



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

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

March 31, 2015

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-5101802, issued to CHEVRON APPALACHIA, LLC, 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: TAYLOR C 3H
Farm Name: WILLIAMS OHIO VALLEY MIDS[...]
API Well Number: 47-5101802
Permit Type: Horizontal 6A Well
Date Issued: 03/31/2015

Promoting a healthy environment.

04/03/2015

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.



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601 57th Street
Charleston, WV 25304
(304) 926-0450 fax (304) 926-0452

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

**ORDER
ISSUED UNDER
WEST VIRGINIA CODE, CHAPTER 22, ARTICLE 6A**

TO: Chevron Appalachia, LLC
800 Mountain View Drive
Smithfield, WV 15478

DATE: March 31, 2015
ORDER NO.: 2015-W-3

INTRODUCTION

This Order (hereinafter "Order") is issued by the Office of Oil and Gas (hereinafter "OOG"), by and through its Chief, pursuant to the authority of W. Va. Code §§ 22-1-1, 22-6-1 and 22-6A-1 *et seq.* to Chevron Appalachia, LLC (hereinafter "Chevron" or "Operator"), collectively the "Parties."

FINDINGS OF THE CHIEF

In support of this Order, the Chief hereby finds the following:

1. OOG, an office within the West Virginia Department of Environmental Protection, is the agency with the duty and authority to execute and enforce W. Va. Code §22-6-1 and §22-6A-1 *et seq.*, and the rules and regulations promulgated thereunder.
2. Chevron is a "person" as defined by W. Va. Code §22-6-1(n), with a corporate address as 800 Mountain View Drive, Smithfield, PA 15478.
3. On November 14, 2014 and February 5, 2015, Chevron submitted applications for gas wells identified as API numbers 47-051-01800, 47-051-01801, 47-051-01802, 47-051-01803, 47-051-01804, 47-51-01805, 47-051-01824, 47-051-01825 and 47-05101826 located on the Taylor C Pad in the Clay District of Marshall County, West Virginia.
4. On February 27, 2015, Chevron requested a waiver for Streams 1 and 2 outlined in Exhibit 1, from well location restriction requirements in W. Va. Code §22-6A-12(b) for gas well permit applications identified as API numbers 47-051-01800, 47-051-01801, 47-051-01802, 47-051-01803, 47-051-01804, 47-51-01805, 47-051-01824, 47-051-01825 and 47-051-01826, located on the Taylor C Pad in the Clay District of Marshall County, West Virginia.

04/03/2015

CONCLUSIONS OF LAW

1. West Virginia Code §22-1-6(d) requires, in part, that “[i]n addition to other powers, duties and responsibilities granted and assigned to the secretary by this chapter, the secretary is authorized and empowered to... (3) Enter private lands to make surveys and inspections for environmental protection purposes; to investigate for violations of statutes or rules which the Office of Oil and Gas is charged with enforcing; to serve and execute warrants and processes; to make arrests; issue orders, which for the purposes of this chapter include consent agreements; and to otherwise enforce the statutes or rules which the Office of Oil and Gas is charged with enforcing.”
2. West Virginia Code §22-6A-2(a)(6) requires, in part, that “Concomitant with the broad powers to condition the issuance of well work permits, the secretary should also have broad authority to waive certain minimum requirements of this article when, in his or her discretion, such waiver is appropriate: *Provided*, That the secretary shall submit a written report of the number of waivers granted to the Legislature commencing January 1, 2013, and each year thereafter.”
3. West Virginia Code §22-6A-12(b) requires, in part, that “[n]o 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 Office of Oil and Gas 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 Office of Oil and Gas 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.”

ORDER

Therefore, the Office of Oil and Gas grants Chevron a waiver for Perennial Streams #1 and #2 from well location restriction requirements in W. Va. Code §22-6A-12(b) for gas well permit applications identified as API numbers 47-051-01800, 47-051-01801, 47-051-01802, 47-051-01803, 47-051-01804, 47-51-01805, 47-051-01824, 47-051-01825 and 47-05101826, located on the Taylor C Pad in Clay District of Marshall County, West Virginia. The Office of Oil and Gas hereby **ORDERS** that Chevron Appalachia, LLC shall meet the following site construction and operational requirements for the Taylor C well pad:


- a. A berm shall be constructed around the perimeter of the pad to contain any potential spills and storm water runoff. Berm is to be at least one and a half feet (1.5') in height;
- b. Super silt fence and erosion control blankets shall be installed on all slopes and down gradient locations of the pad and topsoil pile areas as erosion and sediment controlling BMPs;
- c. Perennial Streams #1 and #2 shall have super silt fence installed adjacent to the streams;
- d. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
- e. Drill cuttings and associated drilling mud shall be disposed of in a permitted landfill;
- f. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
- g. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
- h. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
- i. Inspections of the storm water and spill prevention measures shall be conducted after any major storm event defined as a half inch (½") rain within any twenty-four (24) hour period;
- j. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
- k. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 31th day of March, 2015.

IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

By: _____


JAMES A. MARTIN, CHIEF



SITE LOCATION MAP
GLEN EASTON QUAD
1" = 2000'

NOTES:

1. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
2. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
3. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
4. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
5. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
6. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
7. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
8. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
9. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.
10. The well site is located on the east side of French Run, approximately 1/2 mile north of the confluence of French Run and Lick Run.

LIMITS OF DISTURBANCE = 22.0 ACRES

FOR CONTINUATION SEE SHEET ES 100



Know what's below.
Call before you dig.



LEGEND

---	2" x 4" LOC.
---	4" x 4" LOC.
---	6" x 6" LOC.
---	8" x 8" LOC.
---	10" x 10" LOC.
---	12" x 12" LOC.
---	14" x 14" LOC.
---	16" x 16" LOC.
---	18" x 18" LOC.
---	20" x 20" LOC.
---	24" x 24" LOC.
---	30" x 30" LOC.
---	36" x 36" LOC.
---	42" x 42" LOC.
---	48" x 48" LOC.
---	54" x 54" LOC.
---	60" x 60" LOC.
---	66" x 66" LOC.
---	72" x 72" LOC.
---	78" x 78" LOC.
---	84" x 84" LOC.
---	90" x 90" LOC.
---	96" x 96" LOC.
---	102" x 102" LOC.
---	108" x 108" LOC.
---	114" x 114" LOC.
---	120" x 120" LOC.
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---	252" x 252" LOC.
---	258" x 258" LOC.
---	264" x 264" LOC.
---	270" x 270" LOC.
---	276" x 276" LOC.
---	282" x 282" LOC.
---	288" x 288" LOC.
---	294" x 294" LOC.
---	300" x 300" LOC.
---	306" x 306" LOC.
---	312" x 312" LOC.
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---	366" x 366" LOC.
---	372" x 372" LOC.
---	378" x 378" LOC.
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---	396" x 396" LOC.
---	402" x 402" LOC.
---	408" x 408" LOC.
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---	420" x 420" LOC.
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---	672" x 672" LOC.
---	678" x 678" LOC.
---	684" x 684" LOC.
---	690" x 690" LOC.
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---	708" x 708" LOC.
---	714" x 714" LOC.
---	720" x 720" LOC.
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---	798" x 798" LOC.
---	804" x 804" LOC.
---	810" x 810" LOC.
---	816" x 816" LOC.
---	822" x 822" LOC.
---	828" x 828" LOC.
---	834" x 834" LOC.
---	840" x 840" LOC.
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---	852" x 852" LOC.
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---	864" x 864" LOC.
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---	876" x 876" LOC.
---	882" x 882" LOC.
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---	906" x 906" LOC.
---	912" x 912" LOC.
---	918" x 918" LOC.
---	924" x 924" LOC.
---	930" x 930" LOC.
---	936" x 936" LOC.
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---	948" x 948" LOC.
---	954" x 954" LOC.
---	960" x 960" LOC.
---	966" x 966" LOC.
---	972" x 972" LOC.
---	978" x 978" LOC.
---	984" x 984" LOC.
---	990" x 990" LOC.
---	996" x 996" LOC.
---	1000" x 1000" LOC.

Exhibit F

TAYLOR C WELL SITE
FORK RIDGE ROAD (GO ROAD 17) CLAY DISTRICT
MARSHALL COUNTY WV, 26041
PREPARED FOR
CHEVRON APPALACHIA, LLC
800 MOUNTAIN VIEW DRIVE
SMITHFIELD, PA 15478

REVISION RECORD

NO.	DATE	DESCRIPTION
1	04/03/2015	ISSUED FOR PERMIT
2	04/03/2015	ISSUED FOR PERMIT
3	04/03/2015	ISSUED FOR PERMIT
4	04/03/2015	ISSUED FOR PERMIT
5	04/03/2015	ISSUED FOR PERMIT
6	04/03/2015	ISSUED FOR PERMIT
7	04/03/2015	ISSUED FOR PERMIT
8	04/03/2015	ISSUED FOR PERMIT
9	04/03/2015	ISSUED FOR PERMIT
10	04/03/2015	ISSUED FOR PERMIT



