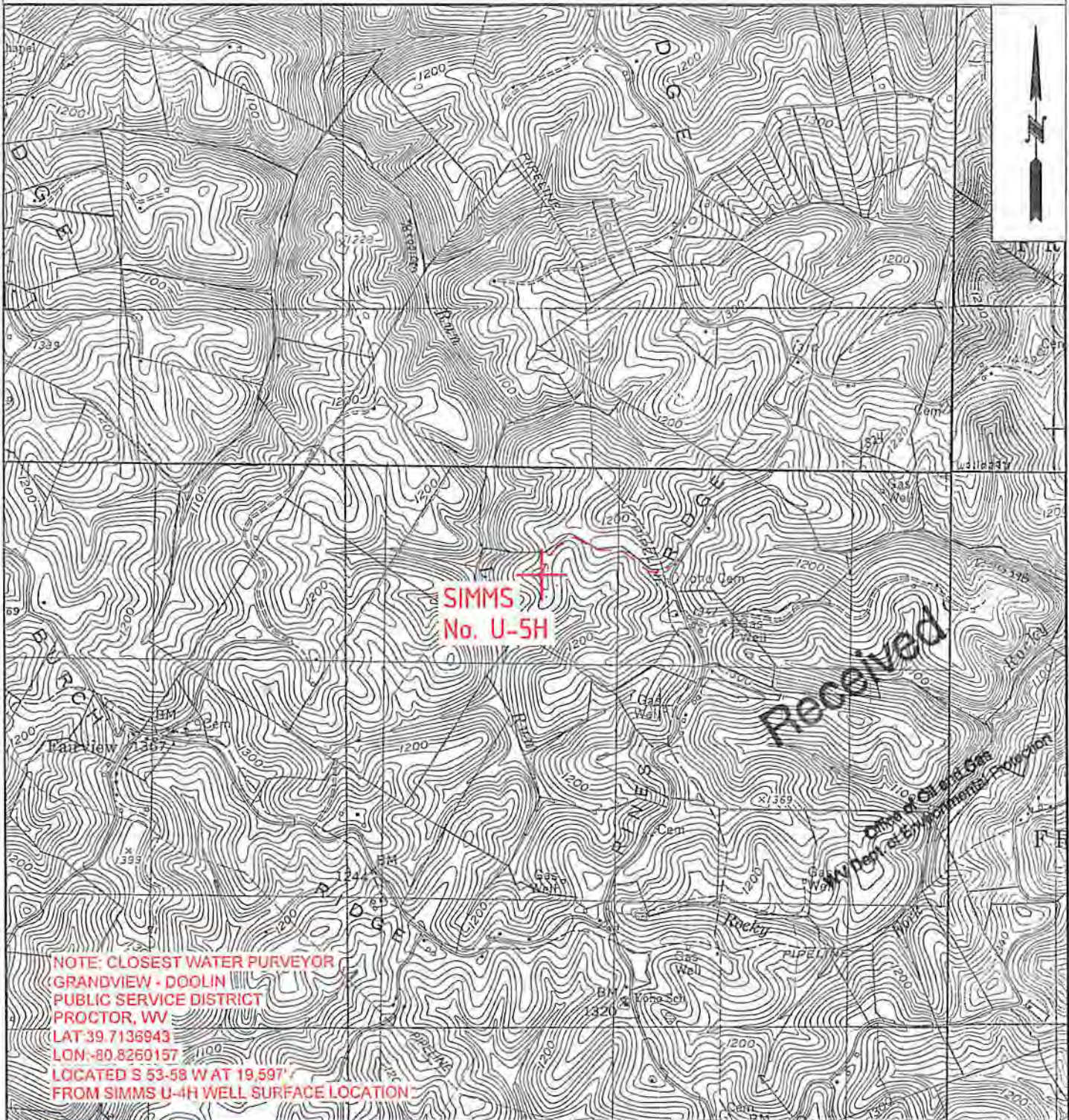
02/28/2014

WW-9

# PROPOSED SIMMS WELL No. U-5H

051 01731

SUPPLEMENT PG 2



*12-11-13*

*DATA  
12-11-13*

**W0110295**

OPERATOR	TOPO SECTION	LEASE NAME
GASTAR EXPLORATION USA, Inc. 229 W Main Street, Suite 301 Clarksburg, WV 26301	NEW MARTINSVILLE 7.5'	SIMMS
	SCALE: 1"=2000'	DATE: DATE: 11/12/13

