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MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: Shannon Fields OHI 10H
Wheeling QUAD
Richland DISTRICT
Ohio COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 12/14/2021

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: Date: 1/24/2022

Title: Inspector

Approved by:

Name: Date:

Title:

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J. ATTACHMENTS

Attachment 1	Pre-Spud Sign In Sheet
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Attachment 6	Evacuation Plan
Attachment 7	Well Location Topo Map
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1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Ohio County	911 or 304-234-3811
State Police	Ohio County	911 or 304-238-1100
Ambulance Service	Ohio County	911 or 304-227-4357
Hospital	Ohio County	304-234-0123
Fire Department	Ohio County	911 or 304-234-3756
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Inspector Supervisor	Doug Newlon	304-932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

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Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	832-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Safety Officer	
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

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Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Remediation/Cleanup	Ryan Environmental	304-842-5578
Heavy Equipment	Burns Drilling	724-428-4361
Heavy Equipment/Rouster	Roughcut	501-827-1221
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
Parkview Memorial Gardens	1922 Warden Run Road Wheeling, WV 26003	304-242-1320

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).

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- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Shawn Jackson	Completions Superintendent	304-541-3204
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	

**In addition, SWN Wellsite supervisors must maintain current well control certification.

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2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

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B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commence

C. Muster, Secure the Area, and Restrict Access

All personnel shall be directed to the Muster Area and shall remain there until the person in charge (the acting incident commander) deems it safe for further movement (i.e., a complete evacuation from site). This is assuming that the muster area is unaffected by the incident and has been deemed a safe area.

In event of a well control emergency, all personnel should gather at a safe upwind location. This location should be pre-determined and take into account the possibility of secondary explosions. The primary muster point should be upwind of the prevailing direction with at least one alternate site. (See Attachment 6)

All roads in the immediate area leading to the location shall be secured. If an emergency event presents a hazard to public roadways, the local law enforcement agencies shall be contacted to establish the necessary road closures. Local law enforcement agencies can be contacted through the 911 operator. (Refer to section 1.0 "Contacts, Schedules, And Meetings")

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4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

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Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.

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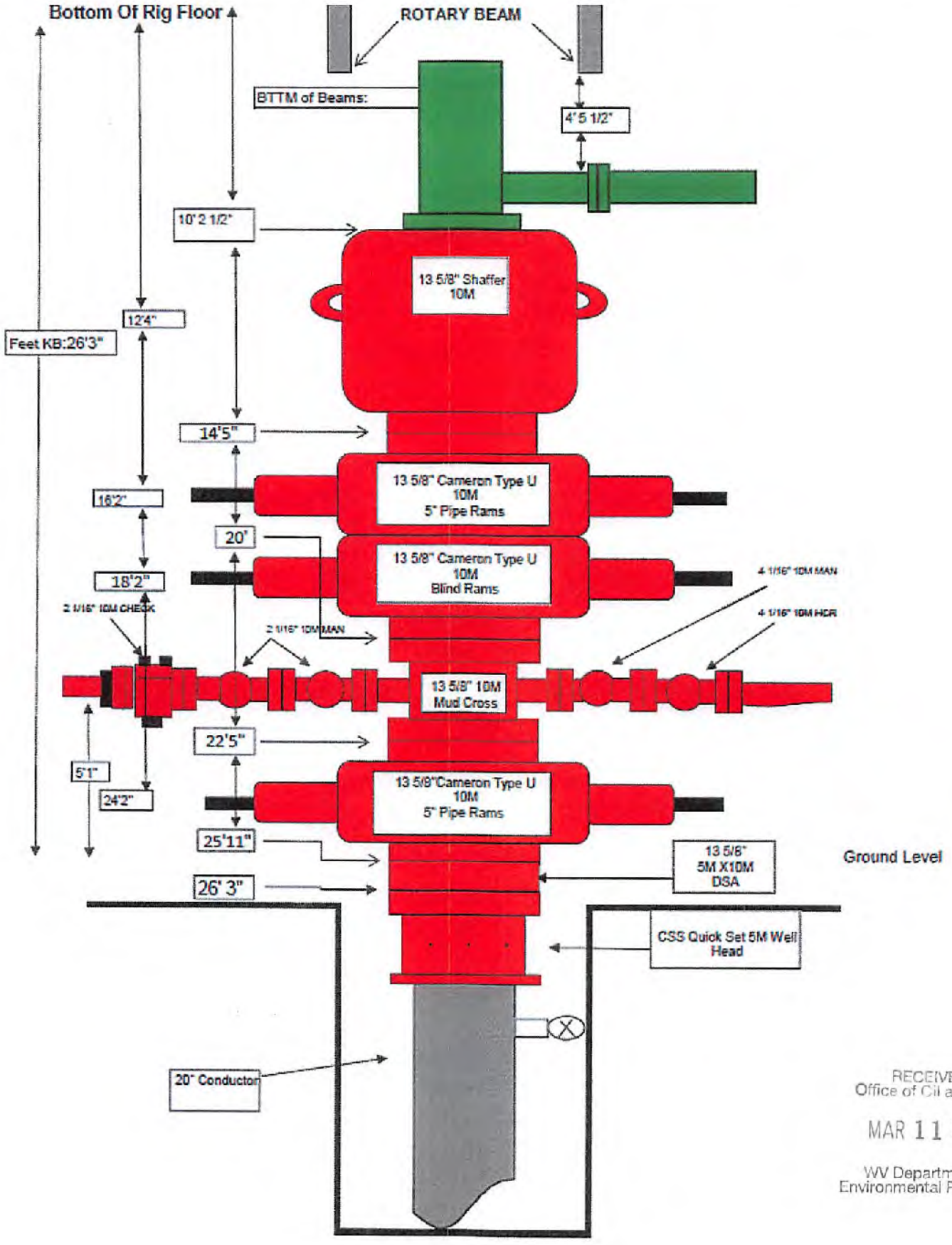

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D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.

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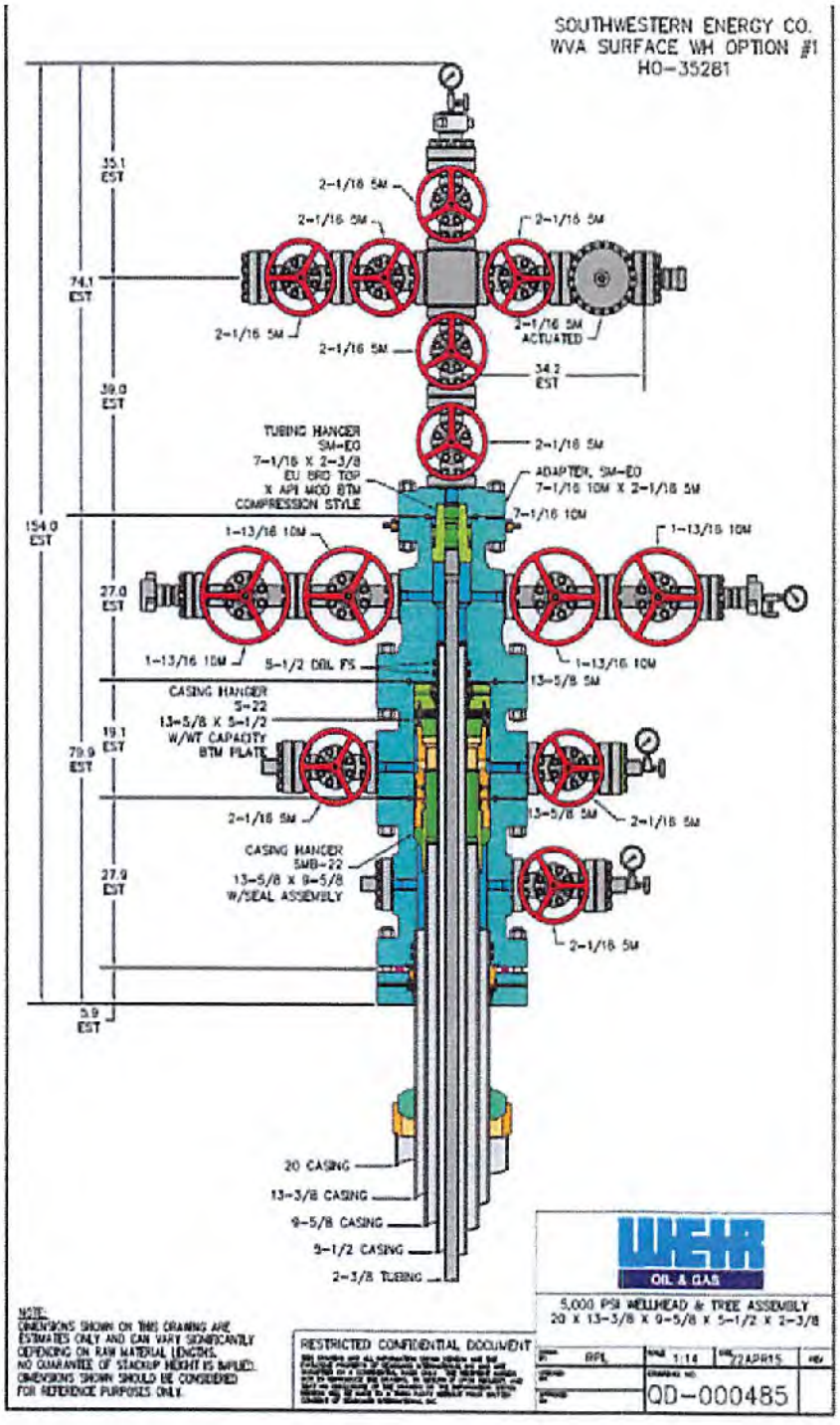

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H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

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E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

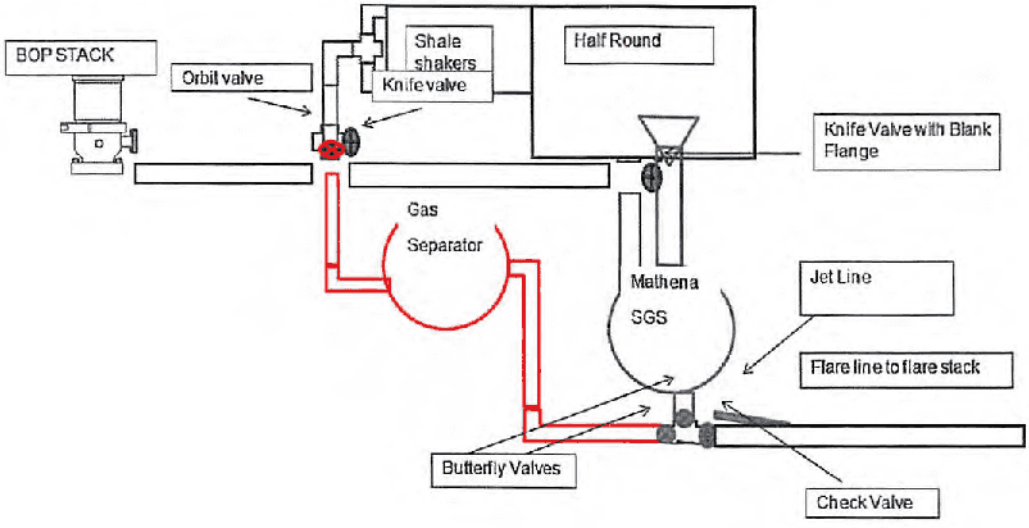
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



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8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

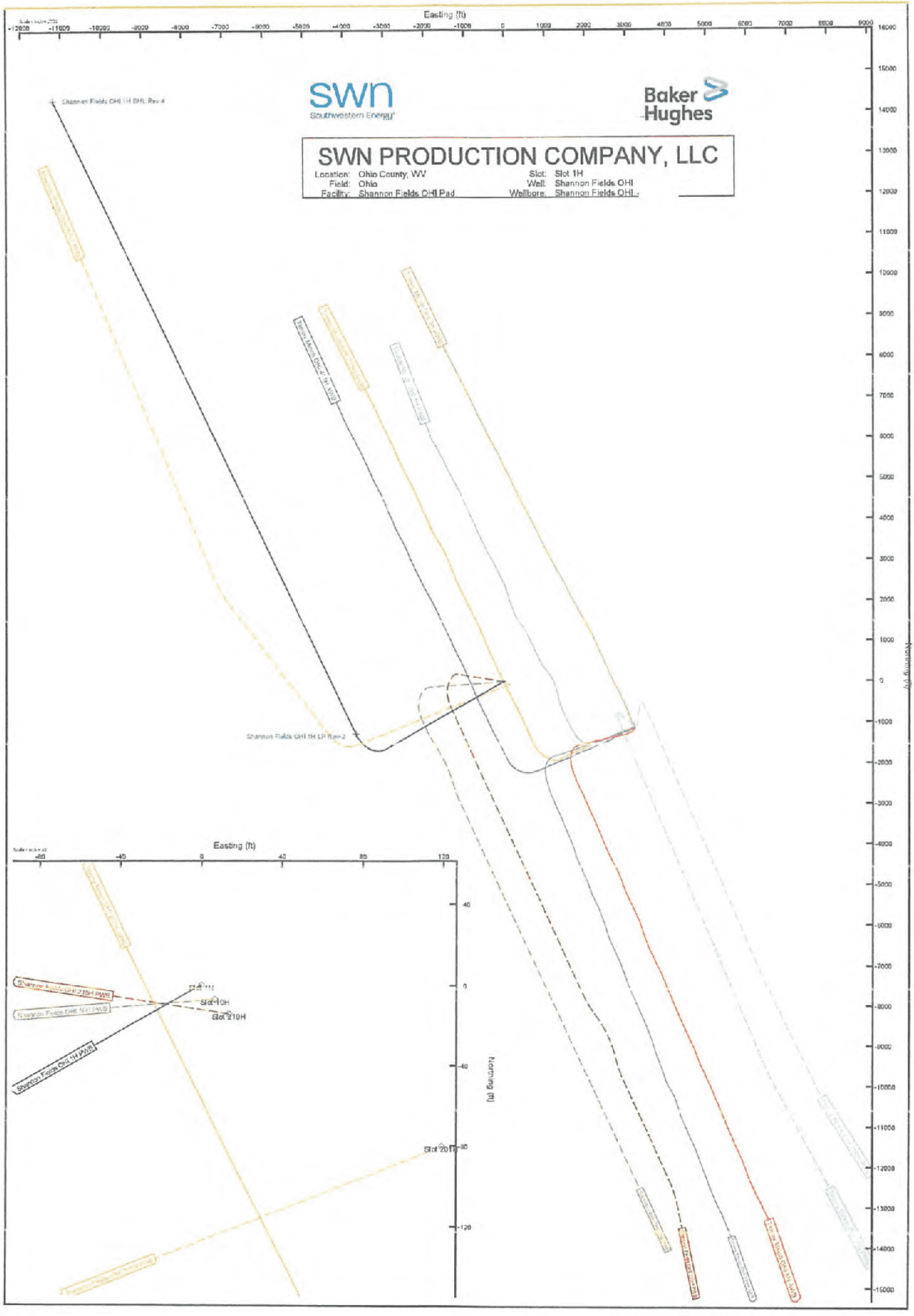
All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The


Easting (ft)
Northing (ft)
swn
Southwestern Energy
Baker Hughes
SWN PRODUCTION COMPANY, LLC
Location: Ohio County, WV
Field: Ohio
Facility: Shannon Fields OHI Pad
Slot: Slot 1H
Well: Shannon Fields OHI
Wellbore: Shannon Fields OHI
Shannon Fields OHI 1H OHL Rev 4
Shannon Fields OHI 1H LP Rev 2
Slot 1H
Slot 10H
Slot 210H
Slot 201H

calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

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9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

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  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 3
VISITOR SIGN IN SHEET

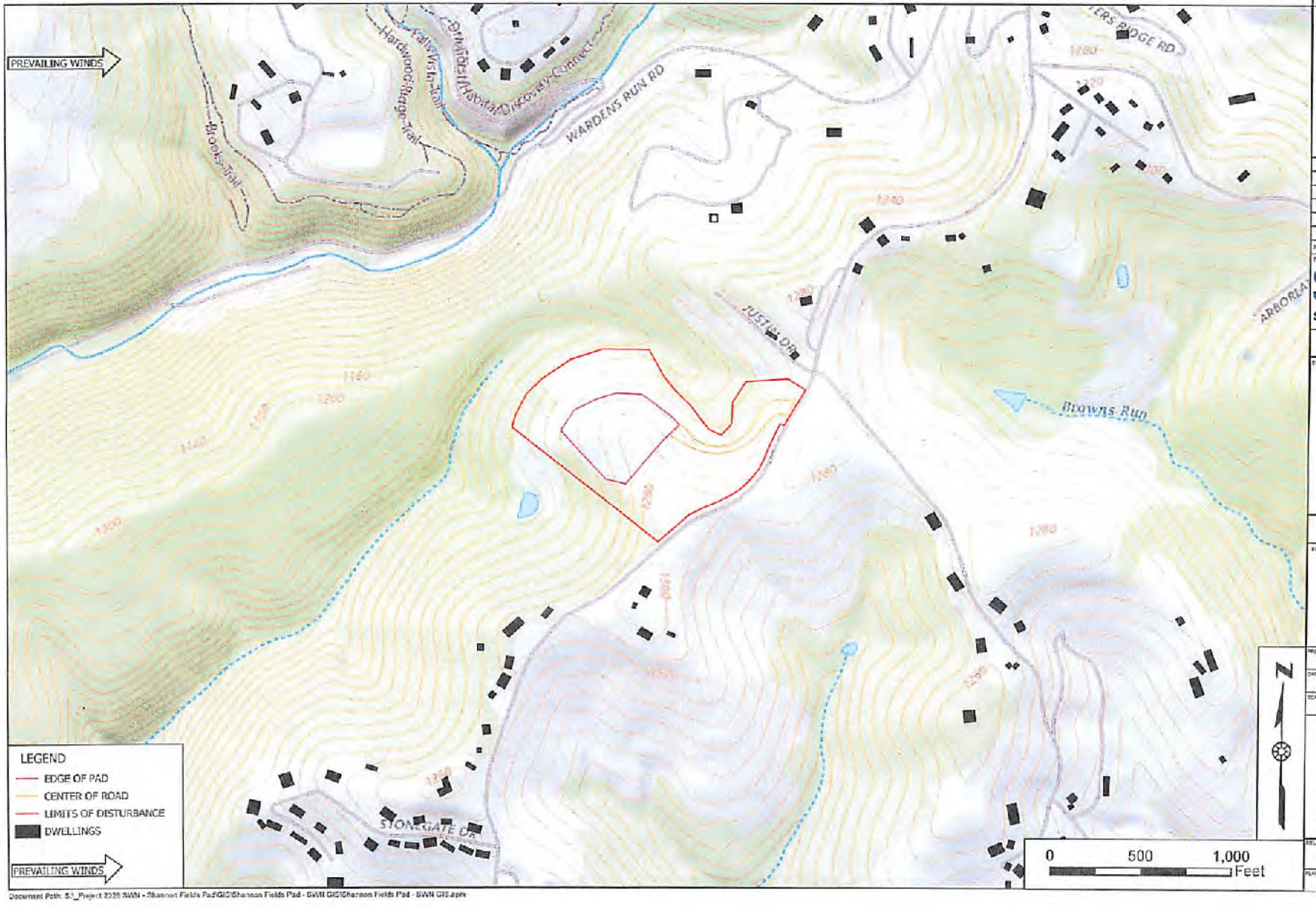
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



NO.	DATE	DESCRIPTION
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5		
4		
3		
2		
1		

PREPARED FOR:
SWN Southwestern Energy

PREPARED BY:
ASCENT Consulting & Engineering

PROJECT MANAGER:	2326
DRAWN:	MVW
DATE:	11/23/2021
ENGINEER:	AW
SCALE:	1:6,000
APPROVED:	

FLARE MAP
FOR
SHANNON FIELDS
OHI PAD

LOCATED IN RICHLAND DISTRICT,
OHIO COUNTY, WV

TITLE:
FLARE MAP

SHEET NO.: 1

Document Path: S:_Project 2326 SWN - Shannon Fields Pad\GIS\Shannon Fields Pad - SWN GIS\Shannon Fields Pad - SWN GIS.aprx

ATTACHMENT 5
1-MILE RADIUS TOPO MAP

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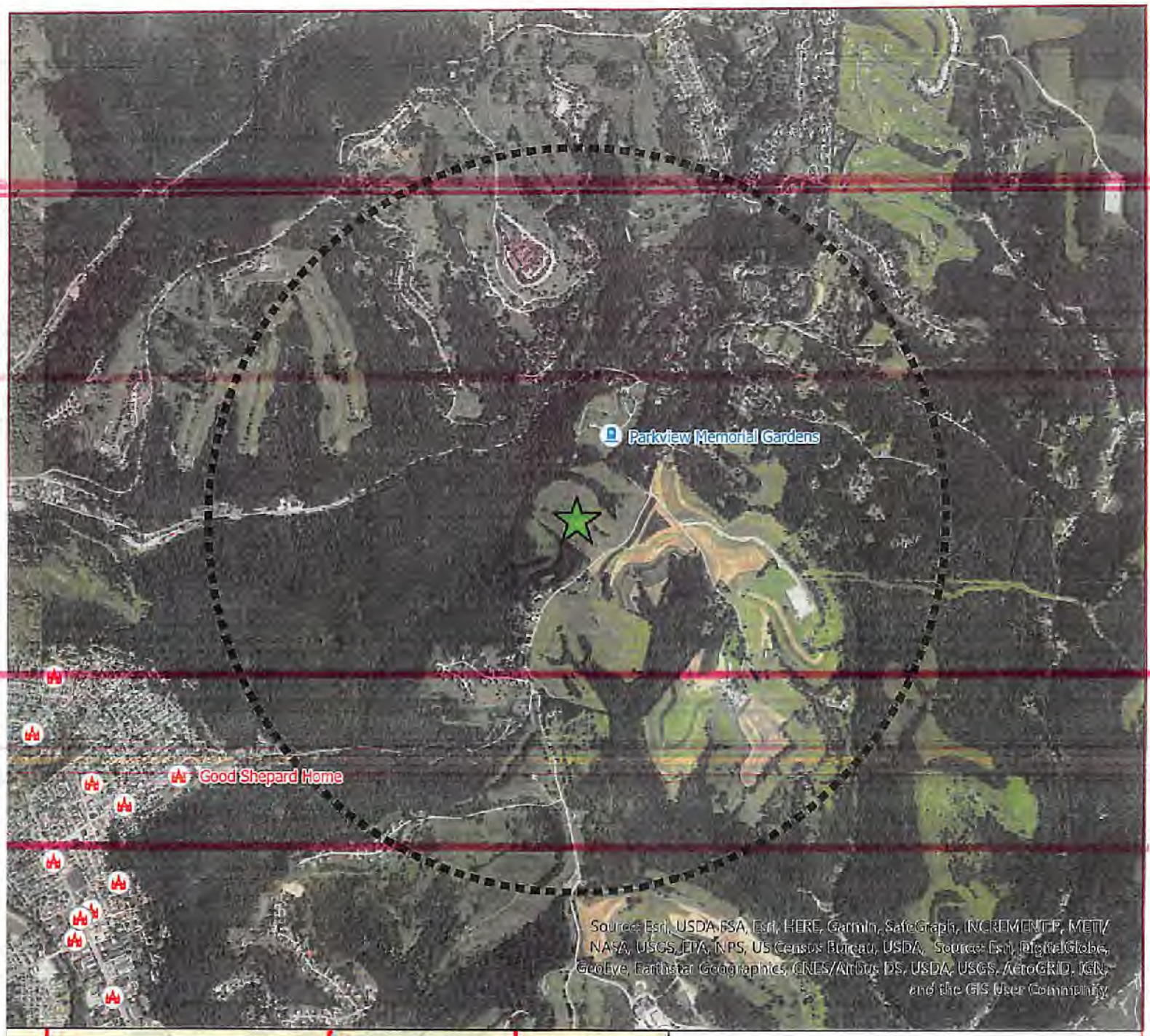

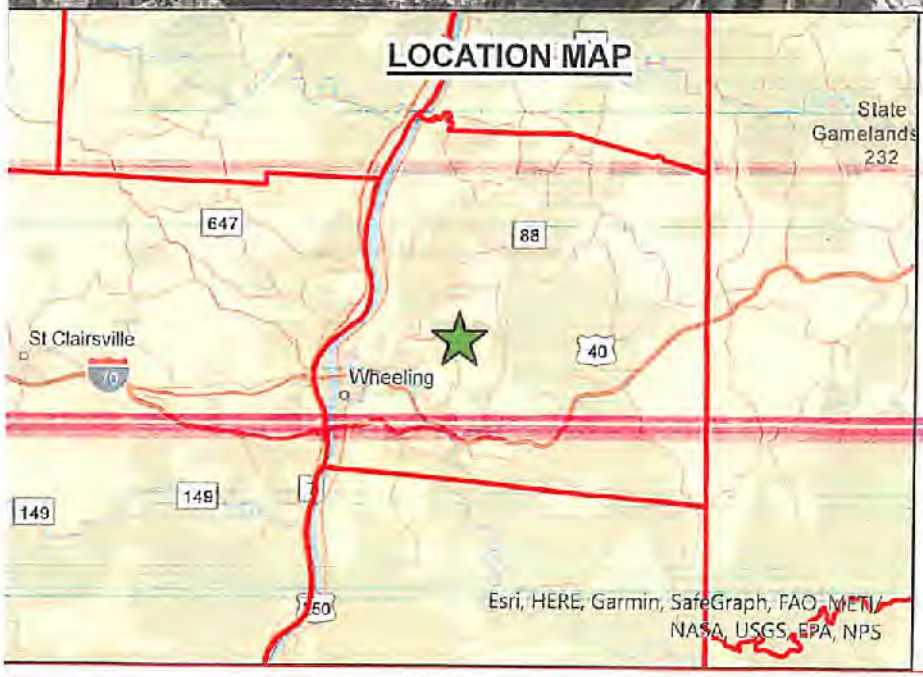

Legend

N

- Shannon Fields Pad
- 1-Mile Buffer
- Cemeteries
- Churches
- Schools

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0 1,250 2,500 Feet

1:24,000 Absolute Scale

Shannon Fields OHI Pad - 1-Mile
Ohio County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

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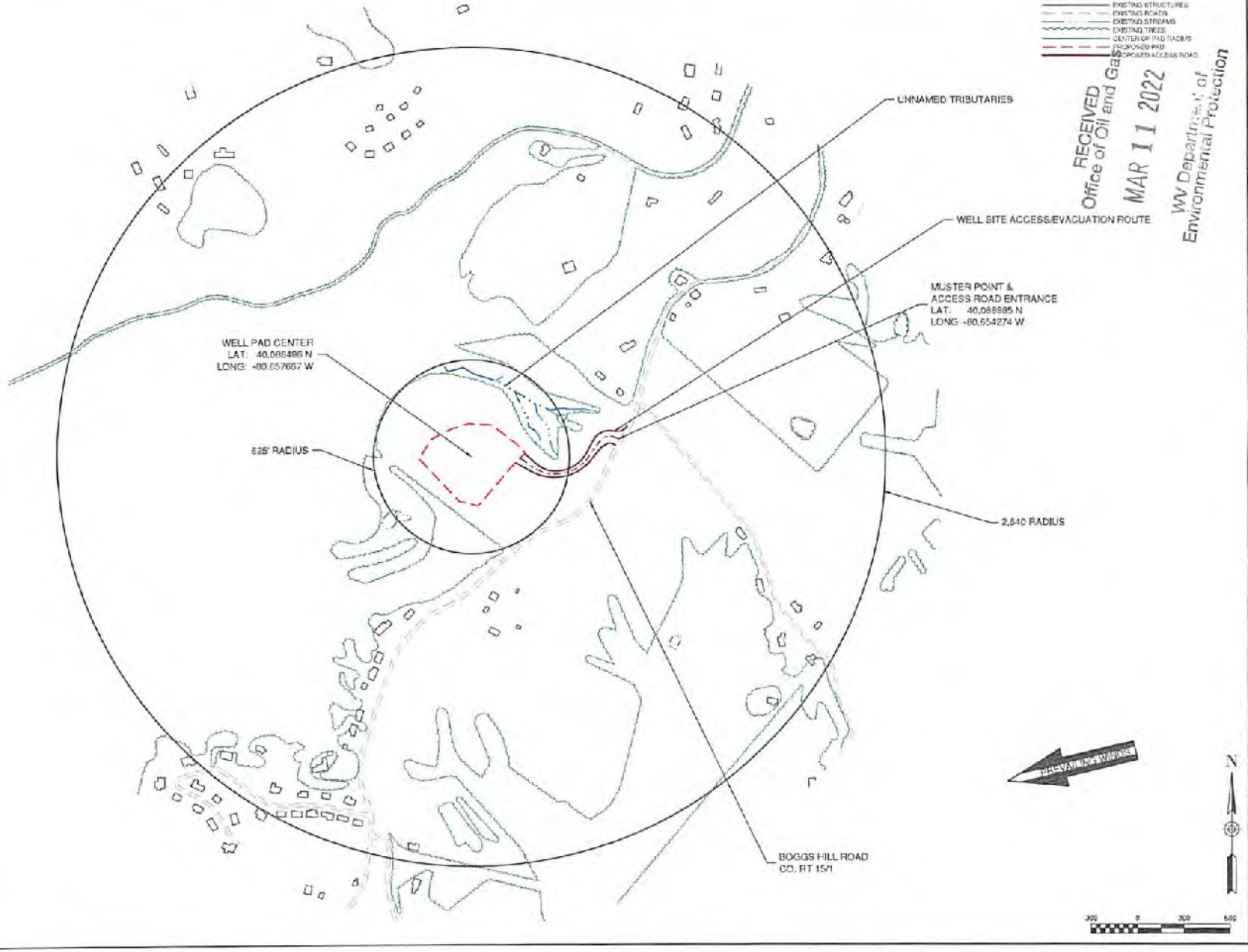
ATTACHMENT 6
EVACUATION PLAN


LEGEND
EXISTING STRUCTURES
EXISTING ROADS
EXISTING STREAMS
EXISTING TREES
CENTER OF PAD RADIUS
PROPOSED PAD
PROPOSED ACCESS ROAD
UNNAMED TRIBUTARIES
WELL SITE ACCESS/EVACUATION ROUTE
MUSTER POINT &
ACCESS ROAD ENTRANCE
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LONG: -80.654274 W
WELL PAD CENTER
LAT: 40.088496 N
LONG: -80.657667 W
625' RADIUS
2,640 RADIUS
BOGGS HILL ROAD
CO. RT 151
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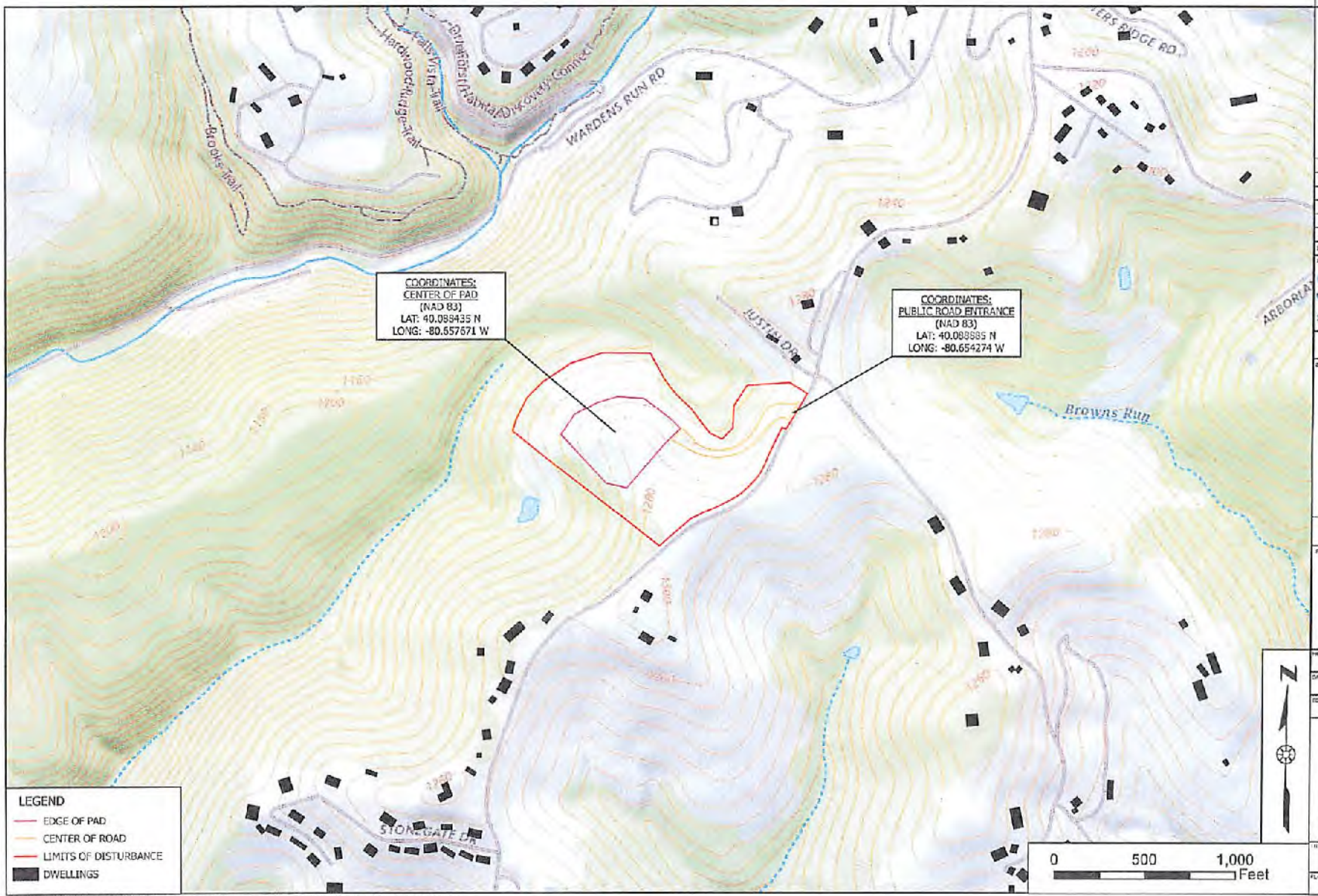
Environmental Protection
PROJECT LOCATION
LOCATION MAP NOT TO SCALE
NO. DATE DESCRIPTION
PREPARED FOR
SWN
Southwestern Energy
SEAL
PREPARED BY
ASCENT
Consulting & Engineering
2241 DAVISSON RUN ROAD
CLARKSBURG, WV 26301
WWW.ASCENTCONSULTINGENGINEERS.COM
(304) 920 - 3401
PROJECT NUMBER 2326
DRAWN EMS
DATE 11/17/2021
DESIGN EMS
SCALE AS SHOWN
CHECKED MRN
CONSTRUCTION PLANS FOR
SWN PRODUCTION COMPANY, LLC
SHANNON FIELDS PAD
TRIADELPHIA
OHIO COUNTY, WV
TITLE
EVACUATION PLAN WITHOUT USGS MAP
PLAN STATUS
APPROVED FOR PERMITS
SHEET No.
3

ATTACHMENT 7
WELL LOCATION TOPO MAP



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PREPARED FOR:
SWN
Southwestern Energy

SEAL

PREPARED BY:
ASCENT
Consulting & Engineering

PROJECT NUMBER: 2326	DRAWN: MVW
DATE: 11/23/202	CHECKED: AW
SCALE: 1:6,000	APPROVED:

ACCESS ROAD MAP
FOR
SHANNON FIELDS
OHI PAD

LOCATED IN RICHLAND DISTRICT,
OHIO COUNTY, WV

SHEET: ACCESS ROAD MAP

PLAN STATUS | Sheet No. 1

Document Path: S:_Project 2326 SWN - Shannon Fields Pad\GIS\Shannon Fields Pad - SWN GIS\Shannon Fields Pad - SWN GIS.aprx

ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

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All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	304-884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Olivia McNamara	Vice President HSE	(832) 796-2747	(346) 796-2747	
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5518	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Matt Weems	Senior Drilling Engineer	(832) 796-6361	(832) 430-0003	
Eric Draxten	Drilling Superintedent	(304) 884-2818	(501) 269-4393	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

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SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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2. CELLAR ENTRY....3
3. PAD PREPARATION....4
4. FRAC MOBILIZATION....4
5. COMPLETIONS OPERATIONS....5
6. CONTINGENCY OPERATIONS....8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

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4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PIC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak:** Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. Large leak: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

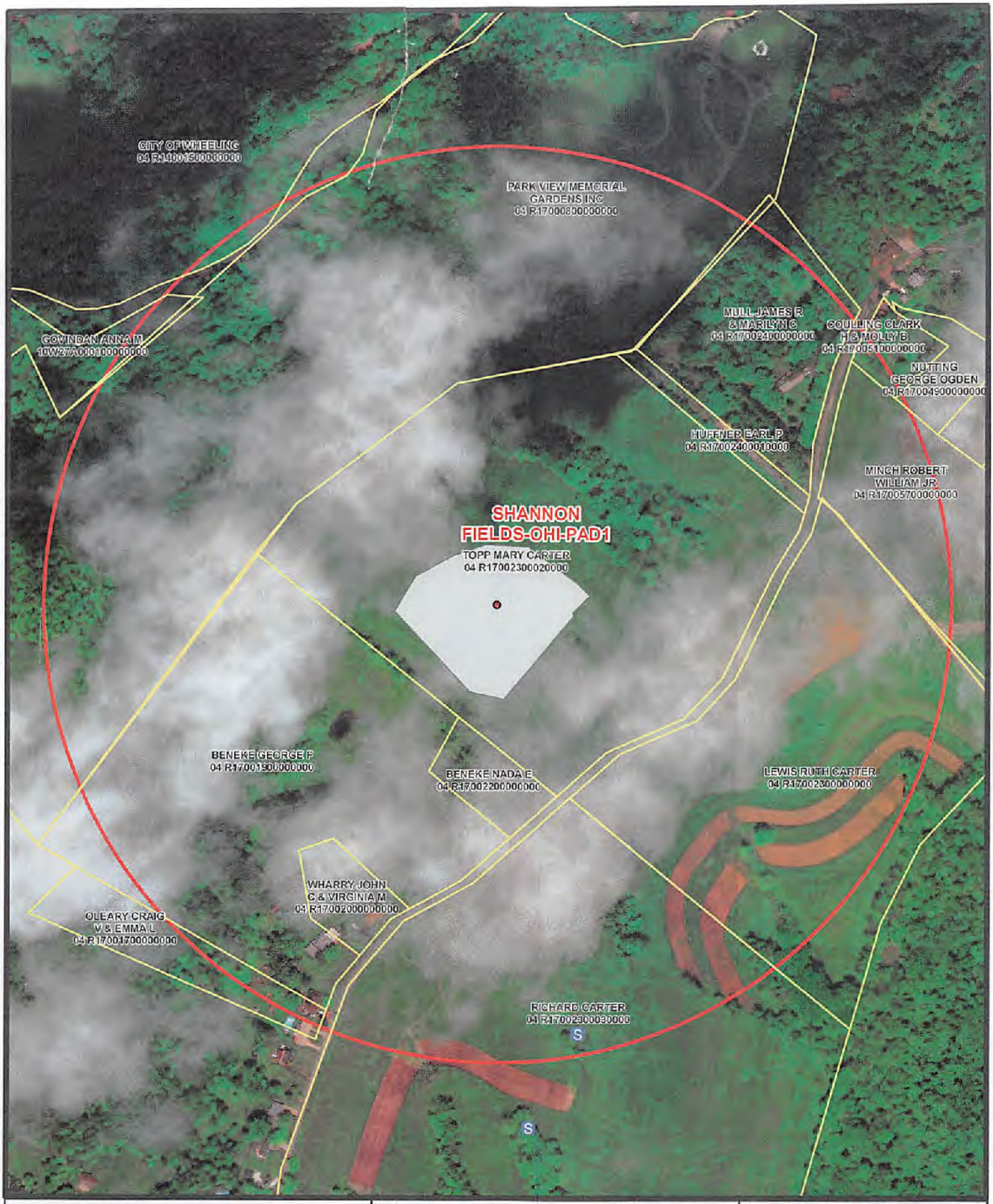
C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.

a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak**: redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.



N

1 in = 417 ft

0 0.025 0.05 0.1 0.15 0.2 Miles

Coordinate System: NAD 1983 UTM Zone 17N
Units: Meter

- Shannon Fields Pad Point
- Spring
- Water Well
- Pond
- Parcel
- 1500' Buffer

Coordinates: 40.088506, -80.657603

Water Purveyor Map
Well Pad: Shannon Fields
County: OHI

SWN Southwestern Energy

Date: 2/18/2022 | Author: willish

MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: OCC A OHI 1H
Valley Grove QUAD
Triadelphia DISTRICT
OHIO COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 2/8/2022

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: _____ Date: 3/8/2022

Title: _____

RECEIVED
Office of Oil and Gas
APR 14 2022
WV Department of
Environmental Protection

Approved by:

Name: _____ Date: _____

Title: _____

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DRILLING SIMOPS MANUAL

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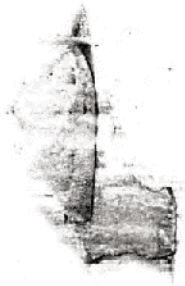


1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Ohio County	911 or 304-234-3811
State Police	Ohio County	911 or 304-238-1100
Ambulance Service	Ohio County	911 or 304-227-4357
Hospital	Ohio County	304-234-0123
Fire Department	Ohio County	911 or 304-234-3756
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Inspector Supervisor	Doug Newlon	(304) 932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	832-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Primary Safety Officer	
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Remediation/Cleanup	Ryan Environmental	304-842-5578
Heavy Equipment	Burns Drilling	724-428-4361
Heavy Equipment/Rouster	Roughcut	501-827-1221
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
None- See 1-Mile Map		

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Shawn Jackson	Completions Superintendent	304-541-3204
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	

**In addition, SWN Wellsite supervisors must maintain current well control certification.

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

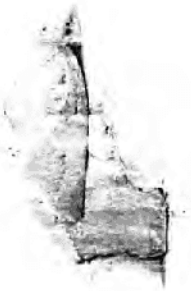
See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4



E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commence

C. Muster, Secure the Area, and Restrict Access

All personnel shall be directed to the Muster Area and shall remain there until the person in charge (the acting incident commander) deems it safe for further movement (i.e., a complete evacuation from site). This is assuming that the muster area is unaffected by the incident and has been deemed a safe area.

In event of a well control emergency, all personnel should gather at a safe upwind location. This location should be pre-determined and take into account the possibility of secondary explosions. The primary muster point should be upwind of the prevailing direction with at least one alternate site. (See Attachment 6)

All roads in the immediate area leading to the location shall be secured. If an emergency event presents a hazard to public roadways, the local law enforcement agencies shall be contacted to establish the necessary road closures. Local law enforcement agencies can be contacted through the 911 operator. (Refer to section 1.0 "Contacts, Schedules, And Meetings")

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

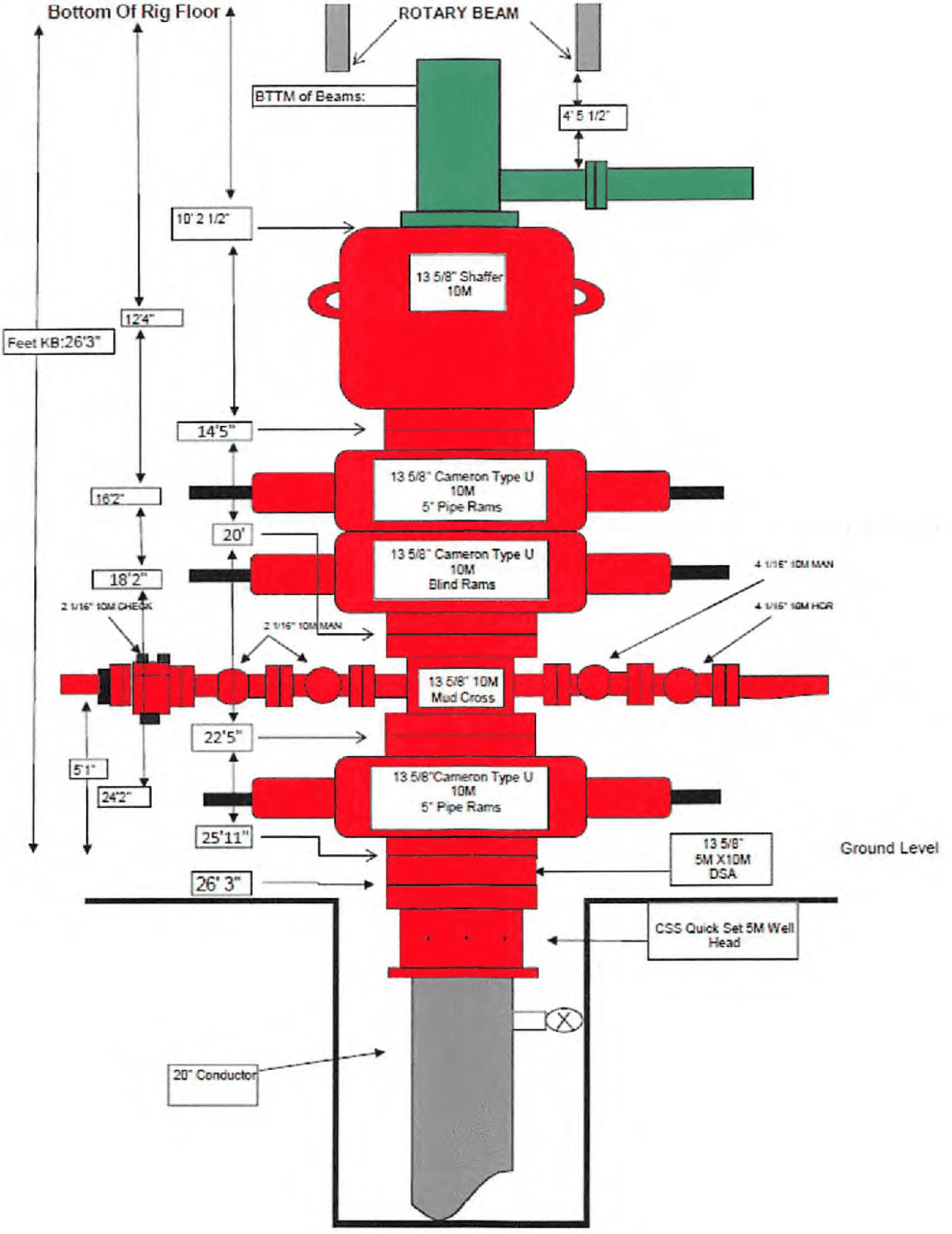
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20'
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
2 1/16" 10M CHECK
4 1/16" 10M HCR
2 1/16" 10M MAN
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

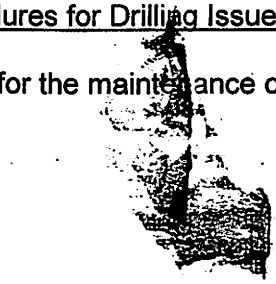
D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:



- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

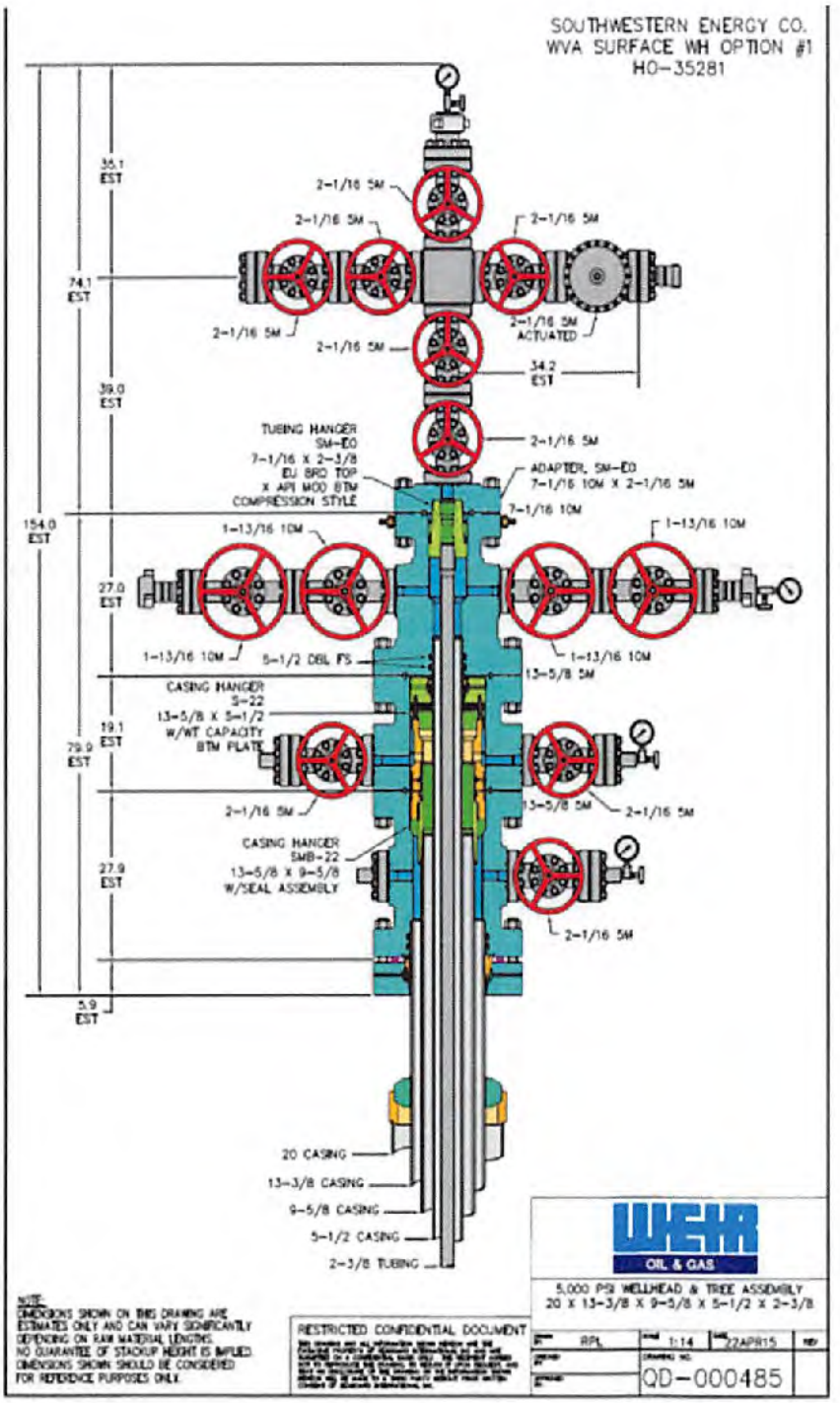
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
H0-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
79.9 EST
19.1 EST
27.9 EST
5.9 EST
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
TUBING HANGER SM-EO
7-1/16 X 2-3/8 EU 8RD TOP X API MOD BTM COMPRESSION STYLE
2-1/16 5M
ADAPTER, SM-EO 7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
5-1/2 DBL FS
13-5/8 5M
CASING HANGER S-22 13-5/8 X 5-1/2 W/WT CAPACITY BTM PLATE
13-5/8 5M
2-1/16 5M
2-1/16 5M
CASING HANGER SMB-22 13-5/8 X 9-5/8 W/SEAL ASSEMBLY
2-1/16 5M
20 CASING
13-3/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS. NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED. DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
WEIR OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RPL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

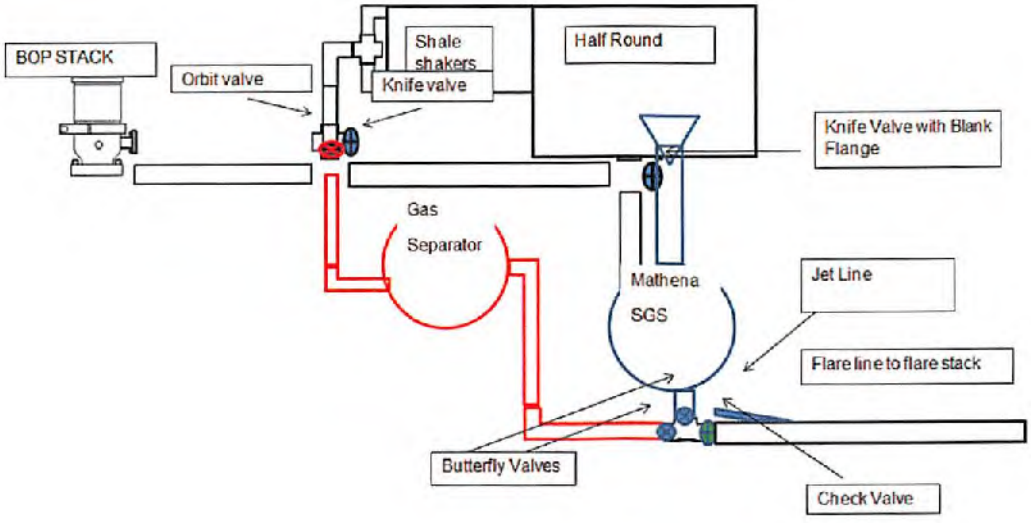
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

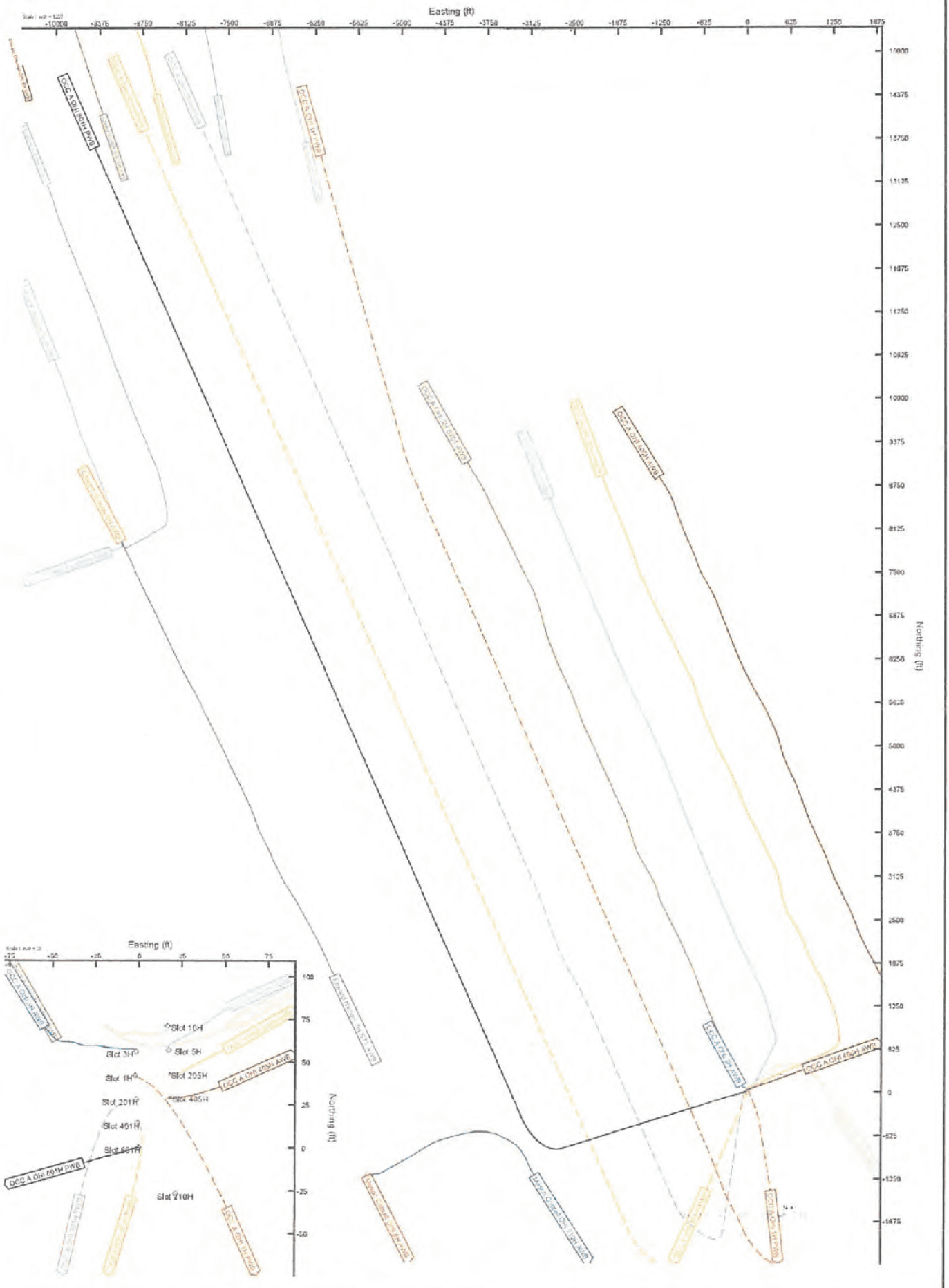
In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

SWN PRODUCTION COMPANY, LLC

Location: Ohio County, WV
Field: Ohio WV
Facility: OCC A OHI Pad
Slot:
Well: OCC A OHI
Wellbore: OCC A OHI



calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

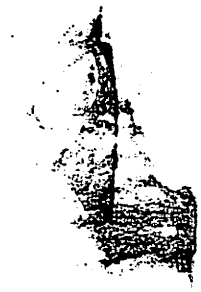
Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)



ATTACHMENT 3
VISITOR SIGN IN SHEET

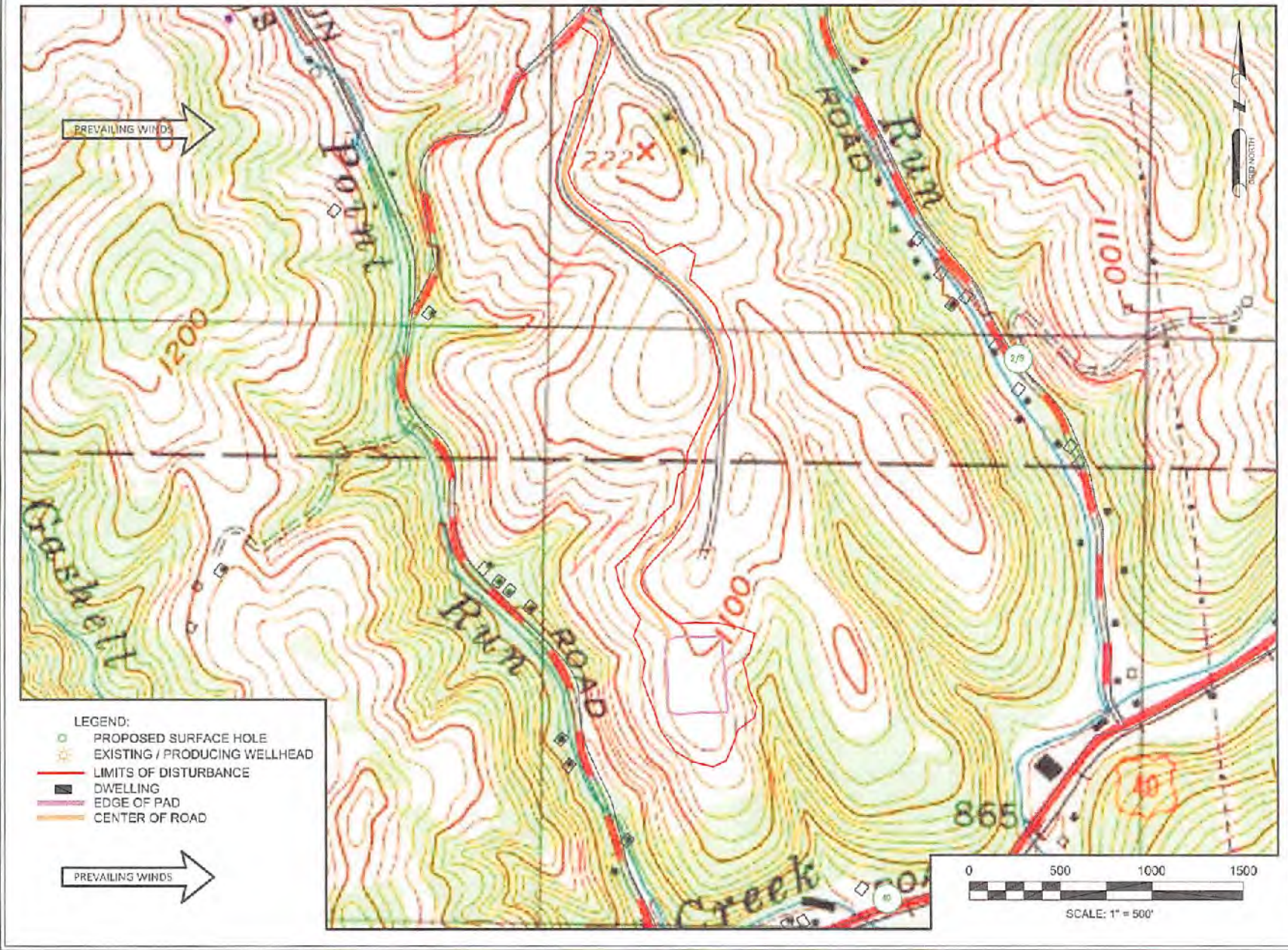
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



PROJECT LOCATION

LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

7 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

SWN
Southwestern Energy

SEAL

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ENGINEERS
ENVIRONMENTAL
GIS MAPPING
www.jhacompanies.com
68011 VINEYARD ROAD
ST. CLAIRSVILLE, OH 43950
(740) 695-6100
PA * OH * NY * WV

PROJECT ID	2022-027 OCC A OH PAD	DRAWN	CLM
DATE	02/21/22	CHECKED	CLW
SCALE	AS NOTED	CHECKED	CLW

FLARE MAP
FOR
OCC A OH PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE
FLARE MAP

PLAN TYPE	SHEET NO.
FINAL	1

THESE DRAWINGS SHALL NOT BE REVISED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF JHA COMPANIES

ATTACHMENT 5
1-MILE RADIUS TOPO MAP

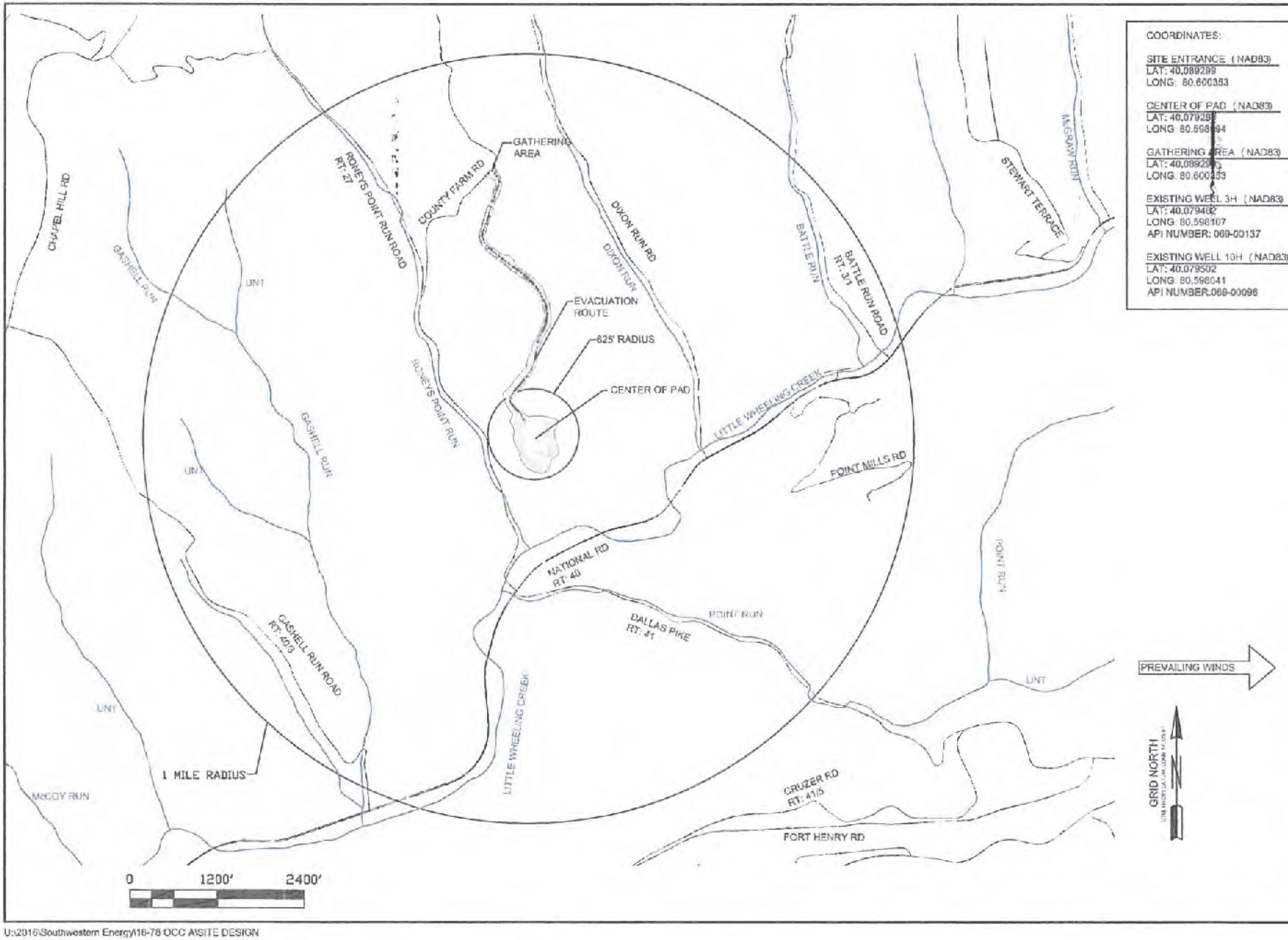
Legend

- OCCA_1_Mile
- OCCA_Pad
- CEMETERIES
- CHURCHES
- SCHOOLS

OCCA-1Mile
Ohio County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN



COORDINATES:

SITE ENTRANCE (NAD83)
LAT: 40.089299
LONG: 80.600353

CENTER OF PAD (NAD83)
LAT: 40.079285
LONG: 80.598694

GATHERING AREA (NAD83)
LAT: 40.089299
LONG: 80.600353

EXISTING WELL 3H (NAD83)
LAT: 40.079482
LONG: 80.598107
API NUMBER: 069-00137

EXISTING WELL 10H (NAD83)
LAT: 40.079502
LONG: 80.598041
API NUMBER: 069-00096

NO.	DATE	REVISION

PROJECT #: 16-78
DATE: 2017-05-16
DRAWN BY: NLL
CHECKED BY: MCH

ELK LAKE SERVICES, LLC
280 Indian Springs Road, Suite 123
Indiana, PA 15701
Phone: (724) 463-7303

Southwestern Energy
Southwestern Energy Company
P.O Box 872025
Houston, TX 77287

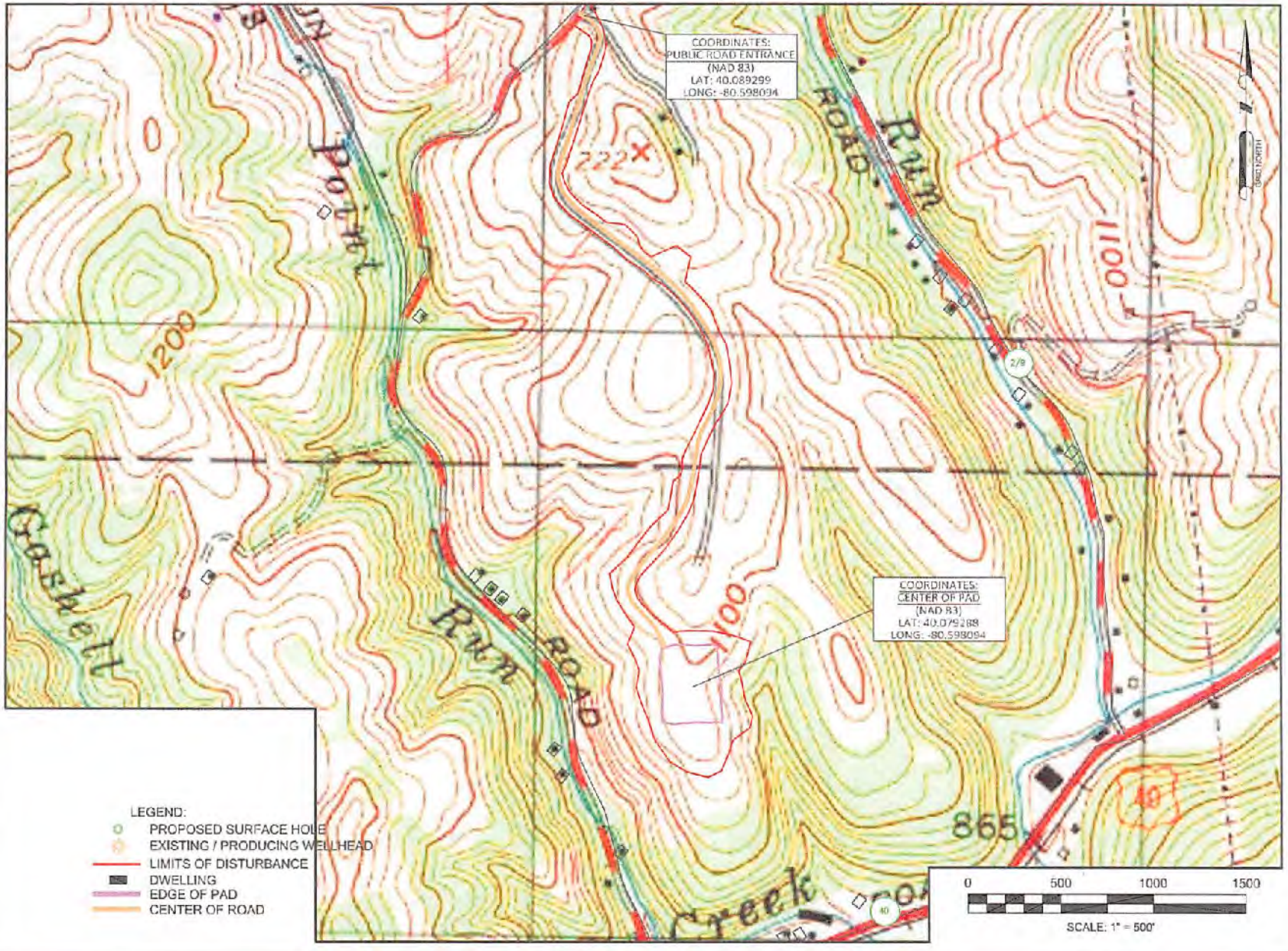
PROJECT
OCC A
PAD "A"
TRIADELPHIA DISTRICT
OHIO COUNTY
WEST VIRGINIA

TITLE
EVACUATION ROUTE/ PREVAILING WIND

SHEET NO.
EP2.1

U:\2016\Southwestern Energy\16-78 OCC A\SITE DESIGN

ATTACHMENT 7
WELL LOCATION TOPO MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

SWN
Southwestern Energy

SEAL

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ST. CLAIRSVILLE, OH 43950
(740) 695-0100
PA * OH * NY * WV

PROJECT NO.	2022-027 OCC A OH PAD	DRAWN	CLW
DATE	12/2022	DESIGN	CLW
SCALE	AS NOTED	CHECKED	CLW

FLARE MAP
FOR
OCC A OH PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
ACCESS ROAD MAP

PLAN TYPE	SHEET NO.
FINAL	2

THESE DRAWINGS SHALL NOT BE UTILIZED IN ANY FASHION FROM OR REPRODUCED WITHOUT THE SPECIFIC WRITTEN PERMISSION OF JHA COMPANIES

ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	(304) 884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Dave Bert (Interm)	Vice President HSE	(570) 996-4201		
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5518	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Cole Barron	Senior Drilling Engineer	(832) 796-2986	(281) 777-2027	
Daniel Hughes	Well Site Supervisor II		(681) 433-9272	
Joel Still	Well Site Supervisor II		(304) 439-4404	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	
Completions				
Aaron Balderson	Completions Superintendent	(304) 884-1638	(713) 829-4638	

Last Revised 3/4/2022

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

TABLE OF CONTENTS

1. INTRODUCTION 3
2. CELLAR ENTRY 3
3. PAD PREPARATION 4
4. FRAC MOBILIZATION 4
5. COMPLETIONS OPERATIONS 5
6. CONTINGENCY OPERATIONS 8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation or modification where necessary and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.
If the production pad is detached from the completion activity pad the standard production practice dictates monitoring.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak:** Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak**: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
   a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

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MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: OCC A OHI 201H
Valley Grove QUAD
Triadelphia DISTRICT
OHIO COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 2/15/2022

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: Wayne J. Ka P Date: 3/8/2022

Title: Inspector

Approved by:

Name:_____ Date: _____

Title: _____

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J. ATTACHMENTS

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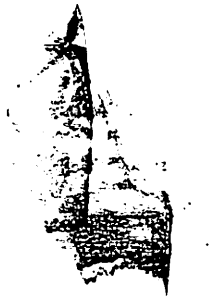


1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Ohio County	911 or 304-234-3811
State Police	Ohio County	911 or 304-238-1100
Ambulance Service	Ohio County	911 or 304-227-4357
Hospital	Ohio County	304-234-0123
Fire Department	Ohio County	911 or 304-234-3756
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Inspector Supervisor	Doug Newlon	(304) 932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	832-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Primary Safety Officer	
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Remediation/Cleanup	Ryan Environmental	304-842-5578
Heavy Equipment	Burns Drilling	724-428-4361
Heavy Equipment/Rouster	Roughcut	501-827-1221
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
None- See 1-Mile Map		

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Shawn Jackson	Completions Superintendent	304-541-3204
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	

**In addition, SWN Wellsite supervisors must maintain current well control certification.

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commence

C. Muster, Secure the Area, and Restrict Access

All personnel shall be directed to the Muster Area and shall remain there until the person in charge (the acting incident commander) deems it safe for further movement (i.e., a complete evacuation from site). This is assuming that the muster area is unaffected by the incident and has been deemed a safe area.

In event of a well control emergency, all personnel should gather at a safe upwind location. This location should be pre-determined and take into account the possibility of secondary explosions. The primary muster point should be upwind of the prevailing direction with at least one alternate site. (See Attachment 6)

All roads in the immediate area leading to the location shall be secured. If an emergency event presents a hazard to public roadways, the local law enforcement agencies shall be contacted to establish the necessary road closures. Local law enforcement agencies can be contacted through the 911 operator. (Refer to section 1.0 "Contacts, Schedules, And Meetings")

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

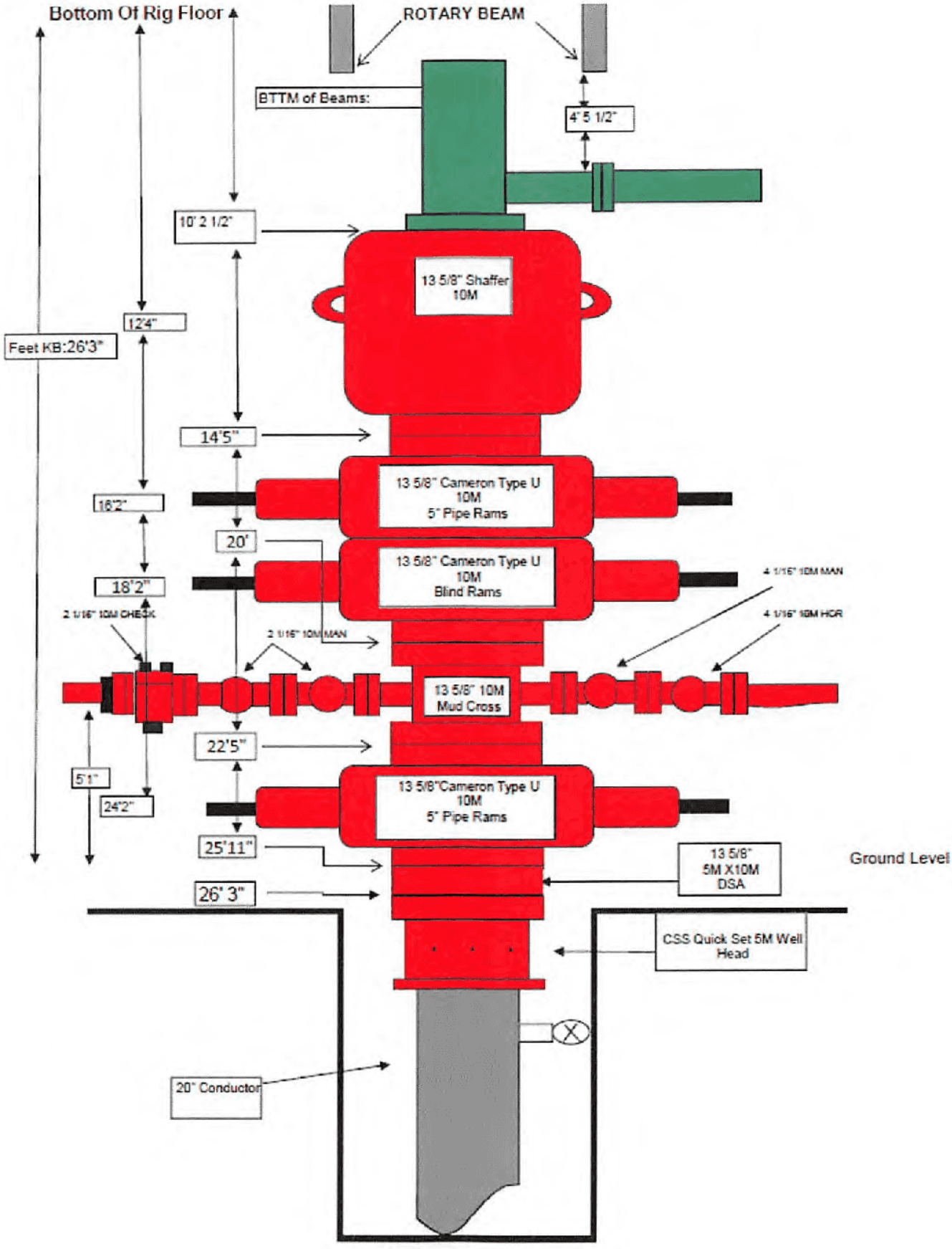
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20'
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
2 1/16" 10M CHECK
4 1/16" 10M HCR
2 1/16" 10M MAN
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

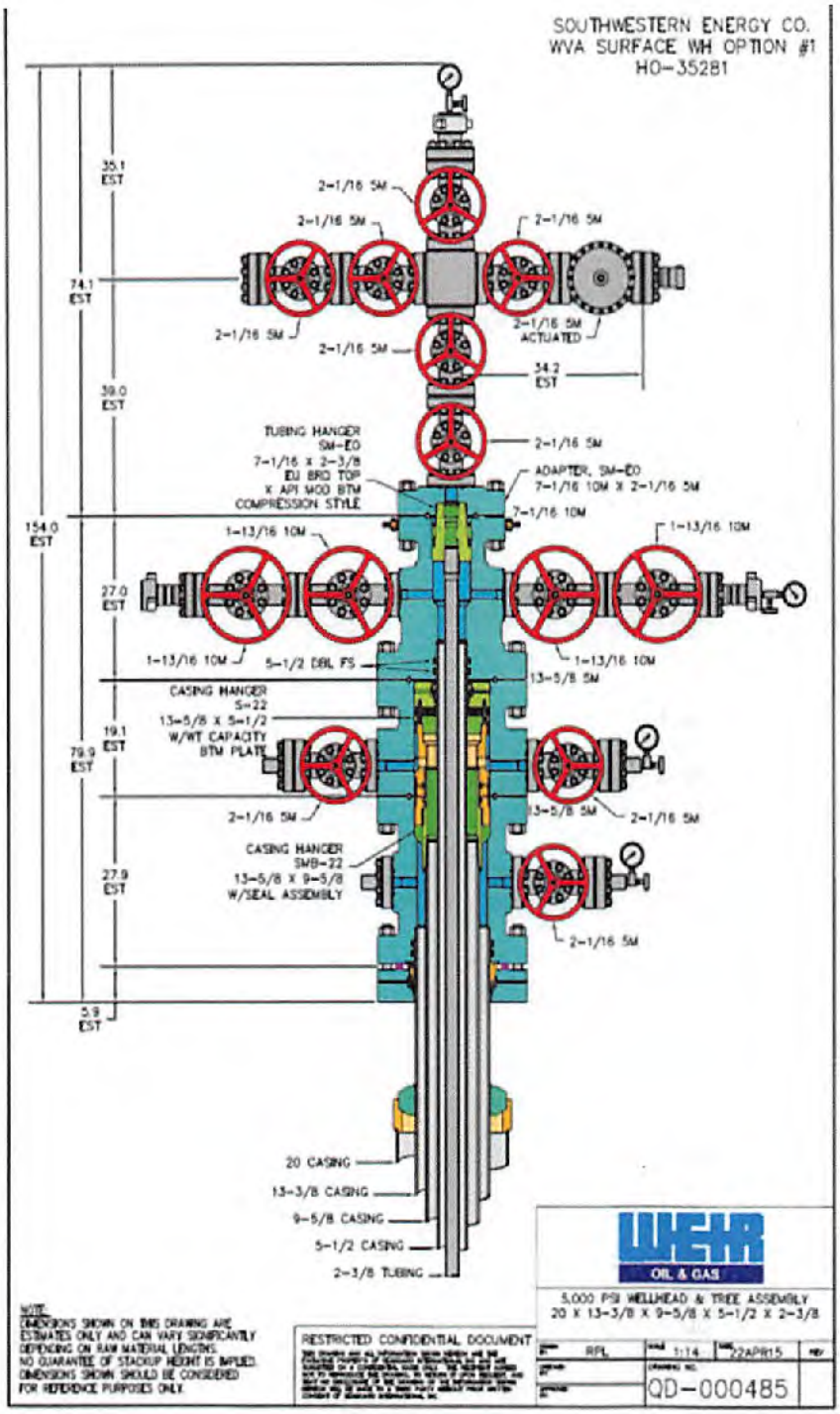
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
HO-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
79.9 EST
19.1 EST
27.9 EST
3.9 EST
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
2-1/16 5M
TUBING HANGER SM-EO
7-1/16 x 2-3/8 EU BRD TOP X API 14OO BTM COMPRESSION STYLE
ADAPTER, SM-EO 7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
5-1/2 DBL FS
13-5/8 5M
CASING HANGER 5-22 13-5/8 X 5-1/2 W/WT CAPACITY BTM PLATE
13-5/8 5M
2-1/16 5M
2-1/16 5M
CASING HANGER SMB-22 13-5/8 X 9-5/8 W/SEAL ASSEMBLY
2-1/16 5M
20 CASING
13-3/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS. NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED. DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RPL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

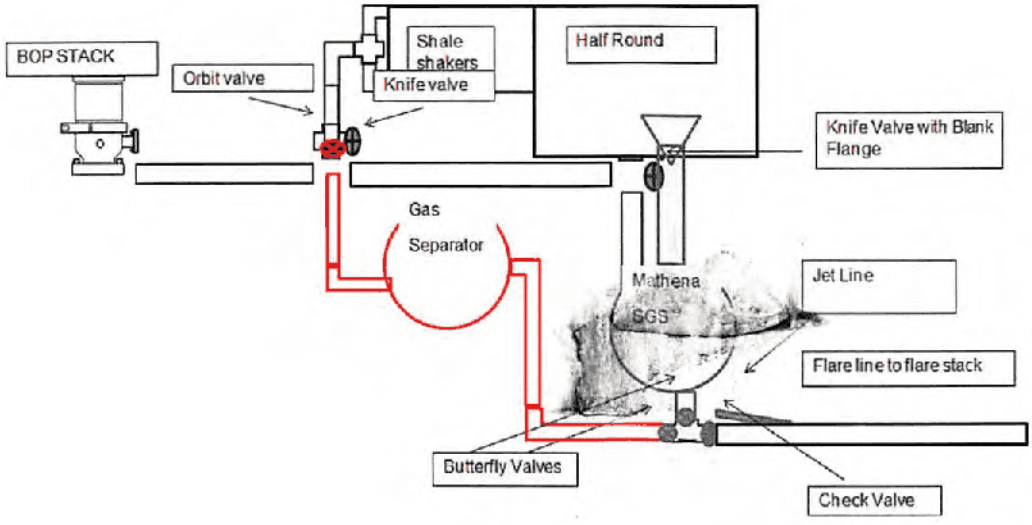
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

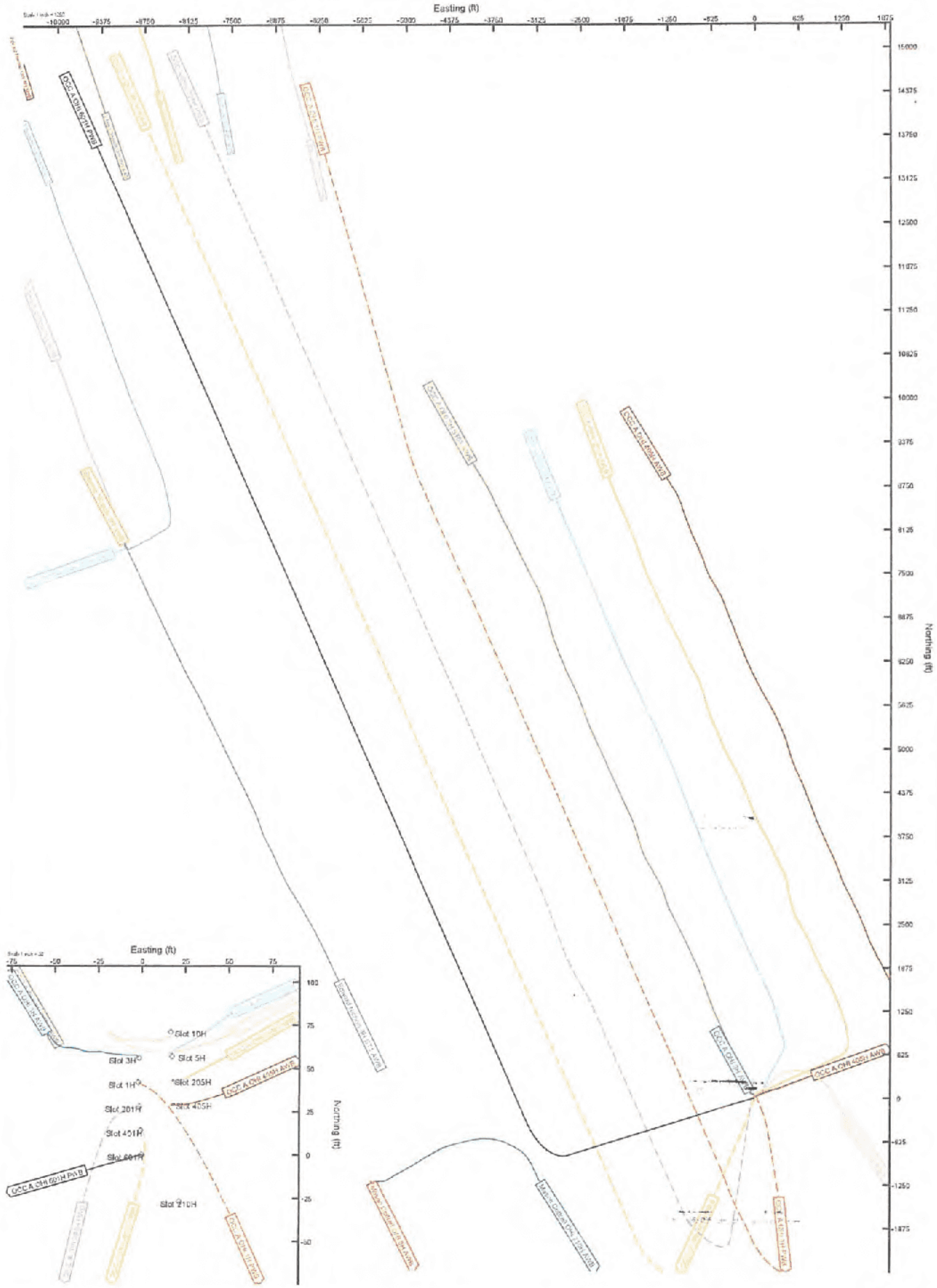
In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

SWN PRODUCTION COMPANY, LLC

Location: Ohio County, WV
Field: Ohio VW
Facility: OCC A OHI Pad
Slot:
Well: OCC A OHI
Wellbore: OCC A OHI



calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 3
VISITOR SIGN IN SHEET

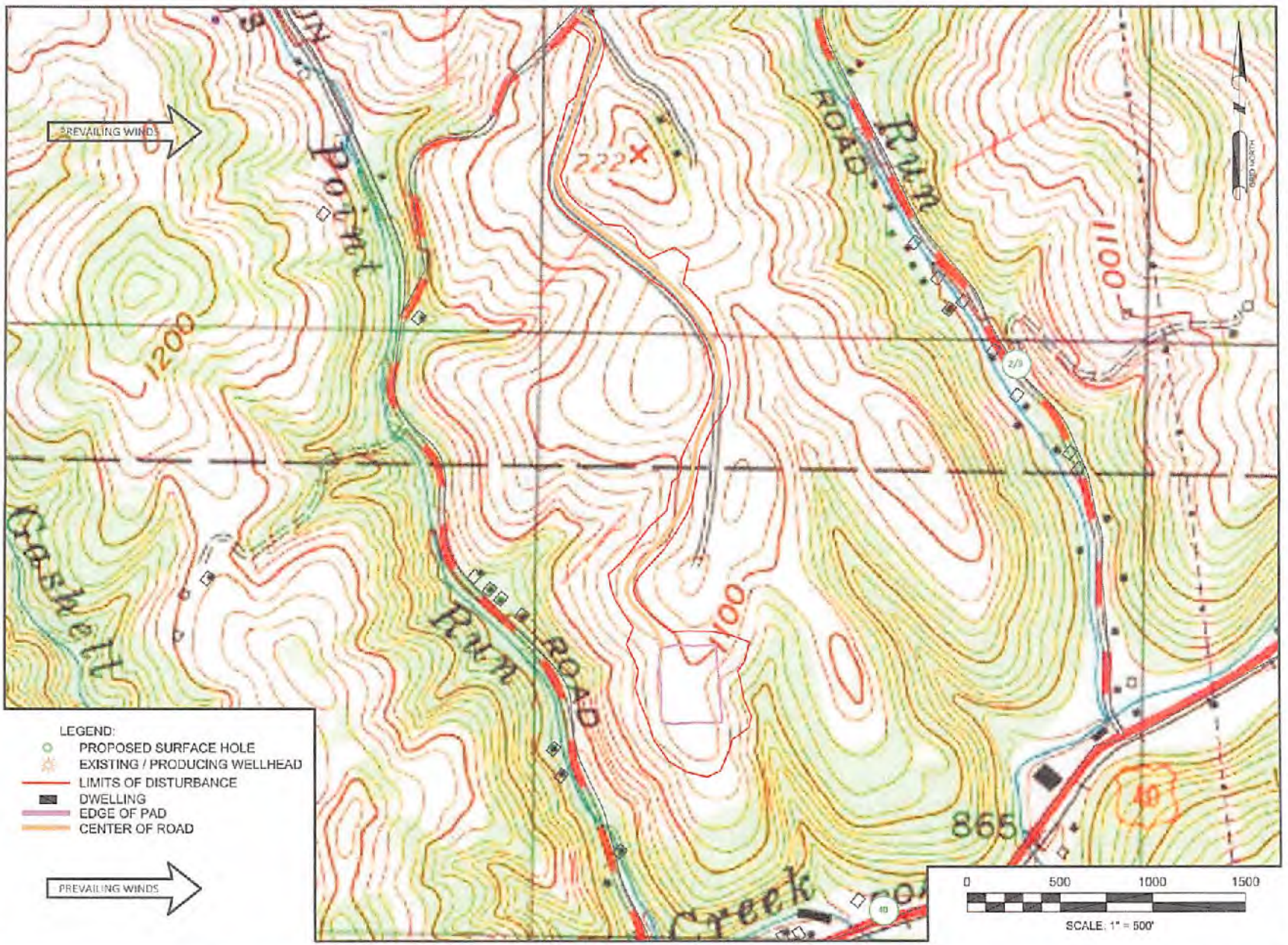
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

SWN
Southwestern Energy®

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(740) 695-6100
PA * OH * NY * WV

PROJECT #:	2022-027 OCC A OH PAD	Drawn:	CLW
DATE:	02/21/22	Design:	CLW
SCALE:	AS NOTED	Checked:	CLW

FLARE MAP
FOR
OCC A OH1 PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
FLARE MAP

PLAN TYPE:	Sheet #:
FINAL	1

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ATTACHMENT 5
1-MILE RADIUS TOPO MAP

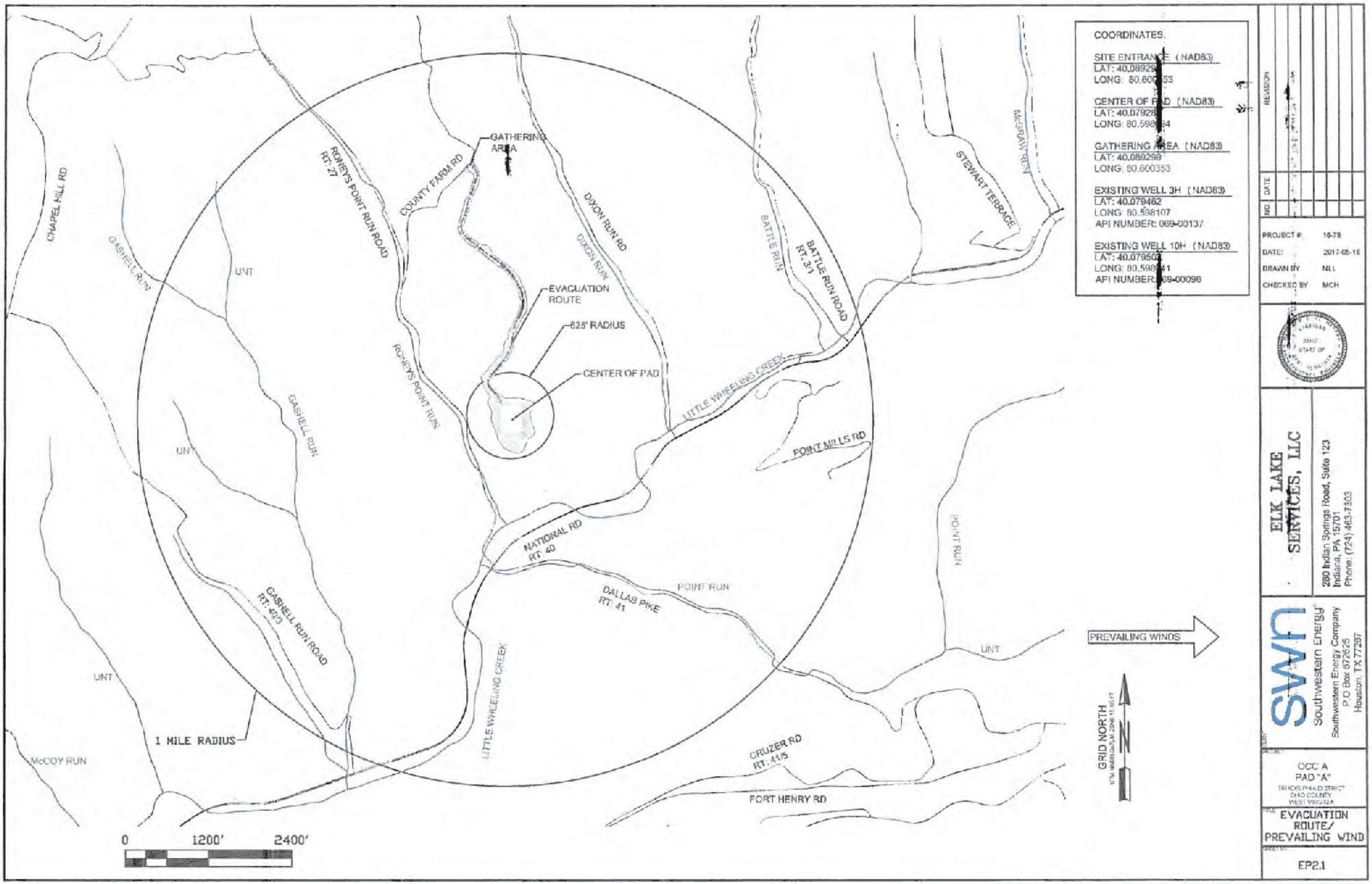
Legend

- OCCA_1_Mile
- OCCA_Pad
- CEMETERIES
- CHURCHES
- SCHOOLS

OCCA-1Mile
Ohio County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN



NO	DATE	REVISION

PROJECT #: 16-78
DATE: 2017-05-16
DRAWN BY: NLL
CHECKED BY: MCH

ELK LAKE SERVICES, LLC
280 Indian Springs Road, Suite 123
Indiana, PA 15701
Phone: (724) 463-7303

SWN Southwestern Energy
Southwestern Energy Company
P.O Box 872625
Houston, TX 77287

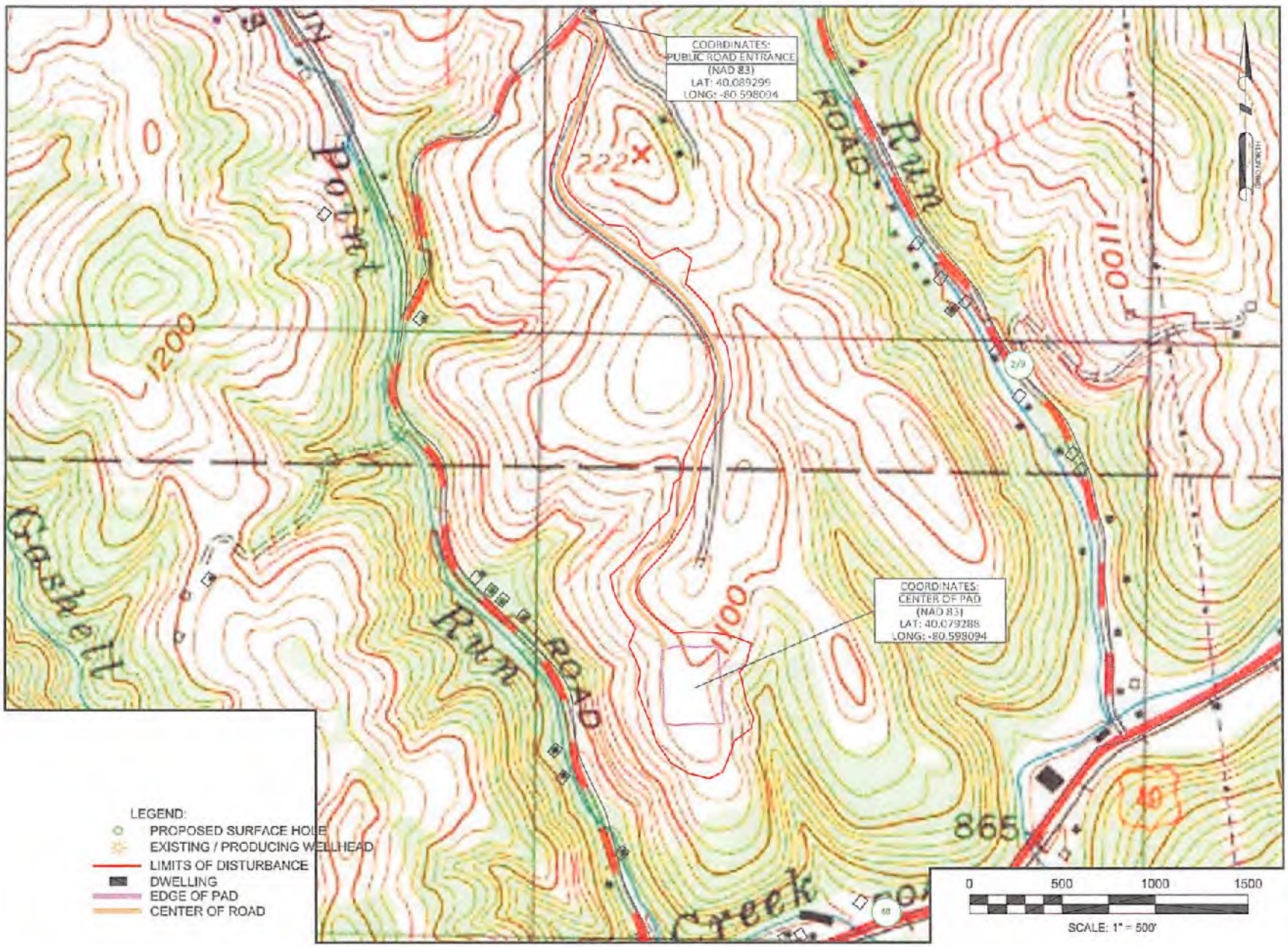
OCC A
PAD "A"
TRIADELPHIA DISTRICT
OHIO COUNTY
WEST VIRGINIA

TITLE: EVACUATION ROUTE/ PREVAILING WIND

SHEET NO: EP2.1

U:\2016\Southwestern Energy\16-78 OCC A\SITE DESIGN

ATTACHMENT 7
WELL LOCATION TOPO MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

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swn
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PA * OH * NY * WV

PROJECT #: 2022-027 OCC A OHI PAD	Drawn: CLW
DATE: 02/2/22	Design: CLW
SCALE: AS NOTED	Checked: CLW

FLARE MAP
FOR
OCC A OHI PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
ACCESS ROAD MAP

PLAN TYPE	SHEET NO.
FINAL	2

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ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-8657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	(304) 884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Dave Bert (Interm)	Vice President HSE	(570) 996-4201		
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5516	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Cole Barron	Senior Drilling Engineer	(832) 796-2966	(281) 777-2027	
Daniel Hughes	Well Site Supervisor II		(681) 433-9272	
Joel Still	Well Site Supervisor II		(304) 439-4404	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	
Completions				
Aaron Balderson	Completions Superintendent	(304) 884-1638	(713) 829-4638	

Last Revised 3/4/2022

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation or modification where necessary and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.
If the production pad is detached from the completion activity pad the standard production practice dictates monitoring.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak:** Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak**: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
   a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

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MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: OCC A OHI 201H
Valley Grove QUAD
Triadelphia DISTRICT
OHIO COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 2/15/2022

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: Wayne J. Ka P Date: 3/8/2022

Title: Inspector

Approved by:

Name:_____ Date: _____

Title: _____

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J. ATTACHMENTS

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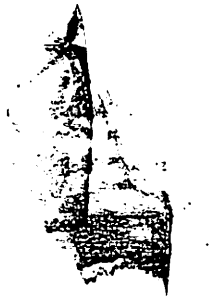


1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Ohio County	911 or 304-234-3811
State Police	Ohio County	911 or 304-238-1100
Ambulance Service	Ohio County	911 or 304-227-4357
Hospital	Ohio County	304-234-0123
Fire Department	Ohio County	911 or 304-234-3756
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Inspector Supervisor	Doug Newlon	(304) 932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	832-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Primary Safety Officer	
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Remediation/Cleanup	Ryan Environmental	304-842-5578
Heavy Equipment	Burns Drilling	724-428-4361
Heavy Equipment/Rouster	Roughcut	501-827-1221
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
None- See 1-Mile Map		

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Shawn Jackson	Completions Superintendent	304-541-3204
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	

**In addition, SWN Wellsite supervisors must maintain current well control certification.

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commence

C. Muster, Secure the Area, and Restrict Access

All personnel shall be directed to the Muster Area and shall remain there until the person in charge (the acting incident commander) deems it safe for further movement (i.e., a complete evacuation from site). This is assuming that the muster area is unaffected by the incident and has been deemed a safe area.

