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

November 21, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706547, issued to JAY-BEE OIL & GAS, 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: SCHULBERG 1HC
Farm Name: MOORE, CARRIE J.
API Well Number: 47-1706547
Permit Type: Horizontal 6A Well
Date Issued: 11/21/2014

Promoting a healthy environment.

API Number: 17-06547

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. Operator shall employ measures to minimize dust along Broad Run Road, while also operating in accordance with their Oil and Gas Road District Wide Bonding Agreement with the West Virginia Division of Highways.

2. The well pad containment berm and mountable berm at road entrance to pad shall be installed prior to commencement of any additional well work on this well pad.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

17-06547

WW-6B
(9/13)

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

17 5 286

1) Well Operator: Jay-Bee Oil & Gas, Inc | 24610 (Operator ID) | Doddridge (County) | McClellan (District) | Center Point 7.5' (Quadrangle)

2) Operator's Well Number: Schulberg 1HC Well Pad Name: Schulberg Pad

3) Farm Name/Surface Owner: Carrie J Moore Public Road Access: Broad Run Rd

4) Elevation, current ground: 887.4 Elevation, proposed post-construction: 887.4

5) Well Type (a) Gas ■ Oil _____ Underground Storage _____
Other _____
(b)If Gas Shallow ■ Deep _____
Horizontal ■

DCN
7-1-2014

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus, 7000', 3500#

8) Proposed Total Vertical Depth: 7000'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 13,325'

11) Proposed Horizontal Leg Length: 6,325'

12) Approximate Fresh Water Strata Depths: 61'

13) Method to Determine Fresh Water Depths: Well Record 47-017-05952

14) Approximate Saltwater Depths: 1074'

15) Approximate Coal Seam Depths: 674'-678'

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

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

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

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WW-6B
(9/13)

Schulberg 1HC

18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	16	New	J55	40	30	30	8.22 CTS
Fresh Water	11 3/4	New	J55	32	300	300	142.25 CTS
Coal	N/A						
Intermediate	8 5/8	New	J55	23/24	2,000	2,000	508.43 CTS
Production	5 1/2	New	P110	17/20	13,325	13,325	2135.36
Tubing	N/A						
Liners	N/A						

Cement up to 1000' from surface

DCN
7-1-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	16	17 1/2	.495	3,000	Class A Cement	1.19
Fresh Water	11 3/4	15	.333	1,500	Class A Cement	1.26
Coal	N/A					
Intermediate	8 5/8	11	.264	2,500	Class A Cement	1.45
Production	5 1/2	7 7/8	.304	15,000	Type 1 Cement	1.34
Tubing	N/A					
Liners	N/A					

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

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17-06547

WW-6B
(9/13)

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

Drill and Stimulate a new Horizontal Well. Using a top hole rig, we will drill top hole to kick off point by drilling the conductor, freshwater and intermediate holes. Using a directional rig we will drill the production holes.

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

300-350' per stage 8,500bbls of water, 150,000-400,000lbs of sand, friction reducer, 1# per gallon, scale inhibitor and bacteria prevention 1/4# per gallon 2000 gallons 15% vol acid.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 4.9

22) Area to be disturbed for well pad only, less access road (acres): 4.9

23) Describe centralizer placement for each casing string:

Vertical - Every 500' Bow Centralizer, and 50' from top of ground. Horizontal every 42' Spiral Centralizer, Curve - Every 84' Spiral Centralizer.

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

Formation - 15" hole for the 11 3/4 fresh water case, Class A Cement, 2% Calcium Chloride ✓
Formation - 11" hole for the 8 5/8 intermediate base, Class A Cement, 2% Calcium Chloride
Baker Hughes - 7 7/8" hole for the 5 1/2 production case, Type 1 Cement, Fly Ash, Barite, Finetol 300L, R-3 Celio Flake, Sugar, CD-32, FL-62

25) Proposed borehole conditioning procedures:

Air Hole: 15" hole for the 11 3/4 fresh water case - Circulate until clean with air. If soaping, slug then dry.
Air Hole: 11" hole for the 8 5/8 intermediate base - Circulate until clean with air. If soaping, slug then dry.
7 7/8" hole for the 5 1/2 production case - Circulate with mud and sweeps for two times bottoms up.
If needed weight up mud until no cuttings retrieved, then circulate with mud and sweeps for two times bottoms up.

*Note: Attach additional sheets as needed.

