



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

July 23, 2015


WELL WORK PERMIT
Horizontal 6A Well

This permit, API Well Number: 47-900157, issued to SWN PRODUCTION COMPANY, 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: LINDA GREATHOUSE BRK 1H
Farm Name: GREATHOUSE, LINDA REEVES

API Well Number: 47-900157

Permit Type: Horizontal 6A Well

Date Issued: 07/23/2015

Promoting a healthy environment.

07/24/2015

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 one hundred (100) 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.

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

1) Well Operator: SWN Production Co., LLC 494512924 009-Brooke 1-Buffalo 247-Bethany
Operator ID County District Quadrangle

2) Operator's Well Number: Linda Greathouse BRK 1H Well Pad Name: Linda Greathouse BRK Pad

3) Farm Name/Surface Owner: Linda Reeves Greathouse Public Road Access: Hukill Run Road

4) Elevation, current ground: 1138' Elevation, proposed post-construction: 1138'

5) Well Type (a) Gas Oil _____ Underground Storage _____
Other _____

(b) If Gas Shallow Deep _____
Horizontal

Handwritten signature and date: 4/9/15

6) Existing Pad: Yes or No yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target Formation- Marcellus, Target Top TVD- 5822', Target Base TVD- 5894' Anticipated Thickness- 72', Associated Pressure- 3784

8) Proposed Total Vertical Depth: 5871'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14,600'

11) Proposed Horizontal Leg Length: 8016"

12) Approximate Fresh Water Strata Depths: 62', 94', & 300'

13) Method to Determine Fresh Water Depths: from nearby water wells

14) Approximate Saltwater Depths: 1025'

15) Approximate Coal Seam Depths: 303'

16) Approximate Depth to Possible Void (coal mine, karst, other): Void Expected from 300'-307'

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

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18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|-----------|-------------|---------|------------------------|----------------------------|------------------------------|-----------------------------------------------|
| Conductor | 20" | New | H-40 | 94# | 125' | 125' | CTS |
| Fresh Water | 13 3/8" | New | J-55 | 54.5# | 450' | 450' | 446 sx/CTS |
| Coal | 9 5/8" | New | J-55 | 40# | 2075' | 2075' | 807 sx/CTS |
| Intermediate | 7" | New | J-55 | 20# | If Needed | If Needed | If Needed/As Needed |
| Production | 5 1/2" | New | HCP-110 | 20# | 14,600' | 14,600' | Least 937 cu ft tall 1875 cu/100' inside pipe |
| Tubing | 2 3/8" | New | P-110 | 4.7# | Approx. 6,636' | Approx. 6,636' | |
| Liners | | | | | | | |

ju 4/9/15

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Max. Associated Surface Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|-----------|------------------------|---------------------|----------------------|----------------------------------------|-------------|--------------------------|
| Conductor | 20" | 30" | 0.25 | 2120 | 81 | Class A | 1.19/50% Excess |
| Fresh Water | 13 3/8" | 17.5" | 0.380 | 2740 | 633 | Class A | 1.19/50% Excess |
| Coal | 9 5/8" | 12 1/4" | 0.395 | 3950 | 1768 | Class A | 1.19/50% Excess |
| Intermediate | 7" | 8 3/4" | 0.317 | 4360 | 3250 | Class A | 1.20/15% Excess |
| Production | 5 1/2" | 8 3/4" | 0.361 | 12360 | 9500 | Class A | 1.20/15% Excess |
| Tubing | 2 3/8" | 4.778" | 0.190 | | | | |
| Liners | | | | | | | |

PACKERS

| | | | | | |
|-------------|--------------------|--|--|--|--|
| Kind: | 10K Arrowset AS1-X | | | | |
| Sizes: | 5 1/2" | | | | |
| Depths Set: | | | | | |

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

Drill and stimulate any potential zones between and including the Benson to 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'-70' below void. (*If freshwater is encountered deeper than anticipated it must be protected, set casing 50'-70' below and cts.)

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

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 unites, vertical separation units, water and oil storage tanks. Max press and anticipated max rate- 9000 lbs @ 80 barrels a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 29.7

22) Area to be disturbed for well pad only, less access road (acres): 9.4

23) 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.

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

See Attachment ***

25) Proposed borehole conditioning procedures:

All boreholes will be conditioned with circulation and rotation for a minimum of 30 minutes and continuing until operator is satisfied with borehole conditions.

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*Note: Attach additional sheets as needed.

No More than 3% CaCl
will be used in Surface
String

SLB Cement Additives *****Ref: 2013-78**

| | Product Name | Product Use | Chemical Name | CAS Number |
|---------------|--------------|--------------------------|--------------------------------------|-------------|
| Surface | D046 | antifoam | Fuller's earth (attapulgite) | 8031-18-3 |
| | | | Polypropylene glycol | 25322-69-4 |
| | D130 | polyester flake - lcm | polyethylene terephthalate | 25038-59-9 |
| | S001 | calcium chloride | calcium chloride | 10043-52-4 |
| | | | | |
| | SPACER | | | |
| | | | | |
| Intermediate | D130 | polyester flake - lcm | polyethylene terephthalate | 25038-59-9 |
| | D020 | bentonite extender | bentonite | 1302-78-9 |
| | | | | |
| | D046 | antifoam | Fuller's earth (attapulgite) | 8031-18-3 |
| | | | Polypropylene glycol | 25322-69-4 |
| | D130 | polyester flake - lcm | polyethylene terephthalate | 25038-59-9 |
| | | | | |
| | D044 | granulated salt | sodium chloride | 7647-14-5 |
| | D153 | Anti-Settling Agent | chrystalline silica | 14808-60-7 |
| | | | | |
| | SPACER | | | |
| | D020 | bentonite extender | bentonite | 1302-78-9 |
| | D130 | polyester flake - lcm | polyethylene terephthalate | 25038-59-9 |
| | | | | |
| Kick Off Plug | D080 | cement liquid dispersant | product classified as non-hazardous. | |
| | D801 | mid-temp retarder | product classified as non-hazardous | |
| | D047 | antifoam agent | polypropylene glycol | 25322-69-4 |
| | | | | |
| | SPACER | | | |
| | B389 | MUDPUSH* Express | Carbohydrate | proprietary |
| | D206 | Antifoaming Agent | Silica Organic Polymer | proprietary |
| | D031 | barite | barium sulfate | 7727-43-7 |
| | | | fatty acid amine | proprietary |
| | | | ethoxylated alcohol | proprietary |
| | | glycerol | 56-81-5 | |
| B220 | surfactant | 2,2'-Iminodiethanol | 111-42-2 | |
| | | | | |
| | D167 | UNIFLAC* S | aliphatic amide polymer | proprietary |