GATEWAY
Consulting Engineers & Surveyors
409 Holiday Drive, Suite 300 Proctor, WV 26424
Phone (412) 921-4000 - Fax (412) 921-4001
www.gatewayeng.com

04/03/2015

ES 103

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

1) Well Operator: Chevron Appalachia, LLC 49449935 51 Clay Glen Easton, WV
Operator ID County District Quadrangle

2 370

2) Operator's Well Number: 3H Well Pad Name: Taylor C

3) Farm Name/Surface Owner: Williams Ohio Valley Midstream LLC Public Road Access: CR 17 Fork Ridge Road

4) Elevation, current ground: 1257' Elevation, proposed post-construction: 1236'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No *JW 10/15/14*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus, 6535', 49' - 0.64 psi/ft

8) Proposed Total Vertical Depth: 6555'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15,989'

11) Proposed Horizontal Leg Length: 8955'

12) Approximate Fresh Water Strata Depths: 528' GL

13) Method to Determine Fresh Water Depths: 2 mi radius offset wells, freshwater wells, and freshwater base level

14) Approximate Saltwater Depths: 1276', 1880'-2370' KB: Francis 1V offset well

15) Approximate Coal Seam Depths: 790' GL

16) Approximate Depth to Possible Void (coal mine, karst, other): 790' GL

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: Ireland Mine

Depth: 790' GL

Seam: Pittsburgh No. 8'

Owner: CONSOL Energy

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NOV 14 2014

WV Department of
Environmental Protection

18) **CASING AND TUBING PROGRAM**

TYPE	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20"	New			40'	40'	141.8
Fresh Water	13-3/8"	New	J-55	54.5#	600'	600'	691.0
Coal							
Intermediate	9-5/8"	New	N-80	40#	2,330'	2,330'	941.0
Production	5-1/2"	New	P-110	20#	15,989'	15,989'	3430.0
Tubing							
Liners							

ju 10/15/14

TYPE	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	26"				
Fresh Water	13-3/8"	17-1/2"	0.380"	2,730 psi	Class A	1.18
Coal						
Intermediate	9-5/8"	12-1/4"	0.395"	5,750 psi	Class A	1.29
Production	5-1/2"	8-1/2"	0.361"	12,640 psi	Class A	1.61
Tubing						
Liners						

PACKERS

Kind:	None			
Sizes:				RECEIVED
Depths Set:				Office of Oil and Gas
				NOV 14 2014

WV Department of
Environmental Protection

WW-6B
(9/13)

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

Drill 17-1/2" hole to 600 then run and cement 13-3/8" casing to surface covering the fresh water. Drill 12.25" hole to 2,330' then run and cement to surface 9 5/8" casing, covering the Big Injun. Drill 8 1/2" hole to KOP at 5,578'. Drill 8 1/2" curve and lateral to 15,989' MD and 6,555 TVD. Run 5 1/2" production casing and cement back to surface'.

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

Chevron will utilizing plug and perf method with 52 stages using 8,572 bbl of fluid and 315,000 lbm of sand per stage. Anticipated max pressure: 9500psi

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 22.01

22) Area to be disturbed for well pad only, less access road (acres): 4.66

23) Describe centralizer placement for each casing string:

There will be a bow spring centralizer every two jts on the Water string and intermediate. The production string will have two centralizer every jt in the lateral and curve, then one every jt from KOP to surface.

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

For the Water String the blend will contain class A cement, 3% CaCl₂, and flake. The intermediate will contain class A cement, 10% CaCl₂, Salt, and flake. The Production cement will have a lead and tail cement. The lead will contain class A cement, KCl, dispersant, suspension agent, and retarder. The tail will contain class A cement, Calcium Carbonate, KCl, dispersant, de-foamer, suspension agent, and friction reducer.

25) Proposed borehole conditioning procedures:

Well will be circulated a minimum of 3 bottoms up once casing point has been reached on all hole sections and until uniform mud properties are achieved.

Received
Office of Oil & Gas
MAR 11 2015

*Note: Attach additional sheets as needed.

4705101802

Cement Additives

Water String the blend will contain class A cement, 3% CaCl₂, and flake.

The intermediate will contain class A cement, 10% CaCl₂, Salt, and flake.

The Production cement will have a lead and tail cement.

The lead will contain class A cement, KCl, dispersant, suspension agent, and retarder.

The tail will contain class A cement, Calcium Carbonate, KCl, dispersant, de-foamer, suspension agent, and friction reducer.