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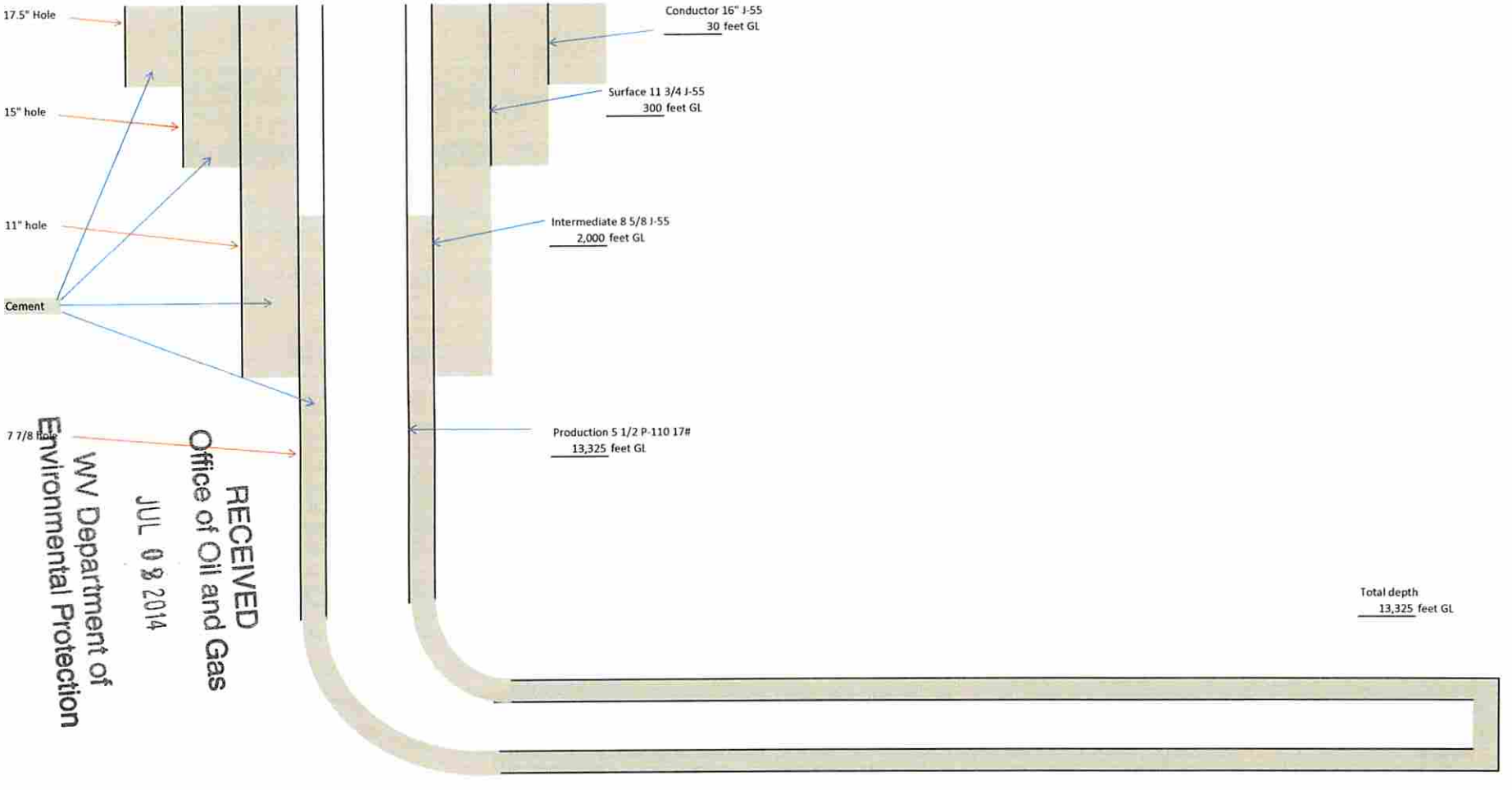
Jay-Bee Oil & Gas Inc.
Well Name Schulberg 1HC
GL Elevation 887.4'
KB 14 feet

Date 6/30/2014
District McClellan
County Doddridge
State West Virginia

Input by: Shane Dowell



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17-0654-7

WW-9
(9/13)

API Number 47 - 17 - 06547
Operator's Well No. Schulberg 1HC

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Jay-Bee Oil & Gas, Inc OP Code 24610

