west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Friday, April 27, 2018
WELL WORK PERMIT
Vertical / Re-Work

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit approval for ALBERT & MARY HOHMAN 1
47-103-02231-00-00

This well work permit 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 any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of 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.

Per 35 CSR 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- 0450.

James A. Martin
Chief

Operator's Well Number:	ALBERT & MARY HOHMAN 1
Farm Name:	HOHMAN, ALBERT & MARY
U.S. WELL NUMBER:	47-103-02231-00-00
Vertical	Re-Work
Date Issued:	4/26/2018

04/27/2018

47-103-02231W

PERMIT CONDITIONS

West Virginia Code §22-6-11 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. 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 §22-6-20, which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

2. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.

3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.

4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

5. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours

7. Well work activities shall not constitute a hazard to the safety of persons.

8. 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.

04/27/2018

WW - 2B
(Rev. 8/10)

47 10 3 02 2 3 1 W

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	Wetzel	Proctor	Wileyville
rework	Operator ID	County	District	Quadrangle

2) Operator's Well Number: Albert & Mary Hohman 1 3) Elevation: 1302'

4) Well Type: (a) Oil _____ or Gas X

(b) If Gas: Production ____ / Underground Storage _____

Deep _____ / Shallow X

5) Proposed Target Formation(s): Upper Devonian Proposed Target Depth: 6868-69'

6) Proposed Total Depth: 9910' Feet Formation at Proposed Total Depth: Tuscarora

7) Approximate fresh water strata depths: 381' Deepest water well within 1500' is +985' SS elevation, which calculates to 332' TVD at the well location.

8) Approximate salt water depths: 1639' Salinity curve analysis on the Margaret Sue Kelley 10H to the south determined that the top of Salt Water is in a sand lobe within the Raven Cliff Formation.

9) Approximate coal seam depths: 1078'

DMH 3-14-18

10) Approximate void depths,(coal, Karst, other): None that we are aware of.

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)

**See Attachment WILL FRAC UPPER DEVONIAN.

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	20"			40'	40'	
Fresh Water	13 3/8"	J-55	54.5	1140'	1140'	CTS
Coal						
Intermediate	9 5/8"	J-55	40.0	2558'	2558'	CTS
Production	7"	P-110	26.0	9717'	9717'	
Tubing						
Liners						

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MAR 21 2018

Packers: Kind: _____
Sizes: _____
Depths Set _____

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04/27/2018

47-103-02231W

Albert Mary Hohman #1

Updated Procedure (April 24, 2018)

1. MIRU Workover Rig & kill well
2. POH w/tbg
3. RUN corrosion log/ cement bond log and pulse neutron log
4. Check PBTD 7117'
5. Set Retrievable Bridge Plug w/Pressure Gauge set above Lower Marcellus @ 6975'
6. Pressure test casing
7. Ensure wellbore is filled with water leaving a 1000' air gap
8. RDMO WO Rig Leave a lower master valve and a cross over spool to 7-1/16" looking up 5K
9. RIH w/micro seismic array & Tilt meter (min OD required 3.9") record fractures from the Margaret Sue Kelly 2H & 4H for a total of 20 stages
10. POH with micro seismic array & tilt meter
11. RU wireline & perforate Single Cluster in Upper Devonian Approx. 6868-69' 6 spf 60 deg phasing 12 holes
12. If time allows pump a DFIT
13. Frac Upper Devonian (single Cluster 25-30 BPM 70,000#'s) tag proppant with Carbo ceramics non-radioactive tracer (NRT)
14. RIH w/Temp Log
15. Retrieve RBP and gauge
16. RIH Pulse Neutron Log
17. Set CIBP & 100' of cement 20' above the Lower Marcellus @ 6975'
18. MIRU Workover Rig
19. RIH w/6830' of 2-3/8" tbg
20. RD Workover Rig

gwm

04/27/2018

47103022 31 N

SWN Southwestern Energy

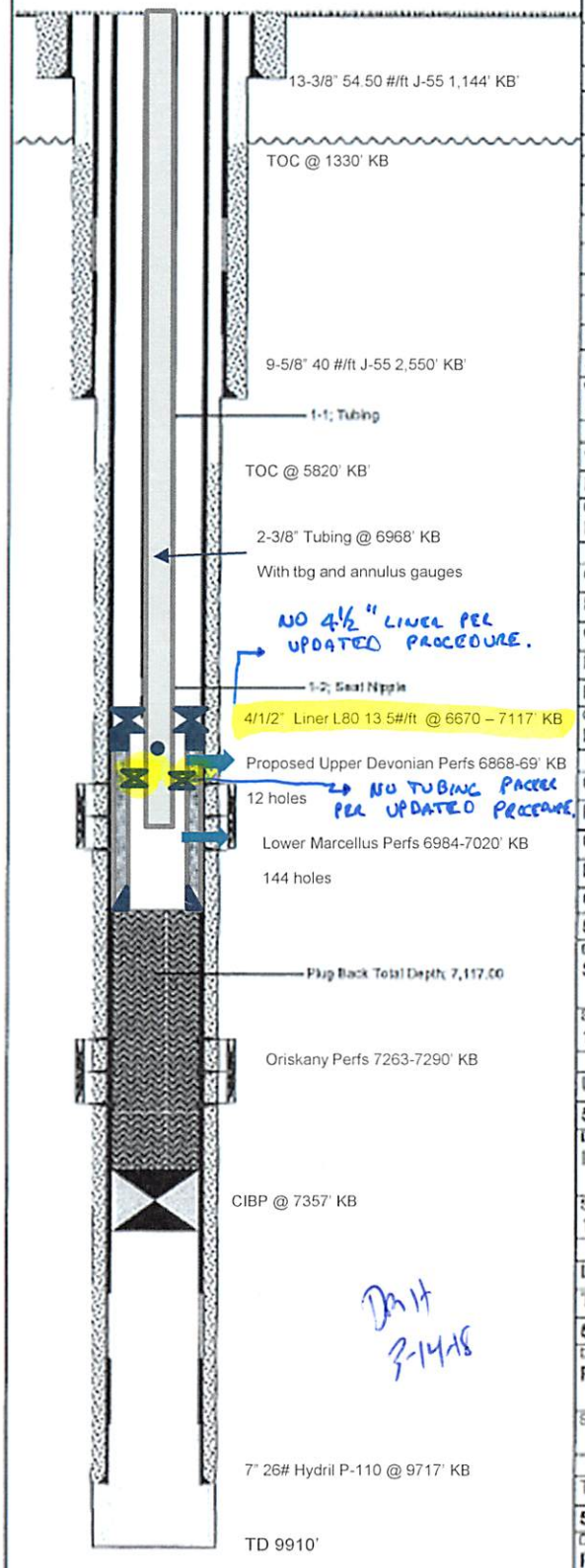
Well Summary

ALBERT-MARY HOHMAN 1

Well RC#: 4001158166

Vertical - ALBERT-MARY HOHMAN 1, 2/22/2018 8:37:02 AM

Vertical schematic (actual)



Well Header Setup

Well Name	Well API Number
ALBERT-MARY HOHMAN 1	47103022310000

Original KB Elevation (ft)	Ground Elevation (ft)	Spud Date	Rig Release Date
1,334.00	1,302.00	4/30/2007	6/5/2007

Surface Legal Location	Latitude (°)	Longitude (°)
	39.69688237	-80.70699018

Wellbore Sections Setup

Wellbore Name	Kick Off Depth (ftKB)	Vertical Section Direction (°)
ALBERT-MARY HOHMAN 1		

Section Des	Size (in)	Act Top (ftKB)	Act Btm (ftKB)
Surface	17 1/2	15.0	1,144.0
Intermediate	12 1/4	1,144.0	2,550.0
Production	8 3/4	2,550.0	9,910.0

Plug Back Total Depths

Date	Depth (ftKB)	Method	Com
	7,117.0		

Casing Data

Surface

Casing Description	Run Date	Set Depth (ftKB)
Surface	5/2/2007	1,144.00

Item Des	OD (in)	Wt (lb/ft)	Grade	Len (ft)
Casing Joints	13.375	54.50	J-55	1,129.00

Intermediate

Casing Description	Run Date	Set Depth (ftKB)
Intermediate	5/6/2007	2,550.00

Item Des	OD (in)	Wt (lb/ft)	Grade	Len (ft)
Casing Joints	9.625	40.00	J-55	2,491.00
Float Collar	9.625			0.93
Casing Joints	9.625	40.00	N-80	41.79
Float Shoe	9.625			1.22

Production

Casing Description	Run Date	Set Depth (ftKB)
Production	5/31/2007	9,717.00

Item Des	OD (in)	Wt (lb/ft)	Grade	Len (ft)
Casing Joints	7.000	26.00	P-110	9,652.00
Float Collar	7.000			2.00
Casing Joints	7.000	26.00	P-110	46.00
Float Shoe	7.000			2.00

Cement Data

5/2/2007 05:00, Surface

Description	String	Wellbore	Type
Surface Casing Cement	5/2/2007 05:00, Surface	ALBERT-MARY HOHMAN 1	Casing

Stage Number	Description	Top (ftKB)	Btm (ftKB)	Full Return?
1	Surface Casing Cement	15.0	1,144.0	

Fluid	Fluid Des	Amount (sacks)	Class
Lead		21	

5/6/2007 23:00, Intermediate

Description	String	Wellbore	Type
Intermediate Casing Cement	5/6/2007 23:00, Intermediate	ALBERT-MARY HOHMAN 1	Casing

Stage Number	Description	Top (ftKB)	Btm (ftKB)	Full Return?
1	Intermediate Casing Cement	1,330.0	2,550.0	

Fluid	Fluid Des	Amount (sacks)	Class
Lead		4	Type 1
Tail		4	

5/31/2007 20:15, Production

Description	String	Wellbore	Type
Production Casing Cement	5/31/2007 20:15, Production	ALBERT-MARY HOHMAN 1	Casing

Stage Number	Description	Top (ftKB)	Btm (ftKB)	Full Return?
	Production Casing Cement	5,820.0	9,717.0	

Fluid	Fluid Des	Amount (sacks)	Class
Tail		13	Poz 50/50

5/31/2007 20:15, Production

Description	String	Wellbore	Type
Production Casing Cement	5/31/2007 20:15, Production	ALBERT-MARY HOHMAN 1	Plug

DMH 3-14-18

04/27/2018

103-02231 W

WR-35

DATE: June 24, 2008
API #: 47-10302231

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas

Well Operator's Report of Well Work

Farm name: ALBERT AND MARY HOHMAN Operator Well No.: 625531

LOCATION: Elevation: 1302' Quadrangle: WILEYVILLE 7.5

District: PROCTOR County: WETZEL
Latitude: 4200 Feet South of 39 Deg. 42 Min. 30 Sec.
Longitude 11400 Feet West of 80 Deg. 40 Min. 00 Sec.

Company: CHESAPEAKE APPALACHIA, L.L.C.

	Casing & Tubing	Used in Drilling	Left in well	Cement fill up Cu. Ft.
Address: Post Office Box 6070				
Charleston, WV 25362-0070				
Agent: Michael John				
Inspector: Bill Hatfield	20"	40'		
Date Permit Issued: 03/27/2007	13 3/8"	1140	1140	CTS
Date Well Work Commenced: 04/30/2007	9 5/8"	2558	2558	CTS
Date Well Work Completed:	7"	9717	9717	
Verbal Plugging:				
Date Permission granted on:				
Rotary XX Cable Rig				
Total Depth (feet): 9710'				
Fresh Water depths (ft):				
Salt water depths (ft):				
Is coal being mined in area (Y/N)? NO				
Coal Depths (ft):				

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MAR 21 2018
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Environmental Protection

OPEN FLOW DATA

Producing formation Marcellus Pay zone depth (ft) 6984 – 7020 Set Cement Plug between Oriskany and Marcellus

X Gas: Initial open flow ____ MCF/d Oil: Initial open flow ____ Bbl/d
Final open flow 1500 MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests ____ Hours
Static rock Pressure 2400 psig (surface pressure) after 72 Hours

Second producing formation ____ Pay zone depth (ft) ____
Gas: Initial open flow ____ MCF/d Oil: Initial open flow ____ Bbl/d
Final open flow ____ MCF/d Final open flow ____ Bbl/d
Time of open flow between initial and final tests ____ Hours
Static rock Pressure ____ psig (surface pressure) after ____ Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

Signed: Chesapeake Appalachia, L.L.C.
By: Marc Watkins, District Manager
Date: 6/24/08

04/27/2018

103 - 02231W

FORMATION RECORD: Well
0 to from Driller's Log Book, to TD from Gamma Ray Log

FROM	TO	ROCK TYPE (described rock types and other minerals penetrated and record occurrences of oil, gas and water from surface to total depth)
0	974	Silt, Sand, Shale
974	982	Sewickley Coal
1075	1085	Pittsburgh Coal
1594	1674	Big Dunkard
1690	1860	Salt Sands
1935	2130	Maxton Sands
2176	2223	Big Lime
2223	2501	Big Injun
2598	2764	Weir
2825	2847	Sunbury
2847	2906	Berea
3043	3065	Gordon
3093	3226	4th Sand
3243	3365	5th Sand
3757	3802	Speechley
3802	6863	Silt, Sand, Shale
6864	6881	Geneseo
6881	6907	Tully
6907	6979	Hamilton
6979	6997	Upper Marcellus
6997	7000	Purcell
7000	7028	Lower Marcellus
7028	7074	Onondaga
7074	7257	Huntersville
7257	7381	Oriskany
7381	7555	Helderberg
7555	7643	Corriganville
7643	7747	Tonoloway
7747	8794	Salina
8794	9171	Lockport
9171	9557	Rose Hill
9557	9815	Tuscarora
9815	TD	Juniata

WATER:

Depth (ft)	Amount	Type

GAS CHECKS:

Depth(ft)	MCF/D

OIL SHOWS:

Depth	Amount

PERFORATIONS:
Stage 1:
Marcellus 6984-7020 W/144 holes
Stage 2:
Oriskany 7263-7290w/52 holes

STIMULATION:
Stage 1:
w/25580 slick water & 428189# 30/50

Stage 2:
w/1833 bbls cross link gel & 105,000# 20/40

Frac delayed. Log scheduled for 10/8 to determine if there is a casing leak.