In event of a well control emergency, all personnel should gather at a safe upwind location. This location should be pre-determined and take into account the possibility of secondary explosions. The primary muster point should be upwind of the prevailing direction with at least one alternate site. (See Attachment 6)

All roads in the immediate area leading to the location shall be secured. If an emergency event presents a hazard to public roadways, the local law enforcement agencies shall be contacted to establish the necessary road closures. Local law enforcement agencies can be contacted through the 911 operator. (Refer to section 1.0 "Contacts, Schedules, And Meetings")

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

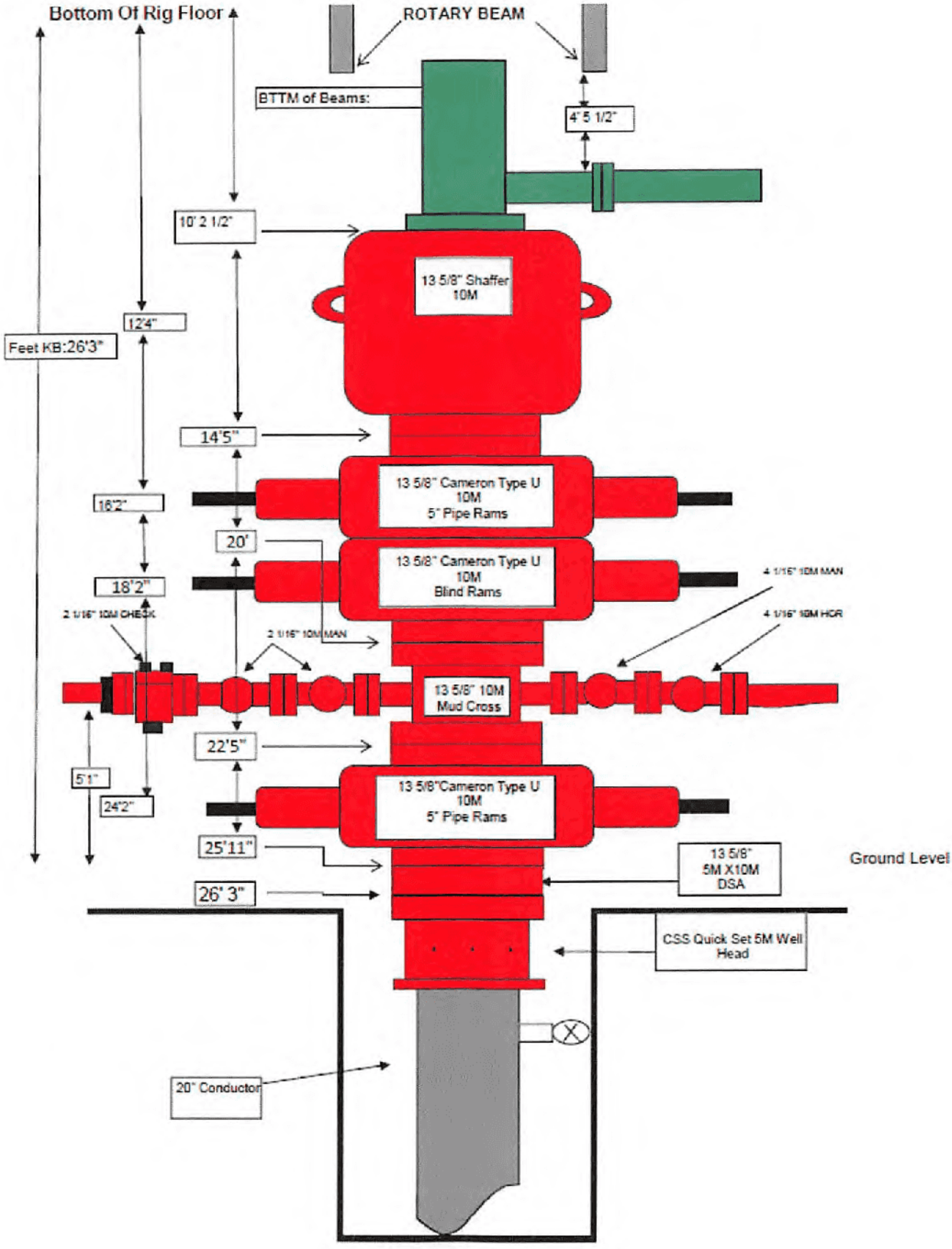
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20'
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
2 1/16" 10M CHECK
4 1/16" 10M HCR
2 1/16" 10M MAN
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

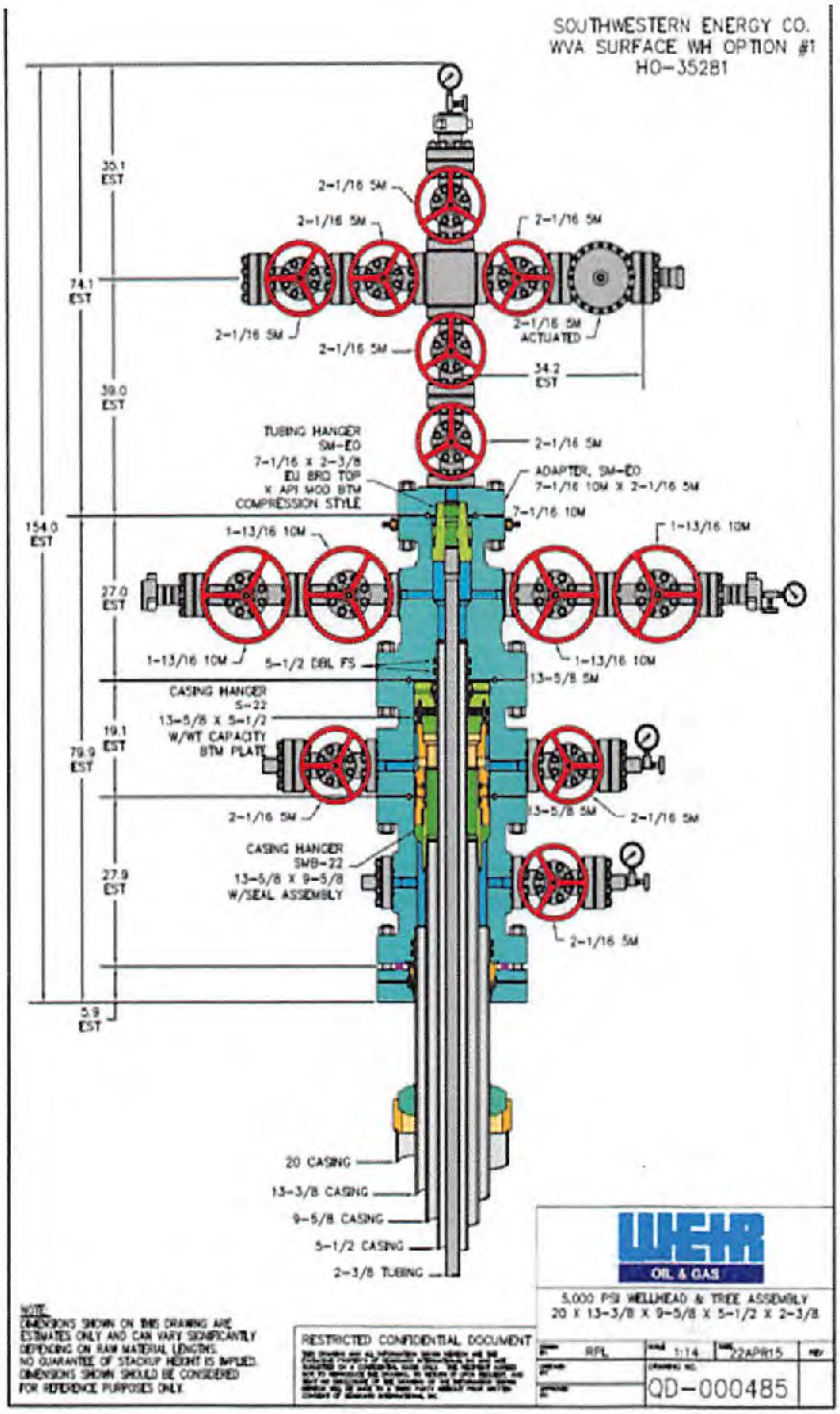
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
HO-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
79.9 EST
19.1 EST
27.9 EST
3.9 EST
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
2-1/16 5M
TUBING HANGER SM-EO
7-1/16 x 2-3/8 EU BRD TOP X API 14OO BTM COMPRESSION STYLE
ADAPTER, SM-EO 7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
5-1/2 DBL FS
13-5/8 5M
CASING HANGER 5-22 13-5/8 X 5-1/2 W/WT CAPACITY BTM PLATE
13-5/8 5M
2-1/16 5M
2-1/16 5M
CASING HANGER SMB-22 13-5/8 X 9-5/8 W/SEAL ASSEMBLY
2-1/16 5M
20 CASING
13-3/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS. NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED. DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RPL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

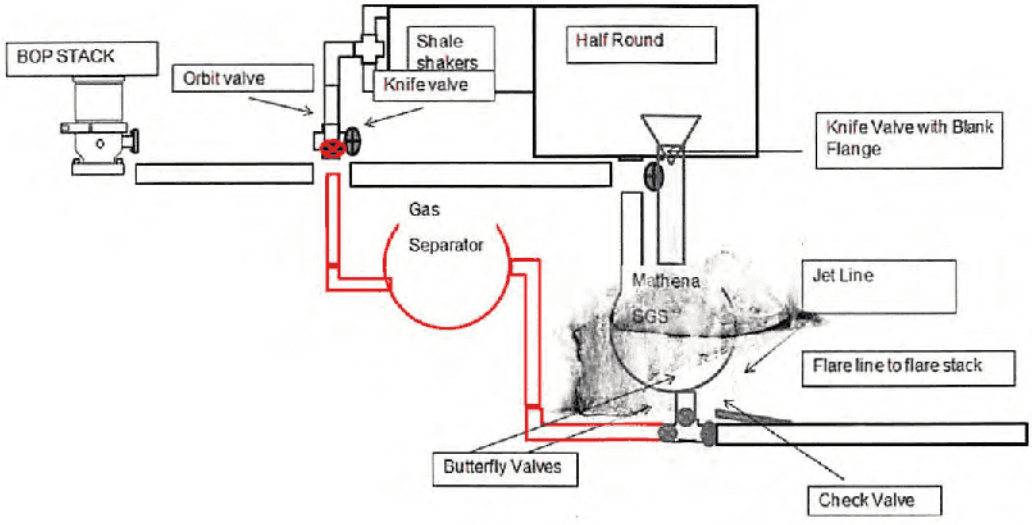
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

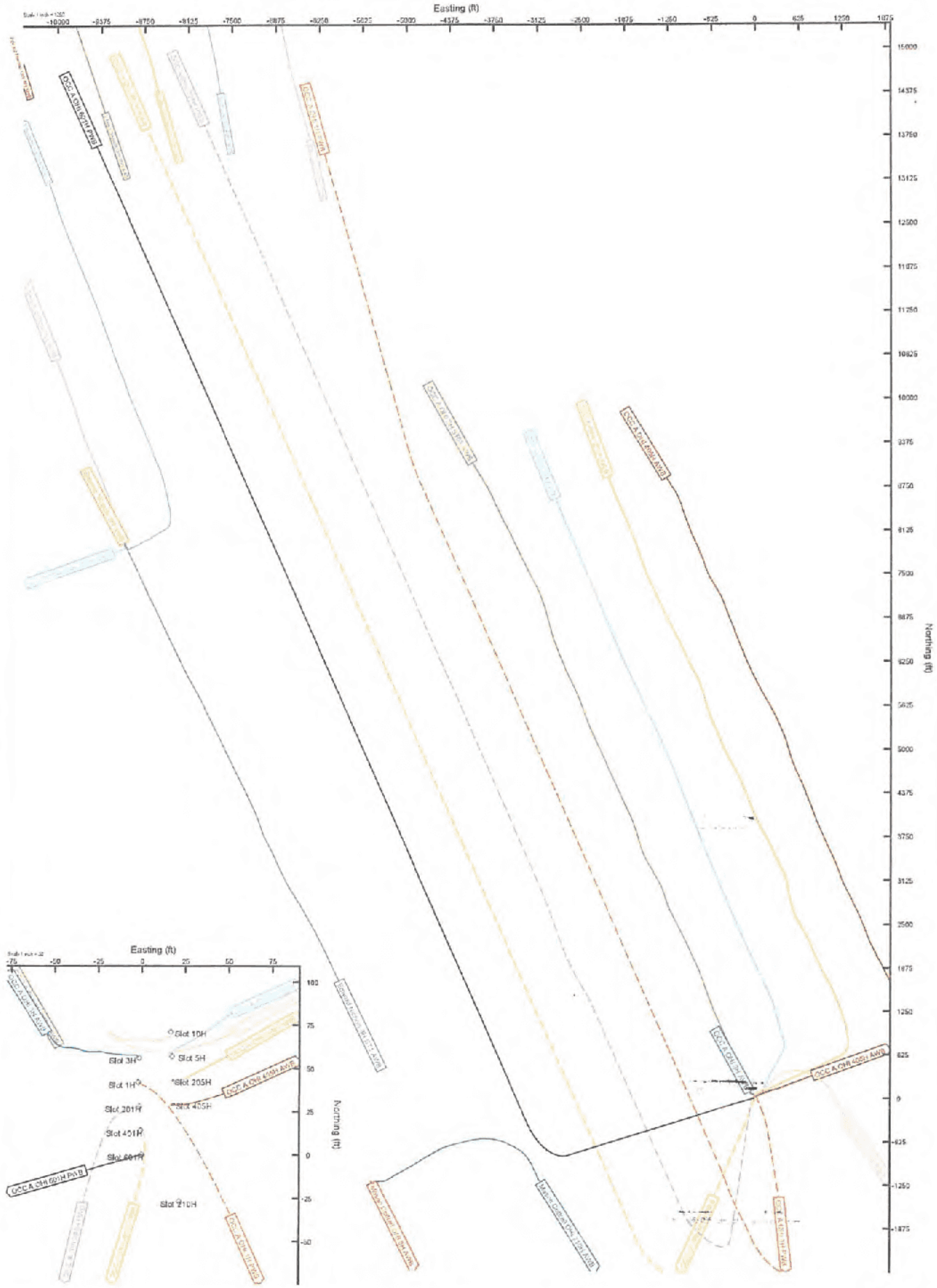
In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

SWN PRODUCTION COMPANY, LLC

Location: Ohio County, WV
Field: Ohio VW
Facility: OCC A OHI Pad
Slot:
Well: OCC A OHI
Wellbore: OCC A OHI



calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 3
VISITOR SIGN IN SHEET

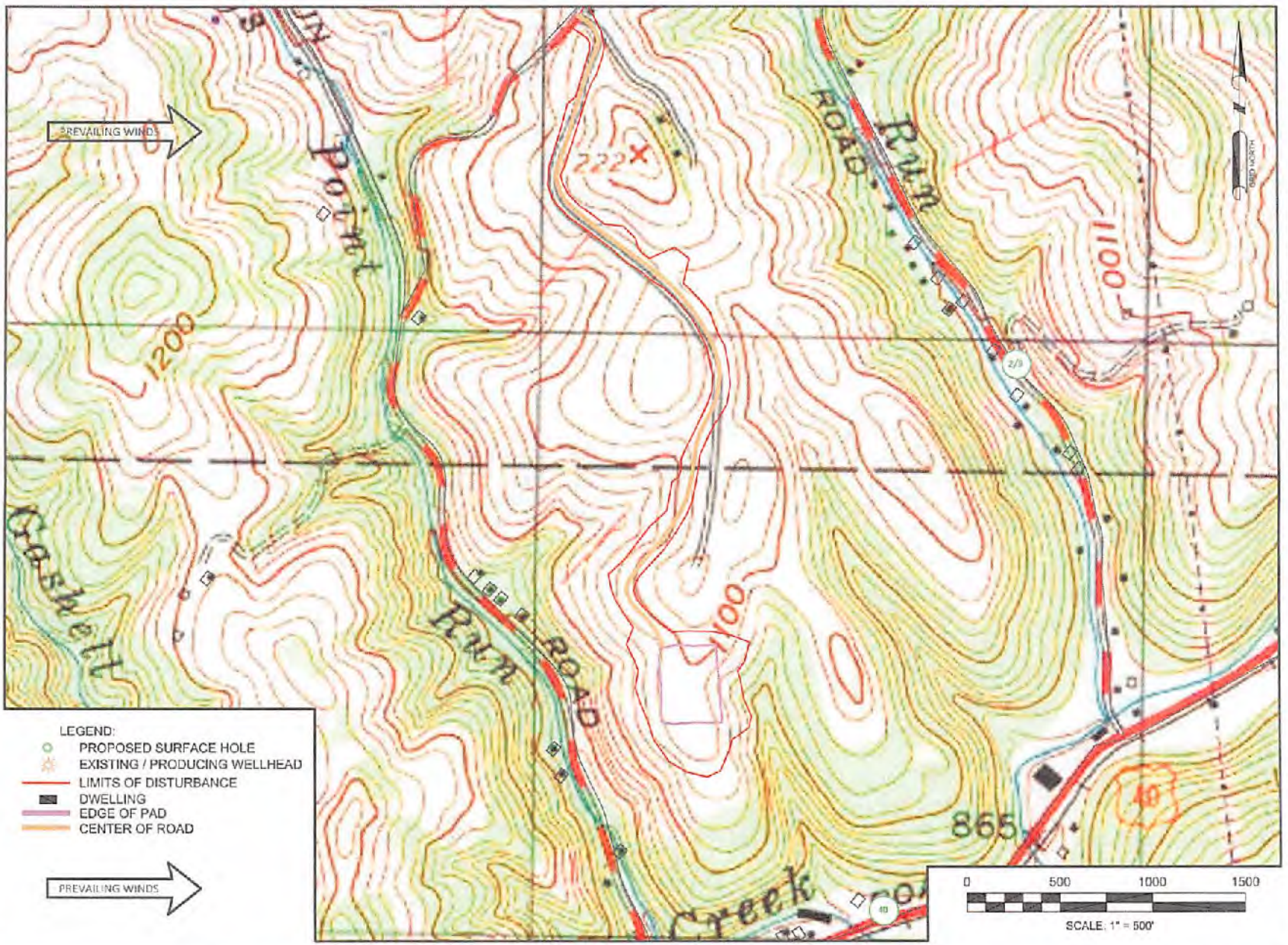
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

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SWN
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PROJECT #:	2022-027 OCC A OH PAD	Drawn:	CLW
DATE:	02/21/22	Design:	CLW
SCALE:	AS NOTED	Checked:	CLW

FLARE MAP
FOR
OCC A OH1 PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
FLARE MAP

PLAN TYPE:	Sheet #:
FINAL	1

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ATTACHMENT 5
1-MILE RADIUS TOPO MAP

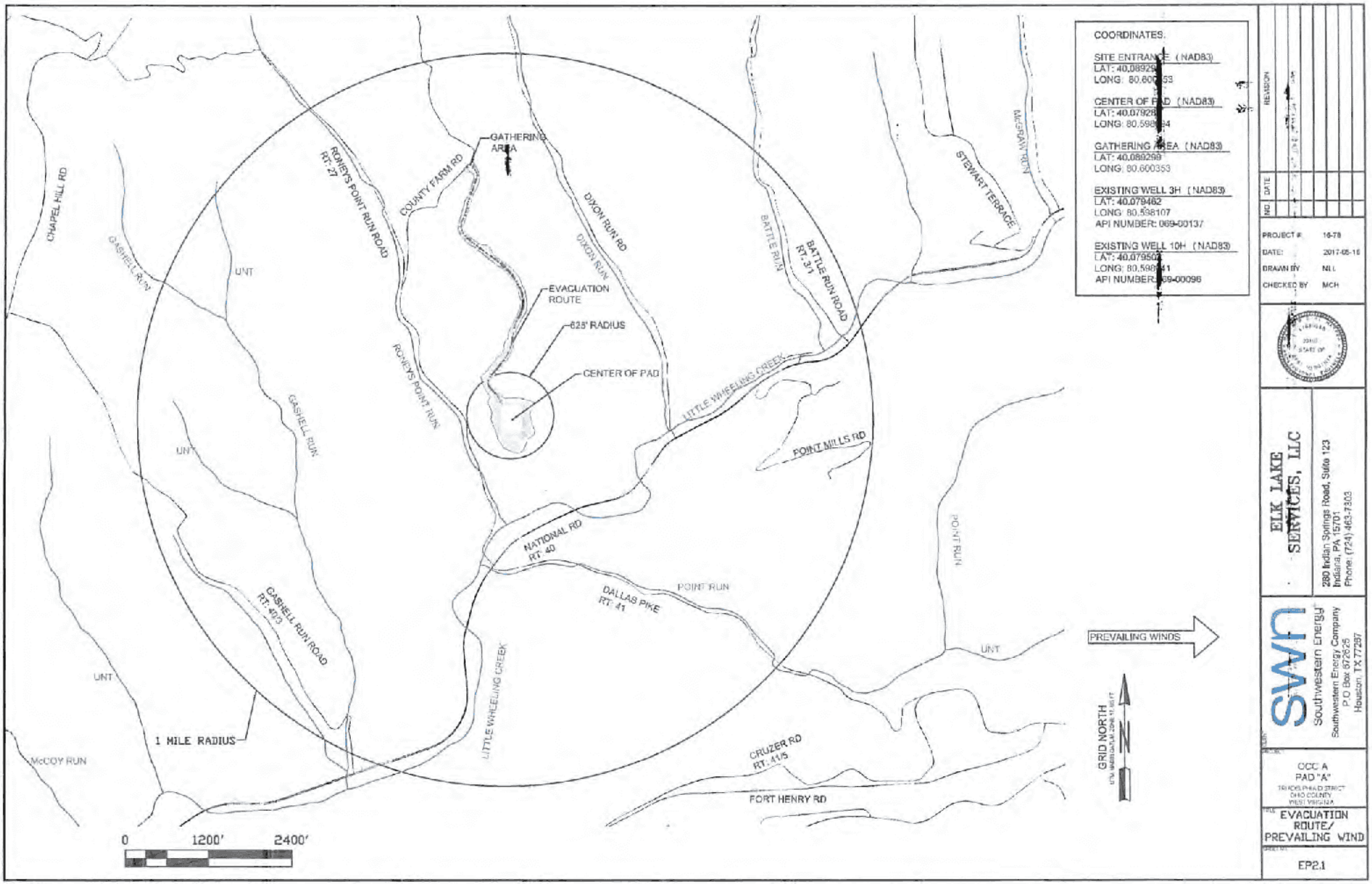
Legend

- OCCA_1_Mile
- OCCA_Pad
- CEMETERIES
- CHURCHES
- SCHOOLS

OCCA-1Mile
Ohio County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN



NO	DATE	REVISION

PROJECT #: 16-78
DATE: 2017-05-16
DRAWN BY: NLL
CHECKED BY: MCH

ELK LAKE SERVICES, LLC
280 Indian Springs Road, Suite 123
Indiana, PA 15701
Phone: (724) 463-7303

SWN Southwestern Energy
Southwestern Energy Company
P.O Box 872625
Houston, TX 77287

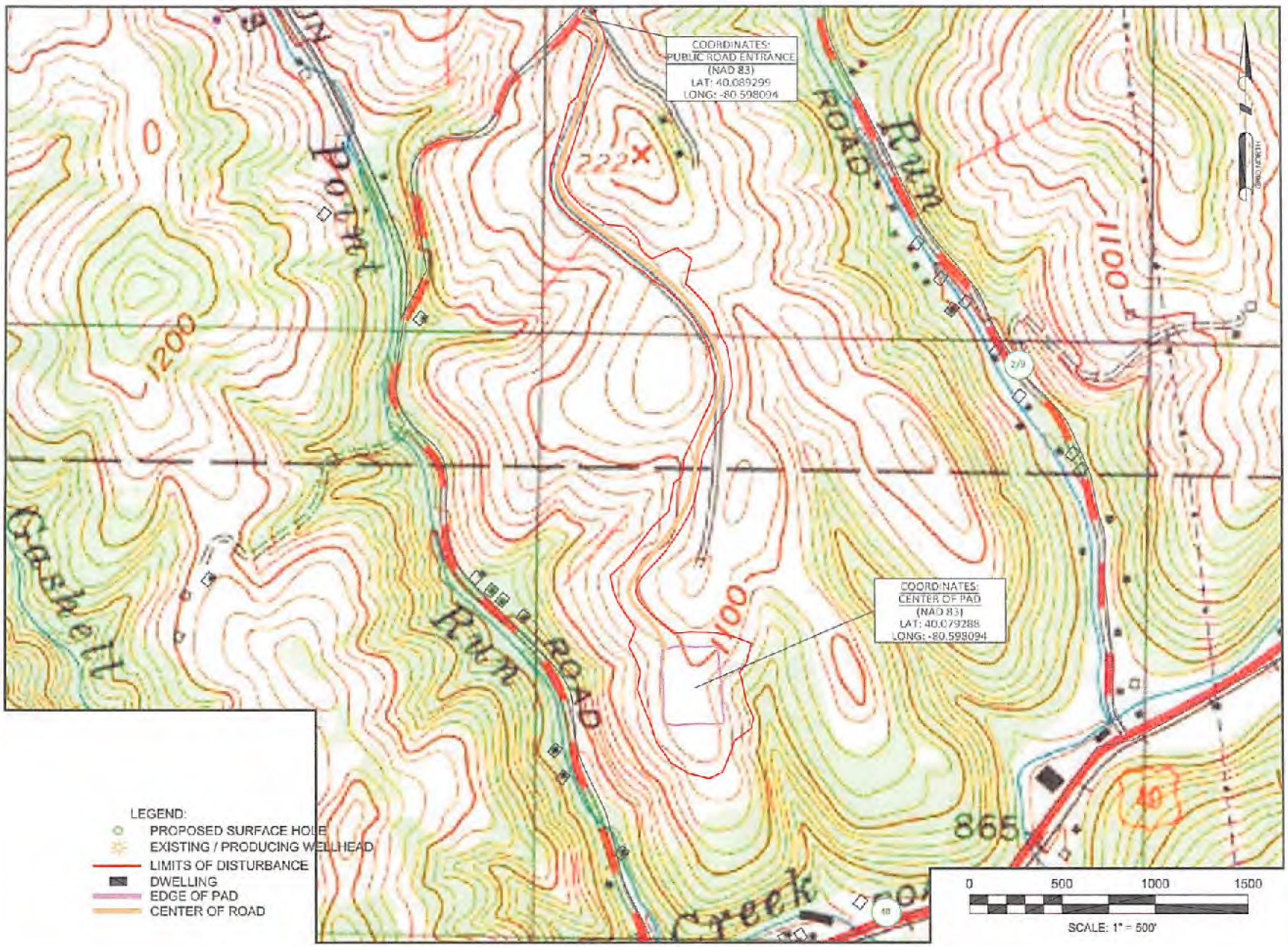
OCC A
PAD "A"
TRIADELPHIA DISTRICT
OHIO COUNTY
WEST VIRGINIA

TITLE: EVACUATION ROUTE/ PREVAILING WIND

SHEET NO: EP2.1

U:\2016\Southwestern Energy\16-78 OCC A\SITE DESIGN

ATTACHMENT 7
WELL LOCATION TOPO MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

swn
Southwestern Energy®

SEAL

JHA Companies
SURVEYORS
ENGINEERS
ENVIRONMENTAL
GIS MAPPING
www.jhacompanies.com
68011 VINEYARD ROAD
ST. CLAIRSVILLE, OH 43950
(740) 695-6100
PA * OH * NY * WV

PROJECT #: 2022-027 OCC A OHI PAD	Drawn: CLW
DATE: 02/2/22	Design: CLW
SCALE: AS NOTED	Checked: CLW

FLARE MAP
FOR
OCC A OHI PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
ACCESS ROAD MAP

PLAN TYPE	SHEET NO.
FINAL	2

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ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-8657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	(304) 884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Dave Bert (Interm)	Vice President HSE	(570) 996-4201		
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5516	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Cole Barron	Senior Drilling Engineer	(832) 796-2966	(281) 777-2027	
Daniel Hughes	Well Site Supervisor II		(681) 433-9272	
Joel Still	Well Site Supervisor II		(304) 439-4404	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	
Completions				
Aaron Balderson	Completions Superintendent	(304) 884-1638	(713) 829-4638	

Last Revised 3/4/2022

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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3. PAD PREPARATION 4
4. FRAC MOBILIZATION 4
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6. CONTINGENCY OPERATIONS 8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation or modification where necessary and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.
If the production pad is detached from the completion activity pad the standard production practice dictates monitoring.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak:** Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak**: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
   a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

4706900342

MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: OCC A OHI 401H
Valley Grove QUAD
Triadelphia DISTRICT
OHIO COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 2/15/2022

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: [signature] Date: 3/8/2022

Title: Inspector

Approved by:

Name:_____ Date: _____

Title: _____

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WV Department of
Environmental Protection

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1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Ohio County	911 or 304-234-3811
State Police	Ohio County	911 or 304-238-1100
Ambulance Service	Ohio County	911 or 304-227-4357
Hospital	Ohio County	304-234-0123
Fire Department	Ohio County	911 or 304-234-3756
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Inspector Supervisor	Doug Newlon	(304) 932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	832-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Primary Safety Officer	
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Remediation/Cleanup	Ryan Environmental	304-842-5578
Heavy Equipment	Burns Drilling	724-428-4361
Heavy Equipment/Rouster	Roughcut	501-827-1221
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
None- See 1-Mile Map		

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Shawn Jackson	Completions Superintendent	304-541-3204
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	

**In addition, SWN Wellsite supervisors must maintain current well control certification.

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

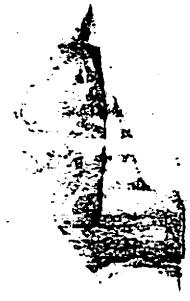
See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9



3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commence

C. Muster, Secure the Area, and Restrict Access

All personnel shall be directed to the Muster Area and shall remain there until the person in charge (the acting incident commander) deems it safe for further movement (i.e., a complete evacuation from site). This is assuming that the muster area is unaffected by the incident and has been deemed a safe area.

In event of a well control emergency, all personnel should gather at a safe upwind location. This location should be pre-determined and take into account the possibility of secondary explosions. The primary muster point should be upwind of the prevailing direction with at least one alternate site. (See Attachment 6)

All roads in the immediate area leading to the location shall be secured. If an emergency event presents a hazard to public roadways, the local law enforcement agencies shall be contacted to establish the necessary road closures. Local law enforcement agencies can be contacted through the 911 operator. (Refer to section 1.0 "Contacts, Schedules, And Meetings")

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

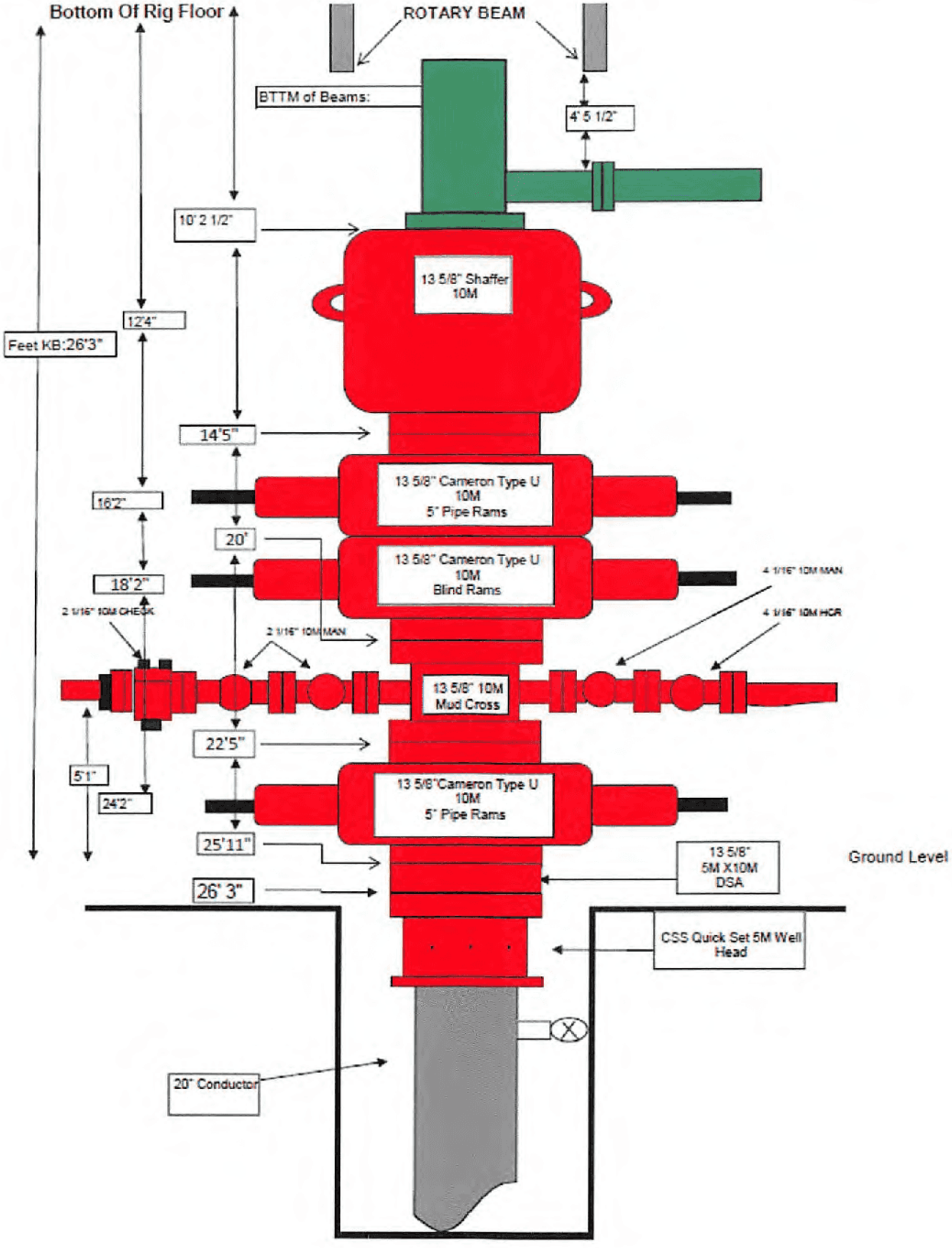
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20"
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
2 1/16" 10M CHECK
4 1/16" 10M HCR
2 1/16" 10M MAN
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

D. Personnel with Well Control Training

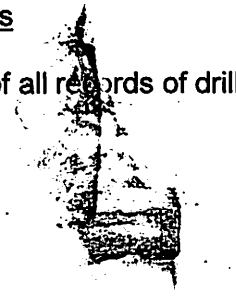
At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.



These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

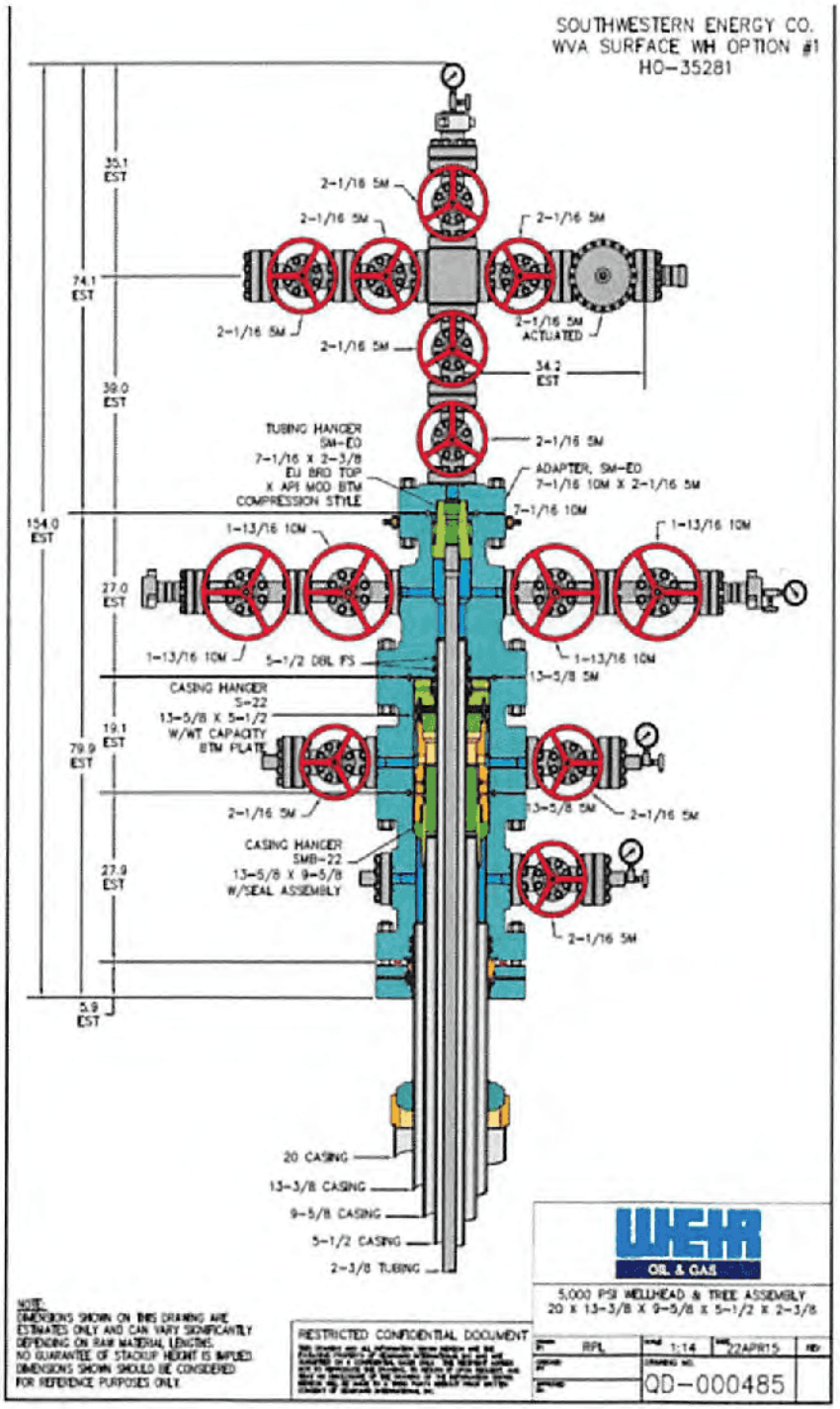
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
HO-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
79.9 EST
19.1 EST
27.9 EST
5.9 EST
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
TUBING HANGER 5M-EO 7-1/16 X 2-3/8 EU BRD TOP X API MOD BTM COMPRESSION STYLE
ADAPTER, 5M-EO 7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
5-1/2 DBL FS
13-5/8 5M
CASING HANGER S-22 13-5/8 X 5-1/2 W/WT CAPACITY BTM PLATE
CASING HANGER SMB-22 13-5/8 X 9-5/8 W/SEAL ASSEMBLY
20 CASING
13-3/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS. NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED. DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
WEIR OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RPL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

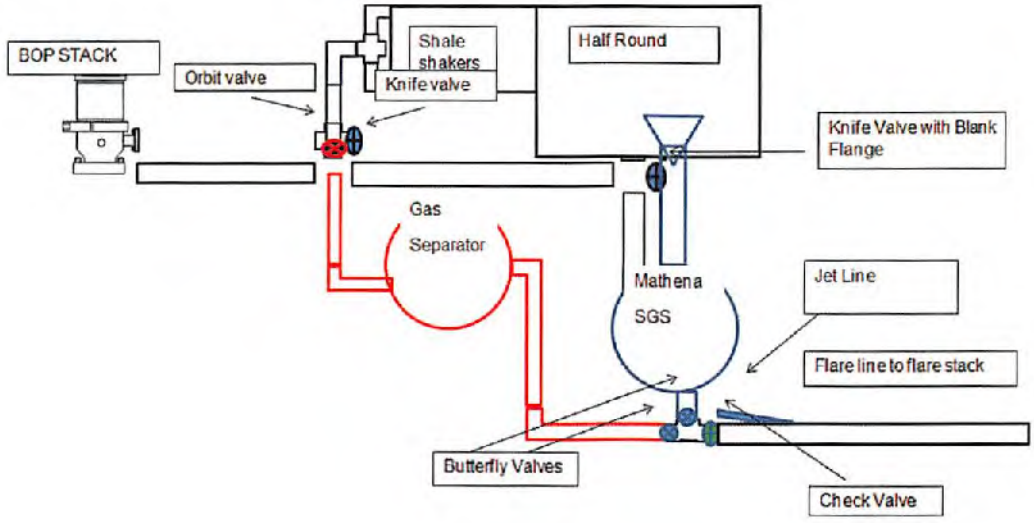
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

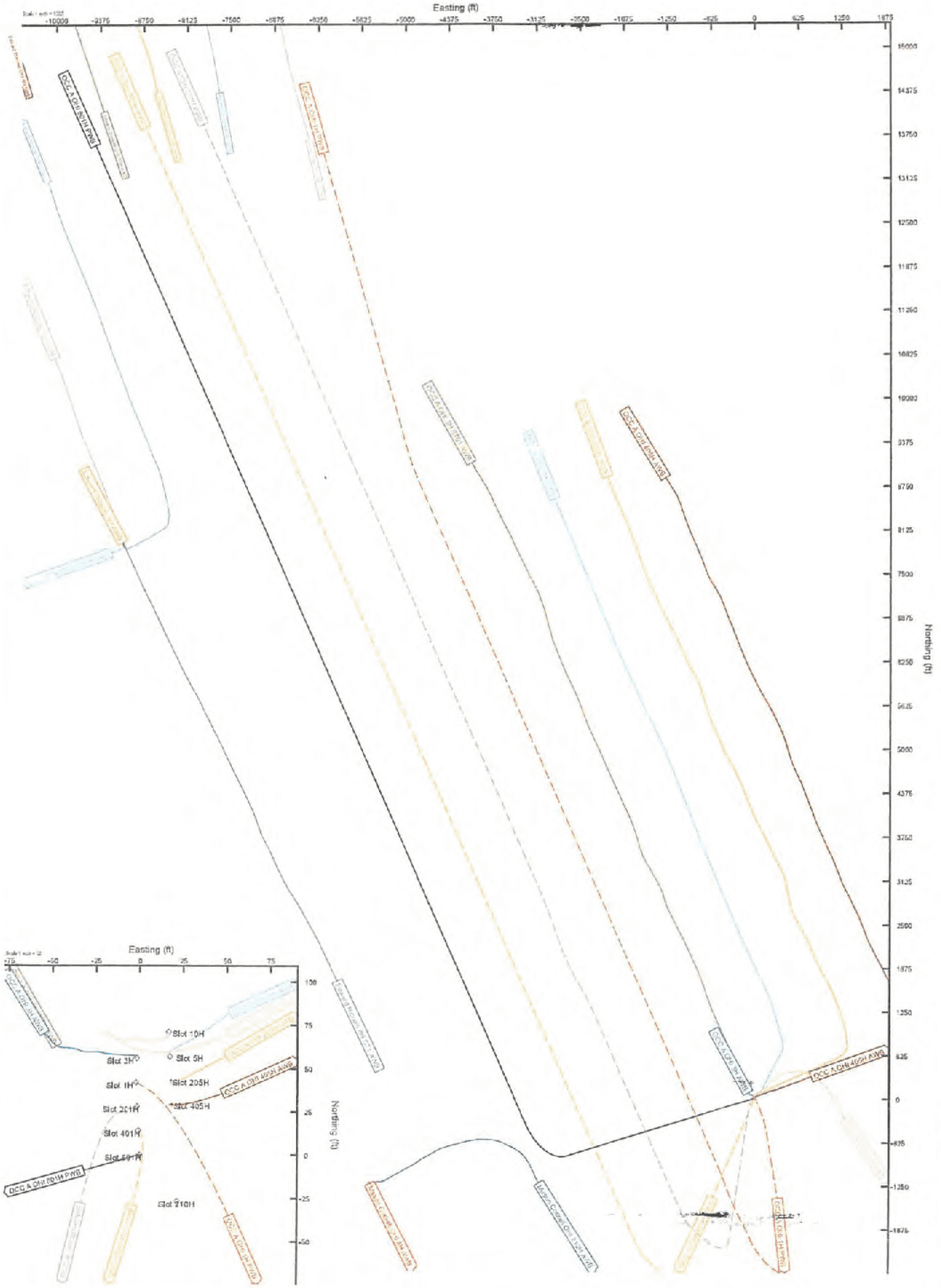
Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

SWN PRODUCTION COMPANY, LLC

Location: Ohio County, WV
Field: Ohio WV
Facility: OCC A OHI Pad

Slot:
Well: OCC A OHI
Wellbore: OCC A OHI



calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 3
VISITOR SIGN IN SHEET

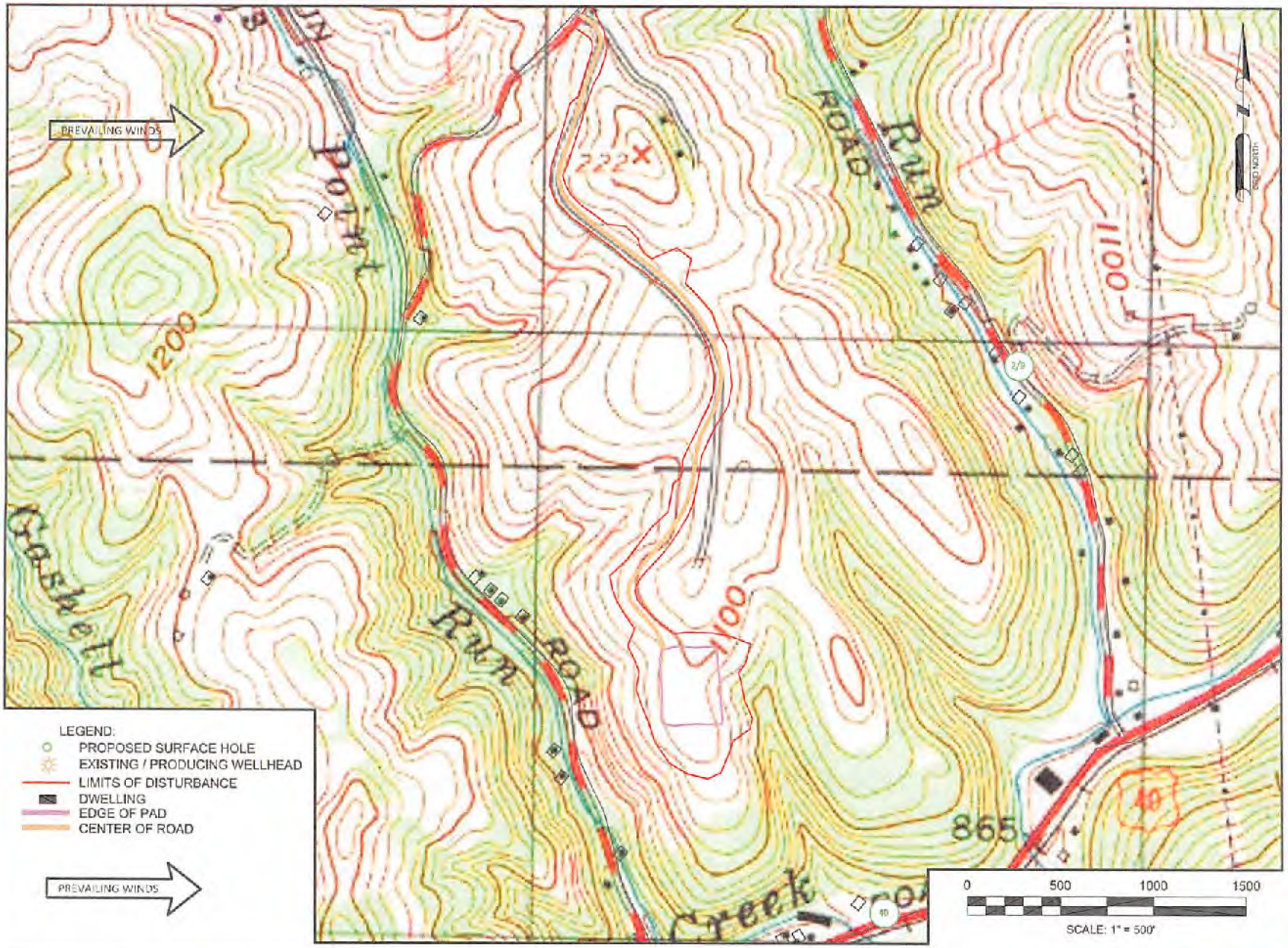
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



PROJECT LOCATION

LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

SWN
Southwestern Energy

SEAL

JHA Companies
SURVEYORS
ENGINEERS
ENVIRONMENTAL
GIS MAPPING
www.jhacompanies.com
68011 VINEYARD ROAD
ST. CLAIRSVILLE, OH 43950
(740) 695-6100
PA * OH * NY * WV

PROJECT ID	2020-0327 OCC A OH PAD	DRAWN	CLW
DATE	02/21/20	DESIGN	CLW
SCALE	AS NOTED	CHECKED	CLW

FLARE MAP
FOR
OCC A OH PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE
FLARE MAP

PLAN TYPE	SHEET NO.
FINAL	1

THESE DRAWINGS SHALL NOT BE USED IN ANY MANNER, FOR ANY CONSTRUCTION WORK, THE WRITTEN PERMISSION OF JHA COMPANIES

ATTACHMENT 5
1-MILE RADIUS TOPO MAP

Legend

- OCCA_1_Mile
- OCCA_Pad
- CEMETERIES
- CHURCHES
- SCHOOLS

OCCA-1Mile
Ohio County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN

COORDINATES:

SITE ENTRANCE (NAD83)
LAT: 40.089299
LONG: 80.600353

CENTER OF PAD (NAD83)
LAT: 40.079288
LONG: 80.598694

GATHERING AREA (NAD83)
LAT: 40.089299
LONG: 80.600353

EXISTING WELL 3H (NAD83)
LAT: 40.079462
LONG: 80.598107
API NUMBER: 069-00137

EXISTING WELL 10H (NAD83)
LAT: 40.079502
LONG: 80.598241
API NUMBER: 069-00096

NO.	DATE	REVISION

PROJECT #: 16-78
DATE: 2017-05-16
DRAWN BY: NLL
CHECKED BY: MCH

ELK LAKE SERVICES, LLC
280 Indian Springs Road, Suite 123
Indiana, PA 15701
Phone: (724) 463-7303

SWN Southwestern Energy
Southwestern Energy Company
P O Box 5726525
Houston, TX 77267

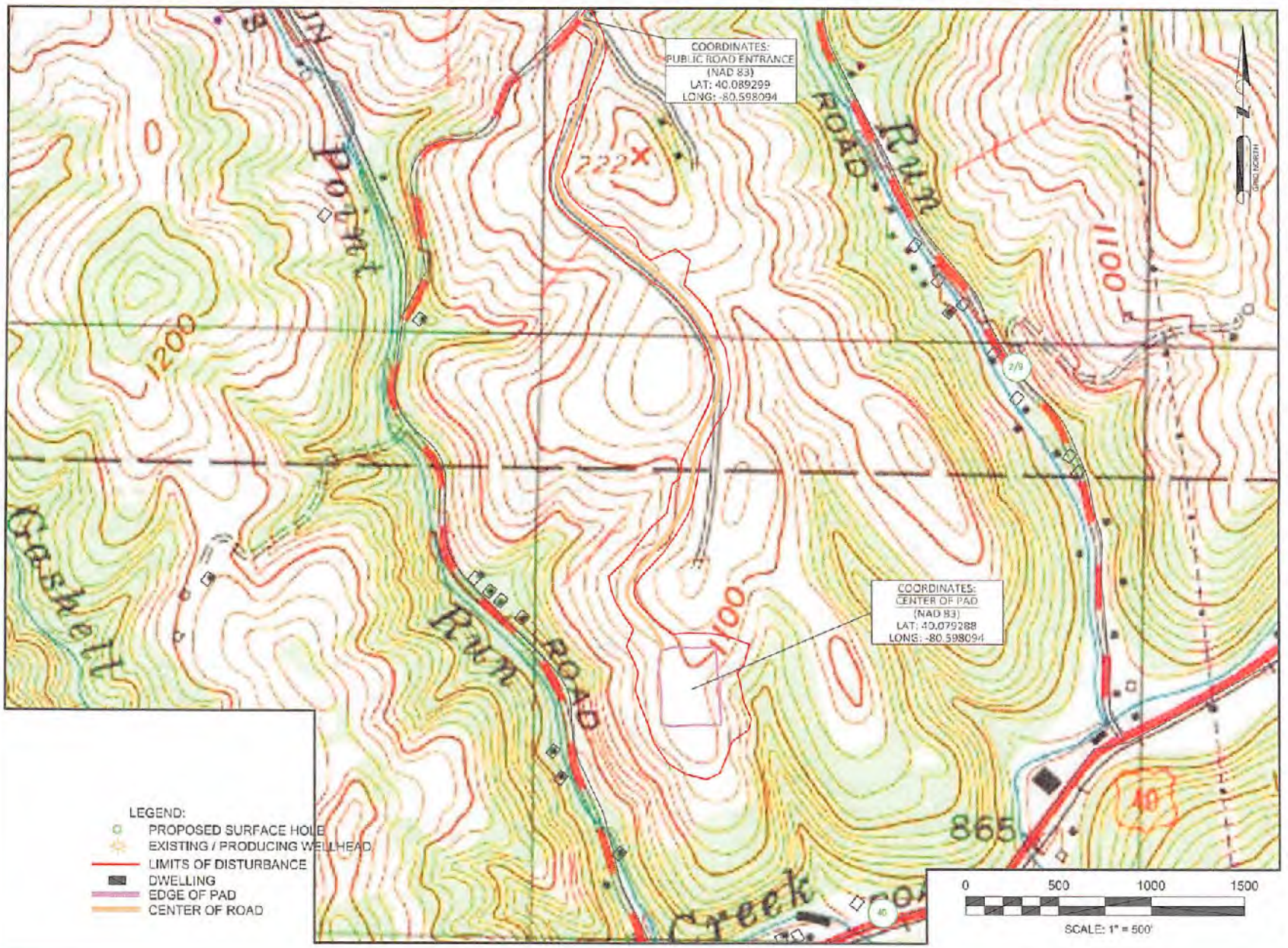
OCC A
PAD "A"
TRIADELPHIA DISTRICT
OHIO COUNTY
WEST VIRGINIA

EVACUATION ROUTE/ PREVAILING WIND

EP2.1

U:\2016\Southwestern Energy\16-78 OCC A\SITE DESIGN

ATTACHMENT 7
WELL LOCATION TOPO MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
(800) 245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

swn
Southwestern Energy®

SEAL

JHA Companies
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ST. CLAIRSVILLE, OH 43950
(740) 695-6100
PA * OH * NY * WV

PROJECT #	2025A030 OCC A CHI PAD	DRAWN:	CLW
DATE:	10/01/25	CHKD:	CLW
SCALE:	AS NOTED	CHECKED:	CLW

FLARE MAP
FOR
OCC A CHI PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
ACCESS ROAD MAP

PLAN TYPE:	SHEET NO.
FINAL	2

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ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	(304) 884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Dave Bert (Interm)	Vice President HSE	(570) 996-4201		
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5518	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Cole Barron	Senior Drilling Engineer	(832) 796-2966	(281) 777-2027	
Daniel Hughes	Well Site Supervisor II		(681) 433-9272	
Joel Still	Well Site Supervisor II		(304) 439-4404	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	
Completions				
Aaron Balderson	Completions Superintendent	(304) 884-1638	(713) 829-4638	

Last Revised 3/4/2022

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation or modification where necessary and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.
If the production pad is detached from the completion activity pad the standard production practice dictates monitoring.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak:** Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak**: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

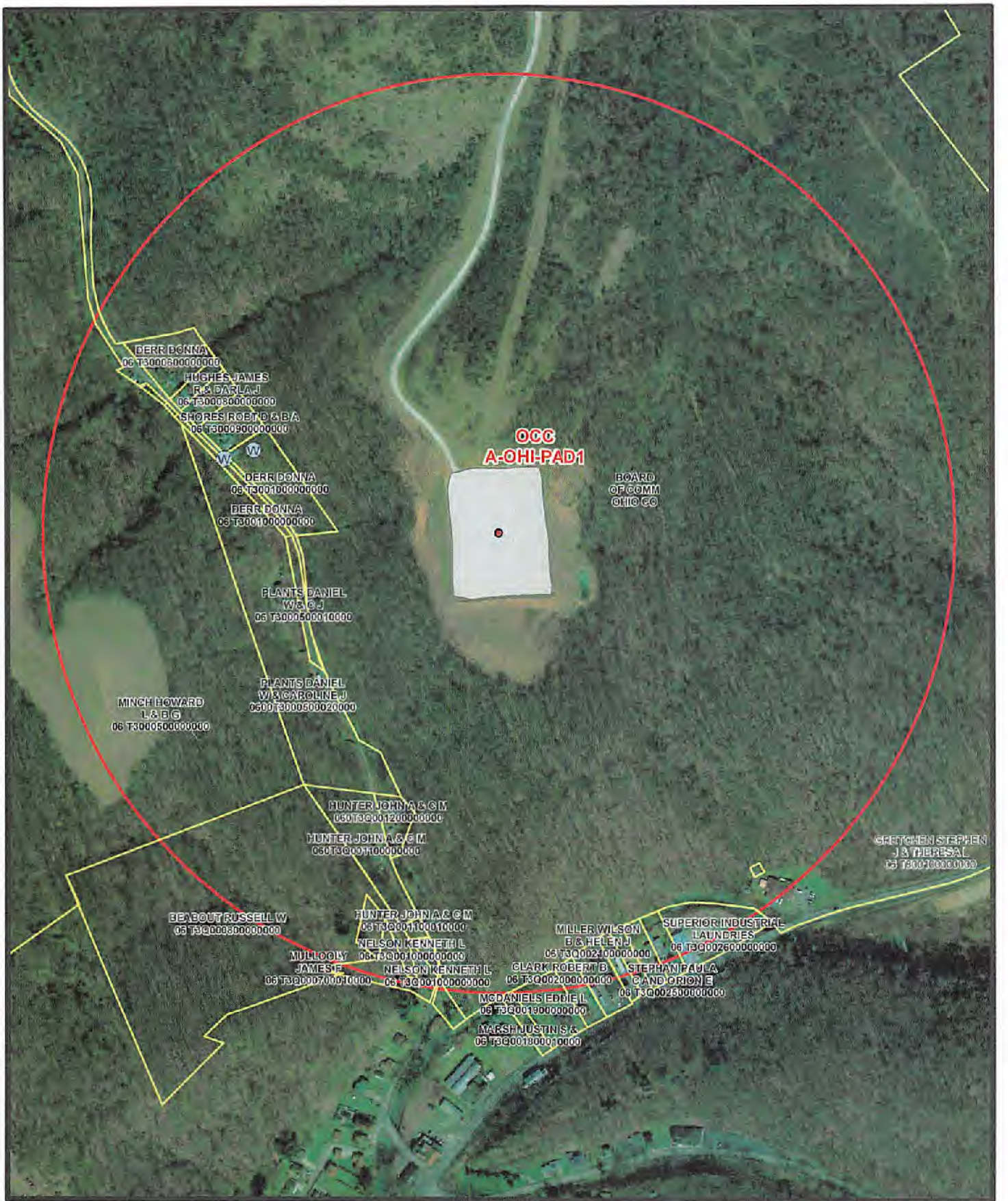
5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
   a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.



N

1 in = 417 ft

0 0.025 0.05 0.1 0.15 0.2

Coordinate System: NAD 1983 UTM Zone 17N
Units: Meter

S Spring
W Water Well
P Pond
Parcel
1500' Buffer

Coordinates: 40.079317, -80.598057

Water Purveyor Map
Well Pad: OCC A Pad
County: OHI

SWN Southwestern Energy®

Date: 2/14/2022 | Author: willisb

4706900343

MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: OCC A OHI 601H
Valley Grove QUAD
Triadelphia DISTRICT
OHIO COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 2/15/2022

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: Wayne Knox Date: 3/8/2022

Title: Inspector

Approved by:

Name:_____ Date: _____

Title: _____

RECEIVED
Office of Oil and Gas
APR 20 2022
WV Department of
Environmental Protection

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DRILLING SIMOPS MANUAL

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Attachment 9	Completions SimOps Manual

1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Ohio County	911 or 304-234-3811
State Police	Ohio County	911 or 304-238-1100
Ambulance Service	Ohio County	911 or 304-227-4357
Hospital	Ohio County	304-234-0123
Fire Department	Ohio County	911 or 304-234-3756
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Inspector Supervisor	Doug Newlon	(304) 932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	832-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Primary Safety Officer	
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Remediation/Cleanup	Ryan Environmental	304-842-5578
Heavy Equipment	Burns Drilling	724-428-4361
Heavy Equipment/Rouster	Roughcut	501-827-1221
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
None- See 1-Mile Map		

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Shawn Jackson	Completions Superintendent	304-541-3204
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	

**In addition, SWN Wellsite supervisors must maintain current well control certification.

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commence

C. Muster, Secure the Area, and Restrict Access

All personnel shall be directed to the Muster Area and shall remain there until the person in charge (the acting incident commander) deems it safe for further movement (i.e., a complete evacuation from site). This is assuming that the muster area is unaffected by the incident and has been deemed a safe area.

In event of a well control emergency, all personnel should gather at a safe upwind location. This location should be pre-determined and take into account the possibility of secondary explosions. The primary muster point should be upwind of the prevailing direction with at least one alternate site. (See Attachment 6)

All roads in the immediate area leading to the location shall be secured. If an emergency event presents a hazard to public roadways, the local law enforcement agencies shall be contacted to establish the necessary road closures. Local law enforcement agencies can be contacted through the 911 operator. (Refer to section 1.0 "Contacts, Schedules, And Meetings")

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

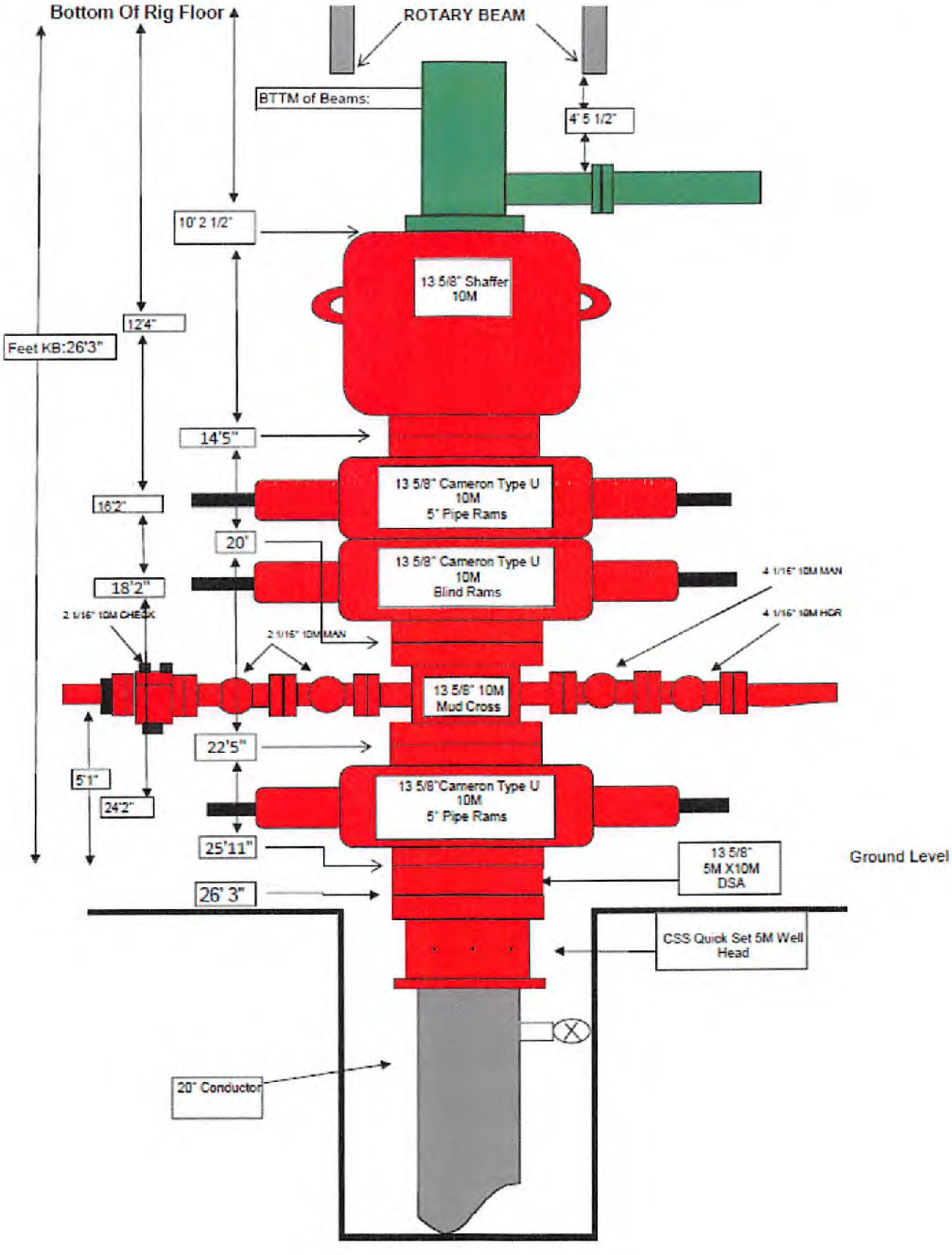
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20'
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
4 1/16" 10M HCR
2 1/16" 10M CHECK
2 1/16" 10M MAN
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

D. Personnel with Well Control Training

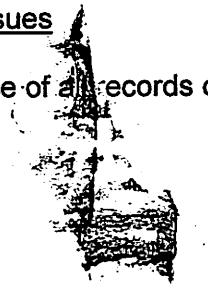
At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.



These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

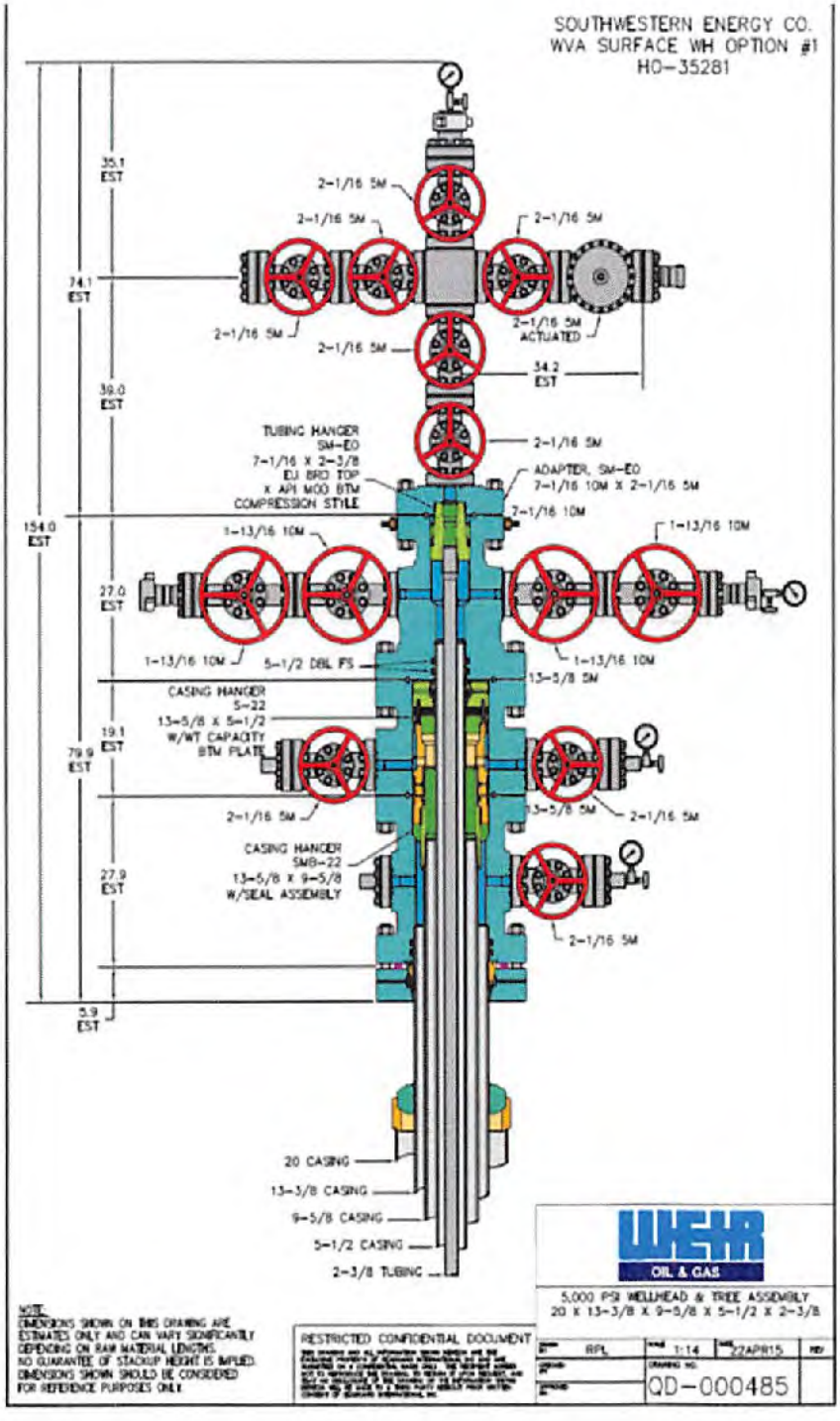
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
HO-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
79.9 EST
19.1 EST
27.9 EST
5.9 EST
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
TUBING HANGER
SM-EO
7-1/16 X 2-3/8
EU BRD TOP
X API MOD BTM
COMPRESSION STYLE
ADAPTER, SM-EO
7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
5-1/2 DBL FS
13-5/8 5M
CASING HANGER
5-22
13-5/8 X 5-1/2
W/WT CAPACITY
BTM PLATE
CASING HANGER
SMB-22
13-5/8 X 9-5/8
W/SEAL ASSEMBLY
20 CASING
13-3/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE
ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY
DEPENDING ON RAW MATERIAL LENGTHS.
NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED.
DIMENSIONS SHOWN SHOULD BE CONSIDERED
FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RPL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

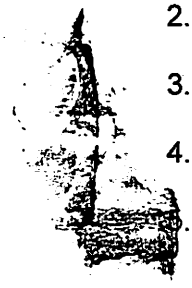
A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location



C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

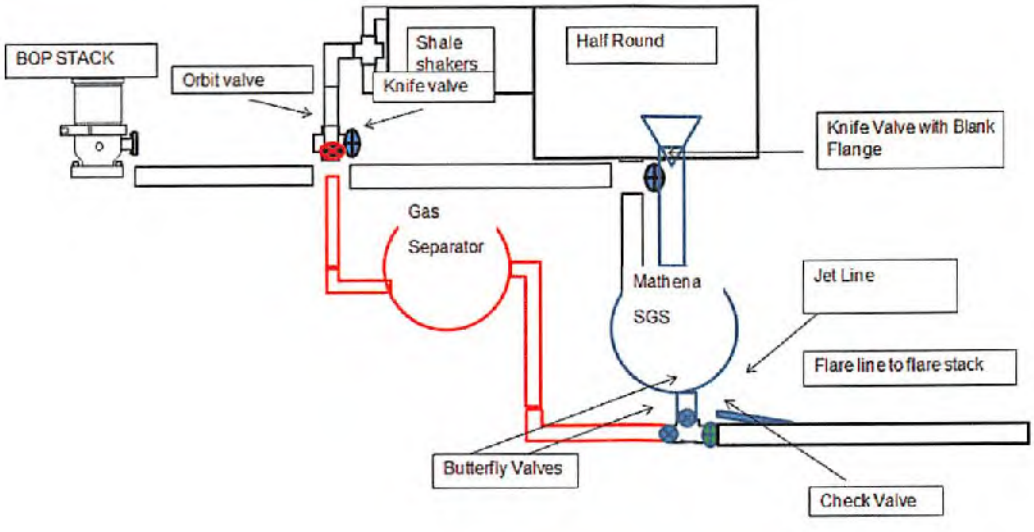
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

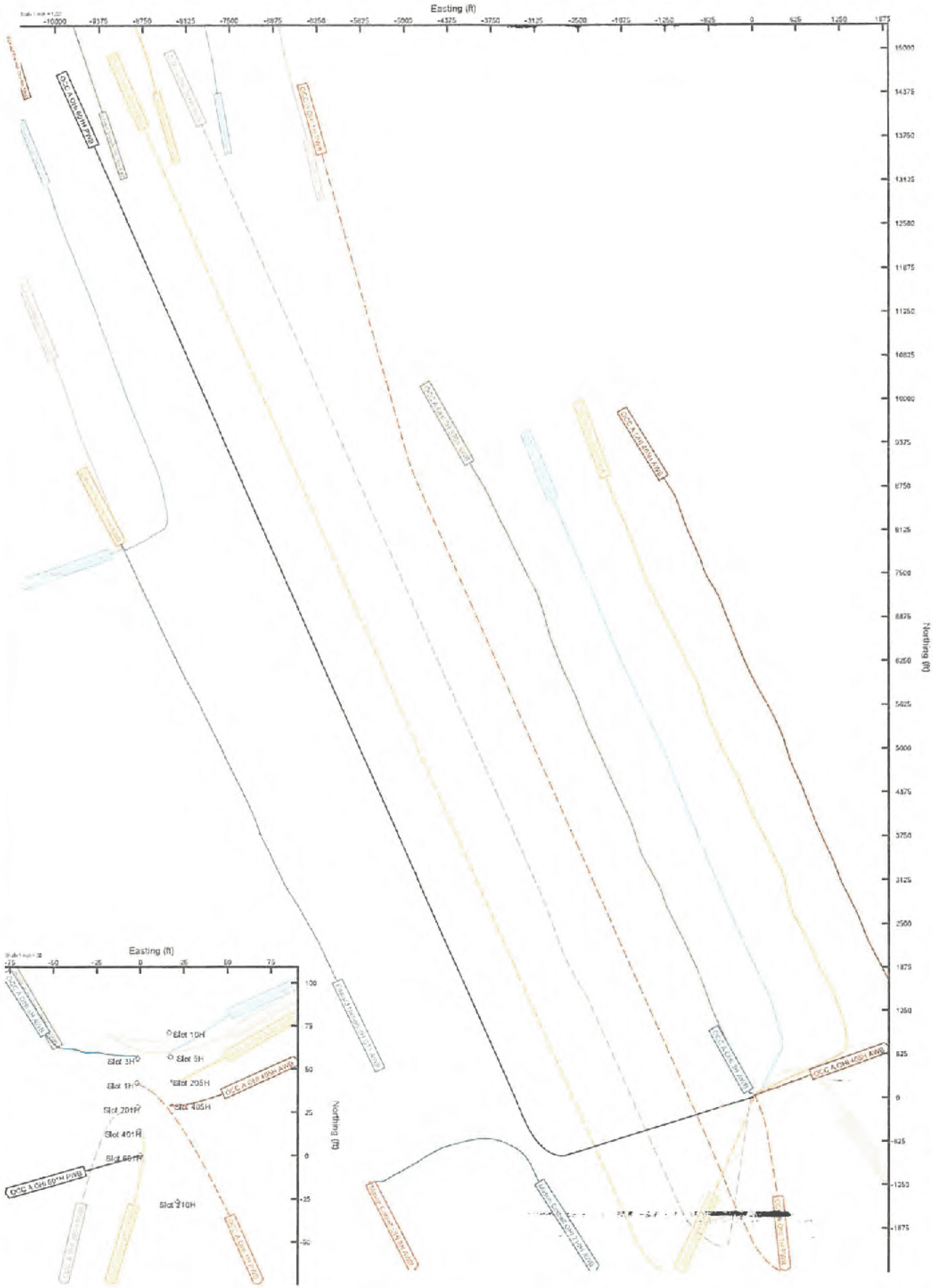
In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

SWN PRODUCTION COMPANY, LLC

Location: Ohio County, WV
Field: Ohio VW
Facility: OCC A OHI Pad
Slot:
Well: OCC A OHI
Wellbore: OCC A OHI



calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

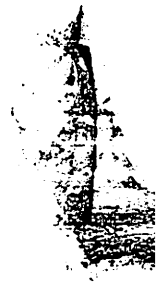
Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)



ATTACHMENT 3
VISITOR SIGN IN SHEET

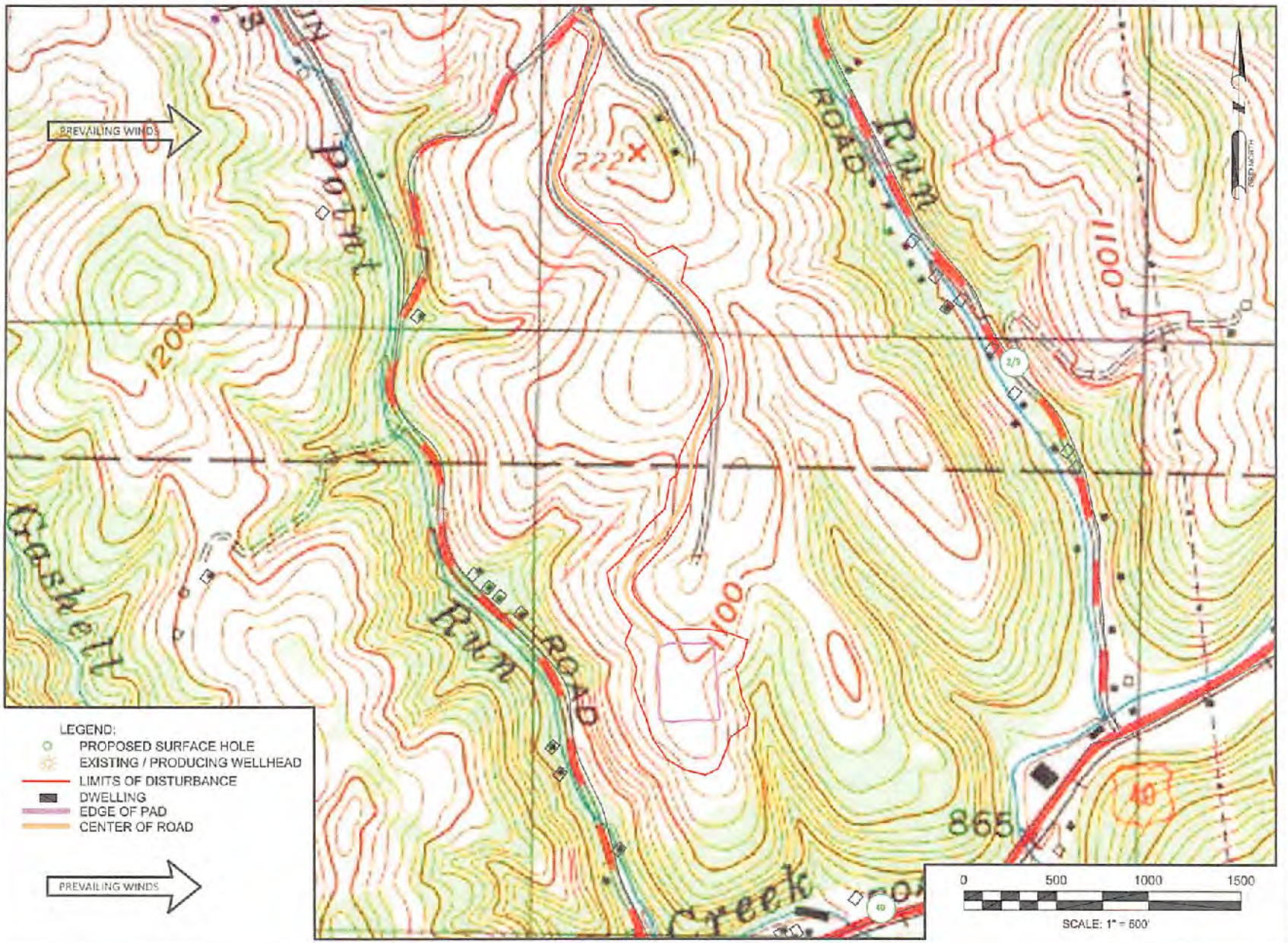
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:
SWN
Southwestern Energy

SEAL

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GIS MAPPING
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ST. CLAIRSVILLE, OH 43950
(740) 695-6100
PA * OH * NY * WV

PROJECT ID: 2022-0227 OCC A OHI PAD	DRAWN: CLW
DATE: 8/25/22	DESIGN: CLW
SCALE: AS NOTED	CHECKED: CLW

FLARE MAP
FOR
OCC A OHI PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
FLARE MAP

PLAN TYPE:	SHEET NO.
FINAL	1

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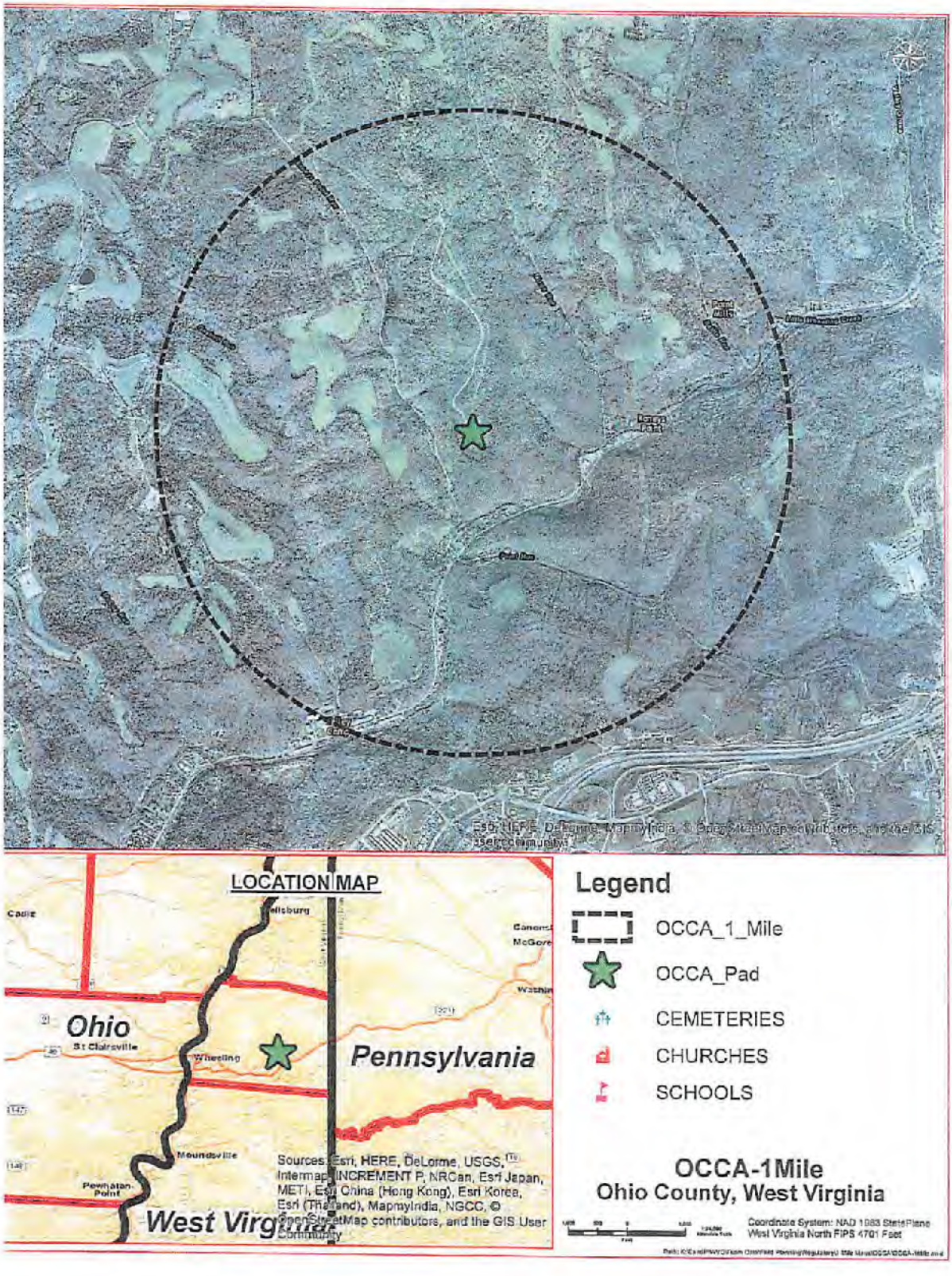
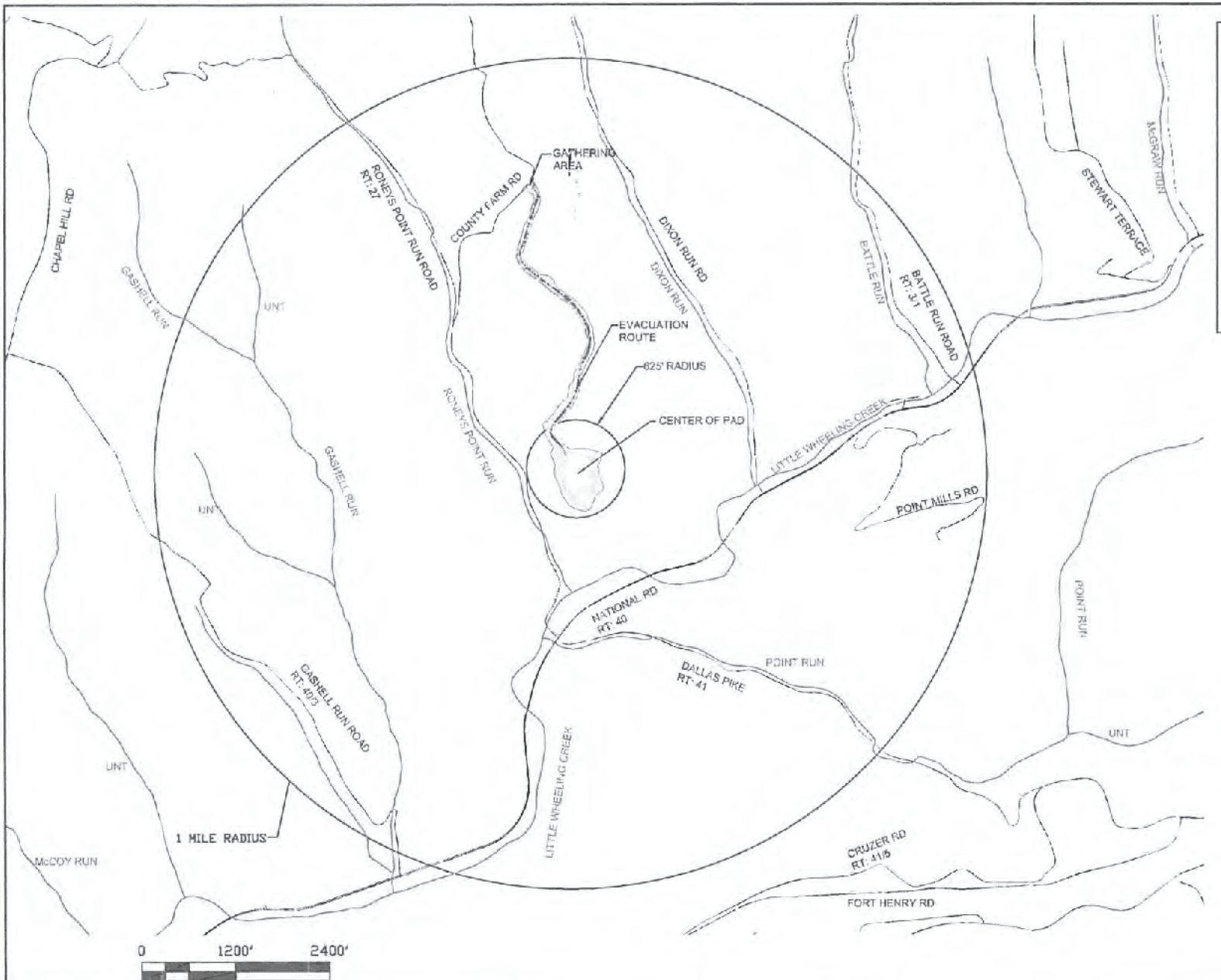
ATTACHMENT 5
1-MILE RADIUS TOPO MAP


LOCATION MAP
Ohio
Pennsylvania
West Virginia
Wheeling
Moundsville
Pennsylvania
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
Legend
OCCA_1_Mile
OCCA_Pad
CEMETERIES
CHURCHES
SCHOOLS
OCCA-1Mile
Ohio County, West Virginia
Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN



COORDINATES:

SITE ENTRANCE (NAD83)
LAT: 40.089299
LONG: 80.600353

CENTER OF PAD (NAD83)
LAT: 40.079288
LONG: 80.598094

GATHERING AREA (NAD83)
LAT: 40.089299
LONG: 80.600353

EXISTING WELL 3H (NAD83)
LAT: 40.079462
LONG: 80.598107
API NUMBER: 069-00137

EXISTING WELL 10H (NAD83)
LAT: 40.079502
LONG: 80.598041
API NUMBER:069-00096

NO.	DATE	REVISION

PROJECT #: 16-78
DATE: 2017-05-16
DRAWN BY: NLL
CHECKED BY: MCH

ELK LAKE SERVICES, LLC
280 Indian Springs Road, Suite 123
Indiana, PA 15701
Phone: (724) 463-7303

SWN Southwestern Energy
Southwestern Energy Company
P.O Box 872825
Houston, TX 77287

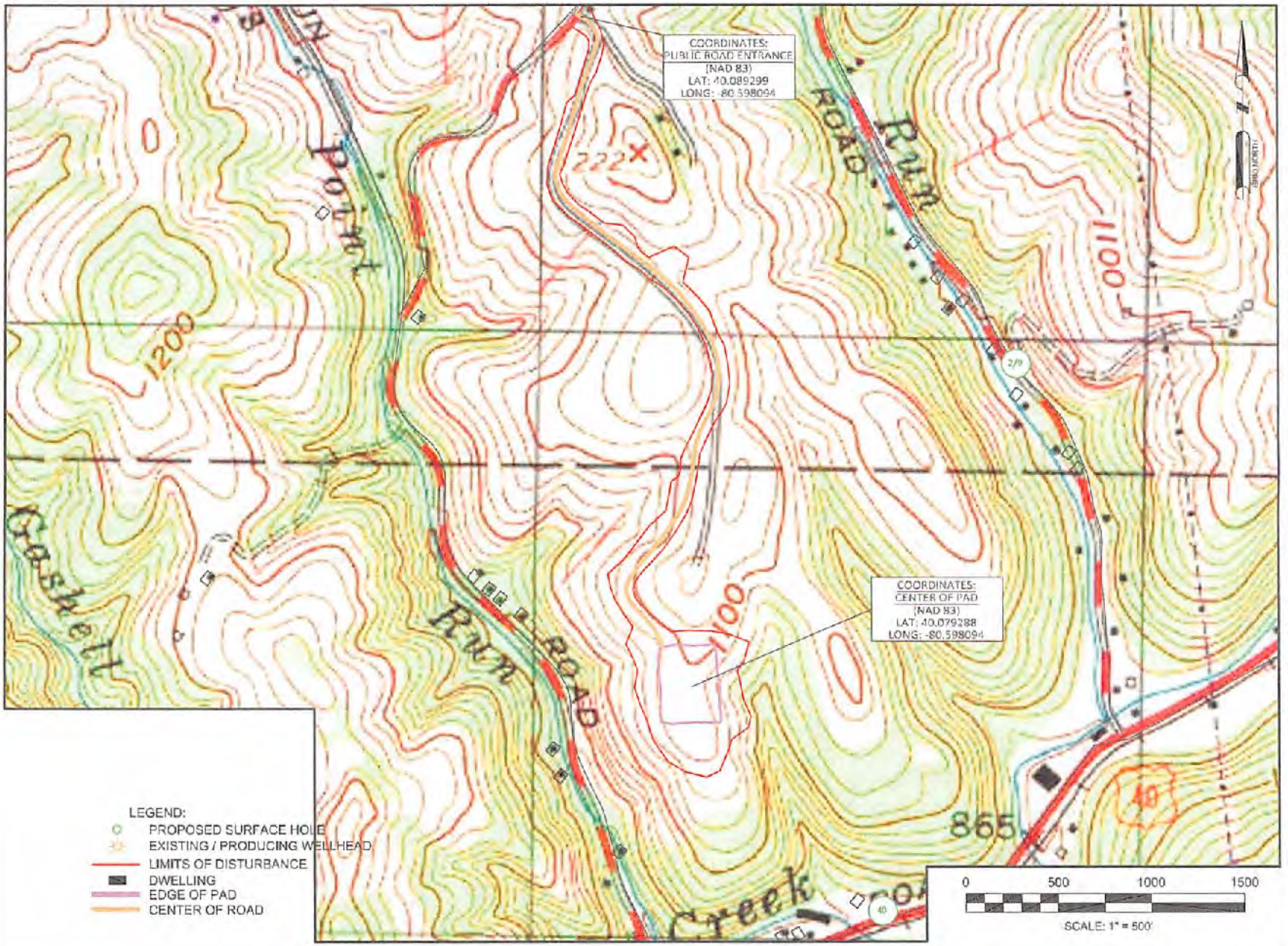
OCC A
PAD "A"
TRIADELPHIA DISTRICT
OHIO COUNTY
WEST VIRGINIA

EVACUATION ROUTE/ PREVAILING WIND

EP2.1

U:\2016\Southwestern Energy\16-78 OCC A\SITE DESIGN

ATTACHMENT 7
WELL LOCATION TOPO MAP



LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

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Southwestern Energy

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PROJECT #:	2022-0020 OCC A OHI PAD	DRAWN:	CLW
DATE:	09/09/22	DESIGN:	CLW
SCALE:	AS NOTED	CHECKED:	CLW

FLARE MAP
FOR
OCC A OHI PAD
LOCATED IN TRIADELPHIA DISTRICT
OHIO COUNTY, WEST VIRGINIA

TITLE:
ACCESS ROAD MAP

PLAN TYPE:	SHEET NO.
FINAL	2

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ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	(304) 884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Dave Bert (Interm)	Vice President HSE	(570) 996-4201		
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Kellman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 841-5518	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Cole Barron	Senior Drilling Engineer	(832) 796-2966	(281) 777-2027	
Daniel Hughes	Well Site Supervisor II		(681) 433-9272	
Joel Still	Well Site Supervisor II		(304) 439-4404	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	
Completions				
Aaron Balderson	Completions Superintendent	(304) 884-1638	(713) 829-4638	

Last Revised 3/4/2022

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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4. FRAC MOBILIZATION....4
5. COMPLETIONS OPERATIONS....5
6. CONTINGENCY OPERATIONS....8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation or modification where necessary and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.
If the production pad is detached from the completion activity pad the standard production practice dictates monitoring.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak**: Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak**: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.

a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation or modification where necessary and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.
If the production pad is detached from the completion activity pad the standard production practice dictates monitoring.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
   - Wellheads (cellars)
   - Blender
   - Flowback tanks
   - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
   - Inside frac van
   - Tank loading area
   - Wellhead area
   - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak:** Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak:** LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
   a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

N

1 in = 417 ft

0 0.025 0.05 0.1 0.15 0.2 Miles

Coordinate System: NAD 1983 UTM Zone 17N
Units: Meter

Spring
Water Well
Pond
Parcel
1500' Buffer

Coordinates: 40.079317, -80.598057

Water Purveyor Map
Well Pad: OCC A Pad
County: OHI

SWN Southwestern Energy®

Date: 2/14/2022 | Author: willisb

MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: Charles Jamison MSH 810H
Cameron QUAD
Liberty DISTRICT
MARSHALL COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 9/28/2021

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name:_____ Date: _____

Title: _____

Approved by:

Name:_____ Date: _____

Title: _____

SWN PRODUCTION COMPANY, LLC – CONFIDENTIAL

B. S. 10-12-21

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J. ATTACHMENTS

Attachment 1	Pre-Spud Sign In Sheet
Attachment 2	Well Site Safety Meeting Sign In Sheet
Attachment 3	Visitor Sign In Sheet
Attachment 4	Plan View Map
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Attachment 7	Well Location Topo Map
Attachment 8	WV Notification Numbers
Attachment 9	Completions SimOps Manual

1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Marshall County	911 or 304-834-1500
State Police	Marshall County	911 or 304-834-4100
Ambulance Service	Marshall County	911 or 304-834-1500
Hospital	Marshall County	304-845-3211
Fire Department	Marshall County	911 or 304-842-1500
WV DEP Oil and Gas Inspector	Barry Stollings	304-552-4194
WV DEP Enforcement Supervisor	Doug Newlon	304-932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	304-541-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Safety Officer	304-884-1613 Office
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Heavy Equipment	Burns Drilling	724-428-4361
Roustabout	Apex	724-747-6100
Roustabout	Recon	740-609-3050
Roustabout	Platinum	678-994-2833 724-884-5477
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
Greenwood School (Historical)	Cameron, WV 26033	Historical Society 304-845-3692
Courtwright School (Historical)	Cameron, WV 26033	Historical Society 304-845-3692

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Barry Stollings

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and

- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	
Eric Draxten	Drilling Superintendent	501-269-4393

**In addition, SWN Wellsite supervisors must maintain current well control certification.

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commences.