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Environmental Protection

04/03/2015

Scenario-1: Marcellus well drilled first as Pilot well:

- a. **If a void is encountered, we will drill ahead to min 30' or max 50' below mine void and stop drilling.**
 - **Notify DEP Inspector and obtain permit/ approval to plug back hole. The plugback procedure will be as follows:**
 - Trip in hole with 2-7/8" tubing cement stinger to 20' above top of void.
 - Mix and pump cement to fill rat hole below void. Trip out of hole and lay down tubing
 - Trip in hole with Open Hole Packer and set at 20' above top of void. Test packer.
 - Trip out of hole and lay down packer running tool
 - TIH w/ 2-7/8" tubing to 5'+/- from top of packer
 - Mix and pump **15.6ppg** cement on top of packer and fill hole to within 10' from surface.
 - Trip out of hole and lay down tubing.
 - Nipple down BOPE and related equipment
 - Cut casing, lay wellhead and casing cut piece
 - Weld on steel plate to cover casing
 - Rig down and skid rig to next well. Note: Cellar ring removal, cellar filling and installation of land mark will be done later

The rest wells original plan will be revised to incorporate a coal casing string as follows:

b. Marcellus Wells Contingency Casing Plan:

- Drill 26" hole to **688'** (min 50' or max 150' beyond freshwater zone)
- Run 20" 94.5# J-55 BTC casing
- Cement casing to surface using displacement method with **30% excess**
- Drill 17-1/2" hole to **940'** (min 30' or max 50 beyond mine void)
- Run 13-3/8" 54.5# J-55 BTC casing with cement basket **20' above mine void**
- **Cement casing using displacement method to bottom of mine void using 100% excess**
- **Grout from surface to cement basket using whatever volume of cement necessary to get cement to surface**
- Drill 12-1/4" hole to **2,311'** 100' below the Berea Sand
- Run 9-5/8" 40# N-80 BTC casing to isolate the Berea, shallow gas sand and salt water zones
- Cement casing to surface using displacement method with **30% excess**
- Drill 8-1/2" production hole to TD
- Run 5 1/2" 20# P-110 VA Superior production casing to TD
- Cement casing to surface using displacement method with **10% excess**

c. Utica/ Point Pleasant well Contingency Casing Plan: In a situation where there is also Utica/ Point Pleasant well(s) to be drilled on same pad, the Point Pleasant/Utica well contingency casing design based on the outcome of the Marcellus pilot well drilled will be as follows:

- Drill 26" hole to **638'** (min 50' or max 150' beyond freshwater zone)
- Run 24" 186# X-56 DDS casing
- Cement casing to surface using displacement method with **30% excess**
- Drill 21" hole to **940'** (min 30' or max 50 beyond mine void)
- Run 18-5/8" 87.5# J-55 BTC casing with cement basket **20' above mine void**
- **Cement casing using displacement method to bottom of mine void using 100% excess**
- **Grout from surface to cement basket using whatever volume of cement necessary to get cement to surface**
- Drill 17-1/2" hole to **2,542'** 100' below the Berea Sand
- Run 13-3/8" 72# N-80 BTC casing to isolate the Berea, shallow gas sand and salt water zones
- Cement casing to surface using displacement method with **30% excess**
- Drill 12-1/4" hole to **8,846'** 100' below the Lockport

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Scenario-2: Drilling String/ Bottom Hole Assembly Stuck during drilling:

- If the drill string/BHA gets stuck during drilling operation:
 - Make all necessary effort and attempt to free the drill string/BHA.
 - If all effort and attempts proves unsuccessful, will notify WV DEP Inspector of situation and obtain verbal and/or email approval to plug hole back with cement plug(s) and sidetrack well
 - Cement plug(s) will be set as needed to the desired depth adequate for successful sidetrack of well without compromising anti-collision with the original hole and ghost well(s)/adjacent wells on the same pad
 - Cement plug(s) additives will contain Class H cement, KCl, Dispersant, Anti-Foam, and Retarder.
 - Trip in hole with Drilling Bottom Hole Assembly
 - Dress/drill cement to proposed kick off point
 - Kick off and sidetrack well and directionally drill sidetrack well to original casing point

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Taylor C 3H

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Marshall Co. WV
September 18, 2014