Watershed (HUC 10) Broad Run Quadrangle Center Point 7.5'

Elevation 887.4 County Doddridge District McClellan

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: Drill Cuttings - Air Drilling Top Hole

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

DCW
7-1-14

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
■ Underground Injection (UIC Permit Number 47-085-09721)
_____ Reuse (at API Number _____)
_____ Off Site Disposal (Supply form WW-9 for disposal location)
■ Other (Explain Using Contract Haulers Norte/CES (API's 47-085-05151)

Will closed loop system be used? If so, describe: Yes, Centrifuge System (Boss, Newalta) Possible, directional

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air Vertical/Water Based Horizontal

-If oil based, what type? Synthetic, petroleum, etc. Brine Base Drilling Mud on horizontal

Additives to be used in drilling medium? Bentonite, Salt, Soda Ash

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

-Landfill or offsite name/permit number? Meadowfill/Permit 101219WV

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) Shane Dowell

Company Official Title Office Manager

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Environmental Protection

Subscribed and sworn before me this 1 day of July, 20 14

Notary Public _____

My commission expires October 23, 2020

OFFICIAL SEAL
Danielle L. Butler
Notary Public
State of West Virginia
My Commission Expires
October 23, 2020
125 Ash Tree Lane
St. Mary's, WV 26170

17-06547

Form WW-9

Operator's Well No. Schulberg 1HC

Jay-Bee Oil & Gas, Inc

Proposed Revegetation Treatment: Acres Disturbed 4.9 Prevegetation pH 6.8

Lime 3 Tons/acre or to correct to pH 6.8

Fertilizer type 10-20-20

Fertilizer amount 750 lbs/acre

Mulch Hay 2000 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	KY-31	20
		Creeping Red Fescue	30
		Lathco Flat Pea/Perennial Ryegrass	30

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: Douglas Newlon

Comments: seed & Mulch any disturbed areas

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Title: Oil & Gas Inspector Date: 7/2/14

Field Reviewed? (✓) Yes ( ) No

17-06547

Form WW-9

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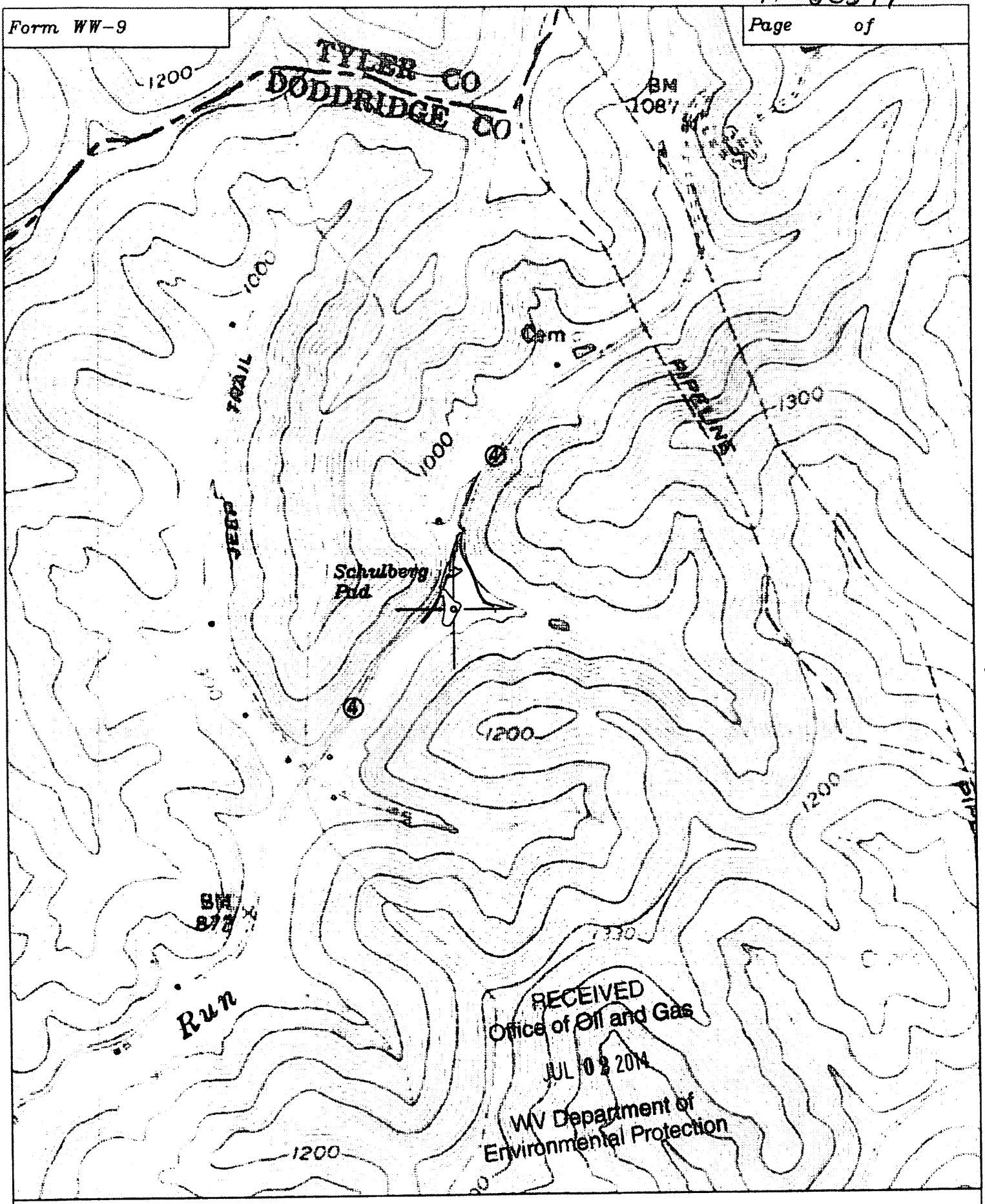

