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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

December 19, 2012

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-5101608, issued to CHESAPEAKE APPALACHIA, L.L.C., 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 of completion of drilling, 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: FORK RIDGE MSH 206H  
Farm Name: CONSOLIDATION COAL COMPA

**API Well Number: 47-5101608**

**Permit Type: Horizontal 6A Well**

Date Issued: 12/19/2012

**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. 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.
2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. 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.
3. 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.
4. 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.
5. 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.



west virginia department of environmental protection

WVDEP Office of Oil and Gas  
601 57<sup>th</sup> Street Southeast; Charleston, WV  
(304) 926-0450

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

December 19, 2012

Mr. Daniel French  
1162 Hinerman Hill Road  
Glen Easton, WV 26309

Re: Permit for Chesapeake Energy, Fork Ridge MSH 3H, 201H, & 206H  
API numbers: 51-01607, 51-01606, & 51-01608


Mr. French:

The Office of Oil and Gas (OOG) has reviewed your comments concerning Chesapeake's permits for the above referenced well. The comment was sent to the operator for their response. The operator has responded and the response is enclosed for your records.

After considering your comments, the applicant's response, and the inspector's findings, the OOG has determined that the permits meet the requirements set forth in Article 6, Chapter 22 of the West Virginia Code and Legislative Rule Title 35, Series 4 in the statute and legislative rule. Consequently, the OOG is lifting the suspensions today. For your information and convenience, I am including with this letter a copy of the permit as issued.

As you may know, surface owners are entitled to compensation for damages to their property resulting from oil and gas drilling activity. Absent an agreement by the parties, such damage compensation may be addressed pursuant to Article 7, Chapter 22 of the West Virginia Code. Please contact Gene Smith at (304) 926-0499, extension 1652 if you have any questions.

Sincerely,

  
Laura K. Cooper  
Permitting Section

Enclosure

Cc: Wilson Law Offices  
Chesapeake Energy representative Danielle Southall  
Derek Haught, OOG Inspector

Promoting a healthy environment.

C. Richard Wilson, Esq.  
Serving WV & OH



515 Jefferson Avenue  
Moundsville, WV 26041  
(304) 843-2300  
Fax: (304) 843-2301

[www.wilsonlawoffices.com](http://www.wilsonlawoffices.com)

November 28, 2012

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304

Re: Chesapeake Energy Well Permit Applications  
Fork Ridge MSH 3H, 201H and 206H  
Cameron District, Marshall County, West Virginia

Dear Sir or Ms.:

I represent Daniel French of 1162 Hinerman Hill Road, Glen Easton, WV 26039, who has requested that I submit written comments on his behalf in objection to the issuance of Marcellus gas well permits for the above referenced well. Mr. Hinerman has received notice as a Water Purveyor, as defined in West Virginia Code §22-6A-10(b) of the permit process.

Mr. French has a well which services a home on his property, as well as several wells and springs which water livestock which he runs on his property and adjoining leased property.

He is concerned about the effects which this drilling work may have on the future safety and utility of his water sources. He does not wish to sign a "Statement of No Objection" with respect to these wells. He wishes to know what steps are being taken to protect his water and what will be done if the drilling work negatively impacts his water sources.

At the present time his water is satisfactory and safe for residential and domestic animal uses and he wishes to ensure that it remains that way.

Pursuant to the notice he wishes to receive a copy of the permit, as issued, notice of the issuance of any permit, or any other action thereon and a list of persons qualified to test his water sources.

Thank you for your consideration of these comments.

Very truly yours,

A handwritten signature in blue ink, appearing to read "C. Richard Wilson".

C. Richard Wilson

:sc

cc: Mr. Dan French

RECEIVED  
OFFICE OF OIL & GAS  
2012 NOV 29 P 1:14  
WV DEPARTMENT OF  
ENVIRONMENTAL PROTECTION



Danielle Southall  
Regulatory Technician I

December 4, 2012

Chief James Martin  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Re: Response to Water Purveyor Objections for Proposed New Wells, Fork Ridge  
MSH 3H, 201H, and 206H  
Cameron District, Marshall County, West Virginia

Dear Chief Martin:

Please allow this correspondence to serve as Chesapeake Appalachia, L.L.C.'s ("Chesapeake") written response to Daniel French's correspondence dated November 28, 2012 (copy attached), wherein Mr. French objects to the Well Work Permit Application which was filed by Chesapeake with the Office of Oil and Gas on November 2, 2012 (the "Application"), as it relates to the above referenced well.

Mr. French's objections set forth in his November 28, 2012 correspondence and Chesapeake's corresponding responses are set forth below

#### OBJECTIONS AND RESPONSES

1. **Objection:** *He is concerned about the effects which this drilling work may have on the future safety and utility of his water sources. He does not wish to sign a "Statement of No Objection" with respect to these wells. He wishes to know what steps are being taken to protect his water and what will be done if the drilling work negatively impacts his water sources.*

**Response:** The WW-6B shows Chesapeake's casing program, which complies with the WV DEP's rules and regulations for protecting fresh water. Wetland and stream delineations are performed prior to any road or pad design to ensure no areas are impacted. It is not a requirement to provide this information with the permit application. The erosion and sediment control plan also address sediment control and the WW-6A explains the surface owners' rights to have water well or springs to be sampled. On 2/4/2012, SAIC tested three springs and one stream, and sampled a well on 2/17/2012.

Chief James Martin  
December 4, 2012  
Page 2

Chesapeake believes its response adequately addresses Mr. French's concerns and, accordingly, respectfully requests that you kindly approve the Application.

Sincerely,

Chesapeake Appalachia, LLC

Dee Southall

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

1) Well Operator: <u>Chesapeake Appalachia, LLC</u>	494477557	51-Marshall	1-Cameron	370-Glen Easton
	Operator ID	County	District	Quadrangle

2) Operator's Well Number: Fork Ridge MSH 206H Well Pad Name: Fork Ridge MSH Pad

3 Elevation, current ground: 1391' Elevation, proposed post-construction: 1391'

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

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):  
Target formation-Marcellus, Target top TVD- 6787', Target base TVD-6838', Anticipated thickness- 51', Associated Pressure -4276

7) Proposed Total Vertical Depth: 6815'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 13,500'

10) Approximate Fresh Water Strata Depths: 661'

11) Method to Determine Fresh Water Depth: From the DE Contour Map

12) Approximate Saltwater Depths: 1047'

13) Approximate Coal Seam Depths: 961'

14) Approximate Depth to Possible Void (coal mine, karst, other): None that we are aware of.

15) Does land contain coal seams tributary or adjacent to, active mine? yes

16) Describe proposed well work: \_\_\_\_\_  
Drill and stimulate any potential zones between and including the Benson to the Marcellus. \*\*If we should encounter a void, place basket above and below void area - balance cement to bottom of void and grout from basket to surface. Run casing not less than 20' below void nor more than 50' below void.  
(\*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts)

17) Describe fracturing/stimulating methods in detail:  
Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface.  
The well is produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 10.6

19) Area to be disturbed for well pad only, less access road (acres): 5.5

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 DMH  
 10-24-12  
 10-24-12

WW - 6B  
(1/12)

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	J-55	94#	100'	100' ✓	CTS
Fresh Water	13 3/8"	New	J-55	54.5#	761'	761' ✓	700 SX/CTS
Coal	9 5/8"	New	J-55	40#	2460'	2460' ✓	920 SX/CTS
Intermediate	7"	New	P-110	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	P-110	20#	13,500'	13,500' ✓	Lead 1090 sx Tail 1190 sx/100' inside intermediate
Tubing	2 3/8"	New	N-80	4.7#	Approx. 7280'	Approx. 7280'	
Liners							

*Dmit 10-24-12*  
*Case 10-24-12*

<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"	30"	0.25"	2120	15.6 ppg ✓	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	15.6 ppg ✓	1.19/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	15.6 ppg ✓	1.19/50% Excess
Intermediate	7"	8 3/4"	.0317	4360	15.6 ppg ✓	1.20/15% Excess
Production	5 1/2"	8 3/4"	0.361	12360	15.6 ppg ✓	1.20/15% Excess
Tubing	2 3/8"	4.778"	0.190			
Liners						

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**PACKERS**

Kind:	10K Arrowset AS1-X		
Sizes:	5 1/2"		
Depths Set:	Approx. 6,197'		



21) Describe centralizer placement for each casing string. \_\_\_\_\_

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

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

\*\*Please see attached sheets for Chemical Listing of Cement & Additives for Chesapeake Energy wells.