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| | | | | | |
|-------------------|------------|----------------------------------|-------------------------------|----------------------------------|-------------|
| Production - Lead | D154 | low-temperature extender | non-crystalline silica | 7631-86-9 | |
| | D400 | EasyBLOK | boric acid | 10043-35-3 | |
| | D046 | antifoam | Fuller's earth (attapulgit) | 8031-18-3 | |
| | | | Polypropylene glycol | 25322-69-4 | |
| | D201 | basic cements enabler | chrystalline silica | 14808-60-7 | |
| | | | metal oxide | proprietary | |
| | D202 | low-temperature solid dispersant | sulphonated synthetic polymer | proprietary | |
| | | | formaldehyde (impurity) | 50-00-0 | |
| | | D046 | antifoam | Fuller's earth (attapulgit) | 8031-18-3 |
| | | | | Polypropylene glycol | 25322-69-4 |
| | | D167 | UNIFLAC* S | aliphatic amide polymer | proprietary |
| | | D065 | TIC* Dispersant | Sodium Polynaphthalene Sulfonate | 9008-63-3 |
| Sodium Sulfate | | | | 7757-82-6 | |
| D201 | | basic cements enabler | chrystalline silica | 14808-60-7 | |
| | | | metal oxide | proprietary | |
| D153 | | Anti-Settling Agent | chrystalline silica | 14808-60-7 | |
| | | | | | |
| | | SPACER | | | |
| B389 | | MUDPUSH* Express | Carbohydrate | proprietary | |
| D206 | | Antifoaming Agent | Silica Organic Polymer | proprietary | |
| D031 | barite | barium sulfate | 7727-43-7 | | |
| | | fatty acid amine | proprietary | | |
| | | ethoxylated alcohol | proprietary | | |
| | | glycerol | 56-81-5 | | |
| B220 | surfactant | 2,2'-Iminodiethanol | 111-42-2 | | |

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% Concentration Used

| |
|-------------|
| 0.2% BWOC |
| 0.125 lb/sk |
| 2% BWOC |
| |
| 1 lb/bbl |
| 20 lb/bbl |
| |
| 0.2% BWOC |
| |
| 0.125 lb/sk |
| 10% BWOW |
| 0.15% BWOC |
| |
| |
| 20 lb/bbl |
| 1 lb/bbl |
| |
| 0.05 gal/sk |
| 0.01 gal/sk |
| 0.02 gal/sk |
| |
| |
| 1 lb/bbl |
| 0.1 gal/bbl |
| 310 lb/bbl |
| |
| |
| |
| 1 gal/bbl |
| |
| 0.35% BWOC |

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| |
|-------------|
| 6% BWOC |
| 0.8% BWOC |
| |
| 0.2% BWOC |
| |
| 0.2% BWOC |
| |
| 0.3% BWOC |
| |
| 0.2% BWOC |
| 0.35% BWOC |
| |
| 0.25% BWOC |
| |
| 0.2% BWOC |
| 0.2% BWOC |
| |
| |
| proprietary |
| proprietary |
| 7727-43-7 |
| proprietary |
| proprietary |
| 56-81-5 |
| 111-42-2 |

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Southwestern Energy Company

Proposed Drilling Program

Well : LINDA GREATHOUSE BRK 1
 Field : PANHANDLE FIELD
 County : BROOKE
 SHL : 40.204141 Latitude -80.606946 Longitude
 BHL : 40.226939 Latitude -80.615394 Longitude
 KB Elev : 1164 ft MSL

Re-entry Rig : TBD
 Prospect : PANHANDLE
 State : WV



KB : 26 ft AGL GL Elev : 1138 ft MSL

| Tubular Detail | | | | | | |
|----------------|---------|--------|---------|--------|------|--------|
| | Size | Weight | Grade | Cxn | From | To |
| Conductor | 20" | # | H-40 | | 0' | 125' |
| Surface | 13.375" | 54.5# | J-55 | BTC | 0' | 450' |
| Intermediate | 9.625" | 40# | J-55 | LTC | 0' | 2075' |
| Production | 5.5" | 20# | HCP-110 | HT CDC | 0' | 14641' |

0' to 450'
Air / Mist

450' to 2075'
Air / Mist

2075' to 5381'
Air / Mist

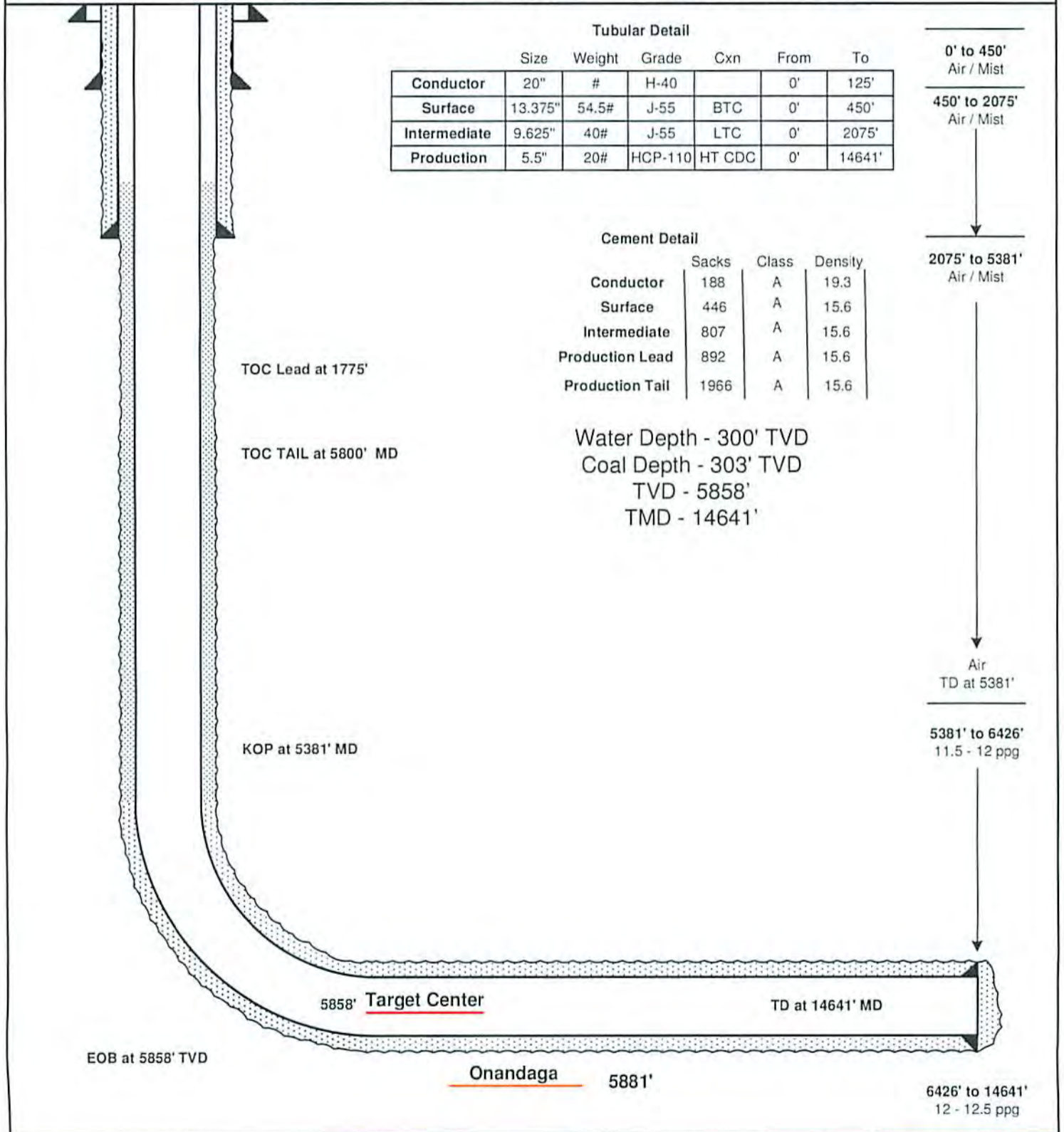
| Cement Detail | | | |
|-----------------|-------|-------|---------|
| | Sacks | Class | Density |
| Conductor | 188 | A | 19.3 |
| Surface | 446 | A | 15.6 |
| Intermediate | 807 | A | 15.6 |
| Production Lead | 892 | A | 15.6 |
| Production Tail | 1966 | A | 15.6 |

Water Depth - 300' TVD
 Coal Depth - 303' TVD
 TVD - 5858'
 TMD - 14641'

Air
TD at 5381'

5381' to 6426'
11.5 - 12 ppg

6426' to 14641'
12 - 12.5 ppg



K:\EandP\WVD\Team Data\Drilling\Wells\Linda Greathouse Pad\Linda Greathouse BRK 1H\Drilling Program\Master SWN Well logs Sheet 1 of 0-1.xlsm 07/24/2015

NOTE: This drawing was created for the Reentry Rig. The depths and lengths shown in the plot are referenced to Reentry Rig RKB.