10/4/2007 Loaded from SMS

Frac delayed. Log scheduled for 10/8 to determine if there is a casing leak.

10/5/2007 Loaded from SMS

Frac delayed. Log scheduled for 10/5 to determine if there is a casing leak.

10/8/2007 Loaded from SMS

Schlumberger ran GHOST image, Gas hold up & GR/PSI/Temp logs. Logs indicated that the gas into the casing is leaking past the bottom plugs.

10/9/2007 Loaded from SMS

Coil tubing scheduled to arrive Oct 10.

10/10/2007 Loaded from SMS

MIRU Leader Coil Tubing.

10/11/2007 Loaded from SMS

TIH w/ Leader coil tubing. Tagged plug @ 7043~ @ 1:00 PM. Began drilling. Drilled for 15 minutes. Pump truck broke down. POOH for night.

10/12/2007 Loaded from SMS

MIRU Leader CTU. RIH. Tag plug # 1 @ 7043~ . Mill (on water) from 8:30 AM to 12:15 PM. Chase plug to plug # 2 @ 7051.3~ mill on plug until 6:30 PM. Milled to 7052.4~ Having difficulty with severe hanging & finally quit drilling. POOH to inspect mill. Pulled to 3700~ . Started to drag 7,000 to 12,000 over string weight. Got to surface. SI 7| . Trouble assumed to be in pack off assembly. Can not get mill out of lubricator to inspect. SDFN will resume in AM. Pumped a total of 1490 bbls.

10/15/2007 Loaded from SMS ORISKANY PLUG FROM @ 7357' TO 7100'.

10/13- RIH. Tag bottom @ 7357~ . MIRU BJ Services. Spot 50 sks cement plug (Type 1, .8% CD-32, .125% ASA301, .4% BA-10 mixed @ 14.6 PPG, 1.33 CuFt/sk.) Dress top of plug @ 7100~ . Circulate hole to surface. Spot 500 gals MSA acid from 7070~ to 6760~ . POOH. Blowing coil clean with N2. Shut down, secure well head. RDMO Leader coil unit & pumping equipment.
10/12- Found debris in the pack-off head. Replaced mill. Chain tensioner not working, repair. RIH & tag plug @ 7056~ . Mill out plug. Chase to 7345~ . POOH. Secure well head. Remove mill. Realase Baker Tool. Pumped 525 bbls.

10/16/2007 Loaded from SMS

Completed water hauling.

10/17/2007 Loaded from SMS

Key Energy ran sinker bar. Tag cmt plug @ 7117~ . Perforate the Marcellus 6984~ - 7020~ w/ 144 holes @ 60 deg phase w/ 4 spf using tag guns. Preparing for frac.

10/18/2007 Loaded from SMS

Perforate the Marcellus 10/16/07 from 6984~ - 7020~ w/ 144 holes @ 60 deg phase w/ 4 spf using tag guns. Preparing for frac.

Stimulation Stage 1: Frac													
BD Rate BPM	BD Press psi	BD ISIP	Pre FG psi/ft	ATP psi	MTP psi	ATR BPM	MTR BPM	Post FG psi/ft	Clean Vol bbls	ISIP psi	5 min psi	10 min psi	15 min psi
									25580	0			
	Total	lb			Max Conc								
	Comment												

10/19/2007 Loaded from SMS

04/27/2018

103-02231W

WW-2A
(Rev. 6-14)

1). Date: 2/21/2018

2.) Operator's Well Number Albert & Marv Hohm

3.) API Well No.: State 47- County 103 - Permit 02231

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

4) Surface Owner(s) to be served:
(a) Name Albert and Marv Hohman
Address 197 Whetstone Road
New Martinsville, WV 26155
(b) Name
Address
(c) Name
Address

6) Inspector Derek Haught
Address PO Box 85
Smithville, WV 26178
Telephone 304-206-7613

5) (a) Coal Operator
Name
Address

(b) Coal Owner(s) with Declaration
Name Consolidation Coal Company
Address 1800 Washington Road
Pittsburgh, PA 15241
Name
Address

(c) Coal Lessee with Declaration
Name
Address

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

___ Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas

OR

___ Included is the information required by Chapter 22, Article 6, Section 8(d) of the Code of West Virginia (see page 2)

I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through ___ on the above named parties by:

_____ Personal Service (Affidavit attached)
X Certified Mail (Postmarked postal receipt attached)
_____ Publication (Notice of Publication attached)

I have read and understand Chapter 22-6 and 35 CSR 4, and I agree to the terms and conditions of any permit issued under this application.

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, 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.

OFFICIAL SEAL
Notary Public, State of West Virginia
BRITTANY R WOODY
3302 Old Elkins Road
Buckhannon, WV 26201
My commission expires November 27, 2022

RECEIVED
Office of Oil and Gas
MAR 21 2018
WV Department of
Environmental Protection

Well Operator SWN Production Co., LLC
By: Dee Southall
Its: Senior Regulatory Analyst
Address: P.O. Box 1300
Jane Lew, WV 26378
Telephone: 304-884-1610
Email: Dee_Southall@swn.com

Subscribed and sworn before me this 14th day of March, 2018

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 phone number, as a 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 of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov

04/27/2018

103-02231W

WW-2A1
(Rev. 1/11)

Operator's Well Number Albert & Mary Hohman 1

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
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:

Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
See Attachment			

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

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MAR 21 2018
WV Department of
Environmental Protection

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 initiated.

Well Operator: SWN Production Co., LLC
By: Its: Gary Nuckolls
Staff Landman

04/27/2018

EXHIBIT "A"

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, LLC, Operator
Albert-Mary Hohman 1
Wetzel County, West Virginia

#	TMP	LEASE #	LESSOR	LESSEE	ROYALTY	BK/PG
1	12-8-12	723461-029	Albert L. Hohman and Mary Hohman (Albert L. Hohman and Mary Hohman, Trustees of The Hohman Revocable Trust, dated August 8, 2014)	Chesapeake Appalachia, L.L.C.	12.5%	111A/437
			Chesapeake Appalachia, L.L.C.	SWN Production Company		157A/540

103-02231W

103 - 02231W

WW-9
(5/16)

API Number 47 - 103 - 02231
Operator's Well No. Albert & Mary Hohman 1

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 Wileyville

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 ☑

ANY WELL EFFLUENT MUST BE CONTAINED IN TANKS AND DISPOSED OF OFF-SITE. JWM

If so, please describe anticipated pit waste: _____

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? NA

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

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

-Landfill or offsite name/permit number? NA

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Office of Oil and Gas
MAR 21 2018
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Environmental Protection

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on April 1, 2016, 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 Senior Regulatory Analyst

OFFICIAL SEAL
Notary Public, State of West Virginia
BRITTANY R WOODY
3302 Old Elkins Road
Buckhannon, WV 26201
My commission expires November 27, 2022

Subscribed and sworn before me this 19th day of March, 2018

Brittany R Woody Notary Public

My commission expires 11/27/22

04/27/2018

103-02231W

Form WW-9

Operator's Well No. Albert & Mary Hohman 1

Proposed Revegetation Treatment: Acres Disturbed 6.40 Prevegetation pH _____

Lime as determined by pH test min. 2 Tons/acre or to correct to pH 5.53

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	Seed Type	lbs/acre
**See Attachment			

Attach:
Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, provide water volume, include dimensions (L, W, D) of the pit, and dimensions (L, W), and area in acres, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: _____

Comments: _____

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Office of Oil and Gas
MAR 21 2018
WV Department of
Environmental Protection

Title: Oil & Gas Inspect. Date: 3-14-18

Field Reviewed? (✓) Yes ( ) No

04/27/2018

Attachment 3B

WVD Seeding Specification

To Order Seed contact Lyndsi Eddy Flippo office 570-996-4271 cell 501-269-5451 lyndsi_eddy@swn.com (please allow 7 to 10 days for delivery)

NON-ORGANIC PROPERTIES

Seed Mixture: ROW Mix	SWN Supplied
Orchardgrass	40%
Timothy	15%
Annual Ryegrass	15%
Brown Top Millet	5%
Red Top	5%
Medium Red Clover	5%
White Clover	5%
Birdsfoot Trefoil	5%
Rough Bluegrass	5%

All legumes are innoculated at 5x normal rate

Apply @ 100lbs per acre
April 16th- Oct. 14th

Apply @ 200lbs per acre
Oct. 15th- April 15th PLUS
50lbs per acre of Winter Wheat

SOIL AMENDMENTS

10-20-20 Fertilizer	*Apply @ 500lbs per Acre
Pelletized Lime	Apply @ 2 Tons per Acre

*unless otherwise dictated by soil test results

Seeding Calculation Information:

1452' of 30' ROW/LOD is One Acre
871' of 50' ROW/LOD is One Acre
622' of 70' ROW/LOD is One Acre

Synopsis:

Every 622 linear feet in a 70' ROW/LOD, you should be using (2) 50lb bags of seed, (4) 50lb bags of fertilizer and (80) 50lb bags of Lime (2x seed in winter months + 50lb Winter Wheat/ac).

Special Considerations:

Landowner Special Considerations including CREP program participants require additional guidance that is not given here. Discuss these requirements with SWN supervision at the beginning of the project to allow time for special seed delivery.

ORGANIC PROPERTIES

Seed Mixture: SWN Production Organic Mix	SWN Supplied
Organic Timothy	50%
Organic Red or White Clover	50%
OR	
Organic Perennial Ryegrass	50%
Organic Red or White Clover	50%

Apply @ 100lbs per acre
April 16th- Oct. 14th

Organic Fertilizer @ 200lbs per Acre

Apply @ 200lbs per acre
Oct. 15th- April 15th

Pelletized Lime @ 2 Tons per Acre

WETLANDS (delineated as jurisdictional wetlands)

Seed Mixture: Wetland Mix	SWN Supplied
VA Wild Ryegrass	20%
Annual Ryegrass	20%
Fowl Bluegrass	20%
Cosmos 'Sensation'	10%
Redtop	5%
Golden Tickseed	5%
Maryland Senna	5%
Showy Tickseed	5%
Fox Sedge	2.5%
Soft Rush	2.5%
Woolgrass	2.5%
Swamp Verbena	2.5%

Apply @ 25lbs per acre
April 16th- Oct. 14th

Apply @ 50lbs per acre
Oct. 15th- April 15th

NO FERTILIZER OR LIME INSIDE WETLAND LIMITS

103-02231W

WW-9- GPP
Rev. 5/16

NA

Page _____ of _____
API Number 47 - 103 - 02231
Operator's Well No. Albert & Mary Hohman 1

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

Operator Name: SWN Production Co., LLC

Watershed (HUC 10): Steener Fork Quad: Wileyville

Farm Name: Albert & Mary Hohman

1. List the procedures used for the treatment and discharge of fluids. Include a list of all operations that could contaminate the groundwater.

2. Describe procedures and equipment used to protect groundwater quality from the list of potential contaminant sources above.

3. List the closest water body, distance to closest water body, and distance from closest Well Head Protection Area to the discharge area.

4. Summarize all activities at your facility that are already regulated for groundwater protection.

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MAR 2[illegible]3
WV Department of
Environmental Protection

5. Discuss any existing groundwater quality data for your facility or an adjacent property.

04/27/2018

6. Provide a statement that no waste material will be used for deicing or fill material on the property.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

8. Provide provisions and frequency for inspections of all GPP elements and equipment.

Signature: _____

Date: _____

103-02231W

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MAR 21 2018
WV Department of
Environmental Protection

ALBERT & MARY HOHMAN WTZ WELL PAD
AS-BUILT AND EROSION & SEDIMENT CONTROL IMPROVEMENT PLAN

PROCTOR DISTRICT, WETZEL COUNTY, WEST VIRGINIA
LYNN CAMP RUN WATERSHED

LOCATION COORDINATES:
ACCESS ROAD ENTRANCE
LATITUDE: 39.695652 LONGITUDE: -80.709263 (NAD 83)
N 4394018.62 E 524927.11 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.696723 LONGITUDE: -80.707795 (NAD 83)
N 4394138.13 E 525052.52 (UTM ZONE 17 METERS)

EVACUATION GATHERING AREA
LATITUDE: 39.695673 LONGITUDE: -80.709129 (NAD 83)
N 4395491.45 E 530585.09 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:
THE ACCESS ROAD(S) AND WELL PAD HAVE BEEN CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

FLOODPLAIN NOTES:
THE PROPOSED SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #54103C0075C.