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23) Proposed borehole conditioning procedures. \_\_\_\_\_

All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and continuing until operator is satisfied with borehole conditions.

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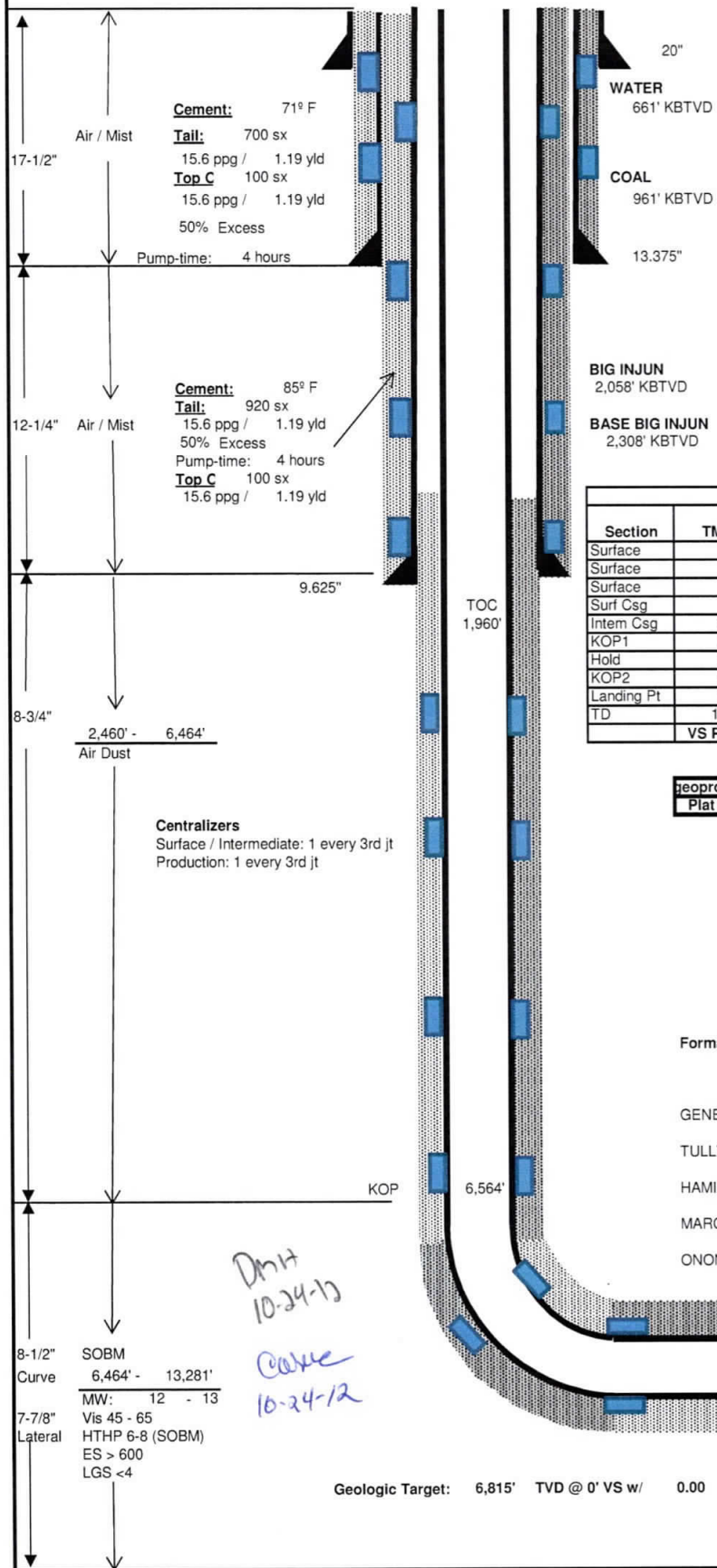
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\*Note: Attach additional sheets as needed.

DmH  
10-24-10

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2012 NOV - 2 P 1:51  
16

		<b>Well Name:</b> Fork Ridge MSH 206H	<b>Drilling Rig:</b> Nomac 337
<b>Drilling Engineer:</b> Casey McDonough	<b>Formation:</b> Marcellus	<b>Directional Drilling:</b> Halliburton	<b>Drilling Mud:</b> Nova
<b>Superintendent:</b> John Melville	<b>County, State:</b> Marshall, WV	<b>Cement Surface:</b> Schlumberger	<b>Cement Longstrings:</b> Schlumberger
<b>Asset Manager:</b> Brian Wasinger	<b>Surface Latitude:</b> 39.871398	<b>Surface Longitude:</b> -80.638593	<b>Wellhead:</b> Sweco
<b>Geologist:</b> Matt Herrin	<b>BH Latitude:</b> 39.852633	<b>BH Longitude:</b> -80.638979	<b>AFE #:</b> 171244
<b>Land:</b> Bryan Lohoff	<b>KB Elevation:</b> 1411'	<b>Ground Elevation:</b> 1391'	



Wellhead Equipment						
Tree Description						
Tubing Head **						
Blanking Cap						
'B' Section						
11" x 5M x 7-1/16" 10M						
'A' Section						
9-5/8" SOW x 11" 5M						
** Space out such that Blanking Cap is no more than 30" above grade.						
Casing Detail						
	Size	Wt	Grd	Conn.	From:	To:
Conductor	20.000	94.0 #	J-55	STC	0'	100'
Surface	13.375	54.5 #	J-55	STC	0'	761'
Interm	9.625	40 #	J-55	LTC	0'	2,460'
Prod	5.5	20 #	P-110	GBCD	0'	13,281'

Casing Design						
	Size	ID	Coil	Burst	Tens	MU torq
Surface	13.375	12.615	1130	2740	514	5140
Interm	9.625	8.835	2570	3950	520	5200
Prod	5.5	4.778	12200	12360	641	8530

Directional Drilling Details								
Section	TMD	Inc.	Azimuth	TVD	BUR	DLS	+N-S	+E-W
Surface	0.00'	0.00	0.00	0.00'	0.00	0.00	0.0'	0.0'
Surface	180'	0.00	0.00	180'	0.00	0.00	0.0'	0.0'
Surface	190'	0.00	0.00	190'	0.00	0.00	0.0'	0.0'
Surf Csg	365'	0.00	0.00	365'	0.00	0.00	0.0'	0.0'
Interm Csg	2,000'	0.00	0.00	2,000'	0.00	0.00	0.0'	0.0'
KOP1	2,560'	0.00	0.00	2,560'	0.00	0.00	0.0'	0.0'
Hold	3,474'	18.28	248.42	3,458'	2.00	2.00	-53.2'	-134.4'
KOP2	6,564'	18.28	248.42	6,392'	0.00	0.00	-409.6'	-1,035.7'
Landing Pt	7,280'	90.00	171.35	6,815'	10.01	12.00	-900.9'	-1,098.5'
TD	13,281'	90.00	171.35	6,815'	0.00	0.00	-6,833.3'	-196.0'
VS Plane	171.35						VS Length	6,726.09'