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WW-9
(9/13)

API Number 47 - 69 - _____
Operator's Well No. Linda Greathouse BRK 1H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name SWN Production Co., LLC OP Code 494512924

Watershed (HUC 10) Upper Ohio South Quadrangle 247-Bethany

Elevation 1138' County 009-Brooke District 1-Buffalo

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: closed loop system in place at this time- cuttings will be taken to a permitted landfill.

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 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.)

Will closed loop system be used? If so, describe: Yes

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air drill to KOP, Fluid drill with SOB from KOP to TD

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

Additives to be used in drilling medium? see attached sheets

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, sawdust)

-Landfill or offsite name/permit number? meadow SWF- 1032, SS Grading SWF- 4902, Northwest SWF- 1025, Short Creek 1034/WW0109517/CID28726, Carbon Limestone 28726/CID28726
Arden Landfill 10072, American 02-12954, Country wide 38390/CID38390, 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 _____
Company Official (Typed Name) Dee Southall
Company Official Title Regulatory Supervisor

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Subscribed and sworn before me this 27th day of March, 2015

Brittany R Woody
My commission expires 11/27/2015



SWN Production Co., LLC

Proposed Revegetation Treatment: Acres Disturbed 29.7 Prevegetation pH _____

Lime as determined by pH test min. 2 _____ Tons/acre or to correct to pH 9.4

Fertilizer type 10-20-20

Fertilizer amount 600 lbs/acre

Mulch Hay/Straw 2.5 Tons/acre

Seed Mixtures

Temporary

Permanent

| Seed Type | lbs/acre |
|---------------|----------|
| White Grove | 15 |
| Red Top | 15 |
| Orchard Grass | 20 |

| Seed Type | lbs/acre |
|---------------|----------|
| White Grove | 15 |
| Red Top | 15 |
| Orchard Grass | 20 |

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.

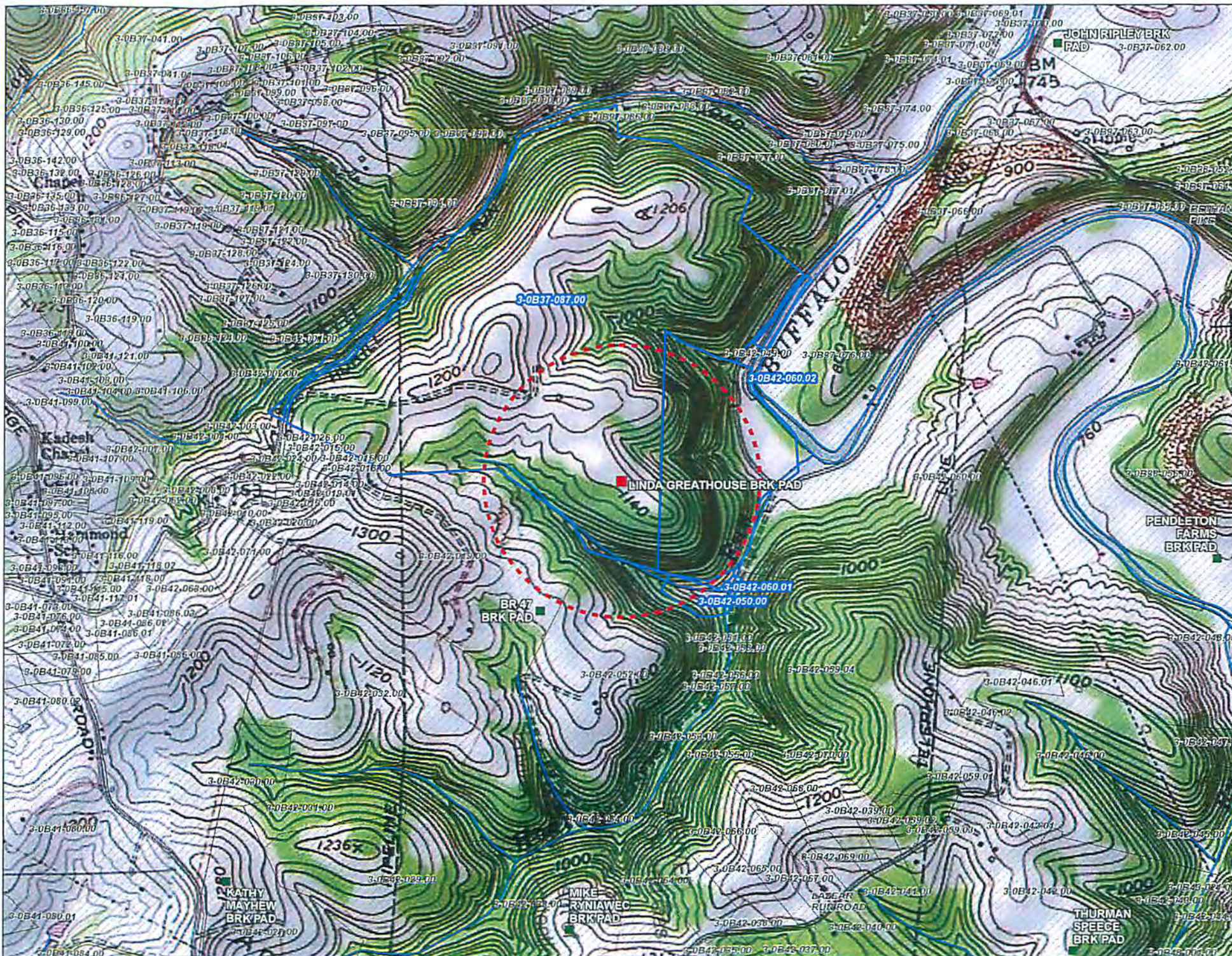
Plan Approved by: *Jane Nicholas*
Comments: _____

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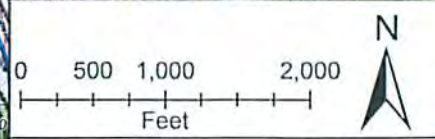
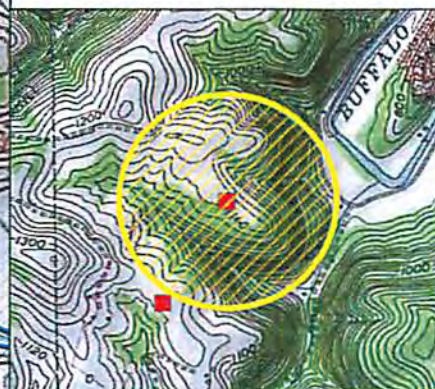
WV Department of
Environmental Protection

Title: Oil and Gas Inspector Date: 4/9/15

Field Reviewed? Yes No



- CHK Site of Interest
- Streams
- Parcels With Water Sources (1500' of Source)
- Other Parcels
- 1,500' Buffer Around Wells



WV Water Purveyor Map
LINDA GREATHOUSE BRK PAD -
(913766)
BROOKE COUNTY, WV
 Lat: 40.204092 / Long: -80.60719

Date: 9/12/2014
 Projection: WGS 1984 UTM Zone 17N
 Scale: 1 inch = 1,000 feet

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|-------------------------|-----------------------|-----------------------|---------|-----------|
|-------------------------|-----------------------|-----------------------|---------|-----------|

"SEE EXHIBIT A"

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

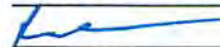
The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is undertaken.