MISS UTILITY STATEMENT:
MISS UTILITY SHALL BE NOTIFIED IF ANY ADDITIONAL EXCAVATION IS NECESSARY.

PROJECT CONTACTS:

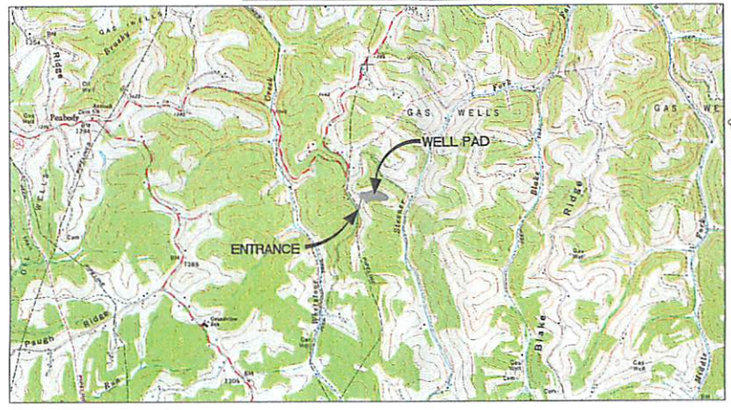
OPERATOR:
SOUTHWESTERN ENERGY
179 INNOVATION DRIVE
JANE LEW, WV 26378
PHONE: (304) 517-1416

SHAWN JACKSON - FIELD PLANNING SUPERVISOR
OFFICE: (304) 884-1618 CELL: (304) 641-3204

AS-BUILT ENGINEER/SURVEYOR:
NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE - PROJECT MANAGER/ENGINEER
OFFICE: (888) 662-4185 CELL: (540) 686-6747

NOTES:
1. ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETE AND PERMANENTLY STABILIZED. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AFTER EACH RUNOFF EVENT IN EXCESS OF 0.5" AND ON A BIWEEKLY BASIS.
2. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS PAVEMENT OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.
3. ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
4. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.
5. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF AUGUST 31, 2017. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATES.
6. THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
7. THE EXISTING EGRESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.

WILEYVILLE USGS 7.5 QUAD MAP



WEST VIRGINIA STATE PLANE COORDINATE SYSTEM
NORTH ZONE, NAD83
ELEVATION BASED ON NAVD88
ESTABLISHED BY SURVEY GRADE GPS & OPUS POST-PROCESSING

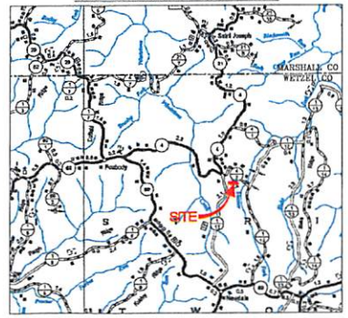
SHEET INDEX:

ALBERT & MARY HOHMAN WTZ LIMITS OF DISTURBANCE AREA (AC)	
Total Site	
Access Road (444')	0.87
Well Pad	5.53
Total Affected Area	6.40
Impacts to County Route 1/11 R/W	
Access Road (7')	0.02
Total Affected Area	0.02
Impacts to Albert & Mary Hohman TM 12 08-12	
Access Road (437')	0.85
Well Pad	5.53
Total Affected Area	6.38

WEST VIRGINIA COUNTY MAP

(NOT TO SCALE)

WVDOH COUNTY ROAD MAP



Well Name	Elev. (MSL)	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long DMS	NAD 83 Lat & long DD
		As-Drilled Coordinates				
Albert & Mary Hohman 1 (Drilled) API# 47-103-02231	1,299.11'	N 436181.16 E 1660229.39	N 438197.71 E 1628791.39	N 4394146.25 E 525092.90	LAT 39-41-44.5270 LONG -80-42-26.3660	LAT 39.696813 LONG -80.707324

DRH
3-14-18

REPRODUCTION NOTE

THESE PLANS WERE CREATED TO BE PLOTTED ON 22"X34" (ANSI D) PAPER. HALF SCALE DRAWINGS ARE ON 11"X17" (ANSI B) PAPER.

THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

AS-BUILT CERTIFICATIONS:
THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 35-8.

MISS Utility of West Virginia
1-800-245-4848
West Virginia State Law
(Section XIV: Chapter 24-C)
Requires that you call two business days before you dig in the state of West Virginia.
IT'S THE LAW!!

EX. WELL PAD HAS BEEN RECLAIMED. PAD CONTAINMENT WILL NEED TO BE ESTABLISHED FOR FUTURE DRILLING.

NAVITUS ENERGY ENGINEERING
Telephone: (888) 662-4185 | www.NavitusEng.com

REVISION | DATE

SWN Southwestern Energy

THIS DOCUMENT WAS PREPARED FOR: SOUTHWESTERN ENERGY

COVER SHEET
ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CYRUS S. KUMP REGISTERED PROFESSIONAL ENGINEER STATE OF WEST VIRGINIA
09/27/2017

DATE: 09/27/2017
SCALE: AS SHOWN
SHEET 1 OF 11

103-0223/W

LEGEND

LEGEND

EX. INDEX CONTOUR & CONTOUR LABEL	PR. INDEX CONTOUR (10' INTERVAL) & CONTOUR LABEL
EX. INTERMEDIATE CONTOUR	PR. INTERMEDIATE CONTOUR (2' INTERVAL)
EX. PROPERTY LINE	PR. INTERMEDIATE CONTOUR (1' INTERVAL)
EX. TOP OF BERM	PR. INDEX ROAD CONTOUR (10' INTERVAL) & CONTOUR LABEL
EX. ROAD EDGE OF GRAVEL/DIRT	PR. INTERMEDIATE ROAD CONTOUR (2' INTERVAL)
EX. ROAD EDGE OF PAVEMENT	PR. PADS/STOCKPILE TOPO LIMITS
EX. ROAD CENTERLINE	PERMITTED LIMITS OF DISTURBANCE
EX. GUARDRAIL	MODIFICATION LIMITS OF DISTURBANCE
EX. BRIDGE	PR. ROAD/IMPOUNDMENT EDGE OF GRAVEL
EX. DITCHLINE/DRAINAGE FEATURE	PR. ROAD CENTERLINE
EX. RIP-RAP	PR. GUARDRAIL
EX. CULVERT	PR. ROCK CONSTRUCTION ENTRANCE
EX. TREELINE	PR. AIR BRIDGE
EX. BUILDING	PR. CULVERT
EX. MISCELLANEOUS FEATURE	PR. DITCH
EX. 100 YR FEMA FLOODPLAIN	PR. RIP-RAP TRAPEZOIDAL DITCH
EX. DELINEATED STREAM	PR. OUTLET PROTECTION
EX. DELINEATED WETLAND/POND	PR. DIVERSION
100' WETLAND/STREAM BUFFER	PR. ROCK LEVEL SPREADER
STREAM/WETLAND DELINEATION STUDY AREA	PR. COMPOST FILTER SOCK
EX. FENCELINE	PR. SUPER SILT FENCE
EX. GATE	PR. WELL HEAD
EX. PERIMETER SAFETY FENCE	PR. PAD DEWATERING SYSTEM
EX. ACCESS GATE WITH EMERGENCY LIFELINE	PR. TOP OF PAD CONTAINMENT BERM
EX. WELL HEAD ON DESIGNED PAD	PR. 220' X 320' PAD FOOTPRINT
EX. GAS WELL	PR. SPOT SHOT
EX. PIPELINE	PR. PERIMETER SAFETY FENCE
EX. PIPELINE R/W	PR. ACCESS GATE WITH EMERGENCY LIFELINE
EX. PIPELINE METER	PR. PIPELINE
EX. PIPELINE VALVE	PR. PIPELINE R/W
EX. PIT	PR. OVERHEAD UTILITY
EX. OVERHEAD UTILITY	PR. POWER POLE/GUY WIRE
EX. POWER POLE/GUY WIRE	PR. OVERHEAD UTILITY R/W
EX. UNDERGROUND ELECTRIC	PR. WATERLINE
EX. UNDERGROUND TELEPHONE	BORING LOCATION
EX. UNDERGROUND FIBER OPTIC	X-SECTION/PROFILE GRID INDEX
EX. UTILITY R/W	X-SECTION/PROFILE GRID INTERMEDIATE
EX. WATERLINE	X-SECTION/PROFILE PROPOSED GRADE
EX. WATER WELL/EX. SPRING	X-SECTION/PROFILE EXISTING GRADE
EX. COMPOST SOCK	X-SECTION/PROFILE WATER SURFACE
EX. SUPER SILT FENCE	X-SECTION/PROFILE CULVERT
EX. SILT FENCE	MATCHLINE
APPROX. LOCATION OF SLIDE AREA	EX. MUSTER AREA / EX. MAILBOX / EX. MINI 250 / EX. SLUG CATCHER
APPROX. LOCATION OF BORROW/ SPOIL AREA	CONTROL PT. / EX. TEG / EX. VRU / EX. COMBUSTOR
PR. TOE BENCH	EX. SAND TRAP / EX. VRT / EX. HTEX / EX. COMPRESSOR
EX. APPROX. SURFACE & SUB-SURFACE WELL LINE AREA	EX. FLARE DRUM & BLOW CASE / EX. TEMP. SAND SEPARATOR
EX. APPROX. SURFACE & SUB-SURFACE BLOW-DOWN/DUMP LINE AREA	EX. METER SKID / EX. FLASH GAS METER
EX. ESD & APPROX. SURFACE & SUB-SURFACE ESD LINE	EX. REBOILER / EX. HEATER TREATER
EX. APPROX. SURFACE & SUB-SURFACE SALES LINE AREA	EX. DEHY W/ REBOILER / EX. PIG LAUNCHER
EX. CONDENSATE LINE	
EX. PRODUCED WATER LINE	EX. STORAGE TANK / EX. GPU
EX. FLASH GAS/MAKEUP GAS/ FUEL SUPPLY LINE	
EX. ABOVE-GND VAPOR LINE	EX. STABILIZER / EX. WELL PAD DEWATERING SYSTEM
EX. SECONDARY CONTAINMENT	

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DATE	REVISION

SWN Southwestern Energy

THIS DOCUMENT WAS PREPARED FOR: SOUTHWESTERN ENERGY

LEGEND

ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS B. KLUG — REGISTERED — STATE OF WEST VIRGINIA — PROFESSIONAL ENGINEER
09/27/2017

DATE: 09/27/2017
SCALE: N/A
SHEET 2 OF 11

103-02231W

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MAR 21 2018
WV Department of
Environmental Protection

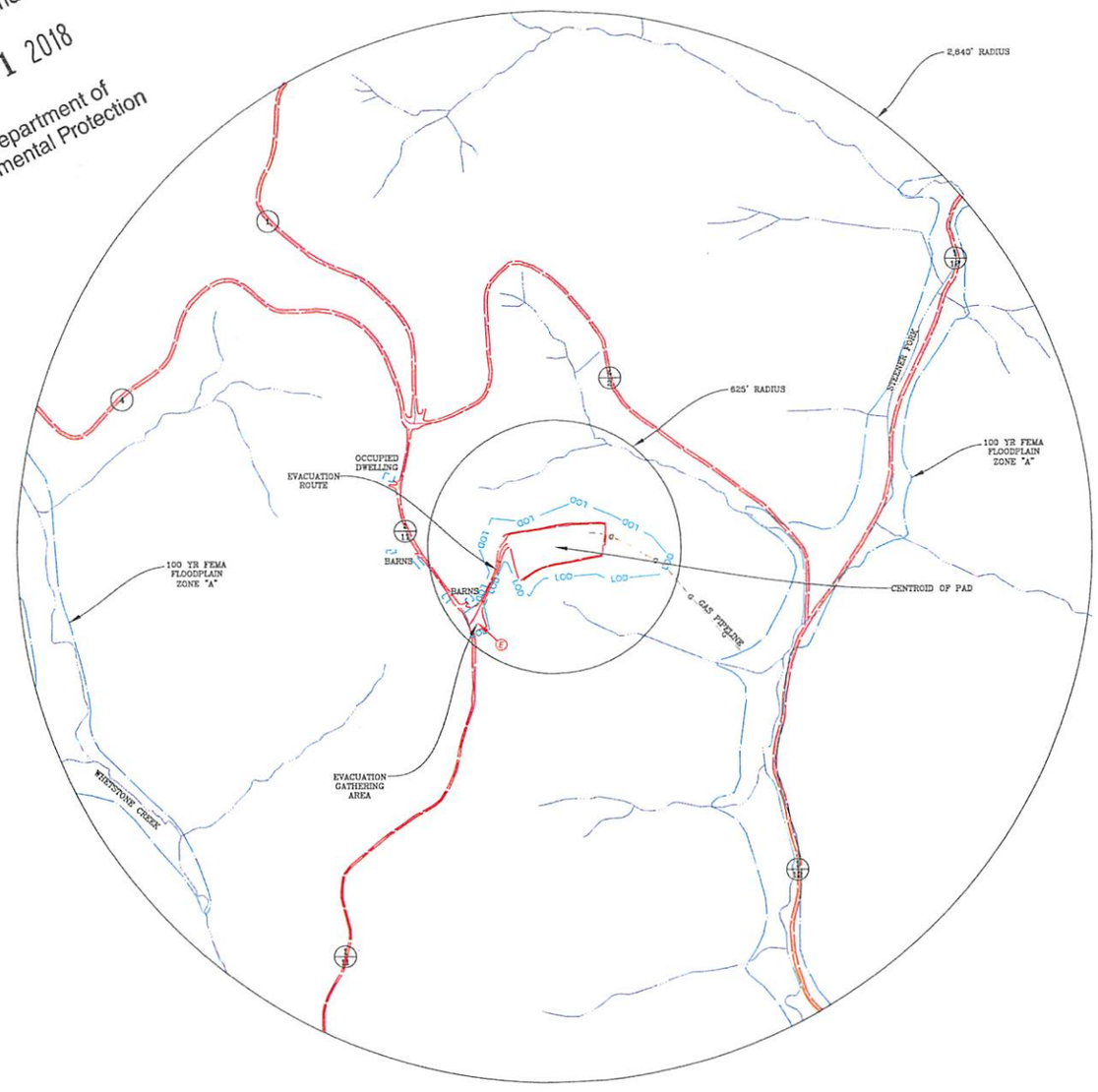
GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS

LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
LATITUDE: 39.708714 LONGITUDE: -80.667883 (NAD 83)
N 4395488.97 E 530577.36 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.709056 LONGITUDE: -80.639893 (NAD 83)
N 4395528.04 E 530868.71 (UTM ZONE 17 METERS)

EVACUATION GATHERING AREA
LATITUDE: 39.708736 LONGITUDE: -80.643203 (NAD 83)
N 4395491.45 E 530585.09 (UTM ZONE 17 METERS)



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DATE	REVISION

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VICINITY MAP

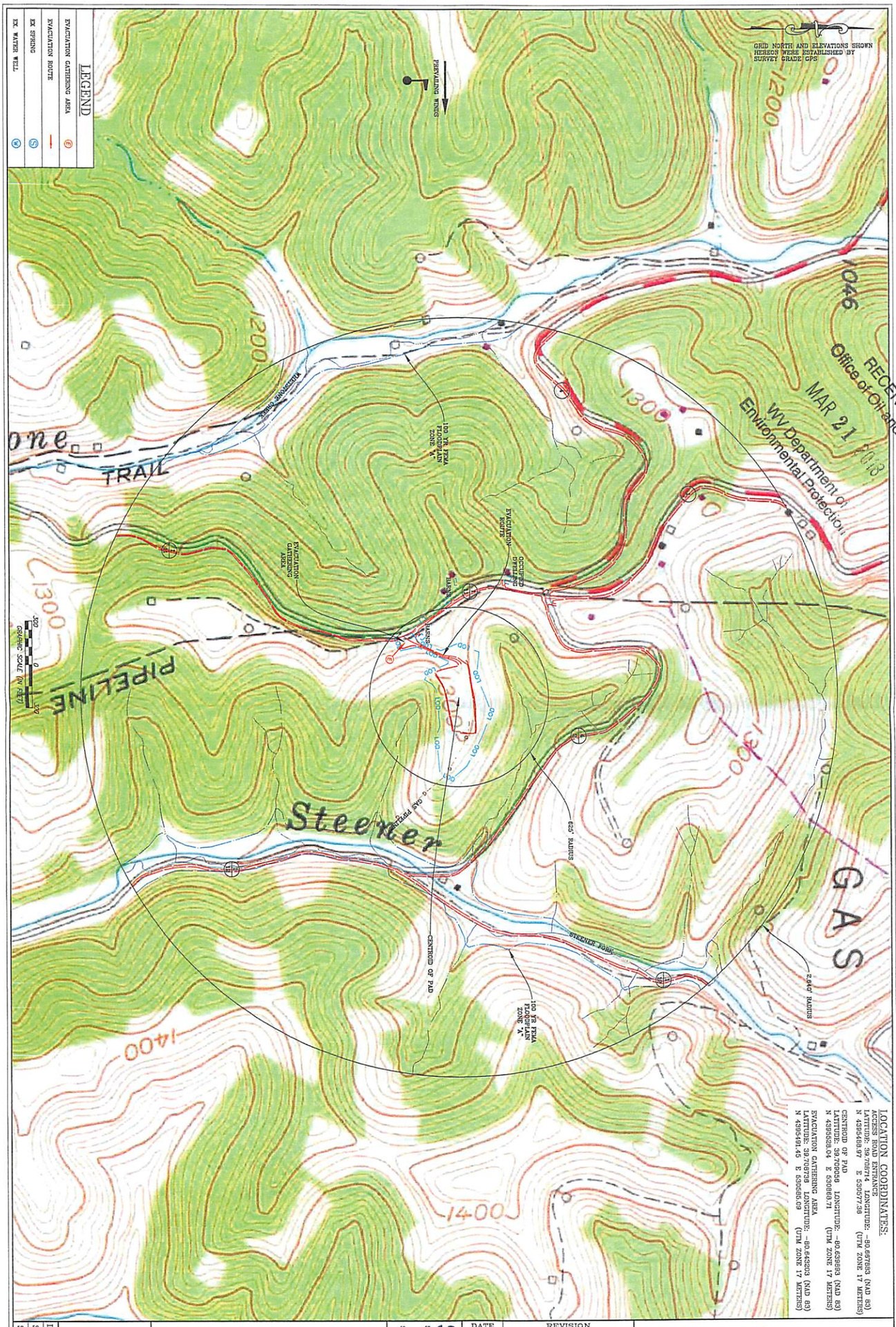
ALBERT & MARY HOHMAN WTZ

WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

JUSTIN S. KING REGISTERED 15578 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
09/27/2017

DATE: 09/27/2017
SCALE: 1" = 300'
SHEET 3 OF 11

103-02231W



LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
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N 4396408.87 E 530877.38 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.706969 LONGITUDE: -80.698698 (NAD 83)
N 4395628.04 E 530868.71 (UTM ZONE 17 METERS)

EVACUATION GATHERING AREA
LATITUDE: 39.708738 LONGITUDE: -80.642303 (NAD 83)
N 4396491.45 E 536685.09 (UTM ZONE 17 METERS)

VICINITY MAP

ALBERT & MARY HOHMAN WTZ

WELL PAD

PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

THIS DOCUMENT WAS PREPARED FOR: Southwestern Energy / SWN

DATE	REVISION

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ENERGY ENGINEERING
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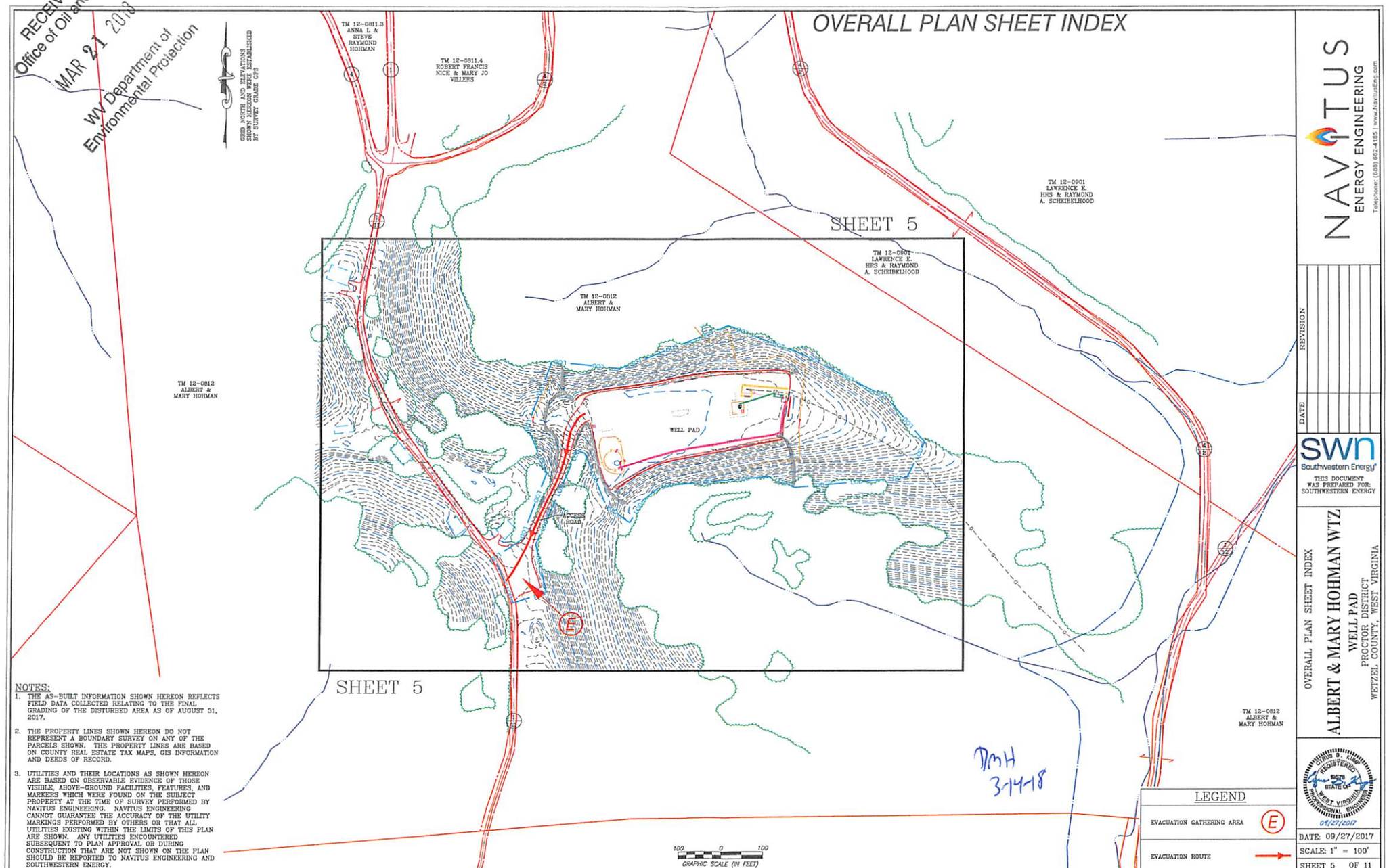
DATE: 09/27/2017
SCALE: 1" = 300'
SHEET 4 OF 11

04/27/2018

103-02231W

OVERALL PLAN SHEET INDEX



NOTES:

1. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF AUGUST 31, 2017.
2. THE PROPERTY LINES SHOWN HEREON DO NOT REPRESENT A BOUNDARY SURVEY ON ANY OF THE PARCELS SHOWN. THE PROPERTY LINES ARE BASED ON COUNTY REAL ESTATE TAX MAPS, GIS INFORMATION AND DEEDS OF RECORD.
3. UTILITIES AND THEIR LOCATIONS AS SHOWN HEREON ARE BASED ON OBSERVABLE EVIDENCE OF THOSE VISIBLE, ABOVE-GROUND FACILITIES, FEATURES, AND MARKERS WHICH WERE FOUND ON THE SUBJECT PROPERTY AT THE TIME OF SURVEY PERFORMED BY NAVITUS ENGINEERING. NAVITUS ENGINEERING CANNOT GUARANTEE THE ACCURACY OF THE UTILITY MARKINGS PERFORMED BY OTHERS OR THAT ALL UTILITIES EXISTING WITHIN THE LIMITS OF THIS PLAN ARE SHOWN. ANY UTILITIES ENCOUNTERED SUBSEQUENT TO PLAN APPROVAL OR DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE PLAN SHOULD BE REPORTED TO NAVITUS ENGINEERING AND SOUTHWESTERN ENERGY.