Lateral Length ==> 6,000.64'

Geoprogram Date	10/1/12
Plot Date	9/12/12

Logging Program		
Run	Log Type	Interval
1	TBD	TBD
2	TBD	TBD
Mudlogger operational at		Surface

Formation Depths (TVD)

GENESECO	6,569'
TULLY	6,651'
HAMILTON	6,670'
MARCELLUS	6,791'
ONONDAGA	6,842'

**Cement:** 123° F  
**Lead:** 1,090 sx  
 15.6 ppg / 1.20 yld  
**Tall:** 1,190 sx  
 15.6 ppg / 1.20 yld  
 15% Excess  
 Pump-time: 5 hours  
**PHL:** 5.5"  
**TMD:** 13,281'  
**TVD:** 6,815'  
**Inclination:** 90.00 deg

Geologic Target: 6,815' TVD @ 0° VS w/ 0.00 degrees/100 ft Up-dip

**Gyro the 1st well on the pad at KOP. Ensure all Surveys are referenced to Grid North!!**

Drawn by: Casey McDonough  
 Date: 10/9/2012

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DMH  
 10-24-12  
 CASEY  
 10-24-12

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 Chesapeake Appalachia, LLC OP Code 494477557

Watershed Middle Grave Creek Quadrangle 370-Glen Easton

Elevation 1391' County 51-Marshall District 1-Cameron

Description of anticipated Pit Waste: Closed loop system in place at this time - cuttings will be taken to a permitted landfill.

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

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number 2D0072539/ 2D0413175/ 2D0610306/ 2D0610317 )
- Reuse (at API Number        at next anticipated well, API# will be included with the WR-34/DDMR &/or permit addendum )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Flow back fluids will be put in steel tanks and reused or taken to a permitted disposal facility.)

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air and salt saturate mud

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

Additives to be used? see attached sheets

Will closed loop system be used? yes

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

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

-Landfill or offsite name/permit number? Meadowfill SWF-1032, SS Grading SWF-4902, Northwestern SWF-1025

Short Creek 1034/WV0109517 / CID28726 , Arden Landfill 100172, Carbon Limestone 28726/CID 28726, American 02-12954, Country Wide 38390/CID 38390, Pine Grove 13688

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 [Signature]

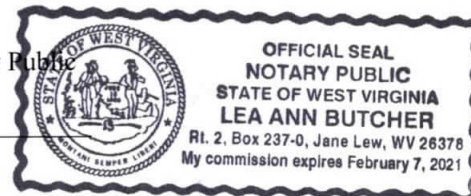
Company Official (Typed Name) Danielle Southall

Company Official Title Regulatory Tech I

Subscribed and sworn before me this 17th day of September, 2012

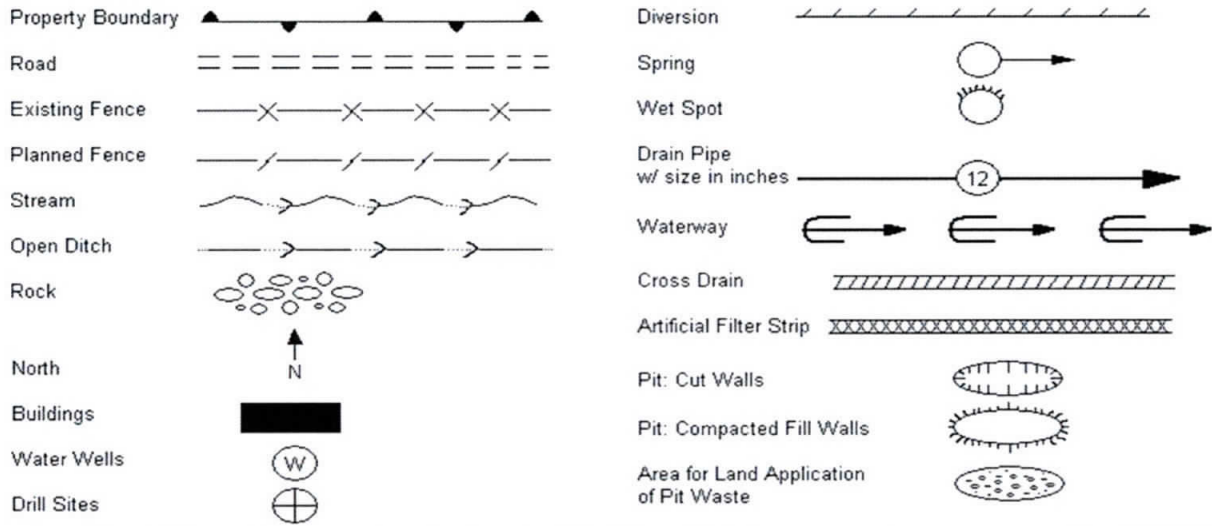
[Signature]  
My commission expires 2/7/21

Notary Public



*Check 10-24-12*  
*DMH*  
*10-24-12*

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Proposed Revegetation Treatment: Acres Disturbed 10 +/- Prevegetation pH         

Lime as determined by pH test min. 2 Tons/acre or to correct to pH 6.5

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

Mulch Hay/Straw 2.5 Tons/acre

Seed Mixtures

Seed Type	Area I lbs/acre	Seed Type	Area II lbs/acre
White Clover	15	White Clover	15
Red Top	15	Red Top	15
Orchard Grass	20	Orchard Grass	20

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] [Signature]

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

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Title: Oil and Gas Inspector Date: 10-24-12

Field Reviewed?  Yes  No

**Marcellus Well Drilling Procedures  
And Site Safety Plan**

Chesapeake Appalachia, LLC

47 - 51 -

Well name Fork Ridge MSH 206H  
Glen Easton, Quad  
Cameron, District  
Marshall County, West Virginia

Submitted by:



8/22/12

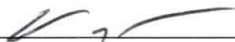
Danielle Southall

Date:

Title Regulatory Tech I

Chesapeake Appalachia, LLC

Approved by:



Date:

10-24-12

Title: Oil + Gas Inspector

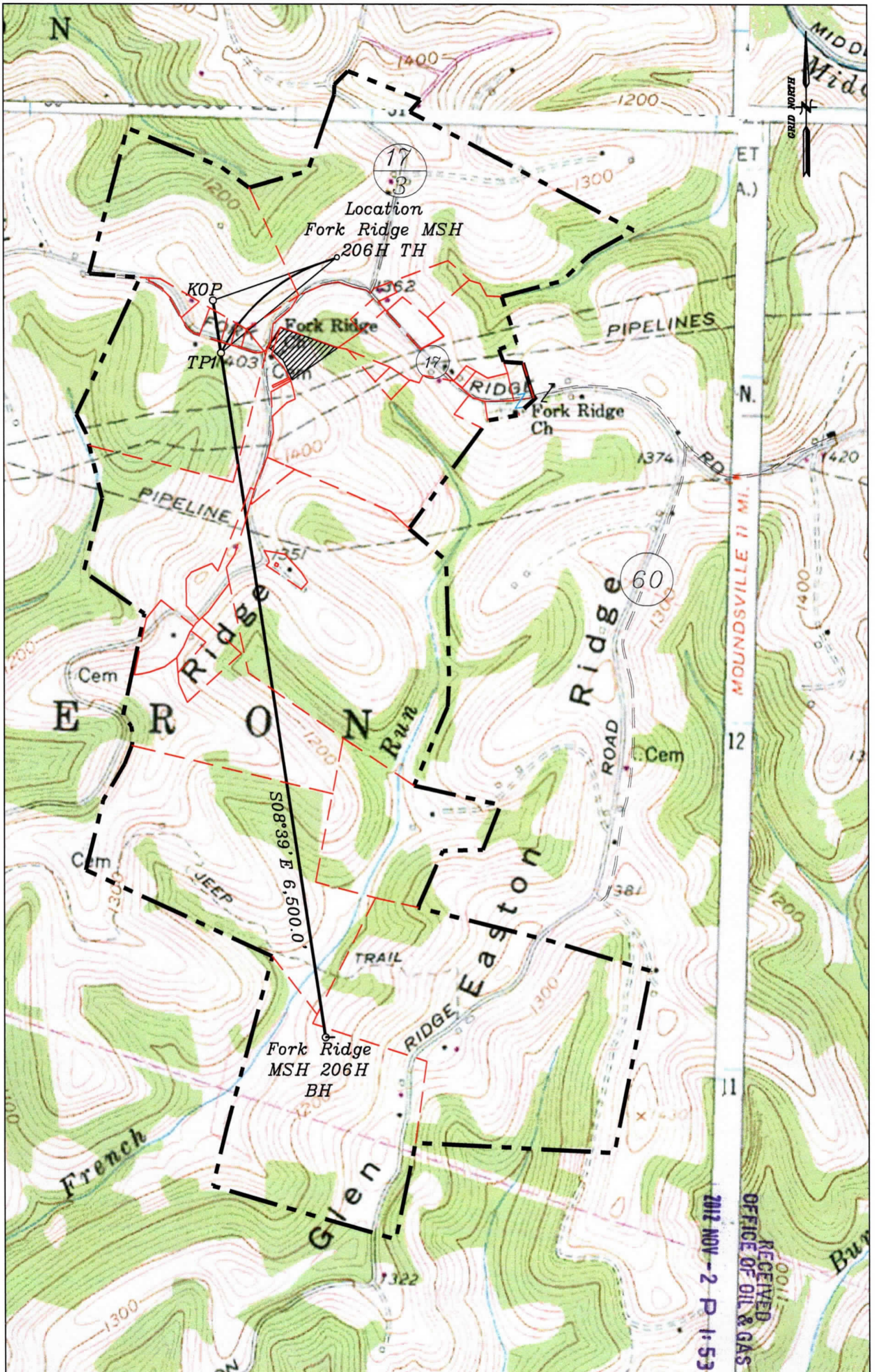
Approved by:

Date:

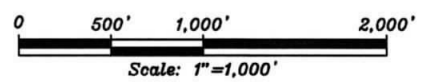
Title: \_\_\_\_\_

Chesapeake Appalachia, L.L.C. – Confidential

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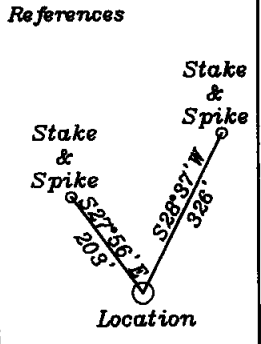


Well: Fork Ridge MSH 206H  
 Quad: Glen Easton 7 1/2'  
 District: Cameron  
 County: Marshall



LATITUDE 39-52-30 N

Top Hole 3,832'  
Bottom Hole 4,026'



- References
- A- Adams T.M. 10/25 5.172 Ac.
  - B- Ward T.M. 10-28 0.84 Ac.
  - C- Wade T.M. 10-25.1 2.84 Ac.
  - D- Carmichael T.M. 10-23.5 2.025 Ac.
  - E- Murray T.M. 10-24 12.08 Ac.
  - F- A Kuhn T.M. 10-20.3 4.0 Ac.
  - G- Carmichael T.M. 10-23.3 0.441 Ac.
  - H- Fork Ridge Universalist Church T.M. 10-9
  - I- Texas Eastern Transmission T.M. 10-24.1 Ac.
  - J- Ritchea D.B. 431-352 Residue of 3rd Parcel
  - K- Consolidation Coal Co. T.M. 10-27 1.787 Ac.
  - L-

- M- Howard T.M. 10-23.4 1.27 Ac.
- N- Murray T.M. 10-6 12.40 Ac.
- O- Yodera T.M. 10-16.1 19.86 Ac.
- P- A. Kuhn T.M. 10-20.4 1.0 Ac.
- Q- Lyons T.M. 10-18 32.0 Ac.
- R- Aston T.M. 10-19 80 Ac.
- S- R. Lyons T.M. 10-7.2 1.601 Ac.
- T- J. Lyons T.M. 10-7.3 1.676 Ac.
- U- Texas Eastern Transmission T.M. 10-23.6 1.005 Ac.
- V- Yoho T.M. 10-23 58.884 Ac.
- W- Consolidation Coal Company T.M. 2-12 94.67 Ac.
- X- Elson T.M. 10-20.1 1.62 Ac.
- Y- Kuhn T.M. 10-20.2 5 Ac.
- Z- L. Kuhn T.M. 10-20 79.12 Ac.