Casing & Cementing Details

Ground Level Elevation: 1235
Depths are measured from KB 15 ft above GL

AZM	Casing Formation	DEPTH		Inclination	HOLE SIZE	CASING SPECS	CEMENT INFO	GENERAL INFO
		MD	TVD					
	30.0" Conductor	40'			36"			
	Bow Spring: 1-shoe jt, 1-every 2nd jt 1 on ea 2-3 jts across previous shoe. Rigid: 2-within 100 ft of surface					Fresh Water Casing 13-3/8" 54.5# J-55 BTC 0.458" wall Capacity = 0.1508 bbl/ft Annulus = 0.1237 bbl/ft (+ 8 bbl for shoe track) Burst = 2730 psi	Cement to surface Class A w/ 3% CaCl ₂ , Salt & Flake Yield = 1.18 cf/sk Weight = 15.6 ppg 123 bbl 586 sks 93 bbl capacity to shoe	30% excess
	13 3/8" Casing	600'			17 1/2"		62,771 lbs air wt with water Minimum 50 ft past deepest known fresh water	
	Basket Top Coal Deepest Coal	795' 815' 825'						
	RED. REG. 8 1/2" - 958'							
	Bow Spring: 1-shoe jt, 1-every 2nd jt 1 on ea 2-3 jts across previous shoe. Rigid: 2-within 100 ft of surface					Intermediate Casing 9-5/8" 40# N-80 BTC 8.835" ID - 8.679" DD Capacity = 0.0758 bbl/ft Annulus = 0.0558 bbl/ft (+ 3.1 bbl for shoe track) Burst = 5750 psi Collapse = 3090 psi	Cement to surface Class A w/ 10% CaCl ₂ , Salt & Flake Yield = 1.29 cf/sk Weight = 15.6 ppg 167.6 bbl 730 sks 173 bbl cap to shoe	30% excess
	RED. REG. 17 1/2" - 1870'							
	Big Injun	1,964'					1,158 psi lift pressure	
	1296 psi test							
	9 5/8" Casing	2,285' 2,330'			12 1/4"			
	BOPE Class for section 13-5/8" 10K Class III BOPE						Class A: 1) LEAD SLURRY 317.9 bbbls 1352.1 sacks 15.2 ppg 1.32 cf/sk TOC Lead = 0 ft MD Class A: 2) TAIL SLURRY 364.4 bbbls 1270.7 sacks 15.2 ppg 1.61 cf/sk TOC Tail = 7,083 ft MD Displacement 353.6 bbbls	Lead Length: 7,083' (Surface to 200' above Marcellus plus 0% in open hole) Tail Length: 8,905' (200' above Upper Marcellus to Shoe plus 0% in open hole)
	Planned KOP	5,578'	5,578'			Prod. Casing 5-1/2", 20# P-110, New Vam Capacity = .0221 bbl/ft (+1 bbl for shoe track) Burst = 12,640 psi Collapse = 11,080 psi ID = 4.778" Drift = 4.653"		
	Middlesex	6,399'	6,302'	50.42°				
	Burkett Sh. Tully Lm.	6,510' 6,542'	6,378' 6,398'	56.75°				
	S5 (Hamilton Sh.)	6,599'	6,431'	70.37°				
	S4 (Upper Marcellus)	6,781'	6,512'	75.96°				
	Stafford (Cherry Valley) S2b (L. Marcellus)	6,838' 6,853'	6,529' 6,533'	88.65°				
	Centralization * 2 Torq glider per jt from shoe to KOP * 1 single bow per 2 jt from KOP to surface							
	Horizontal Landing Point	7,034'	6,555'					
	S1b (Basal Marcellus)		6,594'					
	Onondaga		6,640'					
							Lateral length = 8,955'	
							45ft Shoe Track 15,989'	

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Environmental Protection

04/03/2015

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Chevron Appalachia, LLC OP Code 49449935

Watershed (HUC 10) Middle Grave Creek - Grave Creek Quadrangle Glen Easton, WV

Elevation 1257' County Marshall District Clay

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: _____

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

Proposed Disposal Method For Treated Pit Wastes:

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

Will closed loop system be used? If so, describe: Yes. The system will remove drill cuttings from the drilling fluid. The drill cuttings are then prepared for transportation to an offsite disposal facility.

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. air, oil based

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

Additives to be used in drilling medium? barite, fluid loss, emulsifiers, rheological control

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

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

-Landfill or offsite name/permit number? Arden Landfill - Permit # - PA DEP 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 who furnished 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.