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

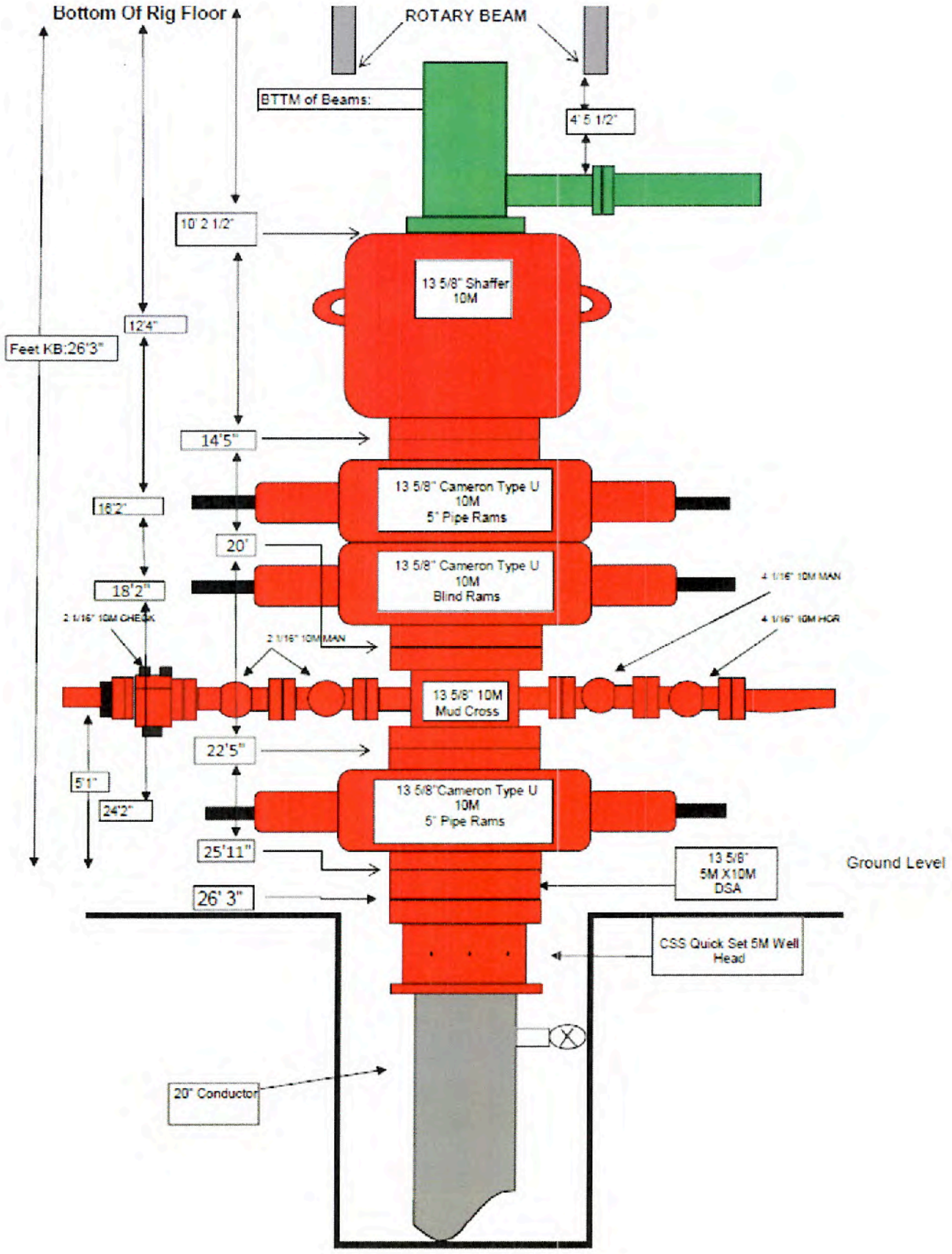
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20'
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
2 1/16" 10M CHECK
2 1/16" 10M MAN
4 1/16" 10M HCR
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

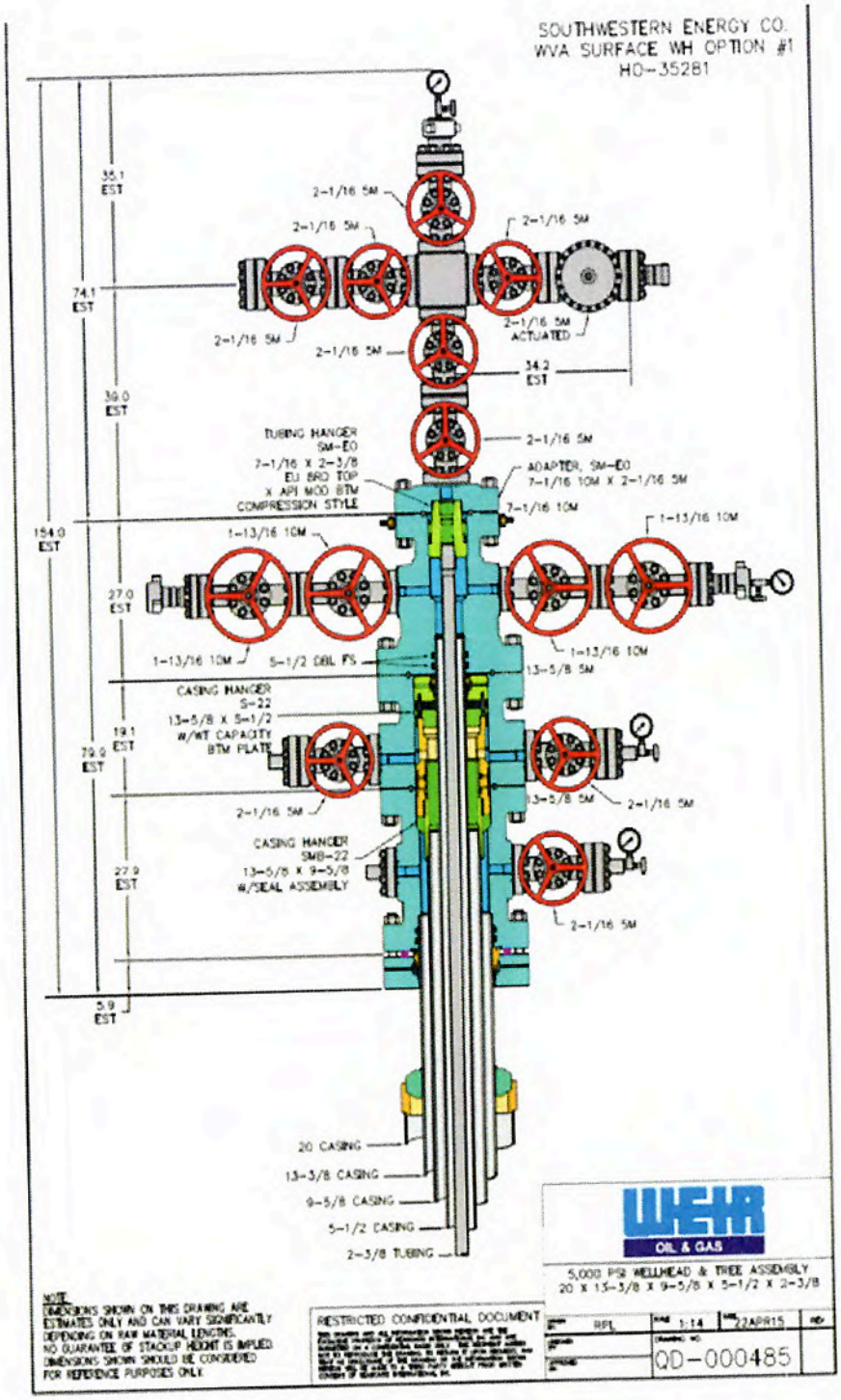
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
HO-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
19.1 EST
79.0 EST
27.9 EST
5.9 EST
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
2-1/16 5M
TUBING HANGER SM-EO 7-1/16 X 2-3/8 EU 8RD TOP X API MOD BTM COMPRESSION STYLE
ADAPTER, SM-EO 7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
1-13/16 10M
5-1/2 DBL FS
13-5/8 5M
CASING HANGER S-22 13-5/8 X 5-1/2 W/WT CAPACITY BTM PLATE
13-5/8 5M
2-1/16 5M
2-1/16 5M
CASING HANGER SMB-22 13-5/8 X 9-5/8 W/SEAL ASSEMBLY
2-1/16 5M
20 CASING
13-3/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS. NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED. DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RFL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

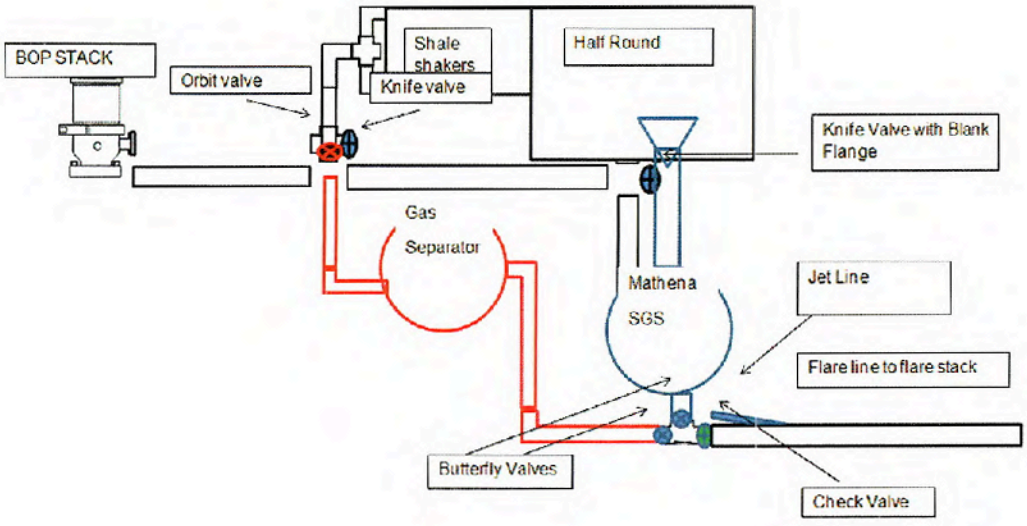
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

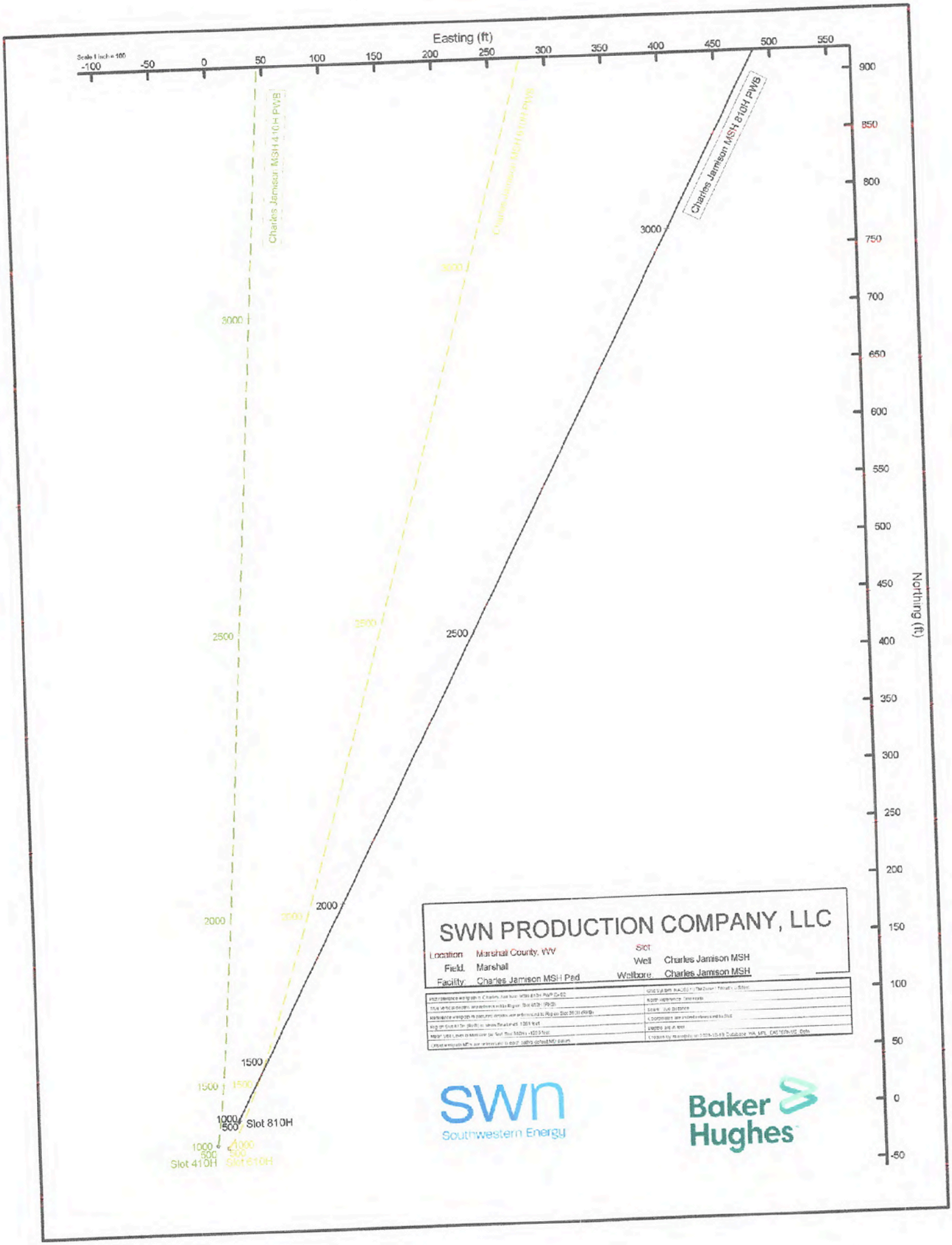
All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The


Easting (ft)
Scale 1 Inch = 100
-100
-50
0
50
100
150
200
250
300
350
400
450
500
550
Northing (ft)
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
-50
Charles Jamison MSH 410H PWB
Charles Jamison MSH 610H PWB
Charles Jamison MSH 810H PWB
3000
2500
2000
1500
1000
500
Slot 810H
Slot 410H
Slot 610H
SWN PRODUCTION COMPANY, LLC
Location: Marshall County, WV
Field: Marshall
Facility: Charles Jamison MSH Pad
Slot
Well: Charles Jamison MSH
Wellbore: Charles Jamison MSH
swn
Southwestern Energy
Baker Hughes

calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision. drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 3
VISITOR SIGN IN SHEET

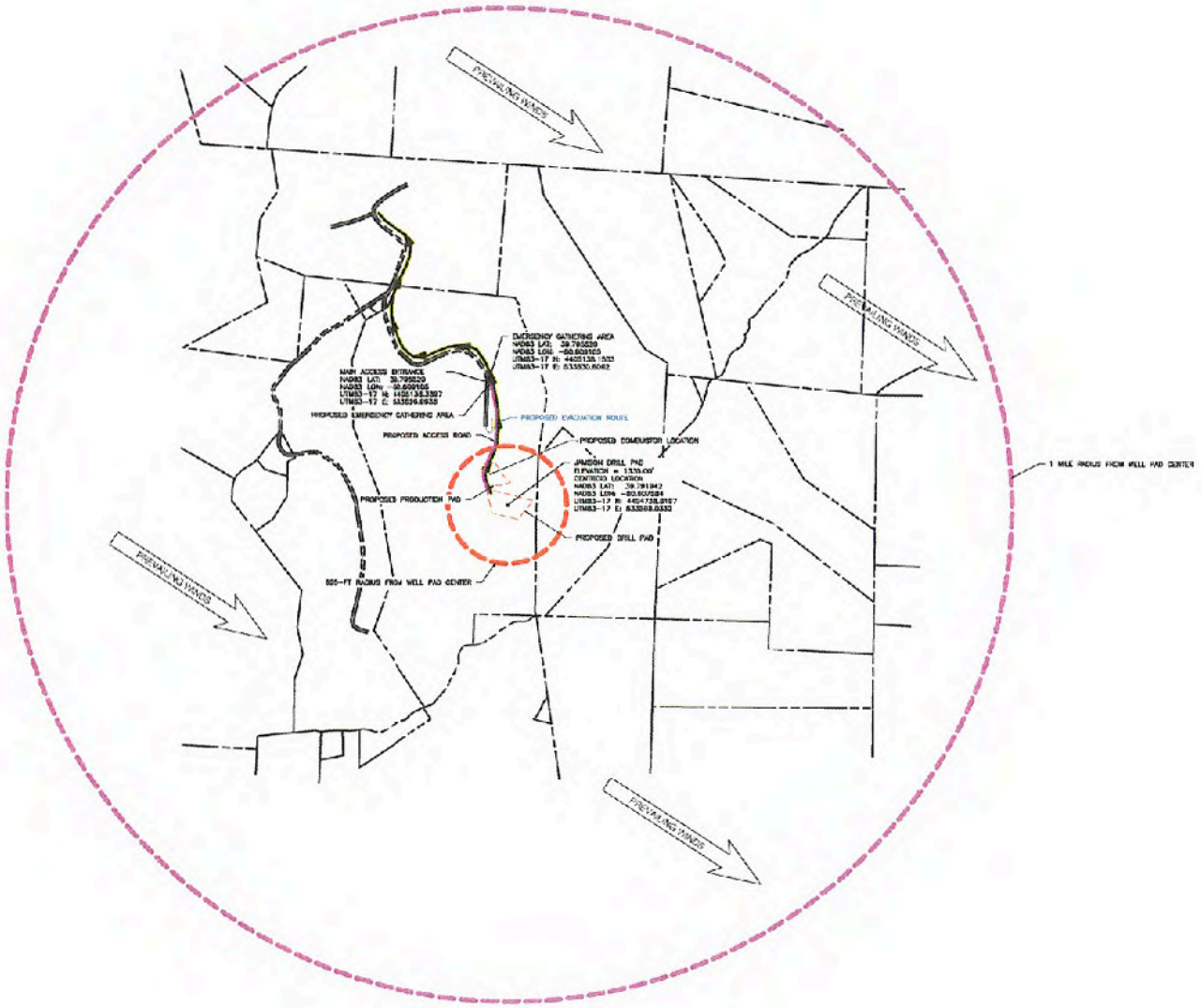
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP



REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
200 Marketplace Ave Suite 200 Bridgeport, WV 26330
Ph: 304.933.3119 888.488.9939 Fax: 304.933.3927
www.cecinc.com

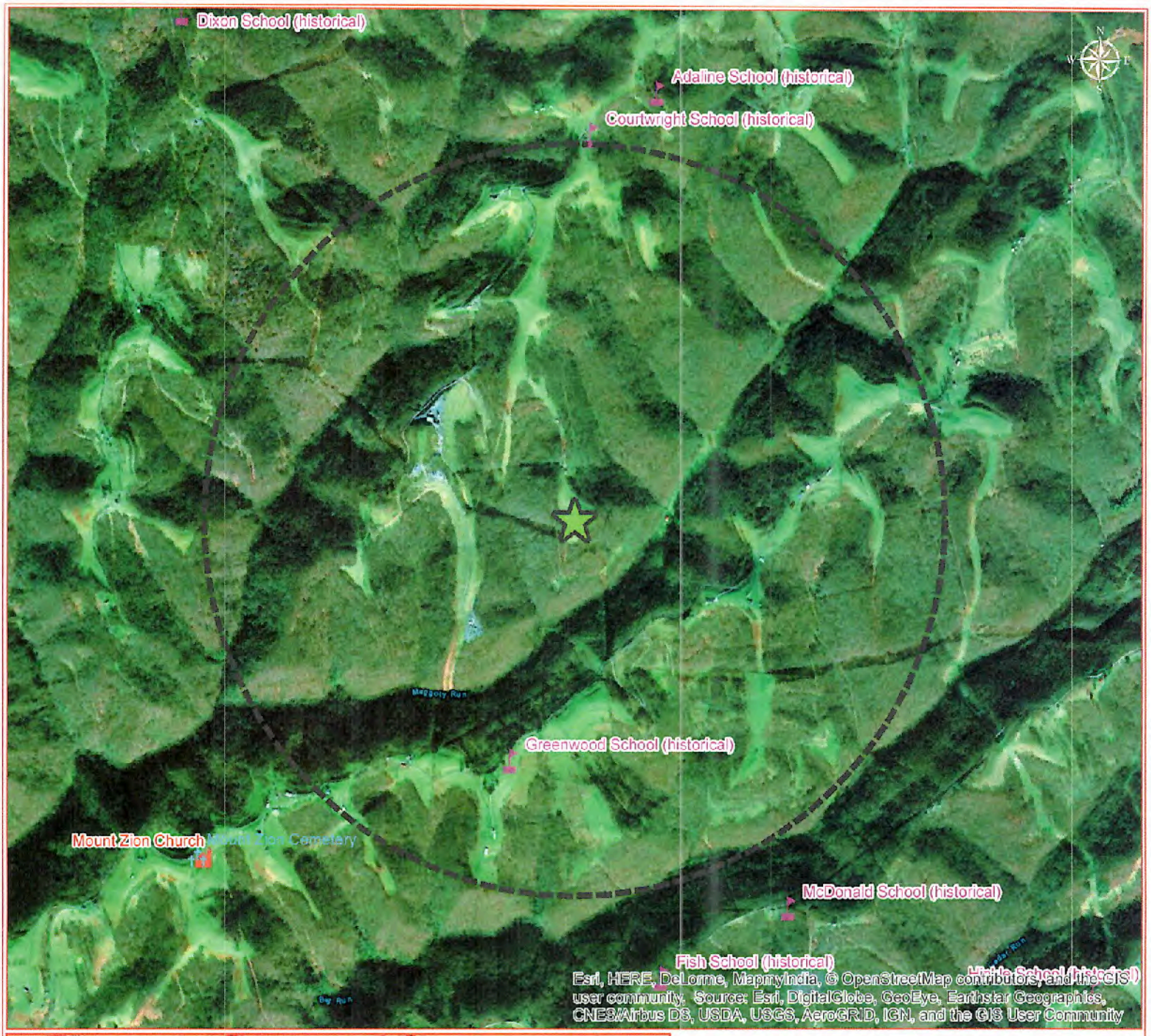
SWN PRODUCTION COMPANY, LLC
JAMISON DRILL PAD
LIBERTY DISTRICT
MARSHALL CO, WEST VIRGINIA

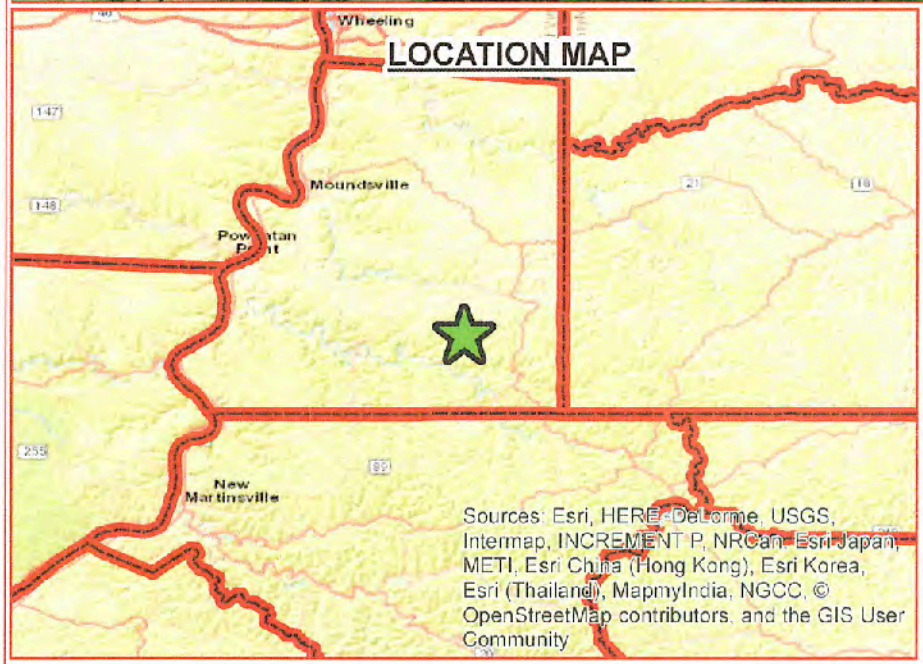
SITE SAFETY PLAN

DATE: JUNE 2019
DRAWN BY: TMG
SCALE: AS SHOWN
PROJECT NO: 170-818
APPROVED BY: JDM

DRAWING NO.
C004
SHEET 3 OF 28

ATTACHMENT 5
1-MILE RADIUS TOPO MAP





Legend

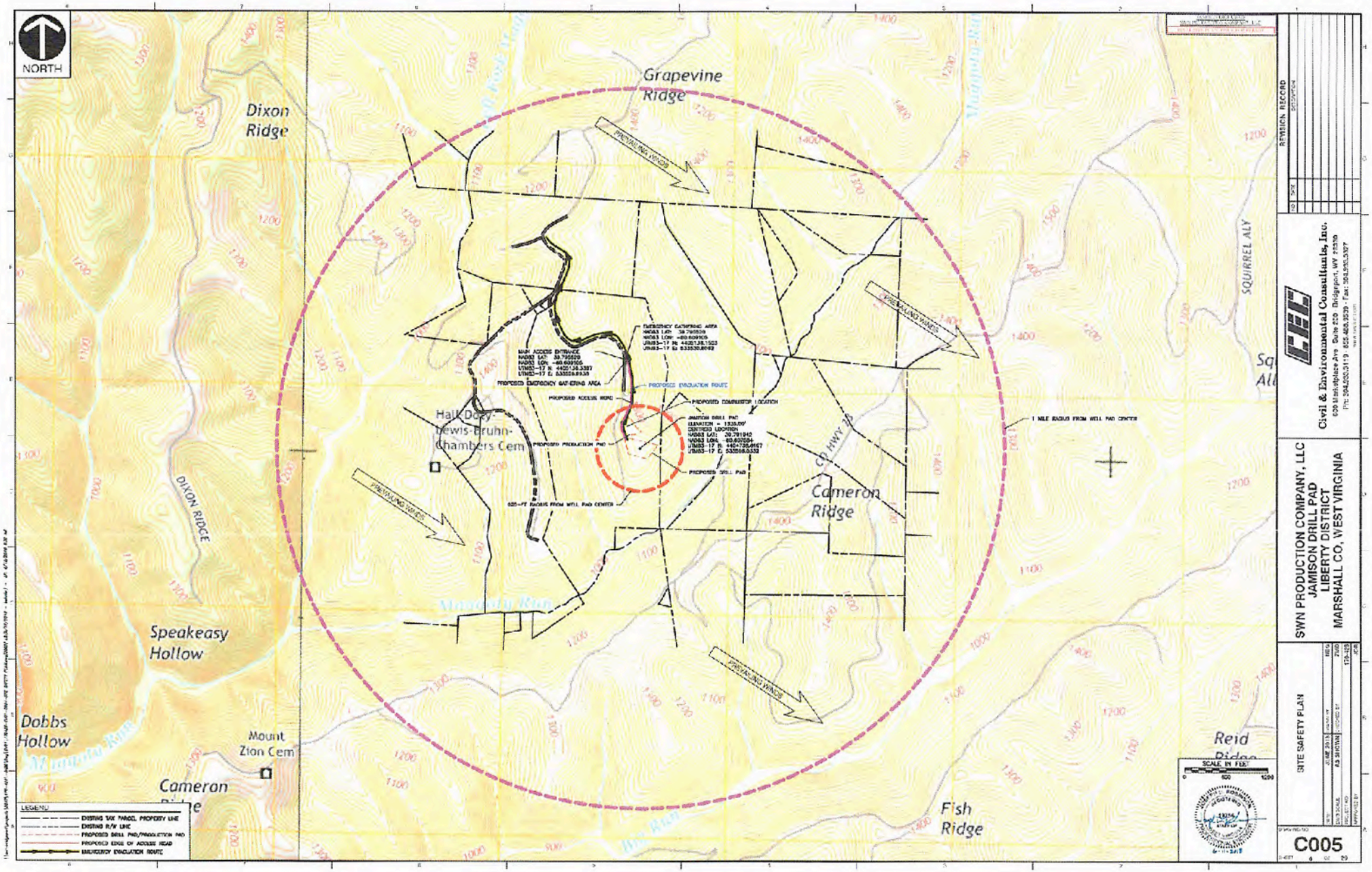
- Jamison
- Jamison_Buffer
- Cemeteries
- Churches
- Schools

Charles Jamison-1Mile
Marshall County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN

ATTACHMENT 7
WELL LOCATION TOPO MAP



REVISION RECORD

NO.	DATE	DESCRIPTION

CEC
Civil & Environmental Consultants, Inc.
620 Marketplace Ave Suite 620 Bridgeport, WV 26330
PH: 304.933.3119 800.486.9539 - Fax: 304.933.3377
www.cecinc.com

SWN PRODUCTION COMPANY, LLC
JAMISON DRILL PAD
LIBERTY DISTRICT
MARSHALL CO, WEST VIRGINIA

SITE SAFETY PLAN

DATE	JUNE 2013
DRAWING NO.	C005
SCALE	AS SHOWN
DESIGNED BY	REG
DRAWN BY	ZMD
PROJECT NO.	179-325
APPROVED BY	JCR

ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	304-884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Olivia McNamara	Vice President HSE	(832) 796-2747	(346) 798-2747	
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5518	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4286	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Matt Weems	Senior Drilling Engineer	(832) 796-6361	(832) 430-0003	
Eric Draxten	Drilling Superintedent	(304) 884-2618	(501) 269-4393	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	

Last Revised 9-8-2021

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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4. FRAC MOBILIZATION 4
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6. CONTINGENCY OPERATIONS 8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak**: Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. **Large leak:** LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.

a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

4700900328

MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: Brownlee Land Ventures BRK 6
Weirton QUAD
Weirton DISTRICT
Brooke COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 9/28/2021

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name:_____ Date: _____

Title: _____

Approved by:

Name:_____ Date: _____

Title: _____

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B.S. 10-12-21

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DRILLING SIMOPS MANUAL

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J. ATTACHMENTS

Attachment 1	Pre-Spud Sign In Sheet
Attachment 2	Well Site Safety Meeting Sign In Sheet
Attachment 3	Visitor Sign In Sheet
Attachment 4	Plan View Map
Attachment 5	1-Mile Radius Map
Attachment 6	Evacuation Plan
Attachment 7	Well Location Topo Map
Attachment 8	WV Notification Numbers
Attachment 9	Completions SimOps Manual

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Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	304-541-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Safety Officer	304-884-1613 Office
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

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1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Brooke County	911 or 304-737-3660
State Police	Brooke County	911 or 304-737-3671
Ambulance Service	Brooke County	911 or 304-737-5002
Hospital	Brooke County	304-797-6000
Fire Department	Brooke County	911 or 304-829-4504
WV DEP Oil and Gas Inspector	Barry Stollings	304-552-4194
WV DEP Inspector Supervisor	Doug Newlon	304-932-8049
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

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Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Heavy Equipment	Burns Drilling	724-428-4361
Roustabout	Apex	724-747-6100
Roustabout	Recon	740-609-3050
Roustabout	Platinum	678-994-2833 724-884-5477
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

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All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
Christ Apostolic Temple	Weirton WV 26062	Historical Society 304-234-3656
Weirton Christian Academy	Weirton WV 26062	Historical Society 304-234-3656

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Barry Stollings

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

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- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

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E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	
Eric Draxten	Drilling Superintendent	501-269-4393

**In addition, SWN Wellsite supervisors must maintain current well control certification.

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2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

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3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commences.

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4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

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Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

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5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

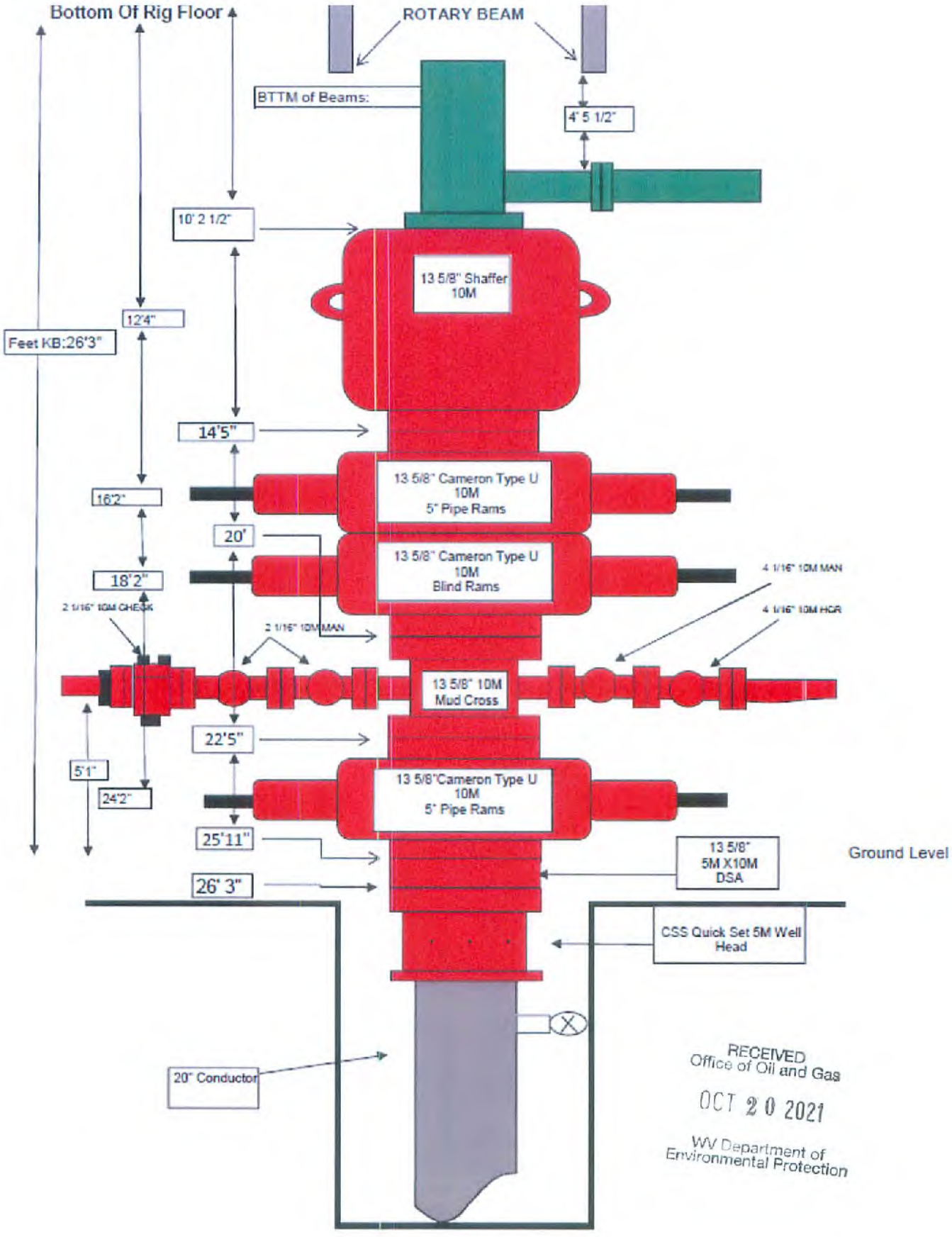
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.



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D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.

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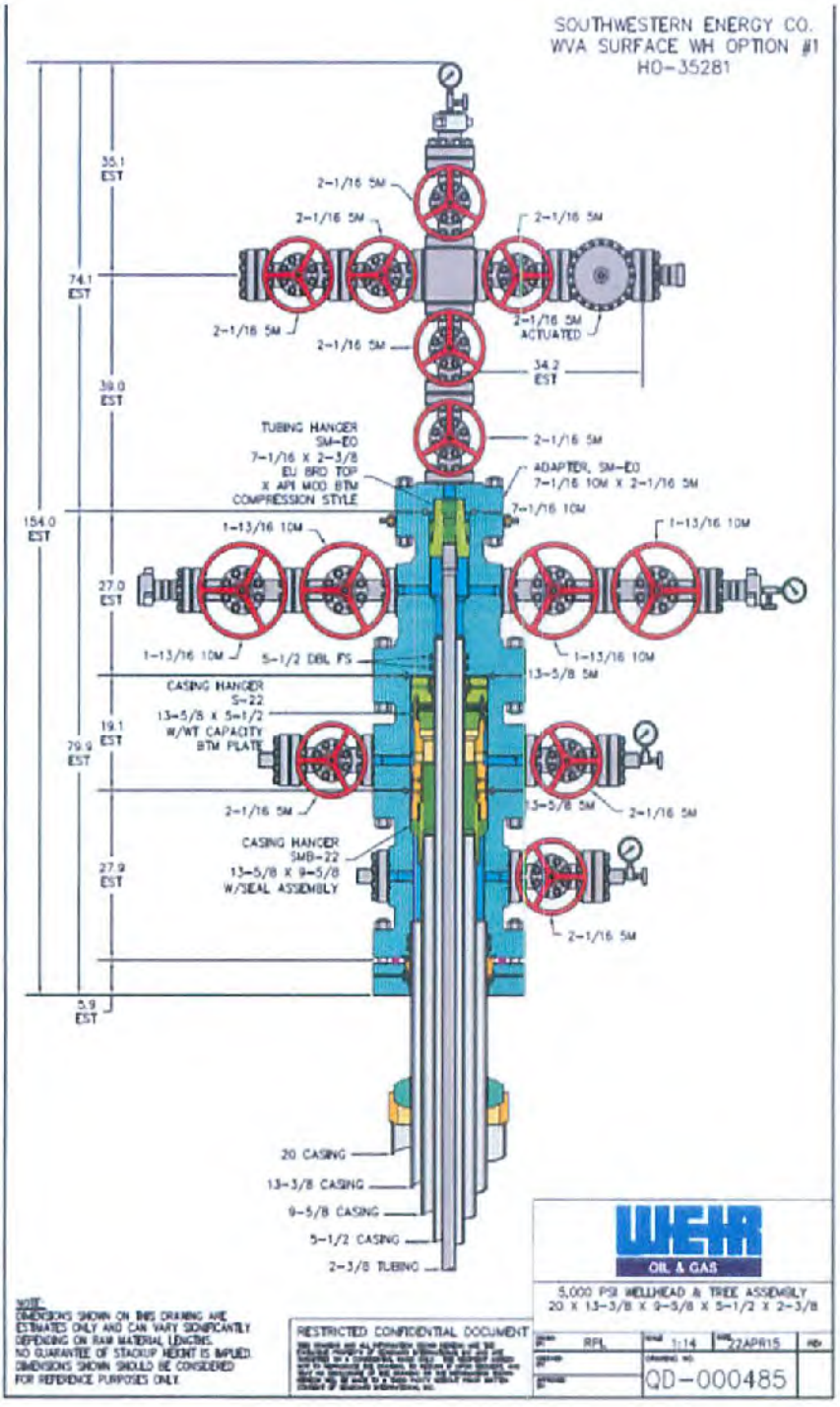

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H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

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6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

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E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

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7.0 FLARING

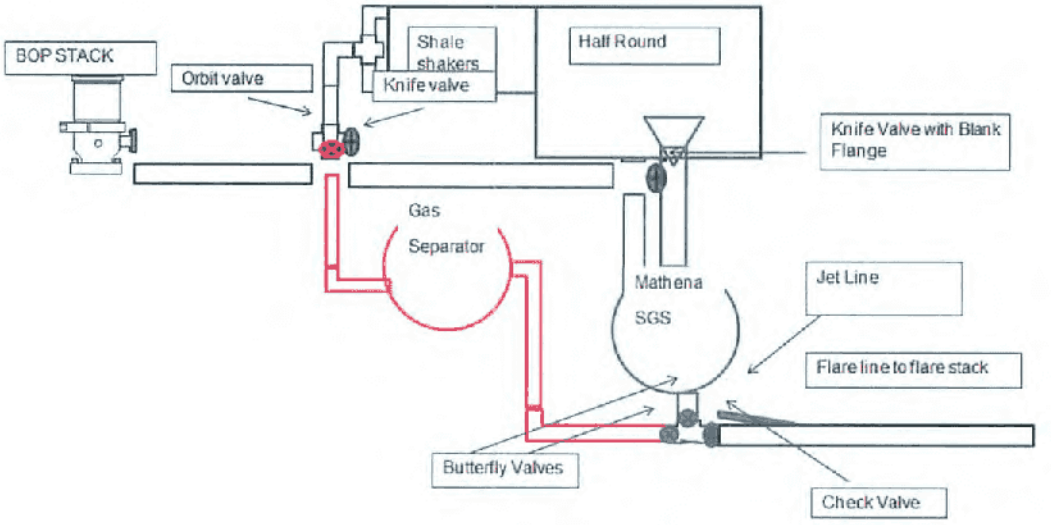
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



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8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

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2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

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9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

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B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

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E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

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F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

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ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

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Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

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Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 3
VISITOR SIGN IN SHEET

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Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

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PLAN VIEW MAP

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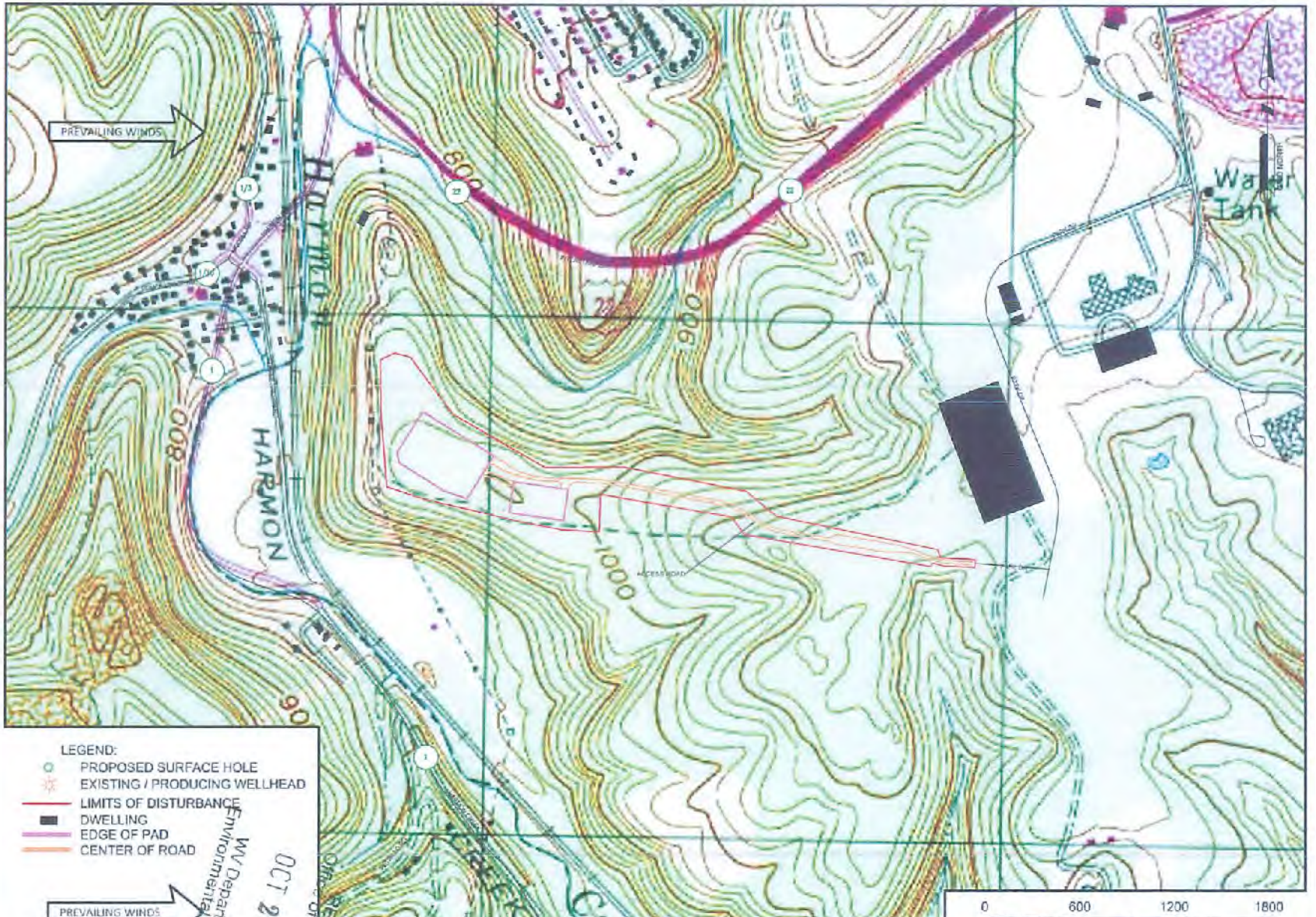

LOCATION MAP
NOT TO SCALE

NO.	DATE	DESCRIPTION

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA

PREPARED FOR:

swn
Southwestern Energy®

SEAL

JHA Companies
SURVEYORS
ENGINEERS
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68011 VINEYARD ROAD
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(740) 695-6100
PA * OH * NY * WV

PROJECT ID	2021-0504 BROWNLEE BRK PAD	DRAWN	LMD
DATE	5/19/2021	DESIGN	LMC
SCALE	AS NOTED	CHECKED	DJH

FLARE MAP
FOR
BROWNLEE BRK PAD
LOCATED IN WEIRTON DISTRICT,
BROOKE COUNTY, WEST VIRGINIA

TITLE
FLARE MAP

PLAN TYPE	SHEET NO.
FINAL	1

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OCT 20 2021
WV Department of Environmental Protection
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ATTACHMENT 5
1-MILE RADIUS TOPO MAP

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OCT 20 2021
WV Department of
Environmental Protection

Legend

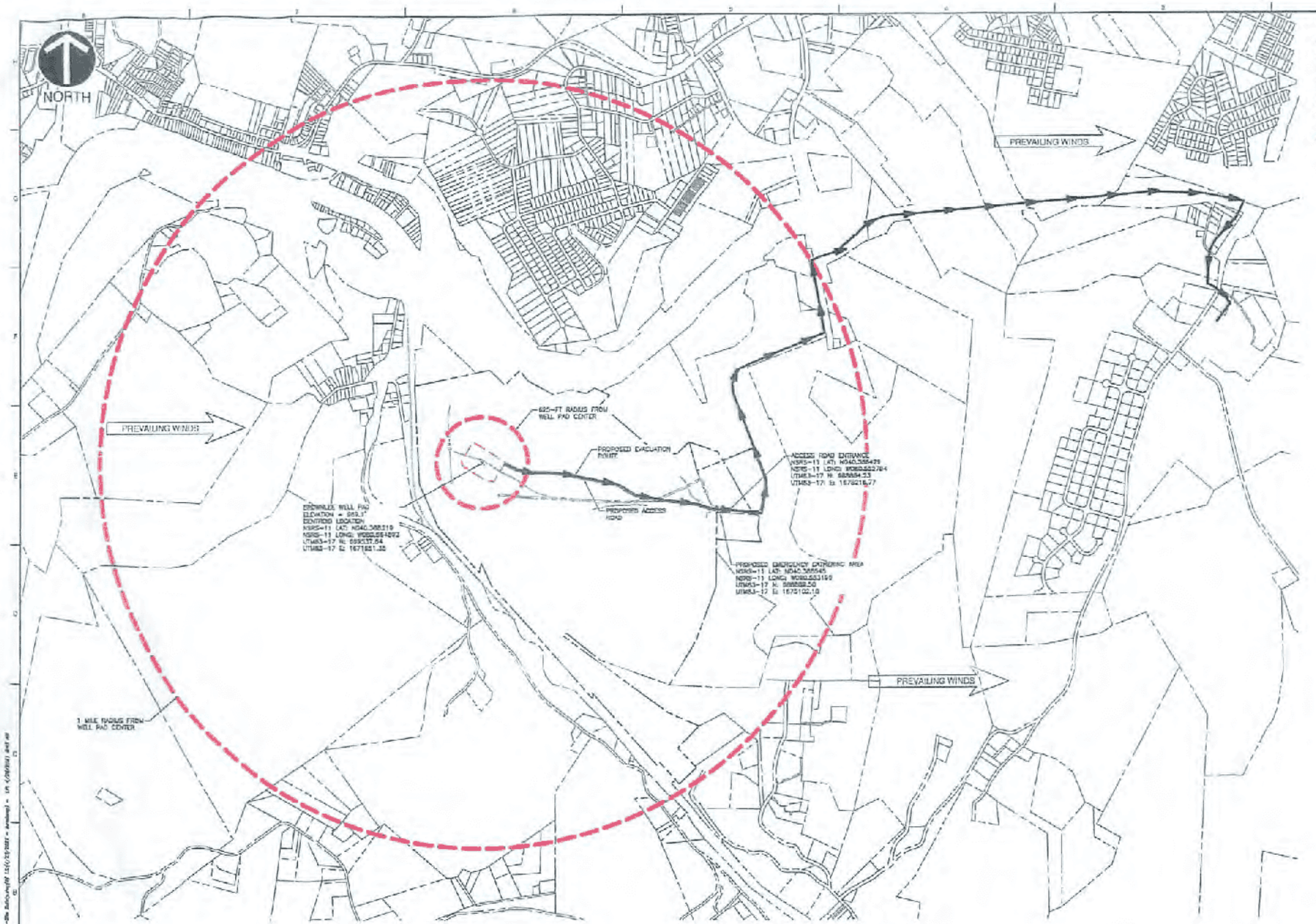
- Brownlee
- Brownlee Buffer
- Cemeteries
- Churches
- Schools

Brownlee BRK-1Mile
Brooke County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN

Barry Stephens
10-12-21



REFERENCE

1. STREAM AND WETLAND INVESTIGATION COMPLETED BY ASCENT ENGINEERING & CONSULTING. RESULTS SHOWN HEREON PROVIDED TO CEC, INC. ON 1/18/2021.
2. SURVEYED PROPERTY LINES BASED ON FIELD SURVEY COMPLETED BY CEC, INC. JANUARY 2021.
3. TAX PARCEL DATA OBTAINED FROM PUBLICLY AVAILABLE COUNTY INFORMATION.
4. PREVAILING WIND DIRECTION FROM THE U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL CLIMATIC DATA CENTER DATED NOVEMBER 1998.

SCALE IN FEET
0 700 1400

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road • Pittsburgh, PA 15205
412-429-2324 • 800-365-2324
www.cecinc.com

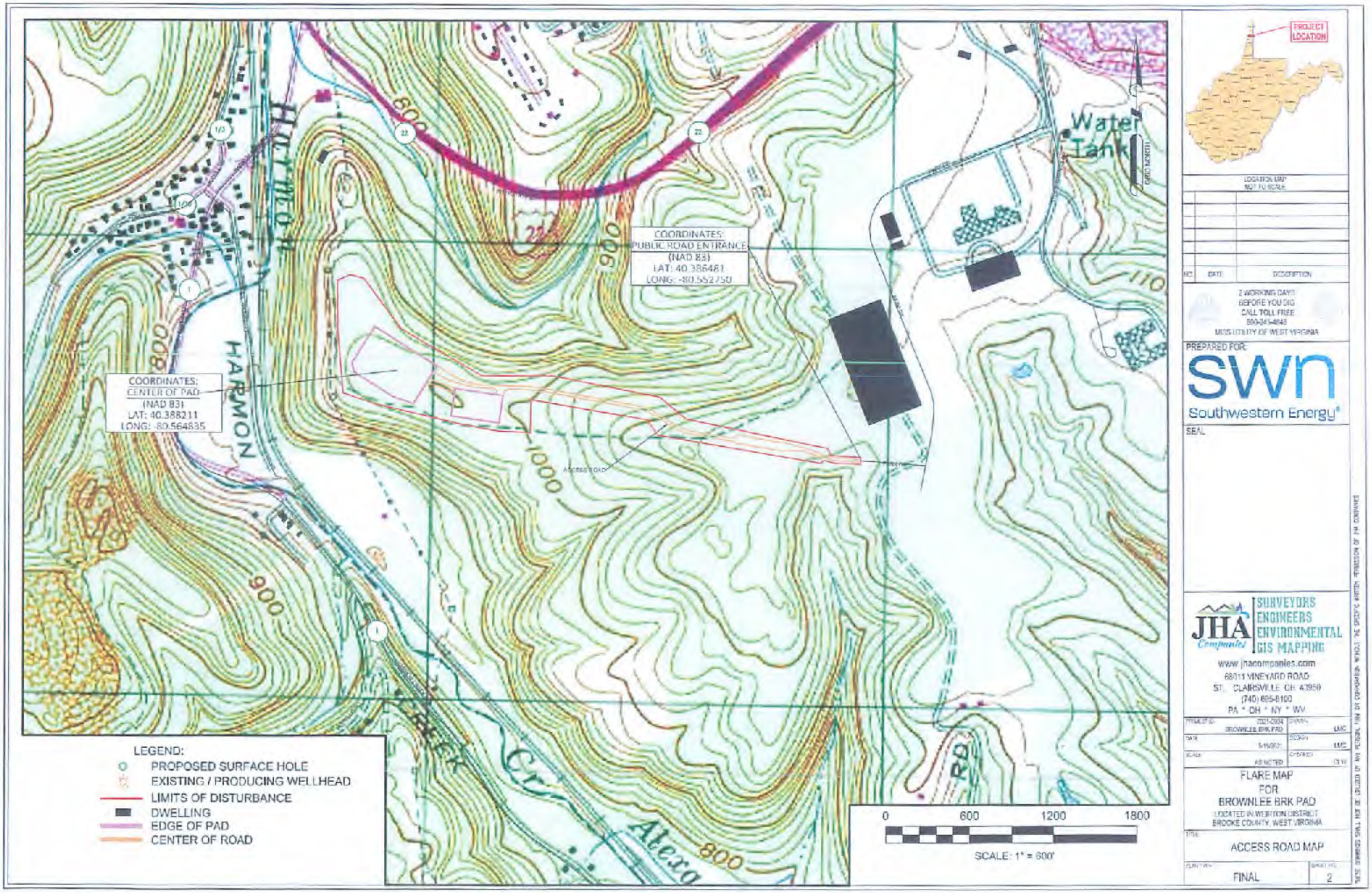
SWN PRODUCTION COMPANY, LLC
BROWNLEE WELL PAD
CITY OF WEIRTON
BROOKE COUNTY, WEST VIRGINIA

SITE SAFETY PLAN

DATE:	APRIL 2021
DRAWN BY:	BJH
CHECKED BY:	CPD
SCALE:	1" = 700'
PROJECT NO:	516-136
APPROVED BY:	DGL

DRAWING NO.: 6
SHEET 6 OF 20

ATTACHMENT 7
WELL LOCATION TOPO MAP


COORDINATES:
CENTER OF PAD
(NAD 83)
LAT: 40.388211
LONG: -80.564835
COORDINATES:
PUBLIC ROAD ENTRANCE
(NAD 83)
LAT: 40.386481
LONG: -80.552750
HARMON
Water Tank
GRID NORTH
ACCESS ROAD
LEGEND:
PROPOSED SURFACE HOLE
EXISTING / PRODUCING WELLHEAD
LIMITS OF DISTURBANCE
DWELLING
EDGE OF PAD
CENTER OF ROAD
0
600
1200
1800
SCALE: 1" = 600'
PROJECT LOCATION
LOCATION MAP
NOT TO SCALE
NO. DATE DESCRIPTION
2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
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68011 VINEYARD ROAD
ST. CLAIRSVILLE, OH 43950
(740) 695-8100
PA * OH * NY * WV
PROJECT ID: 2021-2934 BROWNLEE BRK PAD
DRAWN: LMC
DATE: 5/19/2021
DESIGN: LMC
SCALE: AS NOTED
CHECKED: CEW
FLARE MAP
FOR
BROWNLEE BRK PAD
LOCATED IN WEBSTER DISTRICT
BROOKE COUNTY, WEST VIRGINIA
TITLE:
ACCESS ROAD MAP
FILE TYPE: FINAL
SHEET NO: 2
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ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

swn Production Company

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6657	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	304-884-1618	(304) 641-3204	
Chris Lacy	VP General Counsel & Corporate Secretary	(832) 796-7877	(832) 723-4915	
Robin Valenti	Senior HR Business Partner	(304) 884-1616	(832) 702-4828	
HSE Department				
Olivia McNamara	Vice President HSE	(832) 796-2747	(346) 796-2747	
Matt Boggs	HSE Supervisor - SW APP	(304) 884-1614	(501) 581-1692	
Kenny Durst	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Kellman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5518	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1661		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Matt Weems	Senior Drilling Engineer	(832) 796-6361	(832) 430-0003	
Eric Draxten	Drilling Superintedent	(304) 884-2818	(501) 269-4393	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	

Last Revised 9-8-2021

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

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4. FRAC MOBILIZATION 4
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6. CONTINGENCY OPERATIONS 8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. **Small leak**: Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. Large leak: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
   a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak**: Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

4700900329

MARCELLUS WELL DRILLING PROCEDURES
AND
WELL SITE SAFETY PLAN

SWN Production Company, LLC
1300 Fort Pierpont Drive, Suite 201
Morgantown, West Virginia 26508

API NO. 47-XXX-XXXXX
WELL NAME: Mike Ryniawec BRK 6H
Bethany QUAD
Buffalo DISTRICT
Brooke/Ohio COUNTY, WEST VIRGINIA

Submitted by:

Name: Brittany Woody Date: 12/14/2021

Brittany Woody

Title: Senior Regulatory Analyst SWN Production Co., LLC

Approved by:

Name: Date: 1/7/22

Title: INSPECTOR

Approved by:

Name: Date:

Title:

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MAR 16 2022
WV Department of
Environmental Protection

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1.0 CONTACTS, SCHEDULES, AND MEETINGS

A. Emergency Point of Contact

SWN Production Company, LLC 24-Hour Emergency Hotline: **1-877-879-0376**

B. List of Telephone Numbers

Below is a list of the emergency telephone numbers for external agencies:

Agency Type/ Emergency Service	Name	Emergency Number
County Police	Brooke County	911 or 304-737-3660
State Police	Brooke County	911 or 304-737-3671
Ambulance Service	Brooke County	911 or 304-737-5002
Hospital	Brooke County	304-797-6000
Fire Department	Brooke County	911 or 304-829-4504
WV DEP Oil and Gas Inspector	Gayne Knitowski	304-546-8171
WV DEP Enforcement Supervisor	Scott Rodeheaver	304-282-4296
WV DEP Oil and Gas Chief	James Martin	304-926-0499 x1654

MARCELLUS WELL DRILLING PROCEDURES AND
WELL SITE SAFETY PLAN
SWN PRODUCTION COMPANY, LLC

Emergency Telephone Numbers for SWN Production Company, LLC ("SWNPC") Personnel are found on the following table:

NAME	ROLE	24-HOUR NUMBER
Shawn Jackson	Primary Contact	304-641-3204 Cell
	Planning Section Chief	304-884-1618 Office
Matt Boggs	Primary Contact	501-581-1692 Cell
	Safety Officer	304-884-1614 Office
Bruce Carpenter	Primary Contact	681-495-8266 Cell
	Field Operations HSE Coordinator	304-884-1688 Office
Chris Flanagan	Primary Contact	304-203-4985 Cell
	Incident Command	304-884-1626 Office
Derek Cutright	Secondary Contact	713-471-6657 Cell
	Information Officer	832-796-7473 Office
Chad Keilman	Primary Contact	501-428-3114 Cell
	Regulatory Supervisor	304-884-1648 Office
Josh Boyda	Primary Contact	501-428-3636 Cell
	Field Regulatory Coordinator	304-884-1713 Office
Dawn Keller	Primary Contact	501-697-7230 Cell
	Field Regulatory Coordinator	304-884-1683 Office
Carla Suszkowski	Secondary Contact	724-561-8129 Cell
	Corporate Regulatory	832-796-6372 Office

Phone Numbers for SWNPC Contractors:

Type of Contractor	Company Name	Telephone Number
Well Control Company	Wild Well Control	**281-784-4700**
Earthwork/Equipment	Burns Drilling and Excavating	724-428-4361
Remediation/Cleanup	EnviroTrac	304-322-2614
Remediation/Cleanup	EPS of Vermont	800-577-4557
Heavy Equipment	Burns Drilling	724-428-4361
Roustabout	Apex	724-747-6100
Roustabout	Recon	740-609-3050
Roustabout	Platinum	678-994-2833 724-884-5477
Cleanup Supplies	Burns Drilling and Excavating	724-428-4361

All Schools and Public Facilities within 1 Mile Radius: Contact information is provided below and Attachment 3 provides a map of the locations.

Name	Address	Telephone Number
Leffler School (Historical)	92 Lazaer Run Road Wellsburg, WV 26070	Historical Society 304-737-1551

C. Method of Notification of Public

In the unlikely event that the presence of H_2S gas is detected or there is a well control issue, the public will be notified by telephone or in person by a SWNPC representative.

D. Pre-Spud Meeting

A pre-spud meeting will be held at the rig prior to spud of the well. The WVDEP Oil and Gas Inspector will be notified a minimum of 24 hours in advance of the meeting and invited to attend the meeting.

- WV DEP Oil and Gas Inspector: Gayne Knitowski

The meeting will include a review of the following:

- General safety procedures to be followed during the drilling of the well;
- The permitted casing and cementing program;
- The Geo-prog;
- The permitted wellbore path / directional plan;
- Anti-collision plan; and
- Any other pertinent information for the drilling of the well.

The meeting shall be attended by all personnel to be involved in the drilling operations including, but not limited to:

- Drilling;
- Land;
- HSE;
- Regulatory;
- Geology
- Drilling Contractor Representative;
- Directional Company Representative (if needed);
- Drilling Fluids Representative (if needed); and
- Cementing Company Representative (if needed).
- Sign In Sheet- Attachment 1

Regular Well Site Safety Meetings

Ongoing Communications:

Discussions between the rig toolpusher and well site supervisor will occur at least twice per day during the tourly HSE Meetings and will cover all pertinent aspects of operations, health, safety, and environmental issues. The well site supervisor and drilling engineer will be in daily contact with the SWN Drilling Department via phone and/or email and will discuss all pertinent operations and HSE issues.

Daily Safety Meetings:

HSE meetings will be conducted once per tour for all types of operations occurring on site, including Drilling, Completion, or Workovers. These meetings will include all personnel working on location.

HSE meetings will cover upcoming operations, JSAs for critical operations, recent HSE incidents, and requirements for safe and healthy operations during current weather conditions. Corporate HSE alerts and corrective actions in response to recent HSE incidents will also be discussed when applicable.

The highest ranking contractor representative (drilling, completion or workover) present shall keep an accurate count of all personnel on the location at all times. All personnel not employed by the contractor on location (i.e. drilling, completion or workover) and all non-SWN personnel will be required to sign the attached SIGN IN SHEET (see Attachment 1).

All non-essential persons will be kept off the location at all times, and such access will be enforced by the highest ranking contractor representative present.

Sign In Sheet- Attachment 2

E. Personnel With Well Control Training

Name	Title	Telephone Number
Chris Flanagan	Area Manager	304-203-4985
Chad Haga	Production Engineer	832-707-4257
Ellen Gies	Completions Superintendent	284-543-7749
Chris Allison	Senior Staff Production Engineer	832-316-8356
Brad Riley	Rig Operations Superintendent	304-517-3105
Darrell Schembra	Rig Manager	501-428-2731
Jeffrey Gilmore	Rig Manager	304-541-5256
Joel Still	Rig Manager	304-439-4404
Brian Hughes	Rig Manager	501-548-7429
Will Kaler	Rig Manager	501-428-2971
Waylon Goad	Rig Manager	501-581-1691
Daniel Hughes	Rig Manager	681-433-9272
Justin Henley	Rig Manager	281-753-1073
Robert Woodall	Driller	
Kyle Moore	Driller	
Jason Bonham	Driller	
William Bettorf	Driller	
Jarrod Bennett	Driller	
Robie Abbott	Driller	
Michael Jones	Driller	
Eric Draxten	Drilling Superintendent	501-269-4393

**In addition, SWN Wellsite supervisors must maintain current well control certification.

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Environmental Protection

2.0 MAPS AND DIAGRAMS

A. Pre-Spud Sign In Sheet

See Attachment 1

B. Well Site Safety Meeting Sign In Sheet

See Attachment 2

C. Visitor Sign In Sheet

See Attachment 3

D. Plan View Map

See Attachment 4

E. 1-Mile Radius Topographic Map

See Attachment 5

F. Evacuation Plan

See Attachment 6

G. Well Location Topo Map

See Attachment 7

H. WV Notification Numbers

See Attachment 8

I. Drilling SimOps Manual

See Attachment 9

3.0 WELL WORK

A. Well Work Procedures

This section provides a description of the well work detail for the wells located on this well pad. The purpose is to drill and stimulate the Marcellus formation.

1. If a void is encountered when drilling surface casing, place two baskets above the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20 feet below void nor more than 100 feet below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50 feet below but not more than 150 feet below freshwater and cement to surface.

2. All casing cemented will not be disturbed for at least 8 hours after completion of cementing operations.

3. If cement does not return to surface when cementing Surface and Coal casing, the WVDEP Oil and Gas Inspector will be notified within 24 hours.

4. Surface, Coal and Intermediate strings will be pressure tested at a pressure greater than what is expected to be exerted on each string throughout the remainder of the well operations.

5. No oil or gas production or pressure should exist on the surface or coal protection strings.

6. A Formation Integrity Test (FIT) will be performed immediately following the drill out of surface, coal and intermediate casing.

7. Centralizers will be used in the well in accordance with regulations and company best practices.

8. Production casing will be pressure tested at a pressure greater than what is expected to be exerted upon it during fracturing operations.

9. Well will be perforated within the target formation and stimulated with a slurry of water, sand, and additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs will then be drilled out and the well will be allowed to flow back to surface.

10. Upon completion of fracturing operations the production casing will be pressure tested at a pressure greater than expected shut in pressure.

11. The well will be produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks, as appropriate based on the composition of the hydrocarbons.

B. Local Emergency Planning Office Plan Submission

A copy of this Well Site Safety Plan will be provided to the local county emergency office at least 7 days before dirt work or well work commences.

4.0 CHEMICAL INVENTORY AND SAFETY DATA SHEETS (SDS)

A. Safety Data Sheets

The Safety Data Sheets ("SDS") for all chemicals to be located on site are provided on the attached CD for your information.

B. SDS Location

The SDS will be available in the toolpusher's office when the rig is on location. When the completion crew is on location they will be located in the Well Site Supervisor's trailer.

C. Inventory of Materials

As required, a list of additives on site during each phase of well development is provided below:

Chemical	Storage Vessel	Typical Quantity
Fuels and Lubricants		
Diesel Fuel	ASTs	12,000 - 25,000 gal.
Motor Oil	Lube Skid	55 - 300 gal.
Hydraulic Oil	55-gal. drums or smaller	55 - 440 gal.
Brake Fluid	55-gal. drums or smaller	55 gal.
Used Motor Oil	55-gal. drums	55 - 220 gal.
Lube Oil	55-gal drums	55 - 220 gal.
Drilling		
Salt (NaCl)	Bags/Sacks	2,000 - 20,000 lbs.
Anco Bar (barite)	Bags/Sacks/Drums	90,000 – 120,000 lbs
SOBM Oil Base (Synvert Synthetic Drilling Fluid Base)	Plastic Totes	4,000 - 10,000 gal.
Defoamer	55-gal. drums	55 – 1,000 gal.
Bentonite	Sacks	1,000 – 5,000 lbs
Rheology Modifier	55-gal. drums	55 – 1,000 gal.
Potassium Chloride (KCl)	Bags/Sacks	2,000-12,000 lbs.
Wetting Agent	55-gal. drums	55 – 1,000 gal.
Primary Emulsifier	55-gal. drums	55 – 1,000 gal.
Gilsonite	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Carbonate	Bags/Sacks	2,000 - 10,000 lbs.
Calcium Chloride (CaCl)	Bags/Sacks	2,000-12,000 lbs.
Lime	Bags	6,000 - 12,000 lbs.
Organopuillic Clay	Bags/Sacks	2,000-12,000 lbs.
Salt Gel	Bags/Sacks	2,000-10,000 lbs.
Chemical	**Storage Vessel**	**Typical Quantity**
Drilling (Continued)		
Walnut Hulls	Bags/Sacks	2,000-5,000 lbs.

Cedar Fiber	Bags/Sacks	2,000-5,000 lbs.
KCL Substitute (Anco Guard)	55-gal. drums	55 – 1,000 gal.
Synthetic Oil Based Mud	Frac Tanks / Open Top Mud Tanks	60,000 gal.
Oil Dry (absorbent)	Bags	6,000 - 12,000 lb.
Battery Acid (Sulfuric Acid)	40-80 lb. Lead Acid Batteries in equipment throughout well pad	600 - 800 lbs.
Hydraulic Fracturing		
Hydrochloric Acid (15-28 %)	Plastic Totes on tractor trailers	4750 - 9,500 gal.
Biocide	Totes	7,000 - 14,000 gal.
Sand	Trailer bins	325,000 - 1,300,000 lbs.
Water Gelling Agent	Tractor trailer tankers/ totes	3,000 - 6,000 gal.
Friction Reducer	Tractor trailer tankers/ totes	2,000 - 4,000 gal.
Scale Inhibitor (ethylene glycol)	Plastic Totes	250 - 500 gal.
Guar Gel	Plastic Totes	4,000 - 6,000 gal.
Production		
Natural Gas Condensate	ASTs	16,800 - 33,600 gal.
Produced Brine Water	ASTs	16,800 - 33,600 gal.
Methanol	ASTs	350 - 700 gal.
Ethylene glycol/Triethylene glycol	GPU Units & Dehydration Units	750 gal.

5.0 BOP AND WELL CONTROL

A. BOP Equipment and Casing Heads

The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String
13- 5/8" Annular 13-5/8"
10,000 psi BOP Stack

B. BOP Test Procedure and Schedule

The BOP stack shall be installed after running surface casing and installation of the starter casing head (A section).

If a multi-bowl/thru bore wellhead is installed, the BOP shall be installed on the wellhead and tested. Upon initial installation of the wellhead and the first assembly of the BOP, all of the BOP shall be pressure tested and then retested every 21 days following.

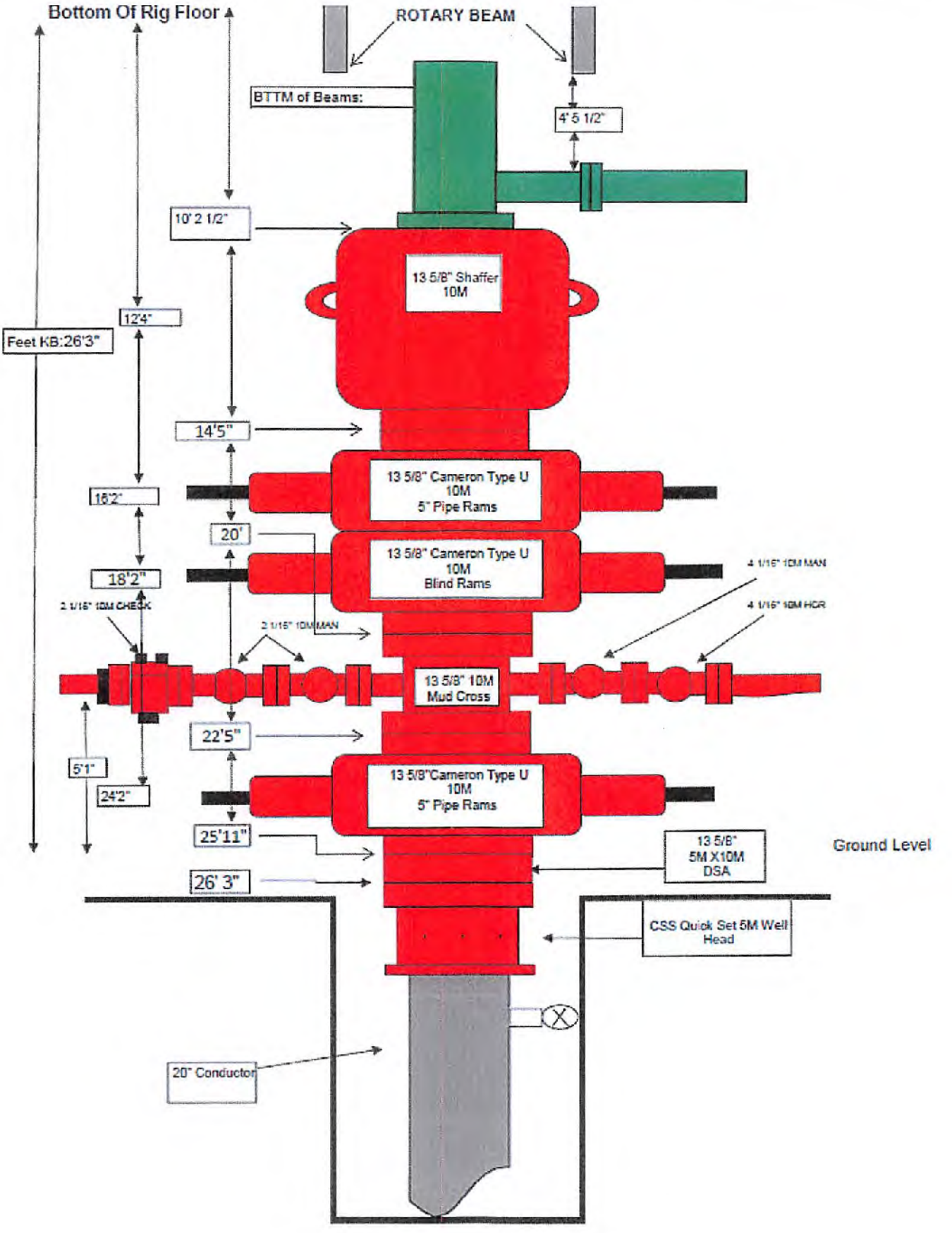
If a conventional wellhead is used, the BOP will be installed and tested upon installation on the first wellhead (A section). Afterwards, once the intermediate section (B) of the wellhead is installed, the BOP stack shall be installed on the intermediate section of the wellhead and any new breaks/makeups shall be tested.

The BOP stack will be pressure tested upon installation and every 21 days following. The BOP stack will be function tested upon installation, weekly, and after every bit trip. All pressure tests shall be performed for thirty (30) minutes. Annular preventers will be tested to 70% of the rated capacity and ram preventers will be tested to 80% of the rated capacity.

On multi-well pads, if the BOP can be moved intact from one well to another, upon installation of the BOP equipment on the new wellhead, only the connection of the BOP stack which was separated and reconnected shall be tested as long as the timing since the prior test is less than 21 days.

C. BOP Equipment

A schematic of the standard BOP equipment to be used is shown on the following page.


Bottom Of Rig Floor
ROTARY BEAM
BTTM of Beams:
4' 5 1/2"
10' 2 1/2"
13 5/8" Shaffer
10M
12'4"
Feet KB:26'3"
14'5"
13 5/8" Cameron Type U
10M
5" Pipe Rams
16'2"
20"
13 5/8" Cameron Type U
10M
Blind Rams
18'2"
4 1/16" 10M MAN
2 1/16" 10M CHECK
4 1/16" 10M HCR
2 1/16" 10M MAN
13 5/8" 10M
Mud Cross
22'5"
5'1"
24'2"
13 5/8"Cameron Type U
10M
5" Pipe Rams
25'11"
13 5/8"
5M X10M
DSA
Ground Level
26' 3"
CSS Quick Set 5M Well
Head
20" Conductor

D. Personnel with Well Control Training

At a minimum, the following personnel that will be present during drilling operations are BOP certified and well control trained:

- Rig Toolpusher
- Rig Moring Tour Driller
- Rig Evening Tour Driller

E. Records Maintenance and Notification Procedures for Drilling Issues

SWNPC uses an electronic database system for the maintenance of all records of drilling, including significant drilling issues, such as:

- Lost circulation;
- Hydrogen sulfide gas;
- Fluid entry; and
- Abnormal pressures.

These records are entered into the database system at the drilling rig and can be accessed from any SWNPC office.

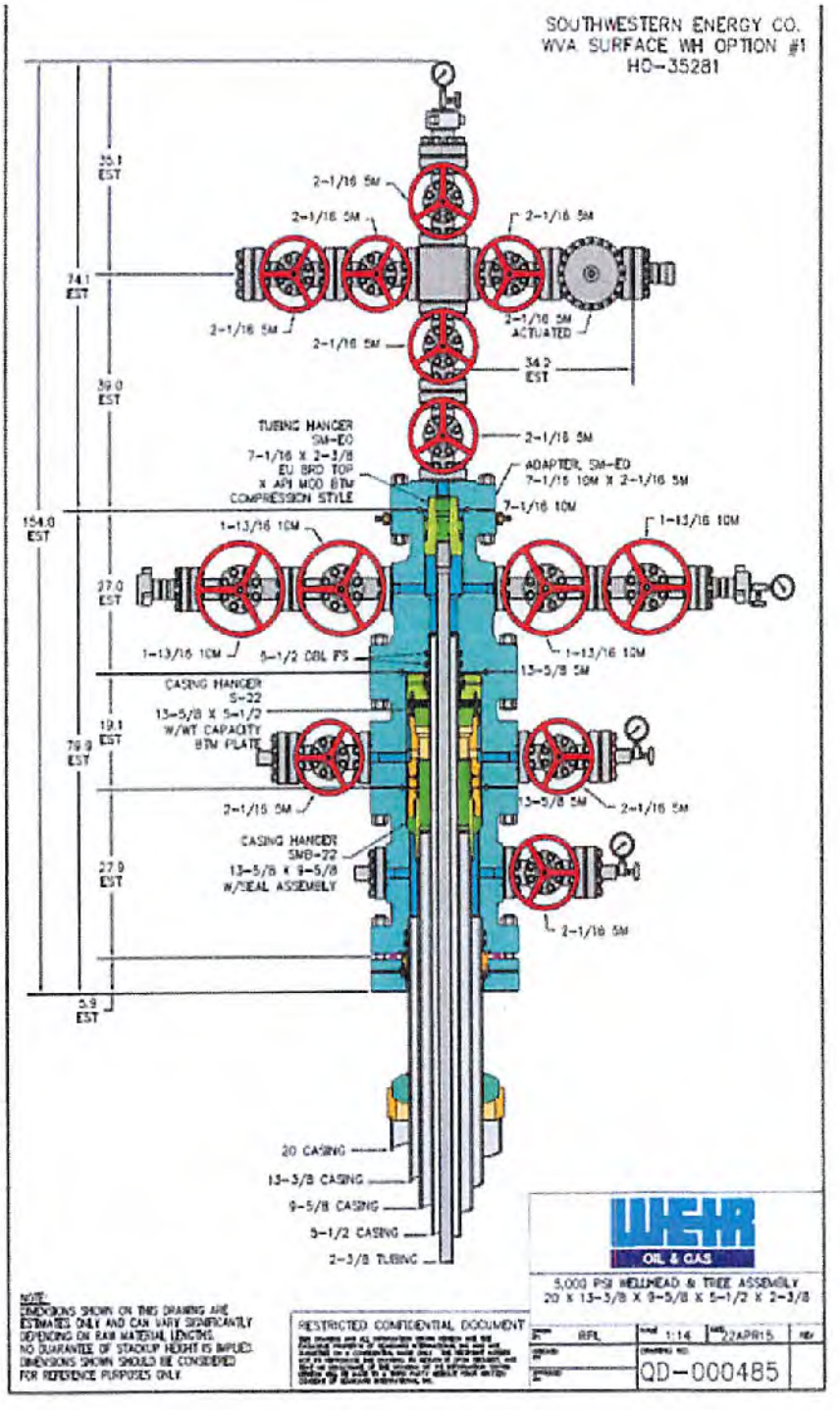
When any of these types of drilling issues are encountered, SWNPC personnel will notify the WVDEP Oil and Gas inspector immediately either via phone call, email, or text message.

F. Notification Procedures for Unusual Drilling Events

When an unusual drilling event is encountered, such as hydrogen sulfide gas or a large kick, the WVDEP Oil and Gas Inspector will be notified as soon as possible via phone call, email, or text message.

G. Wellhead Schematic

A schematic of the wellhead that is anticipated for installation following drilling and completion activities is shown on the following page.


SOUTHWESTERN ENERGY CO.
WVA SURFACE WH OPTION #1
HO-35281
35.1 EST
74.1 EST
39.0 EST
154.0 EST
27.0 EST
19.1 EST
79.9 EST
27.9 EST
5.9 EST
2-1/16 5M
2-1/16 5M ACTUATED
34.2 EST
TUBING HANGER SM-EO
7-1/16 X 2-3/8 EU 8RD TOP X API MOD BTM COMPRESSION STYLE
ADAPTER, SM-EO 7-1/16 10M X 2-1/16 5M
7-1/16 10M
1-13/16 10M
5-1/2 CSG PS
13-5/8 5M
CASING HANGER S-22
13-5/8 X 5-1/2 W/WT CAPACITY BTM PLATE
CASING HANGER SMB-22
13-5/8 X 9-5/8 W/SEAL ASSEMBLY
20 CASING
13-5/8 CASING
9-5/8 CASING
5-1/2 CASING
2-3/8 TUBING
NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS.
NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED.
DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.
RESTRICTED CONFIDENTIAL DOCUMENT
WEIR OIL & GAS
5,000 PSI WELLHEAD & TREE ASSEMBLY
20 X 13-3/8 X 9-5/8 X 5-1/2 X 2-3/8
RFL
1:14
22APR15
QD-000485

H. Well Kill Procedures

Barite and saturated brine will be available on site or nearby if necessary, to weight up beyond the proposed compositions.

Once it is confirmed that a significant gas flow has occurred, the appropriate kill procedure will be employed. The mud weight required to kill the well will be calculated and the surface mud system density will be increased to the required weight. A pumping schedule to circulate the kick out of the well will be calculated and followed once the surface mud system is of proper density.

Either of two kill procedures will be utilized to kill the well, both are recognized by the IADC as appropriate kill procedures. These are as follow:

Drillers Method: Once the kick is detected, the influx is circulated out of the well with the original mud weight and a constant bottom hole pressure (BHP) is maintained by holding circulating drill pipe pressure constant during the first circulation. Then by circulating the hole a second time with a heavier kill weight mud that is of sufficient density to control the well. During the second circulation the casing pressure is held constant until kill weight mud is pumped to the bit with a drill pipe pressure schedule is followed. After kill weight mud has been pumped to the bit, drill pipe pressure is kept constant and casing pressure is monitored as kill weight mud is circulated to surface.

Wait & Weight Method: This procedure has the advantage that only one circulation is required to kill the well. In this procedure, the well is shut-in until an accurate shut in drill pipe pressure can be determined and used to calculate required kill weight mud. Once the appropriate kill weight mud has been prepared, the well is circulated using a predetermined drill pipe pressure schedule until mud has been pumped to the bit. Then drill pipe pressure is held constant until kill weight mud has been circulated to surface.

6.0 HYDROGEN SULFIDE ("H_2S")

A. Detection, Monitoring, and Warning Equipment

H_2S monitoring equipment will be installed at the rig floor, shakers, cellar, and pits. If an alarm is presented from any of the sensors, drill operations will cease and all personnel will gather at the appropriate muster area. Properly trained and equipped personnel will determine the validity of the alarm. If the presence of H_2S is confirmed, SWNPC's H_2S Contingency plan will be activated. A copy of this plan is available upon request and details the equipment, training, and procedures required for operation in an H_2S environment.

B. Hydrogen Sulfide Training

H_2S training programs covering the topics below will be initiated:

1. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
2. Each crew member will be given certification test to verify his competence to respond in an H_2S situation
3. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit
4. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors
5. In addition to the H_2S monitoring equipment mentioned above, two safety area signs, one H_2S condition sign and two wind socks will be mobilized to location

C. Notification Procedures

In the unlikely event that hydrogen sulfide would be present, SWNPC will immediately notify the WVDEP Oil and Gas Inspector by phone.

SWNPC will then notify all affected residents and agencies by telephone or in person.

D. Procedures for Protection Zone Establishment and Maintenance

In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Protection Zones will be established while drilling that will be located at the predetermined muster points furthest upwind of the location of the H_2S. Access will be controlled by a sign, color-coded flags, and a sign-in sheet.

E. Personal Protective Equipment ("PPE") List

The following PPE will be available on location:

1. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape;
2. (1) 10 – minute escape pack will be installed on the board; and
3. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in an area that is upwind.

7.0 FLARING

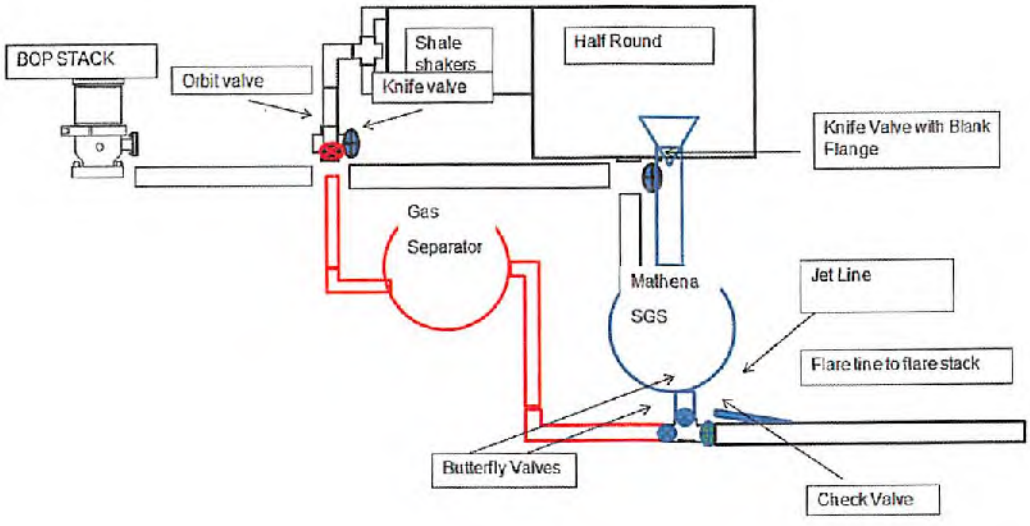
A. Description and Plan for Flaring

If a significant show of natural gas is encountered it will be flared through the 10-inch flanged flowline to a flare stack.

The fire department will be notified immediately prior to flaring, if possible.

It is anticipated that the duration of flaring should not last more than 10 days.

Below is a schematic of the flare:



8.0 COLLISION AVOIDANCE SAFEGUARD, PRACTICES AND STANDARD PLANS

A. Wellbore Anti-Collision and Directional Surveying

1. Well Planning Requirements

- No two wellbores should be designed to be closer than 10' once drilling commences. In the event that two surface locations are closer than 10' apart then directional equipment will be required below conductor and greater than 10' of separation shall be achieved as soon as possible.
- During the well planning process a clearance scan will be performed and validated. The Directional Drilling Contractor and the Drilling Engineer shall calculate a Separation Factor for all potential collision risk wells identified in the clearance scan.
- All wells planned with a S.F. of less than 1.5 or at any point closer than 10' planned center to center separation will be reviewed with the Drilling Engineering Manager prior to pre-spud meetings.
- After completion of location and prior to setting the conductor the land survey company will resurvey the stakes for each surface location and drive a steel stake in the ground identifying each individual well. An as-built will be created and circulated to the Drilling Engineer and Drilling Superintendent identifying each well and the appropriate X and Y locations.
- Anti-Collison Diagram shown on the following page.