Well Operator: SWN Production Company L.L.C.

By:



Its:

Robert Walter, Senior Landman

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Exhibit "A"

Attached hereto and made part of the State of West Virginia Oil and Gas Permit Form WW-6A1 by, SWN Production Company L.L.C. Operator
 Linda Greathouse North 1H
 Buffalo District, Brooke County, WV

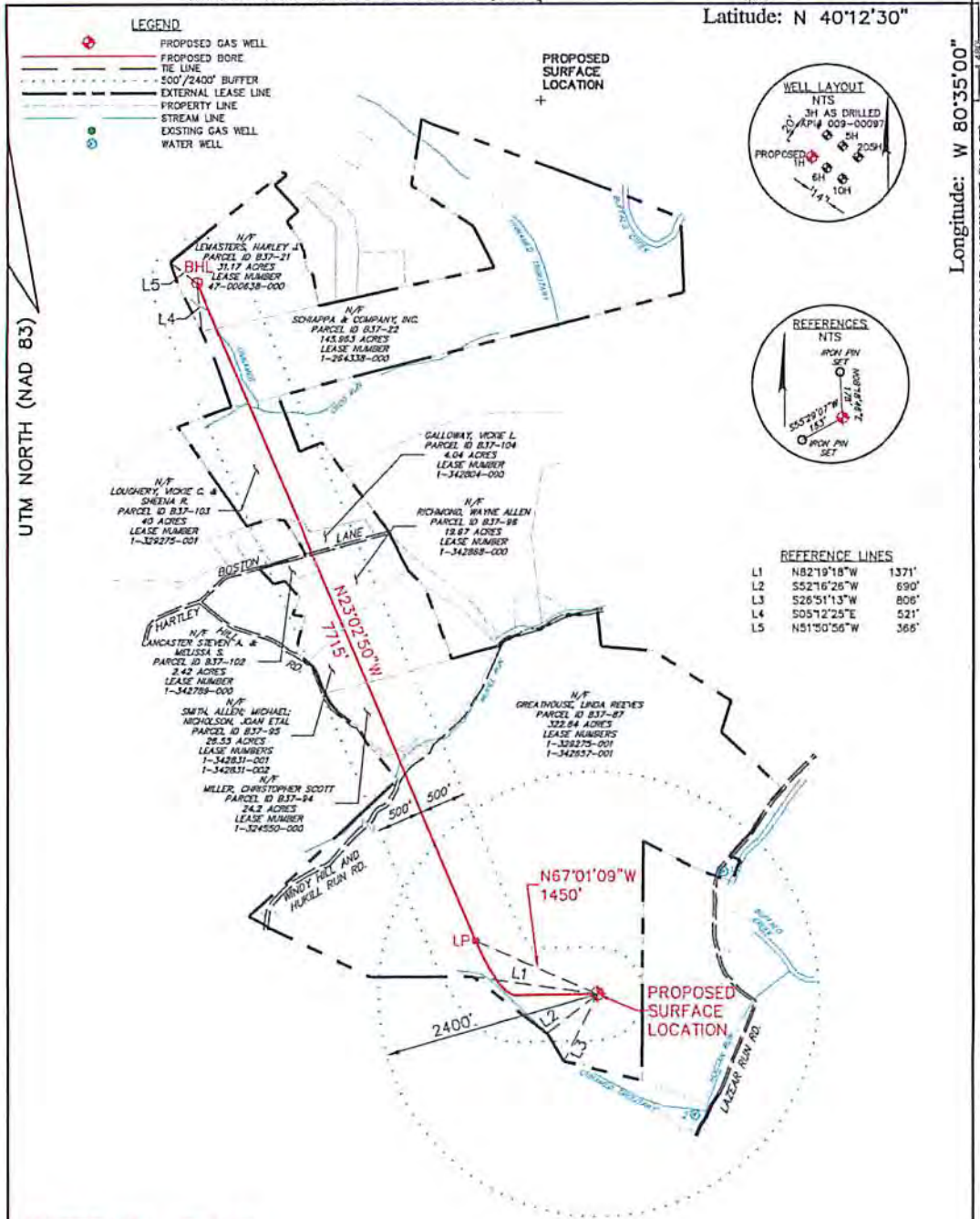
| Tract # | Tax Parcel | Lease Number | Lessor | Lessee | Royalty | BK/PG |
|--------------|-------------------------------------|--------------------------------|------------------------------------------------------|-----------------------------|---------|--------|
| 1) | 3-B37-87 | 1-329275-001 | Linda Reeves Greathouse | Chesapeake Appalachia, LLC. | 18% | 11/162 |
| | | | Chesapeake Appalachia LLC | SWN Production Company LLC | | |
| | 1-329275-001 | Vicki Lynn Greathouse Hamilton | Chesapeake Appalachia LLC | 18.00% | 11/162 | |
| | | Chesapeake Appalachia LLC | SWN Production Company LLC | | | |
| 1-342657-001 | Kentucky Christian Univeristy, Inc. | Chesapeake Appalachia LLC | 18.00% | 15/270 | | |
| | Chesapeake Appalachia LLC | SWN Production Company LLC | | | | |
| 2) | 3-B37-94 | 1-324550-000 | Christopher Scott Miller and Christina Ann Miller | Chesapeake Appalachia, LLC. | 12.50% | 10/136 |
| | | | Great Lakes Energy Partners | Range Resources LLC | | |
| | | | Range Resources LLC | Chesapeake Appalachia LLC | | |
| | | | Chesapeake Appalachia LLC | SWN Production Company LLC | | |
| 3) | 3-B37-95 | 1-342831-001 | Allen Lee Smith | Chesapeake Appalachia LLC | 18.00% | 17/28 |
| | | | Chesapeake Appalachia LLC | SWN Production Company LLC | | |
| | 1-342831-002 | Patty Elizabeth Smith | Chesapeake Appalachia LLC | 18.00% | 17/33 | |
| | | Chesapeake Appalachia LLC | SWN Production Company LLC | | | |
| 4) | 3-B37-96 | 1-342868-000 | Wayne Allen Richmond and Mona Maurleen Richmond | Chesapeake Appalachia LLC | 12.50% | 17/519 |
| | | | Chesapeake Appalachia LLC | SWN Production Company LLC | | |
| 5) | 3-B37-102 | 1-342789-000 | Steven Lancaster and Melissa Lancaster | Chesapeake Appalachia LLC | 18.00% | 16/434 |
| | | | Chesapeake Appalachia LLC | SWN Production Company LLC | | |
| 6) | 3-B37-104 | 1-342804-000 | Vickie L Galloway | Chesapeake Appalachia LLC | 18.00% | 16/565 |
| | | | Chesapeake Appalachia LLC | SWN Production Company LLC | | |
| 7) | 3-B37-103 | 1-329275-001 | Linda Reeves Greathouse and James Russell Greathouse | Chesapeake Appalachia LLC | 18.00% | 17/72 |
| | | | Chesapeake Appalachia LLC | SWN Production Company, LLC | | |
| 8) | 3-B37-22 | 1-264338-000 | Schiappa and Company Inc | Chesapeake Appalachia LLC | 12.50% | 10/469 |
| | | | Chesapeake Appalachia LLC | SWN Production Company, LLC | | |
| 9) | 3-B37-21 | 47-000638-000 | Harley J Lemasters and Rebecca K Lemasters | Chesapeake Appalachia, LLC | 18.00% | 13/286 |
| | | | Chesapeake Appalachia, LLC | SWN Production Company, LLC | | |