DMH 3-14-18

LEGEND

EVACUATION GATHERING AREA (E)

EVACUATION ROUTE

NAVITUS ENERGY ENGINEERING
Telephone: (888) 662-4185 | www.NavitusEng.com

DATE	REVISION

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OVERALL PLAN SHEET INDEX

ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

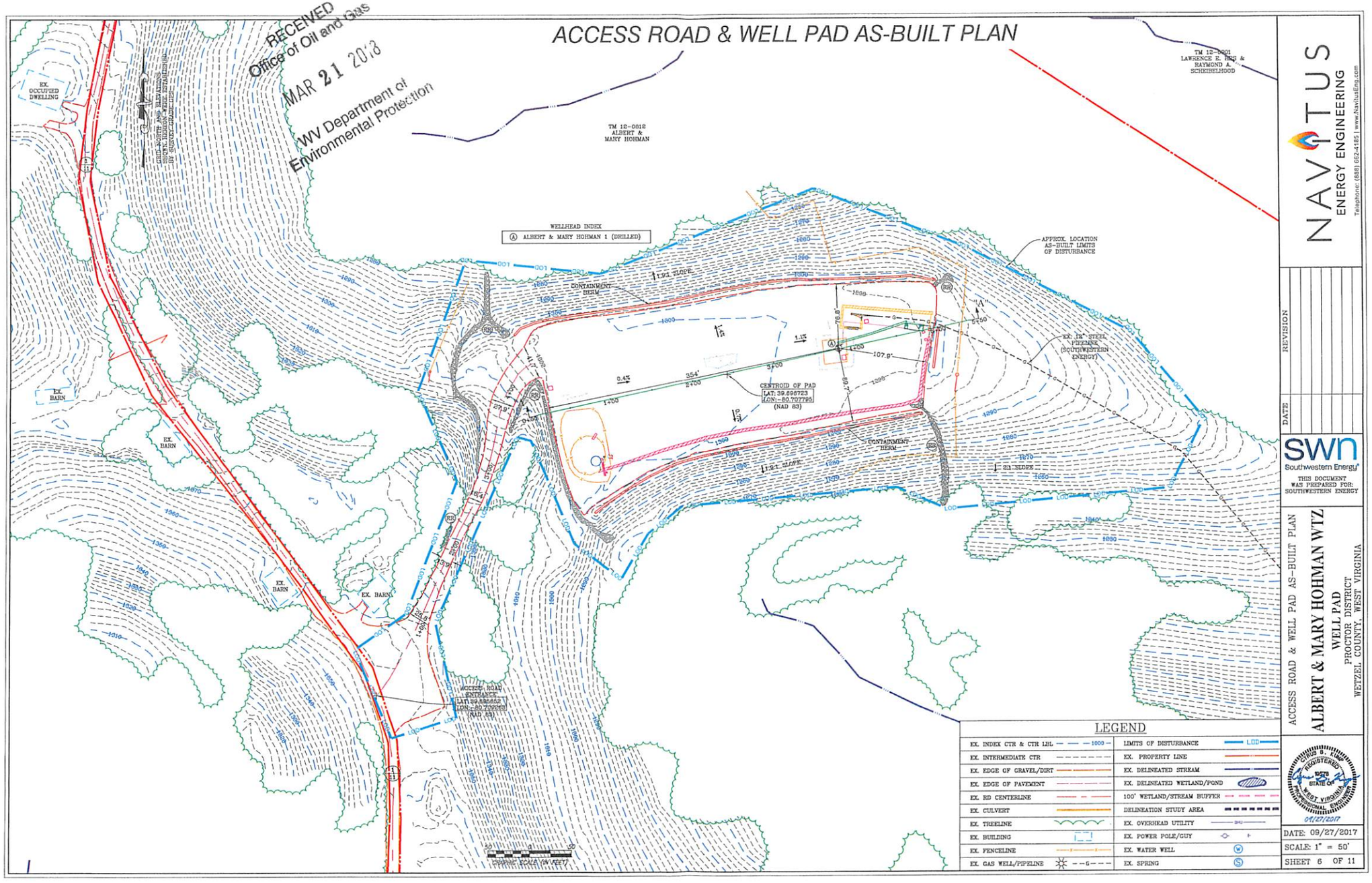
CHRIS D. KUMP REGISTERED 15076 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
04/27/2017

DATE: 09/27/2017
SCALE: 1" = 100'
SHEET 5 OF 11

103-0223(W)

RECEIVED
Office of Oil and Gas
MAR 21 2018
WV Department of
Environmental Protection

ACCESS ROAD & WELL PAD AS-BUILT PLAN



LEGEND

EX. INDEX CTR & CTR LBL	LIMITS OF DISTURBANCE
EX. INTERMEDIATE CTR	EX. PROPERTY LINE
EX. EDGE OF GRAVEL/DIRT	EX. DELINEATED STREAM
EX. EDGE OF PAVEMENT	EX. DELINEATED WETLAND/POND
EX. RD CENTERLINE	100' WETLAND/STREAM BUFFER
EX. CULVERT	DELINEATION STUDY AREA
EX. TREELINE	EX. OVERHEAD UTILITY
EX. BUILDING	EX. POWER POLE/GUY
EX. FENCELINE	EX. WATER WELL
EX. GAS WELL/PIPELINE	EX. SPRING

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REVISION | DATE

SWN Southwestern Energy

THIS DOCUMENT WAS PREPARED FOR: SOUTHWESTERN ENERGY

ACCESS ROAD & WELL PAD AS-BUILT PLAN

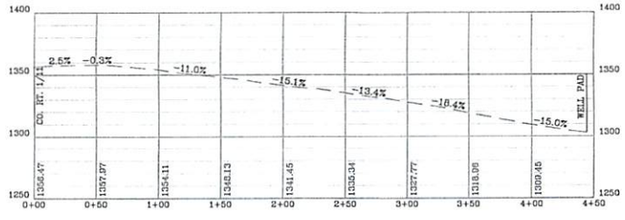
ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS B. KEMP
REGISTERED
8078
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
04/27/2017

DATE: 09/27/2017
SCALE: 1" = 50'
SHEET 6 OF 11

103-0223(W

ACCESS ROAD AS-BUILT PROFILE



ACCESS ROAD AS-BUILT PROFILE
SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

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Telephone: (888) 662-4185 | www.NavitusEng.com

DATE	REVISION

SWN Southwestern Energy

THIS DOCUMENT WAS PREPARED FOR: SOUTHWESTERN ENERGY

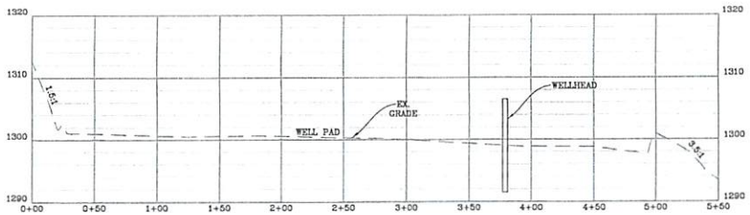
ACCESS ROAD AS-BUILT PROFILE
ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS B. KLUG
REGISTERED
10578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
09/27/2017

DATE: 09/27/2017
SCALE: AS SHOWN
SHEET 7 OF 11

103-02234W

WELL PAD AS-BUILT SECTIONS



WELL PAD AS-BUILT CROSS-SECTION "A-A"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

NAVITUS ENERGY ENGINEERING
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REVISION	DATE

SWN Southwestern Energy

THIS DOCUMENT WAS PREPARED FOR: SOUTHWESTERN ENERGY

WELL PAD AS-BUILT SECTIONS

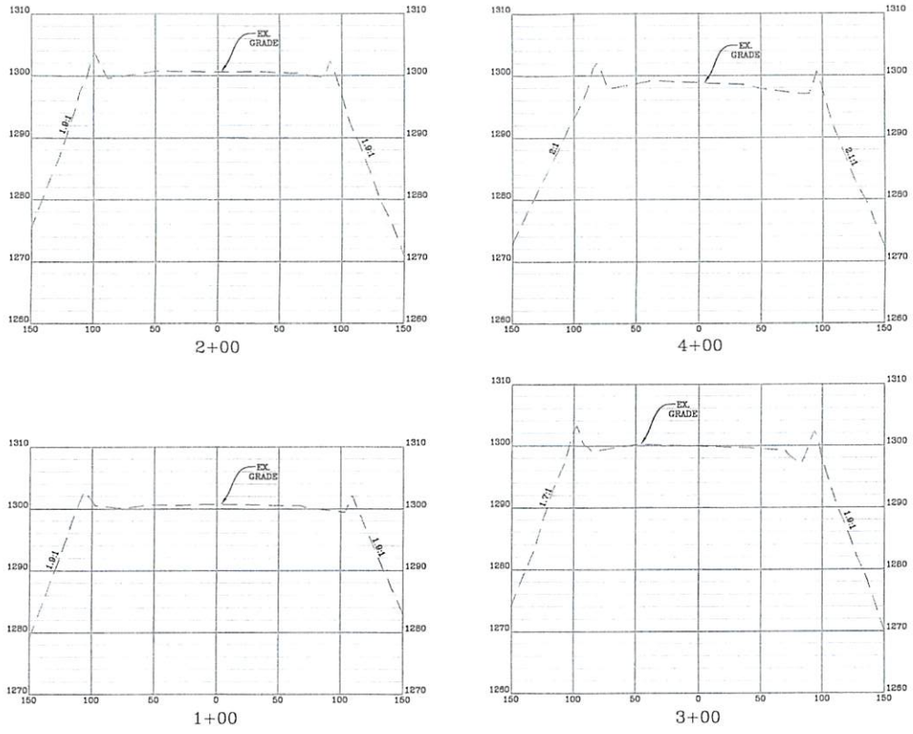
ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS S. KING
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
01/27/2017

DATE: 09/27/2017
SCALE: AS SHOWN
SHEET 8 OF 11

103-0223W

WELL PAD AS-BUILT SECTIONS



WELL PAD AS-BUILT CROSS-SECTIONS ALONG BASELINE "A-A"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

NAVITUS ENERGY ENGINEERING

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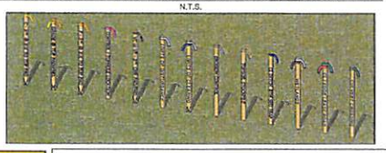
SHEET 9 OF 11

STANDARD STAKEOUT RIBBON COLOR SCHEME

N.T.S.

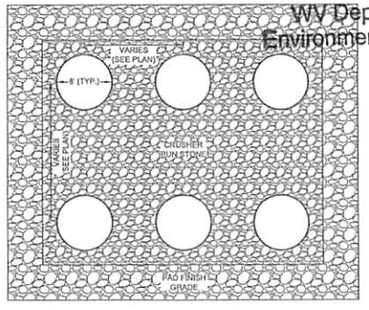


	YELLOW RIBBON: YELLOW RIBBON USED TO INDICATE TOP OF CUTS (C)
	YELLOW & ORANGE RIBBON: YELLOW AND ORANGE RIBBON USED TO INDICATE GRADE AT TOP OF PAD/POND/PIT
	ORANGE RIBBON: ORANGE RIBBON USED TO INDICATE TOES OF FILLS (F)
	PINK RIBBON: PINK RIBBON USED TO INDICATE TOP HOLE LOCATION
	PINK & BLACK STRIPE RIBBON: PINK & BLACK STRIPE RIBBON USED TO INDICATE VERTICAL CUT (VC) AT PAD/POND/PIT CORNER OR EDGE PINK & BLACK STRIPE RIBBON USED TO INDICATE VERTICAL FILL (VF) AT PAD/POND/PIT CORNER OR EDGE
	WHITE RIBBON: WHITE RIBBON USED TO INDICATE LIMITS OF DISTURBANCE
	WHITE & BLUE RIBBON: WHITE & BLUE RIBBON USED TO INDICATE LIMITS OF CLEARING
	PINK & WHITE STRIPE RIBBON: PINK & WHITE STRIPE RIBBON USED TO INDICATE EROSION AND SEDIMENT CONTROL STRUCTURES
	ORANGE & WHITE STRIPE RIBBON: ORANGE & WHITE STRIPE RIBBON USED TO INDICATE TOPSOIL STOCKPILE LOCATIONS
	BLUE RIBBON: BLUE RIBBON USED TO INDICATE CENTERLINE (CL) DITCH BLUE RIBBON USED TO INDICATE BOTTOM (BTM) SEDIMENT TRAPS
	PINK & WHITE RIBBON: PINK & WHITE RIBBON USED TO INDICATE WETLANDS
	LIME GREEN & ORANGE RIBBON: LIME GREEN & ORANGE RIBBON USED TO INDICATE CENTERLINE (CL) OR EDGE OF LEASE ROAD
	GREEN RIBBON: GREEN RIBBON USED TO INDICATE CULVERT CROSSINGS

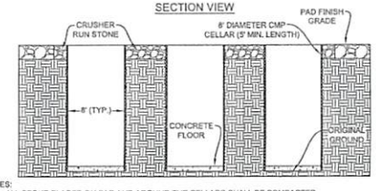
CELLAR DETAIL

N.T.S.

PLAN VIEW



SECTION VIEW



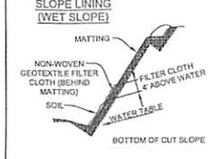
NOTES:
1. ALL STONE PLACED ON PAD AND AROUND THE CELLARS SHALL BE COMPACTED.
2. CELLARS SHALL BE INSTALLED AND SURFACE GRADED TO PREVENT WATER COLLECTION IN CELLARS.

TYPICAL R.E.C.P. (ROLLED EROSION CONTROL PRODUCT) SLOPE INSTALLATION

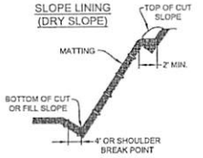
N.T.S.

FILL SLOPE SECTION

SLOPE LINING (WET SLOPE)



SLOPE LINING (DRY SLOPE)

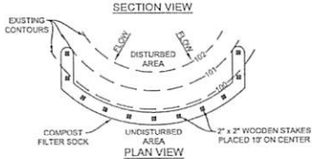


MODIFIED SOURCE: VDOT STANDARDS AND VIRGINIA DCR-DSWC.

COMPOST FILTER SOCK

N.T.S.

SECTION VIEW



PLAN VIEW

ADAPTED FROM FILTREXX
SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1. COMPOST SHALL MEET THE FOLLOWING STANDARDS.