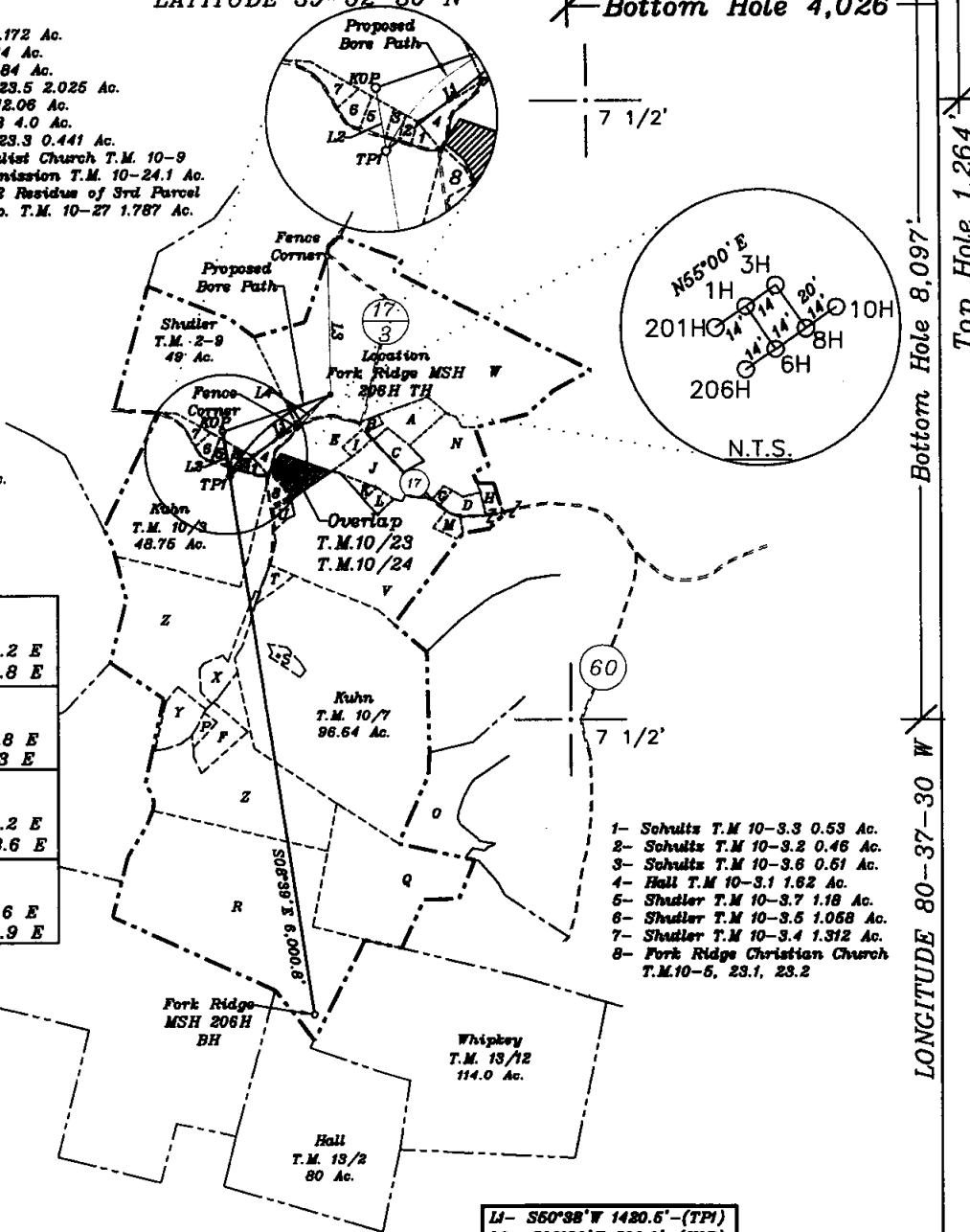
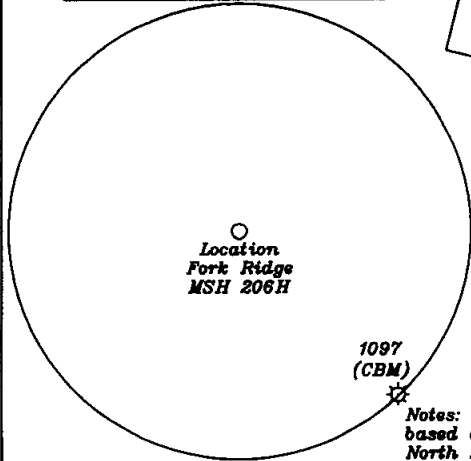
**Top Hole**  
NAD 27-39.871398 N, 80.638593 W  
UTM NAD 83 (Meters)-4413555.0 N, 530924.2 E  
State Plane NAD 27-501523.6 N, 1680426.8 E

**KOP**  
NAD 27-39.870241 N, 80.642756 W  
UTM NAD 83 (Meters)-4413425.1 N, 530568.8 E  
State Plane NAD 27-501117.0 N, 1679253.3 E

**TPI**  
NAD 27-39.868887 N, 80.642465 W  
UTM NAD 83 (Meters)-4413274.9 N, 530594.2 E  
State Plane NAD 27-500822.7 N, 1679328.6 E

**Bottom Hole**  
NAD 27-39.852633 N, 80.638979 W  
UTM NAD 83 (Meters)-4411472.2 N, 530899.6 E  
State Plane NAD 27-494690.3 N, 1680231.9 E

NORTH



- 1- Schults T.M. 10-3.3 0.53 Ac.
- 2- Schults T.M. 10-3.2 0.46 Ac.
- 3- Schults T.M. 10-3.6 0.61 Ac.
- 4- Hall T.M. 10-3.1 1.62 Ac.
- 5- Shudler T.M. 10-3.7 1.18 Ac.
- 6- Shudler T.M. 10-3.5 1.068 Ac.
- 7- Shudler T.M. 10-3.4 1.312 Ac.
- 8- Fork Ridge Christian Church T.M. 10-5, 23.1, 23.2

- L1- S50°38'W 1480.6'-(TPI)
- L2- S08°39'E 500.0'-(KOP)
- L3- S00°55'E 1627.2'-(F.C.)
- L4- N45°16'E 609.2'-(F.C.)

Notes: Ties to wells and corners are based on State Plane Grid North-WV North Zone NAD 27.

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FILE NO. \_\_\_\_\_  
DRAWING NO. 1  
SCALE 1" = 2000'  
MINIMUM DEGREE OF ACCURACY 1 in 2500  
PROVEN SOURCE OF ELEVATION GPS  
submeter unit

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 ENERGY.

(SIGNED) \_\_\_\_\_  
R.P.E. \_\_\_\_\_ L.L.S. 708

STATE OF WEST VIRGINIA  
Division of Environmental Protection  
OFFICE OF OIL AND GAS

DATE October 4, 2012  
OPERATOR'S WELL NO. Fork Ridge MSH 206H  
API WELL NO. \_\_\_\_\_

WELL TYPE: OIL    GAS X LIQUID INJECTION    WASTE DISPOSAL    STATE 47 COUNTY 51 PERMIT 1603 HGA  
(IF "GAS") PRODUCTION X STORAGE    DEEP    SHALLOW X

LOCATION: ELEVATION 1391' WATER SHED Middle Grave Creek  
DISTRICT Cameron COUNTY Marshall  
QUADRANGLE Glen Easton 7 1/2'

SURFACE OWNER Consolidation Coal Company ACREAGE 94.67  
OIL & GAS ROYALTY OWNER Consolidation Coal Company LEASE ACREAGE 555.418 ac.  
LEASE NO. 1-284746-001 to 003, (TM 2/12, 2/9), 1-312544-001 to 003  
LEASE NO. (TM 10/3, 3.3, 3.2, 3.6, 3.1, 3.7, & 3.5), 3rd Party D.B. 694/438 (TM 10/20, 20.1, & 7)  
LEASE NO. 1-324659-000 (TM 10/19)

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

PLUG AND ABANDON    CLEAN OUT AND REPLUG     
TARGET FORMATION Marcellus ESTIMATED DEPTH TVD 6,815'+ Horizontal Leg, TMD 13,281'  
WELL OPERATOR Chesapeake Appalachia, L.L.C. DESIGNATED AGENT Eric B. Gillespie  
ADDRESS P.O. Box 18496 Oklahoma City, OK 73154-0496 ADDRESS P.O. Box 6070 Charleston, WV 25362

LONGITUDE 80-37-30 W  
Top Hole 1,264'  
Bottom Hole 8,097'

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

Date of Notice Certification: 11/1/12

API No. 47- 51-Marshall -  
Operator's Well No. Fork Ridge MSH 206H  
Well Pad Name: Fork Ridge MSH Pad

**Notice has been given:**

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>530924.2</u>
County: <u>51-Marshall</u>	UTM NAD 83 Northing: <u>4413555.0</u>
District: <u>1-Cameron</u>	Public Road Access: <u>Fork Ridge Road</u>
Quadrangle: <u>370-Glen Easton</u>	Generally used farm name: <u>Fork Ridge</u>
Watershed: <u>Middle Grave Creek</u>	

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input checked="" type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
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**Required Attachments:**

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

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OFFICE OF OIL & GAS  
11/2 MW - 2 P 11/1/12

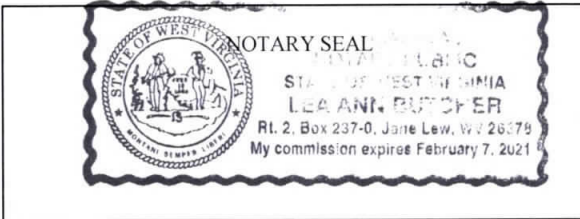


**Certification of Notice is hereby given:**

THEREFORE, I Danielle Southall, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, 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 and imprisonment.