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JUL 17 2015

WV Department of
 Environmental Protection



INTERNAL PLAT

SCALE: 1"=1,400'

GENERAL NOTES:

1. THE BOUNDARY LINES SHOWN HEREON ARE BASED ON RECORD DEED, PLATS, AND TAX MAPS BEST FIT TO FOUND FIELD EVIDENCE AND AERIAL PHOTOS.
2. THIS PLAT DOES NOT REPRESENT AN ACTUAL BOUNDARY SURVEY OF THE INDIVIDUAL PARCELS.
3. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' OF PROPOSED WELL.
4. THERE ARE NO EXISTING OCCUPIED DWELLINGS OR BUILDINGS WITHIN 625' OF PROPOSED WELL.
5. THE PROPOSED WELL IS GREATER THAN 100' FROM PERENNIAL STREAM, WETLAND, POND, RESERVOIR OR LAKE.
6. THERE ARE NO NATIVE TROUT STREAMS WITHIN 300' OF PROPOSED WELL.

| TOP HOLE | LANDING POINT | BOTTOM HOLE |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| (SPC-N NAD 83) N) 622,615.335' E) 1,659,287.584' | (SPC-N NAD 83) N) 623,203.864' E) 1,657,962.020' | (SPC-N NAD 83) N) 630,355.064' E) 1,655,060.017' |
| (GEOGRAPHIC NAD 83) LAT.) 40°12'14.85" LONG.) 80°36'25.30" DEC. LAT.) 40.204118" DEC. LONG.) 80.607028" | (GEOGRAPHIC NAD 83) LAT.) 40°12'20.48" LONG.) 80°36'42.48" DEC. LAT.) 40.205689" DEC. LONG.) 80.611795" | (GEOGRAPHIC NAD 83) LAT.) 40°13'30.79" LONG.) 80°37'21.03" DEC. LAT.) 40.225218" DEC. LONG.) 80.622508" |
| (UTM NAD 83) N) 14,601,305.320' E) 1,750,140.610' N) 4,450,486.763m E) 533,443.925m | (UTM NAD 83) N) 14,601,871.350' E) 1,748,805.860' N) 4,450,659.289m E) 533,037.098m | (UTM NAD 83) N) 14,608,970.240' E) 1,745,785.660' N) 4,452,823.035m E) 532,116.533m |

PROPOSED
WELL ID # 2501162079
LINDA GREATHOUSE 1H
SWN PRODUCTION COMPANY, LLC
DISTRICT: BUFFALO COUNTY: BROCKE, WY

RETTEW
RETTEW Associates, Inc.
5031 Richard Lane, Suite 111
Mechanicsburg PA 17055
Phone (717) 837-2021
Fax (717) 667-6653

swn
Southwestern Energy

DRAWN BY: G.FLORES
CHECKED BY: J. MYERS
DATE: 05-28-2015
REVISED:
PROJECT No: 087569015

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JUL 17 2015

WV Department of Environmental Protection

07/24/2015

SWN
Southwestern Energy®
PO Box 1300
Jane Lew, WV 26378
PHONE: (832) 796-1610

March 26, 2015

Ms. Laura Adkins
WV DEP Office of Oil & Gas
601 57th St., SE
Charleston, WV 25304

RE: SWN's proposed Linda Greathouse BRK 1H in Brooke County, West Virginia, Drilling under Hartley Hill Road and Hukill Run Road.

Dear Ms. Adkins:

SWN Production Company, LLC ("SWN") is applying for a drilling permit for the above referenced well. The State of West Virginia has raised some concern as to SWN's right to drill under Harley Hill Road and Hukill Run Road. Please be advised that SWN has leased all mineral owners under said route as it relates to the above-referenced well and unit.

Thank you.

Sincerely,



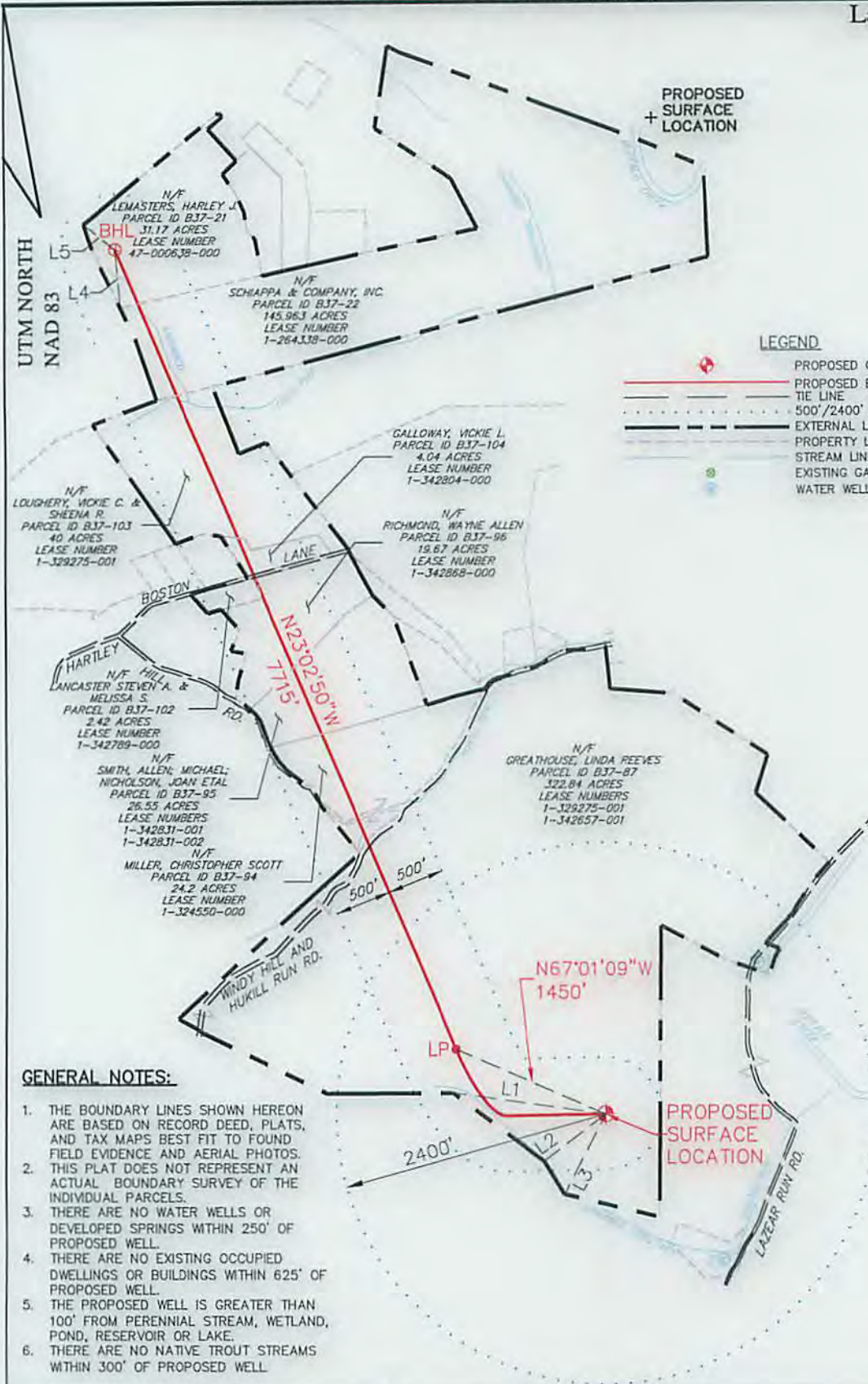
Derek A. Thomas
Senior Landman
SWN Production Company, LLC
PO Box 1300
Jane Lew, WV 26378