2. Scope of Work and Survey Requirements

All wells shall be surveyed from the wellhead to a total depth using the guidelines specified in this document.

Survey tool selection shall be based on the anti-collision requirements, survey tool accuracy, target size, and depth.

SWNPC preferred method of survey calculations shall be the Minimum Radius of Curvature method.

All survey data shall be required to have azimuths pre-corrected to Grid North. The values for convergence and declinations and depth datum details used shall be reported on all definitive surveys. Additionally, survey tool accuracy should be specified on all surveys presented to SWNPC.

During collision scans all offset well surveys will be evaluated for accuracy.

In general, in all development wells, regularly spaced MWD or Magnetic Single Shot Surveys shall be taken at a frequency not to exceed 300'. Additional surveys may be taken at the discretion of the directional driller, Drilling Representative, Drilling Superintendent, or Drilling Engineer to ensure accuracy and minimize the potential for collision.

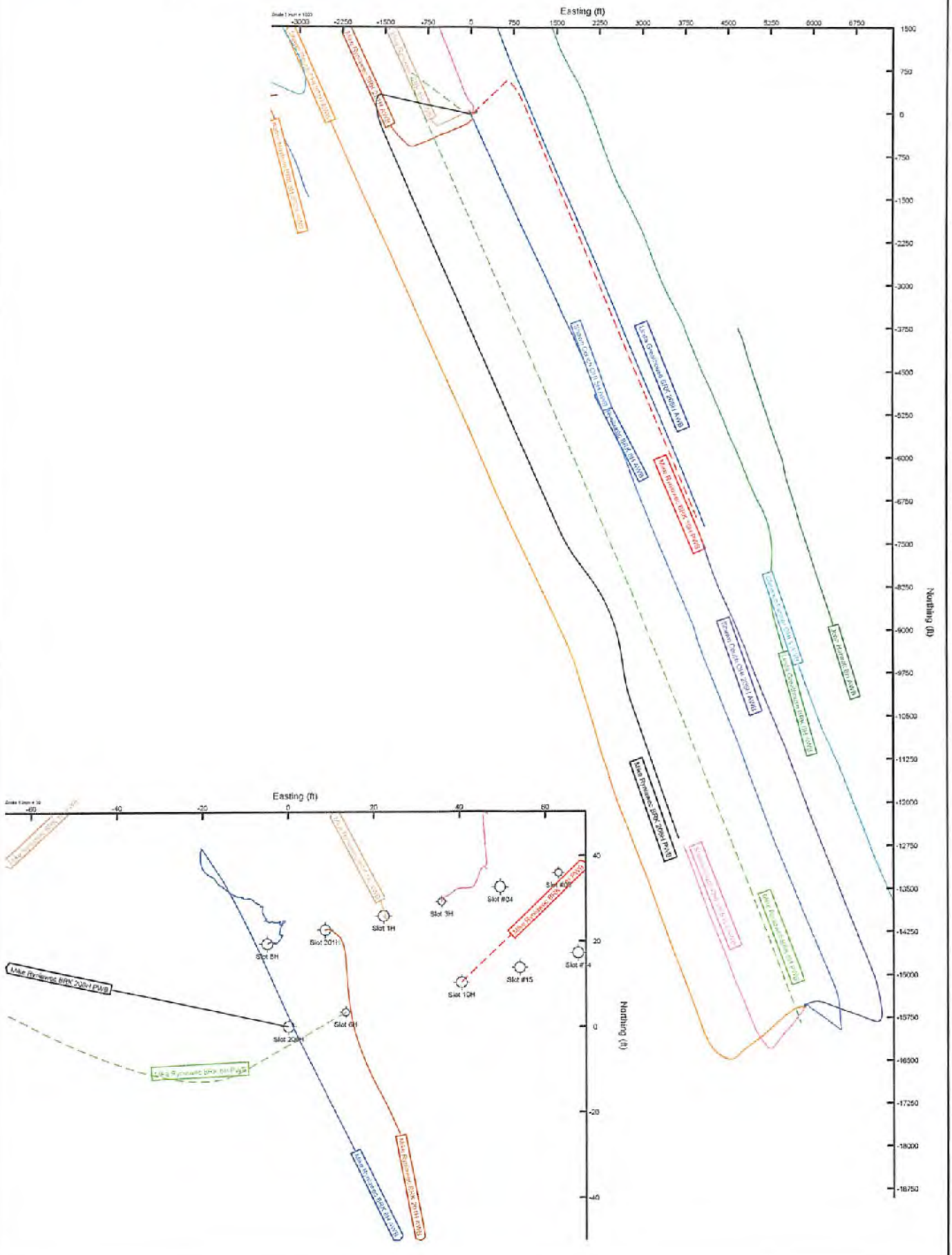
Survey Quality Control and Reporting:

- Deviation calculations shall be performed on the rig by the directional driller and independently verified by SWNPC's 24-hour operations support center. The

SWN PRODUCTION COMPANY, LLC

Location: Brooke County, WV
Field: Brooke WV
Facility: Mike Ryniawec BRK Pad

Slot:
Well: Mike Ryniawec BRK
Wellbore: Mike Ryniawec BRK



calculations shall be performed using a company approved program. The directional drilling contractor is responsible for the accurate reporting of all wellbore positioning data. The directional drilling contractor will present the definitive surveys utilizing data from any of SWNPC's surveying contractors.

- The SWNPC representative will check tie-in data before drilling out of each hole section. Projected surveys will never be used to tie-in subsequent surveys.
- The Drilling Engineer and directional drilling contractor will ensure all directional drilling proposals include the correct tie-in data and clearly identify the projection to which the plan is tied. This projection will be replaced with a survey once drilling commences.

3. Collision Response

In the event of a collision, or if it is determined that there is the likelihood of a collision, drilling operations will cease and well control measures will begin based on the well architecture at the time of the collision and the surface pressures seen. In all cases, the main focus will be to maintain well integrity in both wellbores. Dependent upon the depth and pressures encountered, one of the following will occur:

- The well will be shut in and well kill operations initiated if the surface pressures do not exceed the maximum allowable surface pressure; or
- The well will be diverted to flare should the surface pressure exceed the maximum allowable surface pressure until the time that appropriate kill operations can begin.

The SWNPC Drilling Engineer and Drilling Manager will be contacted by the rig personnel, and the appropriate WV DEP Oil and Gas Inspector will be contacted as notification of the issue. SWNPC's Emergency Management Plan will be initiated and the well control contractor will be contacted to proceed to the wellsite. Appropriate local emergency response personnel will also be contacted.

4. Notification Procedure

In the event of a collision or if it is determined that there is the likelihood of a collision, the WVDEP Oil and Gas Inspector will be notified as soon as practicable by phone.

For WV Notification Numbers, see Attachment 8.

9.0 DRILLING SIMOPS MANUAL

A. Cellar Entry

- Cellar entry while plats are in place is prohibited. Cellar entry without a gas monitor is prohibited.
- Drilling personnel will not entry producing well cellars.

B. Pad Preparation

- Production personnel will perform an inspection of each existing wellhead within 1 week of rig mobilization.
- Drilling personnel will inspect the pad prior to containment installation.
- Production will function test and service all well head valves.
- Production LEL monitoring stations will be located in the producing wells cellars or on the well head of above grade wells and GPUs.
- Confirm jersey barriers have been placed in front of all surface equipment.
- All personnel working on location for drilling during pad preparation will receive instruction no ESD operation and LEL monitors before starting operations.
- Containment plastic will be installed into and attached to the cellar wall.
- All lifts for the cellar plates or wellhead cages will be made using two tag lines to guide the plate into position.
- Hand rails must be installed immediately after a plate is removed from the cellar trench of below grade wells.
- Driving across a cellar cover is prohibited.
- Producing wells located in a trench with active conductor or mouse hole installations will be shut in.

C. Rig Mobilization

- Below grade wells can remain on production during rig moves and skids if the walking path of the rig does not cross production flowlines.
- If the wellheads are below grade in CellarTech cellars, then the cellar cover plates or handrails will be in place at all times.
- The daytime Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of rig mobilization forward.
- A gate and guard shack will be place at the bottom and top of the lease road to control access to the lease road and pad.
- Install check valve on existing well kill line near the cellar and a manual valve on existing well kill line near the dedicated pump for all below grade wells.
- Install firehose to all producing well cellars and connect to a dedicated pump or gravity feed system.
- After finishing rig equipment placement and before starting engines, install LEL monitors.
- Confirm ESD pull stations are located in front of the tank battery and at the lease road entrance to the pad.
- The producing well cellars will be connected to a dedicated air compressor to produce negative pressure in the cellars via Venturi effect.

- If new well cellar entry is required prior to the rig up of the ventilations system two intrinsically safe blowers must be used to move air into and out of the cellar.

D. Producing Well Ventilation

If the existing wells on the well pad are in CellarTech below grade cellars, the following procedure will be followed:

• A negative pressure environment will be maintained in all producing well cellars at all times after initial MIRU of drilling operations. A dedicated 750 cfm compressor will be used to supply air to the ventilation system and should be stationed near the drilling air pack. A vacuum will be pulled on all producing cellars. Each ejector will be threaded to a 3' of 3" pipe which will extend through the cellar plate and into the cellar. The supply air and exhaust lines will be flexible rubber hose rated to 500 psi. Each cellar will be covered with a VentaTex curtain to control air flow into the cellar.

E. Drilling Operations

1. Cellar Hot Work

- Two 12 inch, intrinsically safe blowers will be used to ventilate new well cellars anytime a welder is working in the cellar.
- 4-gas air monitors will be used to monitor the atmosphere inside the cellar and the exhaust line of the blower located in the cellar.
- Fire watch will be maintained from surface if adequate visibility can be maintained.

2. Other Cellar Operations

- Cellar operations not requiring hot work do not require ventilation for entry. The cellar atmosphere will be tested prior to entry and continuous 4-gas monitoring will be required in the cellar while it is occupied.

3. Surface Hot Work

- A designated hot work area will be set up and identified with signage.

4. EL and ESD Events

- The LEL detectors on location are set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing.
- Production LEL alarms will be reported to the production operator and WSS immediately.
- Drilling operations will be suspended and all personnel will report to their assigned SimOps position. (See Attachment 9 for SimOps position table)
- The production operator, production superintendent, and drilling engineer should he notified as soon as possible.
- The production operator will confirm the cause of the LEL event and inform the WSS as to the severity of the issue and requirements for isolating the leak.
- Requirements for returning to Drilling Operations are below:

  - Level 1: LEL source isolation, 0% LEL on location
  - Level 2: LEL source isolation, leak point repair and testing, 0% LEL on location
  - Level 3: Management approval.
- Rig engines can be re-started and circulation resume if the LEL source is isolated and the LEL measurements have returned to 0% after level 1 & 2 events.

5. Traffic Control

- Traffic on the lease road will be one way up or down for commercial trucks.
- Signs will be places at the beginning of the lease road instructing commercial drivers to use a specific radio channel to contact the gate guard for permission to proceed.
- A gate will be installed at the entrance to the pad and manned 24-Hours a day to control access to the location.
- Tight coordination with the staging area will be required to maintain order flow.
- Production trucking operations will be coordinated with drilling operations to avoid congestion.
- Production trucks will be escorted from the gate to the tank battery and back to the gate by the production operator.

F. Contingency Operation

1. Surface Equipment Leaks

- Minor surface leaks will be isolated via Surface Shutdown procedures.
- If the LEL monitors near the rig alarm after a Surface Shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
- Drilling personnel will not enter production equipment area.
- All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process.
- If conditions indicate an LEL detection near a rig engine it is probable the rig will be given the opportunity to circulate at least 1 bottoms up prior to venting if the production situation is not deemed critical.
- When possible all venting will be routed through the combustor.

2. Producing Cellar Leaks

- Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.
- Leaks which are upstream from the ESD cannot be stopped by shutting in the well.
- No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor.

3. Producing Cellar Entry

- LEL Measurements must be a 0% inside and around the cellar before the cellar plates can be removed.
- Rig operations will be suspended before the cellar cover plates are removed.
- If possible, cellar entry will be times to coincide with non-critical operation periods for drilling.

- Handrails and stairs will be in place before production personnel entry the producing cellar.
- A spotter will remain at the cellar while personnel are inside.
- Entry below cellar grating is prohibited without management approval.

4. Simops Drills

SimOps drills will replace BOP drilling every other day. Drills should cycle through various LEL alarm scenarios to ensure the crew is familiar with their assigned duties for each situation.

G. Surface Well Head Operations

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

SimOps involving above grade wellheads will observe the following protocol:

- Production from above grade production trees will only occur if the location layout permits for adequate protection of the producing wellhead utilizing cages.
- A location assessment will be performed prior to rig mobilization to determine if the rig, well head cages, and production equipment can be safely placed on location to ensure safe drilling and production operations.
- Grating will be in place at ground level around the producing wells restricting access to the cellar.
- ESD's and LEL meters will be installed in similar locations as described above the below grade wells.
- All production equipment will be protected by concrete jersey barriers as described in Section 4.
- Engines should not be located within 40 feet of a producing well or production equipment.
- No loads should be lifted over the wellhead cages which exceed the structural protection provided by the cage.
- Drilling personnel will not enter above grade, producing well cellars.

H. Demobilization

Location handover will occur after the rig is off location and the WSS and production operator have completed a location inspection together.

For the complete SimOps manual, see attachment #9.

ATTACHMENT 1
PRE-SPUD SIGN IN SHEET

Southwestern Energy Pre-Spud Sign In Sheet
ALL SWN Employees must sign in upon arrival NO EXCEPTIONS!!
List time, date, and department.

Name Please Print	Department	Date	Time In	Time Out

ATTACHMENT 2
WELL SITE SAFETY MEETING SIGN IN SHEET

Southwestern Energy Well Site Safety Meeting Sign in Sheet
ALL SWN employees must sign in upon arrival NO EXCEPTIONS
List date, time in, time out, and phase of work.

Name Please Print	Department	Date	Time In	Time Out	Phase of Work (Drilling, Completions, or Workover)

ATTACHMENT 3
VISITOR SIGN IN SHEET

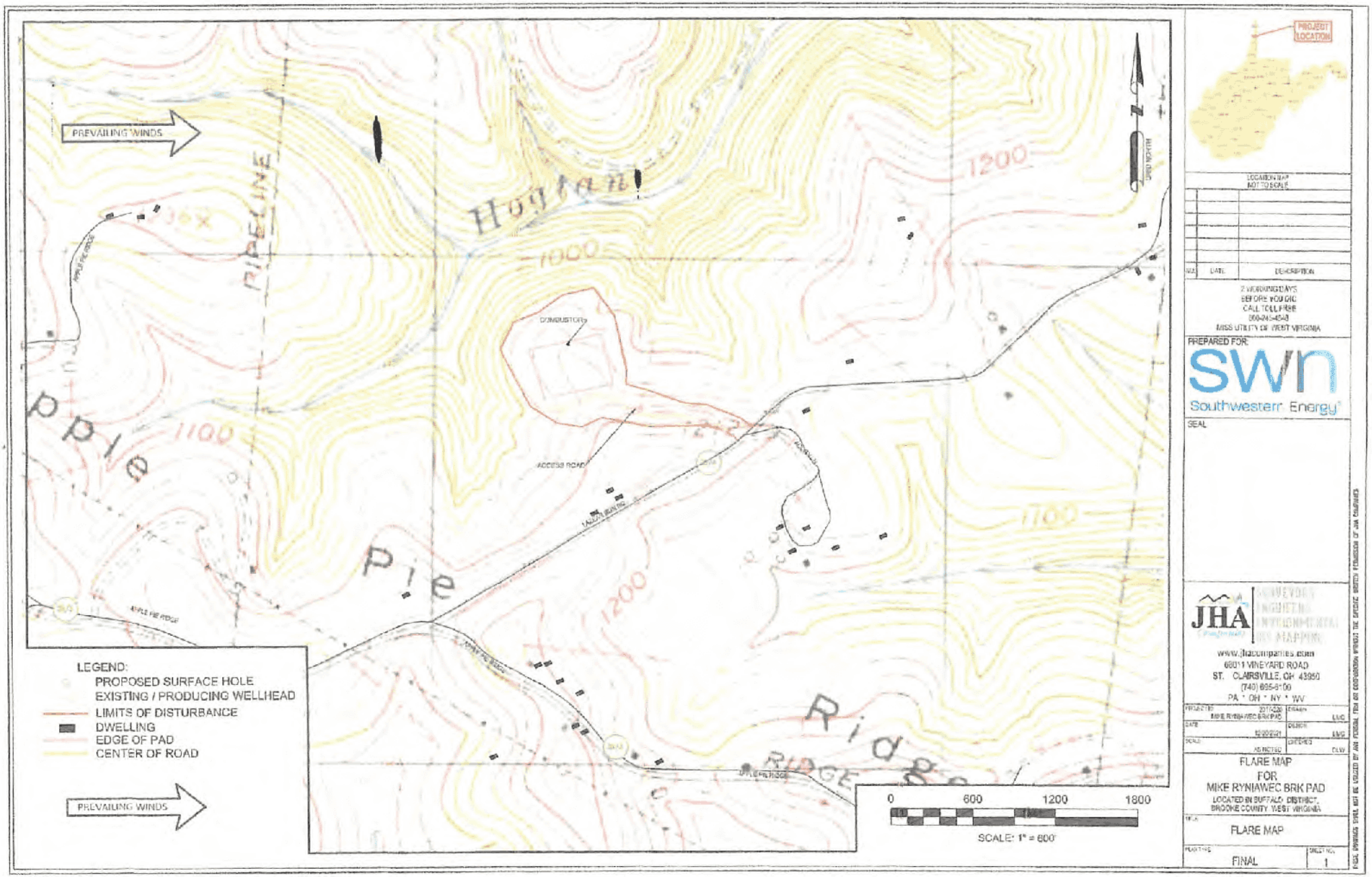
Southwestern Energy Sign In Sheet

All visitors must sign in upon arrival NO EXCEPTIONS!!! List time, date, company.
This allows Southwestern to monitor all visitors to their well site's
Hard hats, safet glasse, steel toe boots are required to be worn at all times on
Anyone has the right to stop the job for Safety. SAFETY is everybodys business!!

ALL ACCIDENTS OR INCIDENTS MUST BE REPORTED TO COMPANY MAN/RIG MANAGER NO MATTER HOW Tap Training

Name Please Print	Company Name	Date	Time In	Time Out	Injury?	Yes	No
						☐	☐
						☐	☐
						☐	☐

ATTACHMENT 4
PLAN VIEW MAP


PREVAILING WINDS
PIPELINE
Hogback
1200
1000
1100
DUMBUSTOR
ACCESS ROAD
Pie
Ridge
LEGEND:
PROPOSED SURFACE HOLE
EXISTING / PRODUCING WELLHEAD
LIMITS OF DISTURBANCE
DWELLING
EDGE OF PAD
CENTER OF ROAD
PREVAILING WINDS
0
600
1200
1800
SCALE: 1" = 600'
PROJECT LOCATION
LOCATION MAP
NOT TO SCALE
NO.
DATE
DESCRIPTION
2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800-245-4848
MISS UTILITY OF WEST VIRGINIA
PREPARED FOR:
swn
Southwestern Energy
SEAL
JHA
www.jhacompanies.com
60011 VINEYARD ROAD
ST. CLAIRSVILLE, OH 43950
(740) 695-8100
PA * OH * NY * WV
PROJECT
2017-520
MIKE RYNIAWEC BRK PAD
DRAWN
LMC
DATE
12/20/2017
DESIGN
LMC
SCALE
AS NOTED
CHECKED
DLW
FLARE MAP
FOR
MIKE RYNIAWEC BRK PAD
LOCATED IN BUFFALO DISTRICT,
BROOKE COUNTY, WEST VIRGINIA
TITLE
FLARE MAP
PLOT TYPE
FINAL
SHEET NO.
1

ATTACHMENT 5
1-MILE RADIUS TOPO MAP

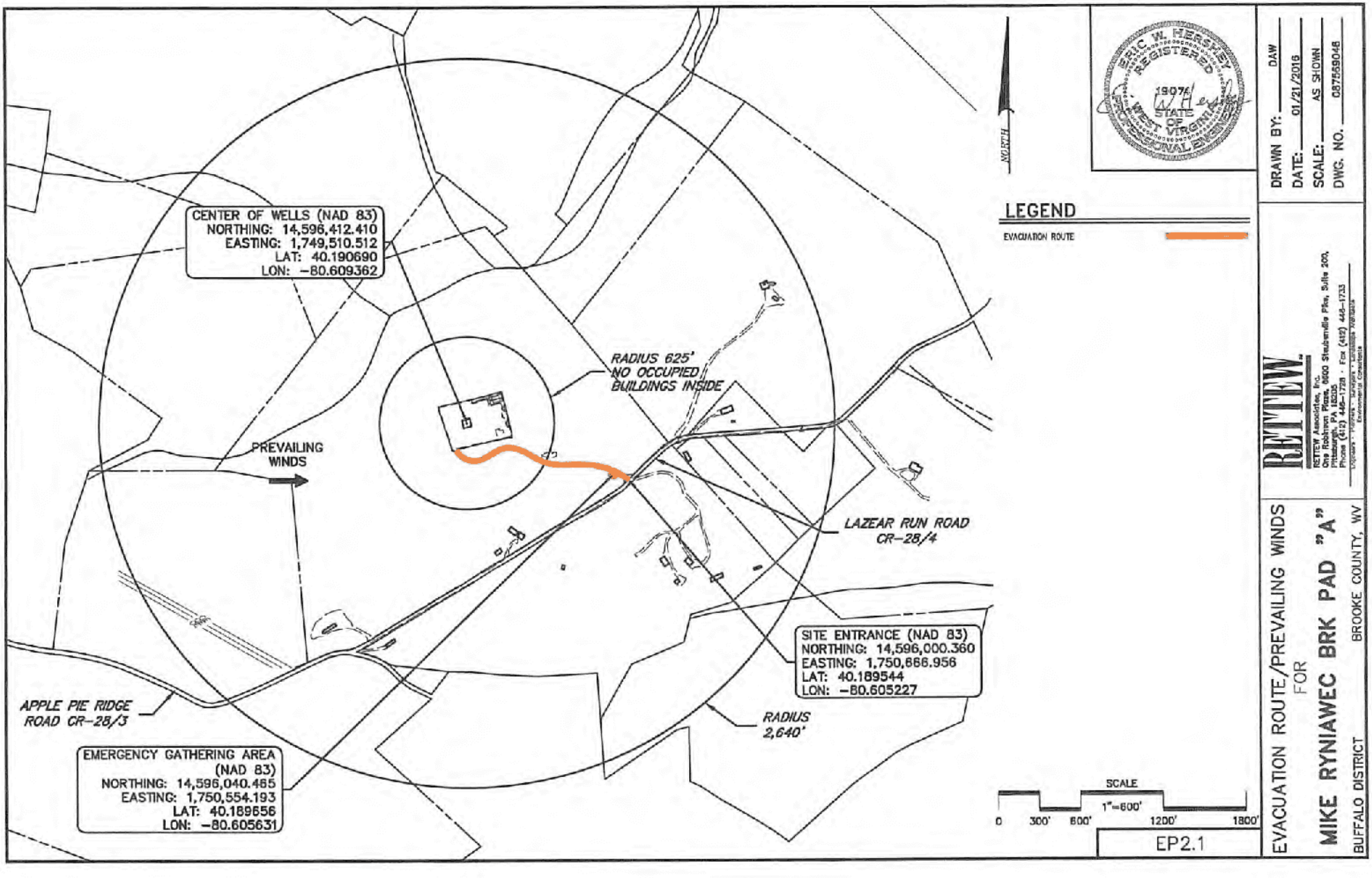
Legend

- Mike_Ryniawec_Pad
- Ryniawec_Pad_1_Mile_Buffer
- sde.GISPUB.bmp_Cemeteries
- sde.GISPUB.bmp_Churches
- sde.GISPUB.bmp_Schools

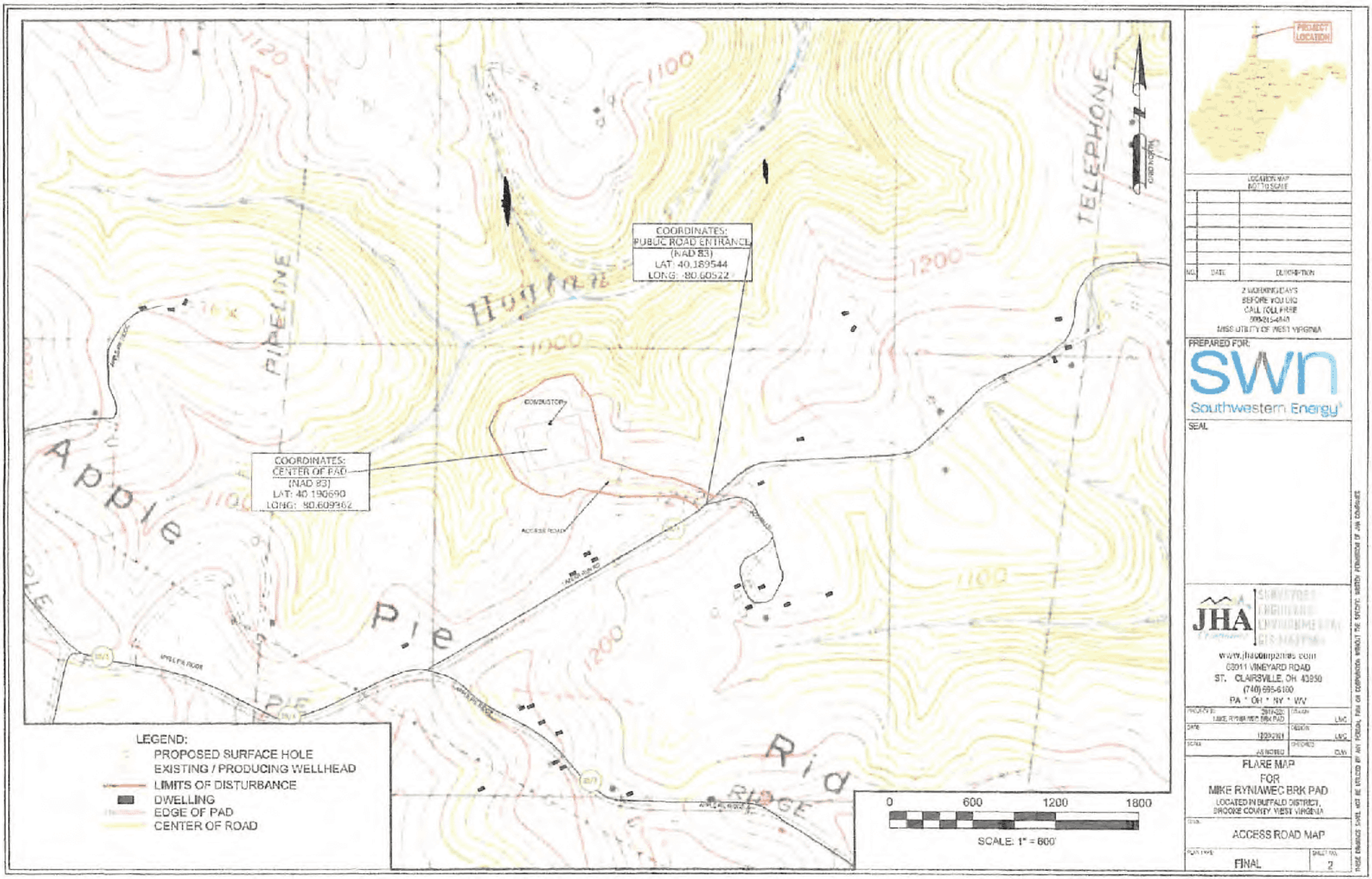
Mike Ryniawec -1 Mile
Brooke County, West Virginia

Coordinate System: NAD 1983 StatePlane West Virginia North FIPS 4701 Feet

ATTACHMENT 6
EVACUATION PLAN


CENTER OF WELLS (NAD 83)
NORTHING: 14,596,412.410
EASTING: 1,749,510.512
LAT: 40.190690
LON: -80.609362
RADIUS 625'
NO OCCUPIED
BUILDINGS INSIDE
PREVAILING
WINDS
LAZEAR RUN ROAD
CR-28/4
SITE ENTRANCE (NAD 83)
NORTHING: 14,596,000.360
EASTING: 1,750,666.956
LAT: 40.189544
LON: -80.605227
APPLE PIE RIDGE
ROAD CR-28/3
RADIUS
2,640'
EMERGENCY GATHERING AREA
(NAD 83)
NORTHING: 14,596,040.465
EASTING: 1,750,554.193
LAT: 40.189656
LON: -80.605631
NORTH
LEGEND
EVACUATION ROUTE
SCALE
1"=600'
0
300'
600'
1200'
1800'
ERIC W. HERSHEY
REGISTERED
19074
STATE
OF WEST VIRGINIA
PROFESSIONAL ENGINEER
DRAWN BY: DAW
DATE: 01/21/2016
SCALE: AS SHOWN
DWG. NO. 087559048
RETTEW
RETTEW Associates, Inc.
One Robinson Plaza, 6500 Steubenville Pike, Suite 200,
Pittsburgh, PA 15205
Phone (412) 446-1728 - Fax (412) 446-1733
Engineers • Planners • Surveyors • Landscape Architects
Environmental Consultants
EVACUATION ROUTE/PREVAILING WINDS
FOR
MIKE RYNIAWEC BRK PAD "A"
BUFFALO DISTRICT
BROOKE COUNTY, WV
EP2.1

ATTACHMENT 7
WELL LOCATION TOPO MAP


COORDINATES:
PUBLIC ROAD ENTRANCE
(NAD 83)
LAT: 40.189544
LONG: -80.60522
COORDINATES:
CENTER OF PAD
(NAD 83)
LAT: 40.190690
LONG: -80.609362
PIPELINE
TELEPHONE
Apple Pie Ridge
LEGEND:
PROPOSED SURFACE HOLE
EXISTING / PRODUCING WELLHEAD
LIMITS OF DISTURBANCE
DWELLING
EDGE OF PAD
CENTER OF ROAD
0
600
1200
1800
SCALE: 1" = 600'
PROJECT LOCATION
LOCATION MAP
NOT TO SCALE
NO.
DATE
DESCRIPTION
2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE
800.245.4848
MISS UTILITY OF WEST VIRGINIA
PREPARED FOR:
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Southwestern Energy
SEAL
JHA
www.jhacompanies.com
63011 VINEYARD ROAD
ST. CLAIRSVILLE, OH 43950
(740) 695-6100
PA * OH * NY * WV
PROJECT:
MIKE RYNIAWEC BRK PAD
DRAWN
LMC
DATE
12/20/2013
CHECKED
LMC
SCALE
AS NOTED
CHECKED
CLH
FLARE MAP
FOR
MIKE RYNIAWEC BRK PAD
LOCATED IN BUFFALO DISTRICT,
BROOKE COUNTY, WEST VIRGINIA
ACCESS ROAD MAP
PLAN TYPE
FINAL
SHEET NO.
2
THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE EXPRESS WRITTEN PERMISSION OF JHA COMPANIES

ATTACHMENT 8
WV NOTIFICATION NUMBERS

West Virginia Incident Notification Numbers

All SWN employee office and cell phone numbers can be found in the employee directory on SWNet.

Name	Title	Office	Cell	Home
Derek Cutright	SVP & Dept Head - SW APP	(832) 796-7473	(713) 471-6857	
Chris Flanagan	Area Manager - SW APP	(304) 884-1626	(304) 203-4985	
Shawn Jackson	Operations Manager - SW APP	304-884-1618	(304) 641-3204	
John Ale	Senior VP General Counsel & Corporate Secretary	(832) 796-6100	(832) 545-5010	(713) 874-0263
Jason Rabalais	HR Director	(832) 796-4012	(713) 855-0251	
HSE Department				
Brit Benko	HSER Vice President	(832) 796-2768	(832) 302-6974	
Charlie Allen	HSE Supervisor - SW APP	(304) 884-1617	(570) 690-3027	
Clayton Travis	Sr. HSE Coordinator - SW APP	(304) 884-1707	(501) 358-9354	
Regulatory				
Dan Croll	Regulatory Director	(832) 796-2867	(713) 689-8139	
Carla Suszkowski	Regulatory Manager	(832) 796-6372	(724) 561-8129	
Chad Keilman	Regulatory Supervisor	(304) 884-1648	(501) 428-3114	
Brittany Woody	Senior Regulatory Analyst	(304) 884-1613	(304) 997-2598	
Production Operations				
Chris Allison	Production Field Manager	(304) 884-1719	(832) 316-8356	
Donny McHenry	Sr. Production Foreman	(304) 884-1624	(304) 641-5518	
Completion Operations				
Ellen Gies	Completions Superintendent	(304) 884-1691	(281) 543-7749	
JD Davidson	Senior Completions Foreman	(570) 690-9428	(570) 996-4266	
Nick Flesher	Completions Formean	(304) 884-1681		
Construction/LMG Operations				
John Dubowski	Construction Superintendent	(304) 884-1678	(346) 773-6078	
Drilling Operations				
Dicky Hall	Technical Expert Drilling Engineer	(832) 796-4870	(713) 569-2935	
Eric Draxten	Drilling Superintedent	(304) 884-2818	(501) 269-4393	
Brad Riley	Rig Operations Superintendent	(304) 884-1710	(304) 517-3105	
Water Team				
Mark Mazoch	Water Team Manager	(832) 796-7542	(713) 825-4567	
Bill Vavrek	Senior Water Team Supervisor - SW APP	(304) 884-1693	(304) 641-6507	

Last Revised 1-13-2020

ATTACHMENT 9
COMPLETIONS SIMOPS MANUAL

SOUTHWESTERN ENERGY PRODUCTION COMPANY LLC COMPLETIONS AND PRODUCTION SIMOPS MANUAL

TABLE OF CONTENTS

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4. FRAC MOBILIZATION....4
5. COMPLETIONS OPERATIONS....5
6. CONTINGENCY OPERATIONS....8

1. INTRODUCTION

The purpose of this manual is to provide detailed procedures governing simultaneous operations (SimOps) OF Completions and Production on locations in the Southwest Appalachia Division of Southwestern Energy Production Company LLC (SWNPC). These operations may occur with Cellar Tech cellars or conventional surface wellheads.

2. CELLAR ENTRY (IF APPLICABLE)

Cellar entry while cover plates are in place is prohibited (plates should not be in place during completion operations). Cellar entry without a gas monitor is prohibited.

Completions personnel will not enter producing well cellars. Production personnel may enter existing well cellars after the following conditions have been confirmed:

a. LEL readings confirm no gas is present in the cellar or on surface.
b. All pressure has been released from production flow lines.
c. Completions operations have been suspended and the high pressure exclusion zone (HPEZ) is inactive.
d. Cellar cover plates are confirmed to be gone and handrails or other barriers are in place to prevent someone from falling into cellar.
e. Secondary LEL measurements confirm no gas is present at the base of cellar below grading.
f. JSEA has been reviewed with completions WSS and Production well operator.

Completions WSS or wellhead technician under direction of completions WSS may enter new well cellars to perform standard completions related tasks. New well cellar entry will be considered non-permit required, confined space entry after LEL measurements have confirmed no gas is present and reclassification permit has been completed. Personnel entering cellar shall wear personal LEL monitors.

New well cellar entry after an LEL detection and/or emergency shut down (ESD) in a producing well cellar in the same trench is prohibited. Work should be suspended as soon as feasible after an LEL detection and/or ESD in a producing cellar located in an offset trench.

Specific cellar entry requirements regarding completions operations or contingency operations are addressed in the following sections.

3. PAD PREPARATION

An inspection of each existing well head will be performed within 1 week of frac prep operations. The inspection should include visual and FLIR camera techniques to confirm there are no leaks present.

Completions personnel will inspect the pad prior to containment installation and document all ground stains and/or equipment issues with photographs and send an email to the completions engineer, foreman, and superintendent.

Production will function test and service all well head valves and ensure a baffle between the existing producing wells and the planned wells in the same trench is installed, if applicable.

Production LEL monitoring stations will be in place at any locations determined by the completions team. The monitors should, at a minimum, be in front of the production equipment, behind the concrete jersey barriers. Emergency shut down (ESD) controls will be placed at the locations directed by the completions team and remote ESD will be assigned to the WSS. Additional production LEL monitors can be installed, the following locations will have a LEL monitors.

- Combustor
- Cellars (If Applicable)
- Tank Battery
- Compressors
- Stabilizers
- GPUs

Confirm jersey barriers have been placed in front of all surface equipment including the gas processing unit (GPU)/sand traps, flash stabilizers, compressors, vapor recovery unit (VRU), tank battery, combustor, and exposed production flowlines.

All personnel working on location for completions during pad preparation will receive instruction on ESD operation & location and LEL monitors before starting operations.

If applicable containment plastic will be installed into and draped into cellars.

All lifts for the cellar plates will be made using two tag lines to guide the plate into position.

Hand rails must be installed immediately after a plate is removed from the cellar trench, if applicable.

Driving across a cellar cover is prohibited.

4. FRAC MOBILIZATION

1) If applicable, cellar cover plates should be removed and handrails installed prior to completions MIRU. If cellar cover plates are still in place, wellsite supervisor (WSS) should contact production well operator and completions foreman. Handrails will be in place at all times. If a cellar cover plate needs to be installed in place of a handrail

for any reason, WSS will contact completions foreman, superintendent, and completions engineer.

2) If applicable, suitable wellhead cages should be positioned over all existing above ground wellheads within the operational footprint.
3) The Well Site Supervisor (WSS) will be the Person in Charge (PiC) from the start of frac mobilization forward.
4) After finishing frac equipment placement and before starting operations, install completions LEL monitors as directed by the completions team. These LEL monitors are to be placed in addition to the production LEL monitors already in place. Completions LEL monitors will be installed at the following locations:
    - Wellheads (cellars)
    - Blender
    - Flowback tanks
    - Produced water unloading area
5) The LEL detectors on location are to be set to alarm at 10% of the lower explosive limit (LEL) for the atmosphere they are testing. An active alarm on the LEL detector at 10% indicates the methane level in the atmosphere is at 10% of the lowest amount required for ignition.
6) After finishing frac equipment placement and before starting operations, install completions ESDs. ESDs installed in front of production equipment will remain in place. Production strobe light should be tied into all ESDs. Completions ESDs will be installed at the following locations:
    - Inside frac van
    - Tank loading area
    - Wellhead area
    - Muster point

5. COMPLETIONS OPERATIONS

If applicable, cellars of new wells will be classified as non-permit required, confined space and will require the same procedures for entry as conventional cellars at a minimum. Additional air monitoring requirements are stipulated below. Unless noted otherwise, LEL detection limits will be set at 10% of the LEL limit. All air monitor alarms shall be immediately reported to the WSS. Only the WSS has the authority to resume operations after an alarm. WSS should monitor water level in cellars and remove any excess water as necessary.

Completions Operations

1) Production group should monitor pressure on active wells and determine when to shut in if necessary.

2) Crane for wireline operations must be situated so that under no circumstance is a suspended load moved over a producing well.
3) SWN FLIR camera should be available so WH facilities can be checked for leaks periodically. Camera should be used to check for leaks once per week during frac and drillout operations.
4) A windsock should be clearly visible from any point on location. At least 3 windsocks should be placed on location.
5) Hot work is not permitted on location unless signed off by completions superintendent and completions manager.

Frac Hit Operations

If a producing well shows an increase in pressure indicating a frac hit, follow the procedures below based on the level of frac hit. A frac hit should be identified through the production well operator monitoring Cygnet. These procedures should be followed assuming the frac hit did not cause a well control event. In the case of a well control event, utilize the well control operations section below.

1) If deemed necessary by the production operator or if pressure on offset wellhead exceeds 4000 psi, cut sand concentration and attempt to flush one full wellbore volume. Hard shutdown can be performed if necessary. Production well operator may shut in producing well through GPU or ESD if necessary.
2) If performing flush, drop rate until corresponding pressure is below 7,000 psi.
   a) Attempt to flush at 60-80 bpm
   b) Do not increase FR concentration to get pressure below 7,000 psi
3) Once well is successfully flushed, shut down and bleed off surface pressure.
4) Once HPEZ is inactive, production personnel will manually secure wellhead.
5) Once producing wells are secure, all employees will report to muster point for a safety standdown.

Once operationally a frac hit has been handled, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

LEL, ESD, and Well Control Events

In the event that an LEL alarm is confirmed to be a real event or any type of well control incident occurs, the following protocol should be followed.

1) Production LEL alarms will be reported to the production operator and WSS immediately.
2) Completions operations will be suspended and all personnel will report to their assigned SimOps position in the table below. The new well cellar, if applicable, will be evacuated for all LEL and/or ESD events.

Position	SimOps Station	Assignment after Confirmation
Frac WSS and Production Well Operator **(Frac WSS will be incident commander)**	Event location	Confirm event. Radio over frac and wireline channels to evacuate to muster point. Frac WSS to kill auxiliary engines. Light plants engines should be killed per WSS discretion based on amount of light necessary to maintain pad safety.
Wireline WSS and Frac Stack Technician	Accumulators	Use ESD to shut in producing wells. Use accumulators to shut in on hydraulic master valve.
Frac Supervisor	Data Van	Use e-stop button inside frac van to kill frac pumps. Sound emergency horn. Clear frac van of any employees.
Frac Line Boss	Inactive HPEZ	Clear grounds/HPEZ of any employees.
Wireline Engineer	Wireline area	Kill wireline truck engine. Clear wireline and crane area of any employees.
Water Supervisor	Water transfer area	Kill boost pump engines. Clear water transfer area of any employees.
SEAC	Muster point	Account for all team members using sign in sheet and act as site safety officer.

3) The completion foreman, superintendent, completions engineer, and production superintendent should be notified as soon as possible.
4) Once operationally the event has been contained, an operations call between the WSS, foreman, superintendent, completions engineer, completions manager, production foreman, production engineer, and production manager will be conducted. Frac operations are to be suspended until clearance to resume operations has been given by completions and production management.

SimOps Drills

SimOps drills will be conducted prior to beginning fracing first stage and every Thursday. Day shift and night shift should each partake in a simops drill. To perform a SimOps drill presonel should man stations as outlined above.

6. CONTINGENCY OPERATIONS

Surface Equipment Leaks

1) Minor surface leaks will be isolated via Surface Shutdown procedures. Surface shut down take the production equipment offline, but will not ESD the producing wells in the cellar if applicable.
2) If the LEL monitors near the rig alarm after a surface shutdown the pad ESD will be activated to shut-in producing wells at the wellhead.
3) Completions personnel will not enter production equipment area. Production personnel will repair and test all production related equipment.
4) All planned venting of surface equipment should be discussed with the WSS prior to beginning the venting process. Estimated vent volumes, distance to the nearest engine and wind should be considered when determining the timing of the vent.

    A. Low volume, long distance, and/or favorable wind direction may allow frac operations to continue.
    B. Higher volumes, shorter distances to engines, or unfavorable wind directions will require frac operations to suspend in preparation for a possible engine shut down due to an LEL alarm.
    C. When possible all venting will be routed through the combustor.

Producing Cellar Leaks (If Applicable)

1) Cellar leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

    A. Downstream leaks can be isolated from the well using the ESD. A downstream leak in the cellar will be detected by the cellar LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.
        a. Blow down surface equipment
        b. Monitor surface LEL reading near leaking cellar
        c. Continue venting cellar
        d. If LEL alarm continues in cellar, assume leak is upstream of ESD
    B. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
        a. Small leak: Leak is contained to the cellar utilizing existing cellar ventilation system with no flare created and 0% LEL readings around the cellars.

- Confirm drilling operations are not producing the gas which triggered the alarm. Check new well cellar and shakers.
- If LEL remains at 0% adjacent to producing cellar, take a second LEL measurement from the alarming cellar.
- If second LEL confirms alarm, adjust ventilation system and/or cellar plate curtain
- If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

b. Large leak: LEL alarms in cellar and on surface near producing wells after surface blow down or ventilation system flare or flowing cellar. Well kill operations will start immediately for large leaks.

2) No initial LEL alarm will be considered a false alarm without independent confirmation by a second monitor. If a cellar LEL triggers an ESD and the alarm continues after surface blow down without surface LEL alarms, a second LEL reading will be taken by running a meter tube into the cellar through one of the cellar plate perforations. If the second meter confirms a safe atmosphere, the cellar LEL can be disabled and replaced by the surface alarm. The well cannot be returned to sales until the cellar LEL monitor is repaired or replaced.

Producing Cellar Entry

1) If possible, cellar entry will be timed to coincide with non-critical operation periods for completions, preferable casing points.
2) Handrails and stair will be in place before production personnel entry the producing cellar.
3) A spotter will remain at the cellar while personnel are inside.
4) Entry below cellar grating is prohibited without management approval. The space below grating in producing well cellars is consider permit required confined space and cannot be accessed without additional training and equipment.

Producing Surface Well Leaks (If Applicable)

5) Surface leaks will be separated into two categories, upstream of the ESD (well head) and downstream of the ESD.

C. Downstream leaks can be isolated from the well using the ESD. A downstream leak will be detected by the LEL meter which will automatically trigger the ESD to shut in all producing wells and ESD the surface equipment.

a. Blow down surface equipment

b. Monitor surface LEL reading near leaking cellar
c. Continue venting cellar
d. If LEL alarm continues in cellar, assume leak is upstream of ESD

D. Leaks which are upstream from the ESD cannot be stopped by shutting in the well. Upstream leaks will be classified as small or large.
   a. **Small leak:** Leak with no flare created and 0% LEL readings around the well/s.
      - Confirm frac operations are not producing the gas which triggered the alarm. Check new well tin horn cellar and shakers.
      - If LEL remains at 0% adjacent to producing well, take a second LEL measurement from the alarming well.
      - If LEL alarms sound adjacent to cellar the leak is immediately reclassified as a large leak and well kill operations being.

   b. **Large leak:** redundant LEL alarms on surface near producing wells after surface blow down. Well kill operations will start immediately for large leaks.

Casing Offload Tally

Well Name: TIMMY MINCH OHI 210 **Intermediate, Set Depth: 1,906.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003370000	4001164289	SWN PRODUCTION COMPANY L...	1,208.20	25.80	1,234.00 KB1,6/28/2016 07:12	6/22/2022 22:45
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Strings

Casing Description	Set Depth (ftKB)	Run Date
Intermediate	1,906.00	

Casing Run Tally

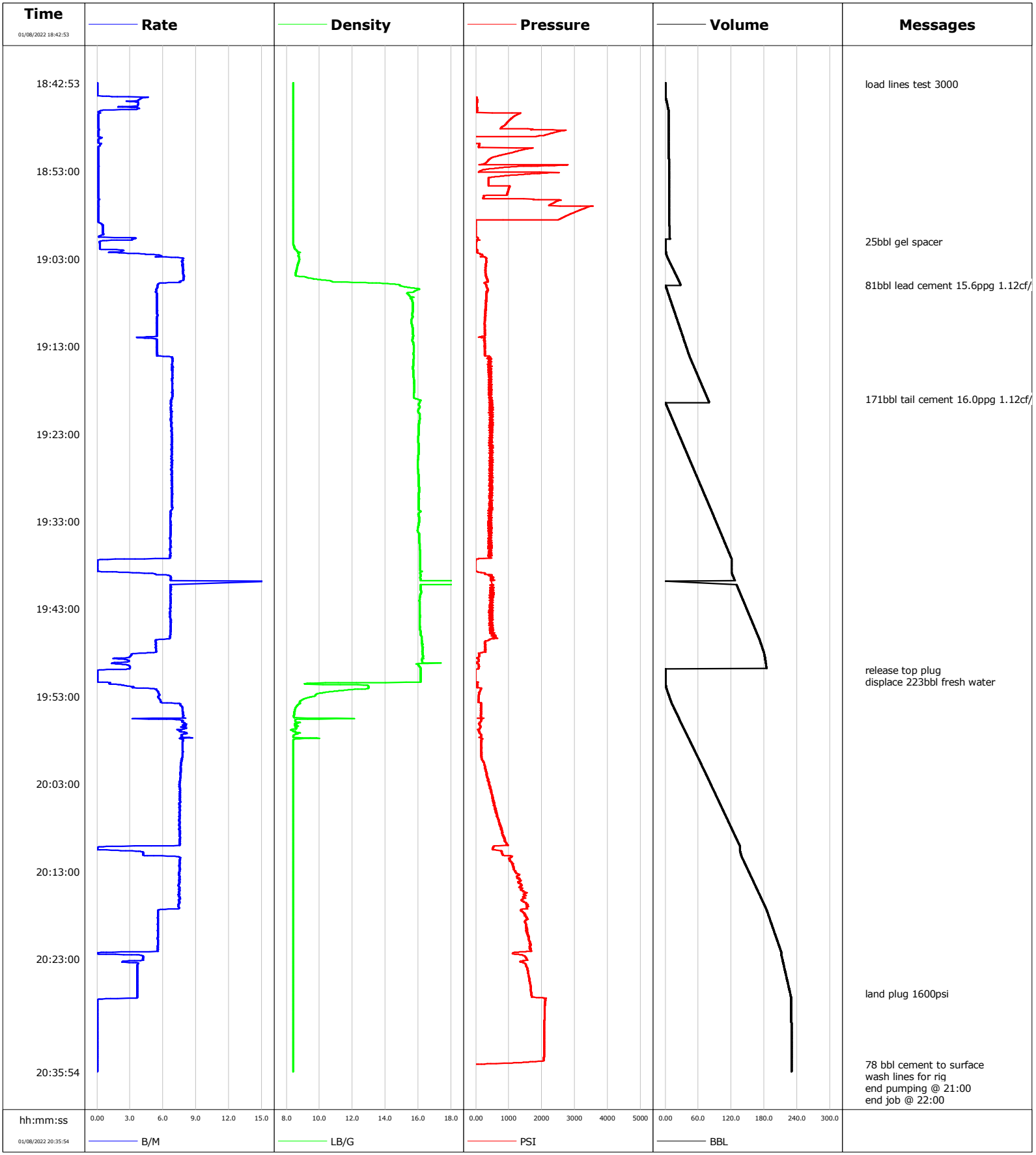
Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
1		Float Shoe	9.625	36.00		Yes	1.90	No	Weatherford Float Shoe		1,904.1	1.90
2	1	Casing Joints	9.625	36.00	K-55	Yes	37.53	Yes	1 BS		1,866.6	39.43
3		Float Collar	9.625	36.00		Yes	1.49	No	Weatherford Float Shoe		1,865.1	40.92
4	2	Casing Joints	9.625	36.00	K-55	Yes	37.97	Yes	2 BS		1,827.1	78.89
5	3	Casing Joints	9.625	36.00	K-55	Yes	38.00	Yes	3 BS		1,789.1	116.89
6	4	Casing Joints	9.625	36.00	K-55	Yes	37.20	Yes	4 BS		1,751.9	154.09
7	5	Casing Joints	9.625	36.00	K-55	Yes	35.37	No			1,716.5	189.46
8	6	Casing Joints	9.625	36.00	K-55	Yes	37.72	Yes	5 BS		1,678.8	227.18
9	7	Casing Joints	9.625	36.00	K-55	Yes	37.04	No			1,641.8	264.22
10	8	Casing Joints	9.625	36.00	K-55	Yes	37.26	Yes			1,604.5	301.48
11	9	Casing Joints	9.625	36.00	K-55	Yes	36.98	No			1,567.5	338.46
12	10	Casing Joints	9.625	36.00	K-55	Yes	35.42	Yes			1,532.1	373.88
13	11	Casing Joints	9.625	36.00	K-55	Yes	36.88	No			1,495.2	410.76
14	12	Casing Joints	9.625	36.00	K-55	Yes	36.87	Yes			1,458.4	447.63
15	13	Casing Joints	9.625	36.00	K-55	Yes	35.95	No			1,422.4	483.58
16	14	Casing Joints	9.625	36.00	K-55	Yes	38.98	Yes			1,383.4	522.56
17	15	Casing Joints	9.625	36.00	K-55	Yes	34.13	No			1,349.3	556.69
18	16	Casing Joints	9.625	36.00	K-55	Yes	36.34	Yes	10 BS		1,313.0	593.03
19	17	Casing Joints	9.625	36.00	K-55	Yes	36.49	No			1,276.5	629.52
20	18	Casing Joints	9.625	36.00	K-55	Yes	37.10	Yes			1,239.4	666.62
21	19	Casing Joints	9.625	36.00	K-55	Yes	37.23	No			1,202.2	703.85
22	20	Casing Joints	9.625	36.00	K-55	Yes	36.51	Yes			1,165.6	740.36
23	21	Casing Joints	9.625	36.00	K-55	Yes	36.83	No			1,128.8	777.19
24	22	Casing Joints	9.625	36.00	K-55	Yes	37.94	Yes			1,090.9	815.13
25	23	Casing Joints	9.625	36.00	K-55	Yes	36.98	No			1,053.9	852.11
26	24	Casing Joints	9.625	36.00	K-55	Yes	36.22	Yes			1,017.7	888.33
27	25	Casing Joints	9.625	36.00	K-55	Yes	36.29	No			981.4	924.62
28	26	Casing Joints	9.625	36.00	K-55	Yes	37.21	Yes			944.2	961.83
29	27	Casing Joints	9.625	36.00	K-55	Yes	36.45	No			907.7	998.28
30	28	Casing Joints	9.625	36.00	K-55	Yes	38.68	Yes			869.0	1,036.96
31	29	Casing Joints	9.625	36.00	K-55	Yes	38.15	No			830.9	1,075.11
32	30	Casing Joints	9.625	36.00	K-55	Yes	37.74	Yes			793.2	1,112.85
33	31	Casing Joints	9.625	36.00	K-55	Yes	35.44	No			757.7	1,148.29
34	32	Casing Joints	9.625	36.00	K-55	Yes	34.83	Yes			722.9	1,183.12
35	33	Casing Joints	9.625	36.00	K-55	Yes	38.63	No			684.3	1,221.75
36	34	Casing Joints	9.625	36.00	K-55	Yes	37.88	Yes			646.4	1,259.63
37	35	Casing Joints	9.625	36.00	K-55	Yes	37.73	No			608.6	1,297.36
38	36	Casing Joints	9.625	36.00	K-55	Yes	38.59	Yes	20 BS		570.1	1,335.95
39	37	Casing Joints	9.625	36.00	K-55	Yes	38.98	No			531.1	1,374.93
40	38	Casing Joints	9.625	36.00	K-55	Yes	36.47	Yes			494.6	1,411.40
41	39	Casing Joints	9.625	36.00	K-55	Yes	37.88	No			456.7	1,449.28
42	40	Casing Joints	9.625	36.00	K-55	Yes	36.86	Yes			419.9	1,486.14
43	41	Casing Joints	9.625	36.00	K-55	Yes	38.00	No			381.9	1,524.14
44	42	Casing Joints	9.625	36.00	K-55	Yes	36.66	Yes			345.2	1,560.80
45	43	Casing Joints	9.625	36.00	K-55	Yes	36.86	No			308.3	1,597.66
46	44	Casing Joints	9.625	36.00	K-55	Yes	38.33	Yes			270.0	1,635.99
47	45	Casing Joints	9.625	36.00	K-55	Yes	37.98	No			232.0	1,673.97
48	46	Casing Joints	9.625	36.00	K-55	Yes	40.00	Yes			192.0	1,713.97
49	47	Casing Joints	9.625	36.00	K-55	Yes	37.08	No			155.0	1,751.05
50	48	Casing Joints	9.625	36.00	K-55	Yes	35.31	Yes	26 BS		119.6	1,786.36
51	49	Casing Joints	9.625	36.00	K-55	Yes	37.10	No			82.5	1,823.46
52	58	Casing Joints	9.625	36.00	K-55	Yes	9.89	No			72.6	1,833.35
53	50	Casing Joints	9.625	36.00	K-55	Yes	38.58	No			34.1	1,871.93
54		Mandrel Hanger	9.625	36.00		Yes	1.00	No	Mandrel Hanger		33.1	1,872.93
55		Landing Joint	9.625	36.00		Yes	36.70	No	Landing Joint		-3.6	1,909.63
	51	Casing Joints	9.625	36.00	K-55	No	37.18	No	OUT 1			
	52	Casing Joints	9.625	36.00	K-55	No	36.83	No	OUT 2			
	53	Casing Joints	9.625	36.00	K-55	No	38.22	No	OUT 3			
	54	Casing Joints	9.625	36.00	K-55	No	37.43	No	OUT 4			
	55	Casing Joints	9.625	36.00	K-55	No	37.11	No	OUT 5			
	56	Casing Joints	9.625	36.00	K-55	No	37.09	No	OUT 6			
	57	Casing Joints	9.625	36.00	K-55	No	20.05	No	Casing pup joint OUT			

Schlumberger

Cementing Job Report

CemCAT v1.8

Well	A WTZ 1H	**Client**	Southwestern
Field	Panhandle	**SIR No.**	EN82-02603
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	01-08-2022



Cementing

PRD Post Job Plot

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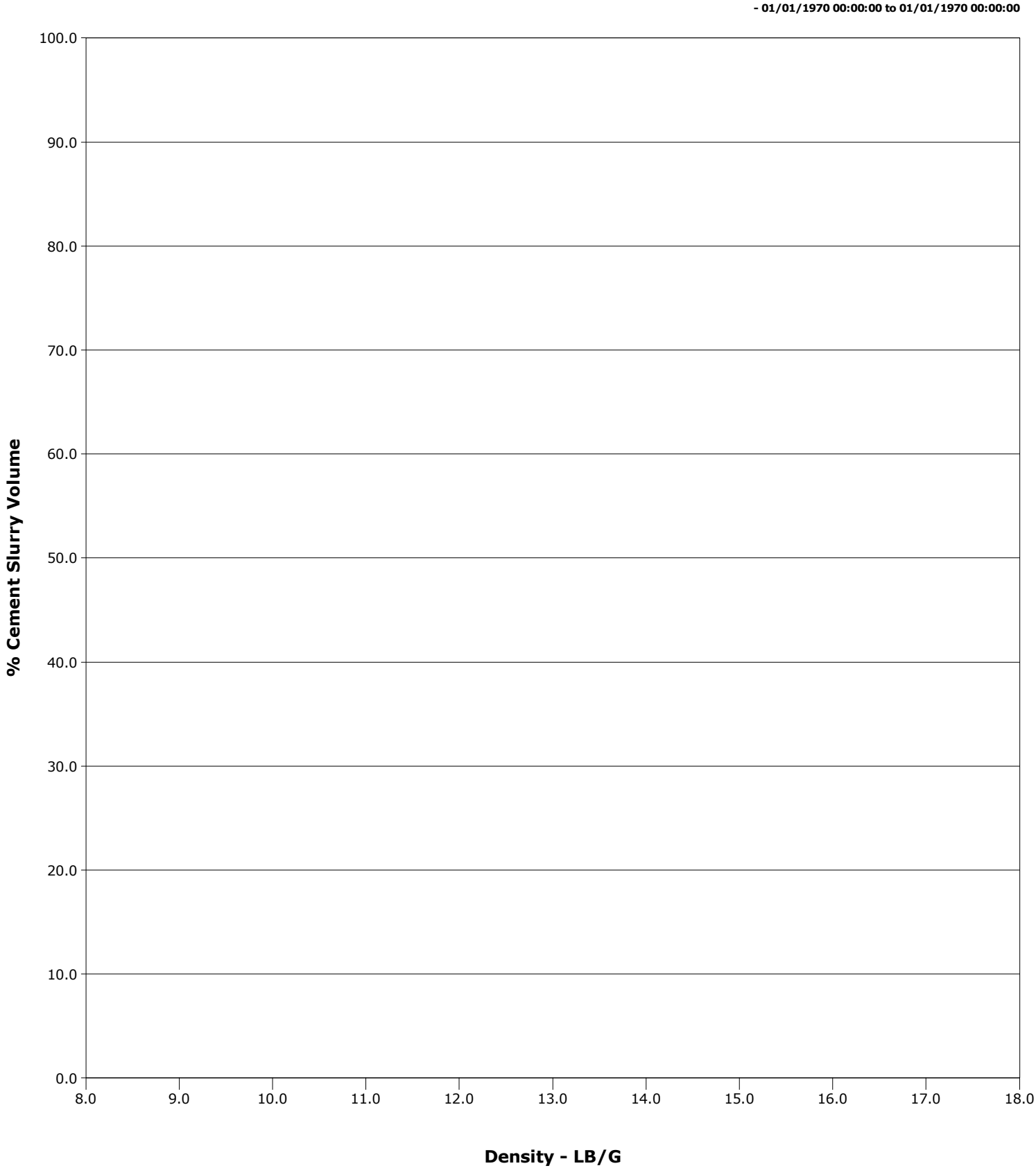
Schlumberger

Cementing Qa/Qc Density Report

Well	A WTZ 1H	**Client**	Southwestern
Field	Panhandle	**SIR No.**	EN82-02603
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	01-08-2022



Schlumberger Cementing Service Report

Customer	Job Number
Southwestern	EN82-02603

Well	Location (legal)	Schlumberger Location	Job Start
A WTZ 1H 1h	47-103-03421-00-00	Weston	Jan/08/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Panhandle		deg	in	2887.0 ft	2887.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Wetzel	West Virginia	psi	91 degF	80 degF	lb/gal
Well Master 0066456841	**API/UWI** 47-103-03421-00-00				

Rig Name	Drilled For	Service Via
sdc 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

25bbl gel spacer
81bbl lead 15.6ppg 1.12cf/f
171bbl tail 16.0ppg 1.12cf/f
223 bbl displacement
land plug 1600psi
2bbl back float hold

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
387.0	13.4	54.5	110	BUTT
2887.0	9.6	36.0	110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	223.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	227.0 bbl	25.0 bbl	140.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	psi

Pipe Rotated	Pipe Reciprocated
☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type	Single

Job Scheduled For	Arrived on Location	Leave Location
Jan/08/2022 02:00	Jan/08/2022 02:00	Jan/08/2022 22:00

Casing Tools

Shoe Type	Float
Shoe Depth	2887.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	2843.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/08/2022	18:42:53	-41	0.0	8.40	0.0	
01/08/2022	18:43:00	-41	0.0	8.40	0.0	load lines test 3000
01/08/2022	18:43:23	-43	0.0	8.40	0.0	
01/08/2022	18:43:53	-43	0.0	8.40	0.0	
01/08/2022	18:44:23	-46	0.0	8.40	0.0	
01/08/2022	18:44:53	37	3.8	8.40	0.0	
01/08/2022	18:45:23	26	3.7	8.41	0.0	
01/08/2022	18:45:53	28	3.8	8.40	0.0	
01/08/2022	18:46:53	1100	0.1	8.40	0.0	
01/08/2022	18:47:23	957	0.1	8.40	0.0	
01/08/2022	18:47:53	813	0.1	8.40	0.0	
01/08/2022	18:48:23	2624	0.1	8.40	0.0	
01/08/2022	18:48:53	2095	0.1	8.40	0.0	
01/08/2022	18:49:23	-33	0.1	8.40	0.0	
01/08/2022	18:49:53	104	0.3	8.40	0.0	
01/08/2022	18:50:23	1676	0.1	8.40	0.0	
01/08/2022	18:50:53	1094	0.1	8.40	0.0	
01/08/2022	18:51:23	549	0.1	8.40	0.0	
01/08/2022	18:51:53	346	0.1	8.40	0.0	
01/08/2022	18:52:23	2045	0.1	8.40	0.0	
01/08/2022	18:52:53	202	0.1	8.40	0.0	

Well	Field	Job Start	Customer	Job Number
A WTZ 1H 1h	Panhandle	Jan/08/2022	Southwestern	EN82-02603

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/08/2022	18:53:53	382	0.1	8.40	0.0	
01/08/2022	18:54:23	377	0.1	8.40	0.0	
01/08/2022	18:54:53	1005	0.1	8.40	0.0	
01/08/2022	18:55:23	962	0.1	8.40	0.0	
01/08/2022	18:55:53	232	0.1	8.40	0.0	
01/08/2022	18:56:23	2489	0.1	8.40	0.0	
01/08/2022	18:56:53	2226	0.1	8.40	0.0	
01/08/2022	18:57:23	3201	0.1	8.40	0.0	
01/08/2022	18:57:53	2875	0.1	8.40	0.0	
01/08/2022	18:58:23	2592	0.1	8.40	0.0	
01/08/2022	18:58:53	-10	0.2	8.40	0.0	
01/08/2022	18:59:23	-11	0.5	8.40	0.0	
01/08/2022	18:59:53	-11	0.5	8.40	0.0	
01/08/2022	19:00:23	-10	0.3	8.40	0.0	
01/08/2022	19:00:53	17	2.8	8.40	0.0	
01/08/2022	19:01:00	17	0.3	8.40	0.0	25bbl gel spacer
01/08/2022	19:01:23	7	0.2	8.41	0.0	
01/08/2022	19:01:53	7	0.2	8.50	0.0	
01/08/2022	19:02:23	105	2.5	8.69	0.0	
01/08/2022	19:02:53	298	7.4	8.77	0.0	
01/08/2022	19:03:23	332	7.8	8.73	0.0	
01/08/2022	19:03:53	307	7.8	8.65	0.0	
01/08/2022	19:04:23	294	7.8	8.59	0.0	
01/08/2022	19:04:53	299	7.8	8.54	0.0	
01/08/2022	19:05:23	363	7.9	9.90	0.0	
01/08/2022	19:05:53	290	5.6	14.33	0.0	
01/08/2022	19:06:00	337	5.5	14.86	0.0	81bbl lead cement 15.6ppg 1.12cf/f
01/08/2022	19:06:23	344	5.4	15.81	0.0	
01/08/2022	19:06:53	331	5.4	15.39	0.0	
01/08/2022	19:07:23	318	5.4	15.64	0.0	
01/08/2022	19:07:53	297	5.4	15.63	0.0	
01/08/2022	19:08:23	323	5.4	15.67	0.0	
01/08/2022	19:08:53	284	5.5	15.65	0.0	
01/08/2022	19:09:23	295	5.5	15.64	0.0	
01/08/2022	19:09:53	276	5.4	15.59	0.0	
01/08/2022	19:10:23	276	5.4	15.58	0.0	
01/08/2022	19:10:53	266	5.4	15.64	0.0	
01/08/2022	19:11:23	287	5.4	15.66	0.0	
01/08/2022	19:11:53	184	5.5	15.67	0.0	
01/08/2022	19:12:23	257	5.4	15.64	0.0	
01/08/2022	19:12:53	279	5.5	15.70	0.0	
01/08/2022	19:13:23	280	5.4	15.72	0.0	
01/08/2022	19:13:53	276	5.5	15.69	0.0	
01/08/2022	19:14:23	337	6.9	15.71	0.0	
01/08/2022	19:14:53	422	6.8	15.69	0.0	
01/08/2022	19:15:23	403	6.9	15.67	0.0	
01/08/2022	19:15:53	480	6.8	15.68	0.0	
01/08/2022	19:16:23	464	6.9	15.68	0.0	
01/08/2022	19:16:53	409	6.8	15.73	0.0	
01/08/2022	19:17:23	469	6.8	15.73	0.0	
01/08/2022	19:17:53	396	6.8	15.74	0.0	
01/08/2022	19:18:23	438	6.9	15.73	0.0	
01/08/2022	19:18:53	392	6.8	15.72	0.0	
01/08/2022	19:19:00	404	6.8	15.82	0.0	171bbl tail cement 16.0ppg 1.12cf/f

Well	Field	Job Start	Customer	Job Number
A WTZ 1H 1h	Panhandle	Jan/08/2022	Southwestern	EN82-02603

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/08/2022	19:20:23	435	6.7	15.98	0.0	
01/08/2022	19:20:53	411	6.7	16.08	0.0	
01/08/2022	19:21:23	520	6.7	16.08	0.0	
01/08/2022	19:21:53	476	6.7	16.03	0.0	
01/08/2022	19:22:23	466	6.8	16.02	0.0	
01/08/2022	19:22:53	516	6.8	16.00	0.0	
01/08/2022	19:23:23	448	6.8	15.99	0.0	
01/08/2022	19:23:53	442	6.8	15.99	0.0	
01/08/2022	19:24:23	393	6.8	16.01	0.0	
01/08/2022	19:24:53	447	6.8	16.01	0.0	
01/08/2022	19:25:23	461	6.8	16.01	0.0	
01/08/2022	19:25:53	460	6.8	15.98	0.0	
01/08/2022	19:26:23	439	6.8	15.96	0.0	
01/08/2022	19:26:53	486	6.8	15.97	0.0	
01/08/2022	19:27:23	452	6.8	15.97	0.0	
01/08/2022	19:27:53	481	6.8	16.00	0.0	
01/08/2022	19:28:23	513	6.8	16.02	0.0	
01/08/2022	19:28:53	490	6.8	16.03	0.0	
01/08/2022	19:29:23	507	6.8	16.03	0.0	
01/08/2022	19:29:53	446	6.9	16.03	0.0	
01/08/2022	19:30:23	465	6.8	16.03	0.0	
01/08/2022	19:30:53	403	6.8	16.01	0.0	
01/08/2022	19:31:23	428	6.8	16.01	0.0	
01/08/2022	19:31:53	409	6.7	16.13	0.0	
01/08/2022	19:32:23	384	6.7	16.01	0.0	
01/08/2022	19:32:53	492	6.7	16.04	0.0	
01/08/2022	19:33:23	444	6.7	16.02	0.0	
01/08/2022	19:33:53	403	6.7	15.96	0.0	
01/08/2022	19:34:23	474	6.7	16.03	0.0	
01/08/2022	19:34:53	492	6.7	16.06	0.0	
01/08/2022	19:35:23	444	6.7	16.06	0.0	
01/08/2022	19:35:53	433	6.7	16.08	0.0	
01/08/2022	19:36:23	389	6.7	16.09	0.0	
01/08/2022	19:36:53	409	6.6	16.11	0.0	
01/08/2022	19:37:23	-9	0.5	16.09	0.0	
01/08/2022	19:37:53	-22	0.0	16.09	0.0	
01/08/2022	19:38:23	-24	0.0	16.10	0.0	
01/08/2022	19:38:53	158	3.2	16.11	0.0	
01/08/2022	19:39:23	546	6.7	16.12	0.0	
01/08/2022	19:40:23	488	6.7	16.14	0.0	
01/08/2022	19:40:53	501	6.7	16.14	0.0	
01/08/2022	19:41:23	558	6.7	16.12	0.0	
01/08/2022	19:41:53	474	6.7	16.08	0.0	
01/08/2022	19:42:23	475	6.7	16.06	0.0	
01/08/2022	19:42:53	408	6.7	16.07	0.0	
01/08/2022	19:43:23	433	6.6	16.07	0.0	
01/08/2022	19:43:53	449	6.6	16.09	0.0	
01/08/2022	19:44:23	424	6.7	16.07	0.0	
01/08/2022	19:44:53	536	6.7	16.06	0.0	
01/08/2022	19:45:23	504	6.7	16.09	0.0	
01/08/2022	19:45:53	510	6.7	16.13	0.0	
01/08/2022	19:46:23	577	6.6	16.20	0.0	
01/08/2022	19:46:53	277	5.4	16.21	0.0	
01/08/2022	19:47:23	282	5.3	16.27	0.0	

Well	Field	Job Start	Customer	Job Number
A WTZ 1H 1h	Panhandle	Jan/08/2022	Southwestern	EN82-02603

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/08/2022	19:48:23	93	3.1	16.29	0.0	
01/08/2022	19:48:53	89	2.8	16.21	0.0	
01/08/2022	19:49:23	84	2.6	15.98	0.0	
01/08/2022	19:49:53	61	2.9	16.12	0.0	
01/08/2022	19:50:00	-25	0.4	16.12	0.0	release top plug
01/08/2022	19:50:23	-18	0.0	16.12	0.0	
01/08/2022	19:50:53	-19	0.0	16.13	0.0	
01/08/2022	19:51:00	-20	0.0	16.13	0.0	displace 223bbl fresh water
01/08/2022	19:51:23	31	0.1	16.13	0.0	
01/08/2022	19:51:53	39	3.1	12.96	0.0	
01/08/2022	19:52:23	129	5.5	11.18	0.0	
01/08/2022	19:52:53	92	5.7	9.75	0.0	
01/08/2022	19:53:53	155	7.6	8.79	0.0	
01/08/2022	19:54:23	152	7.8	8.54	0.0	
01/08/2022	19:54:53	146	7.8	8.46	0.0	
01/08/2022	19:55:23	155	7.8	8.45	0.0	
01/08/2022	19:55:53	148	7.7	8.53	0.0	
01/08/2022	19:56:23	126	8.0	8.68	0.0	
01/08/2022	19:56:53	86	7.5	8.30	0.0	
01/08/2022	19:57:23	152	7.7	8.52	0.0	
01/08/2022	19:57:53	190	7.6	8.65	0.0	
01/08/2022	19:58:23	171	7.8	8.40	0.0	
01/08/2022	19:58:53	161	7.8	8.40	0.0	
01/08/2022	19:59:23	173	7.8	8.39	0.0	
01/08/2022	19:59:53	165	7.8	8.39	0.0	
01/08/2022	20:00:23	213	7.7	8.39	0.0	
01/08/2022	20:00:53	265	7.7	8.39	0.0	
01/08/2022	20:01:23	296	7.6	8.39	0.0	
01/08/2022	20:01:53	330	7.6	8.39	0.0	
01/08/2022	20:02:23	366	7.6	8.40	0.0	
01/08/2022	20:02:53	383	7.5	8.39	0.0	
01/08/2022	20:03:23	431	7.5	8.39	0.0	
01/08/2022	20:03:53	467	7.5	8.39	0.0	
01/08/2022	20:04:23	497	7.6	8.39	0.0	
01/08/2022	20:04:53	536	7.5	8.39	0.0	
01/08/2022	20:05:23	574	7.5	8.39	0.0	
01/08/2022	20:05:53	575	7.5	8.39	0.0	
01/08/2022	20:06:23	611	7.5	8.39	0.0	
01/08/2022	20:06:53	685	7.5	8.39	0.0	
01/08/2022	20:07:23	727	7.5	8.39	0.0	
01/08/2022	20:07:53	746	7.5	8.39	0.0	
01/08/2022	20:08:23	784	7.5	8.39	0.0	
01/08/2022	20:08:53	805	7.5	8.39	0.0	
01/08/2022	20:09:23	880	7.5	8.39	0.0	
01/08/2022	20:09:53	935	7.5	8.39	0.0	
01/08/2022	20:10:23	508	0.0	8.39	0.0	
01/08/2022	20:10:53	792	4.2	8.39	0.0	
01/08/2022	20:11:23	1050	7.5	8.39	0.0	
01/08/2022	20:11:53	1045	7.5	8.39	0.0	
01/08/2022	20:12:23	1120	7.5	8.39	0.0	
01/08/2022	20:12:53	1169	7.5	8.39	0.0	
01/08/2022	20:13:23	1301	7.5	8.39	0.0	
01/08/2022	20:13:53	1312	7.5	8.39	0.0	
01/08/2022	20:14:23	1355	7.5	8.39	0.0	

Well	Field	Job Start	Customer	Job Number
A WTZ 1H 1h	Panhandle	Jan/08/2022	Southwestern	EN82-02603

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/08/2022	20:15:23	1519	7.4	8.39	0.0	
01/08/2022	20:15:53	1427	7.4	8.39	0.0	
01/08/2022	20:16:23	1398	7.5	8.39	0.0	
01/08/2022	20:16:53	1556	7.4	8.39	0.0	
01/08/2022	20:17:23	1398	5.8	8.39	0.0	
01/08/2022	20:17:53	1503	5.5	8.39	0.0	
01/08/2022	20:18:23	1541	5.5	8.39	0.0	
01/08/2022	20:18:53	1521	5.5	8.39	0.0	
01/08/2022	20:19:23	1514	5.5	8.39	0.0	
01/08/2022	20:19:53	1551	5.5	8.39	0.0	
01/08/2022	20:20:23	1617	5.5	8.39	0.0	
01/08/2022	20:20:53	1602	5.5	8.39	0.0	
01/08/2022	20:21:23	1669	5.5	8.39	0.0	
01/08/2022	20:21:53	1639	5.5	8.39	0.0	
01/08/2022	20:22:23	1114	0.0	8.39	0.0	
01/08/2022	20:22:53	1528	4.2	8.39	0.0	
01/08/2022	20:23:23	1394	2.3	8.39	0.0	
01/08/2022	20:23:53	1530	3.6	8.39	0.0	
01/08/2022	20:24:23	1571	3.7	8.39	0.0	
01/08/2022	20:24:53	1597	3.6	8.39	0.0	
01/08/2022	20:25:23	1619	3.6	8.39	0.0	
01/08/2022	20:25:53	1646	3.6	8.39	0.0	
01/08/2022	20:26:23	1666	3.6	8.39	0.0	
01/08/2022	20:27:00	1682	3.6	8.39	0.0	land plug 1600psi
01/08/2022	20:27:23	1767	3.6	8.39	0.0	
01/08/2022	20:27:53	2104	0.0	8.40	0.0	
01/08/2022	20:28:23	2087	0.0	8.40	0.0	
01/08/2022	20:28:53	2082	0.0	8.40	0.0	
01/08/2022	20:29:23	2080	0.0	8.40	0.0	
01/08/2022	20:29:53	2076	0.0	8.40	0.0	
01/08/2022	20:30:23	2073	0.0	8.40	0.0	
01/08/2022	20:30:53	2071	0.0	8.40	0.0	
01/08/2022	20:31:23	2069	0.0	8.40	0.0	
01/08/2022	20:31:53	2067	0.0	8.40	0.0	
01/08/2022	20:32:23	2066	0.0	8.40	0.0	
01/08/2022	20:32:53	2064	0.0	8.40	0.0	
01/08/2022	20:33:23	2063	0.0	8.40	0.0	
01/08/2022	20:33:53	2061	0.0	8.40	0.0	
01/08/2022	20:34:23	2059	0.0	8.40	0.0	
01/08/2022	20:34:53	1164	0.0	8.40	0.0	
01/08/2022	20:35:00	254	0.0	8.40	0.0	78 bbl cement to surface
01/08/2022	20:35:01	166	0.0	8.40	0.0	wash lines for rig
01/08/2022	20:35:02	64	0.0	8.40	0.0	end pumping @ 21:00
01/08/2022	20:35:03	13	0.0	8.40	0.0	end job @ 22:00
01/08/2022	20:35:23	-33	0.0	8.40	0.0	

Well	Field	Job Start	Customer	Job Number
A WTZ 1H 1h	Panhandle	Jan/08/2022	Southwestern	EN82-02603

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.8			25.0	251.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
3555	-33	759	2100			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	251.0 bbl	223.0 bbl	64 degF	[X]	78.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Danny Cover	-	[X] -

Service Quality Evaluation

Client:	Southwestern
Field:	Panhandle
Rig:	sdc 41
Well:	A WTZ 1H
Service Line:	Cementing
Job Type:	intermediate

Service Order #:	
Date:	Jan/08/2022
Operating Time (hh:mm):	00:00
Client Rep:	
Schlumberger Engineer:	Danny Cover
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** [X] **no** [ ]	5
1b	Free of environmental spill or non-compliant discharge	5	**yes** [X] **no** [ ]	5
1c	Wellsite left clean	4	**yes** [X] **no** [ ]	4
			Sub-total	100%
2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** [X] **no** [ ]	3
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** [X] **no** [ ]	2
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** [X] **no** [ ]	2
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** [X] **no** [ ]	2
			Sub-total	100%
3	**Execution**			
3a	Lost time < 30 mins	3	**yes** [X] **no** [ ]	3
3b	Equipment pressure tested succesfully	3	**yes** [ ] **no** [X]	0
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** [X] **no** [ ]	2
3d	Plugs / darts released and tested succesfully	2	**yes** [X] **no** [ ]	2
3e	Density variation met expectations	2	**yes** [X] **no** [ ]	2
3f	Personnel performed as per expectations	2	**yes** [X] **no** [ ]	2
3g	Equipment performed as per expectations	2	**yes** [X] **no** [ ]	2
3h	Job pumped as per design	3	**yes** [X] **no** [ ]	3
3i	Did job start on time	2	**yes** [X] **no** [ ]	2
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** [X] **no** [ ]	3
			Sub-total	87%
4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** [X] **no** [ ]	10
			Sub-total	100%

Total 94%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

DRAFT

Operator: SWN Production Company, LLC
Pad Name: Rheinbeau
API: 47-051-01622

Order Number: _____

Civil Penalty Assessment: $15,200

ABATEMENT TIME CALCULATION

Type A Violation (i.e. pollution violation)

	NOV#	DATE ISSUED	DATE ABATED	TOTAL DAYS TO ABATE
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____

Type B Violation

	NOV#	DATE ISSUED	DATE ABATED	TOTAL DAYS TO ABATE
1.	11753	10/25/21	12/2/21	38
2.	_____	_____	_____	_____

Type C Violation

	NOV#	DATE ISSUED	DATE ABATED	TOTAL DAYS TO ABATE
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____

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Civil Administrative Penalty Matrix

This application of this Matrix, and its provisions, are at the sole discretion of the Chief.

I. Type(s) of Violation(s)

Each Notice of Violation (NOV), or violation(s) described in a NOV, is a separate violation. The ABATEMENT TIME CALCULATION form is designed to assist with the calculation of the total number of days between NOV issuance and abatement. This Matrix allows Civil Administrative Penalties to be calculated individually or collectively.

A. Did the operator violate W. Va. Code § 22-6-7, 35 CSR § 1 or other Water Pollution Control Act provision, rule, permit or order by allowing or causing pollution or harm to the environment or the public? If yes, complete A.1 below:

1. **Total number of days between NOV and abatement (per violation) = _____.**
2. **First day of abatement period multiplied by total number of NOVs _____, multiplied $5,000 = _____.**
3. **Remaining number of days between NOV and abatement _____ multiplied by total number of NOVs 1 _____ = _____, multiplied by $500 = _____.**
4. **Penalty calculation under Section A _____**

B. Did the operator violate any statute, rule, permit, or order governing oil and gas activity that had the potential to cause pollution or harm to the environment or the public? If yes, complete B.1 below:

1. **Total number of days between NOV and abatement (per violation) = 38 _____.**
2. **Total number of days between NOV and abatement 38 _____ multiplied by total number of NOVs 1 _____ = 38 _____, multiplied by $500 = $19,000 _____.**
3. **Penalty calculation under Section B $19,000 _____.**

C. Did the operator violate any statue, rule, permit or order considered a minor nature governing oil and gas activity and found not causing environmental impact or harm? If yes, complete C.1 below:

1. **Total number of days between NOV and abatement (per violation) = _____.**
2. **Total number of days between NOV and abatement _____ multiplied by total number of NOVs_____ = _____, multiplied by $100 = _____.**
3. **Penalty calculation under Section C _____.**

D. Add total(s) from A.4. and B.3. and C.3. to calculate base penalty.

1. **Total Base Penalty (TBP) = $19,000.**

DRAFT

II. Assessment Factors

All assessment factors must be applied, and in consecutive order to arrive at final penalty calculation.

A. Gravity (+/- 25%)

1. **Minor: The violation(s) posed no potential or actual impact to safety or the environment, or the violation(s) are of an administrative nature. The Chief may reduce the base penalty by up to 25%.**
2. **Moderate: The violation(s) posed a potential, but no actual, impact to safety or the environment. The Chief may reduce or increase the base penalty by up to 10%.**
3. **Major: The violation(s) resulted in actual impact to safety or the environment (including all imminent danger findings). The Chief may increase the base penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Total Base Penalty in I.C.1):**

Category: 3 **Reason:** one injured ankle plus a fire

Percentage increase/decrease: 0%

B. Negligence (+/- 25%)

1. **The operator applied due care and the cause of the violation is considered to be beyond the control of the operator. The Chief may reduce the adjusted penalty by up to 25%.**
2. **The violation was an oversight on the part of the operator and may have been avoided if more conscientious effort had been given. The Chief may reduce or increase the adjusted penalty by up to 10%.**
3. **Operator was aware of the violation and failed to address in a timely fashion, or failed to adhere to the OOG instruction to prevent the violation. The Chief may increase the penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Adjusted Penalty in II.A.4):**

Category: 2 **Reason:** A field operator diabled the low suction pressure switches by setting them below 0

Percentage increase/decrease: 0%

C. Violation History (+/- 25%)

1. **The operator has less than ten violations in the previous three years. Depending upon the gravity, negligence or repetitive nature of the previous violations, the Chief may reduce the adjusted penalty by up to 25%.**
2. **The operator has more than ten, but less than twenty, violations in the previous three years. Depending upon the gravity, negligence or repetitive nature of the previous violations, the Chief may reduce or increase the adjusted penalty by up to 10%.**
3. **The operator has more than twenty violations in the previous three years. Depending upon the gravity, negligence or repetitive nature of the previous violations, the Chief may increase the adjusted penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Adjusted Penalty in II.B.4):**

Category: 2 **Reason:** operator has 16 NOVs in previous three years

Percentage increase/decrease: 0%

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D. Good Faith

1. **The operator timely reported the violation (as necessary), was already taking remedial action when the violation was discovered, and/or demonstrated a cooperative nature. The Chief may reduce the adjusted penalty by up to 25%.**
2. **The operator commenced remedial action after the NOV was issued and completed abatement in an acceptable timeframe. The Chief may reduce or increase the adjusted penalty by up to 10%.**
3. **The operator failed to abate the violation in the time prescribed (including all Orders to Cease Operations for Failure to Abate), failed to adequately respond to instruction from OOG, or attempted to hide the violation. The Chief may increase the adjusted penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Adjusted Penalty in II.C.4):**

Category: 1 **Reason:** SWN personnel responded quickly and effectively

Percentage increase/decrease: -20%

III. Total Penalty

If you have problems determining the type(s) of violation(s), total days from notice of violation until abatement, or the application of any assessment factor, please contact the Office of Oil and Gas.

Total Percentage Increase/Decrease (TP) = -20%

Total Penalty Calculation = (TBP) x (TP) = $15,200

IV. Review

The application of this Matrix, and any assessment factor (including percentages of decrease/increase) are the sole discretion of the Chief. However, the Chief may, upon request of the operator, undertake a review of the determinations and applications used in calculating a penalty under this Matrix. A Consent Order, or the application of the Matrix, is not a final action of OOG, and thus is not subject to judicial review.

DRAFT

Operator: SWN Production Company, LLC
Pad Name: Thurman Speece
API: 47-019-00186

Order Number: _____

Civil Penalty Assessment: $45,900

ABATEMENT TIME CALCULATION

Type A Violation (i.e. pollution violation)

	NOV#	DATE ISSUED	DATE ABATED	TOTAL DAYS TO ABATE
1.	11770	1/5/22	4/29/22	113 (use 93)
2.	_____	_____	soil "clean" by 4/8/22	_____

Type B Violation

	NOV#	DATE ISSUED	DATE ABATED	TOTAL DAYS TO ABATE
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____

Type C Violation

	NOV#	DATE ISSUED	DATE ABATED	TOTAL DAYS TO ABATE
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____

DRAFT

Civil Administrative Penalty Matrix

This application of this Matrix, and its provisions, are at the sole discretion of the Chief.

I. Type(s) of Violation(s)

Each Notice of Violation (NOV), or violation(s) described in a NOV, is a separate violation. The ABATEMENT TIME CALCULATION form is designed to assist with the calculation of the total number of days between NOV issuance and abatement. This Matrix allows Civil Administrative Penalties to be calculated individually or collectively.

A. Did the operator violate W. Va. Code § 22-6-7, 35 CSR § 1 or other Water Pollution Control Act provision, rule, permit or order by allowing or causing pollution or harm to the environment or the public? If yes, complete A.1 below:

1. **Total number of days between NOV and abatement (per violation) =** 93 _____.
2. **First day of abatement period multiplied by total number of NOVs** 1 _____, **multiplied $5,000 =** $5,000 _____.
3. **Remaining number of days between NOV and abatement** 92 _____ **multiplied by total number of NOVs** 1 _____ **=** 92 _____, **multiplied by $500 =** $51,000 _____.
4. **Penalty calculation under Section A** $46,000 _____

B. Did the operator violate any statute, rule, permit, or order governing oil and gas activity that had the potential to cause pollution or harm to the environment or the public? If yes, complete B.1 below:

1. **Total number of days between NOV and abatement (per violation) =** _____.
2. **Total number of days between NOV and abatement** _____ **multiplied by total number of NOVs** _____ **=** _____, **multiplied by $500 =** _____.
3. **Penalty calculation under Section B** _____.

C. Did the operator violate any statue, rule, permit or order considered a minor nature governing oil and gas activity and found not causing environmental impact or harm? If yes, complete C.1 below:

1. **Total number of days between NOV and abatement (per violation) =** _____.
2. **Total number of days between NOV and abatement** _____ **multiplied by total number of NOVs** _____ **=** _____, **multiplied by $100 =** _____.
3. **Penalty calculation under Section C** _____.

D. Add total(s) from A.4. and B.3. and C.3. to calculate base penalty.

1. **Total Base Penalty (TBP) =** $51,000.

DRAFT

II. Assessment Factors

All assessment factors must be applied, and in consecutive order to arrive at final penalty calculation.

A. Gravity (+/- 25%)

1. **Minor: The violation(s) posed no potential or actual impact to safety or the environment, or the violation(s) are of an administrative nature. The Chief may reduce the base penalty by up to 25%.**
2. **Moderate: The violation(s) posed a potential, but no actual, impact to safety or the environment. The Chief may reduce or increase the base penalty by up to 10%.**
3. **Major: The violation(s) resulted in actual impact to safety or the environment (including all imminent danger findings). The Chief may increase the base penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Total Base Penalty in I.C.1):**

Category: 3 **Reason:** soil and water were impacted with contaminants that took time to reduce to acceptable levels

Percentage increase/decrease: +5%

B. Negligence (+/- 25%)

1. **The operator applied due care and the cause of the violation is considered to be beyond the control of the operator. The Chief may reduce the adjusted penalty by up to 25%.**
2. **The violation was an oversight on the part of the operator and may have been avoided if more conscientious effort had been given. The Chief may reduce or increase the adjusted penalty by up to 10%.**
3. **Operator was aware of the violation and failed to address in a timely fashion, or failed to adhere to the OOG instruction to prevent the violation. The Chief may increase the penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Adjusted Penalty in II.A.4):**

Category: 2 **Reason:** equipment failed allowing leakage of brine

Percentage increase/decrease: +5%

C. Violation History (+/- 25%)

1. **The operator has less than ten violations in the previous three years. Depending upon the gravity, negligence or repetitive nature of the previous violations, the Chief may reduce the adjusted penalty by up to 25%.**
2. **The operator has more than ten, but less than twenty, violations in the previous three years. Depending upon the gravity, negligence or repetitive nature of the previous violations, the Chief may reduce or increase the adjusted penalty by up to 10%.**
3. **The operator has more than twenty violations in the previous three years. Depending upon the gravity, negligence or repetitive nature of the previous violations, the Chief may increase the adjusted penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Adjusted Penalty in II.B.4):**

Category: 2 **Reason:** operator has 14 NOVs in previous three years

Percentage increase/decrease: +0%

DRAFT

D. Good Faith

1. **The operator timely reported the violation (as necessary), was already taking remedial action when the violation was discovered, and/or demonstrated a cooperative nature. The Chief may reduce the adjusted penalty by up to 25%.**
2. **The operator commenced remedial action after the NOV was issued and completed abatement in an acceptable timeframe. The Chief may reduce or increase the adjusted penalty by up to 10%.**
3. **The operator failed to abate the violation in the time prescribed (including all Orders to Cease Operations for Failure to Abate), failed to adequately respond to instruction from OOG, or attempted to hide the violation. The Chief may increase the adjusted penalty by up to 25%.**
4. **Calculation (percentage increase/decrease from Adjusted Penalty in II.C.4):**

Category: 1 **Reason:** SWN personnel responded quickly and effectively

Percentage increase/decrease: -20%

III. Total Penalty

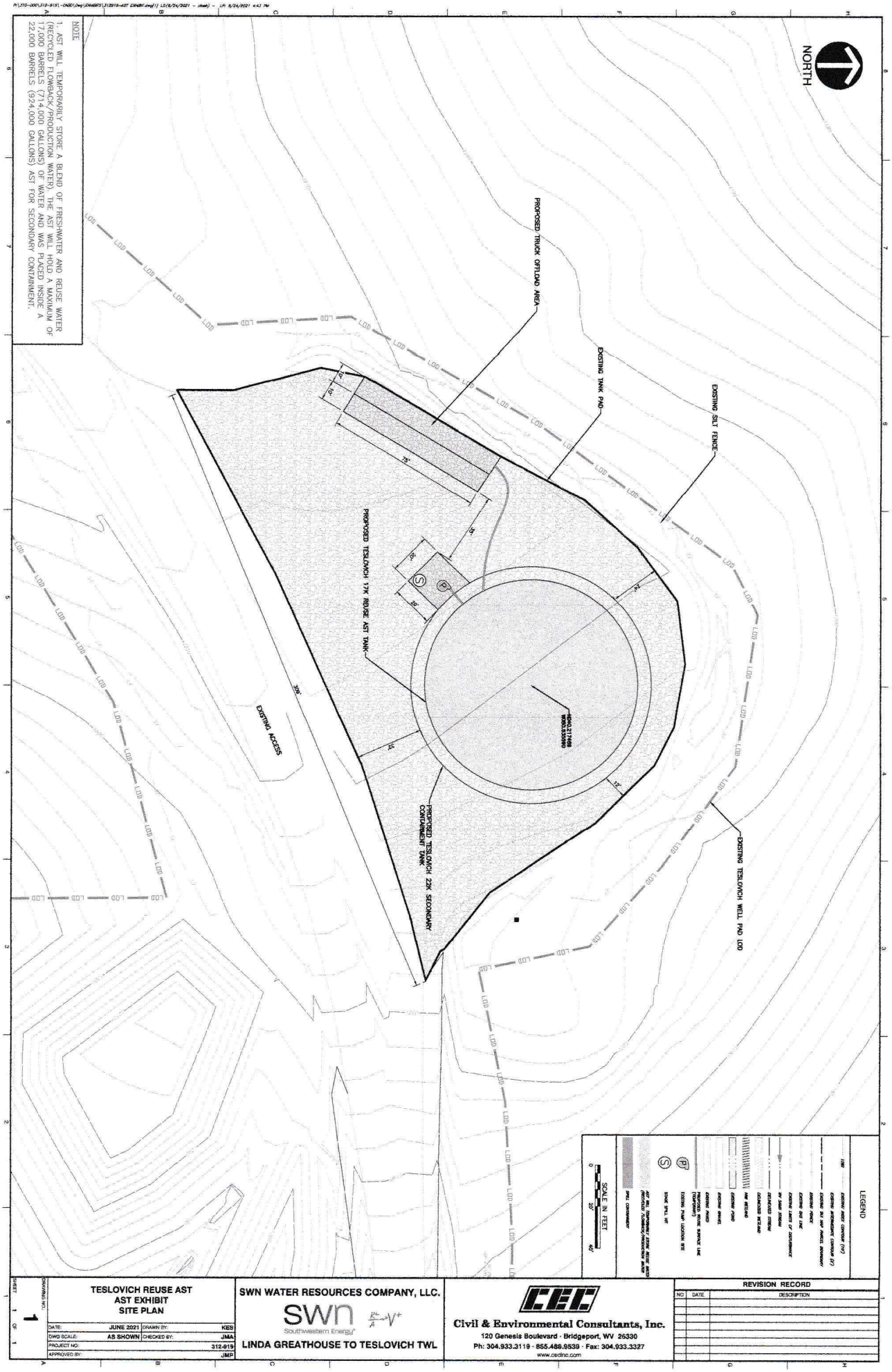
If you have problems determining the type(s) of violation(s), total days from notice of violation until abatement, or the application of any assessment factor, please contact the Office of Oil and Gas.