Well Operator: Chesapeake Appalachia, LLC  
By: Danielle Southall  
Its: Regulatory Tech I  
Telephone: 304-517-1416

Address: PO Box 1300  
Jane Lew, WV 26378  
Facsimile: 304-471-2497  
Email: danielle.southall@chk.com



Subscribed and sworn before me this 17<sup>th</sup> day of September 2012  
Lea Ann Butcher Notary Public  
My Commission Expires 2/7/21

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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2012 NOV -2 P 1:51

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

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** \_\_\_\_\_ **Date Permit Application Filed:** 11/1/12

**Notice of:**

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

**Delivery method pursuant to West Virginia Code § 22-6A-10(b)**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b), no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner.

**Notice is hereby provided to:**

- SURFACE OWNER(s)

Name: Consolidation Coal Company  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317-6506

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- SURFACE OWNER(s) (Impoundments/Pits)

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- COAL OWNER OR LESSEE

Name: Consolidation Coal Company  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317-6506

- COAL OPERATOR

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- WATER PURVEYOR(s)

Name: Daniel French  
Address: 1162 Hinerman Hill Road  
Glen Easton, WV 26039

- OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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2012 NOV - 2 P 1:50

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

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** \_\_\_\_\_ **Date Permit Application Filed:** 11/1/12

**Notice of:**

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

**Delivery method pursuant to West Virginia Code § 22-6A-10(b)**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b), no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner.

**Notice is hereby provided to:**

- SURFACE OWNER(s)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- COAL OWNER OR LESSEE  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- SURFACE OWNER(s) (Road and/or Other Disturbance)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- COAL OPERATOR  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- SURFACE OWNER(s) (Impoundments/Pits)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

- WATER PURVEYOR(s)  
Name: Ryan Adams  
Address: 8990 Fork Ridge Rd  
Glen Easton, WV 26039

- OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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2012 NOV -2 P 1:51

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

**This Notice Shall Include:**

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall also include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Water Well Testing:**

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well.

**Water Testing Laboratories:**

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments.

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

**Written Comment:**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

**Time Limits and Methods for Filing Comments.**

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

**Comment Requirements**

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

**Permit Denial or Condition**

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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DEPT OF OIL & GAS  
MAY 02 2 11 PM '11

WW-6A  
(1-12)

API NO. 47-<sup>51-Marshall</sup> - 01608  
OPERATOR WELL NO. Fork Ridge MSH 206H  
Well Pad Name: Fork Ridge MSH Pad

**Notice is hereby given by:**

Well Operator: Chesapeake Appalachia, LLC  
Telephone: 304-517-1416  
Email: danielle.southall@chk.com

Address: PO Box 1300  
Jane Lew, WV 26378  
Facsimile: 304-471-2497

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).

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

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 09/17/2012 **Date Permit Application Filed:** 11/17/12

**Delivery method pursuant to West Virginia Code § 22-6A-16(c)**

- CERTIFIED MAIL RETURN RECEIPT REQUESTED
- HAND DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

**Notice is hereby provided to the SURFACE OWNER(s)**  
(at the address listed in the records of the sheriff at the time of notice):

Name: <u>Consolidated Coal Company</u>	Name: _____
Address: <u>1000 Consol Energy Drive</u> <u>Canonsburg, PA 15317</u>	Address: _____

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>530924.2</u>
County: <u>51-Marshall</u>	Northing: <u>4413555.0</u>
District: <u>1-Cameron</u>	Public Road Access: <u>Fork Ridge Road</u>
Quadrangle: <u>370-Glen Easton</u>	Generally used farm name: _____
Watershed: <u>Middle Grave Creek</u>	

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: <u>Chesapeake Appalachia, LLC</u>	Address: <u>PO Box 1300</u>
Telephone: <u>304-517-1416</u>	<u>Jane Lew, WV 26378</u>
Email: <u>danielle.southall@chk.com</u>	Facsimile: <u>304-471-2497</u>

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110  
Charleston, West Virginia 25305-0430 • (304) 558-3505

May 25, 2011

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MAY 27 2011

MAINTENANCE DIVISION

To: Heather Huffman

From: Gary K. Clayton *Gary K. Clayton*

Attached please find the original Bond provided by Chesapeake for their Statewide Blanket Bond and the Oil and Gas Statewide Bonding Agreement.

Also transmitted herewith please find a bonding agreement to accompany a bond you already have received from Gastar Exploration USA Inc..

*Sent Bond agreement  
- in duplicate to  
Legal 6/27/11*

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**OIL AND GAS ROAD  
STATEWIDE BONDING AGREEMENT** MAINTENANCE DIVISION

THIS AGREEMENT, executed in duplicate, made and entered into this 19th day of May, 2011, by and between the WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, hereinafter called "DEPARTMENT," and CHESAPEAKE APPALACHIA LLC, hereinafter called "COMPANY."

**WITNESSETH:**

WHEREAS, Company has horizontal gas well drilling operations in certain areas of West Virginia; and

WHEREAS, the Department believes that the frequent and repetitive use of certain sections of highways in the State by Company, its contractors, agents, independent contractors or suppliers of drilling materials or drilling equipment, and employees contributes to increased wear and tear to public roads in the state road system in the State, including local roads ("State Owned Roads"); and,

WHEREAS, the Department and Company have entered into this Agreement to satisfy the requirements of the Department's policy entitled "Oil & Gas Road Policy" dated February 1, 2011, as issued by Paul A. Mattox, Jr., Secretary of Transportation / Commissioner of Highways, and any subsequent related policies, hereinafter called "Policy", a copy of which is made a part of this Bonding Agreement and is identified as Attachment 1.

NOW, THEREFORE, for and in consideration of the mutual agreements hereinafter set forth, the parties agree as follows:

I. For purposes of this Bonding Agreement, "Project Transportation Usage" of the Company shall be understood to mean use of one or more State Owned Roads for the delivery and removal of drilling materials and drilling equipment at the site or location of one or more of Company's horizontal gas well pad locations. To the extent reasonably practical, prior to commencing use of a State Owned Road for Project Transportation Usage after January 1, 2011, the Company shall submit to the Department a section or sections of current official WVDOH County Highway maps identifying the exact location of the proposed project and the State Owned Roads that the Company will utilize for the Project Transportation Usage.

II. Company and Department shall within 14 days of the Company's submittal, agree to a list of these sections of State Owned Roads, hereinafter called "Project Roads List", to be utilized for each of Company's projects, identified by route number and milepost; at a time to be mutually agreed to by the parties prior to initial commencement of Project Transportation Usage of a particular State Owned Road on a Project Roads List, the Company and Department will jointly review the condition of the roads and bridges on the Project Roads List. The Department will document the road type and surface condition and general right-of-way width of each section of road on the Project Road List. Either party may supplement this documentation with photographs, video or other evidence of the present condition of the road surface, shoulders, ditches, culverts, bridges or other structures or appurtenances of roads on the Project Road List, as well as approaches to the roads, utility facilities located within or along the right-of-way, or any other condition, including third-party activities, that may affect the duties and responsibilities of the parties under this Agreement. A copy of any such documentation must be made and provided to the other party within ten business days after the joint review of the roads on the Project Roads List.

III. Department shall issue a Project Agreement or Project Permit, as appropriate, to Company to use State Owned Roads and may include any minor or major improvements required of Company prior to, during or after Project with the assignment of responsibilities of both parties prior to, during and after the operator has completed well fracturing..