$\frac{R^2}{A} \rightarrow V^+$

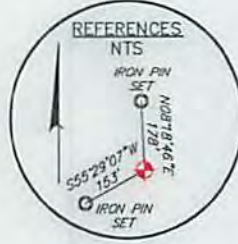
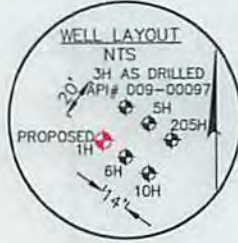
The Right People doing the Right Things,
wisely Investing the Cash Flow from
our underlying Assets, will create Value.
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JUL 17 2015

WV Dep. of Environmental Protection
07/24/2015



| TOP HOLE | |
|--------------------|--|
| (UTM NAD 83) | |
| N) 14,601,305.320' | |
| E) 1,750,140.610' | |
| N) 4,450,486.763m | |
| E) 533,443.925m | |
| LANDING POINT | |
| (UTM NAD 83) | |
| N) 14,601,871.350' | |
| E) 1,748,805.880' | |
| N) 4,450,659.289m | |
| E) 533,037.098m | |
| BOTTOM HOLE | |
| (UTM NAD 83) | |
| N) 14,608,970.240' | |
| E) 1,745,785.660' | |
| N) 4,452,823.035m | |
| E) 532,116.533m | |



REFERENCE LINES

| | | |
|----|-------------|-------|
| L1 | N82°19'18"W | 1371' |
| L2 | S52°16'26"W | 690' |
| L3 | S26°51'13"W | 806' |
| L4 | S05°12'25"E | 521' |
| L5 | N51°50'56"W | 366' |

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

SIGNED: *Craig Robert West*

R.P.E.: _____ L.L.S.: **2241**



FILE #: **087569015**

DRAWING #: **087569015-SV-PLAT**

SCALE: **1" = 1,400'**

MINIMUM DEGREE OF ACCURACY: **1/200**

PROVEN SOURCE: **SUBMETER MAPPING SURVEY GPS**

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

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

DATE: **JUNE 28, 2015**

OPERATOR'S WELL #: **LINDA GREATHOUSE BRK 1H**

API WELL #: **47 09**

STATE: _____ COUNTY: _____ PERMIT: _____

WELL TYPE: OIL GAS WASTE DISPOSAL LIQUID INJECTION PRODUCTION STORAGE DEEP SHALLOW

WATERSHED: **UPPER OHIO SOUTH**

COUNTY/DISTRICT: **BROOKE/ BUFFALO**

SURFACE OWNER: **GREATHOUSE, LINDA REEVES**

OIL & GAS ROYALTY OWNER: **GREATHOUSE, LINDA REEVES**

ELEVATION: **1,138'**

QUADRANGLE: **BETHANY, WV**

ACREAGE: **322.84±**

ACREAGE: **864.91±**

CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PERFORATE NEW FORMATION PLUG & ABANDON

DRILL PLUG OFF OLD FORMATION CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: **MARCELLUS**

ESTIMATED DEPTH: **TVD: 5,858' TMD: 44,141'**

WELL OPERATOR: **SWN PRODUCTION COMPANY, LLC**

DESIGNATED AGENT: **DEE SOUTHALL**

ADDRESS: **P.O. BOX 1300**

ADDRESS: **P.O. BOX 1300**

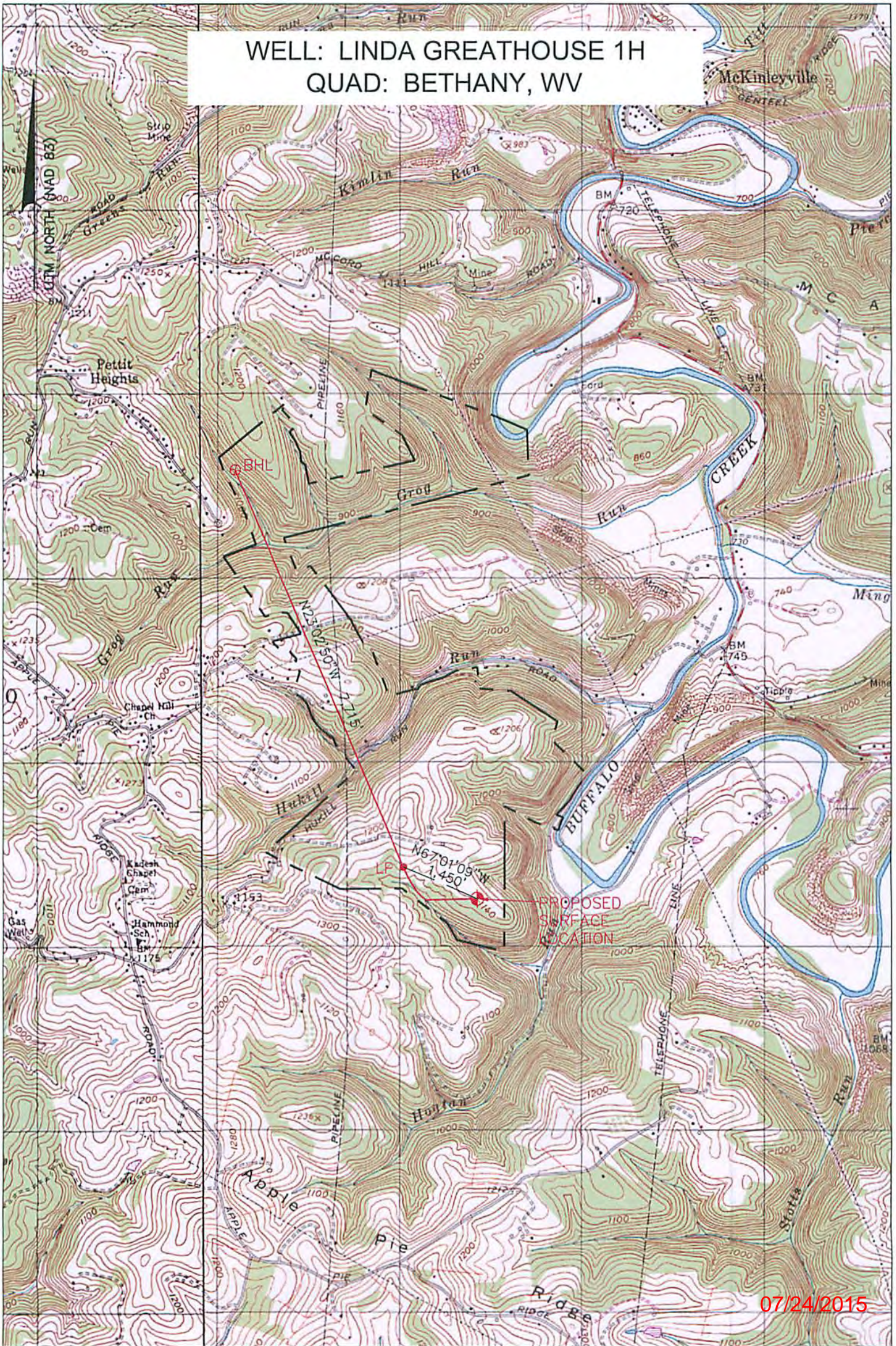
CITY: **JANE LEW** STATE: **WV** ZIP CODE: **26378**

CITY: **JANE LEW** STATE: **WV** ZIP CODE: **26378**



07/24/2015

WELL: LINDA GREATHOUSE 1H QUAD: BETHANY, WV



NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF PROPOSED GAS WELLS AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS AND AERIAL MAPPING.