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Office of Oil & Gas
MAR 11 2015

Company Official Signature Anna Shumaker

Company Official (Typed Name) Anna Shumaker

Company Official Title Permitting Coordinator

Subscribed and sworn before me this 1 day of October, 2014

Thomas Basinger
Notary Public

My commission expires 9/24/2017

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
THOMAS BASINGER
Notary Public
CONNELLSVILLE 04/03/2015
My Commission Expires Sep 24, 2017

4705101802

Form WW-9

Operator's Well No. Taylor C- 3H

Chevron Appalachia, LLC

Proposed Revegetation Treatment: Acres Disturbed 22.01 Prevegetation pH 5.5-6.3

Lime Soil Test Tons/acre or to correct to pH 5.0-7.5

Fertilizer type 10-20-20

Fertilizer amount 1,000 lbs/acre

Mulch Straw 2 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Winter Rye	170
Plant	8/15 - 2/28

Seed Type	lbs/acre
Birdsfoot Trefoil	15
Weeping Lovegrass	45
Perennial Ryegrass	10
Plant 3/1 - 6/15	8/15 - 9/15

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: James Nicholas

Comments: _____

Title: Oil + Gas Inspector

Date: 10/15/14

Field Reviewed? () Yes () No

04/03/2015

CHEVRON
APPALACHIA, LLC



West Virginia Well Site Safety Plan

Taylor C Site
Well 3H
Marshall County, West Virginia

He 10/15/14

Prepared in Conformance with:

*West Virginia's Code §22-6A and Legislative Rule §35-8-5.7
and*

*West Virginia Department of Environmental Protection's, Office of Oil and Gas documents:
"Well Site Safety Plan Standards" (issued August 25, 2011), and
"Deep Well Drilling Procedures and Site Safety Plan Requirements" (issued October 22, 2012)*

Revision 1

Original: September 2012

Revised: June 2013

Revised: May 2014

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Environmental Protection

04/03/2015

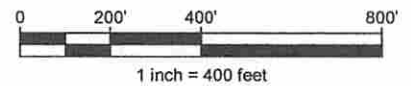


ENTRANCE FROM
FORK RIDGE ROAD
LAT: 39° 52' 05.45"
LON: 80° 41' 29.36"
(BASED ON NAD 83)

ACCESS ROAD TO WELL PAD
LAT: 39° 51' 45.41"
LON: 80° 41' 33.92"
(BASED ON NAD 83)

MATCHLINE TO SHEET 1
MATCHLINE TO SHEET 2

NOTE:
THE BEARINGS AND COORDINATES ARE BASED ON NAD 83,
WEST VIRGINIA NORTH ZONE



Project Number: C-17544-0378
Drawing Scale: 1"=400'
Date Issued: 09/12/2014
Index Number: 102-363
Drawn By: BSCV
Checked By: KPH
Project Manager: KPH
Sheet: 1 of 2

TAYLOR "C" WELL SITE SAFETY PLAN #1
FORK RIDGE ROAD
CLAY DISTRICT, MARSHALL COUNTY, WV
PREPARED FOR:
CHEVRON APPALACHIA, LLC
800 MOUNTAIN VIEW DRIVE
SMITHFIELD, PA 15478

Date	No.	REVISION RECORD
-	01	-
-	02	-
-	03	-
-	04	-
-	05	-
-	06	-
-	07	-
-	08	-

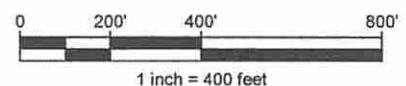
GATEWAY
Consulting Engineers & Surveyors
400 Holiday Drive, Suite 300 Pittsburgh, PA 15220
Phone (412) 921-4030 - Fax (412) 921-9960
Butler, PA (724) 287-1055 • Washington, PA (724) 229-3362
http://www.gatewayengineers.com

MATCHLINE TO SHEET 1
MATCHLINE TO SHEET 2



WELL PAD
LAT: 39° 51' 07.18"
LON: 80° 41' 50.06"
(BASED ON NAD 83)

NOTE:
THE BEARINGS AND COORDINATES ARE BASED ON NAD 83,
WEST VIRGINIA NORTH ZONE



Project Number: C-17544-0379
Drawing Scale: 1"=400'
Date Issued: 09/12/2014
Index Number: 102.363
Drawn By: AICW
Checked By: KPM
Project Manager: KPM
Sheet: 2 of 2

TAYLOR "C" WELL SITE SAFETY PLAN #1
FORK RIDGE ROAD
CLAY DISTRICT, MARSHALL COUNTY, WV
PREPARED FOR:
CHEVRON APPALACHIA, LLC
800 MOUNTAIN VIEW DRIVE
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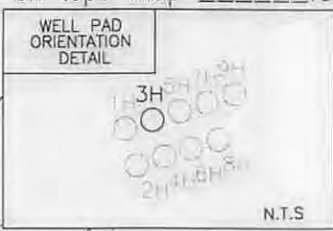
Date	No	REVISION RECORD
-	01	-
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-	03	-
-	04	-
-	05	-
-	06	-
-	07	-
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Butler, PA (724) 267-1055 • Westinghouse, PA (724) 229-3362
<http://www.gatewayeng.com>

SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
 N:4411354.70
 E:525884.02
 NAD 83, WV NORTH
 N:494616.90
 E:1632330.86
 LAT/LON DATUM-NAD83
 LAT:39.851820
 LON:-80.697419

APPROX. LANDING POINT
UTM 17-NAD83
 N:4411806.86
 E:525847.49
 NAD 83, WV NORTH
 N:495446.36
 E:1632224.80
 LAT/LON DATUM-NAD83
 LAT:39.854093
 LON:-80.697836

BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
 N:4413704.86
 E:524092.65
 NAD 83, WV NORTH
 N:502427.20
 E:1626581.38
 LAT/LON DATUM-NAD83
 LAT:39.873047
 LON:-80.718273



- NOTES:
1. There are no water wells or developed springs within 250' of proposed well.
 2. There are no existing buildings within 625' of proposed well.
 3. Proposed well pad is within 100' from perennial stream, wetland, pond, reservoir or lake.
 4. There are no native trout streams within 300' of proposed well.
 5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
 6. It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

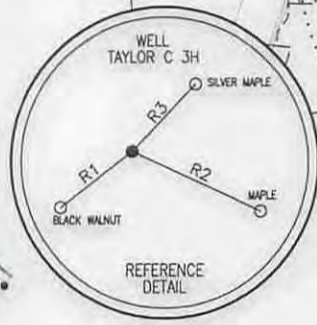
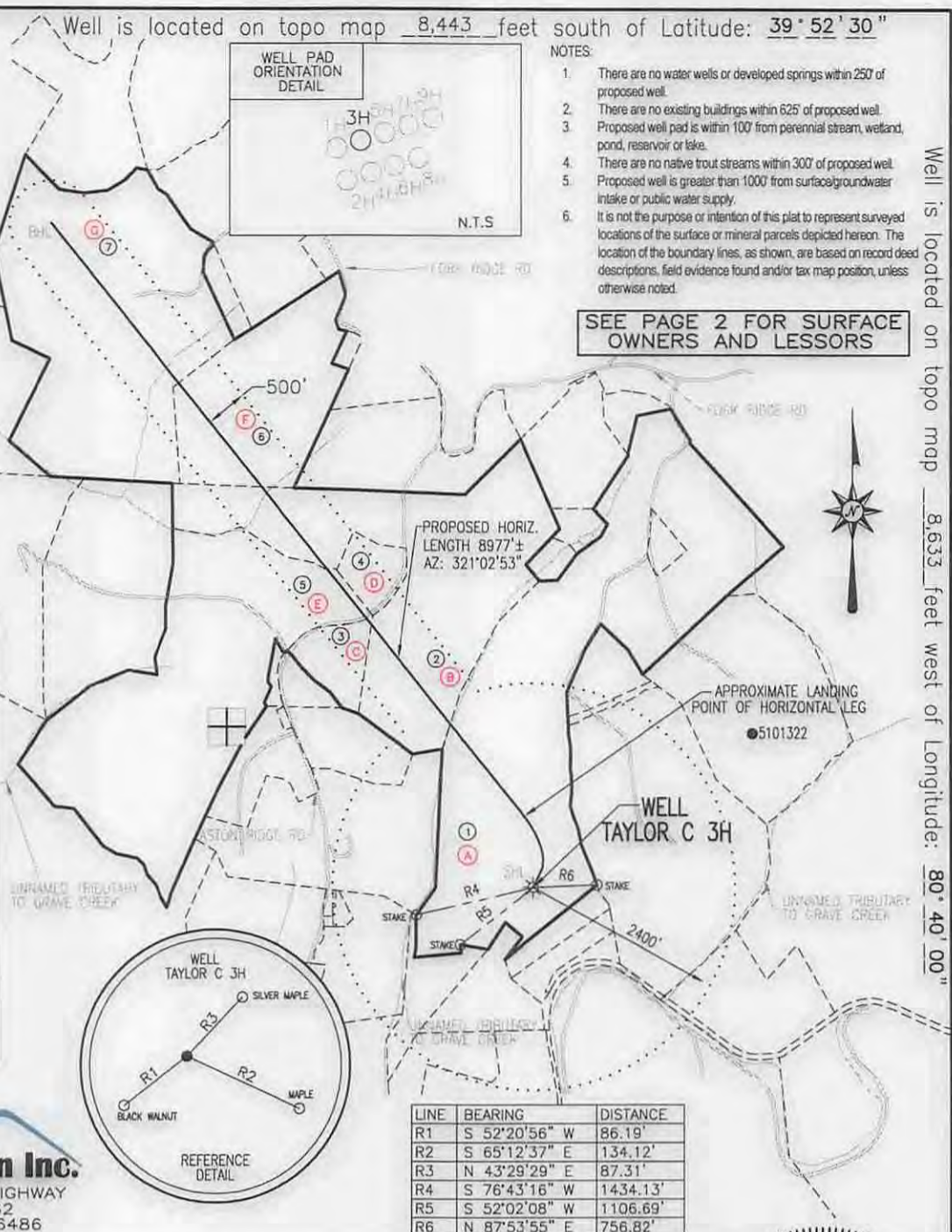
SEE PAGE 2 FOR SURFACE OWNERS AND LESSORS