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IV. In the Project Agreement/Project Permit, the Department shall not require the use of State Owned Roads other than the roads proposed by Company unless the Department has safety concerns as to the Company's proposed roads. A failure to agree on roads that may otherwise be lawfully used for a particular Project Transportation Usage shall result in the designation of the State Owned Roads proposed by Company, with milepost determinations as designated by Department. This Agreement shall only cover portions of State Owned Roads designated on the Project Roads List.

V. For the duration of Company's Project Transportation Usage of the Stated Owned Roads on the Project Roads List, whether by the Company, its contractors (while working on behalf of Company), agents, independent contractors or suppliers of drilling materials or drilling equipment, or employees, the Company agrees to pay for all reasonable maintenance and repair costs incurred by the Department to repair areas of the State Owned Roads included in the Project Roads List that were directly damaged by Company's Project Transportation Usage, as determined to be reasonably necessary and appropriate by the Department. The Department shall keep a record of all labor performed by Department employees and contractors for such maintenance and repairs and shall send an invoice for the same to Company.

VI. Company shall be responsible for the cost of all maintenance and repairs reasonably necessary to put the existing roadways, bridges and appurtenances on the Project Roads List utilized for the Project Transportation Usage in the condition that existed immediately prior to the Project Transportation Usage. Company shall not be required to pay for maintenance or repairs to put any areas of such roadways, bridges and appurtenances on the Project Roads List in a condition better than the condition that existed immediately prior to the Project Transportation Usage. Company shall also not be required to pay for maintenance or repairs to any areas of these roadways, bridges or appurtenances on the Project Roads List that are not actually utilized for the Project Transportation Usage or for damage not caused by Project Transportation Usage.

VII. Company shall notify the Department in writing of Company's final completion of Project Transportation Usage for particular roadways, bridges and appurtenances on the Project Roads List. Within fourteen days after its receipt of written notification of the completion of the Project Transportation Usage for all roads on a Project Roads List, the Department will review the condition of the roadways, bridges and appurtenances on the Project Roads List actually utilized for the Project Transportation Usage and advise Company of any final repairs reasonably necessary to leave these roads, bridges and appurtenances in a condition reasonably deemed by Department to be equal to their condition prior to commencement of Project Transportation Usage; and, upon completion of all such final repairs by or on behalf of Company and acceptance by Department, the Company shall be released from all further liability for maintenance or repairs to roads, bridges, or appurtenances on said Project Roads List. Any maintenance or repair work under the Project Agreement/Project Permit for roads, bridges or appurtenances on the Project Roads List may be performed by a contractor directly chosen by the Company as approved by the Department, the Department's workforce, or a private contractor hired by the Department through the public bid process in accordance with state law, all of which work shall be subject to the standards and specifications of the Department.

VIII. In order to ensure performance of Company's performance and payment obligations under this Bonding Agreement, the Company shall post a corporate surety bond, hereinafter called "**Master Bond**", with the Department named as the beneficiary, which form of bond shall be subject to the consent of the Department, not to be unreasonably withheld. The amount and form of the bond shall be in accordance with the Policy as set forth above. However, the amount of the Master Bond does not limit the amount of claims that may be made by the Department against the Company under this Bonding Agreement. The Company shall provide the Master Bond to the Department within one (1) month after the execution of this Bonding Agreement. The Master Bond shall secure the good faith performance of all payment obligations of Company under the terms of this Bonding Agreement respecting the roads, bridges and appurtenances on the Project Roads List for each Project Transportation Usage undertaken by the Company, and shall remain in effect until termination of this Agreement. Company shall not be obligated to provide any other bonds, sureties, or other guarantees of performance to the Department for Company's use of State Owned Roads, except as required in this Agreement.

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IX. Company shall maintain Commercial General Liability Insurance in the amount of two million dollars, with a minimum coverage of one million dollars per occurrence, for personal injury or death to persons, or for property damage, resulting from Company's Project Transportation Usage and shall present evidence of such insurance to Department upon request.

X. Company's usage of State Owned Roads under the Project Agreement/Project Permit shall comply with all applicable Federal, State and local laws and regulations including, but not limited to, to the extent applicable, the National Environmental Policy Act, Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act, Rare, Threatened and Endangered Species Act, Section 401 Water Quality Certification, and hazardous waste requirements. Further, upon reasonable written request of Department, Company shall furnish Department with acceptable documentation of such compliance which is in the possession of the Company.

XI. Company shall defend, indemnify and hold Department harmless from and against any and all losses, damage, and liability, and from all claims for damages on account of or by reason of bodily injury, including death, which may be sustained, or claimed to be sustained, by any person or persons, including employees of Department, and from and against any and all claims, losses or liabilities for damages to property, arising out of the negligent or willful acts or omissions of Company, its agents, independent contractors and suppliers of drilling materials or drilling equipment, employees and contractors, in the performance of all Project Transportation Usage activities undertaken pursuant to this Agreement (collectively, "claims"). The Company shall not be responsible to indemnify, defend or hold harmless Department for any claims caused by the negligent or willful acts or omissions of the Department or its agents, employees and contractors or third parties not performing work at the direction of Company or delivering drilling equipment or drilling materials, including water, for use by or for company.

XII. If a provision of this Agreement is or becomes illegal, invalid or unenforceable in any jurisdiction, that shall not affect the validity or enforceability of any other provision of this Agreement; or the validity or enforceability in other jurisdictions of that or any other provision of this Agreement.

XIII. Department shall give Company a minimum of thirty days written notice of default under the terms of this Bonding Agreement and the opportunity to cure this default during such thirty-day period. If a default is not cured to the satisfaction of Department, or provision acceptable to Department is not made for a cure, Department may then elect to terminate this Bonding Agreement in whole or in part, and may in addition exercise its rights under the Master Bond or seek any other lawful relief available. Company may terminate this Bonding Agreement upon thirty days written notice to Department for any reason. In the event Company terminates this Agreement for any reason, it shall be liable for the repair and maintenance costs set forth above for prior Project Transportation Usage.

XIV. Nothing herein shall be construed to mean that Company shall have any jurisdiction or control over any public roads in the state road system.

XV. Company, its contractors, agents, employees and suppliers shall at all times be subject to applicable provisions of state and federal law, including without limitation laws requiring operation of vehicles in accordance with legal size and weight restrictions and posted weight limits. Oversize/overweight permits for vehicle or loads not otherwise conforming with law must be obtained in accordance with law; Department agrees to work in good faith with Company to review and grant (where authorized by law) such permits in a timely manner upon request by Company.

XVI. This Bonding Agreement shall be construed and enforced in accordance with the laws of the State of West Virginia, as they may be amended.

XVII. This Bonding Agreement shall be binding upon the successors and assigns of each party hereto.

IN WITNESS WHEREOF, the parties hereto have caused this Bonding Agreement to

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be executed by their duly authorized officers effective as of the date first above written.

WEST VIRGINIA DEPARTMENT OF  
TRANSPORTATION,  
DIVISION OF HIGHWAYS

Dorun Bana  
Witness Executive Secretary

By: Marinda A. Murphy  
State Highway Engineer

Chesapeake Appalachia LLC,  
A limited liability company

[Signature]  
Witness

By: Stacy D. Robert

Title: Vice President - Risk Management

(To be executed in duplicate)

APPROVED AS TO FORM THIS  
8<sup>th</sup> DAY OF July 2011  
[Signature]  
ATTORNEY LEGAL DIVISION  
WEST VIRGINIA DEPARTMENT  
OF HIGHWAYS

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Liberty Mutual Surety  
1001 4th Avenue, Suite 1700  
Seattle, WA 98154

MAINTENANCE DIVISION

PERFORMANCE BOND

Bond 022033412

KNOW ALL BY THESE PRESENTS, That we, Chesapeake Appalachia, L.L.C.