LEGEND

- + PROPOSED GAS WELL
- PROPOSED BORE
- EXTERNAL LEASE LINE

| | | | |
|----------------------------------------------------------------------|--------------------------------------------------------|----------------------------|----------|
| Applicant / Well Operator Name SWN PRODUCTION COMPANY, LLC | Well(Farm) Name LINDA GREATHOUSE BRK | Well # 1H | Serial # |
| Address PO BOX 1300 JANE LEW, WV 26378 | County - Code BROOKE - 009 | District BUFFALO | |
| Surface Landowner / Lessor LINDA GREATHOUSE | USGS 71/2 Quadrangle Map Name BETHANY, W.VA. | | |

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

Date of Notice Certification: 4/15/15

API No. 47- 69 -
Operator's Well No. Linda Greathouse BRK 1H
Well Pad Name: Linda Greathouse BRK 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>WV</u> | UTM NAD 83 Easting: <u>533444.0</u> |
| County: <u>009-Brooke</u> | Northing: <u>4450486.8</u> |
| District: <u>1-Buffalo</u> | Public Road Access: <u>Hukill Run Road</u> |
| Quadrangle: <u>247-Bethany</u> | Generally used farm name: <u>Linda Greathouse</u> |
| Watershed: <u>Upper Ohio South</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>OOG OFFICE USE ONLY</p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</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:

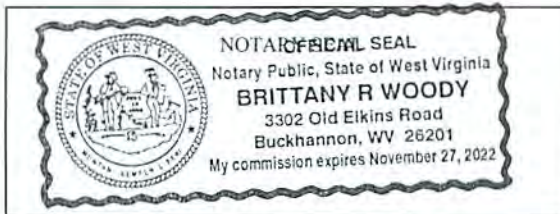
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the 2015 II Legal Advertisement with publication 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 or personal service, the return receipt card or other postal receipt for certified mailing.

wv Department of
Environmental Protection

Certification of Notice is hereby given:

THEREFORE, I _____, 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: | <u>SWN Production Co., LLC</u> | Address: | <u>P.O. Box 1300</u> |
| By: | <u>Dee Southall</u> | | <u>Jane Lew, WV 26378</u> |
| Its: | <u>Regulatory Supervisor</u> | Facsimile: | <u>304-471-2497</u> |
| Telephone: | <u>304-884-1610</u> | Email: | <u>Dee_Southall@swn.com</u> |



Subscribed and sworn before me this 27th day of March 2015
Brittany R Woody Notary Public
 My Commission Expires 11/27/22

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.

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WV Department of
Environmental Protection
07/24/2015

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: 4/15/15 Date Permit Application Filed: 4/15/15

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. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
 Name: Linda Greathouse
 Address: 750 Mountainview Drive
Bethany, WV 26032
 Name: Vicki Hamilton
 Address: 750 Mountainview Drive
Bethany, WV 26032

COAL OWNER OR LESSEE
 Name: Windsor Coal Company
 Address: 1000 Consol Energy Drive
Canonsburg, PA 26059

COAL OPERATOR
 Name: _____
 Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
 Name: _____
 Address: _____
 Name: _____
 Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
 Name: *** See Attachment #1
 Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
 Name: _____
 Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
 Name: _____
 Address: _____

*Please attach additional forms if necessary

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 WV Department of Environmental Protection
 07/24/2015

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 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.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

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

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 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

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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.

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. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

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. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

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 57th St. SE
Charleston, WV 25304
(304) 926-0450

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

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15 015
WRR Department of
Environmental Protection
WV Department of
Environmental Protection

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.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

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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WW-6A
(8-13)

API NO. 47- 69 -
OPERATOR WELL NO. Linda Greathouse BRK 1H
Well Pad Name: Linda Greathouse BRK Pad

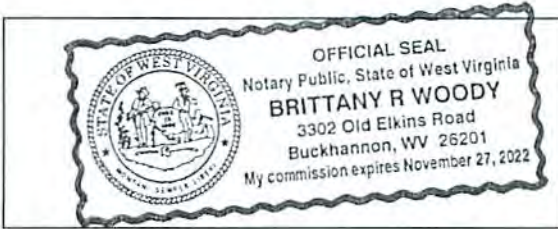
Notice is hereby given by:

Well Operator: SWN Production Co., LLC
Telephone: 304-884-1610
Email: Dee_Southall@swn.com

Address: P.O. 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 depprivacyofficer@wv.gov.



Subscribed and sworn before me this 27th day of March 2015.
Brittany R Woody Notary Public
My Commission Expires 11/27/22

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Attachment # 1

| Date | Pad No. | Pad Name | Parcel No. | Property Owner(s) | Owner Address | City | State | Zip | Owner Phone No. | Assumed/Known Water Source Present (Y/N)? |
|-----------|---------|--------------------------|---------------|-------------------------------------|----------------|-----------|-------|-------|-----------------|-------------------------------------------|
| 9/12/2014 | 913766 | LINDA GREATHOUSE BRK PAD | 3-0B42-060.02 | HAIZLETT JAMES & JO ELLEN | RD L, BOX 220H | WELLSBURG | WV | 26070 | | Y |
| 9/12/2014 | 913766 | LINDA GREATHOUSE BRK PAD | 3-0B42-060.01 | WADE AUSTIN WAYNE & JUSTINE ADAH x2 | RR 2 BOX 81 | WELLSBURG | WV | 26070 | (304)829-4613 | Y |

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF INTENT TO DRILL

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

Notice Time Requirement: Notice shall be provided at least TEN (10) days prior to filing a permit application.

Date of Notice: 03/26/2015 **Date Permit Application Filed:** 4/15/15

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

HAND DELIVERY CERTIFIED MAIL RETURN RECEIPT REQUESTED

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: *Provided*, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner; *Provided, however*, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

Notice is hereby provided to the SURFACE OWNER(s):

Name: Linda Greathouse
Address: 750 Mountainview Drive
Bethany, WV 26032

Name: Vicki Hamilton
Address: 750 Mountainview Drive
Bethany, WV 26032

Notice is hereby given:

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

| | | | | |
|-------------|-------------------------|---------------------------|-------------------------|------------------|
| State: | <u>WV</u> | UTM NAD 83 | Easting: | <u>533444.0</u> |
| County: | <u>Brooke</u> | | Northing: | <u>4450486.8</u> |
| District: | <u>Buffalo</u> | Public Road Access: | <u>Hukill Run Road</u> | |
| Quadrangle: | <u>Bethany</u> | Generally used farm name: | <u>Linda Greathouse</u> | |
| Watershed: | <u>Upper Ohio South</u> | | | |

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: SWN Production Company, LLC
Address: 179 Innovation Drive
Jane Lew, WV 26378
Telephone: 304-517-6603
Email: steve_perkins@swn.com
Facsimile: 304-461-2497