Total Percentage Increase/Decrease (TP) = -10%

Total Penalty Calculation = (TBP) x (TP) = $45,900

IV. Review

The application of this Matrix, and any assessment factor (including percentages of decrease/increase) are the sole discretion of the Chief. However, the Chief may, upon request of the operator, undertake a review of the determinations and applications used in calculating a penalty under this Matrix. A Consent Order, or the application of the Matrix, is not a final action of OOG, and thus is not subject to judicial review.


NOTE
1. AST WILL TEMPORARILY STORE A BLEND OF FRESHWATER AND REUSE WATER (RECYCLED FLOWBACK/PRODUCTION WATER). THE AST WILL HOLD A MAXIMUM OF 17,000 BARRELS (714,000 GALLONS) OF WATER AND WAS PLACED INSIDE A 22,000 BARRELS (924,000 GALLONS) AST FOR SECONDARY CONTAINMENT.
NORTH
PROPOSED TRUCK OFFLOAD AREA
EXISTING TANK PAD
EXISTING SILT FENCE
PROPOSED TESLOVICH 17K REUSE AST TANK
PROPOSED TESLOVICH 22K SECONDARY CONTAINMENT TANK
EXISTING ACCESS
EXISTING TESLOVICH WELL PAD LOD
LEGEND
SCALE IN FEET
TESLOVICH REUSE AST
AST EXHIBIT
SITE PLAN
SWN WATER RESOURCES COMPANY, LLC.
LINDA GREATHOUSE TO TESLOVICH TWL
Civil & Environmental Consultants, Inc.
120 Genesis Boulevard · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com
REVISION RECORD
NO
DATE
DESCRIPTION
DRAWING NO:
SHEET 1 OF 1
DATE: JUNE 2021
DRAWN BY: KES
DWG SCALE: AS SHOWN
CHECKED BY: JMA
PROJECT NO: 312-919
APPROVED BY: JMP

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia Street
Indiana, PA 15701
P: (724) 463-8378
F: (724) 465-4209
PADEP: 32-00382

1276 Bentleyville Road
Van Voorhis, PA 15366
P: (724) 258-8378
F: (724) 258-8376
PADEP: 63-04247

435 Broad Street
Montoursville, PA 17754
P: (570) 321-9002
F: (570) 321-1957
PADEP: 41-04880

950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

14 April 2022

RPG Resources LLC
Attn: Dave Schuster
314 Boden Ave
Carnegie, PA 15106

Work Order: 2032542
Project: SWN Freshwater Impoundment - WV

Report of Analysis

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received	Sample Notes
Ballato	2032542-01	Water	03/29/2022 09:15	3/30/22 17:00	
Trip Blank - WV	2032542-02	Water	03/29/2022 00:00	3/30/22 17:00	

Report Narrative

The results contained in this report are only representative of the samples received. Environmental Service Laboratories, Inc. is not responsible for use or interpretation of the data included herein.

Definitions

R	Received out of recommended hold time. Sample does not meet hold time requirements of 40 CFR Part 136.
J	The reported result is an estimated value less than the Reporting Limit (RL) but greater than the Method Detection Limit (MDL).
H	Analyzed out of recommended hold time. Sample does not meet hold time requirements of 40 CFR Part 136.
RL	Reporting Limit
MDL	Method Detection Limit

Certifications

Analyses performed by Environmental Service Laboratories, Inc., Indiana PA unless otherwise specified.

Environmental Service Laboratories, Inc., Indiana, PA/TNI Certification #32-00382

Approved By

Alicia N Johnston

Alicia Johnston
Project Manager

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RPG Resources LLC
314 Boden Ave
Carnegie, PA 15106

Reported: 04/14/2022 12:07

Lab Sample ID#: 2032542-01
Sample Type: Water
Sample Source: Grab
Sampler: Client
Client Sample ID: Ballato

Sample Date: 03/29/2022 09:15
Receipt Date: 03/30/2022 17:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: EPA 1664B**					**Prep Method: ASTM D3987-06**		
Oil & Grease (HEM)	2.7	mg/L	J	1.4	5.2	TLL/JK/TJC	04/08/22 10:41	04/08/22 19:00
General Chemistry	**Analytical Method: EPA300.0 2.1**					**Prep Method: No Prep - WetChem**		
Chloride	3.30	mg/L		0.303	2.00	TLL	04/10/22 21:22	04/10/22 21:22
General Chemistry	**Analytical Method: SM2510 B-11**					**Prep Method: W_No Prep WetChem**		
Specific Conductance	221	umhos/cm		5.00	5.00	AW	04/05/22 10:55	04/05/22 10:55
General Chemistry	**Analytical Method: SM2540 C-11**					**Prep Method: No Prep - WetChem**		
Total Dissolved Solids	109	mg/L		9	25	LMB	04/04/22 10:53	04/04/22 12:30
General Chemistry	**Analytical Method: SM2540 F-11**					**Prep Method: No Prep - WetChem**		
Settleable Solids	<0.500	mL/L		0.500	0.500	DAA	03/31/22 06:43	03/31/22 07:43
General Chemistry	**Analytical Method: SM4500-H B-11**					**Prep Method: No Prep - WetChem**		
pH	7.80	S.U.	H,R			TLL	04/07/22 16:55	04/07/22 16:55
Temp at time of pH, °C	17.9		H,R			TLL	04/07/22 16:55	04/07/22 16:55
General Chemistry	**Analytical Method: SM4500-O G-01**					**Prep Method: No Prep - WetChem**		
Dissolved Oxygen	6.90	mg/L	H,H			JAW	04/01/22 16:09	04/01/22 18:26
General Chemistry	**Analytical Method: SM5540 C-11**					**Prep Method: No Prep - WetChem**		
MBAS, calc as LAS, mol wt 348 g/mol	<0.0799	mg/L		0.0799	0.200	TLL	03/31/22 09:10	03/31/22 09:10
Total Metals	**Analytical Method: EPA200.7 4.4**					**Prep Method: EPA 200.7 4.4**		
Aluminum	0.012	mg/L		0.005	0.010	ANO	03/31/22 08:14	04/04/22 07:42
Barium	0.027	mg/L		0.004	0.005	ANO	03/31/22 08:14	04/04/22 07:42
Calcium	30.6	mg/L		0.091	0.500	ANO	03/31/22 08:14	04/04/22 07:42
Iron	0.0973	mg/L		0.0153	0.0200	ANO	03/31/22 08:14	04/04/22 07:42
Manganese	0.017	mg/L		0.001	0.005	ANO	03/31/22 08:14	04/04/22 07:42

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RPG Resources LLC
314 Boden Ave
Carnegie, PA 15106

Reported: 04/14/2022 12:07

Lab Sample ID#: 2032542-01
Sample Type: Water
Sample Source: Grab
Sampler: Client
Client Sample ID: Ballato

Sample Date: 03/29/2022 09:15
Receipt Date: 03/30/2022 17:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: Purge and Trap**		
Benzene	<0.410	ug/L		0.410	1.00	MJK	04/05/22 01:10	04/05/22 01:10
Toluene	<0.370	ug/L		0.370	1.00	MJK	04/05/22 01:10	04/05/22 01:10
Ethyl Benzene	<0.420	ug/L		0.420	1.00	MJK	04/05/22 01:10	04/05/22 01:10
m,p-Xylenes	<1.05	ug/L		1.05	2.00	MJK	04/05/22 01:10	04/05/22 01:10
o-Xylene	<0.450	ug/L		0.450	1.00	MJK	04/05/22 01:10	04/05/22 01:10
Total Xylenes	<0.450	ug/L		0.450	1.00	MJK	04/05/22 01:10	04/05/22 01:10
Surrogate: 1,2-Dichloroethane-d4	*107 %*		*80-120*			*MJK*	*04/05/22 01:10*	*04/05/22 01:10*
Surrogate: Toluene-d8	*102 %*		*88-110*			*MJK*	*04/05/22 01:10*	*04/05/22 01:10*
Surrogate: 4-Bromofluorobenzene	*98 %*		*86-115*			*MJK*	*04/05/22 01:10*	*04/05/22 01:10*

Lab Sample ID#: 2032542-02
Sample Type: Water
Sample Source: Trip Blank
Sampler: Client
Client Sample ID: Trip Blank - WV

Sample Date: 03/29/2022 00:00
Receipt Date: 03/30/2022 17:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: Purge and Trap**		
Benzene	<0.410	ug/L		0.410	1.00	MJK	04/05/22 01:35	04/05/22 01:35
Toluene	<0.370	ug/L		0.370	1.00	MJK	04/05/22 01:35	04/05/22 01:35
Ethyl Benzene	<0.420	ug/L		0.420	1.00	MJK	04/05/22 01:35	04/05/22 01:35
m,p-Xylenes	<1.05	ug/L		1.05	2.00	MJK	04/05/22 01:35	04/05/22 01:35
o-Xylene	<0.450	ug/L		0.450	1.00	MJK	04/05/22 01:35	04/05/22 01:35
Total Xylenes	<0.450	ug/L		0.450	1.00	MJK	04/05/22 01:35	04/05/22 01:35
Surrogate: 1,2-Dichloroethane-d4	*105 %*		*80-120*			*MJK*	*04/05/22 01:35*	*04/05/22 01:35*
Surrogate: Toluene-d8	*102 %*		*88-110*			*MJK*	*04/05/22 01:35*	*04/05/22 01:35*
Surrogate: 4-Bromofluorobenzene	*99 %*		*86-115*			*MJK*	*04/05/22 01:35*	*04/05/22 01:35*

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE REQUEST & CHAIN OF CUSTODY

PAGE 1 OF 1

HEADQUARTERS
1803 Philadelphia St.
Indiana, PA 15701
(724) 463-TEST
FAX: (724) 465-4209

SOUTHERN DIVISION
1276 Bentleyville Road
Van Voorhis, PA 15366
(724) 258-TEST
FAX: (724) 258-8376

NORTHERN DIVISION
435 Broad Street
Montoursville, PA
(570) 321-9003
FAX: (570) 321-

NORTHWEST DIVISION

2032542

Requested TAT:
Rush _____ days
Standard X

FOR INTERNAL LABORATORY USE ONLY

Sample Identification	ESL# 2032542	Sample Type: Composite Date on/off	Composite Time on/off	Grab Date	Grab Time	Matrix	# of Containers	Container Type / Preservative	Analysis Requested
Ballato	01			3/29/2022	0915	W	3	Plastic Liter None	Chloride, Dissolved Oxygen, pH, MBAS, Settleable Solids, TDS, SC
						W	1	Plastic Pint HNO3	Al, Ba, Ca, Fe, Mn
						W	1	Amber Glass Liter HCl	Oil and Grease
						W	3	40mL Amber Vial HCl	BTEX
TRIP BLANK	02					W	2	40mL Amber Vial HCl	BTEX

THE UNDERSIGNED PURCHASER HEREBY AGREES TO PAY SERVICE CHARGES ON ACCOUNTS OVER 31 DAYS OLD.
1. THESE SERVICE CHARGES WILL ACCRUE AT THE RATE OF 1 1/2% PER MONTH (18% PER ANNUM OR THE MAXIMUM ALLOWED BY LAW.)
2. THE UNDERSIGNED PURCHASER AGREES TO PAY, IN THE EVENT HIS ACCOUNT BECOMES DELINQUENT AND IS TURNED OVER TO ANY ATTORNEY FOR COLLECTION, REASONABLE ATTORNEY'S FEES PLUS ALL COURT AND ATTENDANT COLLECTION COSTS.

Sampled By: (Signature)	3/29/22 0915 Date/ Time		
Relinquished By: (Signature)	3/29/22 1530 Date/ Time	Received By: (Signature)	Amanda Athey (04247) 3-30-22 7:15 Date/ Time
Relinquished By: (Signature)	(04247) 3/30/22 1520 Date/ Time	Received By: (Signature)	3/30/22 1520 Date/ Time
Relinquished By: (Signature)	3/30/22 1640 Date/ Time	Received By: (Signature)	3/30/22 1700 Date/ Time

Project Notes: Circle State of Collection
WV OH SWN Freshwater Impoundment

Company/Name: **RPG Resources**
Address: 314 Boden Avenue, Carnegie, PA 15106
Contacts: Dave Schuster - 724-766-9441; Dawn Keller - 501-697-7230; Tyler Bryant - 832-796-6520
Email Address: dschuster@rpgres.com
Invoice to SWN WV

Correct Preservations Y / N / NA Correct Containers Y / N / NA Receipt Temperature _____

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE RECEIPT AND REVIEW FORM

Client: RPG - Ballato	Work Or 2032542

PART A: GENERAL INFORMATION- SATELLITE LABORATORY

Received by/Lab ID: 04247	Date/Time Received: 3/30/22 7:15
Method of Delivery: (Client Drop-Off) ESL Courier Other: _____	Received on Ice? (YES) NO
Sample Receipt Temperature: 1.1c °C	IR Gun ID: #7
Containers Removed by Satellite Lab for Analysis of: FECAL TC/EC TC MPN EC MPN TC/EC MPN (N/A)	

PART B: GENERAL INFORMATION- INDIANA LABORATORY

Received by/Lab ID: [illegible]	Samples Received on Ice? (YES) NO
Date/Time Received: 3/31 AM 1700	Date Sampled: 3/29 PM
Method of Delivery: FedEx UPS Client Drop off ~~ESL courier~~ Other: _____	
Sample Receipt Temperature: 1.0 °C	IR Gun ID: 3
Sample State of Collection: (PA) NY OH (WV) Other: _____	PWSID Compliance Drinking Water Samples: YES (NO)

JT 3/31/22

PART C: Receipt Details

Completed (if different from above): _____ (Signature) / / (Date) _____ (Time)

Sample Receipt Criteria			Comments/Qualifiers (Required for Non-Conforming Items)
Chain of custody documents included with samples?	(YES)	NO	Comments:
COC form is properly signed in relinquished/received sections?	(YES)	NO	Comments:
Sample containers intact and sealed?	(YES)	NO	Circle Applicable: Damaged Container Leaking Container Custody Seal Broken Other: _____
Number of containers received matches number indicated on COC?	(YES)	NO	Sample IDs and Containers Affected:
Sample IDs on COC match IDs on bottles?	(YES)	NO	Sample IDs and Containers Affected:
Date and time on COC match date and time on bottles?	(YES)	NO	Sample IDs and Containers Affected:
Samples received within holding time?	(YES)	NO	Sample IDs and Containers Affected:
Samples received at appropriate pH for analysis requested?	(YES)	NO	Sample IDs and Containers Affected and Observed pH:
Samples requiring thermal preservation within 0 ≤ 6°C? Microbiology within 0 ≤ 10°C?	(YES)	NO	For non-WV samples outside of thermal preservation range sampled same day and received on ice are considered acceptable as long as the cooling process has begun.
Adequate sample volume received?	(YES)	NO	Analyses Affected:
VOA vials free of headspace (defined as < 6 mm bubble)?	(YES)	NO	Sample IDs and Containers Affected:

Other Comments:

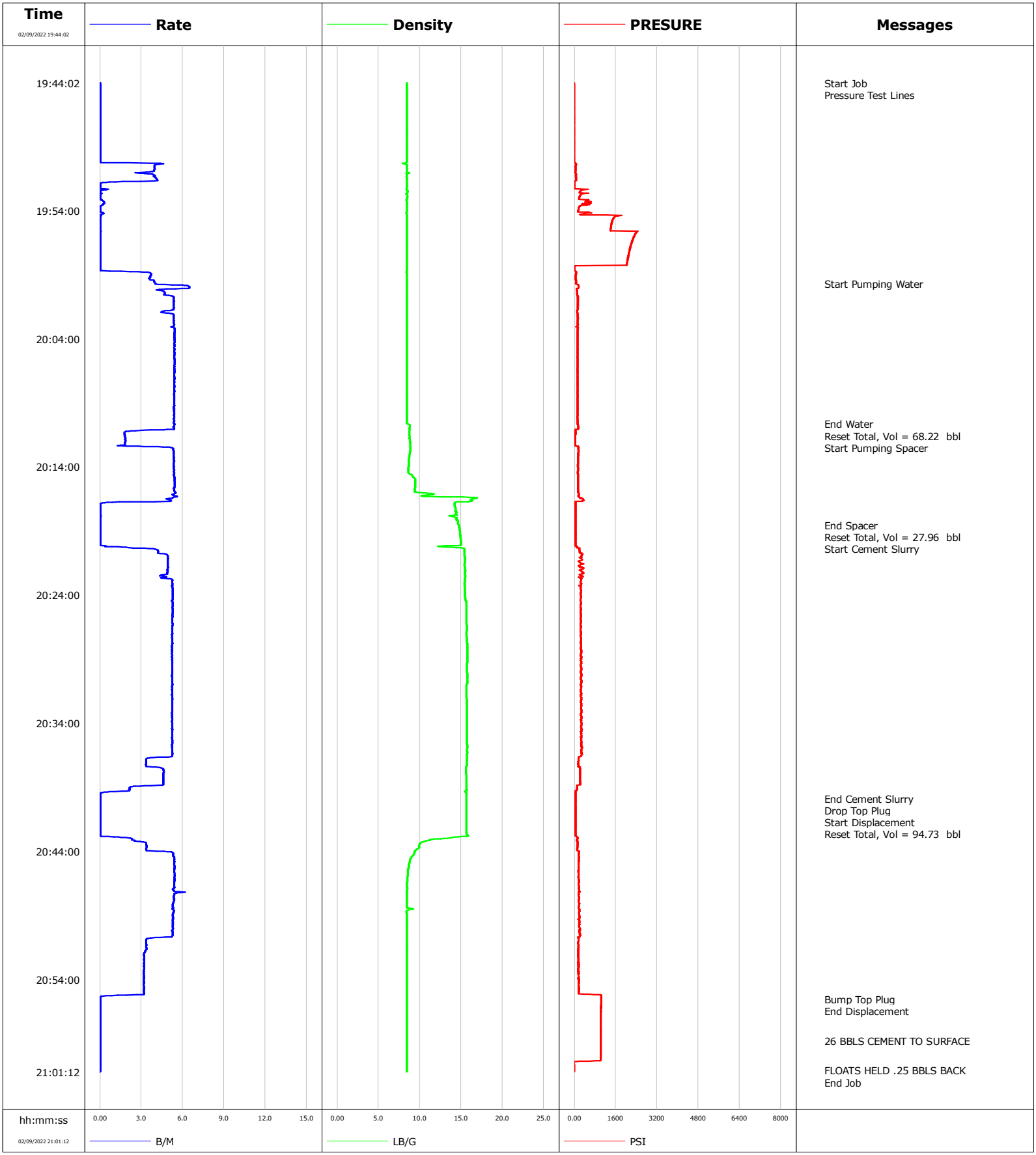
Deficiency Log Created: YES (NO)

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	BETTY SCHAFFER MSH 1H	**Client**	SWN PRODUCTION COMPANY
Field	CAMERON	**SIR No.**	EN82-03224
Engineer	BRIAN FOOTE	**Job Type**	SURFACE
Country	United States	**Job Date**	02-09-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN PRODUCTION COMPANY	EN82-03224

Well	Location (legal)	Schlumberger Location	Job Start
BETTY SCHAFFER MSH 1H 1H	WHEELING, WV	STRASBURG	Feb/09/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
CAMERON	Clean-Sandstone	1 deg	17.5 in	395.0 ft	395.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHALL	West Virginia	psi	64 degF	80 degF	lb/gal

Well Mast	API/UWI
47-051-02382-00-00	47-051-0282-00-00

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
AIR	lb/gal	cP

Service Line	Job Type
Cementing	SURFACE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

CEMENT 378' OF 13 3/8 WITH
25 BBL GEL
95 BBLS 15.6 PPG
444 SK 1.2 YLD 5.27 H20
DROP TOP PLUG
DISP 52 BBL H20
FLOATS HELD .25 BBL BACK
26 BBL CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
378.0	13.4	54.5	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Annulus	52.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	58.0 bbl	24.7 bbl	30.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Casing Tools	Squeeze Job
X	X		

Lift Pressure	Pipe Rotated	Pipe Reciprocated	Shoe Type	Shoe Depth	Squeeze Type	Tool Type
227 psi	☐	☐	Float	378.0 ft		

No. Centralizers	Top Plugs	Bottom Plugs	Stage Tool Type	Stage Tool Depth	Tool Depth	Tail Pipe Size
	1			ft	ft	in

Cement Head Type	Collar Type	Collar Depth	Tail Pipe Depth	Sqz. Total Vol.
Single	Float	329.0 ft	ft	bbl

Job Scheduled For	Arrived on Location	Leave Location
Feb/09/2022	Feb/09/2022	Feb/09/2022

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
02/09/2022	19:44:02	-6	0.0	0.0	8.40	Started Acquisition
02/09/2022	19:44:03	-7	0.0	0.0	8.40	Start Job
02/09/2022	19:44:12	-6	0.0	0.0	8.40	Pressure Test Lines
02/09/2022	19:44:34	-7	0.0	0.0	8.40	
02/09/2022	19:45:06	-7	0.0	0.0	8.40	
02/09/2022	19:45:38	-6	0.0	0.0	8.40	
02/09/2022	19:46:10	-7	0.0	0.1	8.40	
02/09/2022	19:46:42	-6	0.0	0.1	8.40	
02/09/2022	19:47:14	-6	0.0	0.1	8.40	
02/09/2022	19:47:46	-6	0.0	0.1	8.40	
02/09/2022	19:48:18	-6	0.0	0.1	8.40	
02/09/2022	19:48:50	-6	0.0	0.1	8.40	
02/09/2022	19:49:22	-7	0.0	0.1	8.40	
02/09/2022	19:49:54	-7	0.0	0.1	8.40	
02/09/2022	19:50:26	58	4.1	0.7	8.41	
02/09/2022	19:50:58	54	3.9	2.8	8.41	
02/09/2022	19:51:30	67	4.1	4.7	8.40	
02/09/2022	19:52:02	9	0.0	5.8	8.45	
02/09/2022	19:52:34	213	0.0	5.9	8.51	
02/09/2022	19:53:06	183	0.0	5.9	8.45	
02/09/2022	19:53:38	275	0.1	6.0	8.43	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFFER MSH 1H 1H	CAMERON	Feb/09/2022	SWN PRODUCTION COMPANY	EN82-03224

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
02/09/2022	19:54:42	1495	0.0	6.1	8.41	
02/09/2022	19:55:14	1422	0.0	6.1	8.40	
02/09/2022	19:55:46	2394	0.0	6.1	8.40	
02/09/2022	19:56:18	2258	0.0	6.1	8.40	
02/09/2022	19:56:50	2174	0.0	6.1	8.40	
02/09/2022	19:57:22	2110	0.0	6.1	8.40	
02/09/2022	19:57:54	2057	0.0	6.1	8.40	
02/09/2022	19:58:26	2	0.0	6.2	8.40	
02/09/2022	19:58:58	58	3.7	6.8	8.40	
02/09/2022	19:59:30	60	3.9	8.8	8.40	
02/09/2022	19:59:43	61	4.0	9.7	8.40	Start Pumping Water
02/09/2022	20:00:02	166	6.5	11.4	8.40	
02/09/2022	20:00:34	101	4.7	14.1	8.40	
02/09/2022	20:01:06	131	5.4	16.9	8.40	
02/09/2022	20:01:38	139	5.4	19.7	8.40	
02/09/2022	20:02:10	128	5.3	22.4	8.40	
02/09/2022	20:02:42	140	5.3	25.2	8.40	
02/09/2022	20:03:14	132	5.4	28.1	8.41	
02/09/2022	20:03:46	117	5.4	31.0	8.40	
02/09/2022	20:04:18	128	5.4	33.8	8.40	
02/09/2022	20:04:50	121	5.4	36.7	8.40	
02/09/2022	20:05:22	123	5.4	39.6	8.40	
02/09/2022	20:05:54	124	5.4	42.5	8.40	
02/09/2022	20:06:26	116	5.4	45.4	8.40	
02/09/2022	20:06:58	123	5.4	48.2	8.40	
02/09/2022	20:07:30	125	5.4	51.1	8.40	
02/09/2022	20:08:02	128	5.4	54.0	8.40	
02/09/2022	20:08:34	123	5.4	56.9	8.40	
02/09/2022	20:09:06	118	5.4	59.7	8.40	
02/09/2022	20:09:38	130	5.4	62.6	8.40	
02/09/2022	20:10:10	122	5.4	65.4	8.40	
02/09/2022	20:10:39	116	5.4	68.0	8.51	End Water
02/09/2022	20:10:41	126	5.4	68.2	8.68	Reset Total, Vol = 68.22 bbl
02/09/2022	20:10:42	115	5.4	0.1	8.73	
02/09/2022	20:10:45	142	5.4	0.4	8.77	Start Pumping Spacer
02/09/2022	20:11:14	42	2.1	2.7	8.75	
02/09/2022	20:11:46	37	1.8	3.7	8.75	
02/09/2022	20:12:18	37	1.8	4.7	8.84	
02/09/2022	20:12:50	160	5.3	7.0	8.81	
02/09/2022	20:13:22	144	5.4	9.8	8.69	
02/09/2022	20:13:54	147	5.3	12.7	8.65	
02/09/2022	20:14:26	128	5.4	15.5	8.58	
02/09/2022	20:14:58	136	5.4	18.4	9.42	
02/09/2022	20:15:30	142	5.4	21.3	9.45	
02/09/2022	20:16:02	149	5.5	24.2	10.43	
02/09/2022	20:16:34	348	4.9	27.0	16.09	
02/09/2022	20:17:06	44	0.0	28.0	14.23	
02/09/2022	20:18:10	40	0.0	28.0	14.44	
02/09/2022	20:18:33	40	0.0	28.0	14.71	End Spacer
02/09/2022	20:18:37	39	0.0	28.0	14.71	Reset Total, Vol = 27.96 bbl
02/09/2022	20:18:40	40	0.0	0.0	14.74	Start Cement Slurry
02/09/2022	20:19:14	39	0.0	0.0	14.87	
02/09/2022	20:19:46	39	0.0	0.0	14.96	
02/09/2022	20:20:18	116	1.9	0.1	14.43	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFFER MSH 1H 1H	CAMERON	Feb/09/2022	SWN PRODUCTION COMPANY	EN82-03224

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
02/09/2022	20:21:22	185	4.9	4.8	15.43	
02/09/2022	20:21:54	345	4.9	7.4	15.46	
02/09/2022	20:22:26	192	4.6	10.0	15.47	
02/09/2022	20:22:58	247	5.2	12.6	15.43	
02/09/2022	20:23:30	242	5.3	15.4	15.43	
02/09/2022	20:24:02	254	5.3	18.2	15.47	
02/09/2022	20:24:34	268	5.3	21.0	15.61	
02/09/2022	20:25:06	255	5.3	23.9	15.65	
02/09/2022	20:25:38	246	5.3	26.7	15.60	
02/09/2022	20:26:10	272	5.2	29.5	15.64	
02/09/2022	20:26:42	246	5.2	32.3	15.68	
02/09/2022	20:27:14	241	5.2	35.1	15.65	
02/09/2022	20:27:46	246	5.3	37.9	15.71	
02/09/2022	20:28:18	259	5.2	40.6	15.76	
02/09/2022	20:28:50	268	5.2	43.4	15.75	
02/09/2022	20:29:22	283	5.2	46.2	15.70	
02/09/2022	20:29:54	268	5.2	49.0	15.68	
02/09/2022	20:30:26	245	5.2	51.8	15.75	
02/09/2022	20:30:58	244	5.3	54.6	15.69	
02/09/2022	20:31:30	266	5.3	57.4	15.64	
02/09/2022	20:32:02	273	5.2	60.2	15.65	
02/09/2022	20:32:34	251	5.2	63.0	15.70	
02/09/2022	20:33:06	280	5.2	65.8	15.71	
02/09/2022	20:33:38	280	5.2	68.5	15.70	
02/09/2022	20:34:10	271	5.2	71.3	15.71	
02/09/2022	20:34:42	266	5.2	74.1	15.70	
02/09/2022	20:35:14	259	5.2	76.9	15.69	
02/09/2022	20:35:46	274	5.2	79.7	15.74	
02/09/2022	20:36:18	299	5.2	82.5	15.72	
02/09/2022	20:36:50	159	3.4	85.0	15.69	
02/09/2022	20:37:22	147	3.4	86.8	15.69	
02/09/2022	20:37:54	224	4.6	89.1	15.55	
02/09/2022	20:38:26	237	4.6	91.6	15.64	
02/09/2022	20:38:58	102	2.3	93.9	15.62	
02/09/2022	20:39:30	56	0.0	94.7	15.62	
02/09/2022	20:39:53	52	0.0	94.7	15.62	End Cement Slurry
02/09/2022	20:39:55	52	0.0	94.7	15.61	Drop Top Plug
02/09/2022	20:39:57	52	0.0	94.7	15.61	Start Displacement
02/09/2022	20:40:00	52	0.0	94.7	15.61	Reset Total, Vol = 94.73 bbl
02/09/2022	20:40:02	51	0.0	0.0	15.61	
02/09/2022	20:40:34	51	0.0	0.0	15.63	
02/09/2022	20:41:06	49	0.0	0.0	15.63	
02/09/2022	20:41:38	49	0.0	0.0	15.63	
02/09/2022	20:42:10	48	0.0	0.0	15.63	
02/09/2022	20:42:42	47	0.0	0.0	15.79	
02/09/2022	20:43:14	132	2.7	0.8	10.50	
02/09/2022	20:43:46	122	3.4	2.6	9.82	
02/09/2022	20:44:18	167	5.3	4.9	9.20	
02/09/2022	20:44:50	167	5.4	7.8	8.76	
02/09/2022	20:45:22	171	5.4	10.6	8.60	
02/09/2022	20:45:54	168	5.4	13.5	8.52	
02/09/2022	20:46:26	180	5.4	16.4	8.45	
02/09/2022	20:46:58	173	5.3	19.3	8.44	
02/09/2022	20:47:30	173	5.4	22.2	8.42	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFFER MSH 1H 1H	CAMERON	Feb/09/2022	SWN PRODUCTION COMPANY	EN82-03224

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
02/09/2022	20:48:34	204	5.3	27.9	8.70	
02/09/2022	20:49:06	207	5.3	30.7	8.39	
02/09/2022	20:49:38	189	5.3	33.5	8.40	
02/09/2022	20:50:10	185	5.3	36.3	8.40	
02/09/2022	20:50:42	162	5.1	39.1	8.40	
02/09/2022	20:51:14	145	3.3	41.0	8.40	
02/09/2022	20:51:46	147	3.3	42.8	8.39	
02/09/2022	20:52:18	183	3.2	44.5	8.39	
02/09/2022	20:52:50	146	3.2	46.2	8.39	
02/09/2022	20:53:22	142	3.2	47.9	8.40	
02/09/2022	20:53:54	188	3.2	49.6	8.40	
02/09/2022	20:54:26	179	3.2	51.3	8.40	
02/09/2022	20:54:58	177	3.2	53.0	8.40	
02/09/2022	20:55:30	1033	0.0	53.9	8.40	
02/09/2022	20:55:32	1032	0.0	53.9	8.40	Bump Top Plug
02/09/2022	20:55:37	1031	0.0	53.9	8.40	End Displacement
02/09/2022	20:56:02	1029	0.0	53.9	8.40	
02/09/2022	20:56:34	1029	0.0	53.9	8.40	
02/09/2022	20:57:06	1028	0.0	53.9	8.40	
02/09/2022	20:57:38	1028	0.0	54.0	8.40	
02/09/2022	20:58:10	1027	0.0	54.0	8.40	
02/09/2022	20:58:42	1027	0.0	54.0	8.40	
02/09/2022	20:58:48	1027	0.0	54.0	8.40	26 BBLS CEMENT TO SURFACE
02/09/2022	20:59:14	1027	0.0	54.0	8.40	
02/09/2022	21:00:18	1025	0.0	54.0	8.40	
02/09/2022	21:00:50	-18	0.0	54.0	8.40	
02/09/2022	21:01:06	-18	0.0	54.0	8.40	FLOATS HELD .25 BBLS BACK

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
3.5			6.5	94.7	0.0	27.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
1029	227	330	1029			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	95.7 bbl	52.0 bbl	64 degF	Cement Circulated to Surface? [X]	Volume 26.0 bbl
				Washed Thru Perfs [ ]	To ft

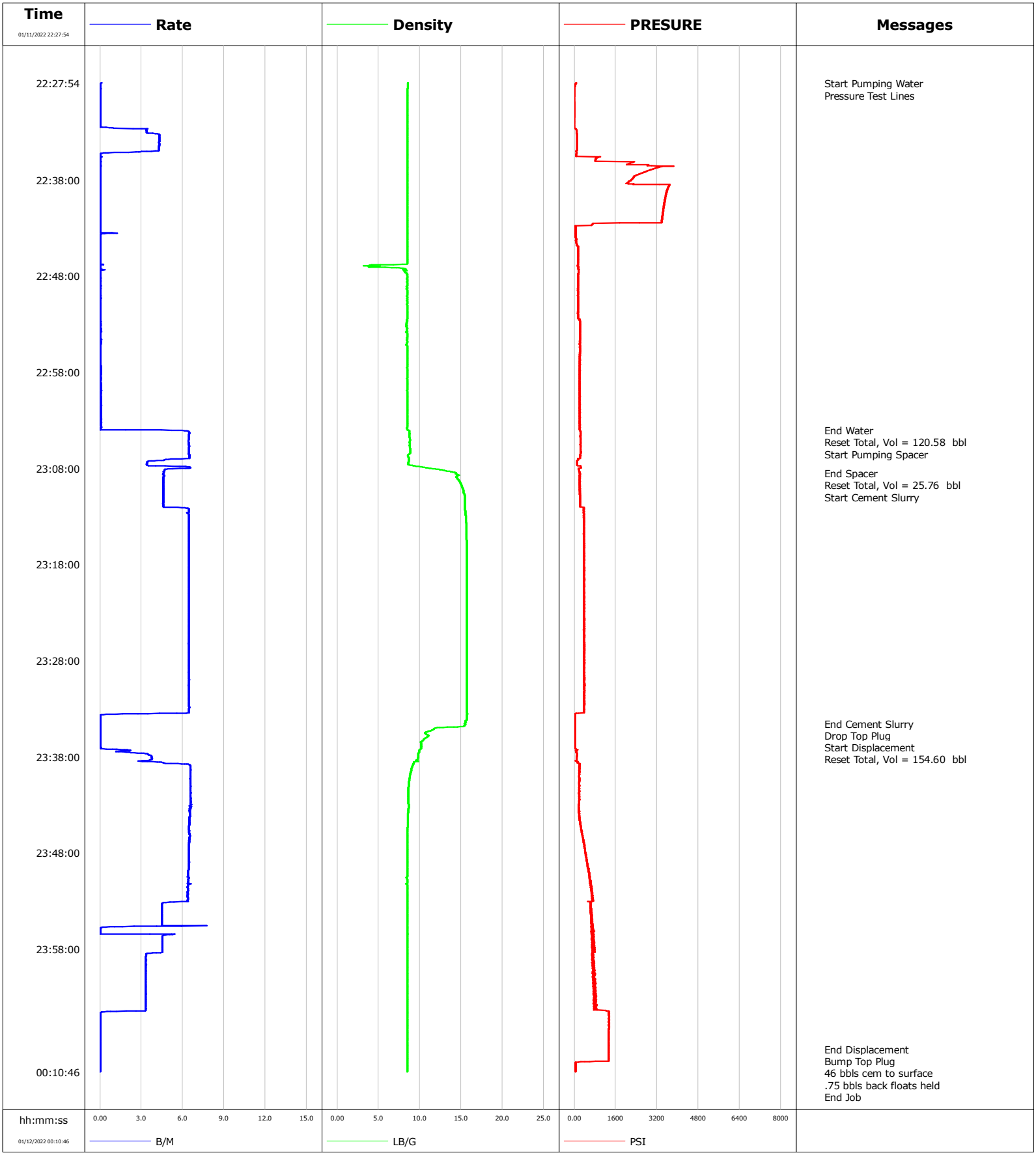
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
BRYAN TRAHAN	BRIAN FOOTE	-	-

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	BETTY SCHAFER MSH 405H	**Client**	SWN
Field	PANHANDLE	**SIR No.**	EN82-02513
Engineer	BRIAN FOOTE	**Job Type**	INTERMEDIATE
Country	United States	**Job Date**	01-11-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-02513

Well	Location (legal)	Schlumberger Location	Job Start
BETTY SCHAFER MSH 405H 405 H	WHEELING WV	STRASBURG	Jan/11/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Dirty-Sandstone	1 deg	12.3 in	1830.0 ft	1830.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHALL	West Virginia	psi	80 degF	80 degF	lb/gal

Well Mast	API/UWI
47-051-02383-00-00	47-051-02383-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Foam	lb/gal	cP

Service Line	Job Type
Cementing	INTERMEDIATE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

CEMENT 1813' OF 9 5/8 WITH
150 BBLS H20
25 BBL GEL
153.9 BBL CLASS A 15.6 PPG
726 SK 1.19 YLD 5.27 H20
DROP TOP PLUG
DISP 136.7 BBL H20
FLOATS HELD .75 BBLS BACK
46 BBL CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
1813.0	9.6	36.0	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	136.7 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	140.1 bbl	24.3 bbl	80.1 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
830 psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
24	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Jan/11/2022	Jan/11/2022	Jan/11/2022

Casing Tools

Shoe Type	Guide
Shoe Depth	2813.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	2769.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
01/11/2022	22:27:54	68	0.3	0.0	8.53	Started Acquisition
01/11/2022	22:28:00	53	0.0	0.0	8.55	Start Pumping Water
01/11/2022	22:28:01	50	0.0	0.0	8.55	Pressure Test Lines
01/11/2022	22:28:37	14	0.0	0.0	8.48	
01/11/2022	22:29:20	2	0.0	0.0	8.48	
01/11/2022	22:30:03	-4	0.0	0.1	8.48	
01/11/2022	22:30:46	-8	0.0	0.1	8.48	
01/11/2022	22:31:29	-11	0.0	0.1	8.48	
01/11/2022	22:32:12	-19	0.0	0.1	8.48	
01/11/2022	22:32:55	56	3.4	1.1	8.47	
01/11/2022	22:33:38	185	4.3	3.9	8.47	
01/11/2022	22:34:21	189	4.3	7.0	8.47	
01/11/2022	22:35:04	140	3.0	10.0	8.47	
01/11/2022	22:35:47	865	0.0	10.3	8.47	
01/11/2022	22:36:30	2858	0.0	10.3	8.47	
01/11/2022	22:37:13	2715	0.0	10.3	8.47	
01/11/2022	22:37:56	2234	0.0	10.3	8.47	
01/11/2022	22:38:39	3672	0.0	10.4	8.47	
01/11/2022	22:39:22	3563	0.0	10.4	8.47	
01/11/2022	22:40:05	3504	0.0	10.4	8.47	
01/11/2022	22:40:48	3456	0.0	10.4	8.47	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 405H 405 H	PANHANDLE	Jan/11/2022	SWN	EN82-02513

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
01/11/2022	22:42:14	3379	0.0	10.4	8.47	
01/11/2022	22:42:57	17	0.0	10.4	8.47	
01/11/2022	22:43:40	13	0.1	10.5	8.47	
01/11/2022	22:44:23	73	0.0	10.5	8.47	
01/11/2022	22:45:06	161	4.5	10.9	8.47	
01/11/2022	22:45:49	151	4.6	14.2	8.47	
01/11/2022	22:46:32	161	4.7	17.5	8.47	
01/11/2022	22:47:15	199	4.6	20.9	8.20	
01/11/2022	22:47:58	177	4.7	24.2	8.46	
01/11/2022	22:48:41	177	4.6	27.5	8.46	
01/11/2022	22:49:24	174	4.6	30.8	8.45	
01/11/2022	22:50:07	167	4.6	34.1	8.44	
01/11/2022	22:50:50	159	4.7	37.5	8.47	
01/11/2022	22:51:33	158	4.7	40.8	8.47	
01/11/2022	22:52:16	164	4.6	44.1	8.47	
01/11/2022	22:52:59	263	6.5	48.4	8.41	
01/11/2022	22:53:42	255	6.6	53.1	8.45	
01/11/2022	22:54:25	248	6.6	57.8	8.45	
01/11/2022	22:55:08	248	6.5	62.6	8.30	
01/11/2022	22:55:51	244	6.5	67.3	8.47	
01/11/2022	22:56:34	241	6.5	72.0	8.47	
01/11/2022	22:57:17	235	6.5	76.7	8.47	
01/11/2022	22:58:00	225	6.6	81.4	8.46	
01/11/2022	22:58:43	237	6.6	86.2	8.46	
01/11/2022	22:59:26	219	6.6	90.9	8.47	
01/11/2022	23:00:09	215	6.5	95.6	8.46	
01/11/2022	23:00:52	223	6.6	100.3	8.47	
01/11/2022	23:01:35	221	6.5	105.0	8.47	
01/11/2022	23:02:18	214	6.5	109.8	8.47	
01/11/2022	23:03:01	219	6.5	114.5	8.47	
01/11/2022	23:03:44	223	6.6	119.2	8.46	
01/11/2022	23:04:04	217	5.2	120.3	8.70	End Water
01/11/2022	23:04:07	236	6.2	120.6	8.73	Reset Total, Vol = 120.58 bbl
01/11/2022	23:04:10	240	6.4	0.3	8.73	Start Pumping Spacer
01/11/2022	23:04:27	249	6.5	2.1	8.75	
01/11/2022	23:05:10	261	6.4	6.8	8.77	
01/11/2022	23:05:53	246	6.4	11.4	8.81	
01/11/2022	23:06:36	237	6.5	16.0	8.58	
01/11/2022	23:07:19	98	3.5	20.1	8.63	
01/11/2022	23:08:02	145	5.8	23.2	11.57	
01/11/2022	23:08:32	178	4.6	25.6	14.33	End Spacer
01/11/2022	23:08:34	190	4.6	25.8	14.32	Reset Total, Vol = 25.76 bbl
01/11/2022	23:08:36	181	4.6	0.2	14.45	Start Cement Slurry
01/11/2022	23:08:45	186	4.7	0.8	14.65	
01/11/2022	23:09:28	180	4.6	4.1	14.87	
01/11/2022	23:10:11	178	4.6	7.4	15.21	
01/11/2022	23:10:54	189	4.6	10.7	15.43	
01/11/2022	23:11:37	185	4.6	14.0	15.46	
01/11/2022	23:12:20	351	6.5	17.7	15.46	
01/11/2022	23:13:03	363	6.5	22.4	15.55	
01/11/2022	23:13:46	362	6.5	27.0	15.60	
01/11/2022	23:14:29	370	6.5	31.6	15.62	
01/11/2022	23:15:12	374	6.5	36.2	15.63	
01/11/2022	23:15:55	363	6.4	40.9	15.68	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 405H 405 H	PANHANDLE	Jan/11/2022	SWN	EN82-02513

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
01/11/2022	23:17:21	372	6.5	50.1	15.69	
01/11/2022	23:18:04	356	6.4	54.7	15.69	
01/11/2022	23:18:47	363	6.5	59.3	15.70	
01/11/2022	23:19:30	376	6.5	64.0	15.70	
01/11/2022	23:20:13	363	6.4	68.6	15.69	
01/11/2022	23:20:56	369	6.5	73.2	15.68	
01/11/2022	23:21:39	388	6.4	77.8	15.67	
01/11/2022	23:22:22	386	6.5	82.5	15.68	
01/11/2022	23:23:05	367	6.5	87.1	15.68	
01/11/2022	23:23:48	387	6.5	91.7	15.68	
01/11/2022	23:24:31	388	6.5	96.3	15.67	
01/11/2022	23:25:14	366	6.5	101.0	15.68	
01/11/2022	23:25:57	371	6.5	105.6	15.68	
01/11/2022	23:26:40	375	6.5	110.2	15.68	
01/11/2022	23:27:23	367	6.5	114.8	15.67	
01/11/2022	23:28:06	374	6.5	119.5	15.68	
01/11/2022	23:28:49	383	6.5	124.1	15.68	
01/11/2022	23:29:32	361	6.5	128.7	15.69	
01/11/2022	23:30:15	367	6.5	133.3	15.70	
01/11/2022	23:30:58	390	6.5	137.9	15.70	
01/11/2022	23:31:41	391	6.5	142.6	15.70	
01/11/2022	23:32:24	370	6.5	147.2	15.69	
01/11/2022	23:33:07	374	6.4	151.8	15.67	
01/11/2022	23:33:50	1	0.0	154.6	15.67	
01/11/2022	23:34:32	-0	0.0	154.6	15.39	End Cement Slurry
01/11/2022	23:34:33	-0	0.0	154.6	15.40	
01/11/2022	23:34:35	-2	0.0	154.6	15.46	Drop Top Plug
01/11/2022	23:34:39	1	0.0	154.6	15.53	Start Displacement
01/11/2022	23:34:43	-1	0.0	154.6	15.46	Reset Total, Vol = 154.60 bbl
01/11/2022	23:35:16	-1	0.0	0.0	11.41	
01/11/2022	23:35:59	-8	0.0	0.0	10.83	
01/11/2022	23:36:42	-10	0.0	0.0	10.16	
01/11/2022	23:37:25	41	1.6	0.4	9.91	
01/11/2022	23:38:08	49	3.8	2.6	9.76	
01/11/2022	23:38:51	155	6.5	5.6	9.17	
01/11/2022	23:39:34	152	6.6	10.3	8.90	
01/11/2022	23:40:17	150	6.5	15.0	8.74	
01/11/2022	23:41:00	149	6.6	19.7	8.64	
01/11/2022	23:41:43	152	6.6	24.4	8.59	
01/11/2022	23:42:26	179	6.6	29.1	8.59	
01/11/2022	23:43:09	120	6.6	33.8	8.68	
01/11/2022	23:43:52	138	6.5	38.5	8.57	
01/11/2022	23:44:35	152	6.5	43.2	8.53	
01/11/2022	23:45:18	206	6.5	47.8	8.51	
01/11/2022	23:46:01	249	6.5	52.5	8.49	
01/11/2022	23:46:44	300	6.5	57.1	8.49	
01/11/2022	23:47:27	345	6.5	61.7	8.48	
01/11/2022	23:48:10	394	6.5	66.4	8.49	
01/11/2022	23:48:53	441	6.5	71.0	8.49	
01/11/2022	23:49:36	488	6.4	75.6	8.48	
01/11/2022	23:50:19	537	6.4	80.2	8.48	
01/11/2022	23:51:02	600	6.4	84.8	8.48	
01/11/2022	23:51:45	599	6.4	89.4	8.48	
01/11/2022	23:52:28	630	6.4	93.9	8.48	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 405H 405 H	PANHANDLE	Jan/11/2022	SWN	EN82-02513

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
01/11/2022	23:53:54	634	4.5	101.6	8.48	
01/11/2022	23:54:37	658	4.5	104.8	8.48	
01/11/2022	23:55:20	624	4.5	108.0	8.48	
01/11/2022	23:56:03	696	4.6	111.3	8.49	
01/11/2022	23:56:46	719	4.5	114.6	8.48	
01/11/2022	23:57:29	643	4.5	117.9	8.48	
01/11/2022	23:58:12	691	4.5	121.1	8.48	
01/11/2022	23:58:55	709	3.3	123.8	8.48	
01/11/2022	23:59:38	727	3.3	126.1	8.48	
01/12/2022	00:00:21	746	3.3	128.5	8.48	
01/12/2022	00:01:04	724	3.3	130.9	8.48	
01/12/2022	00:01:47	731	3.3	133.3	8.48	
01/12/2022	00:02:30	715	3.3	135.6	8.48	
01/12/2022	00:03:13	760	3.3	138.0	8.48	
01/12/2022	00:03:56	731	3.3	140.4	8.48	
01/12/2022	00:04:39	1304	0.0	142.2	8.48	
01/12/2022	00:05:22	1299	0.0	142.2	8.48	
01/12/2022	00:06:05	1297	0.0	142.2	8.48	
01/12/2022	00:06:48	1293	0.0	142.2	8.48	
01/12/2022	00:07:31	1291	0.0	142.2	8.48	
01/12/2022	00:08:14	1289	0.0	142.3	8.48	
01/12/2022	00:08:25	1287	0.0	142.3	8.48	End Displacement
01/12/2022	00:08:28	1287	0.0	142.3	8.48	Bump Top Plug
01/12/2022	00:08:30	1287	0.0	142.3	8.48	46 bbls cem to surface
01/12/2022	00:08:57	1287	0.0	142.3	8.48	
01/12/2022	00:09:40	1284	0.0	142.3	8.48	
01/12/2022	00:10:23	-2	0.0	142.3	8.48	
01/12/2022	00:10:40	-2	0.0	142.3	8.48	.75 bbls back floats held

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.4			6.7	155.6	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
1330	830	561	1335			bbl	lb/gal

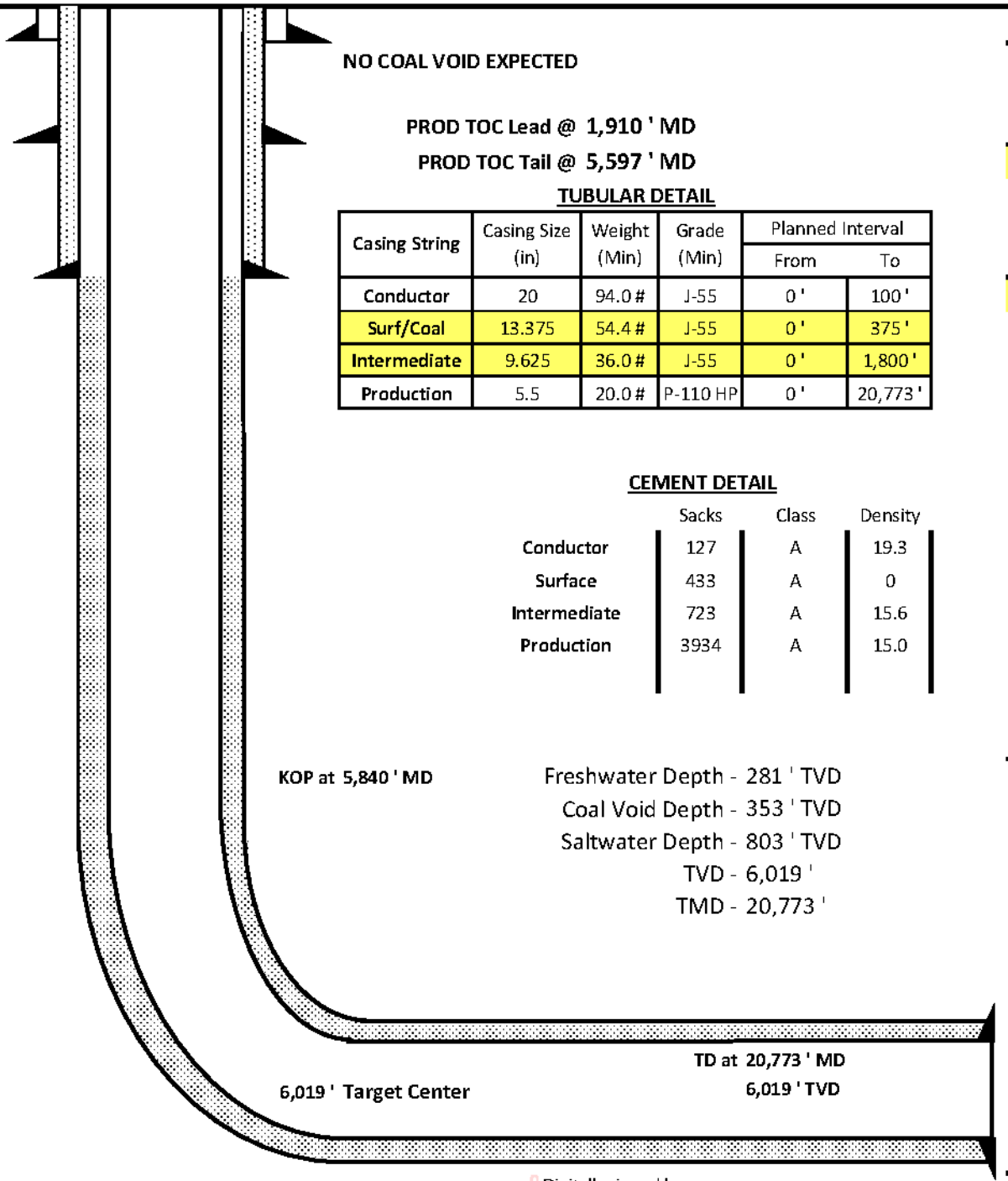
Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	158.3 bbl	136.6 bbl	57 degF	Cement Circulated to Surface? [X]	Volume 46.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
BRIAN TRAHAN	BRIAN FOOTE	-	-

Southwestern Energy Company | Proposed Drilling Program

Well:	BETTY SCHAFER MSH 405	**Re-entry Rig:**	SDC 40
Field:	PANHANDLE FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9910 Latitude	-80.6355 Longitude	
BHL:	40.0241 Latitude	-80.6454 Longitude	
KB Elev:	875 ft MSL	KB: 26 ft AGL	**GL Elev:** 849 ft MSL

swn Southwestern Energy®



TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	100 '
Surf/Coal	13.375	54.4 #	J-55	0 '	375 '
Intermediate	9.625	36.0 #	J-55	0 '	1,800 '
Production	5.5	20.0 #	P-110 HP	0 '	20,773 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor	127	A	19.3
Surface	433	A	0
Intermediate	723	A	15.6
Production	3934	A	15.0

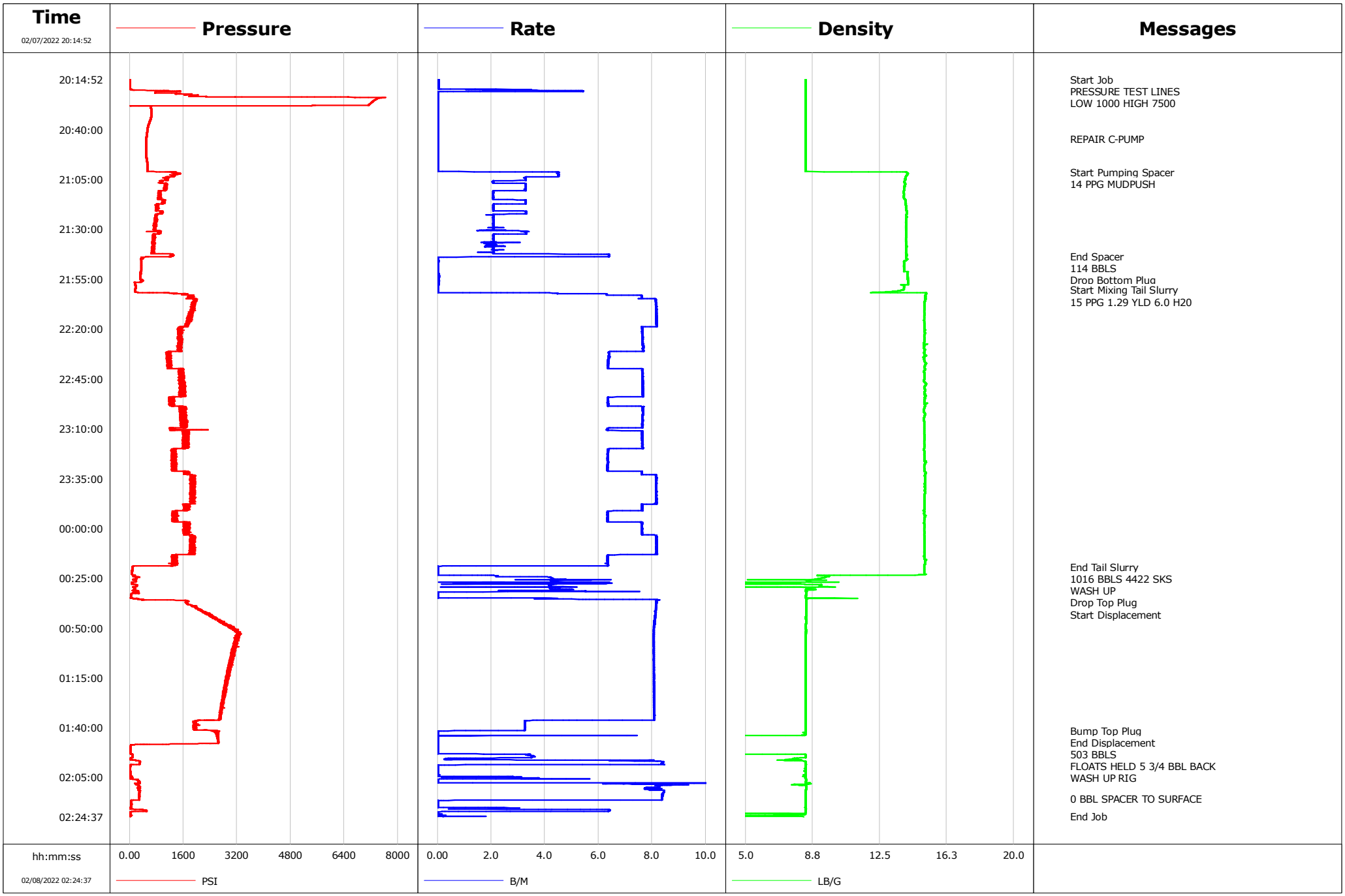
Gayne Knitowski

Digitally signed by Gayne Knitowski
Date: 2022.01.06 14:55:58 -05'00'

Created by: Dicky Hall on 01/03/2022

Schlumberger Cementing Job Report

Well	BETTY SCHAFER MSH 3H	**Client**	SWN PRODUCTION
Field	PANHANDLE	**SIR No.**	EN82-03137
Engineer	ZACHARY BUCK	**Job Type**	PRODUCTION
Country	United States	**Job Date**	02-07-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN PRODUCTION	EN82-03137

Well	Location (legal)	Schlumberger Location	Job Start
BETTY SCHAFER MSH 3H 3H	BETTY SCHAFER PAD	STRASBURG	Feb/07/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Shale	90 deg	8.5 in	22755.0 ft	5831.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHALL	West Virginia	psi	124 degF	124 degF	lb/gal
Well Master 0066459737	**API/UWI** 47-051-02417-00-00				

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Oil Mud	14.20 lb/gal	cP

Service Line	Job Type
Cementing	PRODUCTION

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

110 BBL MUDPUSH 14 PPG
BOTTOM PLUG
993 BBL TAIL 15 PPG
1.29 YLD 6.0 H20 4324 SKS
TOP PLUG
DISPL 503 BBL
44 BBL SPACER TO SURFACE W/ EXCESS

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
22715.0	5.5	20.0	P110	BUTT
1720.0	9.6	36.0	J55	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	503.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	504.1 bbl	82.4 bbl	862.4 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Casing Tools	Squeeze Job
X	X		

Lift Pressure	1950 psi	Shoe Type	Float	Squeeze Type	
Pipe Rotated	☐	Pipe Reciprocated	☐	Shoe Depth	22715.0 ft	Tool Type	
No. Centralizers		Top Plugs	1	Bottom Plugs	1	Stage Tool Type		Tool Depth	ft
Cement Head Type	Single					Stage Tool Depth	ft	Tail Pipe Size	in
Job Scheduled For	Arrived on Location	Leave Location				Collar Type	Float	Tail Pipe Depth	ft
Feb/07/2022 10:00	Feb/07/2022 10:00	Feb/08/2022 00:00				Collar Depth	22666.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/07/2022	20:14:52	7	0.0	8.36	Started Acquisition
02/07/2022	20:15:06	7	0.0	8.36	Start Job
02/07/2022	20:15:52	8	0.0	8.36	
02/07/2022	20:16:52	8	0.0	8.36	
02/07/2022	20:17:52	8	0.1	8.36	
02/07/2022	20:18:52	8	0.1	8.36	
02/07/2022	20:19:52	33	3.3	8.35	
02/07/2022	20:20:42	1482	5.4	8.36	PRESSURE TEST LINES
02/07/2022	20:20:45	1496	5.4	8.36	LOW 1000 HIGH 7500
02/07/2022	20:20:52	1035	5.4	8.36	
02/07/2022	20:21:52	1497	0.0	8.36	
02/07/2022	20:22:52	1982	0.0	8.36	
02/07/2022	20:23:52	7587	0.0	8.36	
02/07/2022	20:24:52	7338	0.0	8.36	
02/07/2022	20:25:52	7255	0.0	8.36	
02/07/2022	20:27:52	5513	0.0	8.36	
02/07/2022	20:28:52	620	0.0	8.36	
02/07/2022	20:29:52	639	0.0	8.36	
02/07/2022	20:30:52	639	0.0	8.36	
02/07/2022	20:31:52	641	0.0	8.36	
02/07/2022	20:32:52	638	0.0	8.36	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/07/2022	20:34:52	623	0.0	8.36	
02/07/2022	20:35:52	597	0.0	8.35	
02/07/2022	20:36:52	577	0.0	8.36	
02/07/2022	20:37:52	557	0.0	8.36	
02/07/2022	20:38:52	545	0.0	8.35	
02/07/2022	20:40:52	521	0.0	8.35	
02/07/2022	20:41:52	513	0.0	8.36	
02/07/2022	20:42:52	505	0.0	8.35	
02/07/2022	20:43:52	497	0.0	8.35	
02/07/2022	20:44:42	496	0.0	8.35	REPAIR C-PUMP
02/07/2022	20:44:52	496	0.0	8.35	
02/07/2022	20:45:52	496	0.0	8.35	
02/07/2022	20:46:52	494	0.0	8.35	
02/07/2022	20:47:52	494	0.0	8.35	
02/07/2022	20:48:52	492	0.0	8.35	
02/07/2022	20:49:52	491	0.0	8.35	
02/07/2022	20:50:52	490	0.0	8.35	
02/07/2022	20:51:52	489	0.0	8.35	
02/07/2022	20:52:52	488	0.0	8.35	
02/07/2022	20:53:52	487	0.0	8.35	
02/07/2022	20:54:52	510	0.0	8.35	
02/07/2022	20:55:52	514	0.0	8.36	
02/07/2022	20:56:52	525	0.0	8.36	
02/07/2022	20:57:52	532	0.0	8.35	
02/07/2022	20:58:52	536	0.0	8.36	
02/07/2022	20:59:52	539	0.0	8.36	
02/07/2022	21:00:52	543	0.0	8.36	
02/07/2022	21:01:09	1062	2.3	11.90	Start Pumping Spacer
02/07/2022	21:01:17	1305	4.5	13.97	14 PPG MUDPUSH
02/07/2022	21:01:52	1388	4.5	14.05	
02/07/2022	21:02:52	1327	4.5	14.01	
02/07/2022	21:03:52	1065	3.3	13.94	
02/07/2022	21:04:52	1104	3.3	13.92	
02/07/2022	21:05:52	970	2.1	13.89	
02/07/2022	21:06:52	938	2.1	13.91	
02/07/2022	21:07:52	1077	3.3	13.92	
02/07/2022	21:08:52	1078	3.3	13.89	
02/07/2022	21:09:52	1066	3.3	13.89	
02/07/2022	21:10:52	895	2.1	13.85	
02/07/2022	21:11:52	895	2.1	13.85	
02/07/2022	21:12:52	870	2.1	13.84	
02/07/2022	21:13:52	901	2.1	13.85	
02/07/2022	21:14:52	826	2.1	13.90	
02/07/2022	21:15:52	1060	3.3	13.93	
02/07/2022	21:16:52	1000	3.3	13.95	
02/07/2022	21:17:52	818	2.1	13.96	
02/07/2022	21:18:52	806	2.1	13.97	
02/07/2022	21:19:52	793	2.1	13.98	
02/07/2022	21:20:52	924	3.1	14.02	
02/07/2022	21:21:52	961	3.3	14.02	
02/07/2022	21:22:52	792	2.1	14.00	
02/07/2022	21:23:52	788	2.1	14.01	
02/07/2022	21:24:52	795	2.1	13.99	
02/07/2022	21:25:52	751	2.1	13.98	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/07/2022	21:27:52	762	2.1	13.98	
02/07/2022	21:28:52	789	2.1	13.97	
02/07/2022	21:29:52	758	2.1	13.98	
02/07/2022	21:30:52	919	3.3	13.99	
02/07/2022	21:31:52	876	3.3	13.99	
02/07/2022	21:32:52	714	2.1	13.98	
02/07/2022	21:33:52	708	2.1	13.98	
02/07/2022	21:34:52	743	2.1	13.97	
02/07/2022	21:35:52	722	2.1	13.97	
02/07/2022	21:36:52	733	2.1	13.98	
02/07/2022	21:37:52	699	1.8	13.99	
02/07/2022	21:38:52	717	2.0	14.00	
02/07/2022	21:39:52	709	2.1	13.99	
02/07/2022	21:40:52	709	2.1	13.99	
02/07/2022	21:41:52	695	2.1	13.97	
02/07/2022	21:42:52	1241	6.4	14.00	
02/07/2022	21:43:36	1186	6.4	14.00	End Spacer
02/07/2022	21:43:52	517	2.9	14.00	
02/07/2022	21:43:53	510	1.9	14.00	114 BBLS
02/07/2022	21:44:52	337	0.0	14.01	
02/07/2022	21:45:52	344	0.0	13.88	
02/07/2022	21:47:52	348	0.0	13.87	
02/07/2022	21:48:52	346	0.0	13.87	
02/07/2022	21:49:52	345	0.0	13.87	
02/07/2022	21:50:22	345	0.0	13.87	Drop Bottom Plug
02/07/2022	21:50:52	344	0.0	13.87	
02/07/2022	21:51:52	323	0.0	14.04	
02/07/2022	21:52:52	324	0.1	14.05	
02/07/2022	21:53:52	322	0.1	14.06	
02/07/2022	21:54:52	321	0.1	14.07	
02/07/2022	21:55:52	395	0.1	14.09	
02/07/2022	21:56:52	157	0.0	14.10	
02/07/2022	21:57:52	160	0.0	13.86	
02/07/2022	21:58:52	179	0.0	13.87	
02/07/2022	21:59:52	174	0.0	13.85	
02/07/2022	22:00:19	174	0.0	13.80	Start Mixing Tail Slurry
02/07/2022	22:00:52	175	0.0	13.58	
02/07/2022	22:01:52	830	2.8	15.06	
02/07/2022	22:02:52	1637	6.3	15.08	
02/07/2022	22:03:52	1894	7.6	15.07	
02/07/2022	22:04:52	1914	8.1	15.06	
02/07/2022	22:05:52	1916	8.1	15.04	
02/07/2022	22:06:27	1956	8.1	14.99	15 PPG 1.29 YLD 6.0 H20
02/07/2022	22:06:52	1943	8.1	14.99	
02/07/2022	22:07:52	1950	8.1	15.01	
02/07/2022	22:08:52	1921	8.2	15.00	
02/07/2022	22:09:52	1921	8.2	15.01	
02/07/2022	22:10:52	1893	8.2	14.99	
02/07/2022	22:11:52	1839	8.2	14.99	
02/07/2022	22:12:52	1792	8.2	15.00	
02/07/2022	22:13:52	1802	8.2	14.98	
02/07/2022	22:14:52	1843	8.2	14.99	
02/07/2022	22:15:52	1766	8.2	14.98	
02/07/2022	22:16:52	1739	8.2	15.00	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/07/2022	22:18:52	1693	8.1	15.01	
02/07/2022	22:19:52	1477	7.6	15.01	
02/07/2022	22:20:52	1522	7.6	15.03	
02/07/2022	22:21:52	1512	7.6	15.03	
02/07/2022	22:22:52	1498	7.6	15.01	
02/07/2022	22:23:52	1471	7.6	14.99	
02/07/2022	22:24:52	1538	7.6	15.01	
02/07/2022	22:25:52	1578	7.6	15.00	
02/07/2022	22:26:52	1474	7.6	14.97	
02/07/2022	22:27:52	1500	7.6	15.11	
02/07/2022	22:28:52	1434	7.7	15.00	
02/07/2022	22:29:52	1524	7.6	14.98	
02/07/2022	22:30:52	1512	7.7	15.01	
02/07/2022	22:31:52	1105	6.4	14.95	
02/07/2022	22:32:52	1109	6.4	14.99	
02/07/2022	22:33:52	1220	6.4	15.01	
02/07/2022	22:34:52	1133	6.4	14.99	
02/07/2022	22:35:52	1119	6.4	15.00	
02/07/2022	22:36:52	1181	6.4	15.06	
02/07/2022	22:37:52	1259	6.3	15.05	
02/07/2022	22:38:52	1143	6.3	15.01	
02/07/2022	22:39:52	1411	6.6	15.03	
02/07/2022	22:40:52	1559	7.6	15.00	
02/07/2022	22:41:52	1554	7.6	14.99	
02/07/2022	22:42:52	1563	7.6	15.03	
02/07/2022	22:43:52	1514	7.6	15.01	
02/07/2022	22:44:52	1553	7.6	15.01	
02/07/2022	22:45:52	1538	7.6	14.96	
02/07/2022	22:46:52	1572	7.6	15.03	
02/07/2022	22:47:52	1606	7.6	15.08	
02/07/2022	22:48:52	1611	7.6	15.01	
02/07/2022	22:49:52	1546	7.6	15.01	
02/07/2022	22:50:52	1507	7.6	15.05	
02/07/2022	22:51:52	1644	7.6	15.01	
02/07/2022	22:52:52	1640	7.6	15.03	
02/07/2022	22:54:52	1222	6.3	15.03	
02/07/2022	22:55:52	1247	6.3	15.01	
02/07/2022	22:56:52	1260	6.3	14.99	
02/07/2022	22:57:52	1269	6.4	15.04	
02/07/2022	22:58:52	1597	7.6	15.03	
02/07/2022	22:59:52	1641	7.6	14.98	
02/07/2022	23:00:52	1539	7.7	14.97	
02/07/2022	23:01:52	1562	7.7	15.00	
02/07/2022	23:02:52	1635	7.6	15.04	
02/07/2022	23:03:52	1591	7.6	15.00	
02/07/2022	23:04:52	1588	7.6	14.96	
02/07/2022	23:05:52	1628	7.6	14.96	
02/07/2022	23:06:52	1542	7.6	15.00	
02/07/2022	23:07:52	1608	7.6	14.99	
02/07/2022	23:08:52	1551	7.6	14.99	
02/07/2022	23:09:52	1356	6.3	14.99	
02/07/2022	23:10:52	1312	6.3	14.99	
02/07/2022	23:11:52	1626	7.6	14.99	
02/07/2022	23:12:52	1664	7.6	15.00	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/07/2022	23:14:52	1683	7.6	15.01	
02/07/2022	23:15:52	1625	7.6	15.00	
02/07/2022	23:16:52	1721	7.6	14.99	
02/07/2022	23:17:52	1724	7.6	14.99	
02/07/2022	23:18:52	1589	7.6	15.00	
02/07/2022	23:19:52	1659	7.6	14.99	
02/07/2022	23:20:52	1258	6.4	14.97	
02/07/2022	23:21:52	1344	6.3	15.01	
02/07/2022	23:22:52	1370	6.3	14.99	
02/07/2022	23:23:52	1273	6.3	15.01	
02/07/2022	23:24:52	1289	6.3	15.02	
02/07/2022	23:25:52	1355	6.3	14.99	
02/07/2022	23:26:52	1304	6.3	15.09	
02/07/2022	23:27:52	1349	6.3	15.02	
02/07/2022	23:28:52	1332	6.3	15.00	
02/07/2022	23:29:52	1324	6.3	14.99	
02/07/2022	23:30:52	1309	6.3	15.00	
02/07/2022	23:31:52	1682	7.6	15.06	
02/07/2022	23:32:52	1684	7.6	15.04	
02/07/2022	23:33:52	1838	8.1	15.02	
02/07/2022	23:34:52	1876	8.2	15.05	
02/07/2022	23:35:52	1940	8.1	15.03	
02/07/2022	23:36:52	1843	8.2	15.04	
02/07/2022	23:37:52	1846	8.2	15.03	
02/07/2022	23:38:52	1853	8.2	15.02	
02/07/2022	23:39:52	1884	8.1	15.04	
02/07/2022	23:40:52	1841	8.2	15.03	
02/07/2022	23:41:52	1825	8.2	15.04	
02/07/2022	23:42:52	1851	8.2	15.02	
02/07/2022	23:43:52	1887	8.2	15.02	
02/07/2022	23:44:52	1804	8.1	15.03	
02/07/2022	23:45:52	1863	8.2	15.01	
02/07/2022	23:46:52	1835	8.2	15.01	
02/07/2022	23:47:52	1602	7.8	15.01	
02/07/2022	23:48:52	1614	7.6	15.01	
02/07/2022	23:49:52	1694	7.6	15.01	
02/07/2022	23:50:52	1682	7.6	14.98	
02/07/2022	23:51:52	1323	6.3	14.99	
02/07/2022	23:52:52	1328	6.3	15.00	
02/07/2022	23:53:52	1377	6.3	15.03	
02/07/2022	23:54:52	1323	6.3	15.01	
02/07/2022	23:55:52	1317	6.3	15.00	
02/07/2022	23:56:52	1683	7.6	14.99	
02/07/2022	23:57:52	1710	7.6	15.01	
02/07/2022	23:58:52	1759	7.6	15.01	
02/07/2022	23:59:52	1663	7.6	15.00	
02/08/2022	00:01:52	1681	7.6	15.00	
02/08/2022	00:02:52	1767	7.6	14.99	
02/08/2022	00:03:52	1794	8.2	15.00	
02/08/2022	00:04:52	1923	8.2	15.02	
02/08/2022	00:05:52	1802	8.1	15.01	
02/08/2022	00:06:52	1903	8.2	15.02	
02/08/2022	00:07:52	1880	8.2	15.00	
02/08/2022	00:08:52	1805	8.2	15.00	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/08/2022	00:10:52	1794	8.2	15.01	
02/08/2022	00:11:52	1899	8.2	14.99	
02/08/2022	00:12:52	1825	8.2	15.01	
02/08/2022	00:13:52	1319	6.3	14.99	
02/08/2022	00:14:52	1354	6.3	15.01	
02/08/2022	00:15:52	1358	6.3	15.07	
02/08/2022	00:16:52	1323	6.3	15.05	
02/08/2022	00:17:52	1292	6.3	15.04	
02/08/2022	00:18:52	251	3.9	14.99	
02/08/2022	00:19:18	86	0.0	14.99	End Tail Slurry
02/08/2022	00:19:25	83	0.0	14.99	1016 BBLS 4422 SKS
02/08/2022	00:19:52	78	0.0	14.99	
02/08/2022	00:20:52	74	0.0	14.99	
02/08/2022	00:21:52	73	0.0	14.99	
02/08/2022	00:22:52	73	0.0	15.00	
02/08/2022	00:23:52	108	2.2	9.62	
02/08/2022	00:23:59	111	2.2	9.68	WASH UP
02/08/2022	00:24:52	188	4.2	9.30	
02/08/2022	00:25:52	173	4.4	8.26	
02/08/2022	00:26:52	193	4.4	8.48	
02/08/2022	00:27:52	98	2.2	7.75	
02/08/2022	00:28:52	207	4.2	9.16	
02/08/2022	00:29:52	149	4.2	8.60	
02/08/2022	00:30:52	153	4.4	8.64	
02/08/2022	00:31:52	239	1.1	8.42	
02/08/2022	00:32:52	58	0.0	8.37	
02/08/2022	00:33:19	43	0.0	8.37	Drop Top Plug
02/08/2022	00:33:52	42	0.0	8.37	
02/08/2022	00:34:52	34	0.0	8.37	
02/08/2022	00:35:20	211	4.0	8.45	Start Displacement
02/08/2022	00:35:52	392	8.3	8.42	
02/08/2022	00:36:52	1691	8.2	8.41	
02/08/2022	00:37:52	1722	8.2	8.41	
02/08/2022	00:38:52	1919	8.1	8.38	
02/08/2022	00:39:52	2011	8.1	8.38	
02/08/2022	00:40:52	2085	8.1	8.38	
02/08/2022	00:41:52	2193	8.1	8.37	
02/08/2022	00:42:52	2271	8.1	8.37	
02/08/2022	00:43:52	2429	8.1	8.37	
02/08/2022	00:44:52	2527	8.1	8.37	
02/08/2022	00:45:52	2673	8.1	8.37	
02/08/2022	00:46:52	2756	8.1	8.37	
02/08/2022	00:47:52	2783	8.1	8.37	
02/08/2022	00:48:52	2965	8.1	8.37	
02/08/2022	00:49:52	3042	8.1	8.37	
02/08/2022	00:50:52	3083	8.1	8.37	
02/08/2022	00:51:52	3237	8.0	8.37	
02/08/2022	00:52:52	3209	8.1	8.37	
02/08/2022	00:53:52	3202	8.0	8.36	
02/08/2022	00:54:52	3179	8.0	8.36	
02/08/2022	00:55:52	3139	8.0	8.36	
02/08/2022	00:56:52	3203	8.0	8.36	
02/08/2022	00:57:52	3140	8.0	8.36	
02/08/2022	00:58:52	3098	8.0	8.36	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/08/2022	01:00:52	3080	8.1	8.36	
02/08/2022	01:01:52	3121	8.0	8.36	
02/08/2022	01:02:52	3068	8.1	8.36	
02/08/2022	01:03:52	3020	8.1	8.36	
02/08/2022	01:04:52	3076	8.0	8.36	
02/08/2022	01:05:52	3020	8.1	8.36	
02/08/2022	01:06:52	2982	8.1	8.36	
02/08/2022	01:08:52	2962	8.1	8.36	
02/08/2022	01:09:52	2931	8.1	8.36	
02/08/2022	01:10:52	2957	8.1	8.36	
02/08/2022	01:11:52	2929	8.1	8.36	
02/08/2022	01:12:52	2926	8.1	8.36	
02/08/2022	01:13:52	2925	8.1	8.36	
02/08/2022	01:14:52	2913	8.1	8.36	
02/08/2022	01:15:52	2847	8.1	8.36	
02/08/2022	01:16:52	2882	8.1	8.36	
02/08/2022	01:17:52	2863	8.1	8.36	
02/08/2022	01:18:52	2849	8.1	8.36	
02/08/2022	01:19:52	2862	8.1	8.36	
02/08/2022	01:20:52	2864	8.1	8.36	
02/08/2022	01:21:52	2843	8.1	8.36	
02/08/2022	01:22:52	2802	8.1	8.36	
02/08/2022	01:23:52	2828	8.1	8.36	
02/08/2022	01:24:52	2765	8.1	8.36	
02/08/2022	01:25:52	2778	8.1	8.36	
02/08/2022	01:26:52	2788	8.1	8.36	
02/08/2022	01:27:52	2800	8.1	8.36	
02/08/2022	01:28:52	2745	8.1	8.36	
02/08/2022	01:29:52	2727	8.1	8.36	
02/08/2022	01:30:52	2739	8.1	8.36	
02/08/2022	01:31:52	2728	8.1	8.36	
02/08/2022	01:32:52	2723	8.1	8.36	
02/08/2022	01:33:52	2685	8.1	8.36	
02/08/2022	01:34:52	2728	8.1	8.36	
02/08/2022	01:35:52	2713	8.1	8.36	
02/08/2022	01:36:52	1960	3.3	8.36	
02/08/2022	01:37:52	1913	3.3	8.36	
02/08/2022	01:38:52	2000	3.2	8.36	
02/08/2022	01:39:52	1972	3.3	8.36	
02/08/2022	01:40:52	1938	3.3	8.36	
02/08/2022	01:41:27	2588	3.2	8.36	Bump Top Plug
02/08/2022	01:41:28	2587	3.2	8.36	End Displacement
02/08/2022	01:41:52	2592	0.0	8.36	
02/08/2022	01:42:08	2520	0.0	8.36	503 BBLS
02/08/2022	01:42:52	2640	0.0	8.36	
02/08/2022	01:43:52	2597	0.0	8.26	
02/08/2022	01:44:52	2615	0.0	0.04	
02/08/2022	01:45:52	2637	0.0	0.03	
02/08/2022	01:46:52	2640	0.0	0.03	
02/08/2022	01:47:52	2462	0.0	0.03	
02/08/2022	01:48:45	35	0.0	0.03	FLOATS HELD 5 3/4 BBL BACK
02/08/2022	01:48:52	32	0.0	0.03	
02/08/2022	01:49:52	22	0.0	0.03	
02/08/2022	01:50:52	22	0.0	0.03	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Feb/07/2022	SWN PRODUCTION	EN82-03137

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/08/2022	01:52:52	19	0.0	0.03	
02/08/2022	01:53:17	67	2.5	7.24	WASH UP RIG
02/08/2022	01:53:52	78	3.4	8.37	
02/08/2022	01:54:52	78	3.5	8.37	
02/08/2022	01:55:52	23	0.3	7.83	
02/08/2022	01:56:52	304	8.3	8.34	
02/08/2022	01:57:52	303	8.4	8.37	
02/08/2022	01:58:52	23	0.0	8.36	
02/08/2022	01:59:52	14	0.0	8.36	
02/08/2022	02:00:52	13	0.0	8.36	
02/08/2022	02:01:52	20	0.0	8.33	
02/08/2022	02:02:52	19	0.0	8.37	
02/08/2022	02:03:52	19	0.0	8.27	
02/08/2022	02:04:52	58	3.1	8.36	
02/08/2022	02:05:52	148	0.0	8.39	
02/08/2022	02:06:52	262	0.0	8.37	
02/08/2022	02:07:52	305	9.6	8.40	
02/08/2022	02:08:52	254	8.5	8.10	
02/08/2022	02:09:52	284	8.2	8.40	
02/08/2022	02:10:52	290	7.8	8.38	
02/08/2022	02:11:52	298	8.4	8.37	
02/08/2022	02:12:52	285	8.4	8.37	
02/08/2022	02:13:52	284	8.4	8.36	
02/08/2022	02:15:29	283	8.4	8.36	0 BBL SPACER TO SURFACE
02/08/2022	02:15:52	292	8.4	8.36	
02/08/2022	02:16:52	43	0.0	8.36	
02/08/2022	02:17:52	39	0.0	8.36	
02/08/2022	02:18:52	51	0.0	8.36	
02/08/2022	02:19:52	38	0.0	8.36	
02/08/2022	02:20:52	52	0.4	8.37	
02/08/2022	02:21:52	484	6.4	8.35	
02/08/2022	02:22:52	18	0.0	8.36	
02/08/2022	02:23:52	17	0.0	7.90	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.9			8.5	1016.0	0.0	114.0	

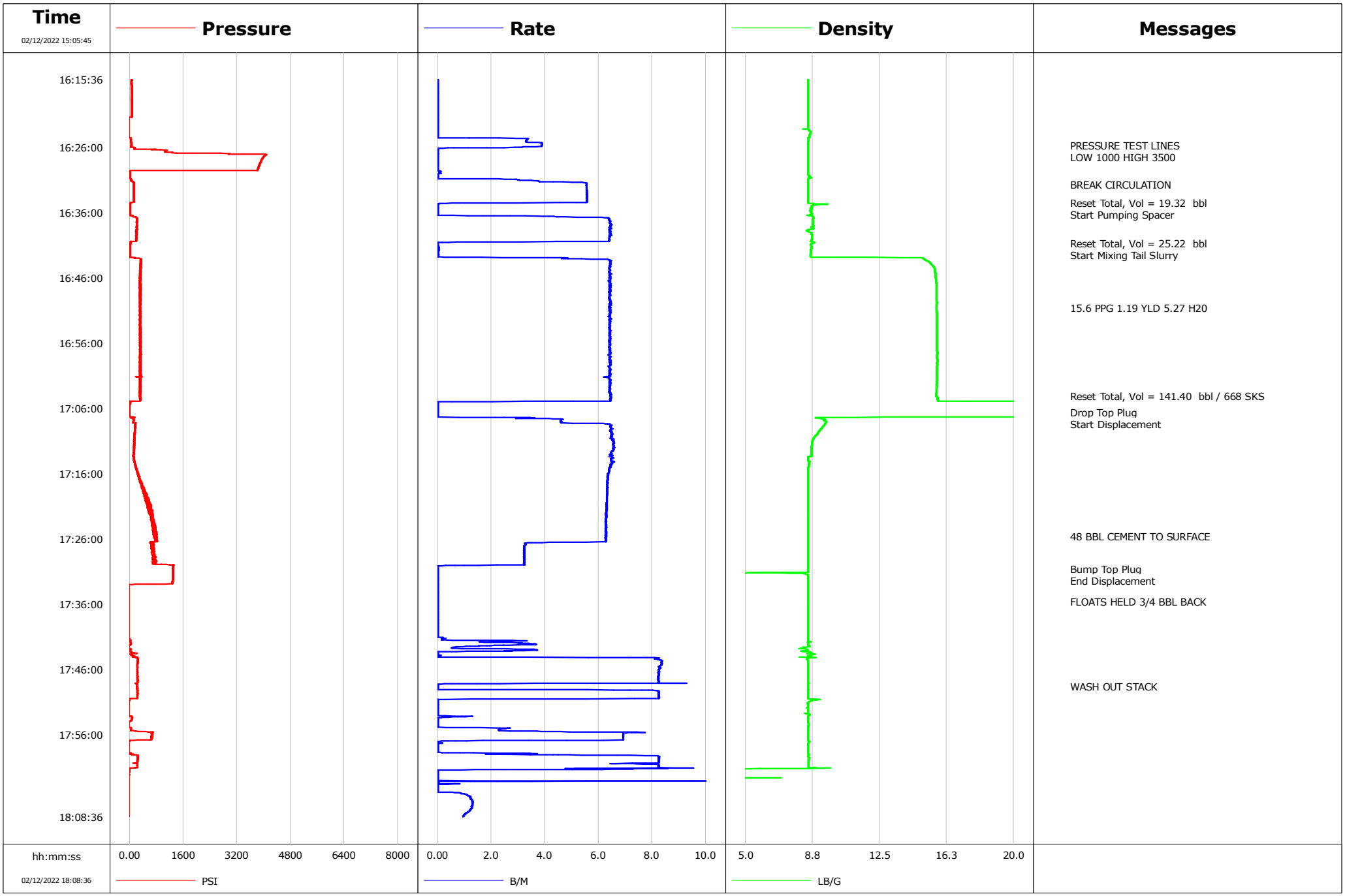
Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
7644	17	1403	2620			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	993.4 bbl	503.0 bbl	65 degF	Cement Circulated to Surface? ☐	Volume bbl
				Washed Thru Perfs ☐	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
DICKY HALL	ZACHARY BUCK	☐ -	☒ -

Schlumberger Cementing Job Report

Well	BETTY SCHAFER MSH 1H	**Client**	SWN PRODUCTION
Field	PANHANDLE	**SIR No.**	EN82-03225
Engineer	ZACHARY BUCK	**Job Type**	INTERMDIATE
Country	USA	**Job Date**	2/12/2022



Schlumberger

Cementing Service Report

Customer	Job Number
SWN PRODUCTION	EN82-03225

Well	Location (legal)	Schlumberger Location	Job Start
BETTY SCHAFER MSH 1H 1H	BETTY SCHAFER PAD	STRASBURG	Feb/12/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Dirty-Sandstone	0 deg	12.3 in	1734.0 ft	1734.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHALL	West Virginia	psi	80 degF	80 degF	lb/gal

Well Master	API/UWI
0066459918	47-051-02382-00-00

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	INTERMDIATE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

BREAK CIRCULATION
25 BBL GEL SPACER
138.2 BBL TAIL 15.6 PPG
1.19 YLD 5.27 H20 652 SKS
TOP PLUG
DISPL 129.6 BBL H20
48 BBL CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
1717.0	9.6	36.0	J55	8RD
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	129.6 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	132.8 bbl	24.2 bbl	75.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
800 psi		

No. Centralizers	Top Plugs	Bottom Plugs
24	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Feb/12/2022 13:00	Feb/12/2022 13:45	Feb/12/2022 19:05

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	1717.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	1676.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/12/2022	16:12:31	60	0.0	8.50	
02/12/2022	16:13:31	62	0.0	8.50	
02/12/2022	16:14:31	59	0.0	8.51	
02/12/2022	16:15:31	59	0.0	8.50	
02/12/2022	16:16:31	58	0.0	8.50	
02/12/2022	16:17:31	62	0.0	8.50	
02/12/2022	16:18:31	60	0.0	8.50	
02/12/2022	16:19:31	60	0.0	8.50	
02/12/2022	16:20:31	62	0.0	8.50	
02/12/2022	16:21:31	-21	0.0	8.51	
02/12/2022	16:23:31	-21	0.0	8.61	
02/12/2022	16:24:31	-17	0.0	8.56	
02/12/2022	16:25:31	56	3.9	8.50	
02/12/2022	16:25:41	56	3.9	8.50	PRESSURE TEST LINES
02/12/2022	16:25:44	56	3.9	8.50	LOW 1000 HIGH 3500
02/12/2022	16:26:31	1089	0.0	8.50	
02/12/2022	16:27:31	3984	0.0	8.50	
02/12/2022	16:28:31	3883	0.0	8.50	
02/12/2022	16:29:31	3810	0.0	8.50	
02/12/2022	16:30:31	2	0.0	8.55	
02/12/2022	16:31:31	120	5.5	8.50	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 1H 1H	PANHANDLE	Feb/12/2022	SWN PRODUCTION	EN82-03225

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/12/2022	16:32:31	125	5.6	8.50	
02/12/2022	16:33:31	126	5.6	8.50	
02/12/2022	16:34:31	19	2.1	8.50	
02/12/2022	16:34:32	22	1.4	8.50	Reset Total, Vol = 19.32 bbl
02/12/2022	16:35:31	15	0.0	8.73	
02/12/2022	16:35:36	9	0.0	8.67	Start Pumping Spacer
02/12/2022	16:36:31	92	2.7	8.73	
02/12/2022	16:37:31	224	6.4	8.79	
02/12/2022	16:38:31	219	6.4	8.80	
02/12/2022	16:39:31	195	6.5	8.71	
02/12/2022	16:40:31	39	1.2	8.79	
02/12/2022	16:40:46	20	0.0	8.69	Reset Total, Vol = 25.22 bbl
02/12/2022	16:41:31	10	0.0	8.68	
02/12/2022	16:41:36	10	0.0	8.67	Start Mixing Tail Slurry
02/12/2022	16:42:31	9	0.0	8.64	
02/12/2022	16:43:31	362	6.4	15.25	
02/12/2022	16:44:31	341	6.4	15.58	
02/12/2022	16:45:31	304	6.4	15.63	
02/12/2022	16:46:31	316	6.4	15.65	
02/12/2022	16:47:31	343	6.4	15.68	
02/12/2022	16:48:31	314	6.4	15.69	
02/12/2022	16:49:31	324	6.4	15.69	
02/12/2022	16:50:31	318	6.4	15.68	
02/12/2022	16:51:31	310	6.4	15.69	
02/12/2022	16:52:31	317	6.4	15.69	
02/12/2022	16:53:31	330	6.4	15.71	
02/12/2022	16:54:31	322	6.4	15.71	
02/12/2022	16:55:31	304	6.4	15.71	
02/12/2022	16:56:31	303	6.4	15.70	
02/12/2022	16:57:31	344	6.4	15.72	
02/12/2022	16:58:31	350	6.4	15.72	
02/12/2022	16:59:31	311	6.4	15.71	
02/12/2022	17:00:31	312	6.4	15.69	
02/12/2022	17:01:31	329	6.4	15.70	
02/12/2022	17:02:31	321	6.4	15.69	
02/12/2022	17:03:31	338	6.4	15.67	
02/12/2022	17:04:09	288	6.5	15.66	Reset Total, Vol = 141.40 bbl / 668 SKS
02/12/2022	17:04:31	318	6.5	15.73	
02/12/2022	17:05:31	-2	0.0	25.00	
02/12/2022	17:06:31	-10	0.0	22.71	
02/12/2022	17:06:36	-10	0.0	22.60	Drop Top Plug
02/12/2022	17:07:31	142	3.1	9.08	
02/12/2022	17:07:36	113	4.2	9.31	Start Displacement
02/12/2022	17:08:31	182	6.4	9.42	
02/12/2022	17:09:31	157	6.4	9.12	
02/12/2022	17:10:31	136	6.5	8.83	
02/12/2022	17:11:31	127	6.5	8.71	
02/12/2022	17:12:31	133	6.5	8.68	
02/12/2022	17:13:31	127	6.5	8.49	
02/12/2022	17:14:31	159	6.5	8.56	
02/12/2022	17:15:31	210	6.4	8.49	
02/12/2022	17:16:31	281	6.3	8.49	
02/12/2022	17:17:31	331	6.3	8.49	
02/12/2022	17:18:31	388	6.3	8.49	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 1H 1H	PANHANDLE	Feb/12/2022	SWN PRODUCTION	EN82-03225

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
02/12/2022	17:20:31	611	6.3	8.49	
02/12/2022	17:21:31	692	6.3	8.50	
02/12/2022	17:22:31	666	6.3	8.50	
02/12/2022	17:23:31	656	6.3	8.50	
02/12/2022	17:24:31	722	6.3	8.50	
02/12/2022	17:25:31	821	6.3	8.50	
02/12/2022	17:25:36	821	6.3	8.50	48 BBL CEMENT TO SURFACE
02/12/2022	17:26:31	750	5.2	8.50	
02/12/2022	17:27:31	695	3.2	8.50	
02/12/2022	17:28:31	678	3.2	8.50	
02/12/2022	17:30:31	1294	0.0	8.50	
02/12/2022	17:30:36	1293	0.0	8.50	Bump Top Plug
02/12/2022	17:31:31	1289	0.0	8.43	
02/12/2022	17:32:31	1282	0.0	8.50	
02/12/2022	17:33:31	-20	0.0	8.50	
02/12/2022	17:34:31	-25	0.0	8.50	
02/12/2022	17:35:31	-24	0.0	8.50	
02/12/2022	17:35:36	-24	0.0	8.50	FLOATS HELD 3/4 BBL BACK
02/12/2022	17:36:31	-25	0.0	8.50	
02/12/2022	17:37:31	-24	0.0	8.50	
02/12/2022	17:38:31	-22	0.0	8.50	
02/12/2022	17:39:31	-20	0.0	8.50	
02/12/2022	17:40:31	-19	0.0	8.50	
02/12/2022	17:41:31	-11	0.1	8.50	
02/12/2022	17:42:31	-15	1.1	8.61	
02/12/2022	17:43:31	159	0.0	8.66	
02/12/2022	17:44:31	244	8.2	8.45	
02/12/2022	17:45:31	233	8.3	8.50	
02/12/2022	17:46:31	235	8.2	8.50	
02/12/2022	17:47:31	247	8.2	8.50	
02/12/2022	17:48:31	235	0.0	8.50	
02/12/2022	17:48:36	212	0.0	8.50	WASH OUT STACK
02/12/2022	17:49:31	233	8.2	8.49	
02/12/2022	17:50:31	51	8.2	8.50	
02/12/2022	17:51:31	-18	0.0	8.50	
02/12/2022	17:52:31	-19	0.0	8.50	
02/12/2022	17:53:31	68	0.0	8.50	
02/12/2022	17:54:31	-24	0.0	8.52	
02/12/2022	17:55:31	200	3.7	8.50	
02/12/2022	17:57:31	-19	0.0	8.51	
02/12/2022	17:58:31	-19	0.0	8.50	
02/12/2022	17:59:31	238	8.2	8.54	
02/12/2022	18:00:31	234	7.7	8.52	
02/12/2022	18:01:31	-11	0.0	0.08	
02/12/2022	18:02:31	-17	0.0	0.07	
02/12/2022	18:03:31	-17	0.1	0.16	
02/12/2022	18:04:31	-18	0.0	0.17	
02/12/2022	18:05:31	-18	1.2	0.45	
02/12/2022	18:06:31	-18	1.3	0.70	
02/12/2022	18:07:31	-18	1.2	0.88	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 1H 1H	PANHANDLE	Feb/12/2022	SWN PRODUCTION	EN82-03225

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.4			8.5	141.5	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
4072	4	265	1300			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	138.2 bbl	129.6 bbl	65 degF	[X]	48.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
DICKY HALL	ZACHARY BUCK	[ ] -	[X] -

Remedial Cement Procedure

BETTY SCHAFER MSH 3

AFE# 1007787

API# 4705102417000

BETTY SCHAFER-MSH-PAD1 - pad / unit

Field - PANHANDLE AREA

MARSHALL CO, WV

Design Approval: _____

Prepared By: **Kevin Porsch**

Reviewed By: _____

Completion Contact Information

Contact	Position	Location	Office	Cell	Email
Nick Flesher	Completions Foreman	Morgantown		(304) 669-3777	Nick_Flesher@swn.com
Aaron Balderson	Completions Superintendent	Morgantown	(304) 884-1820	(713) 829-4683	Aaron_Balderson@SWN.COM
Quentin Dyson	Vice President Operations Services	Houston	(832) 796-6130	(501) 428-1654	Quentin_Dyson@swn.com
Matt Briggs	Completions Manager	Houston	(832) 796-7309	(501) 428-6630	Matt_Briggs@swn.com
Kevin Porsch	Sr. Staff Completions Engineer	Houston	(832) 796-2924	(832) 707-2099	Kevin_Porsch@swn.com
Andrea Bond	Staff Drilling and Completions Analyst	Houston	(832) 796-7428	(832) 302-6921	Andrea_Bond@swn.com

General Contact Information

Contact	Position	Location	Office	Cell	Email
Chris Flanagan	Area Manager	Morgantown	(304) 884-1626	(304) 203-4985	Chris_Flanagan@swn.com
Matt Boggs	HS&E Supervisor	Morgantown	(304) 884-1614	(501) 581-1692	Matt_Boggs@swn.com
Bill Vavrek	Water Team Superintendent	Morgantown	(304) 884-1693	(304) 641-6507	Bill_Vavrek@swn.com
Carla Suszkowski	Regulatory Manager	Houston	(832) 796-6372	(724) 561-8129	Carla_Suszkowski@swn.com
Liz Gee	Sr. Regulatory Analyst	Houston	(832) 796-7632	(281) 900-7484	Liz_Gee@swn.com

- All invoices, reports and miscellaneous paperwork should reflect the **BETTY SCHAFER MSH 3**, and AFE number **# 1007787**.