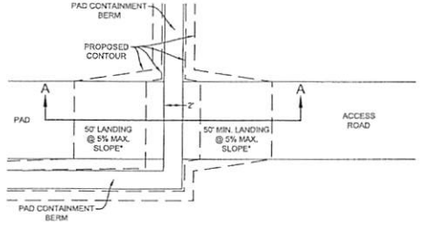
ORGANIC MATTER CONTENT	80%-100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5-8.0
MOISTURE CONTENT	35%-55%
PARTICLE SIZE	98% PASS THROUGH 1" SCREEN
SOLUBLE SALT CONCENTRATION	5.0 dS MAXIMUM

NOTES:
1. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE, BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8' UP THE SLOPE OR TO A HEIGHT EQUAL TO THE EFFECTIVE SOCK HEIGHT, WHICHEVER IS GREATER, AT 45° TO THE MAIN SOCK ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED MANUFACTURER'S MAXIMUM PERMISSIBLE SLOPE LENGTH.
2. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
4. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
5. BIODEGRADABLE FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
7. IN THE EVENT THE GROUND IS FROZEN, #5 REBAR WITH SAFETY CAPS SHALL BE USED INSTEAD OF WOODEN STAKES TO ANCHOR THE FILTER SOCK. ONCE THE GROUND THAWS, THE REBAR ANCHORS SHALL BE REMOVED AND REPLACED WITH 2" x 2" WOODEN STAKES AND INSTALLED AS SHOWN IN THE DETAIL ABOVE.

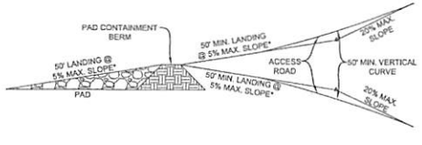
MOUNTABLE BERM

N.T.S.

PLAN VIEW



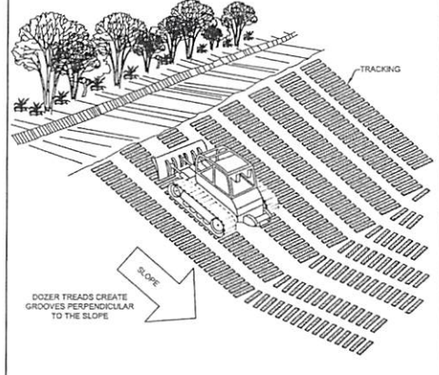
CROSS-SECTION A-A



NOTES:
1. MOUNTABLE BERMS THAT DO NOT SERVE AS THE MAIN PAD ACCESS MAY BE STEEPER THAN 5% IF NOTED IN THE PLANS.

SLOPE TRACKING

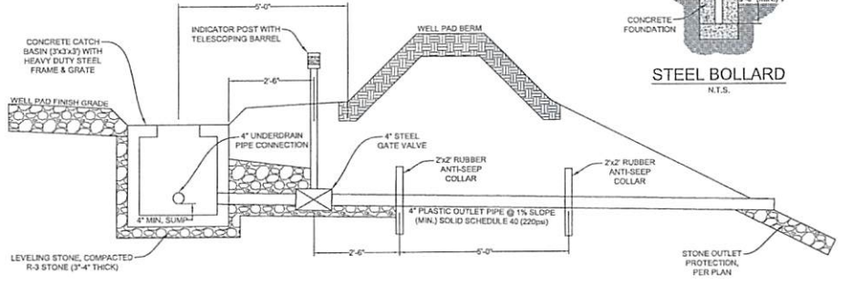
N.T.S.

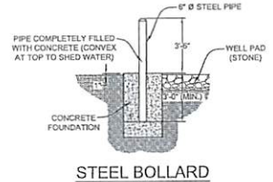


NOTES:
1. TRACKING SLOPES ARE DONE BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PARALLEL TO THE CONTOUR. IF A BULLDOZER IS USED, THE BLADE SHOULD BE UP.

WELL PAD UNDERDRAIN CATCH BASIN & OUTLET

N.T.S.





STEEL BOLLARD

N.T.S.

NOTES:
1. UNDERDRAIN INFLOW INVERT ELEVATIONS SHALL BE ABOVE THE TOP OF THE DISCHARGE TO PREVENT BACKFLOW INTO THE UNDERDRAIN.
2. TOP OF CONCRETE CATCH BASIN SHALL BE SET BELOW THE FINISH STONE GRADE OF THE WELL PAD TO ENSURE SURFACE WATER CAN FLOW INTO THE BASIN.
3. STEEL GATE VALVE, INDICATOR POST WITH TELESCOPING BARREL, AND ANTI-SEEP COLLARS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. LOCATION AND HEIGHT OF INDICATOR POST SHALL BE FIELD VERIFIED FOR ACCESSIBILITY BY OWNER PRIOR TO INSTALLATION.
5. THERE SHALL BE NO DISCHARGE THROUGH WELL PAD OUTLETS FROM DRILL PAD DURING DRILLING OR COMPLETIONS ACTIVITIES.
6. ALL GATE VALVES SHALL BE CLOSED DURING WELL PAD DRILLING OR COMPLETIONS ACTIVITIES.
7. CATCH BASIN SHALL BE PROTECTED BY STEEL BOLLARDS AS SHOWN ON THE PLAN AND INSTALLED PER THE STEEL BOLLARD DETAIL.

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CHRIS D. KUHN
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STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER
04/27/2017

DATE: 09/27/2017
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SHEET 10 OF 11

REVEGETATION

TAKEN FROM THE
WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL
WEST VIRGINIA DIVISION OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS
CHARLESTON, W.VA.
SECTION IV

TEMPORARY SEEDING:

a. GENERAL CONDITIONS WHERE PRACTICE APPLIES
WHERE EXPOSED SOIL SURFACES ARE NOT TO BE FINE-GRADED OR WORKED FOR PERIODS LONGER THAN 21 DAYS. TEMPORARY VEGETATIVE COVER WITH SEDIMENT CONTROLS MUST BE ESTABLISHED WHERE RUNOFF WILL GO DIRECTLY INTO A STREAM. IMMEDIATELY UPON CONSTRUCTION OF THE SITE (SITE INCLUDES ROAD AND LOCATION), VEGETATION MUST BE ESTABLISHED ON ROAD BANKS AND LOCATION SLOPES. PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO AREAS THAT WILL BE LEFT UN-WORKED FOR A PERIOD OF MORE THAN SIX MONTHS.

b. SEED MIXTURES AND PLANTING DATES
REFER TO TABLES IV-2 THROUGH IV-4 FOR RECOMMENDED DATES TO ESTABLISH VEGETATIVE COVER AND THE APPROVED LISTS OF TEMPORARY AND PERMANENT PLANT SPECIES AND PLANTING RATES. TABLE IV-3 GIVES RECOMMENDED TYPES OF TEMPORARY VEGETATION, RATES OF APPLICATION, AND OPTIMUM SEEDING DATES. IN SITUATIONS WHERE ANOTHER COVER IS DESIRED, CONTACT THE LOCAL SOIL CONSERVATION DISTRICT FOR SEEDING RECOMMENDATIONS.

c. SEED APPLICATION
APPLY SEED BY BROADCASTING, DRILLING, OR BY HYDROSEED ACCORDING TO THE RATES INDICATED IN TABLE IV-3. PERFORM ALL PLANTING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. NECESSARY SITE PREPARATION AND ROUGHENING OF THE SOIL SURFACE SHOULD BE DONE JUST PRIOR TO SEEDING. SEEDBED PREPARATION MAY NOT BE REQUIRED ON NEWLY DISTURBED AREAS.

PERMANENT SEEDING:

a. GENERAL
PERMANENT VEGETATIVE COVER WILL BE ESTABLISHED WHERE NO FURTHER SOIL DISTURBANCE IS ANTICIPATED OR NEEDED. SOIL FERTILITY AND PH LEVEL SHOULD BE TESTED AND ADJUSTED ACCORDING TO SEED SPECIES PLANTED. PLANTING OF PERMANENT VEGETATIVE COVERS MUST BE PERFORMED ON ALL DISTURBED AREAS AFTER COMPLETION OF THE DRILLING PROCESS. ANY SITE THAT CONTAINS SIGNIFICANT AMOUNTS OF TOPSOIL SHALL HAVE THE TOPSOIL REMOVED AND STOCKPILED WHEN FEASIBLE. TOPSOIL SHOULD NOT BE ADDED TO SLOPES STEEPER THAN 2:1 UNLESS A GOOD BONDING TO THE SUB-LAYER CAN BE ACHIEVED. AFTER PROPER GRADING AND SEEDBED PREPARATION, THE VEGETATION WILL REESTABLISH GROUND COVER FOR THE CONTROL OF SURFACE WATER RUNOFF EROSION.
ALL REQUIRED SEEDBED PREPARATION AND LOOSENING OF SOIL BY DISKING OR DOZER TRACKING SHOULD BE PERFORMED JUST PRIOR TO SEEDING. IF SEEDBED PREPARATION IS NOT FEASIBLE, 50% MORE SEED SHALL BE ADDED TO THE RECOMMENDED RATES SHOWN IN TABLES IV-3 AND IV-4.
WHEN HYDROSEEDING, SEEDBED PREPARATION MAY NOT BE NECESSARY IF ADEQUATE SITE PREPARATION WAS PERFORMED. INCORPORATE THE APPROPRIATE AMOUNT OF LIME AND/OR FERTILIZER IN THE SLURRY MIX WHEN HYDROSEEDING.
WHEN HYDROSEEDING, FIRST MIX THE LIME, FERTILIZER, AND HYDRO-MULCH IN THE RECOMMENDED AMOUNT OF WATER. MIX THE SEED AND INOCULANTS TOGETHER WITHIN ONE HOUR PRIOR TO PLANTING, AND ADD TO THE SLURRY JUST BEFORE SEEDING. APPLY THE SLURRY UNIFORMLY OVER THE PREPARED SITE. ASSURE THAT AGITATION IS CONTINUOUS THROUGHOUT THE SEEDING OPERATION AND THE MIX IS APPLIED WITHIN ONE HOUR OF INITIAL MIXING.

b. LIME AND FERTILIZER
1. LIME SHALL BE APPLIED TO ALL PERMANENT SEEDINGS. THE PH OF THE SOIL IS TO BE DETERMINED AND LIME APPLIED ACCORDINGLY. ONCE THE PH IS KNOWN, SELECT THE AMOUNT OF LIME TO BE APPLIED FROM TABLE IV-5.
2. FERTILIZER SHALL BE APPLIED IN ALL PERMANENT SEEDINGS. APPLY THE EQUIVALENT FOR 500 LBS. MINIMUM 10-20-20 FERTILIZER PER ACRE OR USE THE AMOUNT OF FERTILIZER AND LIME RECOMMENDED BY A CERTIFIED SOIL TEST.
3. APPLICATION: FOR BEST RESULTS AND MAXIMUM BENEFITS, THE LIME AND FERTILIZER ARE TO BE APPLIED AT THE TIME OF SEEDBED PREPARATION.

c. PERMANENT SEED MIXTURES
PLANNERS SHOULD TAKE INTO CONSIDERATION THE SPECIES MAKEUP OF THE EXISTING PASTURE AND THE LANDOWNER'S FUTURE PASTURE MANAGEMENT PLANS WHEN RECOMMENDING SEED MIXTURES. SELECTION: FROM TABLES IV-4A AND IV-4B, PERMANENT SEEDING MIXTURES SUITABLE FOR ESTABLISHMENT IN WEST VIRGINIA.
NOTES:
1. ALL LEGUMES MUST BE PLANTED WITH THE PROPER INOCULANTS PRIOR TO SEEDING.
2. 'LATHCO' FLATPEA IS POTENTIALLY POISONOUS TO SOME LIVESTOCK.
3. ONLY ENDOPHYTE FREE VARIETIES OF TALL FESCUE SHOULD BE USED. TALL FESCUE AND CROWNVETCH ARE ALSO VERY INVASIVE SPECIES, NON-NATIVE TO WV.
4. FOR UNPREPARED SEEDBEDS OR SEEDING OUTSIDE THE OPTIMUM TIMEFRAMES, ADD 50% MORE SEED TO THE SPECIFIED RATE. MIXTURES IN TABLE IV-4B ARE MORE WILDLIFE AND FARM FRIENDLY; THOSE LISTED IN BOLD ARE SUITABLE FOR USE IN SHADED WOODLAND SETTINGS. MIXTURES IN ITALIC ARE SUITABLE FOR USE IN FILTER STRIPS.

d. SEEDING FOR WILDLIFE HABITAT
CONSIDER THE USE OF THE NATIVE PLANTS OR LOCALLY ADAPTED PLANTS WHEN SELECTING COVER TYPES AND SPECIES FOR WILDLIFE HABITAT. WILDLIFE FRIENDLY SPECIES OR MIXES THAT HAVE MULTIPLE VALUES SHOULD BE CONSIDERED. SEE WILDLIFE FRIENDLY SPECIES/MIXTURES IN TABLE IV-4B. CONSIDER SELECTING NO OR LOW MAINTENANCE LONG-LIVED PLANTS ADAPTABLE TO SITES WHICH MAY BE DIFFICULT TO MAINTAIN WITH EQUIPMENT.