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Well: Schulberg
Quad: Center Point 7 1/2'
District: McClellan
County: Doddridge

0 500' 1,000' 2,000'
Scale: 1"=1,000'

FORM WW-6

Top Hole 5,241'

Bottom Hole 9,795'

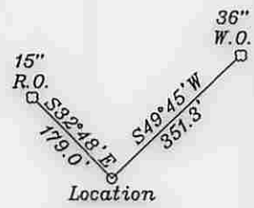
LATITUDE 39-27-30 N

Bottom Hole 7,562'

Top Hole 9,948'

LONGITUDE 80-37-30 N

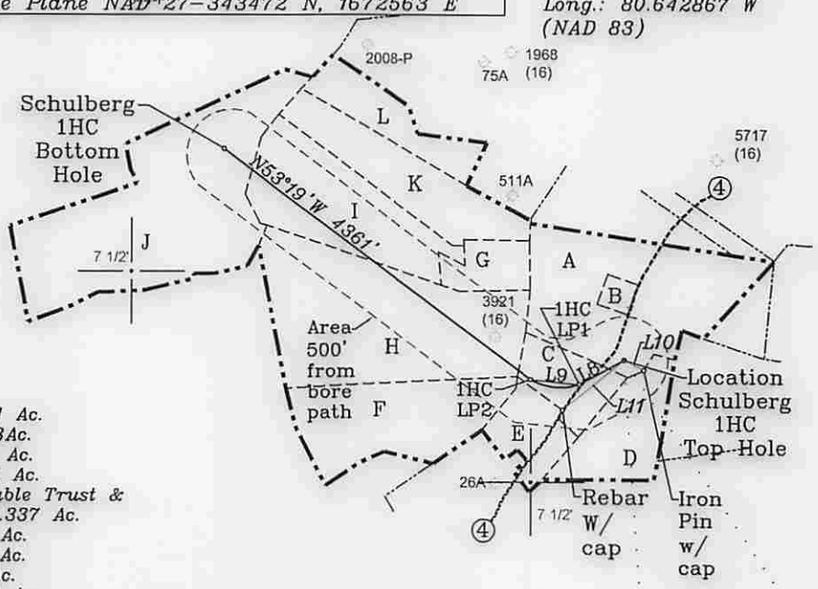
References



Top Hole
NAD 27-39.430842 N, 80.643114 W
UTM NAD83(meters)-4364659.4 N. 530730.5 E
State Plane NAD 27-341085.9 N, 1677116.4 E
Landing Point LP-1
NAD 27-39.430072 N, 80.644881 W
UTM NAD83(meters)-4364573.4 N. 530578.7 E
State Plane NAD 27-340812 N, 1676614 E
Landing Point LP-2
NAD 27-39.430203 N, 80.646841 W
UTM NAD83(meters)-4364587.3 N. 530410.0 E
State Plane NAD 27-340867 N, 1676061 E
Bottom Hole
NAD 27-39.437231 N, 80.659340 W
UTM NAD83(meters)-4365363.1 N. 529331.3 E
State Plane NAD 27-343472 N, 1672563 E