(hereinafter called the Principal), as Principal, and Safeco Insurance Company of America, a corporation duly organized under the laws of the State of Washington (hereinafter called the Surety), as Surety, are held and firmly bound unto West Virginia Department of Transportations, Division of Highways

\_\_\_\_\_ (hereinafter called the Obligee),  
in the sum of One Million Dollars And Zero Cents

\_\_\_\_\_ (\$ 1,000,000.00 ) Dollars, for the payment of which sum well and truly to be made, we, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed and sealed this 19th day of May, 2011.

WHEREAS, said Principal has entered into a written Contract with said Obligee, dated \_\_\_\_\_, for use of State roadways pursuant to Oil and Gas Road Statewide Bonding Agreement

in accordance with the terms and conditions of said Contract, which is hereby referred to and made a part hereof as if fully set forth herein:

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, That if the above bounden Principal shall well and truly keep, do and perform each and every, all and singular, the matters and things in said contract set forth and specified to be by said Principal kept, done and performed, at the times and in the manner in said contract specified, or shall pay over, make good and reimburse to the above named Obligee, all loss and damage which said Obligee may sustain by reason of failure or default on the part of said Principal so to do, then this obligation shall be null and void; otherwise shall remain in full force and effect.

NO SUIT, ACTION OR PROCEEDING by the Obligee to recover on this bond shall be sustained unless the same be commenced within two (2) years following the date on which Principal ceased work on said Contract.



Chesapeake Appalachia, L.L.C.  
By [Signature] Principal

Safeco Insurance Company of America  
By [Signature] Stacy L. Roberts Attorney-in-Fact

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POWER OF ATTORNEY

Safeco Insurance Companies of America  
1001 4th Avenue  
Suite 1700  
Seattle, WA 98154

KNOW ALL BY THESE PRESENTS:

No. 13359

That SAFECO INSURANCE COMPANY OF AMERICA, a Washington corporation, does hereby appoint

\*\*\*\*\*STACY L. ROBERTS; Oklahoma City, Oklahoma\*\*\*\*\*

its true and lawful attorney(s)-in-fact, with full authority to execute on behalf of the company fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind SAFECO INSURANCE COMPANY OF AMERICA thereby as fully as if such instruments had been duly executed by its regularly elected officers at its home office. IN WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA has executed and attested these presents

this 17th day of April 2009

*Dexter R. Legg*

*T. Mikolajewski*

Dexter R. Legg, Secretary

Timothy A. Mikolajewski, Vice President

CERTIFICATE

Extract from the By-Laws of SAFECO INSURANCE COMPANY OF AMERICA:

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

Extract from a Resolution of the Board of Directors of SAFECO INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

- (i) The provisions of Article V, Section 13 of the By-Laws, and
- (ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
- (iii) Certifying that said power-of-attorney appointment is in full force and effect,

the signature of the certifying officer may be by facsimile, and the seal of the Company may be facsimile thereof."

I, Dexter R. Legg, Secretary of SAFECO INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of this corporation, and of a Power of Attorney issue pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation

this 19th day of May 2011



*Dexter R. Legg*

Dexter R. Legg, Secretary

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Supplier Name	Product Name	Product Use	Chemical Name	CAS Number
BAKER HUGHES	ALPHA 1427	Biocide	Didecyl Dimethyl Ammonium Chloride	007173-51-1
			Ethanol	000064-17-5
			Glutaraldehyde (Pentanediol)	000111-30-8
			Quaternary Ammonium Compound	068424-85-1
			Water	007732-18-5
	BF-7L	Buffer	Potassium Carbonate	000584-08-7
	ClayCare	Clay Stabilizer	Choline Chloride	000067-48-1
			Water	007732-18-5
	Enzyme G-I	Breaker	No Hazardous Components	NONE
	ENZYME G-NE	Breaker	No Hazardous Components	NONE
	FRW-18	Friction Reducer	Petroleum Distillate Hydrotreated Light	064742-47-8
	GW-3LDF	Gel	Petroleum Distillate Blend	N/A-014
			Polysaccharide Blend	N/A-021
	SCALETROL 720	Scale Inhibitor	Diethylene Glycol	000111-46-6
Ethylene Glycol			000107-21-1	
XLW-32	Crosslinker	Boric Acid	010043-35-3	
		Methanol (Methyl Alcohol)	000067-56-1	
FRAC TECH SERVICES	APB01 (AMMONIUM PERSUFATE BREAKER)	Breaker	Ammonium Persulfate	007727-54-0
	B05 (LOW PH BUFFER)	Buffer	Acetic acid	000064-19-7
	BXL03 Borate XL Delayed High Temp	Crosslinker	No Hazardous Components	NONE
	FRW-200	Friction Reducer	No Hazardous Components	NONE
	HVG01 (TURQUOISE-1 BULK)	Gelling Agent	Petroleum Distillate Hydrotreated Light	064742-47-8
	KCLS-4	Clay Stabilizer	No Hazardous Components	NONE
	LTB-1	Breaker	Ammonium Persulfate	N/A

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Supplier Name	Product Name	Product Use	Chemical Name	CAS Number
NALCO ONESOURCE	EC6110A	Biocide	Ethanol	000064-17-5
			Glutaraldehyde (Pentanediol)	000111-30-8
			Quaternary Ammonium Compounds	N/A-063
	EC6629A	Biocide	No Hazardous Components	NONE
WEATHERFORD	WBK-133 OXIDIZER	Breaker	Ammonium Persulfate	007727-54-0
	WBK-134	Breaker	Ammonium Persulfate	007727-54-0
			Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7
	WCS-631LC	Clay Stabilizer	Proprietary Non Hazardous Salt	N/A-229
			Water	007732-18-5
	WFR-55LA	Friction Reducer	No Hazardous Components	NONE
	WGA-15L	Gel	Petroleum Distillate Hydrotreated Light	064742-47-8
	WPB-584-L	Buffer	Potassium Carbonate	000584-08-7
			Potassium Hydroxide	001310-58-3
	WXL-101LE	Crosslinker	No Hazardous Components	NONE
	WXL-101LM	Crosslinker	Petroleum Distillate Hydrotreated Light	064742-47-8
	WXL-105L	Crosslinker	Water	007732-18-5
			Ethylene Glycol	000107-21-1
Boric Acid			010043-35-3	
Ethanolamine			000141-43-5	
SCHLUMBERGER	B244 Green-Cide 25G	Biocide	Glutaraldehyde	111-30-8
	L071 Temporary Clay Stabilizer	Clay Stabilizer	Cholinium Chloride	67-48-1
	Breaker J218	Breaker	Diammonium Peroxidisulphate	7727-54-0
	EB-Clean* J475 Breaker		Diammonium Peroxidisulphate	7727-54-0
	Friction Reducer B315	Friction Reducer	Distillates (petroleum), Hydrotreated light Aliphatic Alcohol Glycol Ether	64742-47-8
	Friction Reducer J609		Ammonium Sulfate	7705-20-2

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Supplier Name	Product Name	Product Use	Chemical Name	CAS Number
SCHLUMBERGER	Water Gelling Agent J580	Gel	Carbohydrate Polymer	Proprietary
	Scale Inhibitor B317	Scale Inhibitor	Trisodium ortho phosphate Ethane-1, 2-diol	7601-54-9 107-21-1
	Borate Crosslinker J532	Crosslinker	Aliphatic polyol Sodium tetraborate decahydrate	Proprietary 1303- 96-4
	Crosslinker J610		Aliphatic polyol Potassium hydroxide	Proprietary 1310- 58-3

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