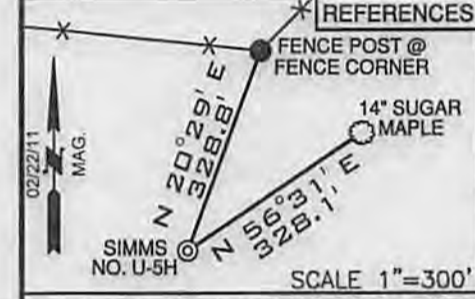
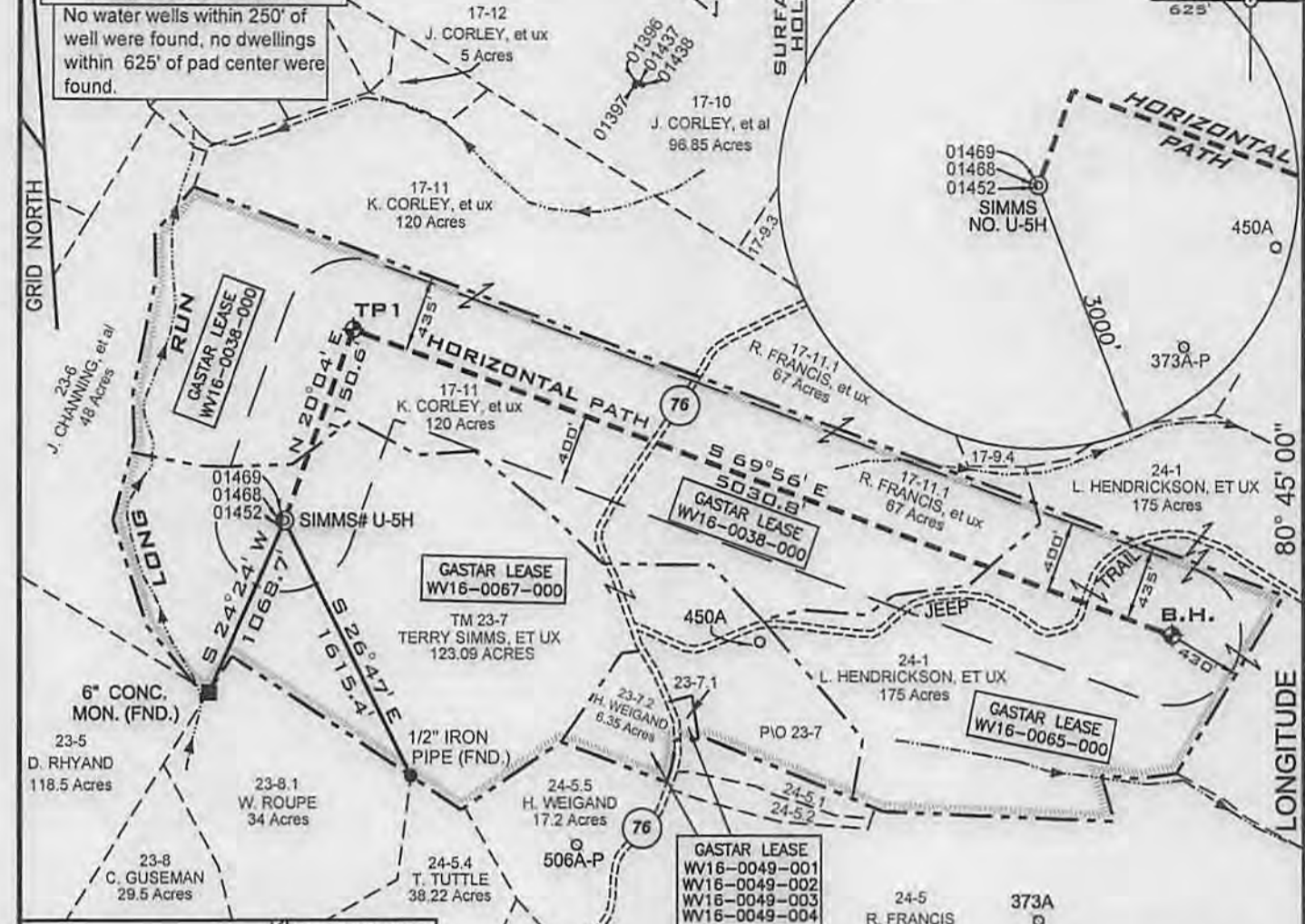
02/28/2014



**NOTES**  
 OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN NOVEMBER, 2013.  
 COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

**LEGEND**  
 - - - - LEASED TRACTS  
 - - - - INTERIOR MINERAL TRACTS  
 - - - - SURFACE TRACTS  
 ===== HARD LEASE LINE

LATITUDE 39° 45' 00"  
**SIMMS UNIT**  
**WELL NO. U-5H**  
**319.91± ACRES**



SURFACE HOLE	TARGET POINT 1	BOTTOM HOLE
UTM. NAD83, ZONE 17 IN METERS	UTM. NAD83, ZONE 17 IN METERS	UTM. NAD83, ZONE 17 IN METERS
N) 4,399,588.3	N) 4,399,919.5	N) 4,399,417.9
E) 519,682.6	E) 519,797.3	E) 521,245.8
UTM. NAD83, ZONE 17 IN FEET	UTM. NAD83, ZONE 17 IN FEET	UTM. NAD83, ZONE 17 IN FEET
N) 14,434,316	N) 14,435,403	N) 14,433,757
E) 1,704,992	E) 1,705,368	E) 1,710,121

FILE NUMBER W0110295 (WB5-54)  
 DRAWING NUMBER SIMMS\_U-5H\_WP  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY 1/200  
 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. 2122 *Jonathan N. White*



WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304

DATE: NOVEMBER 18, 2013

OPERATORS WELL NO. SIMMS NO. U-5H

API WELL NO. 47-051-01731 H6A  
 STATE COUNTY PERMIT

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION ELEVATION 1220' WATERSHED (HUC 10) FISH CREEK - (UNDEFINED)  
 DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE NEW MARTINSVILLE 7.5' LEASE NUMBER WV16-0067-000, WV16-0049-003, WV16-049-004, WV16-0065-000, WV16-038-000, WV16-0049-001, WV16-0049-002

SURFACE OWNER TERRY E. & DEBORAH SIMMS ACREAGE 123.09

OIL & GAS ROYALTY OWNER TERRY E. & DEBORAH L. SIMMS, ET AL LEASE ACREAGE 319.91

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

TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH 11245' + Horizontal Leg

WELL OPERATOR GASTAR EXPLORATION USA, INC. DESIGNATED AGENT MICHAEL McCOWN  
 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301

02/28/2014

COUNTY NAME PERMIT