LEGEND

- ⊕ - TOPO MAP POINT
- ☼ - WELL
- - ALL ARE POINTS UNLESS OTHERWISE NOTED.
- - MINERAL TRACT BOUNDARY
- - - - - PARCEL LINES
- - - - - WELL REFERENCE
- - - - - PROPOSED HORIZONTAL WELL
- - - - - ROAD
- - - - - STREAM CENTER LINE
- (A) - LESSORS
- (1) - SURFACE OWNERS

GAS WELLS

- - EXISTING WELLS
- ⊙ - PLUGGED WELLS



LINE	BEARING	DISTANCE
R1	S 52°20'56" W	86.19'
R2	S 65°12'37" E	134.12'
R3	N 43°29'29" E	87.31'
R4	S 76°43'16" W	1434.13'
R5	S 52°02'08" W	1106.69'
R6	N 87°53'55" E	756.82'

Well is located on topo map 8,633 feet west of Longitude: 80°40'00"

Blue Mountain Inc.
 11023 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: TAYLOR C 3H
 DRAWING #: TAYLOR C 3H
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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.

Signed: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D. SIX
 LICENSED
 No. 2000
 STATE OF
 WEST VIRGINIA
 PROFESSIONAL SURVEYOR

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: MARCH 5, 2015
 OPERATOR'S WELL #: TAYLOR C 3H
 API WELL #: 47 51 01802 H6A
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: MIDDLE GRAVE CREEK - GRAVE CREEK ELEVATION: 1257.00'

COUNTY/DISTRICT: MARSHALL / CLAY QUADRANGLE: GLEN EASTON, WV 7.5'

SURFACE OWNER: WILLIAMS OHIO VALLEY MIDSTREAM LLC ACREAGE: 265.439±

OIL & GAS ROYALTY OWNER: LEE R. & SHERRI L. TAYLOR ACREAGE: 828.552±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,555'± TMD 16,010.7'±

WELL OPERATOR CHEVRON APPALACHIA, LLC DESIGNATED AGENT KENNETH E. TAWNEY
 Address 800 MOUNTAIN VIEW DRIVE Address 500 LEE STREET, EAST SUITE 1600
 City SMITHFIELD State PA Zip Code 15478 City CHARLESTON State WV Zip Code 25301-3202

04/03/2015

TAYLOR C

3H

PAGE 2 OF 2

	SURFACE OWNER	DIST-TM/PAR
1	WILLIAMS OHIO VALLEY MIDSTREAM LLC	4-10/21
2	LEWIS A. ASTON JR. ET UX	4-10/6
3	RONALD K. LILLEY SR. ET UX	4-10/4.2
4	GEORGE K. HOWARD ET UX	4-10/6.1
5	DENNIS D. WINGROVE ET UX	4-10/4
6	MARNIE KAY BUCHANAN	4-9/11
7	THOMAS E. & LESLIE M. HICKS	4-8/37

	LESSOR
A	LEE R. & SHERRI L. TAYLOR
B	LEWIS A. ASTON JR. & CATHY ASTON
C	THE DAKAN FAMILY REVOCABLE LIVING TRUST, ET AL
D	LEWIS A. ASTON JR. & CATHY ASTON
E	THE DAKAN FAMILY REVOCABLE LIVING TRUST, ET AL
F	JAMES & MARNIE BUCHANAN
G	CHRISTA D. HICKS & LESLIE M. HICKS

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MAR 11 2015

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04/03/2015

51-01802
H6A

MARCH 5, 2015