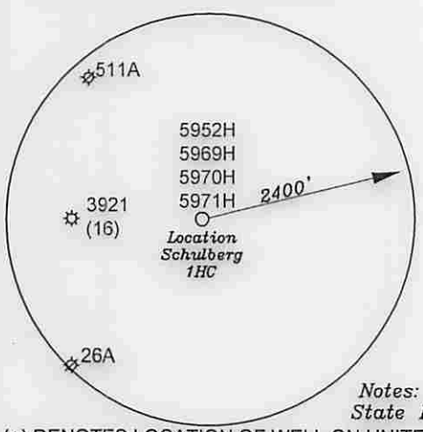
NUMBER	DIRECTION	DISTANCE
L8	S61°24'W	573'
L9	N84°19'W	556'
L10	N62°47'W	249'
L11	N50°47'E	892'

Notes: No water wells were found within 250' of the well location. A house is located S78°11'E 608' from the center of the well pad. Lat.: 39.431007 N, Long.: 80.642867 W (NAD 83)



NORTH

A- Moore et vir TM 6-7 64 Ac.
B- Moore et vir TM 6-36 3Ac.
C- Looman T.M. 6-16 14.91 Ac.
D- C. Swiger T.M. 6-37 25 Ac.
E- Ebeling Family Irrevocable Trust & Dorothy McGee TM 6-16.1 16.337 Ac.
F- Hayes TM 6-14.1 49.89 Ac.
G- Sansalone TM 6-2 13.1 Ac.
H- Gordon TM 6-6 90.25 Ac.
I- Brownlee TM 6-2.2 52.5 Ac.
J- Weedon TM 13-20 Tyler Co. 96 Ac.
K- Davis TM 6-2.1 34 Ac.
L- Olson TM 6-1.2 25.7 Ac.

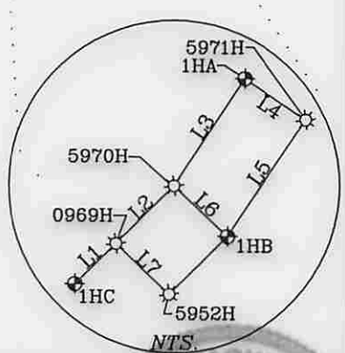


L1- N45°34'E 15.0'
L2- N45°34'E 21.6'
L3- N33°36'E 33.8'
L4- S55°48'E 19.4'
L5- S34°03'W 36.7'
L6- S47°02'E 19.3'
L7- S47°02'E 19.3'

Notes: All wells within 500' of the horizontal leg are shown on this plat based upon information taken from DEP mapping, well plats, & aerial photos.

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

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



FILE NO. _____
DRAWING NO. 1
SCALE 1" = 2000'
MINIMUM DEGREE OF ACCURACY 1 in 200
PROVEN SOURCE OF ELEVATION GPS submeter unit

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

(SIGNED) David L Jackson

R.P.E. _____ P.L.S. 708

DAVID JACKSON LICENSED No. 708 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

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

DATE March 25, 2014
OPERATOR'S WELL NO. Schulberg 1HC
API WELL NO.
47 — 017 — 06547 HGA
STATE COUNTY PERMIT

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

LOCATION: ELEVATION 887.4' WATER SHED Broad Run
DISTRICT McClellan COUNTY Doddridge County
QUADRANGLE Center Point 7 1/2'

SURFACE OWNER Carrie J. Moore et vir ACREAGE 64 ac.

OIL & GAS ROYALTY OWNER & LEASE NO. Mary Schulberg D74/75 (TM 6/7, 8, 9, 14, 14.1, 15, 16, 16.1, 23, 24, 25, 30, 31, 36, 37); James A. Eliopulos - Elio - (TM 6/6); Clarence & Joyce Brownlee D405D (TM 6/1.1, 1.2); Willard Harbart T1205/W675/W664 (TM 13/20 Tyler Co.)

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

PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD 6,787'±; TMD 13,325'±

WELL OPERATOR Jay Bee Oil & Gas, Inc. DESIGNATED AGENT Randy Broda

ADDRESS 1720 Rt. 22, East Union, NJ 07083 ADDRESS Route 1, Box 5, Cairo, WV 26337