ADDRESS:

Southwestern Energy Office: Houston, TX
10000 Energy Dr
Spring, TX 77389

Southwestern Energy Field Office: Morgantown, WV
1300 Fort Pierpont Drive, Suite 201
Morgantown, WV 26508

General Information

Scope of Work

During hydraulic fracturing operations communication was observed between the frac (top perf 9,425' MD) and the casing annulus. A remedial cement job will be performed on the 5-1/2" x 9-5/8" casing annulus. Prior to frac, a cement bond log was run to the point of refusal to evaluate the production casing cement job and the top of cement was not found. Subsequently, a cement bond log was then tractored into the lateral and top of cement was found to be at 7,640' MD which was 4,911' below the calculated top of cement of 2,729' MD.

Pipe Dimensions

String	OD (in)	Wt (#/ft)	Grade	ID (in)	Drift (in)	Burst	80% Burst	Collapse	Capacity (bbls/ft)	Setting Depth (ft)
Conductor	20"	94	J-55	19.124	18.94	2110	1688	520		136
Surface	13-	54.5	J-55	12.615	12.4599	2730	2184	1130		376
Intermediate	9-	36	J-55	8.921	8.765	3520	2816	2020	0.077	1,720
Production	5-	20	P-110	4.778	4.653	14360	11488	13150	0.0222	22,712
Tubing	2-	6.5	P-110	2.441	2.347	14530	11624	14550	0.0058	6,465

Directions to Location

Latitude: 39.99102081, Longitude: -80.6355139 Contact Gary Smith for bonded road information.

Note: All depths are referenced to rig RKB of 26' above ground level (AGL). Ensure all rig or wireline operation depths are referenced to rig RKB of 26' AGL. Proper depth reference will be critical to ensuring plugs, perfs, etc are set at the proper depth.

Workover Rig Standards

- A minimum of two TIW valves are required on location. One must be in the basket at all times, and the other should be made up on a joint of tubing on the ground and easily accessible.
- All connections from the wellhead to the BOP stack should be flanged connections.
- BOP's should be mounted as close as practical to the wellhead and be operated by an independent accumulator system with an independent power supply.
- BHA diagram should be received, placed in field well file, and input into Wellview.
- All snubbing calculations must be performed and documented.
- If tubing collapse is a concern, fill pipe w/ fluid while running in the hole.
- The bleed off line should be anchored.
- Top profile nipple and tubing depth info can be found in the well design info at the beginning of this procedure. The bottom nipple should be set one joint above EOT.

Remedial Cement Job

1) Prior to frac rig down, RIH and set bridge plug with wireline at 5,790'. Ensure plug is not set across a collar.
2) Perform positive/negative pressure test to +5000/-0 psi.
3) Make up wireline perforating gun string consisting of two guns with 6 shots 0.50" or greater.
4) RIH, tag bridge plug, pick up 1' and perforate casing at ~5,785' MD. Watch CCL and ensure perforations are not across collar (Nearest collar should be at 4,867').
5) Ensure proper valve alignment and attempt to establish circulation through perfs and out of the 5-1/2"x 9-5/8" casing valve to the gas buster. 2-3 bbl max rate. Note: if unable to establish circulation try

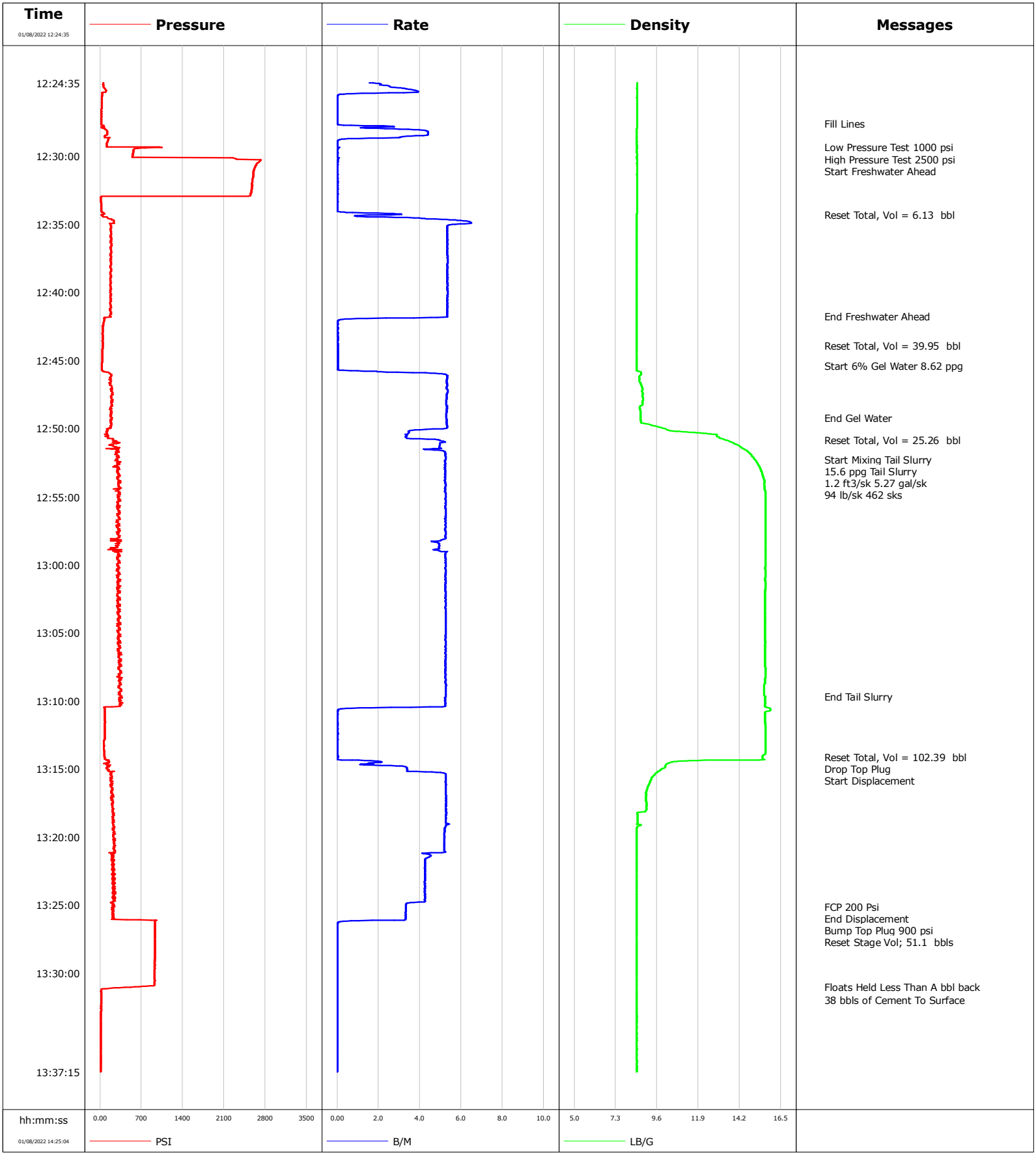
pumping down the 9-5/8" casing valve and up through production casing to the gas buster through the flowback line.

6) Make up Halliburton FasDrill cement retainer and RIH. Set retainer 25' above top perforation (~5,760').
7) Perform positive/negative pressure test to +5000/-0 psi.
8) POOH, close well and lay down lubricator and WL equipment.
9) MIRU Service unit, pumps/swivel, and BOP reverse unit and pipe racks. RU reverse unit lines, function test and pressure test BOP to (low 250 psi, high 90% of BOP working pressure) for 15 minutes and chart the test. Perform accumulator drawdown test.
10) Conduct BOP drill at the start of operations.
11) Pick up cementing workstring with stinger and RIH to top of retainer
12) Performing circulating squeeze as follows:
    a. Sting in to retainer and re-establish circulation.
    b. Circulate 50 bbls down tubing and out 5-1/2 x 9-5/8" casing valve
    c. Mix and pump 25 bbl 14 ppg spacer at 3 BPM
    d. Mix and pump 230 bbl 15 ppg cement at 3 BPM (est. new TOC to be 1,220')
    e. Pump xx bbl fresh water displacement to the retainer at 3 BPM (stop displacement ½ to 1 bbl short of retainer)
    f. Sting out of retainer
    g. Test retainer and check that it is holding by pressuring up production casing to 1,000 psi
    h. Reverse circulate 1 wellbore volume or until fluids clean up.
    i. POOH and wait on Cement
13) Wait on cement for 8 hours
14) Rig up wireline and PCE and pressure test lubricator to 5000 psi
15) Run CBL from top of retainer to surface. Perform 0 psi pass logging down and apply 2000 psi for pressure pass logging up.
16) Pick up drillout BHA.
17) RIH and drillout cement retainer and tag bridge plug at 5,790'
18) Close annular and test production casing to 17 PPG equivalent mud weight (2,550 psi at surface with fresh water in hole). Monitor backside and discontinue test if any pressure is observed.
19) Follow standard drillout procedure to drillout the frac plugs to TD.

Schlumberger

Cementing Job Report

Well	Betty Schafer MSH 405H	**Client**	SWN Production Company
Field	Panhandle	**SIR No.**	EN82-02512
Engineer	Marco Arrington	**Job Type**	Cem Surface Casing
Country	US	**Job Date**	01-08-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN Production Company	EN82-02512

Well	Location (legal)	Schlumberger Location	Job Start
Betty Schafer MSH 405H 405H	Betty Schafer Pad		Jan/08/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Panhandle		deg	17.5 in	394.0 ft	394.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	West Virginia	psi	degF	degF	lb/gal

Well Master	API/UWI
00664556837	47-051-02383-00-00

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Cem Surface Casing

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	

Service Instructions

Provide equipment, materials and services to cement 13 3/8" Surface casing in a 17 1/2" OH 100% excess
Bring CemNET* as Contingency
Bring 300 sacks Top out with S001

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
136.0	20.0	94.0	H-40	BUTT
375.1	13.4	54.5	J-55	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
	51.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	58.0 bbl	54.2 bbl	29.6 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
200 psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Jan/08/2022 06:00	Jan/08/2022 06:00	Jan/08/2022 14:30

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	375.1 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	329.4 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
01/08/2022	12:24:35	59	1.4	8.48	Started Acquisition
01/08/2022	12:26:40	25	0.0	8.48	
01/08/2022	12:27:35	23	0.0	8.48	Fill Lines
01/08/2022	12:28:45	138	0.2	8.48	
01/08/2022	12:29:19	1004	0.1	8.48	Low Pressure Test 1000 psi
01/08/2022	12:30:12	2313	0.0	8.48	High Pressure Test 2500 psi
01/08/2022	12:30:30	2668	0.0	8.48	Start Freshwater Ahead
01/08/2022	12:30:50	2618	0.0	8.48	
01/08/2022	12:32:55	2515	0.0	8.48	
01/08/2022	12:34:17	26	3.0	8.48	Reset Total, Vol = 6.13 bbl
01/08/2022	12:35:00	178	5.6	8.48	
01/08/2022	12:37:05	188	5.3	8.47	
01/08/2022	12:39:10	178	5.3	8.47	
01/08/2022	12:41:15	179	5.3	8.47	
01/08/2022	12:41:45	177	5.3	8.47	End Freshwater Ahead
01/08/2022	12:43:20	45	0.0	8.47	
01/08/2022	12:43:53	43	0.0	8.48	Reset Total, Vol = 39.95 bbl
01/08/2022	12:45:22	29	0.0	8.47	Start 6% Gel Water 8.62 ppg
01/08/2022	12:45:25	30	0.0	8.47	
01/08/2022	12:47:30	215	5.3	8.80	
01/08/2022	12:49:14	206	5.3	8.68	End Gel Water

Well	Field	Job Start	Customer	Job Number
Betty Schafer MSH 405H 405H	Panhandle	Jan/08/2022	SWN Production Company	EN82-02512

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
01/08/2022	12:50:51	225	5.0	13.50	Reset Total, Vol = 25.26 bbl
01/08/2022	12:51:40	295	5.2	14.64	
01/08/2022	12:52:15	290	5.2	15.03	Start Mixing Tail Slurry
01/08/2022	12:52:25	310	5.2	15.12	15.6 ppg Tail Slurry
01/08/2022	12:53:00	330	5.2	15.36	1.2 ft3/sk 5.27 gal/sk
01/08/2022	12:53:15	308	5.2	15.44	94 lb/sk 462 sks
01/08/2022	12:53:45	308	5.2	15.56	
01/08/2022	12:55:50	312	5.2	15.64	
01/08/2022	12:57:55	317	5.2	15.65	
01/08/2022	13:00:00	304	5.2	15.63	
01/08/2022	13:02:05	319	5.2	15.61	
01/08/2022	13:04:10	323	5.2	15.61	
01/08/2022	13:06:15	315	5.2	15.62	
01/08/2022	13:08:20	358	5.2	15.63	
01/08/2022	13:09:41	359	5.2	15.63	End Tail Slurry
01/08/2022	13:10:25	346	5.2	15.62	
01/08/2022	13:12:30	79	0.0	15.63	
01/08/2022	13:14:08	81	0.0	15.48	Reset Total, Vol = 102.39 bbl
01/08/2022	13:14:15	79	0.0	15.48	Start Displacement
01/08/2022	13:14:35	89	1.7	10.24	
01/08/2022	13:16:40	190	5.2	9.00	
01/08/2022	13:18:45	229	5.3	8.52	
01/08/2022	13:20:50	227	5.2	8.47	
01/08/2022	13:22:55	220	4.2	8.47	
01/08/2022	13:25:00	228	3.3	8.47	
01/08/2022	13:25:06	225	3.3	8.47	FCP 200 Psi
01/08/2022	13:25:16	219	3.3	8.47	End Displacement
01/08/2022	13:25:40	206	3.3	8.47	Bump Top Plug 900 psi
01/08/2022	13:25:59	247	3.3	8.48	Reset Stage Vol; 51.1 bbls
01/08/2022	13:27:05	931	0.0	8.48	
01/08/2022	13:29:10	926	0.0	8.48	
01/08/2022	13:31:00	661	0.0	8.48	Floats Held Less Than A bbl back
01/08/2022	13:31:15	19	0.0	8.48	
01/08/2022	13:32:00	18	0.0	8.48	38 bbls of Cement To Surface
01/08/2022	13:33:20	15	0.0	8.48	
01/08/2022	13:35:25	13	0.0	8.48	
01/08/2022	13:37:30	12	0.0	8.48	
01/08/2022	13:39:35	9	0.0	8.48	
01/08/2022	13:41:40	12	0.0	8.48	
01/08/2022	13:43:45	105	4.3	8.36	
01/08/2022	13:45:50	101	4.4	8.57	
01/08/2022	13:47:55	29	1.2	8.26	
01/08/2022	13:50:00	211	6.9	8.48	
01/08/2022	13:52:05	261	8.3	8.48	
01/08/2022	13:54:10	269	8.3	8.48	
01/08/2022	13:56:15	262	8.3	8.48	
01/08/2022	13:58:20	247	8.3	8.48	
01/08/2022	14:00:25	249	8.3	8.48	
01/08/2022	14:02:30	27	0.0	0.36	
01/08/2022	14:04:35	21	0.0	0.07	
01/08/2022	14:06:40	21	0.0	0.06	
01/08/2022	14:08:45	11	0.0	0.06	
01/08/2022	14:10:50	11	0.0	0.06	
01/08/2022	14:12:55	15	0.0	0.06	

Well	Field	Job Start	Customer	Job Number
Betty Schafer MSH 405H 405H	Panhandle	Jan/08/2022	SWN Production Company	EN82-02512

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
01/08/2022	14:17:05	18	0.0	0.06	
01/08/2022	14:19:10	20	0.0	0.06	
01/08/2022	14:21:15	20	0.0	0.06	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
				102.0		25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
	0		900		FreshWater	51.0 bbl	8.34 lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	99.0 bbl	51.0 bbl	56 degF	Cement Circulated to Surface? [X]	Volume 38.0 bbl
				Washed Thru Perfs [ ]	To ft

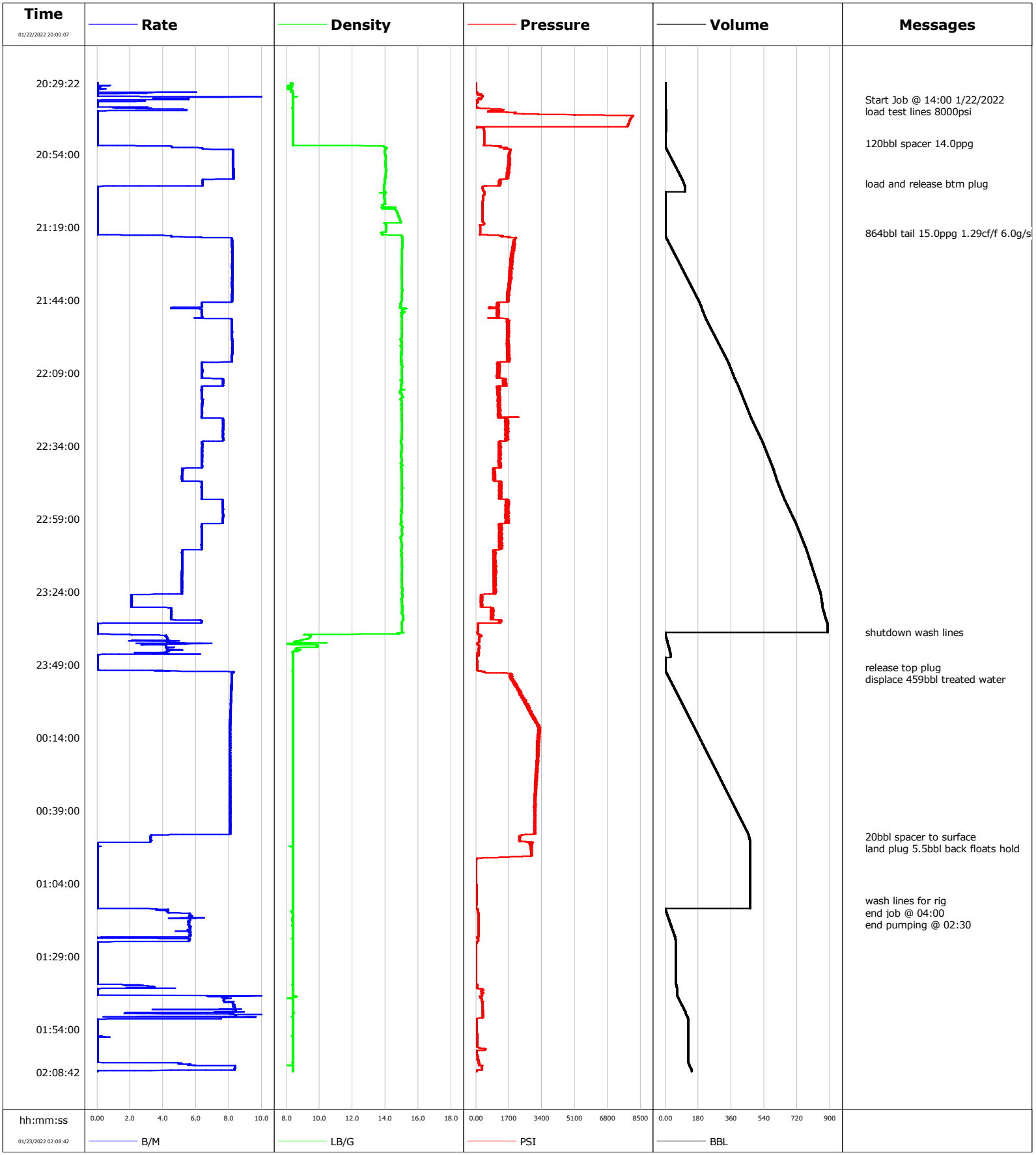
Customer or Authorized Representative	Schlumberger Supervisor		
	Marco Arrington	Circulation Lost [ ]	Job Completed [X]
		-	-

Schlumberger

Cementing Job Report

CemCAT v1.8

Well	Betty Schafer 405H	**Client**	Southwestern
Field	Panhandle	**SIR No.**	EN82-02744
Engineer	Danny Cover	**Job Type**	production
Country	United States	**Job Date**	01-22-2022



Cementing

PRD Post Job Plot

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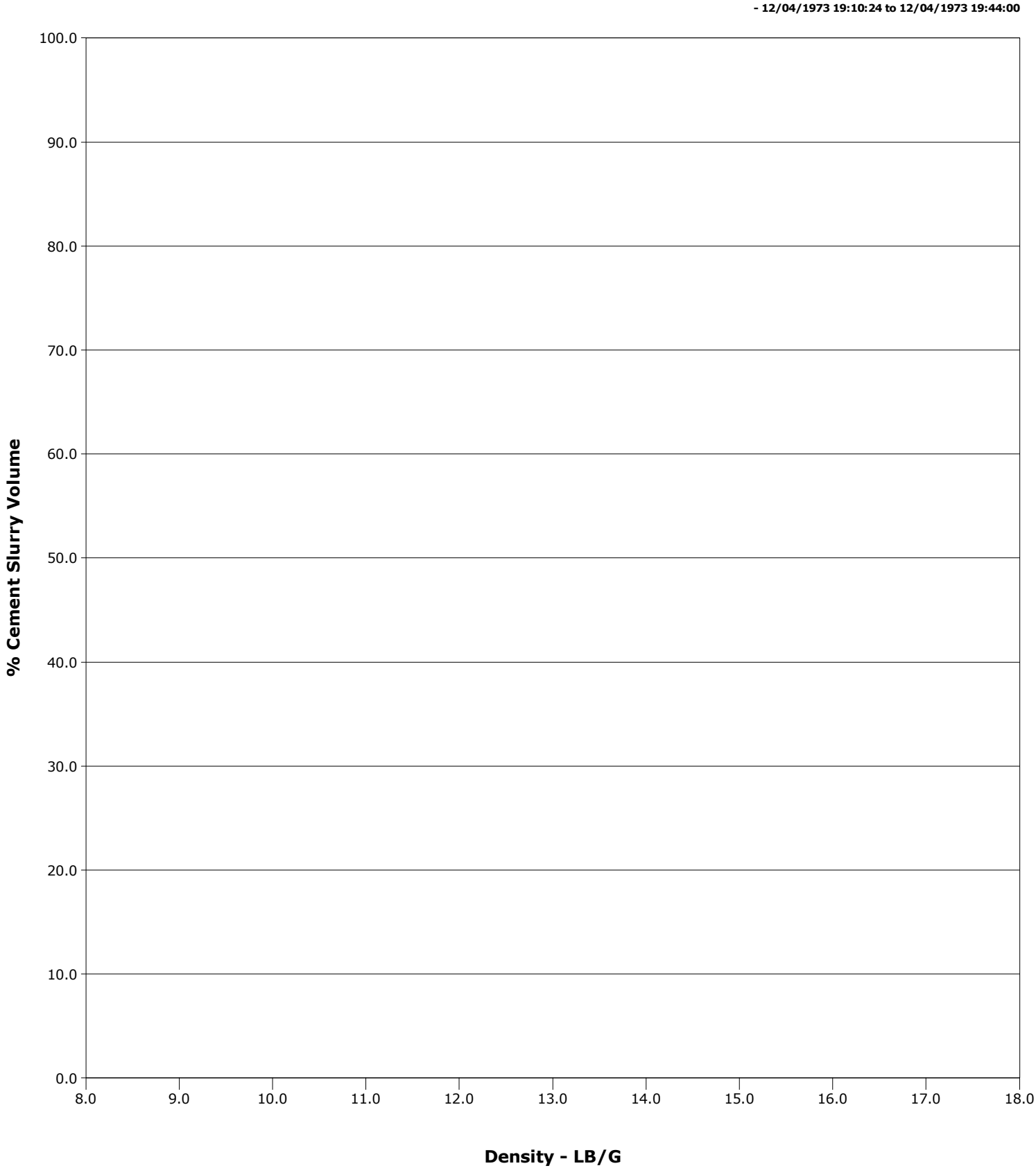
Cementing Qa/Qc Density Report

Well	Betty Schafer 405H	**Client**	Southwestern
Field	Panhandle	**SIR No.**	EN82-02744
Engineer	Danny Cover	**Job Type**	production
Country	United States	**Job Date**	01-22-2022



Schlumberger Cementing Service Report

Customer	Job Number
Southwestern	EN82-02744

Well	Location (legal)	Schlumberger Location	Job Start
Betty Schafer 405H 405H	47-051-02383-00-00	Weston	Jan/22/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Panhandle		deg	8.5 in	20761.0 ft	5982.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	West Virginia	psi	125 degF	125 degF	lb/gal
Well Master 0066456837	**API/UWI** 47-051-02383-00-00				

Rig Name	Drilled For	Service Via
sdc 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	production

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

load test lines 8000psi
120 bbl spacer 14.0ppg
bottom plug
846 bbl tail 15.0ppg 1.29cf/f 6.0g/sk
top plug
displace 459bbl treated water
land plug 20bbl spacer to surface
5.5bbl back floats hold

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
1810.0	9.6	36.0	110	BUTT
20761.0	5.5	20.0	110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	459.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	460.0 bbl	87.0 bbl	780.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Lift Pressure	Pipe Rotated	Pipe Reciprocated	No. Centralizers	Top Plugs	Bottom Plugs	Cement Head Type
X	X	psi	X			1	1	Single

Job Scheduled For	Arrived on Location	Leave Location
Jan/22/2022 14:00	Jan/22/2022 14:00	Jan/22/2022 05:00

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	20761.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	20710.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	20:00:07	0	0.0	0.02	0.0	
01/22/2022	20:00:37	0	0.0	0.02	0.0	
01/22/2022	20:01:07	1	0.0	0.02	0.0	
01/22/2022	20:01:37	0	0.0	0.02	0.0	
01/22/2022	20:02:07	0	0.0	0.02	0.0	
01/22/2022	20:02:37	0	0.0	0.02	0.0	
01/22/2022	20:03:07	0	0.0	0.02	0.0	
01/22/2022	20:03:37	0	0.0	0.02	0.0	
01/22/2022	20:04:07	0	0.0	0.02	0.0	
01/22/2022	20:04:37	0	0.0	0.02	0.0	
01/22/2022	20:05:07	0	0.0	0.02	0.0	
01/22/2022	20:05:37	0	0.0	0.02	0.0	
01/22/2022	20:06:07	1	0.0	0.02	0.0	
01/22/2022	20:06:37	0	0.0	0.02	0.0	
01/22/2022	20:07:07	1	0.0	0.02	0.0	
01/22/2022	20:07:37	0	0.0	0.02	0.0	
01/22/2022	20:08:07	0	0.0	0.02	0.0	
01/22/2022	20:08:37	0	0.0	0.02	0.0	
01/22/2022	20:09:07	0	0.0	0.02	0.0	
01/22/2022	20:09:37	0	0.0	0.02	0.0	
01/22/2022	20:10:07	0	0.0	0.02	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	20:11:07	0	0.0	0.02	0.0	
01/22/2022	20:11:37	0	0.0	0.02	0.0	
01/22/2022	20:12:07	0	0.0	0.02	0.0	
01/22/2022	20:12:37	0	0.0	0.02	0.0	
01/22/2022	20:13:07	0	0.0	0.02	0.0	
01/22/2022	20:13:37	0	0.0	0.02	0.0	
01/22/2022	20:14:37	0	0.0	0.02	0.0	
01/22/2022	20:15:07	1	0.0	0.02	0.0	
01/22/2022	20:15:37	0	0.0	0.02	0.0	
01/22/2022	20:16:07	0	0.0	0.02	0.0	
01/22/2022	20:16:37	0	0.0	0.02	0.0	
01/22/2022	20:17:07	0	0.0	0.02	0.0	
01/22/2022	20:17:37	1	0.0	0.02	0.0	
01/22/2022	20:18:07	0	0.0	0.02	0.0	
01/22/2022	20:18:37	0	0.0	0.02	0.0	
01/22/2022	20:19:07	0	0.0	0.02	0.0	
01/22/2022	20:19:37	0	0.0	0.02	0.0	
01/22/2022	20:20:07	0	0.0	0.02	0.0	
01/22/2022	20:20:37	0	0.0	0.02	0.0	
01/22/2022	20:21:07	0	0.0	0.02	0.0	
01/22/2022	20:21:37	0	0.0	0.02	0.0	
01/22/2022	20:22:07	0	0.0	0.02	0.0	
01/22/2022	20:22:37	0	0.0	0.02	0.0	
01/22/2022	20:23:07	1	0.0	0.02	0.0	
01/22/2022	20:23:37	0	0.0	0.02	0.0	
01/22/2022	20:24:07	0	0.0	0.02	0.0	
01/22/2022	20:24:37	0	0.0	0.02	0.0	
01/22/2022	20:25:07	1	0.0	0.02	0.0	
01/22/2022	20:25:37	0	0.0	0.02	0.0	
01/22/2022	20:26:07	1	0.0	0.02	0.0	
01/22/2022	20:26:37	0	0.0	0.02	0.0	
01/22/2022	20:27:07	0	0.0	0.02	0.0	
01/22/2022	20:27:37	-0	0.0	0.02	0.0	
01/22/2022	20:28:07	-1	0.3	8.22	0.0	
01/22/2022	20:28:37	0	0.0	0.48	0.0	
01/22/2022	20:29:07	-1	0.0	8.32	0.0	
01/22/2022	20:29:37	-1	0.0	8.34	0.0	
01/22/2022	20:30:07	0	0.0	8.30	0.0	
01/22/2022	20:30:37	0	0.0	8.32	0.0	
01/22/2022	20:31:07	0	0.0	8.31	0.0	
01/22/2022	20:31:37	-1	0.2	8.20	0.0	
01/22/2022	20:32:07	-1	0.0	8.34	0.0	
01/22/2022	20:32:37	-0	0.0	8.31	0.0	
01/22/2022	20:33:07	6	1.3	8.37	0.0	
01/22/2022	20:33:37	162	0.0	8.37	0.0	
01/22/2022	20:34:07	324	2.5	8.37	0.0	
01/22/2022	20:34:37	153	5.6	8.37	0.0	
01/22/2022	20:35:00	253	5.5	8.37	0.0	Start Job @ 14:00 1/22/2022
01/22/2022	20:35:07	253	5.5	8.37	0.0	
01/22/2022	20:35:37	22	0.0	8.37	0.0	
01/22/2022	20:36:07	77	0.0	8.37	0.0	
01/22/2022	20:36:37	10	0.0	8.37	0.0	
01/22/2022	20:37:00	21	0.0	8.37	0.0	load test lines 8000psi
01/22/2022	20:37:07	21	0.0	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	20:38:07	166	2.9	8.36	0.0	
01/22/2022	20:38:37	1417	5.4	8.37	0.0	
01/22/2022	20:39:07	665	0.0	8.37	0.0	
01/22/2022	20:39:37	2021	0.0	8.37	0.0	
01/22/2022	20:40:07	2443	0.0	8.37	0.0	
01/22/2022	20:40:37	8116	0.0	8.37	0.0	
01/22/2022	20:41:07	8037	0.0	8.37	0.0	
01/22/2022	20:41:37	7986	0.0	8.37	0.0	
01/22/2022	20:42:07	7943	0.0	8.37	0.0	
01/22/2022	20:42:37	7913	0.0	8.37	0.0	
01/22/2022	20:43:07	7883	0.0	8.37	0.0	
01/22/2022	20:43:37	7857	0.0	8.37	0.0	
01/22/2022	20:44:07	7828	0.0	8.37	0.0	
01/22/2022	20:44:37	31	0.0	8.37	0.0	
01/22/2022	20:45:07	396	0.0	8.37	0.0	
01/22/2022	20:45:37	392	0.0	8.37	0.0	
01/22/2022	20:46:07	415	0.0	8.37	0.0	
01/22/2022	20:46:37	415	0.0	8.37	0.0	
01/22/2022	20:47:07	416	0.0	8.36	0.0	
01/22/2022	20:48:07	418	0.0	8.36	0.0	
01/22/2022	20:48:37	416	0.0	8.36	0.0	
01/22/2022	20:49:07	415	0.0	8.36	0.0	
01/22/2022	20:49:37	417	0.0	8.36	0.0	
01/22/2022	20:50:00	416	0.0	8.36	0.0	120bbl spacer 14.0ppg
01/22/2022	20:50:07	415	0.0	8.36	0.0	
01/22/2022	20:50:37	415	0.0	8.36	0.0	
01/22/2022	20:51:07	1135	4.0	13.82	0.0	
01/22/2022	20:51:37	1506	4.6	14.03	0.0	
01/22/2022	20:52:07	1527	6.4	13.99	0.0	
01/22/2022	20:52:37	1798	8.2	13.98	0.0	
01/22/2022	20:53:07	1745	8.2	13.96	0.0	
01/22/2022	20:53:37	1742	8.2	13.96	0.0	
01/22/2022	20:54:07	1713	8.2	13.98	0.0	
01/22/2022	20:54:37	1687	8.2	14.00	0.0	
01/22/2022	20:55:07	1705	8.2	14.02	0.0	
01/22/2022	20:55:37	1693	8.2	14.02	0.0	
01/22/2022	20:56:07	1751	8.2	13.99	0.0	
01/22/2022	20:56:37	1667	8.2	13.98	0.0	
01/22/2022	20:57:07	1687	8.3	14.00	0.0	
01/22/2022	20:57:37	1669	8.2	14.02	0.0	
01/22/2022	20:58:07	1681	8.2	14.01	0.0	
01/22/2022	20:58:37	1686	8.2	14.00	0.0	
01/22/2022	20:59:07	1627	8.3	14.04	0.0	
01/22/2022	20:59:37	1647	8.3	14.04	0.0	
01/22/2022	21:00:07	1671	8.3	14.02	0.0	
01/22/2022	21:00:37	1610	8.3	14.02	0.0	
01/22/2022	21:01:07	1681	8.3	14.00	0.0	
01/22/2022	21:01:37	1585	8.3	13.99	0.0	
01/22/2022	21:02:07	1574	8.3	14.00	0.0	
01/22/2022	21:02:37	1240	6.4	13.96	0.0	
01/22/2022	21:03:07	1271	6.4	13.96	0.0	
01/22/2022	21:03:37	1235	6.4	13.96	0.0	
01/22/2022	21:04:00	1172	6.4	13.96	0.0	load and release btm plug
01/22/2022	21:04:07	1247	6.4	13.95	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	21:05:07	338	0.0	13.93	0.0	
01/22/2022	21:05:37	353	0.0	13.93	0.0	
01/22/2022	21:06:07	356	0.0	13.93	0.0	
01/22/2022	21:06:37	402	0.0	13.95	0.0	
01/22/2022	21:07:37	435	0.0	13.94	0.0	
01/22/2022	21:08:07	370	0.0	13.94	0.0	
01/22/2022	21:08:37	375	0.0	13.94	0.0	
01/22/2022	21:09:07	375	0.0	13.94	0.0	
01/22/2022	21:09:37	375	0.0	13.95	0.0	
01/22/2022	21:10:07	353	0.0	13.95	0.0	
01/22/2022	21:10:37	353	0.0	13.97	0.0	
01/22/2022	21:11:07	352	0.0	13.97	0.0	
01/22/2022	21:11:37	352	0.0	13.83	0.0	
01/22/2022	21:12:07	352	0.0	14.58	0.0	
01/22/2022	21:12:37	352	0.0	13.85	0.0	
01/22/2022	21:13:07	351	0.0	14.63	0.0	
01/22/2022	21:13:37	351	0.0	14.68	0.0	
01/22/2022	21:14:07	351	0.0	14.72	0.0	
01/22/2022	21:14:37	350	0.0	14.76	0.0	
01/22/2022	21:15:07	350	0.0	14.79	0.0	
01/22/2022	21:15:37	349	0.0	14.82	0.0	
01/22/2022	21:16:07	349	0.0	14.86	0.0	
01/22/2022	21:16:37	349	0.0	14.88	0.0	
01/22/2022	21:17:07	348	0.0	14.91	0.0	
01/22/2022	21:17:37	428	0.0	13.96	0.0	
01/22/2022	21:18:07	361	0.0	14.03	0.0	
01/22/2022	21:18:37	210	0.0	14.03	0.0	
01/22/2022	21:19:07	212	0.0	14.05	0.0	
01/22/2022	21:19:37	212	0.0	14.04	0.0	
01/22/2022	21:20:07	205	0.0	14.04	0.0	
01/22/2022	21:20:37	207	0.0	14.02	0.0	
01/22/2022	21:21:00	207	0.0	13.76	0.0	864bbl tail 15.0ppg 1.29cf/f 6.0g/sk cement
01/22/2022	21:21:07	206	0.0	13.79	0.0	
01/22/2022	21:21:37	617	1.4	14.08	0.0	
01/22/2022	21:22:07	1269	4.5	15.00	0.0	
01/22/2022	21:22:37	2041	8.1	15.00	0.0	
01/22/2022	21:23:07	1996	8.2	15.02	0.0	
01/22/2022	21:23:37	1945	8.2	15.02	0.0	
01/22/2022	21:24:07	1945	8.2	15.02	0.0	
01/22/2022	21:24:37	1979	8.2	15.02	0.0	
01/22/2022	21:25:07	1932	8.2	15.03	0.0	
01/22/2022	21:25:37	2007	8.2	15.03	0.0	
01/22/2022	21:26:07	1880	8.2	15.02	0.0	
01/22/2022	21:26:37	1941	8.2	15.00	0.0	
01/22/2022	21:27:07	1880	8.2	15.01	0.0	
01/22/2022	21:27:37	1831	8.2	15.00	0.0	
01/22/2022	21:28:07	1837	8.2	15.00	0.0	
01/22/2022	21:28:37	1813	8.2	15.01	0.0	
01/22/2022	21:29:07	1822	8.2	15.00	0.0	
01/22/2022	21:29:37	1884	8.2	14.99	0.0	
01/22/2022	21:30:07	1801	8.2	14.99	0.0	
01/22/2022	21:30:37	1865	8.2	15.00	0.0	
01/22/2022	21:31:07	1801	8.2	15.00	0.0	
01/22/2022	21:31:37	1781	8.2	15.00	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	21:32:37	1803	8.2	14.98	0.0	
01/22/2022	21:33:07	1765	8.2	14.98	0.0	
01/22/2022	21:33:37	1744	8.2	14.97	0.0	
01/22/2022	21:34:07	1833	8.2	14.98	0.0	
01/22/2022	21:34:37	1768	8.2	14.98	0.0	
01/22/2022	21:35:07	1757	8.2	14.98	0.0	
01/22/2022	21:35:37	1772	8.2	14.99	0.0	
01/22/2022	21:36:07	1716	8.2	14.98	0.0	
01/22/2022	21:36:37	1695	8.2	14.99	0.0	
01/22/2022	21:37:07	1740	8.2	14.99	0.0	
01/22/2022	21:37:37	1718	8.2	15.00	0.0	
01/22/2022	21:38:07	1736	8.2	14.99	0.0	
01/22/2022	21:38:37	1714	8.2	15.00	0.0	
01/22/2022	21:39:07	1774	8.2	14.99	0.0	
01/22/2022	21:39:37	1680	8.2	15.00	0.0	
01/22/2022	21:40:07	1724	8.2	15.01	0.0	
01/22/2022	21:41:07	1637	8.2	15.00	0.0	
01/22/2022	21:41:37	1649	8.2	15.00	0.0	
01/22/2022	21:42:07	1629	8.2	15.00	0.0	
01/22/2022	21:42:37	1701	8.2	14.99	0.0	
01/22/2022	21:43:07	1609	8.2	14.97	0.0	
01/22/2022	21:43:37	1646	8.2	14.99	0.0	
01/22/2022	21:44:07	1600	8.2	14.99	0.0	
01/22/2022	21:44:37	1630	8.2	14.95	0.0	
01/22/2022	21:45:07	1150	6.4	14.92	0.0	
01/22/2022	21:45:37	1097	6.3	14.93	0.0	
01/22/2022	21:46:07	1130	6.4	14.88	0.0	
01/22/2022	21:46:37	782	4.5	14.86	0.0	
01/22/2022	21:47:07	1083	6.3	15.10	0.0	
01/22/2022	21:47:37	1170	6.3	15.01	0.0	
01/22/2022	21:48:07	1126	6.3	15.10	0.0	
01/22/2022	21:48:37	1133	6.3	15.05	0.0	
01/22/2022	21:49:07	1110	6.3	14.99	0.0	
01/22/2022	21:49:37	1056	6.3	14.96	0.0	
01/22/2022	21:50:07	1163	6.4	14.99	0.0	
01/22/2022	21:50:37	1645	8.2	14.99	0.0	
01/22/2022	21:51:07	1645	8.2	14.99	0.0	
01/22/2022	21:51:37	1589	8.2	14.98	0.0	
01/22/2022	21:52:07	1670	8.2	14.98	0.0	
01/22/2022	21:52:37	1635	8.2	14.99	0.0	
01/22/2022	21:53:07	1611	8.2	14.99	0.0	
01/22/2022	21:53:37	1619	8.2	14.97	0.0	
01/22/2022	21:54:07	1640	8.2	15.00	0.0	
01/22/2022	21:54:37	1631	8.2	14.99	0.0	
01/22/2022	21:55:07	1701	8.2	14.99	0.0	
01/22/2022	21:55:37	1627	8.2	14.97	0.0	
01/22/2022	21:56:07	1724	8.2	14.99	0.0	
01/22/2022	21:56:37	1603	8.2	14.98	0.0	
01/22/2022	21:57:07	1622	8.2	14.96	0.0	
01/22/2022	21:57:37	1600	8.2	14.93	0.0	
01/22/2022	21:58:07	1580	8.2	14.96	0.0	
01/22/2022	21:58:37	1701	8.2	14.98	0.0	
01/22/2022	21:59:07	1637	8.2	14.96	0.0	
01/22/2022	21:59:37	1606	8.2	14.91	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	22:00:37	1622	8.2	14.97	0.0	
01/22/2022	22:01:07	1715	8.2	14.99	0.0	
01/22/2022	22:01:37	1627	8.2	14.96	0.0	
01/22/2022	22:02:07	1620	8.2	14.98	0.0	
01/22/2022	22:02:37	1668	8.2	14.95	0.0	
01/22/2022	22:03:07	1615	8.2	14.95	0.0	
01/22/2022	22:03:37	1742	8.2	14.95	0.0	
01/22/2022	22:04:07	1641	8.2	14.95	0.0	
01/22/2022	22:04:37	1600	8.2	14.96	0.0	
01/22/2022	22:05:07	1666	8.2	14.95	0.0	
01/22/2022	22:05:37	1088	6.3	14.99	0.0	
01/22/2022	22:06:07	1219	6.3	14.95	0.0	
01/22/2022	22:06:37	1202	6.3	15.02	0.0	
01/22/2022	22:07:07	1148	6.3	14.99	0.0	
01/22/2022	22:07:37	1219	6.4	15.01	0.0	
01/22/2022	22:08:07	1099	6.4	14.98	0.0	
01/22/2022	22:08:37	1253	6.4	14.99	0.0	
01/22/2022	22:09:07	1176	6.4	14.98	0.0	
01/22/2022	22:09:37	1102	6.3	14.99	0.0	
01/22/2022	22:10:07	1112	6.3	14.99	0.0	
01/22/2022	22:10:37	1156	6.3	14.99	0.0	
01/22/2022	22:11:07	1371	7.6	14.99	0.0	
01/22/2022	22:11:37	1553	7.6	14.94	0.0	
01/22/2022	22:12:07	1495	7.7	15.01	0.0	
01/22/2022	22:12:37	1462	7.6	14.97	0.0	
01/22/2022	22:13:07	1538	7.6	14.94	0.0	
01/22/2022	22:13:37	1064	6.4	14.93	0.0	
01/22/2022	22:14:37	1156	6.4	15.00	0.0	
01/22/2022	22:15:07	1219	6.3	14.92	0.0	
01/22/2022	22:15:37	1222	6.3	14.89	0.0	
01/22/2022	22:16:07	1110	6.4	14.99	0.0	
01/22/2022	22:16:37	1198	6.3	14.99	0.0	
01/22/2022	22:17:07	1220	6.3	15.05	0.0	
01/22/2022	22:17:37	1124	6.3	14.95	0.0	
01/22/2022	22:18:07	1178	6.4	14.93	0.0	
01/22/2022	22:18:37	1205	6.4	14.98	0.0	
01/22/2022	22:19:07	1237	6.4	14.97	0.0	
01/22/2022	22:19:37	1208	6.4	14.96	0.0	
01/22/2022	22:20:07	1124	6.4	14.98	0.0	
01/22/2022	22:20:37	1178	6.4	14.97	0.0	
01/22/2022	22:21:07	1282	6.3	14.97	0.0	
01/22/2022	22:21:37	1178	6.4	14.97	0.0	
01/22/2022	22:22:07	1200	6.3	14.96	0.0	
01/22/2022	22:22:37	1155	6.4	14.97	0.0	
01/22/2022	22:23:07	1134	6.4	14.98	0.0	
01/22/2022	22:23:37	1253	6.3	14.99	0.0	
01/22/2022	22:24:07	2021	6.3	14.98	0.0	
01/22/2022	22:24:37	1615	7.6	14.98	0.0	
01/22/2022	22:25:07	1664	7.6	14.98	0.0	
01/22/2022	22:25:37	1558	7.6	14.99	0.0	
01/22/2022	22:26:07	1551	7.7	14.99	0.0	
01/22/2022	22:26:37	1554	7.7	15.00	0.0	
01/22/2022	22:27:07	1524	7.6	15.00	0.0	
01/22/2022	22:27:37	1675	7.6	14.99	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	22:28:37	1577	7.6	15.00	0.0	
01/22/2022	22:29:07	1551	7.6	14.99	0.0	
01/22/2022	22:29:37	1508	7.6	14.98	0.0	
01/22/2022	22:30:07	1670	7.6	14.98	0.0	
01/22/2022	22:30:37	1603	7.6	14.98	0.0	
01/22/2022	22:31:07	1656	7.6	14.98	0.0	
01/22/2022	22:31:37	1701	7.7	14.96	0.0	
01/22/2022	22:32:07	1527	7.6	14.94	0.0	
01/22/2022	22:32:37	1211	6.3	14.94	0.0	
01/22/2022	22:33:07	1205	6.4	14.95	0.0	
01/22/2022	22:33:37	1158	6.4	14.96	0.0	
01/22/2022	22:34:07	1263	6.4	14.97	0.0	
01/22/2022	22:34:37	1209	6.4	14.99	0.0	
01/22/2022	22:35:07	1196	6.4	14.98	0.0	
01/22/2022	22:35:37	1279	6.4	14.97	0.0	
01/22/2022	22:36:07	1215	6.4	14.96	0.0	
01/22/2022	22:36:37	1242	6.4	14.94	0.0	
01/22/2022	22:37:07	1271	6.3	14.94	0.0	
01/22/2022	22:37:37	1179	6.4	14.95	0.0	
01/22/2022	22:38:07	1232	6.4	14.96	0.0	
01/22/2022	22:38:37	1241	6.4	14.97	0.0	
01/22/2022	22:39:07	1159	6.4	14.98	0.0	
01/22/2022	22:39:37	1291	6.4	14.99	0.0	
01/22/2022	22:40:07	1240	6.3	14.93	0.0	
01/22/2022	22:40:37	1228	6.4	15.02	0.0	
01/22/2022	22:41:07	1220	6.4	14.95	0.0	
01/22/2022	22:41:37	982	5.2	14.96	0.0	
01/22/2022	22:42:07	957	5.2	14.98	0.0	
01/22/2022	22:42:37	937	5.2	14.97	0.0	
01/22/2022	22:43:07	897	5.2	14.96	0.0	
01/22/2022	22:43:37	894	5.1	14.98	0.0	
01/22/2022	22:44:07	900	5.1	14.99	0.0	
01/22/2022	22:44:37	891	5.1	14.97	0.0	
01/22/2022	22:45:07	952	5.1	14.97	0.0	
01/22/2022	22:45:37	950	5.1	14.98	0.0	
01/22/2022	22:46:07	1297	6.0	14.97	0.0	
01/22/2022	22:46:37	1294	6.3	14.98	0.0	
01/22/2022	22:47:07	1225	6.3	14.99	0.0	
01/22/2022	22:47:37	1309	6.3	14.99	0.0	
01/22/2022	22:48:07	1278	6.3	14.98	0.0	
01/22/2022	22:48:37	1291	6.4	14.97	0.0	
01/22/2022	22:49:07	1315	6.3	14.98	0.0	
01/22/2022	22:49:37	1207	6.3	14.97	0.0	
01/22/2022	22:50:07	1242	6.3	14.97	0.0	
01/22/2022	22:50:37	1276	6.4	14.98	0.0	
01/22/2022	22:51:07	1184	6.3	14.99	0.0	
01/22/2022	22:51:37	1291	6.3	14.99	0.0	
01/22/2022	22:52:07	1254	6.4	14.99	0.0	
01/22/2022	22:52:37	1643	7.6	14.99	0.0	
01/22/2022	22:53:07	1658	7.6	14.99	0.0	
01/22/2022	22:53:37	1566	7.6	14.99	0.0	
01/22/2022	22:54:07	1623	7.6	14.99	0.0	
01/22/2022	22:54:37	1588	7.6	14.99	0.0	
01/22/2022	22:55:07	1636	7.6	14.99	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	22:56:07	1574	7.6	14.95	0.0	
01/22/2022	22:56:37	1691	7.6	14.99	0.0	
01/22/2022	22:57:07	1569	7.6	14.98	0.0	
01/22/2022	22:57:37	1549	7.6	14.94	0.0	
01/22/2022	22:58:07	1631	7.6	14.94	0.0	
01/22/2022	22:58:37	1580	7.6	14.94	0.0	
01/22/2022	22:59:07	1615	7.6	14.95	0.0	
01/22/2022	22:59:37	1647	7.6	14.95	0.0	
01/22/2022	23:00:07	1556	7.6	14.96	0.0	
01/22/2022	23:00:37	1279	6.8	14.94	0.0	
01/22/2022	23:01:07	1255	6.3	14.95	0.0	
01/22/2022	23:01:37	1275	6.3	15.01	0.0	
01/22/2022	23:02:07	1357	6.3	15.01	0.0	
01/22/2022	23:02:37	1190	6.3	14.98	0.0	
01/22/2022	23:03:07	1224	6.3	14.99	0.0	
01/22/2022	23:03:37	1300	6.3	15.00	0.0	
01/22/2022	23:04:07	1255	6.3	15.02	0.0	
01/22/2022	23:04:37	1278	6.3	15.00	0.0	
01/22/2022	23:05:07	1288	6.3	14.95	0.0	
01/22/2022	23:05:37	1206	6.3	14.92	0.0	
01/22/2022	23:06:07	1245	6.3	14.93	0.0	
01/22/2022	23:06:37	1212	6.3	14.94	0.0	
01/22/2022	23:07:07	1203	6.3	14.97	0.0	
01/22/2022	23:07:37	1330	6.3	15.00	0.0	
01/22/2022	23:08:37	1287	6.3	14.96	0.0	
01/22/2022	23:09:07	1193	6.3	14.98	0.0	
01/22/2022	23:09:37	950	5.3	14.96	0.0	
01/22/2022	23:10:07	941	5.1	14.94	0.0	
01/22/2022	23:10:37	958	5.1	14.99	0.0	
01/22/2022	23:11:07	978	5.1	14.97	0.0	
01/22/2022	23:11:37	1001	5.1	14.95	0.0	
01/22/2022	23:12:07	989	5.1	15.00	0.0	
01/22/2022	23:12:37	1006	5.1	14.99	0.0	
01/22/2022	23:13:07	922	5.1	14.99	0.0	
01/22/2022	23:13:37	985	5.2	14.99	0.0	
01/22/2022	23:14:07	900	5.2	14.99	0.0	
01/22/2022	23:14:37	949	5.2	14.99	0.0	
01/22/2022	23:15:07	912	5.2	14.97	0.0	
01/22/2022	23:16:07	970	5.1	15.00	0.0	
01/22/2022	23:16:37	1006	5.1	14.99	0.0	
01/22/2022	23:17:07	1063	5.1	14.99	0.0	
01/22/2022	23:17:37	1000	5.1	15.00	0.0	
01/22/2022	23:18:07	1009	5.1	14.99	0.0	
01/22/2022	23:18:37	955	5.1	15.00	0.0	
01/22/2022	23:19:07	941	5.1	15.00	0.0	
01/22/2022	23:19:37	917	5.1	14.99	0.0	
01/22/2022	23:20:07	907	5.1	14.98	0.0	
01/22/2022	23:20:37	910	5.1	14.97	0.0	
01/22/2022	23:21:07	934	5.1	15.00	0.0	
01/22/2022	23:21:37	950	5.1	15.00	0.0	
01/22/2022	23:22:07	967	5.1	15.00	0.0	
01/22/2022	23:22:37	993	5.1	14.99	0.0	
01/22/2022	23:23:07	982	5.1	15.04	0.0	
01/22/2022	23:23:37	1004	5.1	15.02	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	23:24:37	949	5.1	15.01	0.0	
01/22/2022	23:25:07	291	2.1	15.02	0.0	
01/22/2022	23:25:37	299	2.1	15.02	0.0	
01/22/2022	23:26:07	302	2.1	15.00	0.0	
01/22/2022	23:26:37	294	2.1	14.96	0.0	
01/22/2022	23:27:07	296	2.1	14.98	0.0	
01/22/2022	23:27:37	296	2.1	14.98	0.0	
01/22/2022	23:28:07	273	2.1	15.00	0.0	
01/22/2022	23:28:37	267	2.1	15.00	0.0	
01/22/2022	23:29:07	259	2.1	14.99	0.0	
01/22/2022	23:29:37	803	4.5	15.01	0.0	
01/22/2022	23:30:07	904	4.5	15.00	0.0	
01/22/2022	23:30:37	758	4.5	15.01	0.0	
01/22/2022	23:31:07	832	4.5	15.00	0.0	
01/22/2022	23:31:37	768	4.5	15.04	0.0	
01/22/2022	23:32:07	816	4.5	15.05	0.0	
01/22/2022	23:32:37	825	4.5	15.05	0.0	
01/22/2022	23:33:07	821	4.5	15.05	0.0	
01/22/2022	23:33:37	790	4.5	15.05	0.0	
01/22/2022	23:34:07	1319	6.3	14.99	0.0	
01/22/2022	23:34:37	1192	6.3	14.99	0.0	
01/22/2022	23:35:07	84	0.0	14.99	0.0	
01/22/2022	23:35:37	81	0.0	14.99	0.0	
01/22/2022	23:36:07	80	0.0	14.99	0.0	
01/22/2022	23:36:37	79	0.0	14.99	0.0	
01/22/2022	23:37:07	79	0.0	14.99	0.0	
01/22/2022	23:37:37	78	0.0	14.99	0.0	
01/22/2022	23:38:00	74	0.0	15.04	0.0	shutdown wash lines
01/22/2022	23:38:07	76	0.0	15.07	0.0	
01/22/2022	23:38:37	173	1.4	10.79	0.0	
01/22/2022	23:39:07	280	4.2	9.44	0.0	
01/22/2022	23:39:37	166	4.2	9.42	0.0	
01/22/2022	23:40:07	160	4.3	9.32	0.0	
01/22/2022	23:40:37	155	4.3	8.92	0.0	
01/22/2022	23:41:07	153	4.3	8.49	0.0	
01/22/2022	23:41:37	76	5.2	9.80	0.0	
01/22/2022	23:42:07	69	3.0	8.21	0.0	
01/22/2022	23:43:07	156	4.7	9.06	0.0	
01/22/2022	23:43:37	153	4.3	8.56	0.0	
01/22/2022	23:44:07	127	4.5	8.59	0.0	
01/22/2022	23:44:37	147	4.2	8.42	0.0	
01/22/2022	23:45:07	137	4.2	8.37	0.0	
01/22/2022	23:45:37	76	0.0	8.39	0.0	
01/22/2022	23:46:07	47	0.0	8.37	0.0	
01/22/2022	23:46:37	47	0.0	8.37	0.0	
01/22/2022	23:47:07	48	0.0	8.37	0.0	
01/22/2022	23:47:37	54	0.0	8.37	0.0	
01/22/2022	23:48:07	55	0.0	8.37	0.0	
01/22/2022	23:48:37	53	0.0	8.37	0.0	
01/22/2022	23:49:07	54	0.0	8.37	0.0	
01/22/2022	23:49:37	54	0.0	8.37	0.0	
01/22/2022	23:50:00	53	0.0	8.37	0.0	release top plug
01/22/2022	23:50:07	53	0.0	8.37	0.0	
01/22/2022	23:50:37	54	0.0	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/22/2022	23:51:07	148	4.3	8.39	0.0	
01/22/2022	23:51:37	426	8.3	8.37	0.0	
01/22/2022	23:52:07	1823	8.2	8.38	0.0	
01/22/2022	23:52:37	1759	8.2	8.37	0.0	
01/22/2022	23:53:07	1808	8.2	8.38	0.0	
01/22/2022	23:53:37	1770	8.2	8.38	0.0	
01/22/2022	23:54:07	1863	8.2	8.38	0.0	
01/22/2022	23:54:37	1862	8.2	8.38	0.0	
01/22/2022	23:55:07	1970	8.2	8.38	0.0	
01/22/2022	23:55:37	1970	8.2	8.38	0.0	
01/22/2022	23:56:07	2088	8.2	8.38	0.0	
01/22/2022	23:56:37	2069	8.1	8.37	0.0	
01/22/2022	23:57:07	2165	8.2	8.38	0.0	
01/22/2022	23:57:37	2158	8.1	8.38	0.0	
01/22/2022	23:58:07	2193	8.1	8.37	0.0	
01/22/2022	23:58:37	2267	8.1	8.38	0.0	
01/22/2022	23:59:07	2274	8.1	8.37	0.0	
01/22/2022	23:59:37	2313	8.1	8.37	0.0	
01/23/2022	00:00:07	2382	8.1	8.37	0.0	
01/23/2022	00:00:37	2407	8.1	8.37	0.0	
01/23/2022	00:01:07	2439	8.1	8.37	0.0	
01/23/2022	00:01:37	2497	8.1	8.37	0.0	
01/23/2022	00:02:07	2582	8.1	8.37	0.0	
01/23/2022	00:02:37	2559	8.1	8.37	0.0	
01/23/2022	00:03:07	2675	8.1	8.37	0.0	
01/23/2022	00:03:37	2648	8.1	8.38	0.0	
01/23/2022	00:04:07	2691	8.1	8.37	0.0	
01/23/2022	00:04:37	2749	8.1	8.37	0.0	
01/23/2022	00:05:07	2774	8.1	8.37	0.0	
01/23/2022	00:05:37	2893	8.1	8.37	0.0	
01/23/2022	00:06:07	2854	8.1	8.37	0.0	
01/23/2022	00:06:37	2894	8.1	8.37	0.0	
01/23/2022	00:07:07	3004	8.1	8.37	0.0	
01/23/2022	00:07:37	3010	8.1	8.37	0.0	
01/23/2022	00:08:07	3021	8.1	8.37	0.0	
01/23/2022	00:08:37	3057	8.1	8.37	0.0	
01/23/2022	00:09:07	3101	8.1	8.37	0.0	
01/23/2022	00:09:37	3218	8.0	8.37	0.0	
01/23/2022	00:10:07	3184	8.0	8.37	0.0	
01/23/2022	00:10:37	3307	8.1	8.37	0.0	
01/23/2022	00:11:07	3264	8.0	8.37	0.0	
01/23/2022	00:11:37	3242	8.1	8.37	0.0	
01/23/2022	00:12:07	3218	8.1	8.37	0.0	
01/23/2022	00:12:37	3223	8.1	8.37	0.0	
01/23/2022	00:13:07	3276	8.1	8.37	0.0	
01/23/2022	00:13:37	3303	8.0	8.38	0.0	
01/23/2022	00:14:07	3241	8.0	8.38	0.0	
01/23/2022	00:14:37	3197	8.1	8.37	0.0	
01/23/2022	00:15:07	3169	8.1	8.37	0.0	
01/23/2022	00:15:37	3186	8.1	8.37	0.0	
01/23/2022	00:16:37	3184	8.1	8.37	0.0	
01/23/2022	00:17:07	3154	8.1	8.37	0.0	
01/23/2022	00:17:37	3163	8.1	8.37	0.0	
01/23/2022	00:18:07	3134	8.0	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/23/2022	00:19:07	3167	8.1	8.37	0.0	
01/23/2022	00:19:37	3169	8.1	8.37	0.0	
01/23/2022	00:20:07	3154	8.1	8.37	0.0	
01/23/2022	00:20:37	3167	8.1	8.37	0.0	
01/23/2022	00:21:07	3128	8.1	8.37	0.0	
01/23/2022	00:21:37	3219	8.1	8.37	0.0	
01/23/2022	00:22:07	3164	8.1	8.37	0.0	
01/23/2022	00:22:37	3137	8.1	8.37	0.0	
01/23/2022	00:23:07	3144	8.1	8.37	0.0	
01/23/2022	00:23:37	3127	8.1	8.37	0.0	
01/23/2022	00:24:07	3148	8.1	8.37	0.0	
01/23/2022	00:24:37	3141	8.0	8.37	0.0	
01/23/2022	00:25:07	3121	8.1	8.37	0.0	
01/23/2022	00:25:37	3109	8.1	8.37	0.0	
01/23/2022	00:26:07	3154	8.1	8.37	0.0	
01/23/2022	00:26:37	3107	8.1	8.37	0.0	
01/23/2022	00:27:07	3079	8.1	8.37	0.0	
01/23/2022	00:27:37	3135	8.1	8.37	0.0	
01/23/2022	00:28:07	3097	8.1	8.37	0.0	
01/23/2022	00:28:37	3059	8.1	8.37	0.0	
01/23/2022	00:29:07	3141	8.1	8.37	0.0	
01/23/2022	00:29:37	3078	8.1	8.37	0.0	
01/23/2022	00:30:07	3047	8.1	8.37	0.0	
01/23/2022	00:30:37	3126	8.1	8.37	0.0	
01/23/2022	00:31:07	3067	8.1	8.37	0.0	
01/23/2022	00:31:37	3043	8.1	8.37	0.0	
01/23/2022	00:32:07	3048	8.1	8.37	0.0	
01/23/2022	00:32:37	3075	8.1	8.37	0.0	
01/23/2022	00:33:07	3058	8.1	8.37	0.0	
01/23/2022	00:33:37	3051	8.1	8.38	0.0	
01/23/2022	00:34:07	3087	8.1	8.37	0.0	
01/23/2022	00:34:37	3036	8.1	8.37	0.0	
01/23/2022	00:35:07	3038	8.1	8.37	0.0	
01/23/2022	00:35:37	3054	8.1	8.37	0.0	
01/23/2022	00:36:07	3045	8.1	8.37	0.0	
01/23/2022	00:36:37	3018	8.1	8.37	0.0	
01/23/2022	00:37:07	3045	8.1	8.37	0.0	
01/23/2022	00:37:37	3013	8.1	8.37	0.0	
01/23/2022	00:38:07	3078	8.1	8.37	0.0	
01/23/2022	00:38:37	3015	8.1	8.37	0.0	
01/23/2022	00:39:07	3041	8.1	8.37	0.0	
01/23/2022	00:39:37	3024	8.1	8.37	0.0	
01/23/2022	00:40:07	3031	8.1	8.37	0.0	
01/23/2022	00:40:37	3028	8.1	8.37	0.0	
01/23/2022	00:41:07	3009	8.1	8.38	0.0	
01/23/2022	00:41:37	3021	8.1	8.37	0.0	
01/23/2022	00:42:07	3034	8.1	8.37	0.0	
01/23/2022	00:42:37	3037	8.1	8.38	0.0	
01/23/2022	00:43:07	3012	8.1	8.37	0.0	
01/23/2022	00:43:37	3029	8.1	8.37	0.0	
01/23/2022	00:44:07	3014	8.1	8.38	0.0	
01/23/2022	00:44:37	3035	8.1	8.38	0.0	
01/23/2022	00:45:07	3049	8.1	8.38	0.0	
01/23/2022	00:45:37	3040	8.1	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/23/2022	00:46:37	3036	8.1	8.38	0.0	
01/23/2022	00:47:07	2998	8.1	8.37	0.0	
01/23/2022	00:47:37	2299	3.3	8.38	0.0	
01/23/2022	00:48:00	2234	3.3	8.37	0.0	20bbl spacer to surface
01/23/2022	00:48:07	2263	3.2	8.38	0.0	
01/23/2022	00:48:37	2243	3.2	8.38	0.0	
01/23/2022	00:49:00	2249	3.2	8.38	0.0	land plug 5.5bbl back floats hold
01/23/2022	00:49:07	2280	3.3	8.37	0.0	
01/23/2022	00:50:07	2723	0.0	8.38	0.0	
01/23/2022	00:50:37	2894	0.0	8.38	0.0	
01/23/2022	00:51:07	2794	0.0	8.38	0.0	
01/23/2022	00:51:37	2874	0.0	8.38	0.0	
01/23/2022	00:52:07	2830	0.0	8.38	0.0	
01/23/2022	00:52:37	2859	0.0	8.38	0.0	
01/23/2022	00:53:07	2858	0.0	8.38	0.0	
01/23/2022	00:53:37	2856	0.0	8.38	0.0	
01/23/2022	00:54:07	2873	0.0	8.38	0.0	
01/23/2022	00:54:37	2862	0.0	8.38	0.0	
01/23/2022	00:55:07	1332	0.0	8.38	0.0	
01/23/2022	00:55:37	29	0.0	8.38	0.0	
01/23/2022	00:56:07	21	0.0	8.38	0.0	
01/23/2022	00:56:37	17	0.0	8.38	0.0	
01/23/2022	00:57:07	17	0.0	8.38	0.0	
01/23/2022	00:57:37	17	0.0	8.38	0.0	
01/23/2022	00:58:07	18	0.0	8.38	0.0	
01/23/2022	00:58:37	17	0.0	8.38	0.0	
01/23/2022	00:59:07	17	0.0	8.38	0.0	
01/23/2022	00:59:37	17	0.0	8.38	0.0	
01/23/2022	01:00:07	17	0.0	8.38	0.0	
01/23/2022	01:00:37	17	0.0	8.38	0.0	
01/23/2022	01:01:07	17	0.0	8.38	0.0	
01/23/2022	01:01:37	17	0.0	8.38	0.0	
01/23/2022	01:02:07	17	0.0	8.38	0.0	
01/23/2022	01:02:37	17	0.0	8.38	0.0	
01/23/2022	01:03:07	18	0.0	8.38	0.0	
01/23/2022	01:03:37	18	0.0	8.38	0.0	
01/23/2022	01:04:07	18	0.0	8.38	0.0	
01/23/2022	01:04:37	28	0.0	8.38	0.0	
01/23/2022	01:05:07	28	0.0	8.38	0.0	
01/23/2022	01:05:37	28	0.0	8.38	0.0	
01/23/2022	01:06:07	27	0.0	8.38	0.0	
01/23/2022	01:06:37	28	0.0	8.38	0.0	
01/23/2022	01:07:07	28	0.0	8.38	0.0	
01/23/2022	01:07:37	28	0.0	8.38	0.0	
01/23/2022	01:08:07	26	0.0	8.38	0.0	
01/23/2022	01:08:37	26	0.0	8.38	0.0	
01/23/2022	01:09:07	28	0.0	8.38	0.0	
01/23/2022	01:09:37	27	0.0	8.38	0.0	
01/23/2022	01:10:00	25	0.0	8.38	0.0	wash lines for rig
01/23/2022	01:10:07	25	0.0	8.38	0.0	
01/23/2022	01:10:37	26	0.0	8.38	0.0	
01/23/2022	01:11:00	26	0.0	8.38	0.0	end job @ 04:00
01/23/2022	01:11:07	24	0.0	8.38	0.0	
01/23/2022	01:11:37	25	0.0	8.38	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/23/2022	01:12:07	21	0.0	8.38	0.0	
01/23/2022	01:12:37	24	0.0	8.38	0.0	
01/23/2022	01:13:07	84	4.3	8.39	0.0	
01/23/2022	01:13:37	86	4.2	8.30	0.0	
01/23/2022	01:14:07	90	4.4	8.36	0.0	
01/23/2022	01:14:37	140	5.6	8.37	0.0	
01/23/2022	01:15:07	140	5.6	8.38	0.0	
01/23/2022	01:15:37	140	5.6	8.37	0.0	
01/23/2022	01:16:07	140	5.4	8.37	0.0	
01/23/2022	01:16:37	137	5.6	8.36	0.0	
01/23/2022	01:17:07	132	5.5	8.36	0.0	
01/23/2022	01:17:37	136	5.6	8.37	0.0	
01/23/2022	01:18:07	136	5.6	8.37	0.0	
01/23/2022	01:18:37	136	5.6	8.37	0.0	
01/23/2022	01:19:07	140	5.6	8.36	0.0	
01/23/2022	01:19:37	138	5.6	8.37	0.0	
01/23/2022	01:20:07	138	5.6	8.40	0.0	
01/23/2022	01:20:37	138	5.6	8.39	0.0	
01/23/2022	01:21:07	138	5.7	8.39	0.0	
01/23/2022	01:21:37	137	5.6	8.38	0.0	
01/23/2022	01:22:07	141	5.6	8.38	0.0	
01/23/2022	01:22:37	37	0.0	8.36	0.0	
01/23/2022	01:23:37	119	5.6	8.38	0.0	
01/23/2022	01:24:07	34	0.2	8.38	0.0	
01/23/2022	01:24:37	35	0.0	8.37	0.0	
01/23/2022	01:25:07	17	0.0	8.38	0.0	
01/23/2022	01:25:37	17	0.0	8.37	0.0	
01/23/2022	01:26:07	15	0.0	8.37	0.0	
01/23/2022	01:26:37	15	0.0	8.38	0.0	
01/23/2022	01:27:07	15	0.0	8.38	0.0	
01/23/2022	01:27:37	14	0.0	8.38	0.0	
01/23/2022	01:28:07	15	0.0	8.38	0.0	
01/23/2022	01:28:37	16	0.0	8.38	0.0	
01/23/2022	01:29:07	15	0.0	8.38	0.0	
01/23/2022	01:29:37	15	0.0	8.38	0.0	
01/23/2022	01:30:07	15	0.0	8.38	0.0	
01/23/2022	01:30:37	15	0.0	8.38	0.0	
01/23/2022	01:31:07	15	0.0	8.37	0.0	
01/23/2022	01:31:37	15	0.0	8.37	0.0	
01/23/2022	01:32:07	15	0.0	8.37	0.0	
01/23/2022	01:32:37	16	0.0	8.37	0.0	
01/23/2022	01:33:07	16	0.0	8.37	0.0	
01/23/2022	01:33:37	15	0.0	8.37	0.0	
01/23/2022	01:34:07	16	0.0	8.37	0.0	
01/23/2022	01:34:37	15	0.0	8.36	0.0	
01/23/2022	01:35:07	15	0.0	8.37	0.0	
01/23/2022	01:35:37	17	0.0	8.36	0.0	
01/23/2022	01:36:07	16	0.0	8.37	0.0	
01/23/2022	01:36:37	16	0.0	8.37	0.0	
01/23/2022	01:37:07	19	0.0	8.37	0.0	
01/23/2022	01:37:37	19	0.0	8.37	0.0	
01/23/2022	01:38:07	19	0.0	8.37	0.0	
01/23/2022	01:38:37	19	0.0	8.37	0.0	
01/23/2022	01:39:07	64	1.7	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/23/2022	01:40:07	102	0.4	8.40	0.0	
01/23/2022	01:40:37	293	0.0	8.37	0.0	
01/23/2022	01:41:07	286	0.0	8.37	0.0	
01/23/2022	01:41:37	374	0.0	8.37	0.0	
01/23/2022	01:42:07	304	0.0	8.37	0.0	
01/23/2022	01:42:37	308	15.3	8.53	0.0	
01/23/2022	01:43:07	242	7.8	8.47	0.0	
01/23/2022	01:43:37	279	7.8	8.36	0.0	
01/23/2022	01:44:07	282	7.7	8.38	0.0	
01/23/2022	01:44:37	342	7.8	8.36	0.0	
01/23/2022	01:45:07	353	8.2	8.38	0.0	
01/23/2022	01:45:37	342	8.3	8.38	0.0	
01/23/2022	01:46:07	350	8.3	8.40	0.0	
01/23/2022	01:46:37	341	8.3	8.39	0.0	
01/23/2022	01:47:07	349	7.4	8.41	0.0	
01/23/2022	01:47:37	353	8.4	8.39	0.0	
01/23/2022	01:48:07	351	8.4	8.39	0.0	
01/23/2022	01:48:37	351	1.7	8.44	0.0	
01/23/2022	01:49:07	355	8.5	8.39	0.0	
01/23/2022	01:49:37	354	8.4	8.38	0.0	
01/23/2022	01:50:07	351	7.5	8.40	0.0	
01/23/2022	01:50:37	35	0.7	8.37	0.0	
01/23/2022	01:51:07	31	0.0	8.37	0.0	
01/23/2022	01:51:37	31	0.0	8.37	0.0	
01/23/2022	01:52:07	31	0.0	8.37	0.0	
01/23/2022	01:52:37	31	0.0	8.37	0.0	
01/23/2022	01:53:07	30	0.0	8.37	0.0	
01/23/2022	01:53:37	31	0.0	8.37	0.0	
01/23/2022	01:54:07	31	0.0	8.37	0.0	
01/23/2022	01:54:37	31	0.0	8.37	0.0	
01/23/2022	01:55:07	29	0.0	8.37	0.0	
01/23/2022	01:55:37	64	0.0	8.37	0.0	
01/23/2022	01:56:07	68	0.0	8.37	0.0	
01/23/2022	01:57:07	71	0.0	8.36	0.0	
01/23/2022	01:57:37	72	0.0	8.36	0.0	
01/23/2022	01:58:07	72	0.0	8.36	0.0	
01/23/2022	01:58:37	72	0.0	8.36	0.0	
01/23/2022	01:59:07	72	0.0	8.36	0.0	
01/23/2022	01:59:37	72	0.0	8.36	0.0	
01/23/2022	02:00:07	72	0.0	8.36	0.0	
01/23/2022	02:00:37	284	0.0	8.36	0.0	
01/23/2022	02:01:07	462	0.0	8.36	0.0	
01/23/2022	02:01:37	32	0.0	8.36	0.0	
01/23/2022	02:02:07	32	0.0	8.36	0.0	
01/23/2022	02:02:37	32	0.0	8.36	0.0	
01/23/2022	02:03:07	64	0.0	8.36	0.0	
01/23/2022	02:03:37	99	0.0	8.36	0.0	
01/23/2022	02:04:07	61	0.0	8.36	0.0	
01/23/2022	02:04:37	92	0.0	8.36	0.0	
01/23/2022	02:05:07	137	0.0	8.36	0.0	
01/23/2022	02:05:37	154	4.8	8.35	0.0	
01/23/2022	02:06:07	170	5.7	8.37	0.0	
01/23/2022	02:06:37	294	8.3	8.33	0.0	
01/23/2022	02:07:07	299	8.4	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Betty Schafer 405H 405H	Panhandle	Jan/22/2022	Southwestern	EN82-02744

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/23/2022	02:08:07	99	7.5	8.37	0.0	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
6.2			18.4	884.0	0.0	117.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
8116	0	1220				bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	846.0 bbl	459.0 bbl	59 degF	Cement Circulated to Surface? ☐	Volume bbl
				Washed Thru Perfs ☐	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Danny Cover	☐	☒
		-	-

Service Quality Evaluation

Client:	Southwestern	**Service Order #:**	
Field:	Panhandle	**Date:**	Jan/22/2022
Rig:	sdc 40	**Operating Time (hh:mm):**	00:00
Well:	Betty Schafer 405H	**Client Rep:**	
Service Line:	Cementing	**Schlumberger Engineer:**	Danny Cover
Job Type:	production	**Schlumberger FSM:**	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** [X] **no** [ ]	5
1b	Free of environmental spill or non-compliant discharge	5	**yes** [X] **no** [ ]	5
1c	Wellsite left clean	4	**yes** [X] **no** [ ]	4
			Sub-total	100%
2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** [X] **no** [ ]	3
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** [X] **no** [ ]	2
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** [X] **no** [ ]	2
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** [X] **no** [ ]	2
			Sub-total	100%
3	**Execution**			
3a	Lost time < 30 mins	3	**yes** [X] **no** [ ]	3
3b	Equipment pressure tested succesfully	3	**yes** [X] **no** [ ]	3
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** [X] **no** [ ]	2
3d	Plugs / darts released and tested succesfully	2	**yes** [X] **no** [ ]	2
3e	Density variation met expectations	2	**yes** [X] **no** [ ]	2
3f	Personnel performed as per expectations	2	**yes** [X] **no** [ ]	2
3g	Equipment performed as per expectations	2	**yes** [X] **no** [ ]	2
3h	Job pumped as per design	3	**yes** [X] **no** [ ]	3
3i	Did job start on time	2	**yes** [X] **no** [ ]	2
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** [X] **no** [ ]	3
			Sub-total	100%
4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** [X] **no** [ ]	10
			Sub-total	100%

Total 100%

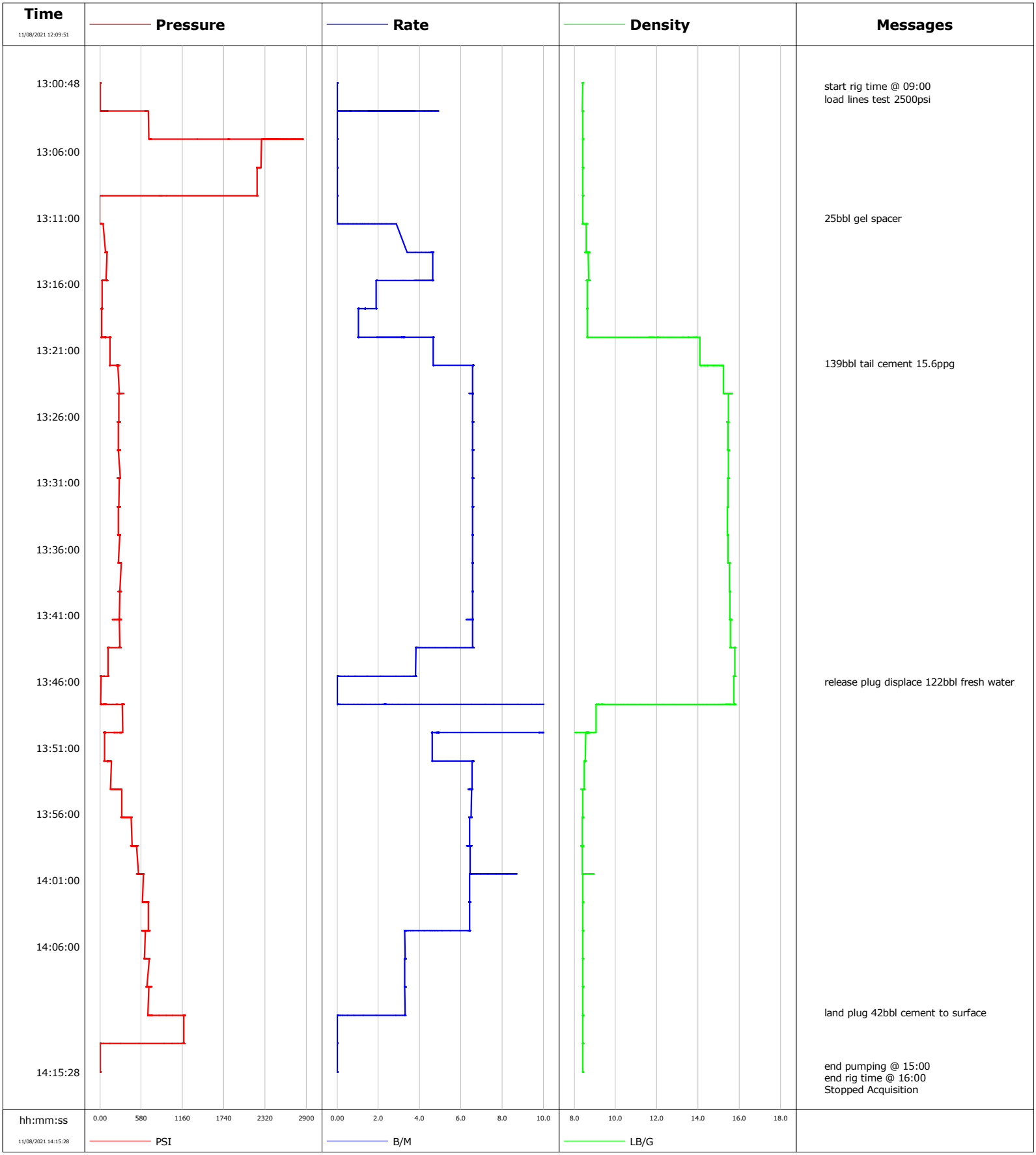
Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

Schlumberger

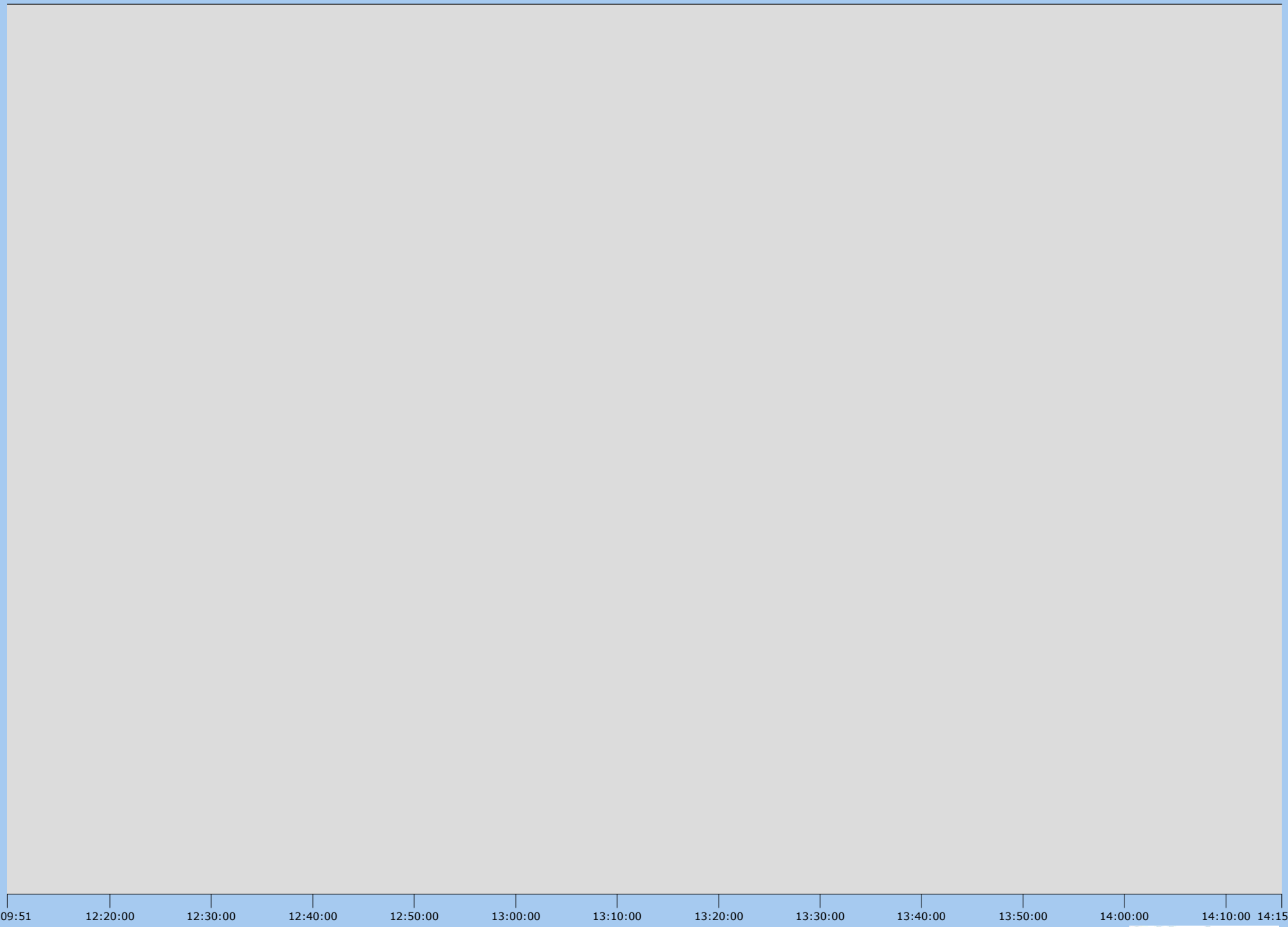
Cementing Job Report

Well	Brian Teslovich	**Client**	Southwestern
Field	Beech bottom	**SIR No.**	EN82-01447
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	11-08-2021



Cementing

PRD Post Job Plot



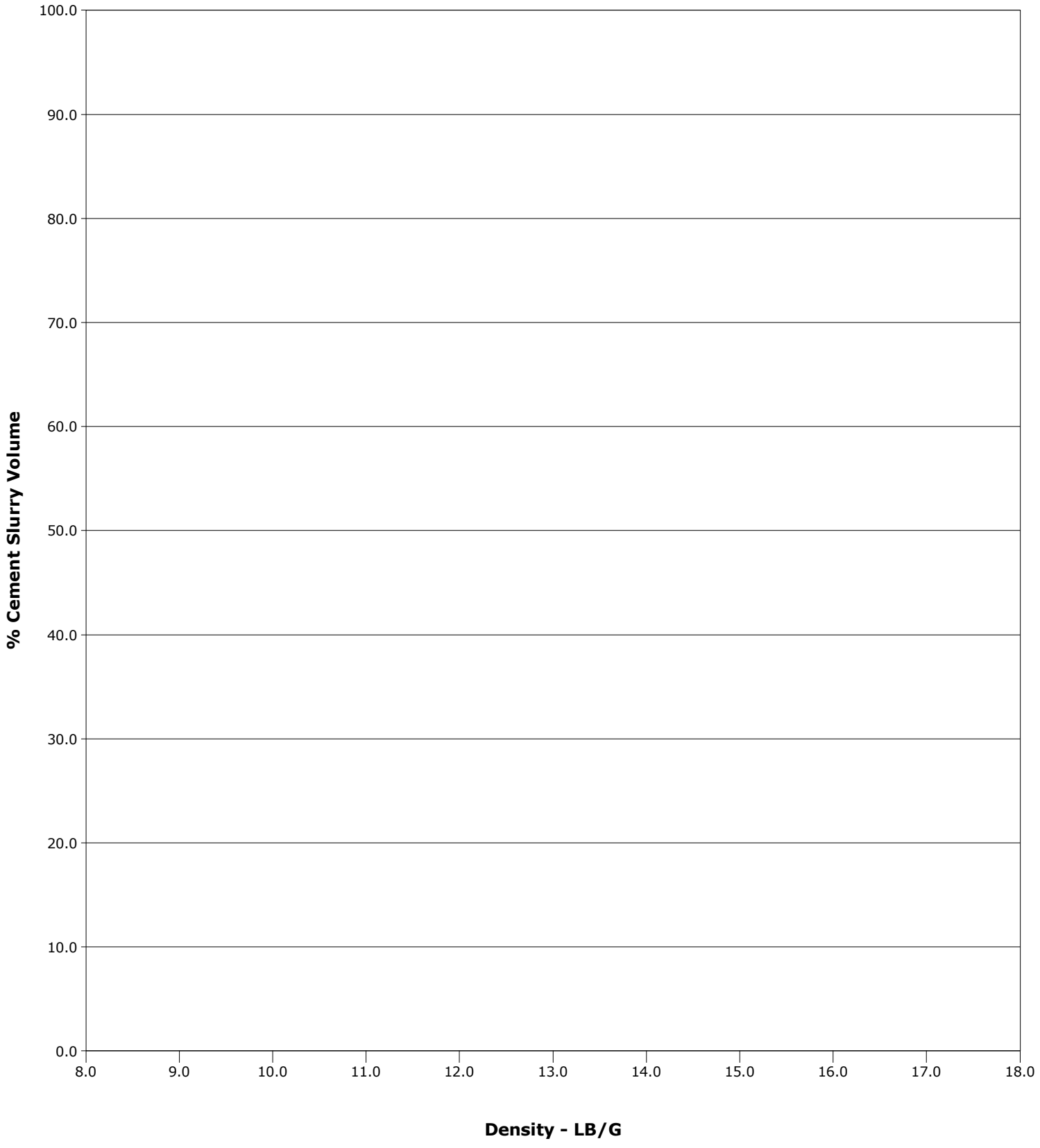
© Schlumberger 1994 - 2021

Schlumberger

Cementing Qa/Qc Density Report

Well	Brian Teslovich	**Client**	Southwestern
Field	Beech bottom	**SIR No.**	EN82-01447
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	11-08-2021

- 09/14/1973 21:13:36 to 09/14/1973 20:32:32



Schlumberger Cementing Service Report

Customer	Job Number
Southwestern	EN82-01447

Well	Location (legal)	Schlumberger Location	Job Start
Brian Teslovich 3	47-009-00311-00-00	Weston	Nov/08/2021

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Beech bottom		deg	12.3 in	1617.0 ft	1617.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Brooke	West Virginia	psi	77 degF	80 degF	lb/gal
Well Master 0066281094	**API/UWI** 47-009-00311-00-00				

Rig Name	Drilled For	Service Via
sdc40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

test lines 2500psi
25bbl gel spacer
139bbl tail 15.6ppg 1.19cf/f 5.27g/sk
122bbl displacement

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
348.0	13.4	54.5	110	BUTT
1617.0	9.6	36.0	110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
	122.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	126.0 bbl	23.0 bbl	71.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Pipe Rotated	Pipe Reciprocated
X	☐	☐	☐

Lift Pressure	No. Centralizers	Top Plugs	Bottom Plugs	Cement Head Type
psi		1		Single

Job Scheduled For	Arrived on Location	Leave Location
Nov/08/2021 09:00	Nov/08/2021 08:00	Nov/08/2021 16:30

Casing Tools

Shoe Type	Float
Shoe Depth	1617.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	1576.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
11/08/2021	12:09:51	1	0.3	8.11	0.0	Started Acquisition
11/08/2021	12:10:00	5	1.0	8.35	0.0	Start Job
11/08/2021	12:10:21	117	4.2	8.41	0.0	
11/08/2021	12:10:51	6	1.1	8.42	0.0	
11/08/2021	12:11:21	242	5.5	8.41	0.0	
11/08/2021	12:11:51	9	0.0	8.42	0.0	
11/08/2021	12:12:21	4	0.0	8.41	0.0	
11/08/2021	12:12:51	3	0.0	8.41	0.0	
11/08/2021	12:13:21	5	0.0	8.41	0.0	
11/08/2021	12:13:51	7	0.0	8.41	0.0	

Well	Field	Job Start	Customer	Job Number
Brian Teslovich 3	Beech bottom	Nov/08/2021	Southwestern	EN82-01447

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.3			10.4	139.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
2854	4	446	1300			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	139.0 bbl	122.0 bbl	61 degF	[X]	42.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Danny Cover	-	[X] -

Service Quality Evaluation

Client:	Southwestern
Field:	Beech bottom
Rig:	sdc40
Well:	Brian Teslovich
Service Line:	Cementing
Job Type:	intermediate

Service Order #:	
Date:	Nov/08/2021
Operating Time (hh:mm):	00:00
Client Rep:	
Schlumberger Engineer:	Danny Cover
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** [X] **no** [ ]	5
1b	Free of environmental spill or non-compliant discharge	5	**yes** [X] **no** [ ]	5
1c	Wellsite left clean	4	**yes** [X] **no** [ ]	4
			Sub-total	100%

2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** [X] **no** [ ]	3
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** [X] **no** [ ]	2
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** [X] **no** [ ]	2
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** [X] **no** [ ]	2
			Sub-total	100%

3	**Execution**			
3a	Lost time < 30 mins	3	**yes** [X] **no** [ ]	3
3b	Equipment pressure tested succesfully	3	**yes** [X] **no** [ ]	3
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** [X] **no** [ ]	2
3d	Plugs / darts released and tested succesfully	2	**yes** [X] **no** [ ]	2
3e	Density variation met expectations	2	**yes** [X] **no** [ ]	2
3f	Personnel performed as per expectations	2	**yes** [X] **no** [ ]	2
3g	Equipment performed as per expectations	2	**yes** [X] **no** [ ]	2
3h	Job pumped as per design	3	**yes** [X] **no** [ ]	3
3i	Did job start on time	2	**yes** [X] **no** [ ]	2
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** [X] **no** [ ]	3
			Sub-total	100%

4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** [X] **no** [ ]	10
			Sub-total	100%

Total 100%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

WW-6B
(04/15)

API NO. 47- 009 -
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

1) Well Operator:	SWN Production Co., LLC	494512924	009- Brooke	Weirton	664-Weirton
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Brownlee Land Ventures BRK 6 Well Pad Name: Brownlee Land Ventures

3) Farm Name/Surface Owner: Brownlee Land Ventures LP Public Road Access: Park Drive

4) Elevation, current ground: 984.5 Elevation, proposed post-construction: 983.9

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

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Down-Dip well to the South, Target Top TVD- 5317', Target Base TVD- 5383', Anticipated Thickness- 66', Associated Pressure- 3499

8) Proposed Total Vertical Depth: 5344' Vertical

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 5344'

11) Proposed Horizontal Leg Length: N/A

12) Approximate Fresh Water Strata Depths: 376'

13) Method to Determine Fresh Water Depths: Based on salinity calculations, the Pottsville marks the TOSW for DNR A & DNR B pads (4-5 mi south). *See below.

14) Approximate Saltwater Depths: 471' TVD, based on nearest salinity profile analysis to south.

15) Approximate Coal Seam Depths: Coal not present at this pad location.

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

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

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

*Question 13: ~Approximately 5 miles north of the proposed well location, the Pottsville is eroded or very near the surface. As such, we believe the TOSW can be found within the next sandstone layer, which is the Ravencliff. Based on projected grid(s), TOSW is placed at the Ravencliff at 471' TVD on the Brownlee pad. TOSW depth will be adjusted based on actual data collected by logging the first well we drill on this pad.