Authorized Representative: Steve Perkins
Address: 179 Innovation Drive
Jane Lew, WV 26378
Telephone: 304-517-6603
Email: steve_perkins@swn.com
Facsimile: 304-461-2497

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 depprivacyofficer@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: 03/26/2015 **Date Permit Application Filed:** 4/15/15

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

- CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED 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: Linda Greathouse
Address: 750 Mountainview Drive
Jane Lew, WV 26032

Name: Vicki Hamilton
Address: 750 Mountainview Drive
Jane Lew, WV 26032

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>533444.0</u> |
| County: | <u>Brooke</u> | | Northing: | <u>4450486.8</u> |
| District: | <u>Buffalo</u> | Public Road Access: | <u>Hukill Run Road</u> | |
| Quadrangle: | <u>Bethany</u> | Generally used farm name: | <u>Linda Greathouse</u> | |
| Watershed: | <u>Upper Ohio South</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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator: SWN Production Company, LLC
Telephone: 304-517-6803
Email: steve_perkins@swn.com

Address: 179 Innovation Drive
Jane Lew, WV 26378
Facsimile: 304-461-2497

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 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

Earl Ray Tomblin
Governor

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

April 8, 2015

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Linda Greathouse Pad, Brooke County
Linda Greathouse BRK 1H

Dear Mr. Martin,

The West Virginia Division of Highways has transferred Permit #06-2011-0232 for the subject site to Southwestern Energy for access to the State Road for the well site located off of Brooke County Route 30 SLS.

The operator has signed an OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.
Regional Maintenance Director
Central Office Oil & Gas Coordinator
Office of Oil and Gas

Cc: Brittany Woody
Southwestern Energy
CH, OM, D-6
File

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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 | Corsslinker | 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 Proprietary |
| | Friction Reducer J609 | | Ammonium Sulfate | 7783-20-2 |

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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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| 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 |

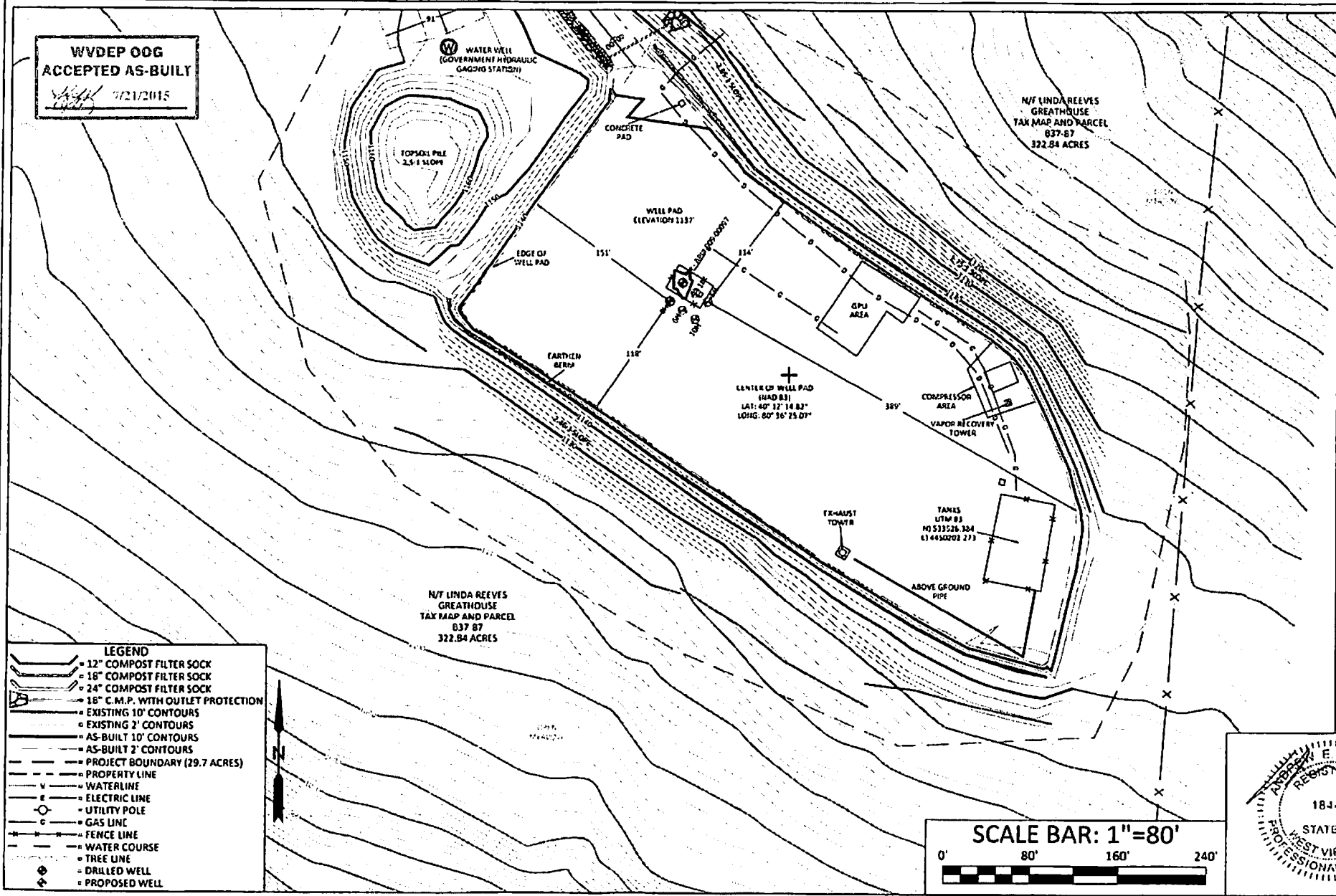
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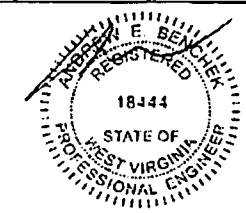
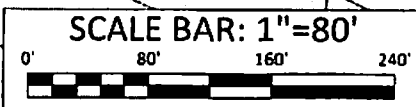
07/24/2015

WVDEP O&G
 ACCEPTED AS-BUILT
 7/21/2015



- LEGEND**
- 12" COMPOST FILTER SOCK
 - 18" COMPOST FILTER SOCK
 - 24" COMPOST FILTER SOCK
 - 18" C.M.P. WITH OUTLET PROTECTION
 - EXISTING 10' CONTOURS
 - EXISTING 2' CONTOURS
 - AS-BUILT 10' CONTOURS
 - AS-BUILT 2' CONTOURS
 - PROJECT BOUNDARY (29.7 ACRES)
 - PROPERTY LINE
 - WATERLINE
 - ELECTRIC LINE
 - UTILITY POLE
 - GAS LINE
 - FENCE LINE
 - WATER COURSE
 - TREE LINE
 - DRILLED WELL
 - PROPOSED WELL

CENTER OF WELL PAD (HAD B3)
 LAT: 40° 12' 14.82"
 LONG: 80° 36' 25.07"



BOORD, BENCHEK and ASSOC., INC.
 Engineering, Surveying, Construction,
 and Mining Services
 Southampton, PA 15117 Phone: 724-746-1165

AS-BUILT

THIS DOCUMENT WAS PREPARED BY
 BOORD, BENCHEK AND ASSOC., INC.
 FOR: SHIN PRODUCTION CO., LLC.

DATE:
 MARCH 2015

LINDA GREATHOUSE
 BRK PAD "A"

BUFFALO DISTRICT,
 BROOKE COUNTY,
 WV

SHEET 02 OF 25