MULCHING

a. GENERAL ORGANIC MULCHES
THE APPLICATION OF STRAW, HAY, OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE TO PREVENT EROSION. STRAW MADE FROM WHEAT OR OATS IS THE PREFERRED MULCH. THE USE OF HAY IS PERMISSIBLE, BUT NOT ENCOURAGED DUE TO THE RISK OF SPREADING INVASIVE SPECIES. MULCH MUST BE APPLIED TO ALL TEMPORARY AND PERMANENT SEEDING ON ALL DISTURBED AREAS. DEPENDING ON SITE CONDITIONS, IN CRITICAL AREAS SUCH AS WATERWAYS OR STEEP SLOPES, ADDITIONAL OR SUBSTITUTE SOIL PROTECTIVE MEASURES MAY BE USED IF DEEMED NECESSARY. EXAMPLES INCLUDE JUTE MESH AND SOIL STABILIZATION BLANKETS OR EROSION CONTROL MATTING.
AREAS THAT HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING. MULCHES CONSERVE DESIRABLE SOIL PROPERTIES, REDUCE SOIL MOISTURE LOSS, PREVENT CRUSTING AND SEALING OF THE SOIL SURFACE, AND PROVIDE A SUITABLE MICROCLIMATE FOR SEED GERMINATION.
AREAS THAT CANNOT BE SEEDED BECAUSE OF THE SEASON SHOULD BE MULCHED TO PROVIDE SOME PROTECTION TO THE SOIL SURFACE. AN ORGANIC MULCH, STRAW, OR HAY SHOULD BE USED AND THE AREA THEN SEEDED AS SOON AS WEATHER OR SEASONAL CONDITIONS PERMIT. DO NOT USE FIBER MULCH (CELLULOSE-HYDROSEED) ALONE FOR THIS PRACTICE; AT NORMAL APPLICATION RATES IT WILL NOT GIVE THE SOIL PROTECTION OF OTHER TYPES OF MULCH.
WOOD CELLULOSE FIBER MULCH IS USED IN HYDROSEEDING OPERATIONS AND APPLIED AS PART OF THE SLURRY. IT CREATES THE BEST SEED-SOIL CONTACT WHEN APPLIED OVER THE TOP OF (AS A SEPARATE OPERATION) NEWLY SEEDED AREAS. FIBER MULCH DOES NOT ALONE PROVIDE SUFFICIENT PROTECTION ON HIGHLY ERODIBLE SOILS, OR DURING LESS THAN FAVORABLE GROWING CONDITIONS. FIBER MULCH SHOULD NOT BE USED ALONE DURING THE DRY SUMMER MONTHS OR WHEN USED FOR LATE FALL MULCH COVER. USE STRAW MULCH DURING THESE PERIODS AND FIBER MULCH MAY BE USED TO TACK (ANCHOR) THE STRAW MULCH. FIBER MULCH IS WELL SUITED FOR STEEP SLOPES, CRITICAL AREAS, AND AREAS SUSCEPTIBLE TO WIND.

b. CHEMICAL MULCHES, SOIL BINDERS, AND TACKIFIERS
A WIDE RANGE OF SYNTHETIC SPRAY ON MATERIALS ARE MARKETED TO STABILIZE AND PROTECT THE SOIL SURFACE. THESE ARE MIXED WITH WATER AND SPRAYED OVER THE MULCH AND TO THE SOIL. THEY MAY BE USED ALONE IN SOME CASES AS TEMPORARY STABILIZERS, OR IN CONJUNCTION WITH FIBER MULCH, STRAW, OR HAY.
WHEN USED ALONE, MOST CHEMICAL MULCHES DO NOT HAVE THE CAPABILITY TO INSULATE THE SOIL OR RETAIN SOIL MOISTURE THAT ORGANIC MULCHES HAVE.

c. SPECIFICATIONS
FROM TABLE IV-6 SELECT THE TYPE OF MULCH AND RATE OF APPLICATION THAT WILL BEST SUIT THE CONDITIONS AT THE SITE.

d. ANCHORING
DEPENDING ON THE FIELD SITUATION, MULCH MAY NOT STAY IN PLACE BECAUSE OF WIND ACTION OR RAPID WATER RUNOFF. IN SUCH CASES, MULCH IS TO BE ANCHORED MECHANICALLY OR WITH MULCH NETTING.
1. MECHANICAL ANCHORING
APPLY MULCH AND PULL MULCH ANCHORING TOOL OVER THE MULCH. WHEN A DISK IS USED, SET THE DISK STRAIGHT AND PULL ACROSS SLOPE. MULCH MATERIAL SHOULD BE TUCKED INTO THE SOIL ABOUT 3".
2. MULCH NETTING
FOLLOW MANUFACTURER'S RECOMMENDATION WHEN POSITIONING AND STAPLING THE MULCH NETTING IN THE SOIL.

swn WVD Seeding Specification

NON-ORGANIC PROPERTIES

Seed Mixture: ROW Mix	SWN Supplied
Orchardgrass	40%
Timothy	15%
Annual Ryegrass	15%
Brown Top Millet	5%
Red Top	5%
Medium Red Clover	5%
White Clover	5%
Birdsfoot Trefoil	5%
Rough Bluegrass	5%

All legumes are inoculated at 5x normal rate

Apply @ 100lbs per acre April 16th- Oct. 14th

Apply @ 200lbs per acre Oct. 15th- April 15th PLUS 50lbs per acre of Winter Wheat

SOIL AMENDMENTS

10-20-20 Fertilizer	*Apply @ 500lbs per Acre
Pelletized Lime	Apply @ 2 Tons per Acre

*unless otherwise directed by soil test results

Seeding Calculation Information

1452' of 30' ROW/LOD is One Acre
871' of 50' ROW/LOD is One Acre
622' of 70' ROW/LOD is One Acre

Example

Every 622 linear feet in a 70' ROW/LOD, you should be using (2) 50lb bags of seed, (4) 50lb bags of fertilizer and (80) 50lb bags of Lime (2x seed in winter months + 50lb Winter Wheat/ac).

Special Considerations:

Landowner Special Considerations including CREP program participants require additional guidance that is not given here. Discuss these requirements with SWN supervision at the beginning of the project to allow time for special seed delivery.

ORGANIC PROPERTIES

Seed Mixture: SWN Production Organic Mix	SWN Supplied
Organic Timothy	50%
Organic Red or White Clover	50%
OR	
Organic Perennial Ryegrass	50%
Organic Red or White Clover	50%

Apply @ 100lbs per acre April 16th- Oct. 14th

Apply @ 200lbs per acre Oct. 15th- April 15th

Organic fertilizer @ 200lbs per Acre

Pelletized Lime @ 2 Tons per Acre

WETLANDS (delineated as jurisdictional wetlands)

Seed Mixture: Wetland Mix	SWN Supplied
VA Wild Ryegrass	20%
Annual Ryegrass	20%
Fowl Bluegrass	20%
Cosmos 'Sensation'	10%
Redtop	5%
Golden Tickseed	5%
Maryland Senna	5%
Showy Tickseed	5%
Fox Sedge	2.5%
Soft Rush	2.5%
Woolgrass	2.5%
Swamp Verbena	2.5%

Apply @ 25lbs per acre April 16th- Oct. 14th

Apply @ 50lbs per acre Oct. 15th- April 15th

NO FERTILIZER OR LIME INSIDE WETLAND LIMITS

Table IV-2
Acceptable Fertilization Recommendation

Species	N (lbs/ac)	P2O5 (lbs/ac)	Example Rec. (per acre)
Cool Season Grass	40	80	400 lbs. 10-20-20
CS Grass & Legume	30	60	300 lbs. 10-20-20
Temporary Cover	40	40	200 lbs. 19-19-19

Table IV-3
Temporary Cover

Species	Seeding Rate (lbs/acre)	Optimum Seeding Dates	Drainage	pH Range
Annual Ryegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Poorly	5.5 - 7.5
Field Bromegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Mod. Well	6.0 - 7.0
Spring Oats	96	3/1 - 6/15	Well - Poorly	5.5 - 7.0
Sundangrass	40	5/15 - 8/15	Well - Poorly	5.5 - 7.5
Winter Rye	168	8/15 - 10/15	Well - Poorly	5.5 - 7.5
Winter Wheat	180	8/15 - 11/15	Well - Mod. Well	5.5 - 7.0
Japanese Millet	30	6/15 - 8/15	Well	4.5 - 7.0
Redtop	5	3/1 - 6/15	Well	4.0 - 7.5
Annual Ryegrass	26	3/1 - 6/15	Well - Poorly	5.5 - 7.5
Spring Oats	64	3/1 - 6/15	Well - Poorly	5.5 - 7.5

NOTE: *These rates should be increased by 50% if planted April 15 - August 1 and October 1 - March 1.*

Table IV-4A
Permanent Seeding Mixture

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage preference	pH Range
Crownvetch / Tall Fescue	10 - 15 / 30	Well - Mod. Well	5.0 - 7.5
Crownvetch / Perennial Ryegrass	**10 - 15 / 20**	**Well - Mod. Well**	**5.0 - 7.5**
Flatpea or Perennial Pea / Tall Fescue	**20 / 15**	**Well - Mod. Well**	**4.0 - 8.0**
Ladino Clover / Serecia Lespedeza / Tall Fescue	**30 / 25 / 2**	**Well - Mod. Well**	**4.5 - 7.5**
Tall Fescue / Ladino Clover / Redtop	*40 / 3 / 3*	*Well - Mod. Well*	*5.0 - 7.5*
Crownvetch / Tall Fescue / Redtop	**10 / 20 / 3**	**Well - Mod. Well**	**5.0 - 7.5**
Tall Fescue / Birdsfoot Trefoil / Redtop	40 / 10 / 3	Well - Mod. Well	5.0 - 7.5
Serecia Lespedeza / Tall Fescue / Redtop	**25 / 30 / 3**	**Well - Mod. Well**	**4.5 - 7.5**
Redtop / Tall Fescue / Creeping Red	30 / 3 / 50	Well - Mod. Well	5.0 - 7.5
Tall Fescue	*50*	*Well - Poorly*	*4.5 - 7.5*
Perennial Ryegrass / Tall Fescue / Lathco Flatpea *	**10 / 15 / 20**	**Well - Poorly**	**5.8 - 8.0**

** 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.*
Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

Table IV-4B
Wildlife and Farm Friendly Seed Mixtures

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage preference	pH Range
KY Bluegrass / Redtop / Ladino Clover or Birdsfoot Trefoil	20 / 3 / 2 / 10	Well - Mod. Well	5.5 - 7.5
Timothy / Alfalfa	**5 / 12**	**Well - Mod. Well**	**6.5 - 8.0**
Timothy / Birdsfoot Trefoil	5 / 8	Well - Poorly	5.5 - 7.5
Orchardgrass / Ladino Clover / Redtop	***10 / 2 / 3***	***Well - Mod. Well***	***5.5 - 7.5***
Orchardgrass / Ladino Clover	*10 / 2*	*Well - Mod. Well*	*5.5 - 7.5*
Orchardgrass / Perennial Ryegrass	***20 / 10***	***Well - Mod. Well***	***5.5 - 7.5***
Creeping Red Fescue / Perennial Ryegrass	**30 / 10**	*Well - Mod. Well*	5.5 - 7.5
Orchardgrass or KY Bluegrass	**20**	**Well - Mod. Well**	**6.0 - 7.5**
Birdsfoot Trefoil / Redtop / Orchardgrass	10 / 5 / 20	Well - Mod. Well	5.5 - 7.5
Lathco Flatpea */ Perennial Ryegrass	**30 / 20**	**Well - Mod. Well**	**5.5 - 7.5**
Lathco Flatpea */ Orchardgrass	30 / 20	Well - Mod. Well	5.5 - 7.5

** 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.*
Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

Table IV-5
Lime and Fertilizer Application Table

pH of Soil	Lime in Tons per Acre	Fertilizer, lbs. per Acre (10-20-20 or Equivalent)
Above 6.0	2	500
5.0 to 6.0	3	500
Below 5.0	4	500

The pH can be determined with a portable pH testing kit or by sending the soil samples to a soil testing laboratory. When 4 tons of lime per acre are applied it must be incorporated into the soil by disking, backblading or tracking up and down the slope.

Table IV-6
Mulch Materials Rates and Uses

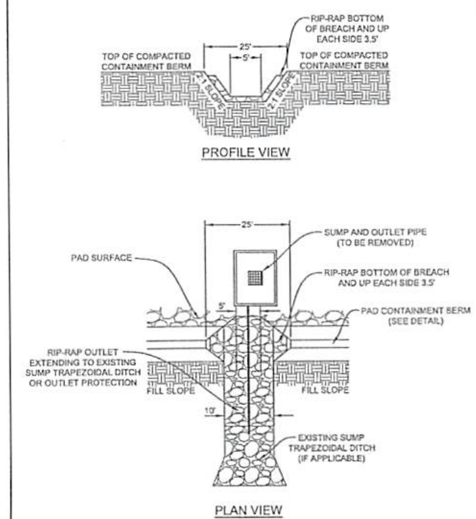
Material	Minimum Rates per acre	Coverage	Remarks
Hay or Straw	2 to 3 Tons 100 to 150 bales	Cover 75% to 90% of Surface	Subject to wind blowing or washing unless tied down
Wood Fiber Pulp Fiber Wood - Cellulose Recirculated Paper	1000 to 1500 lbs	Cover all Disturbed Areas	For hydroseeding

Table IV-1
Recommended Seeding Dates

Planting Dates	Suitability
March 1 - April 15 and August 1 - October 1	Best Seeding Periods
April 15 - August 1	HIGH RISK - moisture stress likely
October 1 - December 1	HIGH RISK - freeze damage to young seedlings
December 1 - March 1	Good seeding period. Dormant seeding

PAD BERM BREACH

N.T.S.