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	426'	426'	394 sx/CTS
Coal	See	Surface	Casing				
Intermediate	9 5/8"	New	J-55	36#	1100'	1100'	731 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	5344'	5344'	Tail 300sx/ 100' Inside Intermediate
Tubing							
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Surface	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

The well will be drilled to a depth approximately 100' below the top of the Onondaga Formation to allow for open hole logging and confirming Marcellus interval formation characteristics. If casing is run, it will be run to total depth of the hole and cemented per regulatory requirements. If the well is determined to be dry and abandoned, it will be plugged per regulatory requirements for plugging and abandoning.

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

Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. In some instances, additional toe prep may be performed by pumping additional water in the toe of the well prior to perforating and pumping Stage 1 to ensure that the toe guns/toe sleeves are fully open prior to pumping stage 1. The well is produced through surface facilities consisting of high pressure production unites, horizontal separation units, water and oil storage tanks. Max press and anticipated max rate- 9000 lbs @ 100 barrels a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 26.10

22) Area to be disturbed for well pad only, less access road (acres): 11.77

23) Describe centralizer placement for each casing string:

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

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

See Attachment ***

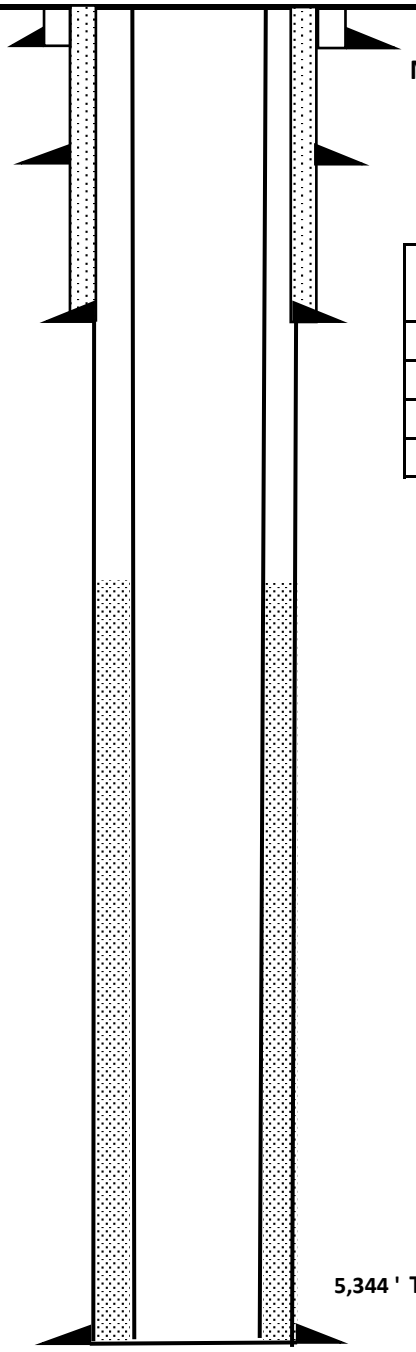
25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

Southwestern Energy Company | Proposed Drilling Program

Well:	BROWNLEE LAND VENTURES BRK 6	**Re-entry Rig:**	TBD
Field:	PANHANDLE FIELD \	**Prospect:**	Marcellus Shale
County:	BROOKE	**State:**	WV
SHL:	40.3881 Latitude	-80.5648 Longitude	
BHL:	40.3881 Latitude	-80.5648 Longitude	
KB Elev:	1,011 ft MSL	KB: 26 ft AGL	**GL Elev:** 985 ft MSL



NO COAL VOID ANTICIPATED

PROD TOC Tail @ 3,800 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	426 '
Intermediate	9.625	36.0 #	J-55	0 '	1,100 '
Production	5.5	20.0 #	P-110 HP	0 '	5,344 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	394	A	15.6
Intermediate:	731	A	15.6
Production:	300	A	15.6-16.0

Freshwater Depth - 376 ' TVD
Coal Depth - Surface
Saltwater Depth - 471 ' TVD
TVD - 5,344 '
TMD - 5,344 '

126 ' to 446 '
Air/Mist

446 ' to 1,120 '
Air/Mist

1,120 ' to 5,000 '
Air/Mist

5,000 ' to 5,344 '
12.0-12.5 ppg

TD @ 5,344 '
12.0-12.5 ppg

5,344 ' Target Center

Marcellus 5,201 ' MD
Onondaga 5,244 ' TVD
Well TD 5,344 ' TVD

Created by: Matt Weems on 11/23/2021

WW-6B
(04/15)

API NO. 47- 009 -
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

1) Well Operator:	SWN Production Co., LLC	494512924	009- Brooke	Weirton	664-Weirton
		Operator ID	County	District	Quadrangle

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3) Farm Name/Surface Owner: Brownlee Land Ventures LP Public Road Access: Park Drive

4) Elevation, current ground: 984.5 Elevation, proposed post-construction: 983.9

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

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Down-Dip well to the South, Target Top TVD- 5317', Target Base TVD- 5383', Anticipated Thickness- 66', Associated Pressure- 3499

8) Proposed Total Vertical Depth: 5344' Vertical

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 5344'

11) Proposed Horizontal Leg Length: N/A

12) Approximate Fresh Water Strata Depths: 376'

13) Method to Determine Fresh Water Depths: Deepest known water well within 1500'.Shallow logs to be run on 1st well to confirm.

14) Approximate Saltwater Depths: 471' TVD, based on nearest salinity profile analysis to south.

15) Approximate Coal Seam Depths: Unnamed coal seam at 441' TVD

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

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

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

API NO. 47- 009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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Tubing							
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
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Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

API NO. 47- 009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

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

See Attachment ***

25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

WW-PN
(5-04-2012)

Horizontal Natural Gas Well Work Permit
Application Notice By Publication

Notice is hereby given:
Pursuant to West Virginia Code 22-6A-10(e) prior to filing an application for a permit for a horizontal well the applicant shall publish in the county in which the well is located or is proposed to be located a Class II legal advertisement.

Paper: _____

Public Notice Date: _____

The following applicant intends to apply for a horizontal natural well work permit which disturbs three acres or more of surface excluding pipelines, gathering lines and roads **or** utilizes more than two hundred ten thousand gallons of water in any thirty day period.

Applicant: SWN Production Company, LLC **Well Number:** Brownlee Land Ventures BRK 6

Address: P.O. Box 1300

Jane Lew, WV 26378

Business Conducted: Natural gas production.

Location –

State: _____ County: 009- Brooke
District: _____ Quadrangle: _____
UTM Coordinate NAD83 Northing: _____
UTM coordinate NAD83 Easting: _____
Watershed: _____

Coordinate Conversion:
To convert the coordinates above into longitude and latitude, visit: http://tagis.dep.wv.gov/convert/llutm_conus.php

Electronic notification:
To receive an email when applications have been received or issued by the Office of Oil and Gas, visit http://www.dep.wv.gov/insidedep/Pages/DEPMailingLists.aspx to sign up.

Reviewing Applications:
Copies of the proposed permit application may be reviewed at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE Charleston, WV 25304 (304-926-0450). Full copies or scans of the proposed permit application will cost $15, whether mailed or obtained at DEP headquarters. Copies may be requested by calling the office or by sending an email to DEP.oog@wv.gov.

Submitting Comments:
Comments may be submitted online at https://apps.dep.wv.gov/oog/comments/comments.cfm, or by letter to Permit Review, Office of Oil and Gas, 601 57th Street, SE Charleston, WV 25304. Please reference the county, well number, and operator when using this option.

Regardless of format for comment submissions, they must be received no later than thirty days after the permit application is received by the Office of Oil and Gas.

For information related to horizontal drilling visit: www.dep.wv.gov/oil-and-gas/pages/default.aspx

WW-6A
(9-13)

API NO. 47-009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

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

Date of Notice: _____ **Date Permit Application Filed**: _____

Notice of:

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

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

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

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

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

☑ SURFACE OWNER(s)
Name: Brownlee Land Ventures
Address: PO Box 51
West Middletown PA 15379
Name: _____
Address: _____

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

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

☑ COAL OWNER OR LESSEE
Name: Brownlee Land Ventures
Address: PO Box 51
West Middletown PA 15379

☐ COAL OPERATOR
Name: _____
Address: _____

☑ SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: None
Address: _____

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

*Please attach additional forms if necessary

API NO. 47-009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

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

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

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

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

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

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

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:
Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:
Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

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

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

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

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

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

API NO. 47-009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

WW-6A
(8-13)

API NO. 47-009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

Notice is hereby given by:

Well Operator: SWN Production Co., LLC
Address: 1300 Fort Pierpont Dr., Suite 201
Morgantown, WV 26508
Telephone: 304-884-1610
Email: Brittany_Woody@swn.com
Facsimile: 304-884-1690

Oil and Gas Privacy Notice:

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

Subscribed and sworn before me this _____ day of _____,_____.

_____ Notary Public

My Commission Expires_____

WW-6AW
(1-12)

API NO. 47- 009 - _____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

VOLUNTARY STATEMENT OF NO OBJECTION

Instructions to Persons Named on Page WW-6A
The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

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

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided,* That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

VOLUNTARY STATEMENT OF NO OBJECTION

I, _____, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	West Virginia	UTM NAD 83 Easting:	536935.446
County:	009- Brooke	Northing:	4470930.198
District:	Weirton	Public Road Access:	Park Drive
Quadrangle:	Weirton	Generally used farm name:	Brownlee Land Ventures
Watershed:	Harmon Creek		

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

*Please check the box that applies	**FOR EXECUTION BY A NATURAL PERSON**
☐ SURFACE OWNER	Signature: _____
☐ SURFACE OWNER (Road and/or Other Disturbance)	Print Name: _____
☐ SURFACE OWNER (Impoundments/Pits)	Date: _____
☐ COAL OWNER OR LESSEE	**FOR EXECUTION BY A CORPORATION, ETC.**
☐ COAL OPERATOR	Company:_____
☐ WATER PURVEYOR	By: _____
☐ OPERATOR OF ANY NATURAL GAS STORAGE FIELD	Its: _____
	Signature: _____
	Date: _____

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

WW-6AC
(1/12)

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

Date of Notice Certification: _____

API No. 47- 009 -_____
Operator's Well No. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

State:	West Virginia	UTM NAD 83 Easting:	536935.446
County:	009- Brooke	Northing:	4470930.198
District:	Weirton	Public Road Access:	Park Drive
Quadrangle:	Weirton	Generally used farm name:	Brownlee Land Ventures
Watershed:	Harmon Creek		

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

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY	OOG OFFICE USE ONLY
☐ 1. NOTICE OF SEISMIC ACTIVITY or ☒ NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED	☐ RECEIVED/ NOT REQUIRED
☒ 2. NOTICE OF ENTRY FOR PLAT SURVEY or ☐ NO PLAT SURVEY WAS CONDUCTED	☐ RECEIVED
☒ 3. NOTICE OF INTENT TO DRILL or ☐ NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or ☐ WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)	☐ RECEIVED/ NOT REQUIRED
☒ 4. NOTICE OF PLANNED OPERATION	☐ RECEIVED
☒ 5. PUBLIC NOTICE	☐ RECEIVED
☒ 6. NOTICE OF APPLICATION	☐ RECEIVED

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

WW-6AC
(1/12)

Certification of Notice is hereby given:

THEREFORE, I Brittany Woody, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator:	SWN Production Co., LLC	Address:	1300 Fort Pierpont Dr., Suite 201
By:	Brittany Woody		Morgantown, WV 26508
Its:	Senior Regulatory Analyst	Facsimile:	304-884-1690
Telephone:	304-884-1610	Email:	Brittany_Woody@swn.com

NOTARY SEAL

Subscribed and sworn before me this _____ day of _____.

_____ Notary Public

My Commission Expires_____

Oil and Gas Privacy Notice:

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

WW-6A2
(1/12)

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

Notice Time Requirement: The notice shall be provided at least **THREE (3) DAYS** prior to commencement of the seismic activity.
Date of Notice: _____ **Date of Seismic Activity**: _____

Delivery method pursuant to West Virginia Code § 22-6A-10a

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

Pursuant to West Virginia Code § 22-6A-10(j), (1) Prior to conducting any seismic activity for seismic exploration for natural gas to be extracted using horizontal drilling methods, the company or person performing the activity shall provide notice to Miss Utility of West Virginia Inc. and to all surface owners, coal owners and lessees, and natural gas storage field operators on whose property blasting, percussion or other seismic-related activities will occur. (2) The notice shall be provided at least three days prior to commencement of the seismic activity. (3) The notice shall also include a reclamation plan in accordance with the erosion and sediment control manual that provides for the reclamation of any areas disturbed as a result of the seismic activity, including filling of shotholes used for blasting. (4) Nothing in this subsection decides questions as to whether seismic activity may be secured by mineral owners, surface owners or other ownership interests.

Notice is hereby provided to:

☐ MISS UTILITY OF WEST VIRGINIA INC.
Address: 1300 Fort Pierpont Dr., Suite 201
Morgantown, WV 26508

☐ SURFACE OWNER(s)
Name: _____
Address: _____
_____
Name: _____
Address: _____
_____

☐ COAL OWNER OR LESSEE
Name: _____
Address: _____
_____

☐ NATURAL GAS STORAGE FIELD OPERATOR
Name: _____
Address: _____
_____

Notice is hereby given:
Pursuant to West Virginia Code § 22-6A-10(j), notice is hereby given that the undersigned well operator will be conducting seismic related activities for seismic exploration for natural gas to be extracted using horizontal drilling methods on the tract of land as follows:

State: West Virginia;
County: _____;
District: Weirton;
Quadrangle: Weirton;
UTM Coordinate NAD83 Northing: _____;
UTM Coordinate NAD83 Easting: _____;
Public Road Access: Park Drive;
Watershed: Harmon Creek;
Generally used farm name: Brownlee Land Ventures;

This Notice Shall Include:
Pursuant to West Virginia Code § 22-6A-10(j)(3), this notice shall include a reclamation plan in accordance with the erosion and sediment control manual that provides for the reclamation of any areas disturbed as a result of the seismic activity, including filling of shotholes used for blasting. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:
Well Operator: SWN Production Co., LLC
Telephone: 304-884-1610
Email: Brittany_Woody@swn.com
Address: 1300 Fort Pierpont Dr., Suite 201
Morgantown, WV 26508
Facsimile: 304-884-1690

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

WW-6A3
(1/12)

Operator Well No. Brownlee Land Ventures BRK 6

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry
Date of Notice: _____ **Date of Planned Entry**: _____

Delivery method pursuant to West Virginia Code § 22-6A-10a

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

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

☐ SURFACE OWNER(s)
Name: _____
Address: _____
_____
Name: _____
Address: _____
_____
Name: _____
Address: _____
_____

☐ COAL OWNER OR LESSEE
Name: _____
Address: _____
_____

☐ MINERAL OWNER(s)
Name: _____
Address: _____
_____
*please attach additional forms if necessary

Notice is hereby given:
Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State:	West Virginia	Approx. Latitude & Longitude:	
County:	009- Brooke	Public Road Access:	Park Drive
District:	Weirton	Watershed:	Harmon Creek
Quadrangle:	Weirton	Generally used farm name:	Brownlee Land Ventures

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator:	SWN Production Co., LLC	Address:	1300 Fort Pierpont Dr., Suite 201 Morgantown, WV 26508
Telephone:	304-884-1610		
Email:	Brittany_Woody@swn.com	Facsimile:	304-884-1690

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

WW-6A4
(1/12)

Operator Well No. Brownlee Land Ventures BRK 6

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

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

Notice Time Requirement: Notice shall be provided at least **TEN (10)** days prior to filing a permit application.
Date of Notice: _____ **Date Permit Application Filed**: _____

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

☐ HAND DELIVERY ☐ CERTIFIED MAIL RETURN RECEIPT REQUESTED

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

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

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____

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

State:	West Virginia	UTM NAD 83 Easting:	536935.446
County:	009- Brooke	Northing:	4470930.198
District:	Weirton	Public Road Access:	Park Drive
Quadrangle:	Weirton	Generally used farm name:	Brownlee Land Ventures
Watershed:	Harmon Creek		

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

Notice is hereby given by:

Well Operator:	SWN Production Co., LLC	Authorized Representative:	
Address:	1300 Fort Pierpont Dr., Suite 201	Address:	
	Morgantown, WV 26508		
Telephone:	304-884-1610	Telephone:	
Email:	Brittany_Woody@swn.com	Email:	
Facsimile:	304-884-1690	Facsimile:	

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

WW-6A4W
(1/12)

Operator Well No. Brownlee Land Ventures BRK 6

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

WAIVER

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

Surface Owner Waiver:
I, _____, hereby state that I have read the notice provisions listed above and hereby waive the notice requirements under West Virginia Code § 22-6A-16(b) for the tract of land as follows:

State:	West Virginia	UTM NAD 83	Easting:	536935.446
County:	009- Brooke		Northing:	4470930.198
District:	Weirton	Public Road Access:		Park Drive
Quadrangle:	Weirton	Generally used farm name:		Brownlee Land Ventures
Watershed:	Harmon Creek			

Name: _____
Address: _____
_____

Signature: _____

Date: _____

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

WW-6A5
(1/12)

Operator Well No. Brownlee Land Ventures BRK

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

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**
Date of Notice: _____ **Date Permit Application Filed**: _____

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

☐ CERTIFIED MAIL
RETURN RECEIPT REQUESTED

☐ HAND
DELIVERY

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

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

Name: _____
Address: _____
_____

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

State:	West Virginia	UTM NAD 83 Easting:	536935.446
County:	009- Brooke	Northing:	4470930.198
District:	Weirton	Public Road Access:	Park Drive
Quadrangle:	Weirton	Generally used farm name:	Brownlee Land Ventures
Watershed:	Harmon Creek		

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

Well Operator:	SWN Production Co., LLC	Address:	1300 Fort Pierpont Dr., Suite 201
Telephone:	304-884-1610		Morgantown, WV 26508
Email:	Brittany_Woody@swn.com	Facsimile:	304-884-1690

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

WW-6RW
(1-12)

API NO. 47- 009 -_____
OPERATOR WELL NO. Brownlee Land Ventures BRK 6
Well Pad Name: Brownlee Land Ventures

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

WELL LOCATION RESTRICTION WAIVER

The well operator, _____ is applying for a permit from the State of West Virginia to conduct oil or gas well work. Please be advised that well work permits are valid for twenty-four (24) months.

Well Location Restrictions

Pursuant to West Virginia Code § 22-6A-12(a), Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements.

WAIVER

I, _____, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	West Virginia	UTM NAD 83 Easting:	
County:	009- Brooke	UTM NAD 83 Northing:	
District:	Weirton	Public Road Access:	Park Drive
Quadrangle:	Weirton	Generally used farm name:	Brownlee Land Ventures
Watershed:	Harmon Creek		

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials and I therefore waive all well site restrictions listed under West Virginia Code § 22-6A-12(a).

WELL SITE RESTRICTIONS BEING WAIVED	**FOR EXECUTION BY A NATURAL PERSON**
*Please check all that apply	Signature: _____
☐ EXISTING WATER WELLS	Print Name: _____
☐ DEVELOPED SPRINGS	Date: _____
☐ DWELLINGS	**FOR EXECUTION BY A CORPORATION, ETC.**
☐ AGRICULTURAL BUILDINGS	Company:_____
	By: _____
	Its: _____
	Signature: _____
	Date: _____

Well Operator: SWN Production Co., LLC
By:_____
Its: _____

Signature:_____
Telephone: _____

NOTARY SEAL

Subscribed and sworn before me this_____day of _____

_____Notary Public

My Commission Expires _____

Oil and Gas Privacy Notice:

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

WW-6A1
(5/13)

Operator's Well No. Brownlee Land Ventures BRK 6

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

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

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

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

See Exhibit A

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

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

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

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

Well Operator: SWN Production Co., LLC
By: Brittany Woody
Its: Senior Regulatory Analyst

WW-9
(2/15)

API Number 47 - 009 - _____

Operator's Well No. Brownlee Land Ventures BRK 6

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) Harmon Creek Quadrangle Weirton

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

Will a pit be used? Yes ☐ No ☑

If so, please describe anticipated pit waste: _____

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

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
■ Underground Injection (UIC Permit Number 34-155-22403, 34-059-24067, 34-119-28776, 34-167-23862, 34-155-23795, 34-121-23995, 34-155-21893)
■ Reuse (at API Number at next anticipated well, API# will be included with the WR-34/DDMR &/or permit addendum.)
_____ Off Site Disposal (Supply form WW-9 for disposal location)
■ Other (Explain flow back fluids will be put in steel tanks and reused or taken to a permitted disposal facility

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

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

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

Additives to be used in drilling medium? Attachment 3A

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

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

-Landfill or offsite name/permit number? Meadowfill SWF- 1032, Short Creek SWF-1034,Carbon Limestone MSWL018781, Wetzel County 1021 Arden Landfill 100172, Apex Sanitary Landfill 06-08438, Brooke Co SWF-1013, Valley 100280

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 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) Brittany Woody

Company Official Title Senior Regulatory Analyst

Subscribed and sworn before me this_____ day of_____, 20_____

_____ Notary Public

My commission expires_____

Form WW-9

Operator's Well No. Brownlee Land Ventures BRK 6

SWN Production Co., LLC

Proposed Revegetation Treatment: Acres Disturbed 4.94 Prevegetation pH _____

Lime as determined by pH test min. 2 Tons/acre or to correct to pH 3.62

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
Attachment 3B			

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: _____

Comments: _____

Title: Oil and Gas Inspector Date: _____

Field Reviewed? (_____) Yes (_____) No

Site Safety Plan Table of Contents

For H6A Well Work Permits and Deep Well Work Permits

Please prepare a Site Safety Plan to accompany each applicable H6A and/or Deep well work permit, adhering to the following organizational and informational structure. Plans submitted must contain an index of the content entirety including page-number references.

1. Contacts, Schedules, and Meetings

A. Emergency point of contact for the well operator covering all phases of activities and including 24 hour contact information (35-8 5.7.b.4)

B. List of telephone numbers for (35-8 5.6.4):
   1. Operator
   2. Contractors
   3. DEP office and oil/gas inspector
   4. Local emergency response units
   5. Local ER personnel
   6. All schools and public facilities within a one mile radius of proposed well site (35-8 5.7.b.5)

C. Method of notification of public of H_2S gas presence and how access will be controlled**.** (applicable horizontal wells include all residents and emergency response personnel who may be affected by an event. Such events may include the presence of H2S, blow-outs, and flaring) (35-8 5.7.f.1)

D. Pre-spud meeting held prior to drilling operations, including (35-8 5.7.h):
   1. Attendance log, including personnel to be employed and involved in drilling operations
   2. Notification of County oil and gas inspector or other designated Office of Oil and Gas representative

E. Describe schedule for conducting regular well site safety meetings. Log attendance at all meetings and also initiate check in check out during drilling, completion, and workover phases (35-8 5.7.h)

2. Maps and Diagrams

A. Plan view map of location, access road, pit(s), flare lines, nearby dwellings, note the north direction and the prevailing wind direction (35-8 5.7.b.1)

B. Topographic map of well location, including
   1. 1 mile radius of well location
   2. UTM NAD 83 coordinates of well site entrance (35-8 5.7.b.2)
   3. UTM NAD 83 coordinates of the point the access road intersects the public route (35-8 5.7.b.2)
   4. Identify public route number and/or route name (35-8 5.7.b.2)

C. Evacuation plan for the removal of personnel from the drilling location and residents in the surrounding area who have the potential to be affected by an emergency (35-8 5.7.b.3)

3. Well Work

A. Detailed written descriptions of well work and procedure to be used during the drilling, completion, and production phases, including schematic plan views of each (35-8 5.7.a)

B. Statement detailing how a copy of the plan will be provided to the local emergency planning committee or county emergency services office within at least 7 days from land disturbance or well work (35-8 5.7.a)

4. Chemical Inventory & MSDS

A. Material Safety Data Sheets for all chemicals anticipated to be used in all aspects of the operation (can be provided on CD or USB drive) (35-8 5.7.a)
B. Statement that all MSDS are to be readily available at the well site and their location indicated in the site safety plan including contact information for person(s) responsible maintaining them on site. (35-8 5.7.g)
C. Inventory of all materials on site for mixing of mud including numbers and type of mixing units - mixed mud amount and weight, amount of weighting material and volume of mixing fluid (35-8 5.7.d.1 & 5.7.d.2)

5. BOP and Well Control

A. BOP equipment and casing heads with types, sizes and ratings to be utilized and available during the drilling for both intermediate and lateral drilling phases (35-8 5.7.c.1 & 5.7.c.8)
B. Procedure and schedule for testing the BOP stack for intermediate drilling phase the BOP tested upon initial set up and the annular tested to 70% of capacity and the ram preventers tested to 80%. Same testing % for bottom and horizontal phase except testing to be done upon initial installation, weekly and after each bit trip (35-8 5.7.c.2)
C. BOP equipment and assembly installation schedule (35-8 5.7.c.3)
D. List and names of all personnel with well control training (35-8 5.7.c.4)
E. Description of system of maintaining detailed records of and for immediate notification to OOG inspector for all significant drilling issues, including but not limited to (35-8 5.7.c.5):
    1. Lost circulation
    2. Hydrogen sulfide gas
    3. Fluid entry
    4. Abnormal pressures
F. Notification of the oil and gas inspector or designated representative as soon as possible of any unusual drilling events, hydrogen sulfide gas***** or large kicks that occur during drilling operations). *(Mandatory immediate notification is required of any encounter of hydrogen sulfide gas - 22-6A wells >10ppm H2S Gasses!) (35-8 5.7.c.5)
G. Schematic and detailed written description of the wellhead assembly to be placed on the well upon completion (35-8 5.7.c.6)
H. Method and type of kill procedures as recognized by the IADC – Wild Well Control Kill Sheet (35-8 5.7.d.3)

6. Hydrogen Sulfide (H_2S)

A. Detection, monitoring and warning equipment including location of the monitoring detection equipment on the site (35-8 5.7.e.1)
B. Statement of H_2S personnel training provided (35-8 5.7.e.2)
C. Method to notify the OOG of H_2S presence (35-8 5.7.e.4)
D. Establish and maintain Protection Zones. Describe detailed written general procedures proposed in drilling phases. (application horizontal wells must include the completion, work-over, and production phases) (35-8 5.7.f.2)
E. List of personal protective equipment (PPE) and the amount of each piece of PPE that will be maintained and available on site. (35-8 5.7.e.3)

7. Flaring

A. Proposed written description and plan including schematic of installation for duration of flaring activities (35-8 5.7.f.1)

8. Collision Avoidance

A. Protocol and established safeguard designed to prevent underground collisions during any drilling on multi-well pads(35-8 5.7)

9. Deep Well Additional Requirements

A. List of anticipated freshwater, saltwater, oil and gas, hydrogen sulfide, thief zones, high pressure and volume zones and their expected depths
B. Detailed casing and cementing program that employs a minimum of three strings of casing which are sufficient weight and quality for the anticipated conditions
C. Flaring activities: Size, construction and length of flare line-anchor method and choke assembly description, Flare lighting system and back up igniters, Notify local fire department (if possible) prior to igniting flares, Minimum clearing distance beyond end of flare.
D. List of names, addresses, and telephone numbers of all residents, businesses, churches, schools and emergency facilities within 1 mile radius that may be affected by specific events during the drilling process. Such events may include presence of hydrogen sulfide, and flaring, etc.

10. Deep Vertical Well Requirements per Policy Statement (Deep Well Drilling Procedures and Site Safety Plan Requirements)

The following selections are needed from the above contents:

1. A - E (E. drilling phase only)
2. A - C
3. A (drilling phase only)
4. B - C
5. A - H
6. A - E
9. A - D.

WW-6A7
(6-12)

OPERATOR: SWN Production Co., LLC WELL NO: Brownlee Land Ventures BRK 6

PAD NAME: Brownlee Land Ventures

REVIEWED BY: _____ SIGNATURE: _____

WELL RESTRICTIONS CHECKLIST

HORIZONTAL 6A WELL

Well Restrictions

☐ At Least 100 Feet from Pad and LOD (including any E&S Control Feature) to any Perennial Stream, Lake, Pond, Reservoir or Wetland; OR

☐ DEP Waiver and Permit Conditions

☐ At Least 300 Feet from Pad and LOD (including any E&S Control Feature) to any Naturally Producing Trout Stream; OR

☐ DEP Waiver and Permit Conditions

☐ At Least 1000 Feet from Pad and LOD (including any E&S Control Feature) to any Groundwater Intake or Public Water Supply; OR

☐ DEP Waiver and Permit Conditions

☑ At Least 250 Feet from an Existing Water Well or Developed Spring to Well Being Drilled; OR

☐ Surface Owner Waiver and Recorded with County Clerk, OR

☐ DEP Variance and Permit Conditions

☐ At Least 625 Feet from an Occupied Dwelling Structure to Center of the Pad; OR

☐ Surface Owner Waiver and Recorded with County Clerk, OR

☐ DEP Variance and Permit Conditions

☐ At Least 625 Feet from Agricultural Buildings Larger than 2500 Square Feet to the Center of the Pad; OR

☐ Surface Owner Waiver and Recorded with County Clerk, OR

☐ DEP Variance and Permit Conditions

OPERATOR: SWN Production Co., LLC

PAD NAME: Brownlee Land Ventures WELL: Brownlee Land Ventures BRK 6

PAD BUILT: _____YES _____NO DATE REVIEWED: _____INT._____

REVIEWED BY (APPLICANT): _____

CONTACT PHONE: _____ EMAIL: _____

APPLICANT SIGNATURE: _____

CHECKLIST FOR FILING A PERMIT
HORIZONTAL 6A WELL

Please include these required elements in the Horizontal Well 6A applications, in order listed below. Do not use staples.

First Well	Subsequent Well
$10,150.00 ☐	$5,150.00 ☐

_____ Fees

_____Checklist / Cover letter

_____ WW-6B Notice of Application _____ Field Approved

_____Cement Additives

_____Well Bore Schematic

_____ WW-9 Fluids/Cuttings Disposal and Reclamation Plan _____ Field Approved

_____ Site Safety Plan _____ Field Approved

_____ Water Management Plan _____ DWWM Approval

_____Topographic Map w/water purveyors, showing access road

_____ Mylar Plat (Signed and sealed) (Surface Owner matches WW-6A)

_____ WW-6A1 Lease Information

_____ Road Crossing Letter

_____ WW-PN Application Notice by Publication

_____ Public Notice (dated copy of advertisement or affidavit of publication)

_____ WW-6AC Notice Certifications, notarized

_____ WW-6A Notice of Application notarized w/ any attachments

_____Topographic Map with labeled surrounding water wells

_____ Certified Mail receipts for WW-6A

_____ WW-6A3 Notice of Entry for Plat Survey

_____ Certified Mail receipts for WW-6A3

_____ WW-6A4 Notice of Intent to Drill

_____ Certified Mail receipts for WW-6A4

_____ WW-6A5 Notice of Planned Operation

_____ Certified Mail receipts for WW-6A5

_____ WW-6RW Well Location Restriction Waiver

_____ WW-6AW Voluntary Statement of No Objection

_____Waiver for Surface Owner at Wellhead

_____Waiver for Surface Owner for Roads or other Disturbances

_____Waiver for Coal Owner, Operator or Lessee

_____Waiver for surface owner for Impoundment or Pit

_____Waiver for Surface Owner or Water Purveyor within 1500 feet of Center of Pad

_____Waiver for Natural gas Storage Field Operator

_____ Road Bonding Agreement / DOH Certification

_____ Frac Additives List of Chemical Names & CAS #s

_____ Site Construction, Reclamation, Erosion & Sediment Control Plans _____ Field Approved

_____Copy of To Scale Plans

_____Inspector packet mailed to inspector (Plat, Topographic Map, WW-6B, WW-9, All Plans)

_____ Bond ($250,000)

_____Operator is registered with the SOS

_____Workers Compensation / Unemployment Insurance account is OK

_____ Professional Engineer/Company has COA

_____ Check for Mine Data at proposed coordinates

_____ Check for Floodplain Data at proposed coordinates

_____ IMP-1A Associated Pit or Impoundment

_____ WW-6A7 Well Restrictions Form w/ Signature

_____ At Least 100 Feet from Pad and LOD (including any E&S Control Feature) to any Perennial Stream, Lake, Pond, Reservoir or Wetland

_____ DEP Waiver and Permit Conditions

_____ At Least 300 Feet from Pad and LOD (including any E&S Control Feature) to any Naturally Producing Trout Stream

_____ DEP Waiver and Permit Conditions

_____ At Least 1000 Feet from Pad and LOD (including any E&S Control Feature) to any Groundwater Intake or Public Water Supply

_____ DEP Waiver and Permit Conditions

_____ At Least 250 Feet from an Existing Water Well or Developed Spring to Well Being Drilled

_____ Surface Owner Waiver and Recorded with County Clerk, OR

_____ DEP Variance and Permit Conditions

_____ At Least 625 Feet from an Occupied Dwelling Structure to the Center of the Pad

_____ Surface Owner Waiver and Recorded with County Clerk, OR

_____ DEP Variance and Permit Conditions

_____ At Least 625 Feet from Agricultural Buildings Larger than 2500 Square Feet to the Center of the Pad

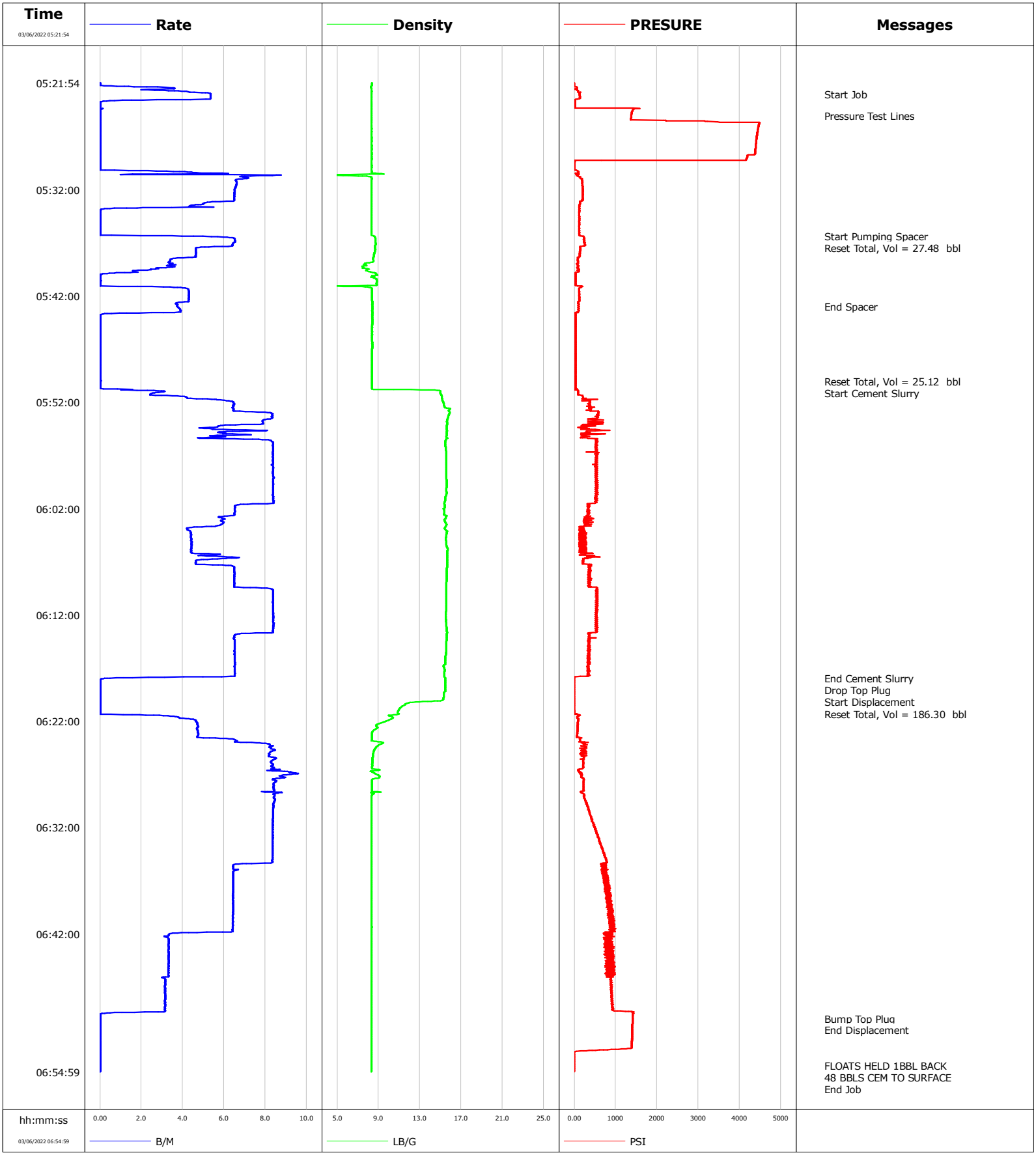
_____ Surface Owner Waiver and Recorded with County Clerk, OR

_____ DEP Variance and Permit Conditions

Schlumberger

Cementing Job Report

Well	CARL ROTTER OHI 206H	**Client**	SWN PRODUCTION COMPANY
Field	PANHANDLE	**SIR No.**	EN82- 03879
Engineer	BRIAN FOOTE	**Job Type**	INTERMEDIATE
Country	United States	**Job Date**	03-06-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN PRODUCTION COMPANY	EN82- 03879

Well	Location (legal)	Schlumberger Location	Job Start
CARL ROTTER OHI 206H 206H	VALLEY GROVE	STRASBURG	Mar/06/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Clean-Sandstone	1 deg	12.3 in	2209.0 ft	2209.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
OHIO	West Virginia	psi	83 degF	80 degF	lb/gal
Well Mast	API/UWI				
47-069-00329-00-00					

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Clear Brine	lb/gal	cP

Service Line	Job Type
Cementing	INTERMEDIATE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

CEMENT 2192' OF 9 5/8 36 # WITH
25 BBL GEL
179 BBL CLASS A 15.6PPG
844 SK 1.19 YLD 5.27 H20
DROP TOP PLUG
DISP 165.8 BBL H20
FLOATS HELD 1 BBL BACK
48 BBL CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2192.0	9.6	32.3	K55	8RD
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	165.6 bbl	Other	ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	168.8 bbl	49.2 bbl	79.2 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Casing Tools	Squeeze Job
X	X		

Lift Pressure	900 psi	Shoe Type	Float	Squeeze Type	
Pipe Rotated	☐	Pipe Reciprocated	☐	Shoe Depth	192.0 ft	Tool Type	
No. Centralizers		Top Plugs	1	Bottom Plugs	Stage Tool Type		Tool Depth	ft
Cement Head Type	Single				Stage Tool Depth	ft	Tail Pipe Size	in
Job Scheduled For	Arrived on Location	Leave Location			Collar Type	Float	Tail Pipe Depth	ft
Mar/06/2022	Mar/06/2022	Mar/06/2022			Collar Depth	50.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/06/2022	05:21:54	-7	0.0	0.0	8.34	
03/06/2022	05:22:54	134	5.3	2.3	8.33	
03/06/2022	05:23:00	121	5.4	2.8	8.33	Start Job
03/06/2022	05:23:54	16	0.0	5.7	8.33	
03/06/2022	05:24:54	1381	0.0	5.7	8.33	
03/06/2022	05:25:00	1377	0.0	5.7	8.33	Pressure Test Lines
03/06/2022	05:25:54	4462	0.0	5.7	8.33	
03/06/2022	05:26:54	4418	0.0	5.7	8.33	
03/06/2022	05:27:54	4387	0.0	5.7	8.33	
03/06/2022	05:28:54	4180	0.0	5.7	8.33	
03/06/2022	05:29:54	10	0.0	5.7	8.33	
03/06/2022	05:30:54	154	7.1	9.7	8.36	
03/06/2022	05:31:54	204	6.5	16.3	8.33	
03/06/2022	05:32:54	197	6.5	22.8	8.33	
03/06/2022	05:33:54	127	0.0	26.9	8.33	
03/06/2022	05:34:54	118	0.0	26.9	8.33	
03/06/2022	05:35:54	113	0.0	26.9	8.33	
03/06/2022	05:36:21	200	4.5	27.1	8.60	Start Pumping Spacer
03/06/2022	05:36:25	225	5.7	27.5	8.64	Reset Total, Vol = 27.48 bbl
03/06/2022	05:36:54	237	6.5	3.1	8.69	
03/06/2022	05:37:54	147	4.6	8.6	8.61	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 206H 206H	PANHANDLE	Mar/06/2022	SWN PRODUCTION COMPANY	EN82- 03879

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/06/2022	05:39:54	31	0.1	15.0	8.75	
03/06/2022	05:40:54	29	0.0	15.0	8.81	
03/06/2022	05:41:54	113	4.3	18.4	8.37	
03/06/2022	05:42:54	95	3.7	22.5	8.38	
03/06/2022	05:43:00	115	3.7	22.9	8.38	End Spacer
03/06/2022	05:43:54	24	0.0	25.1	8.38	
03/06/2022	05:44:54	27	0.0	25.1	8.38	
03/06/2022	05:45:54	26	0.0	25.1	8.38	
03/06/2022	05:46:54	27	0.0	25.1	8.38	
03/06/2022	05:47:54	27	0.0	25.1	8.37	
03/06/2022	05:48:54	27	0.0	25.1	8.37	
03/06/2022	05:49:54	27	0.0	25.1	8.37	
03/06/2022	05:50:02	27	0.0	25.1	8.37	Reset Total, Vol = 25.12 bbl
03/06/2022	05:50:08	26	0.0	0.0	8.37	Start Cement Slurry
03/06/2022	05:50:54	85	2.8	0.3	14.96	
03/06/2022	05:51:54	381	6.4	4.2	15.24	
03/06/2022	05:52:54	590	7.8	10.7	15.89	
03/06/2022	05:53:54	581	7.9	18.9	15.63	
03/06/2022	05:54:54	285	6.1	25.2	15.58	
03/06/2022	05:55:54	532	8.4	32.2	15.47	
03/06/2022	05:56:54	580	8.4	40.6	15.56	
03/06/2022	05:57:54	545	8.3	49.0	15.54	
03/06/2022	05:58:54	509	8.4	57.3	15.54	
03/06/2022	05:59:54	573	8.4	65.7	15.58	
03/06/2022	06:00:54	527	8.4	74.1	15.46	
03/06/2022	06:01:54	334	6.5	81.8	15.39	
03/06/2022	06:02:54	403	6.0	88.2	15.49	
03/06/2022	06:03:54	209	4.2	93.8	15.42	
03/06/2022	06:04:54	119	4.4	98.1	15.50	
03/06/2022	06:05:54	210	4.4	102.5	15.68	
03/06/2022	06:06:54	201	4.6	107.7	15.66	
03/06/2022	06:07:54	391	6.5	113.5	15.59	
03/06/2022	06:08:54	380	6.5	120.0	15.57	
03/06/2022	06:10:54	549	8.4	135.7	15.55	
03/06/2022	06:11:54	534	8.4	144.1	15.50	
03/06/2022	06:12:54	510	8.4	152.5	15.54	
03/06/2022	06:13:54	353	6.5	160.5	15.61	
03/06/2022	06:14:54	386	6.5	167.0	15.53	
03/06/2022	06:15:54	358	6.5	173.5	15.46	
03/06/2022	06:16:54	315	6.5	180.1	15.31	
03/06/2022	06:17:54	-9	1.1	186.3	15.44	
03/06/2022	06:17:56	-9	0.5	186.3	15.45	End Cement Slurry
03/06/2022	06:18:00	-9	0.1	186.3	15.46	Drop Top Plug
03/06/2022	06:18:02	-9	0.1	186.3	15.46	Start Displacement
03/06/2022	06:18:12	-7	0.0	186.3	15.44	Reset Total, Vol = 186.30 bbl
03/06/2022	06:18:54	-6	0.0	0.0	15.43	
03/06/2022	06:19:54	-2	0.0	0.0	15.26	
03/06/2022	06:20:54	-1	0.0	0.0	10.98	
03/06/2022	06:21:54	97	4.6	2.0	9.97	
03/06/2022	06:22:54	72	4.7	6.7	8.49	
03/06/2022	06:24:54	285	8.2	20.1	8.51	
03/06/2022	06:25:54	215	8.3	28.4	8.40	
03/06/2022	06:26:54	148	9.5	36.9	8.66	
03/06/2022	06:27:54	233	8.4	45.6	8.36	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 206H 206H	PANHANDLE	Mar/06/2022	SWN PRODUCTION COMPANY	EN82- 03879

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/06/2022	06:29:54	310	8.4	62.4	8.33	
03/06/2022	06:30:54	393	8.4	70.8	8.33	
03/06/2022	06:31:54	474	8.4	79.2	8.33	
03/06/2022	06:32:54	566	8.4	87.5	8.32	
03/06/2022	06:33:54	670	8.3	95.9	8.32	
03/06/2022	06:34:54	764	8.3	104.2	8.32	
03/06/2022	06:35:54	657	6.4	111.6	8.32	
03/06/2022	06:36:54	763	6.4	118.0	8.32	
03/06/2022	06:37:54	845	6.4	124.5	8.32	
03/06/2022	06:38:54	812	6.4	130.9	8.32	
03/06/2022	06:39:54	827	6.4	137.3	8.32	
03/06/2022	06:40:54	928	6.4	143.8	8.32	
03/06/2022	06:41:54	744	3.9	150.1	8.31	
03/06/2022	06:42:54	762	3.3	153.4	8.32	
03/06/2022	06:43:54	916	3.3	156.7	8.32	
03/06/2022	06:44:54	844	3.3	160.0	8.32	
03/06/2022	06:45:54	774	3.3	163.3	8.32	
03/06/2022	06:46:54	884	3.1	166.5	8.32	
03/06/2022	06:47:54	920	3.1	169.6	8.31	
03/06/2022	06:48:54	935	3.1	172.8	8.32	
03/06/2022	06:49:54	1410	0.0	174.3	8.32	
03/06/2022	06:50:00	1410	0.0	174.3	8.32	Bump Top Plug
03/06/2022	06:50:54	1402	0.0	174.3	8.32	
03/06/2022	06:51:00	1402	0.0	174.3	8.32	End Displacement
03/06/2022	06:51:54	1394	0.0	174.3	8.32	
03/06/2022	06:52:54	904	0.0	174.3	8.32	
03/06/2022	06:53:54	-1	0.0	174.3	8.32	
03/06/2022	06:54:25	-1	0.0	174.3	8.32	FLOATS HELD 1BBL BACK
03/06/2022	06:54:50	-1	0.0	174.3	8.32	48 BBLS CEM TO SURFACE
03/06/2022	06:54:54	-1	0.0	174.3	8.32	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.8			9.6	186.0	0.0	26.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
1410	900	597	1400			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	178.0 bbl	165.6 bbl	64 degF	X	48.0 bbl
				Washed Thru Perfs ☐	To ft

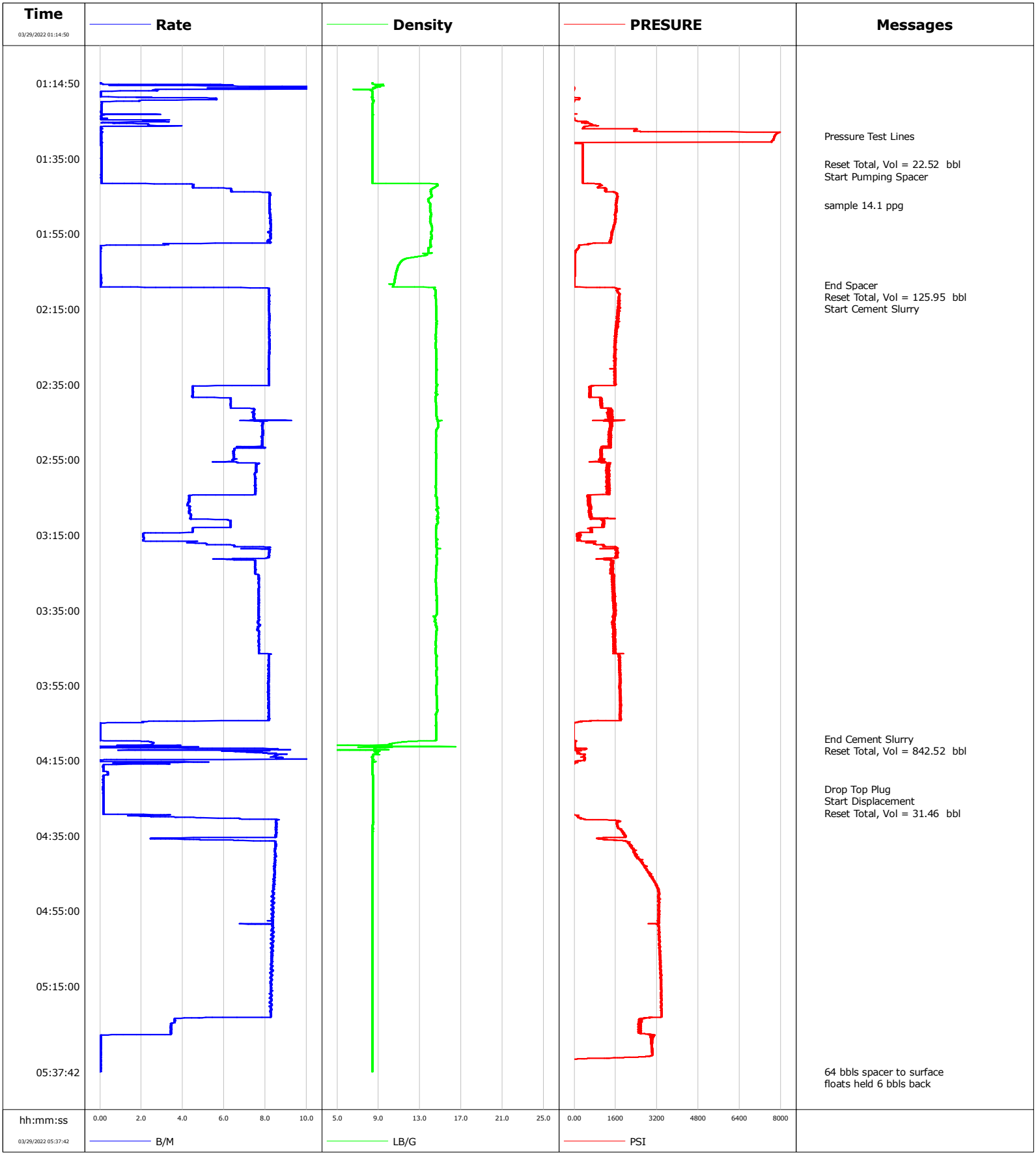
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
COMPANY MAN	BRIAN FOOTE	-	-

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	CARL ROTTER OHI 6H	**Client**	SWN PRODUCTION COMPANY
Field	PANHANDLE	**SIR No.**	EN82-04416
Engineer	BRIAN FOOTE	**Job Type**	PRODUCTION
Country	United States	**Job Date**	03-28-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN PRODUCTION COMPANY	EN82-04416

Well	Location (legal)	Schlumberger Location	Job Start
CARL ROTTER OHI 6H 6H	CARL ROTTER PAD	STRASBURG	Mar/28/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Shale	90 deg	8.8 in	19609.0 ft	6747.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
BARBOUR	West Virginia	psi	134 degF	133 degF	lb/gal

Well Mast	API/UWI
47-069-00327-00-00	47-069-00327

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Oil Mud	13.50 lb/gal	cP

Service Line	Job Type
Cementing	PRODUCTION

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

CEMENT 19607'5.5 20# PRODUCTION CASING WITH
120 BBLS MPE 14 PPG
DROP BOTTOM PLUG
790 BBLS CEM 14.5 PPG
3439 SKS CLASS A
YLD 1.29 H20 5.98
DROP TOP PLUG
434.3 BBLS DISPLACEMENT
FLOATS HELD 6 BBLS BACK,
64 BBLS SPACER TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
19607.0	5.5	20.0	P110	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	434.2 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	435.2 bbl	105.4 bbl	830.6 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
2600 psi	X	

No. Centralizers	Top Plugs	Bottom Plugs
383	1	1

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Mar/28/2022	Mar/28/2022	Mar/28/2022

Casing Tools

Shoe Type	Float
Shoe Depth	19607.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	19561.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/29/2022	01:14:50	27	0.0	0.0	8.42	Started Acquisition
03/29/2022	01:15:55	8	18.1	4.5	9.09	
03/29/2022	01:17:00	32	2.8	13.0	8.33	
03/29/2022	01:18:05	6	0.0	13.1	8.41	
03/29/2022	01:19:10	265	5.6	15.4	8.41	
03/29/2022	01:20:15	24	0.1	17.6	8.43	
03/29/2022	01:21:20	8	0.1	17.7	8.41	
03/29/2022	01:22:25	4	0.1	17.8	8.41	
03/29/2022	01:23:30	24	0.1	18.1	8.42	
03/29/2022	01:24:35	73	0.1	18.2	8.41	
03/29/2022	01:25:40	630	1.0	20.1	8.41	
03/29/2022	01:26:45	432	0.0	22.0	8.41	
03/29/2022	01:27:50	2637	0.1	22.0	8.41	
03/29/2022	01:28:55	7839	0.0	22.1	8.41	
03/29/2022	01:29:04	7827	0.1	22.1	8.41	Pressure Test Lines
03/29/2022	01:30:00	7778	0.1	22.1	8.41	
03/29/2022	01:31:05	392	0.0	22.2	8.41	
03/29/2022	01:32:10	397	0.1	22.3	8.41	
03/29/2022	01:33:15	397	0.1	22.3	8.41	
03/29/2022	01:34:20	397	0.1	22.4	8.41	
03/29/2022	01:35:25	396	0.1	22.5	8.41	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 6H 6H	PANHANDLE	Mar/28/2022	SWN PRODUCTION COMPANY	EN82-04416

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/29/2022	01:36:33	396	0.1	22.5	8.42	Reset Total, Vol = 22.52 bbl
03/29/2022	01:36:38	396	0.1	0.0	8.42	Start Pumping Spacer
03/29/2022	01:37:35	394	0.1	0.1	8.41	
03/29/2022	01:38:40	391	0.1	0.1	8.41	
03/29/2022	01:39:45	388	0.1	0.2	8.41	
03/29/2022	01:40:50	386	0.1	0.3	8.41	
03/29/2022	01:41:55	1069	4.5	1.4	14.69	
03/29/2022	01:43:00	1254	6.4	6.6	14.22	
03/29/2022	01:44:05	1677	8.2	13.9	14.06	
03/29/2022	01:45:10	1725	8.2	22.8	14.10	
03/29/2022	01:46:15	1715	8.2	31.7	13.82	
03/29/2022	01:47:20	1685	8.2	40.5	14.00	
03/29/2022	01:47:22	1694	8.2	40.8	14.00	sample 14.1 ppg
03/29/2022	01:48:25	1697	8.2	49.4	14.00	
03/29/2022	01:49:30	1680	8.2	58.3	14.06	
03/29/2022	01:50:35	1663	8.2	67.2	14.05	
03/29/2022	01:51:40	1660	8.2	76.2	13.99	
03/29/2022	01:52:45	1606	8.3	85.1	14.11	
03/29/2022	01:53:50	1585	8.2	94.0	14.18	
03/29/2022	01:54:55	1517	8.2	102.9	14.09	
03/29/2022	01:56:00	1519	8.2	111.9	14.09	
03/29/2022	01:57:05	1471	8.2	120.7	13.97	
03/29/2022	01:58:10	248	0.0	125.8	14.02	
03/29/2022	01:59:15	164	0.0	125.8	13.82	
03/29/2022	02:00:20	114	0.0	125.8	13.64	
03/29/2022	02:01:25	107	0.0	125.8	11.97	
03/29/2022	02:02:30	107	0.0	125.8	11.14	
03/29/2022	02:03:35	106	0.0	125.8	10.88	
03/29/2022	02:04:40	106	0.0	125.8	10.77	
03/29/2022	02:05:45	108	0.0	125.9	10.67	
03/29/2022	02:06:50	91	0.0	125.9	10.58	
03/29/2022	02:07:55	90	0.0	125.9	10.53	
03/29/2022	02:08:36	90	0.0	126.0	10.41	End Spacer
03/29/2022	02:08:38	90	0.0	126.0	10.41	Reset Total, Vol = 125.95 bbl
03/29/2022	02:08:42	90	0.0	0.0	10.41	Start Cement Slurry
03/29/2022	02:09:00	90	0.0	0.0	10.39	
03/29/2022	02:10:05	1697	8.2	6.9	14.52	
03/29/2022	02:11:10	1827	8.2	15.7	14.48	
03/29/2022	02:12:15	1820	8.2	24.6	14.53	
03/29/2022	02:13:20	1769	8.2	33.4	14.56	
03/29/2022	02:14:25	1789	8.2	42.3	14.57	
03/29/2022	02:15:30	1794	8.2	51.1	14.59	
03/29/2022	02:16:35	1746	8.2	60.0	14.60	
03/29/2022	02:17:40	1771	8.2	68.9	14.62	
03/29/2022	02:18:45	1737	8.2	77.8	14.61	
03/29/2022	02:19:50	1731	8.2	86.6	14.57	
03/29/2022	02:20:55	1720	8.2	95.5	14.55	
03/29/2022	02:22:00	1669	8.2	104.3	14.52	
03/29/2022	02:23:05	1670	8.2	113.2	14.53	
03/29/2022	02:24:10	1657	8.2	122.1	14.52	
03/29/2022	02:25:15	1618	8.2	131.0	14.49	
03/29/2022	02:26:20	1656	8.2	139.8	14.59	
03/29/2022	02:27:25	1651	8.2	148.7	14.61	
03/29/2022	02:28:30	1690	8.2	157.6	14.62	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 6H 6H	PANHANDLE	Mar/28/2022	SWN PRODUCTION COMPANY	EN82-04416

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/29/2022	02:30:40	1620	8.2	175.2	14.61	
03/29/2022	02:31:45	1656	8.2	184.1	14.61	
03/29/2022	02:32:50	1638	8.2	192.9	14.61	
03/29/2022	02:33:55	1636	8.2	201.8	14.59	
03/29/2022	02:35:00	1653	8.2	210.6	14.67	
03/29/2022	02:36:05	662	4.5	216.8	14.60	
03/29/2022	02:37:10	714	4.5	221.7	14.53	
03/29/2022	02:38:15	662	4.5	226.5	14.53	
03/29/2022	02:39:20	1139	6.3	232.9	14.51	
03/29/2022	02:40:25	1154	6.3	239.7	14.55	
03/29/2022	02:41:30	1455	7.4	246.7	14.59	
03/29/2022	02:42:35	1392	7.4	254.8	14.58	
03/29/2022	02:43:40	1384	7.4	262.8	14.62	
03/29/2022	02:44:45	1504	7.5	271.0	14.84	
03/29/2022	02:45:50	1525	7.9	279.6	14.78	
03/29/2022	02:46:55	1462	7.9	288.1	14.63	
03/29/2022	02:48:00	1476	7.9	296.6	14.55	
03/29/2022	02:49:05	1525	7.8	305.1	14.57	
03/29/2022	02:50:10	1436	7.8	313.6	14.56	
03/29/2022	02:51:15	1475	7.8	322.1	14.56	
03/29/2022	02:52:20	1128	6.5	330.0	14.54	
03/29/2022	02:53:25	1127	6.5	337.0	14.57	
03/29/2022	02:54:30	1080	6.5	344.0	14.57	
03/29/2022	02:55:35	665	5.5	351.0	14.55	
03/29/2022	02:56:40	1348	7.6	358.8	14.54	
03/29/2022	02:57:45	1417	7.5	367.0	14.55	
03/29/2022	02:58:50	1347	7.5	375.2	14.54	
03/29/2022	02:59:55	1434	7.5	383.3	14.54	
03/29/2022	03:01:00	1385	7.5	391.4	14.52	
03/29/2022	03:02:05	1363	7.5	399.6	14.53	
03/29/2022	03:03:10	1347	7.5	407.7	14.55	
03/29/2022	03:04:15	1435	7.5	415.8	14.54	
03/29/2022	03:05:20	601	4.3	420.9	14.62	
03/29/2022	03:06:25	690	4.3	425.6	14.64	
03/29/2022	03:07:30	703	4.3	430.2	14.68	
03/29/2022	03:08:35	623	4.3	434.9	14.71	
03/29/2022	03:09:40	734	4.4	439.6	14.71	
03/29/2022	03:10:45	715	4.4	444.4	14.64	
03/29/2022	03:11:50	1171	6.3	450.9	14.73	
03/29/2022	03:12:55	1247	6.3	457.8	14.58	
03/29/2022	03:14:00	760	4.5	462.8	14.55	
03/29/2022	03:15:05	206	2.1	466.2	14.55	
03/29/2022	03:16:10	190	2.1	468.4	14.69	
03/29/2022	03:17:15	854	5.1	472.0	14.62	
03/29/2022	03:18:20	1667	8.2	478.8	14.62	
03/29/2022	03:19:25	1712	8.2	487.6	14.62	
03/29/2022	03:20:30	1712	8.2	496.5	14.60	
03/29/2022	03:21:35	1231	6.5	504.7	14.63	
03/29/2022	03:22:40	1561	7.5	512.7	14.63	
03/29/2022	03:23:45	1582	7.5	520.8	14.59	
03/29/2022	03:24:50	1564	7.5	529.0	14.57	
03/29/2022	03:25:55	1590	7.7	537.2	14.55	
03/29/2022	03:27:00	1585	7.7	545.5	14.51	
03/29/2022	03:28:05	1559	7.7	553.8	14.55	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 6H 6H	PANHANDLE	Mar/28/2022	SWN PRODUCTION COMPANY	EN82-04416

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/29/2022	03:30:15	1589	7.7	570.4	14.61	
03/29/2022	03:31:20	1620	7.7	578.8	14.62	
03/29/2022	03:32:25	1647	7.7	587.1	14.59	
03/29/2022	03:33:30	1602	7.7	595.4	14.64	
03/29/2022	03:34:35	1668	7.7	603.7	14.64	
03/29/2022	03:35:40	1644	7.7	612.0	14.64	
03/29/2022	03:36:45	1590	7.7	620.3	14.36	
03/29/2022	03:37:50	1638	7.7	628.6	14.46	
03/29/2022	03:38:55	1544	7.7	636.9	14.52	
03/29/2022	03:40:00	1646	7.6	645.3	14.66	
03/29/2022	03:41:05	1614	7.7	653.5	14.58	
03/29/2022	03:42:10	1555	7.7	661.9	14.56	
03/29/2022	03:43:15	1678	7.7	670.2	14.53	
03/29/2022	03:44:20	1596	7.7	678.5	14.53	
03/29/2022	03:45:25	1650	7.7	686.8	14.51	
03/29/2022	03:46:30	1693	7.7	695.2	14.52	
03/29/2022	03:47:35	1818	8.2	704.0	14.60	
03/29/2022	03:48:40	1820	8.2	712.8	14.60	
03/29/2022	03:49:45	1803	8.1	721.6	14.61	
03/29/2022	03:50:50	1844	8.1	730.5	14.62	
03/29/2022	03:51:55	1827	8.2	739.3	14.61	
03/29/2022	03:53:00	1877	8.1	748.1	14.64	
03/29/2022	03:54:05	1840	8.2	757.0	14.66	
03/29/2022	03:55:10	1840	8.2	765.8	14.60	
03/29/2022	03:56:15	1848	8.1	774.6	14.60	
03/29/2022	03:57:20	1855	8.2	783.4	14.62	
03/29/2022	03:58:25	1838	8.1	792.2	14.63	
03/29/2022	03:59:30	1855	8.2	801.1	14.65	
03/29/2022	04:00:35	1880	8.2	809.9	14.66	
03/29/2022	04:01:40	1862	8.2	818.7	14.67	
03/29/2022	04:02:45	1863	8.2	827.6	14.51	
03/29/2022	04:03:50	1816	8.2	836.4	14.56	
03/29/2022	04:04:55	98	1.5	842.5	14.55	
03/29/2022	04:06:00	43	0.0	842.5	14.59	
03/29/2022	04:07:05	42	0.0	842.5	14.59	
03/29/2022	04:08:10	41	0.0	842.5	14.59	
03/29/2022	04:09:10	41	0.0	842.5	14.59	End Cement Slurry
03/29/2022	04:09:15	41	0.0	842.5	14.59	
03/29/2022	04:09:16	41	0.0	842.5	14.59	Reset Total, Vol = 842.52 bbl
03/29/2022	04:10:20	91	2.6	1.4	10.61	
03/29/2022	04:11:25	54	0.0	3.8	7.09	
03/29/2022	04:12:30	169	5.9	10.0	8.85	
03/29/2022	04:13:35	443	8.5	18.7	8.47	
03/29/2022	04:14:40	446	6.0	27.9	8.57	
03/29/2022	04:15:45	66	1.6	29.6	8.41	
03/29/2022	04:16:50	14	0.1	30.4	8.41	
03/29/2022	04:17:55	12	0.3	30.5	8.41	
03/29/2022	04:19:00	11	0.1	30.9	8.43	
03/29/2022	04:20:05	10	0.1	31.1	8.45	
03/29/2022	04:21:10	11	0.1	31.2	8.46	
03/29/2022	04:22:15	11	0.1	31.4	8.46	
03/29/2022	04:22:39	10	0.1	31.4	8.46	Drop Top Plug
03/29/2022	04:22:42	11	0.1	31.4	8.46	Start Displacement
03/29/2022	04:22:47	11	0.1	31.5	8.46	Reset Total, Vol = 31.46 bbl

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 6H 6H	PANHANDLE	Mar/28/2022	SWN PRODUCTION COMPANY	EN82-04416

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/29/2022	04:24:25	11	0.1	0.2	8.46	
03/29/2022	04:25:30	11	0.1	0.4	8.46	
03/29/2022	04:26:35	11	0.2	0.6	8.46	
03/29/2022	04:27:40	11	0.2	0.7	8.46	
03/29/2022	04:28:45	11	0.1	0.9	8.46	
03/29/2022	04:29:50	190	2.5	2.3	8.45	
03/29/2022	04:30:55	1690	8.5	9.1	8.44	
03/29/2022	04:32:00	1729	8.5	18.3	8.43	
03/29/2022	04:33:05	1808	8.5	27.5	8.43	
03/29/2022	04:34:10	1973	8.5	36.8	8.42	
03/29/2022	04:35:15	2056	8.5	46.0	8.42	
03/29/2022	04:36:20	2022	8.2	51.6	8.42	
03/29/2022	04:37:25	2252	8.5	60.8	8.42	
03/29/2022	04:38:30	2391	8.5	70.0	8.42	
03/29/2022	04:39:35	2433	8.5	79.2	8.42	
03/29/2022	04:40:40	2518	8.5	88.4	8.42	
03/29/2022	04:41:45	2654	8.5	97.5	8.42	
03/29/2022	04:42:50	2762	8.5	106.7	8.42	
03/29/2022	04:43:55	2887	8.4	115.8	8.42	
03/29/2022	04:45:00	2958	8.4	125.0	8.42	
03/29/2022	04:46:05	3078	8.4	134.1	8.41	
03/29/2022	04:47:10	3193	8.4	143.2	8.42	
03/29/2022	04:48:15	3236	8.4	152.4	8.42	
03/29/2022	04:49:20	3337	8.4	161.4	8.41	
03/29/2022	04:50:25	3335	8.4	170.5	8.41	
03/29/2022	04:51:30	3347	8.4	179.6	8.41	
03/29/2022	04:52:35	3363	8.4	188.6	8.41	
03/29/2022	04:53:40	3319	8.3	197.7	8.41	
03/29/2022	04:54:45	3359	8.4	206.7	8.41	
03/29/2022	04:55:50	3328	8.3	215.8	8.41	
03/29/2022	04:56:55	3343	8.3	224.8	8.41	
03/29/2022	04:58:00	3358	8.3	233.8	8.41	
03/29/2022	04:59:05	3335	8.4	242.8	8.41	
03/29/2022	05:00:10	3352	8.3	251.8	8.41	
03/29/2022	05:01:15	3355	8.3	260.8	8.41	
03/29/2022	05:02:20	3344	8.3	269.9	8.41	
03/29/2022	05:03:25	3373	8.3	278.9	8.41	
03/29/2022	05:04:30	3401	8.4	287.9	8.41	
03/29/2022	05:05:35	3371	8.4	296.9	8.41	
03/29/2022	05:06:40	3391	8.3	305.9	8.41	
03/29/2022	05:07:45	3407	8.3	314.9	8.41	
03/29/2022	05:08:50	3390	8.3	323.9	8.41	
03/29/2022	05:09:55	3417	8.3	332.9	8.41	
03/29/2022	05:11:00	3425	8.3	341.9	8.41	
03/29/2022	05:12:05	3425	8.3	350.9	8.41	
03/29/2022	05:13:10	3434	8.3	359.9	8.41	
03/29/2022	05:14:15	3439	8.3	368.8	8.41	
03/29/2022	05:15:20	3423	8.3	377.8	8.41	
03/29/2022	05:16:25	3446	8.3	386.8	8.41	
03/29/2022	05:17:30	3444	8.3	395.7	8.41	
03/29/2022	05:18:35	3438	8.3	404.7	8.41	
03/29/2022	05:19:40	3456	8.3	413.6	8.41	
03/29/2022	05:20:45	3444	8.3	422.6	8.41	
03/29/2022	05:21:50	3447	8.2	431.5	8.41	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 6H 6H	PANHANDLE	Mar/28/2022	SWN PRODUCTION COMPANY	EN82-04416

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
03/29/2022	05:24:00	2610	3.6	446.1	8.41	
03/29/2022	05:25:05	2562	3.4	450.0	8.41	
03/29/2022	05:26:10	2601	3.4	453.7	8.41	
03/29/2022	05:27:15	2674	3.4	457.4	8.41	
03/29/2022	05:28:20	3024	0.0	459.4	8.41	
03/29/2022	05:29:25	3062	0.0	459.4	8.41	
03/29/2022	05:30:30	3081	0.0	459.5	8.41	
03/29/2022	05:31:35	3089	0.0	459.5	8.41	
03/29/2022	05:32:40	3095	0.0	459.5	8.41	
03/29/2022	05:33:45	2696	0.0	459.5	8.41	
03/29/2022	05:34:50	-5	0.0	459.5	8.41	
03/29/2022	05:35:55	-11	0.0	459.6	8.41	
03/29/2022	05:37:00	-11	0.0	459.6	8.41	
03/29/2022	05:37:39	-11	0.0	459.6	8.41	64 bbls spacer to surface

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.9			8.5	815.0	0.0	120.0	

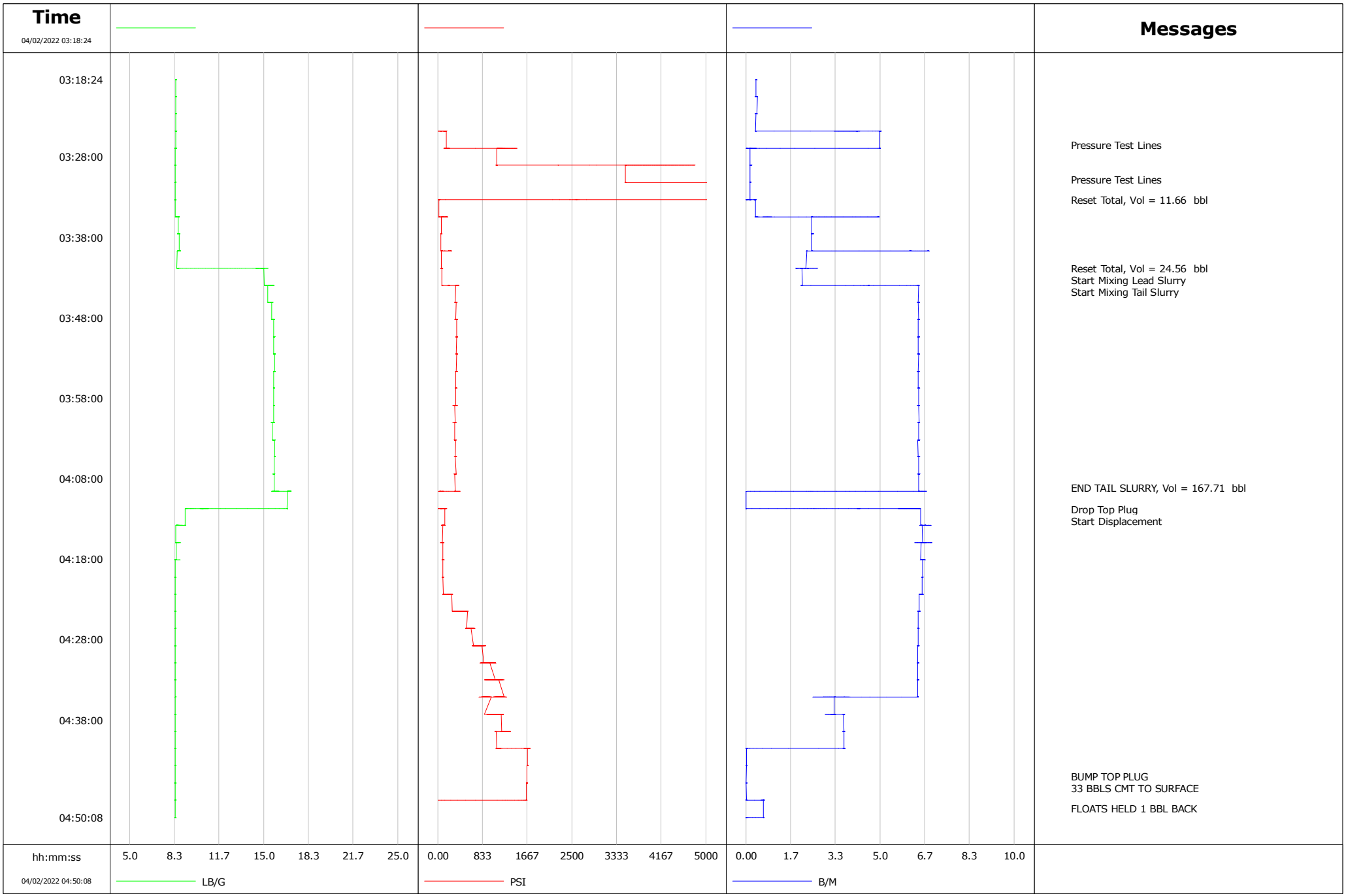
Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
3000	2600	1619	3000			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	790.0 bbl	434.1 bbl	57 degF	Cement Circulated to Surface? ☐	Volume bbl
				Washed Thru Perfs ☐	To ft

Customer or Authorized Representative	Schlumberger Supervisor		
COMPANY MAN	BRIAN FOOTE	Circulation Lost ☐	Job Completed ☒
		-	-

Schlumberger Cementing Job Report

Well	CARL ROTTER OHI 8H	**Client**	SOUTHWESTERN
Field	PANHANDLE	**SIR No.**	EN82-04467
Engineer	JOSHUA NEDROW	**Job Type**	INTERMEDIATE
Country	UNITED STATES OF AMERICA	**Job Date**	4/2/2022



Cementing

PRD Post Job Plot

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Schlumberger

Schlumberger Cementing Service Report

Customer	Job Number
SOUTHWESTERN	EN82-04467

Well	Location (legal)	Schlumberger Location	Job Start
CARL ROTTER OHI 8H 8H	CARL ROTTER PAD	STRASBURG	Apr/02/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Limestone	15 deg	12.3 in	2231.0 ft	2231.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
OHIO	WEST VIRGINIA	psi	84 degF	80 degF	lb/gal
Well Master 0066494934	**API/UWI** 47-069-00330-00-00				

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	INTERMEDIATE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

FILL LINES/PRESSURE TEST
PUMP 25 BBLS GEL SPACER
PUMP 167 BBLS TAIL SLURRY @ 15.6 PPG
SKS: 769 YLD: 1.19 MW:5.27
DROP TOP PLUG
DISPLACE 168 BBLS FRESH WATER
FLOATS HELD 1 BBL BACK
33 BBLS CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2214.0	9.6	36.0	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
		0.0	0.0		
		0.0	0.0		

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	168.0 bbl	N/A	ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	171.2 bbl	49.5 bbl	80.7 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
863 psi		

No. Centralizers	Top Plugs	Bottom Plugs
37	1	0

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Apr/02/2022 02:00	Apr/02/2022 01:00	Apr/02/2022 07:00

Casing Tools		Squeeze Job	
Shoe Type	Guide	Squeeze Type	
Shoe Depth	2214.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	2172.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Message
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Apr/02/2022	SOUTHWESTERN	EN82-04467

Date	Time 24-hr clock	Message
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:18:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Apr/02/2022	SOUTHWESTERN	EN82-04467

Date	Time 24-hr clock	Message
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Apr/02/2022	SOUTHWESTERN	EN82-04467

Date	Time 24-hr clock	Message
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
04/02/2022	03:50:24	
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04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Apr/02/2022	SOUTHWESTERN	EN82-04467

Date	Time 24-hr clock	Message
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Apr/02/2022	SOUTHWESTERN	EN82-04467

Date	Time 24-hr clock	Message
04/02/2022	04:22:24	
04/02/2022	04:22:24	
04/02/2022	04:22:24	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Apr/02/2022	SOUTHWESTERN	EN82-04467

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.0			6.0	167.0		25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
3400	0	1200	1740			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp				
%	163.0 bbl	168.0 bbl	55 degF	Cement Circulated to Surface?	X	Volume	33.0 bbl
				Washed Thru Perfs		To	ft

Customer or Authorized Representative	Schlumberger Supervisor				
BRYAN TARAHAN	JOSHUA NEDROW	Circulation Lost		Job Completed	X
		-		-	

Service Quality Evaluation

Client:	SOUTHWESTERN
Field:	PANHANDLE
Rig:	SDC #40
Well:	CARL ROTTER OHI 8H
Service Line:	Cementing
Job Type:	INTERMEDIATE

Service Order #:	
Date:	Apr/02/2022
Operating Time (hh:mm):	00:00
Client Rep:	BRYAN TARAHAN
Schlumberger Engineer:	JOSHUA NEDROW
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** ☐ **no** ☒	0
1b	Free of environmental spill or non-compliant discharge	5	**yes** ☐ **no** ☒	0
1c	Wellsite left clean	4	**yes** ☐ **no** ☒	0
			Sub-total	0%

2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** ☐ **no** ☒	0
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** ☐ **no** ☒	0
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** ☐ **no** ☒	0
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** ☐ **no** ☒	0
			Sub-total	0%

3	**Execution**			
3a	Lost time < 30 mins	3	**yes** ☐ **no** ☒	0
3b	Equipment pressure tested succesfully	3	**yes** ☐ **no** ☒	0
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** ☐ **no** ☒	0
3d	Plugs / darts released and tested succesfully	2	**yes** ☐ **no** ☒	0
3e	Density variation met expectations	2	**yes** ☐ **no** ☒	0
3f	Personnel performed as per expectations	2	**yes** ☐ **no** ☒	0
3g	Equipment performed as per expectations	2	**yes** ☐ **no** ☒	0
3h	Job pumped as per design	3	**yes** ☐ **no** ☒	0
3i	Did job start on time	2	**yes** ☐ **no** ☒	0
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** ☐ **no** ☒	0
			Sub-total	0%

4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** ☐ **no** ☒	0
			Sub-total	0%

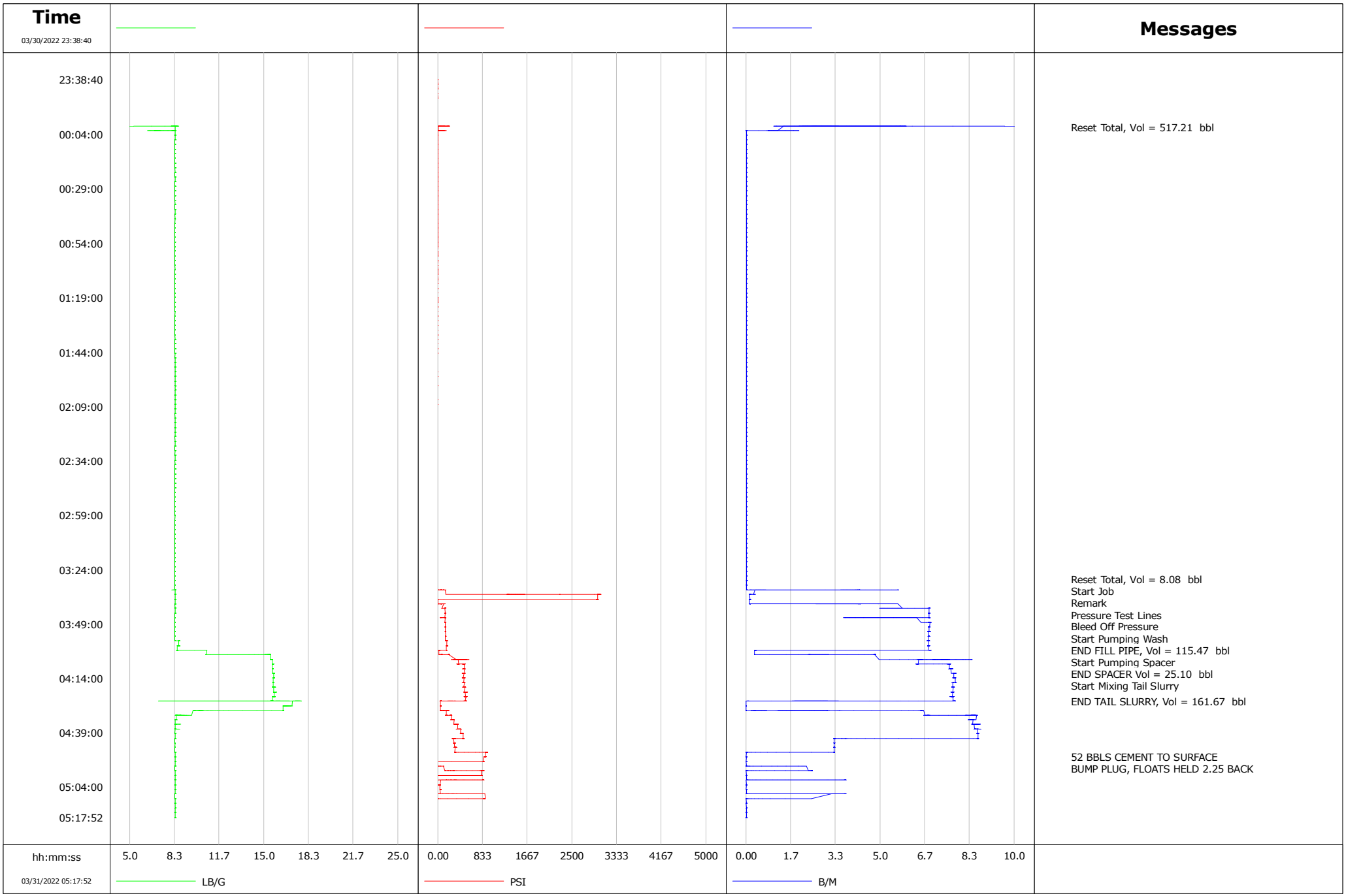
Total 0%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

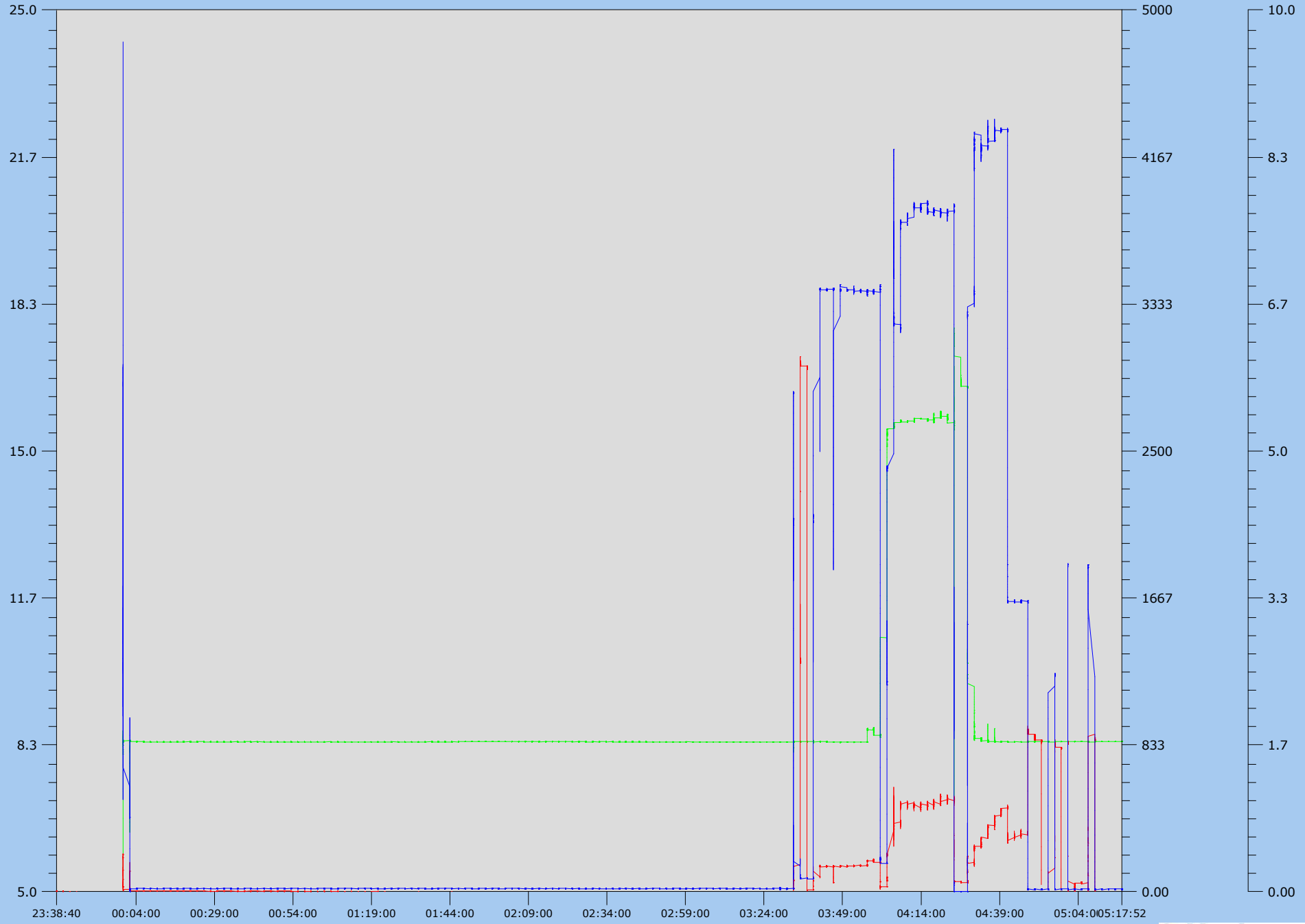
Schlumberger Cementing Job Report

Well	CARL ROTTER OHI 8H	**Client**	SOUTHWESTERN
Field	PANHANDLE	**SIR No.**	EN82-04466
Engineer	JOSHUA NEDROW	**Job Type**	SURFACE
Country	UNITED STATES	**Job Date**	3/31/22



Cementing

PRD Post Job Plot



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Schlumberger

Schlumberger

Cementing Service Report

Customer	Job Number
SOUTHWESTERN	EN82-04466

Well	Location (legal)	Schlumberger Location	Job Start
CARL ROTTER OHI 8H 8H	CARL ROTTER PAD	STRASBURG	Mar/31/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Dirty-Sandstone	0 deg	17.5 in	787.0 ft	787.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
OHIO	WEST VIRGINIA	psi	80 degF	68 degF	lb/gal
Well Master 0066494934	**API/UWI** 47-069-00330-00-00				

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	SURFACE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

FILL LINES/PRESSURE TEST
FILL CASING CAP PLUS 10%
PUMP 25 BBLS GEL SPACER
PUMP 159 BBLS TAIL SLURRY @ 15.6 PPG
SKS:731 YLD: 1.19 MW: 5.27
DROP TOP PLUG
DISPLACE 112 BBLS FRESH WATER
FLOATS HELD 2.25 BBLS BACK
52 BBLS CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
770.0	13.4	54.5	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	112.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	118.9 bbl	24.6 bbl	78.4 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
234 psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
13	1	0

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Mar/31/2022 01:00	Mar/31/2022 01:00	Mar/31/2022 07:30

Casing Tools

Shoe Type	Guide
Shoe Depth	770.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	725.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Message
03/30/2022	23:38:40	Started Acquisition
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/30/2022	23:38:40	
03/30/2022	23:38:40	
03/30/2022	23:38:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	00:10:40	
03/31/2022	00:10:40	
03/31/2022	00:10:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	00:10:40	
03/31/2022	00:10:40	
03/31/2022	00:10:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	00:42:40	
03/31/2022	00:42:40	
03/31/2022	00:42:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	00:42:40	
03/31/2022	00:42:40	
03/31/2022	00:42:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	00:42:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
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03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:14:40	
03/31/2022	01:46:40	
03/31/2022	01:46:40	
03/31/2022	01:46

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	01:46:40	
03/31/2022	01:46:40	
03/31/2022	01:46:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	01:46:40	
03/31/2022	01:46:40	
03/31/2022	01:46:40	
03/31/2022	01:46:40	
03/31/2022	01:46:40	
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03/31/2022	02:18:40	
03/31/2022	02:18:40	
03/31/2022	02:18:40	
03/31/2022	02:18:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	02:18:40	
03/31/2022	02:18:40	
03/31/2022	02:18:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	02:18:40	
03/31/2022	02:18:40	
03/31/2022	02:18:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	02:50:40	
03/31/2022	03:22:40	
03/31/2022	03:22:40	
03/31/2022	03:22

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	03:22:40	
03/31/2022	03:22:40	
03/31/2022	03:22:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	03:22:40	
03/31/2022	03:22:40	
03/31/2022	03:22:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	03:54:40	
03/31/2022	03:54:40	
03/31/2022	03:54:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	03:54:40	
03/31/2022	03:54:40	
03/31/2022	03:54:40	
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03/31/2022	03:54:40	
03/31/2022	03:54:40	
03/31/2022	03:54:40	
03/31/2022	04:01:04	END SPACER Vol = 25.10 bbl
03/31/2022	04:26:40	
03/31/2022	04:26:40	
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03/31/2022	04:26:40	
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03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:26:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:26:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:26:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:26:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	

Well	Field	Job Start	Customer	Job Number
CARL ROTTER OHI 8H 8H	PANHANDLE	Mar/31/2022	SOUTHWESTERN	EN82-04466

Date	Time 24-hr clock	Message
03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	
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03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	
03/31/2022	04:58:40	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.5			6.5	159.0		25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
3000	0	213	930			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp			
%	155.0 bbl	112.0 bbl	67 degF	Cement Circulated to Surface?	[X]	Volume 52.0 bbl
				Washed Thru Perfs	[ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor		
BRYAN TARAHAN	JOSHUA NEDROW	Circulation Lost [ ]	Job Completed [X]
		-	-

Service Quality Evaluation

Client:	SOUTHWESTERN
Field:	PANHANDLE
Rig:	SDC 40
Well:	CARL ROTTER OHI 8H
Service Line:	Cementing
Job Type:	SURFACE

Service Order #:	
Date:	Mar/31/2022
Operating Time (hh:mm):	00:00
Client Rep:	BRYAN TARAHAN
Schlumberger Engineer:	JOSHUA NEDROW
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** ☐ **no** ☒	0
1b	Free of environmental spill or non-compliant discharge	5	**yes** ☐ **no** ☒	0
1c	Wellsite left clean	4	**yes** ☐ **no** ☒	0
			Sub-total	0%

2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** ☐ **no** ☒	0
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** ☐ **no** ☒	0
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** ☐ **no** ☒	0
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** ☐ **no** ☒	0
			Sub-total	0%

3	**Execution**			
3a	Lost time < 30 mins	3	**yes** ☐ **no** ☒	0
3b	Equipment pressure tested succesfully	3	**yes** ☐ **no** ☒	0
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** ☐ **no** ☒	0
3d	Plugs / darts released and tested succesfully	2	**yes** ☐ **no** ☒	0
3e	Density variation met expectations	2	**yes** ☐ **no** ☒	0
3f	Personnel performed as per expectations	2	**yes** ☐ **no** ☒	0
3g	Equipment performed as per expectations	2	**yes** ☐ **no** ☒	0
3h	Job pumped as per design	3	**yes** ☐ **no** ☒	0
3i	Did job start on time	2	**yes** ☐ **no** ☒	0
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** ☐ **no** ☒	0
			Sub-total	0%

4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** ☐ **no** ☒	0
			Sub-total	0%

Total 0%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Strings

Casing Description	Set Depth (ftKB)	Run Date
Production	23,335.00	4/25/2022 01:00

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
1		Float Shoe	5.500	20.00		Yes	2.12	No			23,332.9	2.12
2	1	Casing Joints	5.500	20.00	P-110 HP	Yes	44.29	Yes	CDC 2 x Non-weld Bow 8.25"		23,288.6	46.41
3		Float Collar	5.500	20.00		Yes	1.85	No			23,286.7	48.26
4	2	Casing Joints	5.500	20.00	P-110 HP	Yes	42.51	Yes	Non-weld Bow 8.25"		23,244.2	90.77
5		Toe Sleeve	5.500	20.00		Yes	3.58	No			23,240.7	94.35
6	3	Casing Joints	5.500	20.00	P-110 HP	Yes	42.77	Yes	"Non-weld Bow 8.25"		23,197.9	137.12
7		Toe Sleeve	5.500	20.00		Yes	3.58	No			23,194.3	140.70
8	4	Casing Joints	5.500	20.00	P-110 HP	Yes	44.46	Yes	"Non-weld Bow 8.25"		23,149.8	185.16
9		Toe Sleeve	5.500	20.00		Yes	3.58	No			23,146.3	188.74
10	5	Casing Joints	5.500	20.00	P-110 HP	Yes	41.93	Yes	Non-weld Bow		23,104.3	230.67
11	6	Casing Joints	5.500	20.00	P-110 HP	Yes	44.36	Yes	Non-weld Bow		23,060.0	275.03
12	7	Casing Joints	5.500	20.00	P-110 HP	Yes	43.89	Yes	Non-weld Bow		23,016.1	318.92
13	8	Casing Joints	5.500	20.00	P-110 HP	Yes	44.09	Yes	Non-weld Bow		22,972.0	363.01
14	9	Casing Joints	5.500	20.00	P-110 HP	Yes	42.60	Yes	Non-weld Bow -10		22,929.4	405.61
15	10	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	Non-weld Bow		22,885.1	449.92
16	11	Casing Joints	5.500	20.00	P-110 HP	Yes	42.30	Yes	Non-weld Bow		22,842.8	492.22
17	12	Casing Joints	5.500	20.00	P-110 HP	Yes	41.30	Yes	Non-weld Bow		22,801.5	533.52
18	13	Casing Joints	5.500	20.00	P-110 HP	Yes	43.66	Yes	Non-weld Bow		22,757.8	577.18
19	14	Casing Joints	5.500	20.00	P-110 HP	Yes	42.76	Yes	Non-weld Bow		22,715.1	619.94
20	15	Casing Joints	5.500	20.00	P-110 HP	Yes	44.40	Yes	Non-weld Bow		22,670.7	664.34
21	16	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	Non-weld Bow		22,626.8	708.24
22	17	Casing Joints	5.500	20.00	P-110 HP	Yes	42.62	Yes	Non-weld Bow		22,584.1	750.86
23	18	Casing Joints	5.500	20.00	P-110 HP	Yes	43.75	Yes	Non-weld Bow		22,540.4	794.61
24	19	Casing Joints	5.500	20.00	P-110 HP	Yes	43.43	Yes	Non-weld Bow -20		22,497.0	838.04
25	20	Casing Joints	5.500	20.00	P-110 HP	Yes	44.30	Yes	Non-weld Bow		22,452.7	882.34
26	21	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	Non-weld Bow		22,408.5	926.52
27	22	Casing Joints	5.500	20.00	P-110 HP	Yes	43.99	Yes	Non-weld Bow		22,364.5	970.51
28	23	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		22,320.5	1,014.54
29	24	Casing Joints	5.500	20.00	P-110 HP	Yes	44.07	Yes	Non-weld Bow		22,276.4	1,058.61
30	25	Casing Joints	5.500	20.00	P-110 HP	Yes	43.02	Yes	Non-weld Bow		22,233.4	1,101.63
31	26	Casing Joints	5.500	20.00	P-110 HP	Yes	43.41	Yes	Non-weld Bow		22,190.0	1,145.04
32	27	Casing Joints	5.500	20.00	P-110 HP	Yes	42.18	Yes	Non-weld Bow		22,147.8	1,187.22
33	28	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	Non-weld Bow		22,103.5	1,231.53
34	29	Casing Joints	5.500	20.00	P-110 HP	Yes	44.13	Yes	Non-weld Bow -30		22,059.3	1,275.66
35	30	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	Yes	Non-weld Bow		22,015.1	1,319.86
36	31	Casing Joints	5.500	20.00	P-110 HP	Yes	43.75	Yes	Non-weld Bow		21,971.4	1,363.61
37	32	Casing Joints	5.500	20.00	P-110 HP	Yes	44.42	Yes	Non-weld Bow		21,927.0	1,408.03
38	33	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	Non-weld Bow		21,883.1	1,451.93
39	34	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		21,839.0	1,495.96
40	35	Casing Joints	5.500	20.00	P-110 HP	Yes	40.65	Yes	Non-weld Bow		21,798.4	1,536.61
41	36	Casing Joints	5.500	20.00	P-110 HP	Yes	43.55	Yes	Non-weld Bow		21,754.8	1,580.16