NOTES:
1. IF APPLICABLE EXISTING CONTAINMENT BERM LINER TO BE TRIMMED AT BREACH AND REMOVED.

SITE RECLAMATION NARRATIVE:

POST CONSTRUCTION – THE CONSTRUCTION SITE SHALL BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. THE ESTABLISHMENT OF FINAL COVER MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. THE ACCESS ROADS AND WELL PAD ARE TO BE MAINTAINED THROUGHOUT THE LIFE OF THE FACILITY. ALL CULVERTS, ROADSIDE DITCHES, BROAD-BASED DIPS, DIVERSION DITCHES, ETC. MUST BE MAINTAINED IN PROPER WORKING ORDER. ANY SOIL THAT IS DISTURBED ALONG THE ACCESS ROAD OR WELL PAD MUST BE REVEGETATED ACCORDING TO THESE PLANS AND THE WVDEP OFFICE OF OIL AND GAS FIELD MANUAL. IF NECESSARY, ALL TEMPORARY BMP MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP. ANY AREAS DISTURBED BY REMOVAL OF THE BMP'S SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.

POST USE – WITHIN 6 MONTHS OF THE COMPLETION OF THE FINAL HORIZONTAL WELL ON THE PAD OR THE EXPIRATION OF THE FIVE-YEAR MAXIMUM AGGREGATE PARTIAL RECLAMATION PERIOD, WHICHEVER OCCURS FIRST, THE OPERATOR SHALL COMPLETE FINAL RECLAMATION OF THE WELL PAD AS SET FORTH IN THESE PLANS. ALL EXISTING BMP'S SHOWN SHALL BE INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY BEFORE RECLAMATION CAN BEGIN. DRILL CUTTINGS, DRILLING MUD, AND LINERS FOR WELLS PERMITTED UNDER WV CODE §35-4-21, §22-6A, AND CRS 35-8, MUST BE REMOVED FROM SITE AND DISPOSED OF AT AN APPROVED SOLID WASTE FACILITY OR, IF THE SURFACE OWNER CONSENTS, THE DRILL CUTTINGS AND ASSOCIATED DRILLING MUD MAY BE MANAGED ON SITE IN A MANNER APPROVED BY THE SECRETARY. THE SITE SHALL BE REGRADED AS INDICATED ON THE PLANS. STOCKPILED TOPSOIL SHOULD BE RE-SPREAD OVER DISTURBED AREA. TOPSOIL SHOULD NOT BE ADDED TO SLOPES STEEPER THAN 2:1 UNLESS GOOD BONDING TO THE SUB-SOIL CAN BE ACHIEVED. UPON COMPLETION OF THE GRADING, THE SITE SHALL BE SEEDED AND MULCHED PER THE REVEGETATION DETAILS. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS GRAVEL AND PAVEMENT ACCESS ROADS OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.

NOTES:

1. DURING SITE RECLAMATION ALL FILL AREAS SHALL BE COMPACTED IN 12" MAXIMUM LIFT THICKNESS WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTOR DENSITY, ASTM D-698. MOISTURE CONTENT WILL BE CONTROLLED IN ACCORDANCE WITH THE STANDARD PROCTOR TEST (ASTM-D698) RESULTS.

NAVITUS
ENERGY ENGINEERING
Telephone: (888) 662-4185 | www.NavitusEng.com

DATE	REVISION

swn Southwestern Energy®
THIS DOCUMENT WAS PREPARED FOR: SOUTHWESTERN ENERGY

CONSTRUCTION DETAILS
ALBERT & MARY HOHMAN WTZ
WELL PAD
PROCTOR DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CIRUS B. KUMP
REGISTERED 19578
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER
09/27/2017

DATE: 09/27/2017
SCALE: AS SHOWN
SHEET 11 OF 11

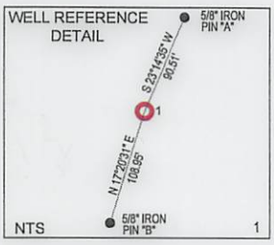
LATITUDE: 39°42'30" BOTTOM & SURFACE HOLE

11448'

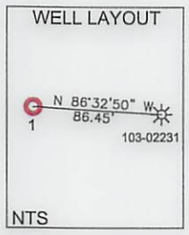
LONGITUDE: -80°40'00" BOTTOM & SURFACE HOLE — 4200'

JHA Companies
SURVEYORS
ENGINEERS
ENVIRONMENTAL
GIS MAPPING
www.jhacompanies.com
68011 Vineyard Road
St. Clairsville, Ohio 43950
740-695-6100

WELL REFERENCE DETAIL



WELL LAYOUT

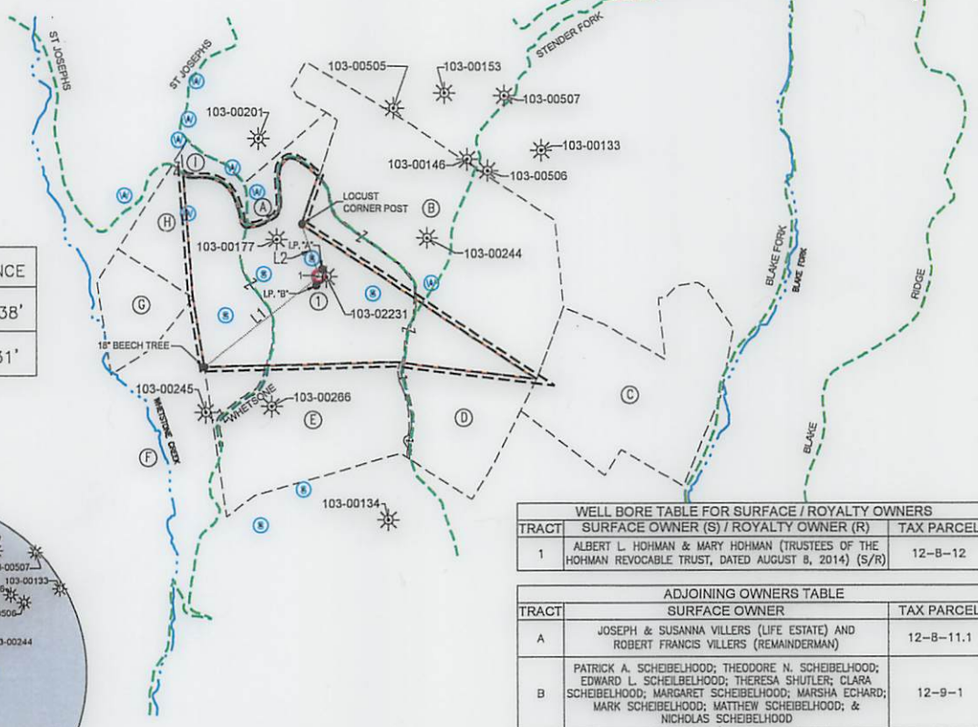


NOTES ON SURVEY

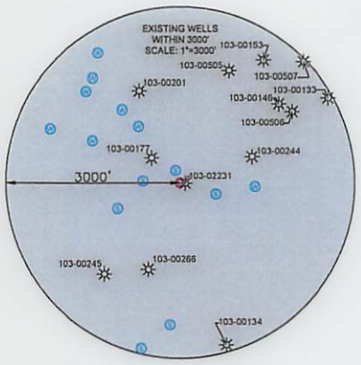
1. COORDINATE SYSTEM IS UTM NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
2. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
3. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. NO DWELLINGS OR BUILDINGS WITHIN 625 FEET OF PROPOSED CENTER OF PAD
5. NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
6. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF THE LIMITS OF DISTURBANCE.
7. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.

GRID NORTH
UTM, NAD83 DATUM, ZONE 17, US FT

SHL
BHL



LINE	BEARING	DISTANCE
L1	N 51°49'23" E	1675.38'
L2	S 18°24'24" E	628.31'



WELL BORE TABLE FOR SURFACE / ROYALTY OWNERS

TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	ALBERT L. HOHMAN & MARY HOHMAN (TRUSTEES OF THE HOHMAN REVOCABLE TRUST, DATED AUGUST 8, 2014) (S/R)	12-8-12

ADJOINING OWNERS TABLE

TRACT	SURFACE OWNER	TAX PARCEL
A	JOSEPH & SUSANNA VILLERS (LIFE ESTATE) AND ROBERT FRANCIS VILLERS (REMAINDERMAN)	12-8-11.1
B	PATRICK A. SCHEIBELHOOD; THEODORE N. SCHEIBELHOOD; EDWARD L. SCHEIBELHOOD; THERESA SHUTLER; CLARA SCHEIBELHOOD; MARGARET SCHEIBELHOOD; MARSHA ECHARD; MARK SCHEIBELHOOD; MATTHEW SCHEIBELHOOD; & NICHOLAS SCHEIBELHOOD	12-9-1
C	MARGARET SUE KELLEY	12-9-17
D	PATRICK A. SCHEIBELHOOD; THEODORE N. SCHEIBELHOOD; EDWARD L. SCHEIBELHOOD; THERESA SHUTLER; CLARA SCHEIBELHOOD; MARGARET SCHEIBELHOOD; MARSHA ECHARD; MARK SCHEIBELHOOD; MATTHEW SCHEIBELHOOD; & NICHOLAS SCHEIBELHOOD	12-9-16
E	LOIS J. ESTEP	12-8-25
F	ALBERT L. HOHMAN & MARY L. HOHMAN, TRUSTEES OF THE HOHMAN REVOCABLE LIVING TRUST DATED AUGUST 8, 2014; JOSEPH A. HOHMAN & DEBRA K. HOHMAN, HIS WIFE	12-8-24
G	ALBERT L. HOHMAN & MARY L. HOHMAN, TRUSTEES OF THE HOHMAN REVOCABLE LIVING TRUST DATED AUGUST 8, 2014; JOSEPH A. HOHMAN & DEBRA K. HOHMAN, HIS WIFE	12-8-24.3
H	ALBERT L. HOHMAN & MARY L. HOHMAN, TRUSTEES OF THE HOHMAN REVOCABLE LIVING TRUST DATED AUGUST 8, 2014; JOSEPH A. HOHMAN & DEBRA K. HOHMAN, HIS WIFE	12-8-10
I	STEVEN RAYMOND HOHMAN & CATHERINE A. HOHMAN, HUSBAND AND WIFE	12-8-11.3

HOWARD D. KEMP
LICENSED
No. 2041
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

2000 0 2000
GRAPHIC SCALE IN FEET

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4394148.25 EASTING: 525092.90
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4394148.25 EASTING: 525092.90

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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2041 3-19-18

COMPANY: SWN Production Company, LLC — SWN Production Company™

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

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)

ALBERT-MARY HOHMAN

OPERATOR'S WELL #: 1

API WELL #: 47 (STATE) 103 (COUNTY) 02231W (PERMIT)

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

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1,298.4'–CONFIRMED GROUND ELEVATION

DISTRICT: PROCTOR COUNTY: WETZEL QUADRANGLE: WILEYVILLE, WV

SURFACE OWNER: ALBERT L. HOHMAN & MARY HOHMAN (TRUSTEES OF THE HOHMAN REVOCABLE TRUST) ACREAGE: ±104.48

OIL & GAS ROYALTY OWNER: ALBERT L. HOHMAN & MARY HOHMAN (TRUSTEES OF THE HOHMAN REVOCABLE TRUST) ACREAGE: ±104.48

DRILL ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒ PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐

CONVERT ☐ PLUG & ABANDON ☐ CLEAN OUT & REPLUG ☐ OTHER CHANGE ☒ (SPECIFY) REWORK

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 9,910' TVD

04/27/2018

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: P.O. BOX 1300
CITY: JANE LEW STATE: WV ZIP CODE: 26378

DESIGNATED AGENT: DEE SOUTHALL
ADDRESS: P.O. BOX 1300
CITY: JANE LEW STATE: WV ZIP CODE: 26378

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- W EXISTING WATER WELL
- S EXISTING SPRING
- SURVEYED BOUNDARY
- DRILLING UNIT
- LEASE BOUNDARY
- PROPOSED PATH

REVISIONS:	DATE: 03-19-2018
	DRAWN BY: D.REED
	SCALE: 1" = 2000'
	DRAWING NO: 2018-236
	WELL LOCATION PLAT

R:\PROJECTS\SWN\2018-236_SWN – ALBERT AND MARY HOHMAN PAD\CADD\PLAT\ALBERT-MARY HOHMAN WTZ 1 SUBMISSION.DWG
MONDAY MARCH 19 2018 12:05PM

PROPERTY NUMBER 2501161214
PAD ID 3001155891