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
42	37	Casing Joints	5.500	20.00	P-110 HP	Yes	42.93	Yes	Non-weld Bow		21,711.9	1,623.09
43	38	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	Yes	Non-weld Bow		21,667.6	1,667.37
44	39	Casing Joints	5.500	20.00	P-110 HP	Yes	43.47	Yes	Non-weld Bow -40		21,624.2	1,710.84
45	40	Casing Joints	5.500	20.00	P-110 HP	Yes	40.21	Yes	Non-weld Bow		21,584.0	1,751.05
46	41	Casing Joints	5.500	20.00	P-110 HP	Yes	43.62	Yes	Non-weld Bow		21,540.3	1,794.67
47	42	Casing Joints	5.500	20.00	P-110 HP	Yes	41.35	Yes	Non-weld Bow		21,499.0	1,836.02
48	43	Casing Joints	5.500	20.00	P-110 HP	Yes	41.90	Yes	Non-weld Bow		21,457.1	1,877.92
49	44	Casing Joints	5.500	20.00	P-110 HP	Yes	44.50	Yes	Non-weld Bow		21,412.6	1,922.42
50	45	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		21,371.4	1,963.62
51	46	Casing Joints	5.500	20.00	P-110 HP	Yes	43.27	Yes	Non-weld Bow		21,328.1	2,006.89
52	47	Casing Joints	5.500	20.00	P-110 HP	Yes	43.31	Yes	Non-weld Bow		21,284.8	2,050.20
53	48	Casing Joints	5.500	20.00	P-110 HP	Yes	43.56	Yes	Non-weld Bow		21,241.2	2,093.76
54	49	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	Yes	Non-weld Bow -50		21,197.1	2,137.86
55	50	Casing Joints	5.500	20.00	P-110 HP	Yes	39.31	Yes	Non-weld Bow		21,157.8	2,177.17
56	51	Casing Joints	5.500	20.00	P-110 HP	Yes	39.87	Yes	Non-weld Bow		21,118.0	2,217.04
57	52	Casing Joints	5.500	20.00	P-110 HP	Yes	41.53	Yes	Non-weld Bow		21,076.4	2,258.57
58	53	Casing Joints	5.500	20.00	P-110 HP	Yes	44.11	Yes	Non-weld Bow		21,032.3	2,302.68
59	54	Casing Joints	5.500	20.00	P-110 HP	Yes	43.03	Yes	Non-weld Bow		20,989.3	2,345.71
60	55	Casing Joints	5.500	20.00	P-110 HP	Yes	41.33	Yes	Non-weld Bow		20,948.0	2,387.04
61	56	Casing Joints	5.500	20.00	P-110 HP	Yes	41.42	Yes	Non-weld Bow		20,906.5	2,428.46
62	57	Casing Joints	5.500	20.00	P-110 HP	Yes	44.06	Yes	Non-weld Bow		20,862.5	2,472.52
63	58	Casing Joints	5.500	20.00	P-110 HP	Yes	41.61	Yes	Non-weld Bow		20,820.9	2,514.13
64	59	Casing Joints	5.500	20.00	P-110 HP	Yes	43.09	Yes	Non-weld Bow -60		20,777.8	2,557.22
65	60	Casing Joints	5.500	20.00	P-110 HP	Yes	42.80	Yes	Non-weld Bow		20,735.0	2,600.02
66	61	Casing Joints	5.500	20.00	P-110 HP	Yes	41.19	Yes	Non-weld Bow		20,693.8	2,641.21
67	62	Casing Joints	5.500	20.00	P-110 HP	Yes	43.02	Yes	Non-weld Bow		20,650.8	2,684.23
68	63	Casing Joints	5.500	20.00	P-110 HP	Yes	43.30	Yes	Non-weld Bow		20,607.5	2,727.53
69	64	Casing Joints	5.500	20.00	P-110 HP	Yes	42.95	Yes	Non-weld Bow		20,564.5	2,770.48
70	65	Casing Joints	5.500	20.00	P-110 HP	Yes	41.34	Yes	Non-weld Bow		20,523.2	2,811.82
71	66	Casing Joints	5.500	20.00	P-110 HP	Yes	41.32	Yes	Non-weld Bow		20,481.9	2,853.14
72	67	Casing Joints	5.500	20.00	P-110 HP	Yes	43.67	Yes	Non-weld Bow		20,438.2	2,896.81
73	68	Casing Joints	5.500	20.00	P-110 HP	Yes	44.07	Yes	Non-weld Bow		20,394.1	2,940.88
74	69	Casing Joints	5.500	20.00	P-110 HP	Yes	44.04	Yes	Non-weld Bow -70		20,350.1	2,984.92
75	70	Casing Joints	5.500	20.00	P-110 HP	Yes	42.88	Yes	Non-weld Bow		20,307.2	3,027.80
76	71	Casing Joints	5.500	20.00	P-110 HP	Yes	41.33	Yes	Non-weld Bow		20,265.9	3,069.13
77	72	Casing Joints	5.500	20.00	P-110 HP	Yes	43.26	Yes	Non-weld Bow		20,222.6	3,112.39
78	73	Casing Joints	5.500	20.00	P-110 HP	Yes	43.21	Yes	Non-weld Bow		20,179.4	3,155.60
79	74	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	Non-weld Bow		20,135.4	3,199.60
80	75	Casing Joints	5.500	20.00	P-110 HP	Yes	42.82	Yes	Non-weld Bow		20,092.6	3,242.42
81	76	Casing Joints	5.500	20.00	P-110 HP	Yes	41.26	Yes	Non-weld Bow		20,051.3	3,283.68
82	77	Casing Joints	5.500	20.00	P-110 HP	Yes	43.22	Yes	Non-weld Bow		20,008.1	3,326.90

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
83	78	Casing Joints	5.500	20.00	P-110 HP	Yes	41.02	Yes	Non-weld Bow		19,967.1	3,367.92
84	79	Casing Joints	5.500	20.00	P-110 HP	Yes	43.62	Yes	Non-weld Bow -80		19,923.5	3,411.54
85	80	Casing Joints	5.500	20.00	P-110 HP	Yes	42.12	Yes	Non-weld Bow		19,881.3	3,453.66
86	81	Casing Joints	5.500	20.00	P-110 HP	Yes	43.20	Yes	Non-weld Bow		19,838.1	3,496.86
87	82	Casing Joints	5.500	20.00	P-110 HP	Yes	43.11	Yes	Non-weld Bow		19,795.0	3,539.97
88	83	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	Non-weld Bow		19,751.1	3,583.87
89	84	Casing Joints	5.500	20.00	P-110 HP	Yes	42.92	Yes	Non-weld Bow		19,708.2	3,626.79
90	85	Casing Joints	5.500	20.00	P-110 HP	Yes	41.30	Yes	Non-weld Bow		19,666.9	3,668.09
91	86	Casing Joints	5.500	20.00	P-110 HP	Yes	41.34	Yes	Non-weld Bow		19,625.6	3,709.43
92	87	Casing Joints	5.500	20.00	P-110 HP	Yes	43.37	Yes	Non-weld Bow		19,582.2	3,752.80
93	88	Casing Joints	5.500	20.00	P-110 HP	Yes	41.15	Yes	Non-weld Bow		19,541.1	3,793.95
94	89	Casing Joints	5.500	20.00	P-110 HP	Yes	43.54	Yes	Non-weld Bow -90		19,497.5	3,837.49
95	90	Casing Joints	5.500	20.00	P-110 HP	Yes	43.20	Yes	Non-weld Bow		19,454.3	3,880.69
96	91	Casing Joints	5.500	20.00	P-110 HP	Yes	43.60	Yes	Non-weld Bow		19,410.7	3,924.29
97	92	Casing Joints	5.500	20.00	P-110 HP	Yes	41.38	Yes	Non-weld Bow		19,369.3	3,965.67
98	93	Casing Joints	5.500	20.00	P-110 HP	Yes	41.35	Yes	Non-weld Bow		19,328.0	4,007.02
99	94	Casing Joints	5.500	20.00	P-110 HP	Yes	41.31	Yes	Non-weld Bow		19,286.7	4,048.33
100	95	Casing Joints	5.500	20.00	P-110 HP	Yes	43.45	Yes	Non-weld Bow		19,243.2	4,091.78
101	96	Casing Joints	5.500	20.00	P-110 HP	Yes	43.67	Yes	Non-weld Bow		19,199.6	4,135.45
102	97	Casing Joints	5.500	20.00	P-110 HP	Yes	42.96	Yes	Non-weld Bow		19,156.6	4,178.41
103	98	Casing Joints	5.500	20.00	P-110 HP	Yes	42.54	Yes	Non-weld Bow		19,114.1	4,220.95
104	99	Casing Joints	5.500	20.00	P-110 HP	Yes	44.53	Yes	Non-weld Bow -100		19,069.5	4,265.48
105	100	Casing Joints	5.500	20.00	P-110 HP	Yes	41.10	Yes	Non-weld Bow		19,028.4	4,306.58
106	101	Casing Joints	5.500	20.00	P-110 HP	Yes	43.34	Yes	Non-weld Bow		18,985.1	4,349.92
107	102	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		18,943.9	4,391.12
108	103	Casing Joints	5.500	20.00	P-110 HP	Yes	44.24	Yes	Non-weld Bow		18,899.6	4,435.36
109	104	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	Non-weld Bow		18,855.7	4,479.26
110	105	Casing Joints	5.500	20.00	P-110 HP	Yes	41.31	Yes	Non-weld Bow		18,814.4	4,520.57
111	106	Casing Joints	5.500	20.00	P-110 HP	Yes	44.29	Yes	Non-weld Bow		18,770.1	4,564.86
112	107	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	Yes	Non-weld Bow		18,725.9	4,609.14
113	108	Casing Joints	5.500	20.00	P-110 HP	Yes	43.48	Yes	Non-weld Bow		18,682.4	4,652.62
114	109	Casing Joints	5.500	20.00	P-110 HP	Yes	36.48	Yes	Non-weld Bow -110		18,645.9	4,689.10
115	110	Casing Joints	5.500	20.00	P-110 HP	Yes	36.54	Yes	Non-weld Bow		18,609.4	4,725.64
116	111	Casing Joints	5.500	20.00	P-110 HP	Yes	44.35	Yes	Non-weld Bow		18,565.0	4,769.99
117	112	Casing Joints	5.500	20.00	P-110 HP	Yes	38.93	Yes	Non-weld Bow		18,526.1	4,808.92
118	113	Casing Joints	5.500	20.00	P-110 HP	Yes	43.88	Yes	Non-weld Bow		18,482.2	4,852.80
119	114	Casing Joints	5.500	20.00	P-110 HP	Yes	37.68	Yes	Non-weld Bow		18,444.5	4,890.48
120	115	Casing Joints	5.500	20.00	P-110 HP	Yes	41.75	Yes	Non-weld Bow		18,402.8	4,932.23
121	116	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	Non-weld Bow		18,358.6	4,976.41
122	117	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	Yes	Non-weld Bow		18,314.9	5,020.11
123	118	Casing Joints	5.500	20.00	P-110 HP	Yes	43.72	Yes	Non-weld Bow		18,271.2	5,063.83

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
124	119	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	Yes	Non-weld Bow -120		18,227.0	5,107.98
125	120	Casing Joints	5.500	20.00	P-110 HP	Yes	43.83	Yes	Non-weld Bow		18,183.2	5,151.81
126	121	Casing Joints	5.500	20.00	P-110 HP	Yes	41.21	Yes	Non-weld Bow		18,142.0	5,193.02
127	122	Casing Joints	5.500	20.00	P-110 HP	Yes	43.98	Yes	Non-weld Bow		18,098.0	5,237.00
128	123	Casing Joints	5.500	20.00	P-110 HP	Yes	39.95	Yes	Non-weld Bow		18,058.1	5,276.95
129	124	Casing Joints	5.500	20.00	P-110 HP	Yes	42.29	Yes	Non-weld Bow		18,015.8	5,319.24
130	125	Casing Joints	5.500	20.00	P-110 HP	Yes	41.32	Yes	Non-weld Bow		17,974.4	5,360.56
131	126	Casing Joints	5.500	20.00	P-110 HP	Yes	44.40	Yes	Non-weld Bow		17,930.0	5,404.96
132		Marker Joint	5.500	20.00		Yes	20.72	Yes	Marker Joint #1 (2/3 lateral)		17,909.3	5,425.68
133	127	Casing Joints	5.500	20.00	P-110 HP	Yes	44.29	Yes	Non-weld Bow		17,865.0	5,469.97
134	128	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	Yes	Non-weld Bow		17,820.8	5,514.25
135	129	Casing Joints	5.500	20.00	P-110 HP	Yes	44.37	Yes	Non-weld Bow -130		17,776.4	5,558.62
136	130	Casing Joints	5.500	20.00	P-110 HP	Yes	42.10	Yes	Non-weld Bow		17,734.3	5,600.72
137	131	Casing Joints	5.500	20.00	P-110 HP	Yes	43.30	Yes	Non-weld Bow		17,691.0	5,644.02
138	132	Casing Joints	5.500	20.00	P-110 HP	Yes	44.16	Yes	Non-weld Bow		17,646.8	5,688.18
139	133	Casing Joints	5.500	20.00	P-110 HP	Yes	44.86	Yes	Non-weld Bow		17,602.0	5,733.04
140	134	Casing Joints	5.500	20.00	P-110 HP	Yes	43.06	Yes	Non-weld Bow		17,558.9	5,776.10
141	135	Casing Joints	5.500	20.00	P-110 HP	Yes	44.05	Yes	Non-weld Bow		17,514.9	5,820.15
142	136	Casing Joints	5.500	20.00	P-110 HP	Yes	42.85	Yes	Non-weld Bow		17,472.0	5,863.00
143	137	Casing Joints	5.500	20.00	P-110 HP	Yes	44.09	Yes	Non-weld Bow		17,427.9	5,907.09
144	138	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	Yes	Non-weld Bow		17,383.8	5,951.24
145	139	Casing Joints	5.500	20.00	P-110 HP	Yes	41.97	Yes	Non-weld Bow -140		17,341.8	5,993.21
146	140	Casing Joints	5.500	20.00	P-110 HP	Yes	44.56	Yes	Non-weld Bow		17,297.2	6,037.77
147	141	Casing Joints	5.500	20.00	P-110 HP	Yes	42.93	Yes	Non-weld Bow		17,254.3	6,080.70
148	142	Casing Joints	5.500	20.00	P-110 HP	Yes	44.22	Yes	Non-weld Bow		17,210.1	6,124.92
149	143	Casing Joints	5.500	20.00	P-110 HP	Yes	44.26	Yes	Non-weld Bow		17,165.8	6,169.18
150	144	Casing Joints	5.500	20.00	P-110 HP	Yes	44.14	Yes	Non-weld Bow		17,121.7	6,213.32
151	145	Casing Joints	5.500	20.00	P-110 HP	Yes	43.38	Yes	Non-weld Bow		17,078.3	6,256.70
152	146	Casing Joints	5.500	20.00	P-110 HP	Yes	43.13	Yes	Non-weld Bow		17,035.2	6,299.83
153	147	Casing Joints	5.500	20.00	P-110 HP	Yes	43.03	Yes	Non-weld Bow		16,992.1	6,342.86
154	148	Casing Joints	5.500	20.00	P-110 HP	Yes	41.19	Yes	Non-weld Bow		16,951.0	6,384.05
155	149	Casing Joints	5.500	20.00	P-110 HP	Yes	39.80	Yes	Non-weld Bow -150		16,911.2	6,423.85
156	150	Casing Joints	5.500	20.00	P-110 HP	Yes	43.02	Yes	Non-weld Bow		16,868.1	6,466.87
157	151	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		16,826.9	6,508.07
158	152	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		16,785.7	6,549.27
159	153	Casing Joints	5.500	20.00	P-110 HP	Yes	43.86	Yes	Non-weld Bow		16,741.9	6,593.13
160	154	Casing Joints	5.500	20.00	P-110 HP	Yes	44.05	Yes	Non-weld Bow		16,697.8	6,637.18
161	155	Casing Joints	5.500	20.00	P-110 HP	Yes	44.08	Yes	Non-weld Bow		16,653.7	6,681.26
162	156	Casing Joints	5.500	20.00	P-110 HP	Yes	43.88	Yes	Non-weld Bow		16,609.9	6,725.14
163	157	Casing Joints	5.500	20.00	P-110 HP	Yes	43.30	Yes	Non-weld Bow		16,566.6	6,768.44

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
164	158	Casing Joints	5.500	20.00	P-110 HP	Yes	41.28	Yes	Non-weld Bow		16,525.3	6,809.72
165	159	Casing Joints	5.500	20.00	P-110 HP	Yes	43.92	Yes	Non-weld Bow -160		16,481.4	6,853.64
166	160	Casing Joints	5.500	20.00	P-110 HP	Yes	43.40	Yes	Non-weld Bow		16,438.0	6,897.04
167	161	Casing Joints	5.500	20.00	P-110 HP	Yes	44.02	Yes	Non-weld Bow		16,393.9	6,941.06
168	162	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	Yes	Non-weld Bow		16,350.2	6,984.76
169	163	Casing Joints	5.500	20.00	P-110 HP	Yes	41.63	Yes	Non-weld Bow		16,308.6	7,026.39
170	164	Casing Joints	5.500	20.00	P-110 HP	Yes	44.09	Yes	Non-weld Bow		16,264.5	7,070.48
171	165	Casing Joints	5.500	20.00	P-110 HP	Yes	41.54	Yes	Non-weld Bow		16,223.0	7,112.02
172	166	Casing Joints	5.500	20.00	P-110 HP	Yes	43.07	Yes	Non-weld Bow		16,179.9	7,155.09
173	167	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	Yes	Non-weld Bow		16,136.2	7,198.79
174	168	Casing Joints	5.500	20.00	P-110 HP	Yes	44.59	Yes	Non-weld Bow		16,091.6	7,243.38
175	169	Casing Joints	5.500	20.00	P-110 HP	Yes	39.98	Yes	Non-weld Bow -170		16,051.6	7,283.36
176	170	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		16,010.4	7,324.56
177	171	Casing Joints	5.500	20.00	P-110 HP	Yes	42.41	Yes	Non-weld Bow		15,968.0	7,366.97
178	172	Casing Joints	5.500	20.00	P-110 HP	Yes	41.35	Yes	Non-weld Bow		15,926.7	7,408.32
179	173	Casing Joints	5.500	20.00	P-110 HP	Yes	44.27	Yes	Non-weld Bow		15,882.4	7,452.59
180	174	Casing Joints	5.500	20.00	P-110 HP	Yes	41.49	Yes	Non-weld Bow		15,840.9	7,494.08
181	175	Casing Joints	5.500	20.00	P-110 HP	Yes	43.78	Yes	Non-weld Bow		15,797.1	7,537.86
182	176	Casing Joints	5.500	20.00	P-110 HP	Yes	40.18	Yes	Non-weld Bow		15,757.0	7,578.04
183	177	Casing Joints	5.500	20.00	P-110 HP	Yes	41.34	Yes	Non-weld Bow		15,715.6	7,619.38
184	178	Casing Joints	5.500	20.00	P-110 HP	Yes	41.87	Yes	Non-weld Bow		15,673.8	7,661.25
185	179	Casing Joints	5.500	20.00	P-110 HP	Yes	43.47	Yes	Non-weld Bow -180		15,630.3	7,704.72
186	180	Casing Joints	5.500	20.00	P-110 HP	Yes	43.98	Yes	Non-weld Bow		15,586.3	7,748.70
187	181	Casing Joints	5.500	20.00	P-110 HP	Yes	44.55	Yes	Non-weld Bow		15,541.8	7,793.25
188	182	Casing Joints	5.500	20.00	P-110 HP	Yes	44.27	Yes	Non-weld Bow		15,497.5	7,837.52
189	183	Casing Joints	5.500	20.00	P-110 HP	Yes	43.32	Yes	Non-weld Bow		15,454.2	7,880.84
190	184	Casing Joints	5.500	20.00	P-110 HP	Yes	43.39	Yes	Non-weld Bow		15,410.8	7,924.23
191	185	Casing Joints	5.500	20.00	P-110 HP	Yes	43.72	Yes	Non-weld Bow		15,367.1	7,967.95
192	186	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	Non-weld Bow		15,322.9	8,012.13
193	187	Casing Joints	5.500	20.00	P-110 HP	Yes	44.58	Yes	Non-weld Bow		15,278.3	8,056.71
194	188	Casing Joints	5.500	20.00	P-110 HP	Yes	41.19	Yes	Non-weld Bow		15,237.1	8,097.90
195	189	Casing Joints	5.500	20.00	P-110 HP	Yes	44.33	Yes	Non-weld Bow -190		15,192.8	8,142.23
196	190	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	Non-weld Bow		15,148.5	8,186.46
197	191	Casing Joints	5.500	20.00	P-110 HP	Yes	44.16	Yes	Non-weld Bow		15,104.4	8,230.62
198	192	Casing Joints	5.500	20.00	P-110 HP	Yes	43.57	Yes	Non-weld Bow		15,060.8	8,274.19
199	193	Casing Joints	5.500	20.00	P-110 HP	Yes	39.18	Yes	Non-weld Bow		15,021.6	8,313.37
200	194	Casing Joints	5.500	20.00	P-110 HP	Yes	44.64	Yes	Non-weld Bow		14,977.0	8,358.01
201	195	Casing Joints	5.500	20.00	P-110 HP	Yes	44.36	Yes	Non-weld Bow		14,932.6	8,402.37
202	196	Casing Joints	5.500	20.00	P-110 HP	Yes	40.05	Yes	Non-weld Bow		14,892.6	8,442.42
203	197	Casing Joints	5.500	20.00	P-110 HP	Yes	43.95	Yes	Non-weld Bow		14,848.6	8,486.37
204	198	Casing Joints	5.500	20.00	P-110 HP	Yes	42.93	Yes	Non-weld Bow		14,805.7	8,529.30

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
205	199	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	Yes	Non-weld Bow -200		14,761.6	8,573.40
206	200	Casing Joints	5.500	20.00	P-110 HP	Yes	44.25	Yes	Non-weld Bow		14,717.4	8,617.65
207	201	Casing Joints	5.500	20.00	P-110 HP	Yes	38.46	Yes	Non-weld Bow		14,678.9	8,656.11
208	202	Casing Joints	5.500	20.00	P-110 HP	Yes	38.00	Yes	Non-weld Bow		14,640.9	8,694.11
209	203	Casing Joints	5.500	20.00	P-110 HP	Yes	44.12	Yes	Non-weld Bow		14,596.8	8,738.23
210	204	Casing Joints	5.500	20.00	P-110 HP	Yes	41.51	Yes	Non-weld Bow		14,555.3	8,779.74
211	205	Casing Joints	5.500	20.00	P-110 HP	Yes	38.35	Yes	Non-weld Bow		14,516.9	8,818.09
212	206	Casing Joints	5.500	20.00	P-110 HP	Yes	43.82	Yes	Non-weld Bow		14,473.1	8,861.91
213	207	Casing Joints	5.500	20.00	P-110 HP	Yes	41.51	Yes	Non-weld Bow		14,431.6	8,903.42
214	208	Casing Joints	5.500	20.00	P-110 HP	Yes	44.09	Yes	Non-weld Bow		14,387.5	8,947.51
215	209	Casing Joints	5.500	20.00	P-110 HP	Yes	44.35	Yes	Non-weld Bow -210		14,343.1	8,991.86
216	210	Casing Joints	5.500	20.00	P-110 HP	Yes	39.00	Yes	Non-weld Bow		14,304.1	9,030.86
217	211	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	Yes	Non-weld Bow		14,260.0	9,075.01
218	212	Casing Joints	5.500	20.00	P-110 HP	Yes	44.42	Yes	Non-weld Bow		14,215.6	9,119.43
219	213	Casing Joints	5.500	20.00	P-110 HP	Yes	41.84	Yes	Non-weld Bow		14,173.7	9,161.27
220	214	Casing Joints	5.500	20.00	P-110 HP	Yes	44.38	Yes	Non-weld Bow		14,129.4	9,205.65
221	215	Casing Joints	5.500	20.00	P-110 HP	Yes	43.65	Yes	Non-weld Bow		14,085.7	9,249.30
222	216	Casing Joints	5.500	20.00	P-110 HP	Yes	37.63	Yes	Non-weld Bow		14,048.1	9,286.93
223	217	Casing Joints	5.500	20.00	P-110 HP	Yes	41.28	Yes	Non-weld Bow		14,006.8	9,328.21
224	218	Casing Joints	5.500	20.00	P-110 HP	Yes	41.33	Yes	Non-weld Bow -220		13,965.5	9,369.54
225	219	Casing Joints	5.500	20.00	P-110 HP	Yes	44.39	Yes	Non-weld Bow		13,921.1	9,413.93
226	220	Casing Joints	5.500	20.00	P-110 HP	Yes	39.98	Yes	Non-weld Bow		13,881.1	9,453.91
227	221	Casing Joints	5.500	20.00	P-110 HP	Yes	41.54	Yes	Non-weld Bow		13,839.6	9,495.45
228	222	Casing Joints	5.500	20.00	P-110 HP	Yes	44.16	Yes	Non-weld Bow		13,795.4	9,539.61
229	223	Casing Joints	5.500	20.00	P-110 HP	Yes	42.55	Yes	Non-weld Bow		13,752.8	9,582.16
230	224	Casing Joints	5.500	20.00	P-110 HP	Yes	44.13	Yes	Non-weld Bow		13,708.7	9,626.29
231	225	Casing Joints	5.500	20.00	P-110 HP	Yes	43.50	Yes	Non-weld Bow		13,665.2	9,669.79
232	226	Casing Joints	5.500	20.00	P-110 HP	Yes	42.14	Yes	Non-weld Bow		13,623.1	9,711.93
233	227	Casing Joints	5.500	20.00	P-110 HP	Yes	37.64	Yes	Non-weld Bow		13,585.4	9,749.57
234	228	Casing Joints	5.500	20.00	P-110 HP	Yes	43.61	Yes	Non-weld Bow -230		13,541.8	9,793.18
235	229	Casing Joints	5.500	20.00	P-110 HP	Yes	43.73	Yes	Non-weld Bow		13,498.1	9,836.91
236	230	Casing Joints	5.500	20.00	P-110 HP	Yes	37.77	Yes	Non-weld Bow		13,460.3	9,874.68
237	231	Casing Joints	5.500	20.00	P-110 HP	Yes	42.40	Yes	Non-weld Bow		13,417.9	9,917.08
238	232	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	Yes	Non-weld Bow		13,373.8	9,961.23
239	233	Casing Joints	5.500	20.00	P-110 HP	Yes	44.13	Yes	Non-weld Bow		13,329.6	10,005.36
240	234	Casing Joints	5.500	20.00	P-110 HP	Yes	43.72	Yes	Non-weld Bow		13,285.9	10,049.08
241	235	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	Non-weld Bow		13,241.9	10,093.08
242	236	Casing Joints	5.500	20.00	P-110 HP	Yes	44.19	Yes	Non-weld Bow		13,197.7	10,137.27
243	237	Casing Joints	5.500	20.00	P-110 HP	Yes	43.80	Yes	Non-weld Bow		13,153.9	10,181.07
244	238	Casing Joints	5.500	20.00	P-110 HP	Yes	44.29	Yes	Non-weld Bow -240		13,109.6	10,225.36
245	239	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	Non-weld Bow		13,065.3	10,269.67

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
246	240	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		13,021.3	10,313.70
247	241	Casing Joints	5.500	20.00	P-110 HP	Yes	42.00	Yes	Non-weld Bow		12,979.3	10,355.70
248	242	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	Yes	Non-weld Bow		12,935.1	10,399.90
249	243	Casing Joints	5.500	20.00	P-110 HP	Yes	44.05	Yes	Non-weld Bow		12,891.1	10,443.95
250	244	Casing Joints	5.500	20.00	P-110 HP	Yes	44.06	Yes	Non-weld Bow		12,847.0	10,488.01
251	245	Casing Joints	5.500	20.00	P-110 HP	Yes	43.92	Yes	Non-weld Bow		12,803.1	10,531.93
252	246	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	Yes	Non-weld Bow		12,758.9	10,576.13
253	247	Casing Joints	5.500	20.00	P-110 HP	Yes	44.17	Yes	Non-weld Bow		12,714.7	10,620.30
254	248	Casing Joints	5.500	20.00	P-110 HP	Yes	44.45	Yes	Non-weld Bow -250		12,670.3	10,664.75
255	249	Casing Joints	5.500	20.00	P-110 HP	Yes	44.05	Yes	Non-weld Bow		12,626.2	10,708.80
256	250	Casing Joints	5.500	20.00	P-110 HP	Yes	44.42	Yes	Non-weld Bow		12,581.8	10,753.22
257	251	Casing Joints	5.500	20.00	P-110 HP	No	44.07	Yes	OUT #1 (bad pin)		12,537.7	10,797.29
257		Marker Joint	5.500	20.00		Yes	20.47	Yes	Marker Joint #2 (1/3 lateral) #5 replace		12,561.3	10,773.69
258	252	Casing Joints	5.500	20.00	P-110 HP	No	44.09	Yes	OUT #2 (Bad box)		12,517.2	10,817.78
258	253	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		12,517.3	10,817.72
259	254	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	Yes	Non-weld Bow		12,473.1	10,861.87
260	255	Casing Joints	5.500	20.00	P-110 HP	Yes	44.01	Yes	Non-weld Bow		12,429.1	10,905.88
261	256	Casing Joints	5.500	20.00	P-110 HP	Yes	43.80	Yes	Non-weld Bow		12,385.3	10,949.68
262	257	Casing Joints	5.500	20.00	P-110 HP	Yes	44.14	Yes	Non-weld Bow		12,341.2	10,993.82
263	258	Casing Joints	5.500	20.00	P-110 HP	Yes	44.35	Yes	Non-weld Bow -260		12,296.8	11,038.17
264	259	Casing Joints	5.500	20.00	P-110 HP	Yes	43.97	Yes	Non-weld Bow		12,252.9	11,082.14
265	260	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	Non-weld Bow		12,208.6	11,126.45
266	261	Casing Joints	5.500	20.00	P-110 HP	Yes	44.08	Yes	Non-weld Bow		12,164.5	11,170.53
267	262	Casing Joints	5.500	20.00	P-110 HP	Yes	43.87	Yes	Non-weld Bow		12,120.6	11,214.40
268	263	Casing Joints	5.500	20.00	P-110 HP	Yes	43.99	Yes	Non-weld Bow		12,076.6	11,258.39
269	264	Casing Joints	5.500	20.00	P-110 HP	Yes	43.88	Yes	Non-weld Bow		12,032.7	11,302.27
270	265	Casing Joints	5.500	20.00	P-110 HP	Yes	43.96	Yes	Non-weld Bow		11,988.8	11,346.23
271	266	Casing Joints	5.500	20.00	P-110 HP	Yes	44.13	Yes	Non-weld Bow		11,944.6	11,390.36
272	267	Casing Joints	5.500	20.00	P-110 HP	Yes	43.77	Yes	Non-weld Bow		11,900.9	11,434.13
273	268	Casing Joints	5.500	20.00	P-110 HP	Yes	43.85	Yes	Non-weld Bow -270		11,857.0	11,477.98
274	269	Casing Joints	5.500	20.00	P-110 HP	Yes	44.76	Yes	Non-weld Bow		11,812.3	11,522.74
275	270	Casing Joints	5.500	20.00	P-110 HP	Yes	43.74	Yes	Non-weld Bow		11,768.5	11,566.48
276	271	Casing Joints	5.500	20.00	P-110 HP	Yes	44.48	Yes	Non-weld Bow		11,724.0	11,610.96
277	272	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	Yes	Non-weld Bow		11,679.8	11,655.16
278	273	Casing Joints	5.500	20.00	P-110 HP	Yes	44.35	Yes	Non-weld Bow		11,635.5	11,699.51
279	274	Casing Joints	5.500	20.00	P-110 HP	Yes	44.19	Yes	Non-weld Bow		11,591.3	11,743.70
280	275	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	Non-weld Bow		11,547.1	11,787.93
281	276	Casing Joints	5.500	20.00	P-110 HP	Yes	43.77	Yes	Non-weld Bow		11,503.3	11,831.70
282	277	Casing Joints	5.500	20.00	P-110 HP	Yes	44.75	Yes	Non-weld Bow		11,458.6	11,876.45

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
283	278	Casing Joints	5.500	20.00	P-110 HP	Yes	43.93	Yes	Non-weld Bow -280		11,414.6	11,920.38
284	279	Casing Joints	5.500	20.00	P-110 HP	Yes	43.68	Yes	Non-weld Bow		11,370.9	11,964.06
285	280	Casing Joints	5.500	20.00	P-110 HP	Yes	43.30	Yes	Non-weld Bow		11,327.6	12,007.36
286		Floatation Collar	5.500	20.00		Yes	2.08	No	Floatation Sub (Air Lock)		11,325.6	12,009.44
287	281	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	Non-weld Bow		11,281.6	12,053.44
288	282	Casing Joints	5.500	20.00	P-110 HP	Yes	44.25	Yes	Non-weld Bow		11,237.3	12,097.69
289	283	Casing Joints	5.500	20.00	P-110 HP	Yes	44.43	Yes	Non-weld Bow		11,192.9	12,142.12
290	284	Casing Joints	5.500	20.00	P-110 HP	Yes	44.43	Yes	Non-weld Bow		11,148.5	12,186.55
291	285	Casing Joints	5.500	20.00	P-110 HP	Yes	41.38	Yes	Non-weld Bow		11,107.1	12,227.93
292	286	Casing Joints	5.500	20.00	P-110 HP	Yes	43.60	Yes	Non-weld Bow		11,063.5	12,271.53
293	287	Casing Joints	5.500	20.00	P-110 HP	Yes	44.05	Yes	Non-weld Bow		11,019.4	12,315.58
294	288	Casing Joints	5.500	20.00	P-110 HP	Yes	44.53	Yes	Non-weld Bow -290		10,974.9	12,360.11
295	289	Casing Joints	5.500	20.00	P-110 HP	Yes	41.23	Yes	Non-weld Bow		10,933.7	12,401.34
296	290	Casing Joints	5.500	20.00	P-110 HP	Yes	44.29	Yes	Non-weld Bow		10,889.4	12,445.63
297	291	Casing Joints	5.500	20.00	P-110 HP	Yes	43.60	Yes	Non-weld Bow		10,845.8	12,489.23
298	292	Casing Joints	5.500	20.00	P-110 HP	Yes	44.43	Yes	Non-weld Bow		10,801.3	12,533.66
299	293	Casing Joints	5.500	20.00	P-110 HP	Yes	44.06	Yes	Non-weld Bow		10,757.3	12,577.72
300	294	Casing Joints	5.500	20.00	P-110 HP	Yes	43.82	Yes	Non-weld Bow		10,713.5	12,621.54
301	295	Casing Joints	5.500	20.00	P-110 HP	Yes	44.08	Yes	Non-weld Bow		10,669.4	12,665.62
302	296	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	Non-weld Bow		10,625.4	12,709.62
303	297	Casing Joints	5.500	20.00	P-110 HP	Yes	44.25	Yes	Non-weld Bow		10,581.1	12,753.87
304	298	Casing Joints	5.500	20.00	P-110 HP	Yes	44.33	Yes	Non-weld Bow -300		10,536.8	12,798.20
305	299	Casing Joints	5.500	20.00	P-110 HP	Yes	44.42	Yes	Non-weld Bow		10,492.4	12,842.62
306	300	Casing Joints	5.500	20.00	P-110 HP	Yes	43.88	Yes	Non-weld Bow		10,448.5	12,886.50
307	301	Casing Joints	5.500	20.00	P-110 HP	Yes	44.16	Yes	Non-weld Bow		10,404.3	12,930.66
308	302	Casing Joints	5.500	20.00	P-110 HP	Yes	43.82	Yes	Non-weld Bow		10,360.5	12,974.48
309	303	Casing Joints	5.500	20.00	P-110 HP	Yes	43.63	Yes	Non-weld Bow		10,316.9	13,018.11
310	304	Casing Joints	5.500	20.00	P-110 HP	Yes	42.40	Yes	Non-weld Bow		10,274.5	13,060.51
311	305	Casing Joints	5.500	20.00	P-110 HP	Yes	44.36	Yes	Non-weld Bow		10,230.1	13,104.87
312	306	Casing Joints	5.500	20.00	P-110 HP	Yes	43.31	Yes	Non-weld Bow		10,186.8	13,148.18
313	307	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	Yes	Non-weld Bow		10,142.5	13,192.46
314	308	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	Non-weld Bow -310		10,098.5	13,236.46
315	309	Casing Joints	5.500	20.00	P-110 HP	Yes	44.12	Yes	Non-weld Bow		10,054.4	13,280.58
316	310	Casing Joints	5.500	20.00	P-110 HP	Yes	43.99	Yes	Non-weld Bow		10,010.4	13,324.57
317	311	Casing Joints	5.500	20.00	P-110 HP	Yes	44.40	Yes	Non-weld Bow		9,966.0	13,368.97
318	312	Casing Joints	5.500	20.00	P-110 HP	Yes	43.65	Yes	Non-weld Bow		9,922.4	13,412.62
319	313	Casing Joints	5.500	20.00	P-110 HP	Yes	43.96	Yes	Non-weld Bow		9,878.4	13,456.58
320	314	Casing Joints	5.500	20.00	P-110 HP	Yes	41.36	Yes	Non-weld Bow		9,837.1	13,497.94
321	315	Casing Joints	5.500	20.00	P-110 HP	Yes	43.07	Yes	Non-weld Bow		9,794.0	13,541.01
322	316	Casing Joints	5.500	20.00	P-110 HP	Yes	44.55	Yes	Non-weld Bow		9,749.4	13,585.56

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
323	317	Casing Joints	5.500	20.00	P-110 HP	Yes	41.36	Yes	Non-weld Bow		9,708.1	13,626.92
324	318	Casing Joints	5.500	20.00	P-110 HP	Yes	44.40	Yes	Non-weld Bow -320		9,663.7	13,671.32
325	319	Casing Joints	5.500	20.00	P-110 HP	Yes	44.16	Yes	Non-weld Bow		9,619.5	13,715.48
326	320	Casing Joints	5.500	20.00	P-110 HP	Yes	43.30	Yes	Non-weld Bow		9,576.2	13,758.78
327	321	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	Non-weld Bow		9,532.0	13,803.01
328	322	Casing Joints	5.500	20.00	P-110 HP	Yes	43.71	Yes	Non-weld Bow		9,488.3	13,846.72
329	323	Casing Joints	5.500	20.00	P-110 HP	Yes	43.23	Yes	Non-weld Bow		9,445.1	13,889.95
330	324	Casing Joints	5.500	20.00	P-110 HP	Yes	44.17	Yes	Non-weld Bow		9,400.9	13,934.12
331	325	Casing Joints	5.500	20.00	P-110 HP	Yes	41.34	Yes	Non-weld Bow		9,359.5	13,975.46
332	326	Casing Joints	5.500	20.00	P-110 HP	Yes	43.37	Yes	Non-weld Bow		9,316.2	14,018.83
333	327	Casing Joints	5.500	20.00	P-110 HP	Yes	41.33	Yes	Non-weld Bow		9,274.8	14,060.16
334	328	Casing Joints	5.500	20.00	P-110 HP	Yes	44.36	Yes	Non-weld Bow -330		9,230.5	14,104.52
335	329	Casing Joints	5.500	20.00	P-110 HP	Yes	41.36	Yes	Non-weld Bow		9,189.1	14,145.88
336	330	Casing Joints	5.500	20.00	P-110 HP	Yes	44.11	Yes	Non-weld Bow		9,145.0	14,189.99
337	331	Casing Joints	5.500	20.00	P-110 HP	Yes	43.58	Yes	Non-weld Bow		9,101.4	14,233.57
338	332	Casing Joints	5.500	20.00	P-110 HP	Yes	44.09	Yes	Non-weld Bow		9,057.3	14,277.66
339	333	Casing Joints	5.500	20.00	P-110 HP	Yes	41.54	Yes	Non-weld Bow		9,015.8	14,319.20
340	334	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	Yes	Non-weld Bow		8,971.6	14,363.40
341	335	Casing Joints	5.500	20.00	P-110 HP	Yes	41.33	Yes	Non-weld Bow		8,930.3	14,404.73
342	336	Casing Joints	5.500	20.00	P-110 HP	Yes	44.04	Yes	Non-weld Bow		8,886.2	14,448.77
343	337	Casing Joints	5.500	20.00	P-110 HP	Yes	44.13	Yes	Non-weld Bow		8,842.1	14,492.90
344	338	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	Non-weld Bow - 340		8,797.9	14,537.13
345	339	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	Non-weld Bow		8,754.0	14,581.03
346	340	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	Yes	Non-weld Bow		8,709.7	14,625.31
347	341	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		8,665.7	14,669.34
348	342	Casing Joints	5.500	20.00	P-110 HP	Yes	41.49	Yes	Non-weld Bow		8,624.2	14,710.83
349	343	Casing Joints	5.500	20.00	P-110 HP	Yes	44.22	Yes	Non-weld Bow		8,580.0	14,755.05
350	344	Casing Joints	5.500	20.00	P-110 HP	Yes	44.02	Yes	Non-weld Bow		8,535.9	14,799.07
351	345	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	Yes	Non-weld Bow		8,491.8	14,843.17
352	346	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	Non-weld Bow		8,447.6	14,887.35
353	347	Casing Joints	5.500	20.00	P-110 HP	Yes	43.98	Yes	Non-weld Bow		8,403.7	14,931.33
354	348	Casing Joints	5.500	20.00	P-110 HP	Yes	43.40	Yes	Non-weld Bow -350		8,360.3	14,974.73
355	349	Casing Joints	5.500	20.00	P-110 HP	Yes	43.84	Yes	Non-weld Bow		8,316.4	15,018.57
356	350	Casing Joints	5.500	20.00	P-110 HP	Yes	43.85	Yes	Non-weld Bow		8,272.6	15,062.42
357	351	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	Non-weld Bow		8,228.7	15,106.32
358	352	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	Yes	Non-weld Bow		8,184.4	15,150.60
359	353	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	Non-weld Bow		8,140.2	15,194.78
360	354	Casing Joints	5.500	20.00	P-110 HP	Yes	43.95	Yes	Non-weld Bow		8,096.3	15,238.73
361	355	Casing Joints	5.500	20.00	P-110 HP	Yes	43.73	Yes	Non-weld Bow		8,052.5	15,282.46
362	356	Casing Joints	5.500	20.00	P-110 HP	Yes	41.31	Yes	Non-weld Bow		8,011.2	15,323.77
363	357	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	Yes	Non-weld Bow		7,967.1	15,367.87

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
364	358	Casing Joints	5.500	20.00	P-110 HP	Yes	44.38	Yes	Non-weld Bow - 360		7,922.7	15,412.25
365	359	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	Yes	Non-weld Bow		7,879.0	15,455.95
366	360	Casing Joints	5.500	20.00	P-110 HP	Yes	43.35	Yes	Non-weld Bow		7,835.7	15,499.30
367	361	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	Non-weld Bow		7,791.5	15,543.53
368	362	Casing Joints	5.500	20.00	P-110 HP	Yes	41.32	Yes	Non-weld Bow		7,750.1	15,584.85
369	363	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		7,708.9	15,626.05
370	364	Casing Joints	5.500	20.00	P-110 HP	Yes	44.47	Yes	Non-weld Bow		7,664.5	15,670.52
371	365	Casing Joints	5.500	20.00	P-110 HP	Yes	41.31	Yes	Non-weld Bow		7,623.2	15,711.83
372	366	Casing Joints	5.500	20.00	P-110 HP	Yes	44.32	Yes	Non-weld Bow		7,578.8	15,756.15
373	367	Casing Joints	5.500	20.00	P-110 HP	Yes	44.95	Yes	Non-weld Bow		7,533.9	15,801.10
374	368	Casing Joints	5.500	20.00	P-110 HP	Yes	44.73	Yes	Non-weld Bow - 370		7,489.2	15,845.83
375	369	Casing Joints	5.500	20.00	P-110 HP	Yes	40.60	Yes	Non-weld Bow		7,448.6	15,886.43
376	370	Casing Joints	5.500	20.00	P-110 HP	Yes	44.25	Yes	Non-weld Bow		7,404.3	15,930.68
377	371	Casing Joints	5.500	20.00	P-110 HP	Yes	41.35	Yes	Non-weld Bow		7,363.0	15,972.03
378	372	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		7,321.8	16,013.23
379	373	Casing Joints	5.500	20.00	P-110 HP	Yes	41.28	Yes	Non-weld Bow		7,280.5	16,054.51
380	374	Casing Joints	5.500	20.00	P-110 HP	Yes	39.64	Yes	Non-weld Bow		7,240.8	16,094.15
381	375	Casing Joints	5.500	20.00	P-110 HP	Yes	44.66	Yes	Non-weld Bow		7,196.2	16,138.81
382	376	Casing Joints	5.500	20.00	P-110 HP	Yes	41.08	Yes	Non-weld Bow		7,155.1	16,179.89
383	377	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	Non-weld Bow		7,110.8	16,224.20
384		Marker Joint	5.500	20.00		Yes	21.35	No	Marker Joint #3 (LP)		7,089.4	16,245.55
385	378	Casing Joints	5.500	20.00	P-110 HP	Yes	43.23	Yes	Non-weld Bow - 380		7,046.2	16,288.78
386	379	Casing Joints	5.500	20.00	P-110 HP	Yes	41.00	Yes	Non-weld Bow		7,005.2	16,329.78
387	380	Casing Joints	5.500	20.00	P-110 HP	Yes	43.21	Yes	Non-weld Bow		6,962.0	16,372.99
388	381	Casing Joints	5.500	20.00	P-110 HP	Yes	44.65	Yes	Non-weld Bow		6,917.4	16,417.64
389	382	Casing Joints	5.500	20.00	P-110 HP	Yes	41.32	Yes	Non-weld Bow		6,876.0	16,458.96
390	383	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		6,832.0	16,502.99
391	384	Casing Joints	5.500	20.00	P-110 HP	Yes	41.32	Yes	Non-weld Bow		6,790.7	16,544.31
392	385	Casing Joints	5.500	20.00	P-110 HP	Yes	41.27	Yes	Non-weld Bow		6,749.4	16,585.58
393	386	Casing Joints	5.500	20.00	P-110 HP	Yes	44.56	Yes	Non-weld Bow		6,704.9	16,630.14
394	387	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		6,663.7	16,671.34
395	388	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	Non-weld Bow - 390		6,619.4	16,715.57
396	389	Casing Joints	5.500	20.00	P-110 HP	Yes	40.75	Yes	Non-weld Bow		6,578.7	16,756.32
397	390	Casing Joints	5.500	20.00	P-110 HP	Yes	41.27	Yes	Non-weld Bow		6,537.4	16,797.59
398	391	Casing Joints	5.500	20.00	P-110 HP	Yes	40.29	Yes	Non-weld Bow		6,497.1	16,837.88
399	392	Casing Joints	5.500	20.00	P-110 HP	Yes	44.16	Yes	Non-weld Bow		6,453.0	16,882.04
400	393	Casing Joints	5.500	20.00	P-110 HP	Yes	41.16	Yes	Non-weld Bow		6,411.8	16,923.20
401	394	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	Yes	Non-weld Bow		6,367.8	16,967.23
402	395	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		6,326.6	17,008.43
403	396	Casing Joints	5.500	20.00	P-110 HP	Yes	41.33	Yes	Non-weld Bow		6,285.2	17,049.76

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
404	397	Casing Joints	5.500	20.00	P-110 HP	Yes	41.21	Yes	Non-weld Bow		6,244.0	17,090.97
405	398	Casing Joints	5.500	20.00	P-110 HP	Yes	44.07	Yes	Non-weld Bow - 400		6,200.0	17,135.04
406	399	Casing Joints	5.500	20.00	P-110 HP	Yes	40.71	Yes	Non-weld Bow		6,159.2	17,175.75
407	400	Casing Joints	5.500	20.00	P-110 HP	Yes	41.20	Yes	Non-weld Bow		6,118.0	17,216.95
408	401	Casing Joints	5.500	20.00	P-110 HP	Yes	41.35	Yes	Non-weld Bow		6,076.7	17,258.30
409	402	Casing Joints	5.500	20.00	P-110 HP	Yes	41.28	Yes	Non-weld Bow		6,035.4	17,299.58
410	403	Casing Joints	5.500	20.00	P-110 HP	Yes	43.96	Yes	Non-weld Bow		5,991.5	17,343.54
411	404	Casing Joints	5.500	20.00	P-110 HP	Yes	43.82	Yes	Non-weld Bow 8.25" -		5,947.6	17,387.36
412	405	Casing Joints	5.500	20.00	P-110 HP	Yes	44.44	Yes	Non-weld Bow 8.25" - 407		5,903.2	17,431.80
413	406	Casing Joints	5.500	20.00	P-110 HP	Yes	44.24	Yes	Non-weld Bow 8.25"		5,859.0	17,476.04
414	407	Casing Joints	5.500	20.00	P-110 HP	Yes	43.79	Yes	Non-weld bow 8.5" - 1		5,815.2	17,519.83
415		Marker Joint	5.500	20.00		Yes	21.40	No	Marker Joint #4 KOP		5,793.8	17,541.23
416	408	Casing Joints	5.500	20.00	P-110 HP	Yes	44.06	No			5,749.7	17,585.29
417	409	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	No			5,705.6	17,629.39
418	410	Casing Joints	5.500	20.00	P-110 HP	Yes	44.02	Yes	"Non-weld bow 8.5"		5,661.6	17,673.41
419	411	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	No			5,617.9	17,717.11
420	412	Casing Joints	5.500	20.00	P-110 HP	Yes	44.12	No			5,573.8	17,761.23
421	413	Casing Joints	5.500	20.00	P-110 HP	Yes	44.05	Yes	"Non-weld bow 8.5"""		5,529.7	17,805.28
422	414	Casing Joints	5.500	20.00	P-110 HP	Yes	43.91	No			5,485.8	17,849.19
423	415	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	No			5,442.1	17,892.89
424	416	Casing Joints	5.500	20.00	P-110 HP	Yes	43.84	Yes	"Non-weld bow 8.5"""		5,398.3	17,936.73
425	417	Casing Joints	5.500	20.00	P-110 HP	Yes	43.82	No			5,354.4	17,980.55
426	418	Casing Joints	5.500	20.00	P-110 HP	Yes	42.80	No			5,311.6	18,023.35
427	419	Casing Joints	5.500	20.00	P-110 HP	Yes	43.95	Yes	"Non-weld bow 8.5"""		5,267.7	18,067.30
428	420	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	No			5,223.8	18,111.20
429	421	Casing Joints	5.500	20.00	P-110 HP	Yes	43.94	No			5,179.9	18,155.14
430	422	Casing Joints	5.500	20.00	P-110 HP	Yes	43.81	Yes	"Non-weld bow 8.5"""		5,136.0	18,198.95
431	423	Casing Joints	5.500	20.00	P-110 HP	Yes	45.02	No			5,091.0	18,243.97
432	424	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	No			5,046.8	18,288.17
433	425	Casing Joints	5.500	20.00	P-110 HP	Yes	44.49	Yes	"Non-weld bow 8.5"""		5,002.3	18,332.66
434	426	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	No			4,958.3	18,376.66
435	427	Casing Joints	5.500	20.00	P-110 HP	Yes	43.87	No			4,914.5	18,420.53
436	428	Casing Joints	5.500	20.00	P-110 HP	Yes	44.25	Yes	"Non-weld bow 8.5"""		4,870.2	18,464.78
437	429	Casing Joints	5.500	20.00	P-110 HP	Yes	43.78	No			4,826.4	18,508.56
438	430	Casing Joints	5.500	20.00	P-110 HP	Yes	43.93	No			4,782.5	18,552.49
439	431	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	Yes	"Non-weld bow 8.5"""		4,738.4	18,596.59
440	432	Casing Joints	5.500	20.00	P-110 HP	Yes	44.56	No			4,693.8	18,641.15
441	433	Casing Joints	5.500	20.00	P-110 HP	Yes	44.07	No			4,649.8	18,685.22
442	434	Casing Joints	5.500	20.00	P-110 HP	Yes	43.78	Yes	"Non-weld bow 8.5" 10		4,606.0	18,729.00
443	435	Casing Joints	5.500	20.00	P-110 HP	Yes	43.62	No			4,562.4	18,772.62
444	436	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	No			4,518.3	18,816.72
445	437	Casing Joints	5.500	20.00	P-110 HP	Yes	44.43	Yes	"Non-weld bow 8.5"""		4,473.8	18,861.15
446	438	Casing Joints	5.500	20.00	P-110 HP	Yes	44.48	No			4,429.4	18,905.63
447	439	Casing Joints	5.500	20.00	P-110 HP	Yes	43.87	No			4,385.5	18,949.50
448	440	Casing Joints	5.500	20.00	P-110 HP	Yes	43.87	Yes	"Non-weld bow 8.5"""		4,341.6	18,993.37
449	441	Casing Joints	5.500	20.00	P-110 HP	Yes	43.87	No			4,297.8	19,037.24
450	442	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	No			4,253.6	19,081.42
451	443	Casing Joints	5.500	20.00	P-110 HP	Yes	42.40	Yes	"Non-weld bow 8.5"""		4,211.2	19,123.82
452	444	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	No			4,167.2	19,167.82
453	445	Casing Joints	5.500	20.00	P-110 HP	Yes	44.27	No			4,122.9	19,212.09
454	446	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	"Non-weld bow 8.5"""		4,078.6	19,256.40

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
455	447	Casing Joints	5.500	20.00	P-110 HP	Yes	43.57	No			4,035.0	19,299.97
456	448	Casing Joints	5.500	20.00	P-110 HP	Yes	43.64	No			3,991.4	19,343.61
457	449	Casing Joints	5.500	20.00	P-110 HP	Yes	44.23	Yes	"Non-weld bow 8.5"""		3,947.2	19,387.84
458	450	Casing Joints	5.500	20.00	P-110 HP	Yes	43.96	No			3,903.2	19,431.80
459	451	Casing Joints	5.500	20.00	P-110 HP	Yes	43.85	No			3,859.3	19,475.65
460	452	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	"Non-weld bow 8.5"""		3,815.2	19,519.83
461	453	Casing Joints	5.500	20.00	P-110 HP	Yes	43.53	No			3,771.6	19,563.36
462	454	Casing Joints	5.500	20.00	P-110 HP	Yes	44.35	No			3,727.3	19,607.71
463	455	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	"Non-weld bow 8.5"""		3,683.3	19,651.71
464	456	Casing Joints	5.500	20.00	P-110 HP	Yes	43.95	No			3,639.3	19,695.66
465	457	Casing Joints	5.500	20.00	P-110 HP	Yes	43.99	No			3,595.3	19,739.65
466	458	Casing Joints	5.500	20.00	P-110 HP	Yes	44.38	Yes	"Non-weld bow 8.5"""		3,551.0	19,784.03
467	459	Casing Joints	5.500	20.00	P-110 HP	Yes	44.04	No			3,506.9	19,828.07
468	460	Casing Joints	5.500	20.00	P-110 HP	Yes	43.60	No			3,463.3	19,871.67
469	461	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	"Non-weld bow 8.5"""		3,419.1	19,915.85
470	462	Casing Joints	5.500	20.00	P-110 HP	Yes	43.64	No			3,375.5	19,959.49
471	463	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	No			3,331.4	20,003.64
472	464	Casing Joints	5.500	20.00	P-110 HP	Yes	43.67	Yes	"Non-weld bow 8.5" 20		3,287.7	20,047.31
473	465	Casing Joints	5.500	20.00	P-110 HP	Yes	43.77	No			3,243.9	20,091.08
474	466	Casing Joints	5.500	20.00	P-110 HP	Yes	43.93	No			3,200.0	20,135.01
475	467	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	"Non-weld bow 8.5"		3,155.8	20,179.19
476	468	Casing Joints	5.500	20.00	P-110 HP	Yes	43.75	No			3,112.1	20,222.94
477	469	Casing Joints	5.500	20.00	P-110 HP	Yes	43.74	No			3,068.3	20,266.68
478	470	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	Yes	"Non-weld bow 8.5"""		3,024.3	20,310.68
479	471	Casing Joints	5.500	20.00	P-110 HP	Yes	41.23	No			2,983.1	20,351.91
480	472	Casing Joints	5.500	20.00	P-110 HP	Yes	44.34	No			2,938.7	20,396.25
481	473	Casing Joints	5.500	20.00	P-110 HP	Yes	43.98	Yes	"Non-weld bow 8.5"""		2,894.8	20,440.23
482	474	Casing Joints	5.500	20.00	P-110 HP	Yes	44.26	No			2,850.5	20,484.49
483	475	Casing Joints	5.500	20.00	P-110 HP	Yes	44.47	No			2,806.0	20,528.96
484	476	Casing Joints	5.500	20.00	P-110 HP	Yes	43.88	Yes	"Non-weld bow 8.5"""		2,762.2	20,572.84
485	477	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	No			2,718.3	20,616.74
486	478	Casing Joints	5.500	20.00	P-110 HP	Yes	44.04	No			2,674.2	20,660.78
487	479	Casing Joints	5.500	20.00	P-110 HP	Yes	43.69	Yes	"Non-weld bow 8.5"""		2,630.5	20,704.47
488	480	Casing Joints	5.500	20.00	P-110 HP	Yes	43.96	No			2,586.6	20,748.43
489	481	Casing Joints	5.500	20.00	P-110 HP	Yes	43.58	No			2,543.0	20,792.01
490	482	Casing Joints	5.500	20.00	P-110 HP	Yes	43.91	Yes	"Non-weld bow 8.5"""		2,499.1	20,835.92
491	483	Casing Joints	5.500	20.00	P-110 HP	Yes	43.93	No			2,455.1	20,879.85
492	484	Casing Joints	5.500	20.00	P-110 HP	Yes	43.78	No			2,411.4	20,923.63
493	485	Casing Joints	5.500	20.00	P-110 HP	Yes	44.18	Yes	"Non-weld bow 8.5"""		2,367.2	20,967.81
494	486	Casing Joints	5.500	20.00	P-110 HP	Yes	44.04	No			2,323.1	21,011.85
495	487	Casing Joints	5.500	20.00	P-110 HP	Yes	43.97	No			2,279.2	21,055.82
496	488	Casing Joints	5.500	20.00	P-110 HP	Yes	44.09	Yes	"""Non-weld bow 8.5"		2,235.1	21,099.91
497	489	Casing Joints	5.500	20.00	P-110 HP	Yes	44.28	No			2,190.8	21,144.19
498	490	Casing Joints	5.500	20.00	P-110 HP	Yes	44.42	No			2,146.4	21,188.61
499	491	Casing Joints	5.500	20.00	P-110 HP	Yes	43.46	Yes	"""Non-weld bow 8.5		2,102.9	21,232.07
500	492	Casing Joints	5.500	20.00	P-110 HP	Yes	43.80	No			2,059.1	21,275.87
501	493	Casing Joints	5.500	20.00	P-110 HP	Yes	44.00	No			2,015.1	21,319.87
502	494	Casing Joints	5.500	20.00	P-110 HP	Yes	43.95	Yes	Non-weld 8.5" - 30		1,971.2	21,363.82
503	495	Casing Joints	5.500	20.00	P-110 HP	Yes	43.95	No			1,927.2	21,407.77
504	496	Casing Joints	5.500	20.00	P-110 HP	Yes	44.19	No			1,883.0	21,451.96
505	497	Casing Joints	5.500	20.00	P-110 HP	Yes	44.31	Yes	Non-weld bow 8.5		1,838.7	21,496.27
506	498	Casing Joints	5.500	20.00	P-110 HP	Yes	43.86	No			1,794.9	21,540.13
507	499	Casing Joints	5.500	20.00	P-110 HP	Yes	44.24	No			1,750.6	21,584.37
508	500	Casing Joints	5.500	20.00	P-110 HP	Yes	44.15	Yes	"""Non-weld bow 8.5"" "		1,706.5	21,628.52
509	501	Casing Joints	5.500	20.00	P-110 HP	Yes	44.14	No			1,662.3	21,672.66
510	502	Casing Joints	5.500	20.00	P-110 HP	Yes	43.49	No			1,618.8	21,716.15

Casing Offload Tally

Well Name: CARL ROTTER OHI 10 **Production, Set Depth: 23,335.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003280000	4001171228	SWN PRODUCTION COMPANY L...	1,336.70	25.40	1,362.10 KB2,9/16/2020 00:00	4/14/2022 04:00
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Drilling

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
511	503	Casing Joints	5.500	20.00	P-110 HP	Yes	43.85	Yes	"""Non-weld bow 8.5"" "		1,575.0	21,760.00
512	504	Casing Joints	5.500	20.00	P-110 HP	Yes	43.93	No			1,531.1	21,803.93
513	505	Casing Joints	5.500	20.00	P-110 HP	Yes	43.07	No			1,488.0	21,847.00
514	506	Casing Joints	5.500	20.00	P-110 HP	Yes	43.80	Yes	"""Non-weld bow 8.5"" "		1,444.2	21,890.80
515	507	Casing Joints	5.500	20.00	P-110 HP	Yes	43.93	No			1,400.3	21,934.73
516	508	Casing Joints	5.500	20.00	P-110 HP	Yes	44.07	No			1,356.2	21,978.80
517	509	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	"""Non-weld bow 8.5"" "		1,312.3	22,022.70
518	510	Casing Joints	5.500	20.00	P-110 HP	Yes	43.69	No			1,268.6	22,066.39
519	511	Casing Joints	5.500	20.00	P-110 HP	Yes	43.97	No			1,224.6	22,110.36
520	512	Casing Joints	5.500	20.00	P-110 HP	Yes	43.90	Yes	"""Non-weld bow 8.5"" "		1,180.7	22,154.26
521	513	Casing Joints	5.500	20.00	P-110 HP	Yes	43.83	No			1,136.9	22,198.09
522	514	Casing Joints	5.500	20.00	P-110 HP	Yes	44.08	No			1,092.8	22,242.17
523	515	Casing Joints	5.500	20.00	P-110 HP	Yes	44.37	Yes	"""Non-weld bow 8.5"" "		1,048.5	22,286.54
524	516	Casing Joints	5.500	20.00	P-110 HP	Yes	43.89	No			1,004.6	22,330.43
525	517	Casing Joints	5.500	20.00	P-110 HP	Yes	44.03	No			960.5	22,374.46
526	518	Casing Joints	5.500	20.00	P-110 HP	Yes	43.69	Yes	"""Non-weld bow 8.5"" "		916.8	22,418.15
527	519	Casing Joints	5.500	20.00	P-110 HP	Yes	44.46	No			872.4	22,462.61
528	520	Casing Joints	5.500	20.00	P-110 HP	Yes	43.27	No			829.1	22,505.88
529	521	Casing Joints	5.500	20.00	P-110 HP	Yes	43.91	Yes	"""Non-weld bow 8.5"" "		785.2	22,549.79
530	522	Casing Joints	5.500	20.00	P-110 HP	Yes	42.52	No			742.7	22,592.31
531	523	Casing Joints	5.500	20.00	P-110 HP	Yes	43.71	No			699.0	22,636.02
532	524	Casing Joints	5.500	20.00	P-110 HP	Yes	44.25	Yes	Non-weld bow 8.5" - 40		654.7	22,680.27
533	525	Casing Joints	5.500	20.00	P-110 HP	Yes	43.44	No			611.3	22,723.71
534	526	Casing Joints	5.500	20.00	P-110 HP	Yes	43.70	No			567.6	22,767.41
535	527	Casing Joints	5.500	20.00	P-110 HP	Yes	44.17	Yes	Non-weld bow 8.5		523.4	22,811.58
536	528	Casing Joints	5.500	20.00	P-110 HP	Yes	43.99	No			479.4	22,855.57
537	529	Casing Joints	5.500	20.00	P-110 HP	Yes	43.92	No			435.5	22,899.49
538	530	Casing Joints	5.500	20.00	P-110 HP	Yes	42.48	Yes	Non-weld bow 8.5		393.0	22,941.97
539	531	Casing Joints	5.500	20.00	P-110 HP	Yes	44.14	No			348.9	22,986.11
540	532	Casing Joints	5.500	20.00	P-110 HP	Yes	43.52	No			305.4	23,029.63
541	533	Casing Joints	5.500	20.00	P-110 HP	Yes	44.20	Yes	Non-weld bow 8.5"		261.2	23,073.83
542	534	Casing Joints	5.500	20.00	P-110 HP	Yes	43.16	No			218.0	23,116.99
543	535	Casing Joints	5.500	20.00	P-110 HP	Yes	43.92	No			174.1	23,160.91
544	536	Casing Joints	5.500	20.00	P-110 HP	Yes	44.02	Yes	Non-weld bow 8.5" - 44		130.1	23,204.93
545	537	Casing Joints	5.500	20.00	P-110 HP	Yes	43.69	No			86.4	23,248.62
546	538	Casing Joints	5.500	20.00	P-110 HP	Yes	44.10	No	Replaced Jt. ref. # 251		42.3	23,292.72
547	539	Casing Joints	5.500	20.00	P-110 HP	Yes	44.36	No	Replaced Jt. ref # 252		-2.1	23,337.08
	540	Casing Joints	5.500	20.00	P-110 HP	No	43.87	No	OUT # 3			
	541	Casing Joints	5.500	20.00	P-110 HP	No	43.88	No	OUT # 4			
	542	Casing Joints	5.500	20.00	P-110 HP	No	41.93	No	OUT # 5			
	543	Casing Joints	5.500	20.00	P-110 HP	No	43.97	No	OUT # 6			
	544	Casing Joints	5.500	20.00	P-110 HP	No	43.63	No	OUT # 7			
	545	Casing Joints	5.500	20.00	P-110 HP	No	43.80	No	OUT # 8			
	546	Casing Joints	5.500	20.00	P-110 HP	No	43.77	No	OUT # 9			
	547	Casing Joints	5.500	20.00	P-110 HP	No	43.74	No	OUT # 10			
	548	Casing Joints	5.500	20.00	P-110 HP	No	44.25	No	OUT # 11			
	549	Casing Joints	5.500	20.00	P-110 HP	No	44.10	No	OUT # 12			
	550	Casing Joints	5.500	20.00	P-110 HP	No	43.80	No	OUT # 13			
	551	Casing Joints	5.500	20.00	P-110 HP	No	44.14	No	OUT # 14			
	552	Casing Joints	5.500	20.00	P-110 HP	No	44.11	No	OUT # 15			
		Marker Joint	5.500	20.00		No	20.74	No	OUT Marker #2 replaced w/ #5			
		Marker Joint	5.500	20.00		No	20.85	No	OUT Marker #6			

WW-6B
(04/15)

API NO. 47- 009 -
OPERATOR WELL NO. Carl Rotter OHI 10H
Well Pad Name: Carl Rotter OHI

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	069-Ohio	3-Liberty	648-Valley Grove
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Carl Rotter OHI 10H Well Pad Name: Carl Rotter OHI

3) Farm Name/Surface Owner: Carl J. & Grace A. Rotter Public Road Access: Rogers Road

4) Elevation, current ground: 1336' Elevation, proposed post-construction: 1336'

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

6) Existing Pad: Yes or No Yes

Gayne Knitowski
Digitally signed by Gayne Knitowski
Date: 2022.03.01 08:20:29 -05'00'

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
'Target Formation- Marcellus, Down-Dip well to the South, Target Top TVD- 6733' Target Base TVD- 6791', Anticipated Thickness- 58', Associated Pressure- 4414

8) Proposed Total Vertical Depth: 6766'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 23344'

11) Proposed Horizontal Leg Length: 16295.43''

12) Approximate Fresh Water Strata Depths: 586'

13) Method to Determine Fresh Water Depths: Salinity Profile Analysis using deepest nearby water well

14) Approximate Saltwater Depths: 832' Salinity Profile Analysis of Pottsville Sandstone

15) Approximate Coal Seam Depths: 721'

16) Approximate Depth to Possible Void (coal mine, karst, other): Possible Void 721'

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

(a) If Yes, provide Mine Info: Name: Tunnel Ridge
Depth: 721'
Seam: Pittsburgh
Owner: Tunnel Ridge

API NO. 47- 009 -
OPERATOR WELL NO. Carl Rotter OHI 10H
Well Pad Name: Carl Rotter OHI

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	760'	760'	713 sx/CTS
Coal	See	Surface	Casing				
Intermediate	9 5/8"	New	J-55	36#	2168'	2168'	909 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	23344'	23344'	Tail 4441sx/ 100' Inside Intermediate
Tubing							
Liners							

Gayne Knitowski

Digitally signed by Gayne Knitowski
Date: 2022.03.01 08:20:52 -05'00'

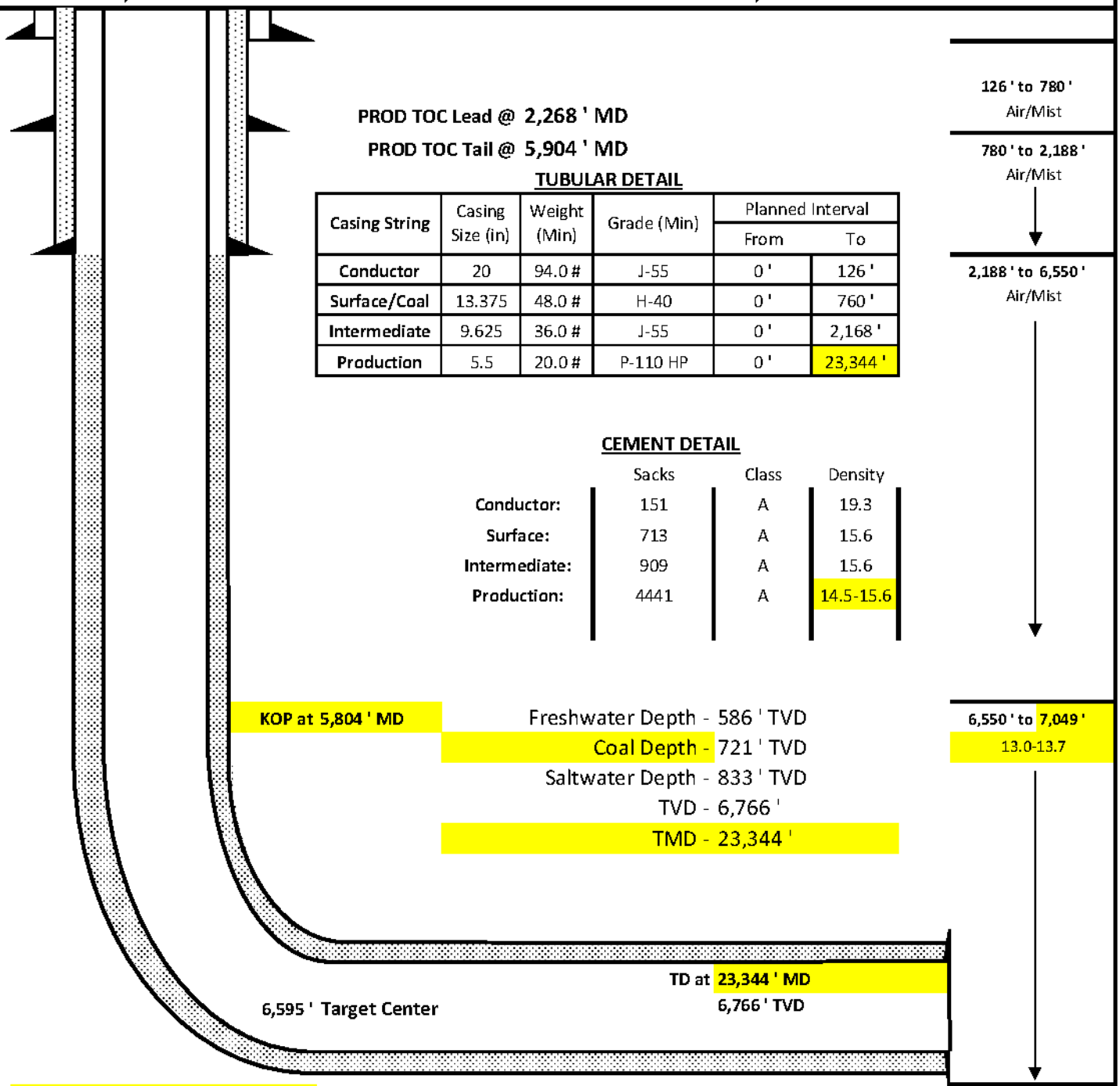
TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Surface	Casing				
Intermediate	9 5/8"	12 1/4"	0.352	3520	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well:	CARL ROTTER OHI 10	**Re-entry Rig:**	TBD
Field:	PANHANDLE FIELD WET	**Prospect:**	Marcellus Shale
County:	OHIO	**State:**	WV
SHL:	40.1016 Latitude	-80.5425 Longitude	
BHL:	40.0599 Latitude	-80.5185 Longitude	
KB Elev:	1,362 ft MSL	KB: 26 ft AGL	**GL Elev:** 1,336 ft MSL



PROD TOC Lead @ 2,268 ' MD

PROD TOC Tail @ 5,904 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface/Coal	13.375	48.0 #	H-40	0 '	760 '
Intermediate	9.625	36.0 #	J-55	0 '	2,168 '
Production	5.5	20.0 #	P-110 HP	0 '	23,344 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	713	A	15.6
Intermediate:	909	A	15.6
Production:	4441	A	14.5-15.6

KOP at 5,804 ' MD

Freshwater Depth - 586 ' TVD

Coal Depth - 721 ' TVD

Saltwater Depth - 833 ' TVD

TVD - 6,766 '

TMD - 23,344 '

TD at 23,344 ' MD

6,766 ' TVD

6,595 ' Target Center

EOB at 7,049 ' MD

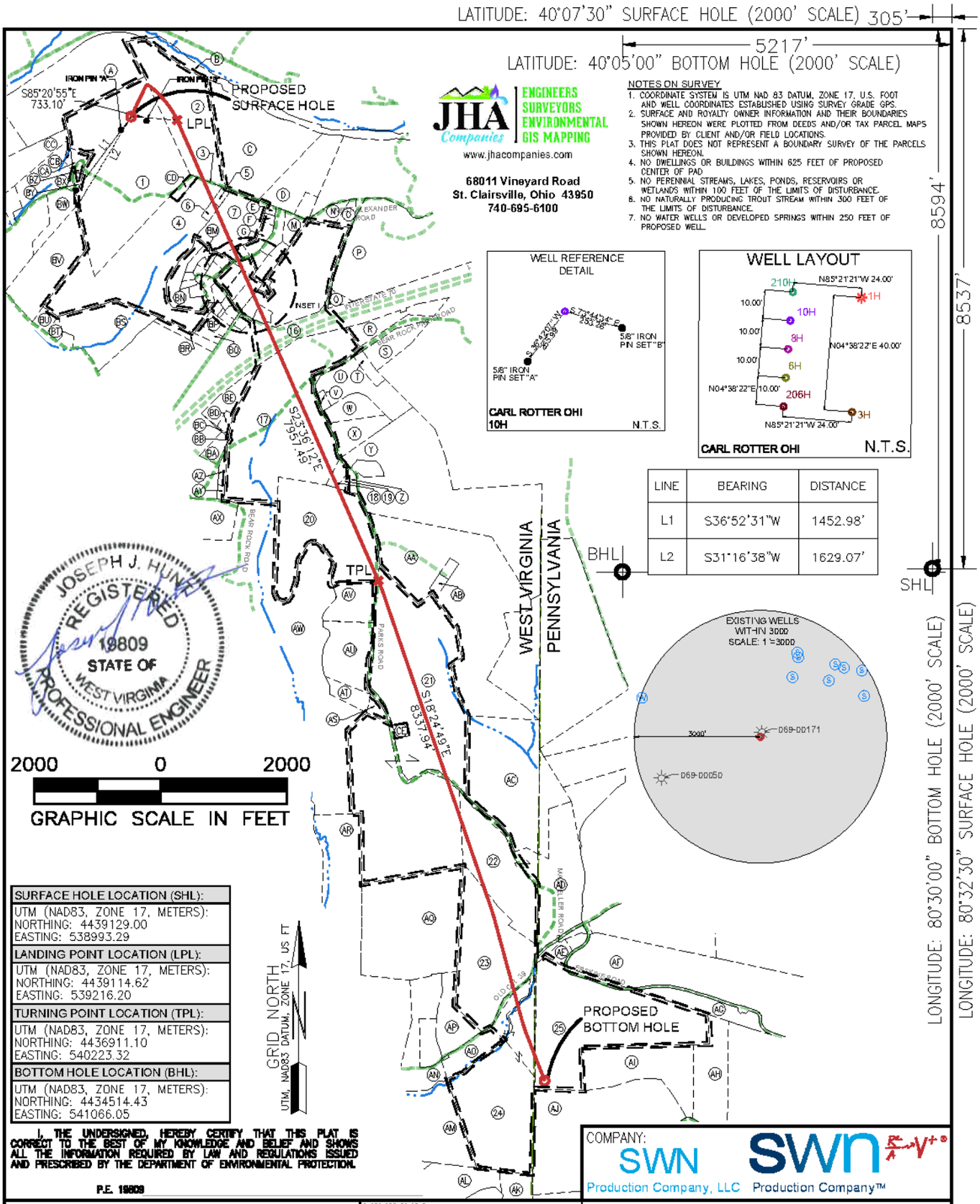
SHL Onondaga 6,621 ' TVD

Onondaga 6,792 ' TVD

Created by: C R Hall on 02/24/2022

Gayne Knitowski

Digitally signed by Gayne Knitowski
Date: 2022.03.01 08:21:12 -05'00'



LINE	BEARING	DISTANCE
L1	S36°52'31"W	1452.98'
L2	S31°16'38"W	1629.07'

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4439129.00 EASTING: 538993.29
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4439114.62 EASTING: 539216.20
TURNING POINT LOCATION (TPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4436911.10 EASTING: 540223.32
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4434514.43 EASTING: 541066.05

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.E. 19809

JOSEPH J. HUNT REGISTERED 19809 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

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

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.

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)

OPERATOR'S WELL #: CARL ROTTER OHI 10H

API WELL #: 47 (STATE) 069 (COUNTY) (PERMIT)

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

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1336.1'

DISTRICT: LIBERTY COUNTY: OHIO QUADRANGLE: VALLEY GROVE,WV

SURFACE OWNER: CARL J. & GRACE A. ROTTER ACREAGE: ±77.45

OIL & GAS ROYALTY OWNER: CARL J. & GRACE A. ROTTER ACREAGE: ±77.45

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,766' TVD 23,344' TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

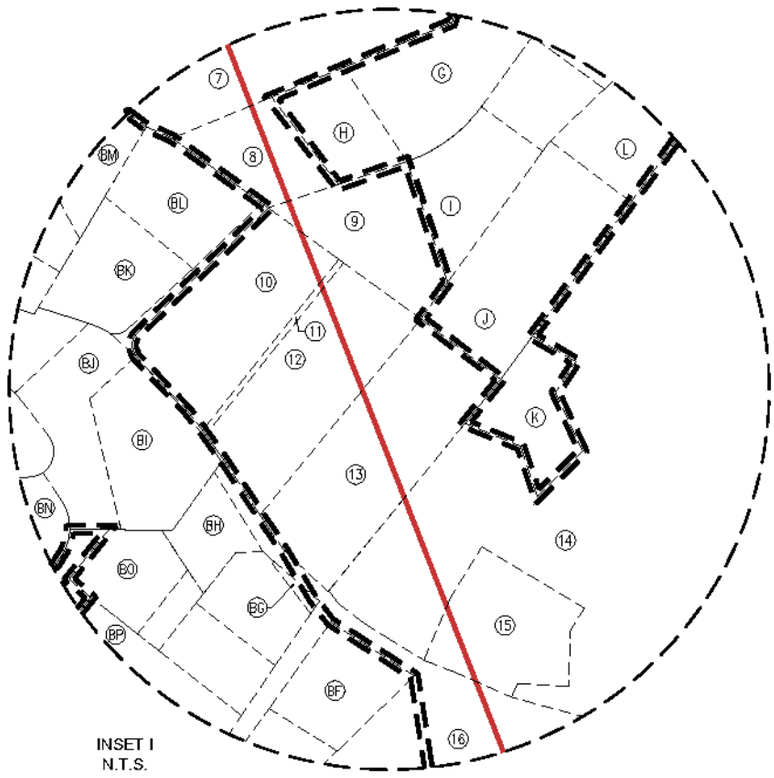
DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- EXISTING WATER WELL
- EXISTING SPRING
- NATURAL WATERWAY
- SURVEYED BOUNDARY
- LEASE BOUNDARY
- PROPOSED PATH
- PUBLIC ROAD

REVISIONS:	DATE: 02-25-2022
	API NO: 47-069-XXXXX
	DRAWN BY: R. GRIMES
	SCALE: 1" = 2000'
	DRAWING NO:2018-0153
	WELL LOCATION PLAT

C:\USERS\RGRIMES\APPDATA\LOCAL\TEMP\ACPUBLISH_7316\CARL ROTTER OHI 10H.DWG
FRIDAY FEBRUARY 25 2022 10:20AM

COMPLETION ID 2501171232
PAD ID 3001156566



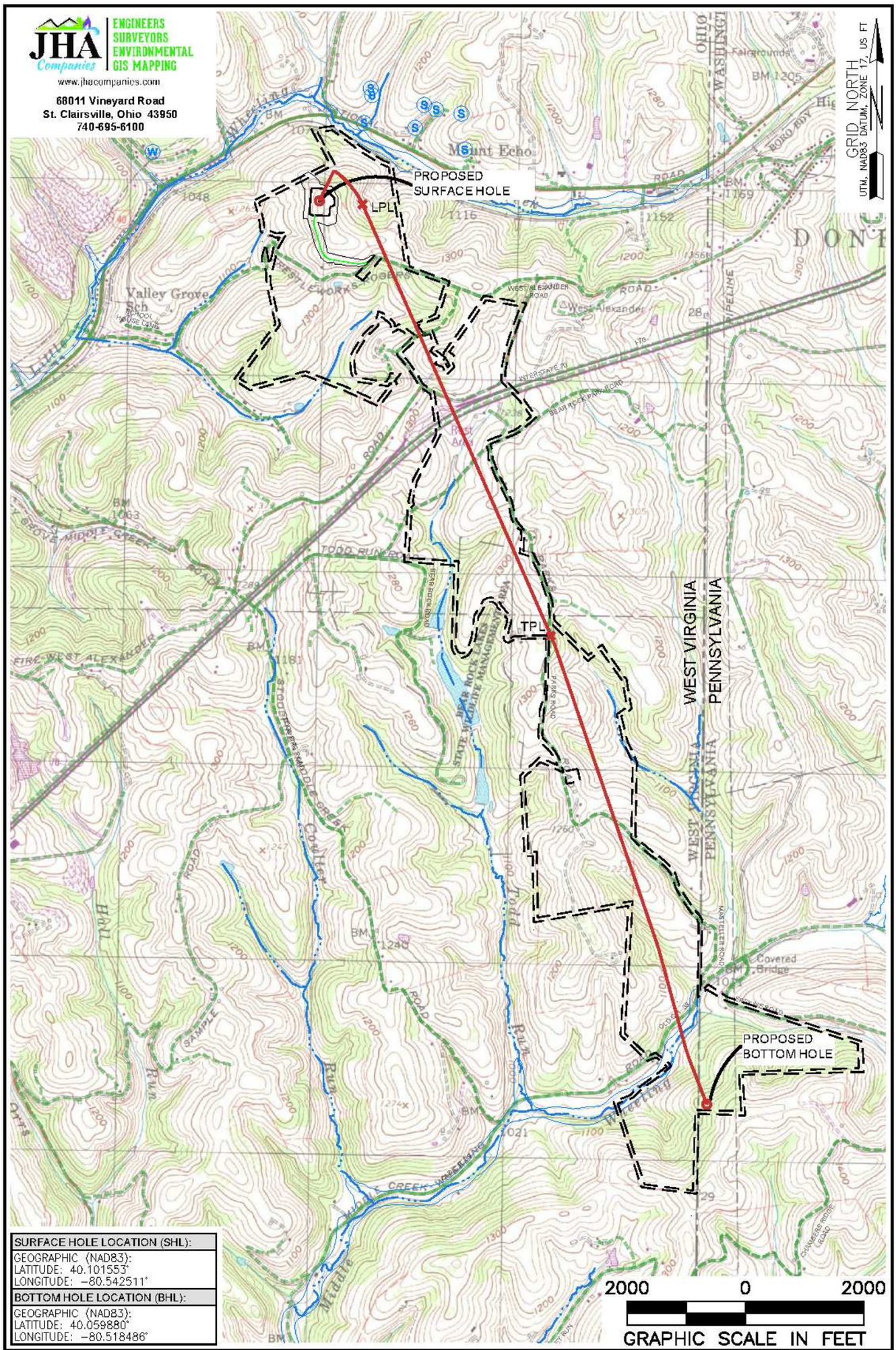
INSET I
N.T.S.

WELL BORE TABLE FOR SURFACE/ROYALTY OWNERS		
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	ROTTER CARL J & GRACE A (S/R)	3-L11-54
TRACT	SURFACE OWNER	TAX PARCEL
2	GRIFFITH SHARON & WARREN	3-L11-60.1
3	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS	REALTREE RD., FKA TRESTLEWORK ROGERS RD., AKA ROGERS ROAD
4	KLAGES LLOYD A JR.	3-L11-46.18
5	POWERS JEFFREY B	3-L11-46.20
6	KLAGES PROPERTIES LLC	3-L11-46.9
7	WOLEN JOHN J & MICHELLE L	3-L11-46.11
8	TUNNEL RIDGE LLC	3-L11-46.13
9	JSNE LLC (LOT 2)	3-L11-46.8
10	KOSOL JOSEPH JOHN JR., & LAURA JEAN	3-L11-48.4
11	TUNNEL RIDGE LLC	3-L11-48.5
12	TUNNEL RIDGE LLC	3-L11-48.2
13	TUNNEL RIDGE LLC	3-L14-54
14	HALL ROBERT H. & LAURA L., HALL DAVID LEE & SANDRA SUE, PASCO THOMAS P. & MARY	3-L15-1.1
15	WOOD BRENTON R & KELLY S	3-L15-1.2
16	STATE OF WEST VIRGINIA, DEPARTMENT OF HIGHWAYS	INTERSTATE 70
17	PASENDARM PATRICA M.	3-L15-2.2
18	MORGAN SALLY A	3-L15-2.4
19	MORGAN SALLY A	3-L15-2.8
20	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	6-T5-2
21	DAVIS JOHN RICHARD JR., DAVIS DEBRA L., DAVIS JOSEPH DAVID	6-T10-1
22	HORR DONNIE L., BRIGGS KAREN L., HORR GLENN B.	6-T10-4
23	HORR DONNIE L & MICHELLE	6-T10-4.1
24	LEMMON JOSHUA, LEMMON MORGAN ASHLEY, LEMMON WADE LEE	6-T10-10
25	MOORE THOMAS E	680-005-00-00-0002-00
ADJOINING OWNERS TABLE		
TRACT	SURFACE OWNER	TAX PARCEL
A	NOLAN JOHN A JR	3-L11-61
B	TUNNEL RIDGE LLC	3-L12-32
C	WATKINS THERESA & MARK	3-L11-60
D	TUNNEL RIDGE LLC	3-L12-25
E	JSNE LLC (LOT 15)	3-L11-46.8
F	TUNNEL RIDGE LLC	3-L11-46.2
G	JSNE LLC (LOTS 5,7,9,11)	3-L11-46.8
H	TUNNEL RIDGE LLC	3-L11-46.19
I	TUNNEL RIDGE LLC	3-L11-46.12
J	TUNNEL RIDGE LLC	3-L11-48.1
K	TUNNEL RIDGE LLC	3-L15-7
L	KLAGES LLOYD A JR & AMY	3-L11-48.10
M	KLAGES LLOYD A JR & AMY	3-L12-30
N	TUNNEL RIDGE LLC	3-L12-18.1
O	TUNNEL RIDGE LLC	3-L12-18.2
P	TRIPLE P LLC	3-L12-18
Q	TURNER FRANCES A	3-L12-18.6
R	TRIPLE P LLC	3-L12-18.8
S	TRIPLE P LLC	3-L12-18.9
T	BERGHOFF BRAD W	3-L15-2.9
U	BERGHOFF GERALD W	3-L15-2.6
V	GYEKIS ROBERT J & VICKI L	3-L15-2.3
W	ERNEST LAWRENCE F & DEBORAH	3-L15-3

ADJOINING OWNERS TABLE		
TRACT	SURFACE OWNER	TAX PARCEL
X	ERNEST LAWRENCE F & DEBORAH K	3-L15-4.1
Y	OLIVER LUCAS B	3-L15-4
Z	JEWETT CLARENCE G AND TRACY	3-L15-4.2
AA	TUNNEL RIDGE LLC	3-L15-4.6
AB	TUNNEL RIDGE LLC	3-L15-4.4
AC	BRIGGS KAREN LYNN & HENRY WILLIAM	6-T10-4.2
AD	HORR DONNIE L & GLENN B & KAREN L BRIGGS,	680-005-00-00-0003-00
AE	HANCHER MATTHEW W,	680-005-00-00-0010-00
AF	DUNN WILLIAM C & SALLIE A,	680-005-00-00-0010-02
AG	BECK DONALD L SR & SANDRA E	680-005-00-00-0010-01
AH	SZAFRANIEC ANDREW D	680-005-00-00-0014-03
AI	HAGAN DAVID E & CLAIRE M FAMILY TR DAVID E & CLAIRE M HAGAN TRUSTEES	680-005-00-00-0001-01
AJ	HAGAN DAVID E & CLAIRE M FAMILY TR DAVID E & CLAIRE M HAGAN TRUSTEES	680-005-00-00-0001-00
AK	ALDERMAN ROY M	6-T10-11.4
AL	ALDERMAN ROY M	6-T10-11.6
AM	KRUPINSKI MARK	6-T10-5.6
AN	KRUPINSKI MARK D & JAN M	6-T10-5
AO	ASHTON BETH A JACOBS DOUGLAS E	6-T10-9
AP	RICHEY DONALD EDWARD JR RICHEY CHRISTINE	6-T10-5.9
AQ	WINESBURG J. MICHAEL	6-T10-5.4
AR	WILD LIFE LEAGUE OF OHIO CO	6-T10-2
AS	DAVIS JOHN R JR & ADA I	6-T5-6
AT	DAVIS JOHN RICHARD & ADA I	6-T5-2.3
AU	DAVIS JOHN RICHARD JR. & ADA I	6-T5-2.1
AV	GIVENS HERSCHEL L. & JONES DOROTHY S.	6-T5-2.2
AW	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	6-T5-1
AX	WEST VIRGINIA DEPT NAT RES	3-L14-29
AY	NIETZELT EDWARD L	3-L14-38
AZ	ERNEST KELLY MICHAEL	3-L14-35
BA	ERNEST DEBORAH J	3-L14-31.5
BB	ERNEST DEBORAH J	3-L14-34
BC	TULLY JAMES M & VERONICA	3-L14-31.1
BD	TULLY JAMES M	3-L14-31.4
BE	TULLY JAMES M & VERONICA	3-L14-31.2
BF	TUNNEL RIDGE, LLC	3-L14-39
BG	NUNES ANDREW J	3-L11-48.9
BH	MARKING JOHN E & TINA J	3-L11-48.3
BI	OHIO RIVER COLLIERIES COMPANY (LOTS 1&2)	3-L11-46.3
BJ	MOORE SCOTT E & LEAH (LOTS 3&5)	3-L11-46.10
BK	TUNNEL RIDGE LLC	3-L11-48.13
BL	TUNNEL RIDGE LLC	3-L11-48.6
BM	TUNNEL RIDGE LLC (LOTS 21-23&25)	3-L11-46.17
BN	HOMESTEAD FARMS LLC (LOTS 6-11&16-20)	3-L11-46
BO	TUNNEL RIDGE, LLC	3-L11-46.7
BP	HENDERSON DENNIS C & MURPHY PATRICIA A	3-L14-53
BQ	TUNNEL RIDGE LLC	3-L14-51
BR	TUNNEL RIDGE LLC	3-L14-52.1
BS	DEAN LAWRENCE J II & JANET S	3-L14-49
BT	WATSON GARY L	3-L14-21
BU	HEINRICH EARNEST J. III & ANGELA R.	3-L14-22
BV	WATSON GARY L	3-L11-55.1
BW	WEASE DUANE L & RHONDA L	3-L11-55.2
BX	DAVIS DONNA EVANS & WEASE RHONDA EVANS	3-L11-49
BY	ROTTER C J & GRACE A	3-L11-53
BZ	ROTTER C J & GRACE A	3-L11-52
CA	DAVIS DONNA E & DANIEL R	3-L11-50
CB	DAVIS DONNA EVANS & DANIEL R	3-L11-49.2
CC	ROTTER CARL J & GRACE A	3-L11-64
CD	SCHMIDT TODD R	3-L11-46.22
CE	DAVIS DEBRA L	6-T5-5

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
	OPERATOR'S WELL #: CARL ROTTER OHI 10H		DATE: 02-25-2022 API NO: 47-089-XXXXX DRAWN BY: R. GRIMES
	DISTRICT: LIBERTY	COUNTY: OHIO	STATE: WV	SCALE: N/A DRAWING NO: 2018-0153 WELL LOCATION PLAT

COMPLETION ID 2501171232
PAD ID 3001156596



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740-695-6100

SURFACE HOLE LOCATION (SHL):
GEOGRAPHIC (NAD83): LATITUDE: 40.101553° LONGITUDE: -80.542511°
BOTTOM HOLE LOCATION (BHL):
GEOGRAPHIC (NAD83): LATITUDE: 40.059880° LONGITUDE: -80.518486°

NOTES ON SURVEY
1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- FLOOD PLAIN
- NATURAL WATERWAY
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- PROPOSED PATH

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC	WELL (FARM) NAME: CARL ROTTER OHI		WELL #: 10H	SERIAL #: XXXX
ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201, MORGANTOWN, WV 26508	COUNTY: OHIO	CODE: 9	DISTRICT: LIBERTY	API #: 47-69-XXXX
SURFACE OWNER: CARL J. & GRACE A. ROTTER	USGS 7 1/2 QUADRANGLE MAP NAME: VALLEY GROVE, WV			

C:\USERS\RGRIMES\APPDATA\LOCAL\TEMP\ACPUBLISH_7316\CARL ROTTER OHI 10H.DWG
FRIDAY FEBRUARY 25 2022 10:20AM

COMPLETION ID 2501171232
PAD ID 3001156566

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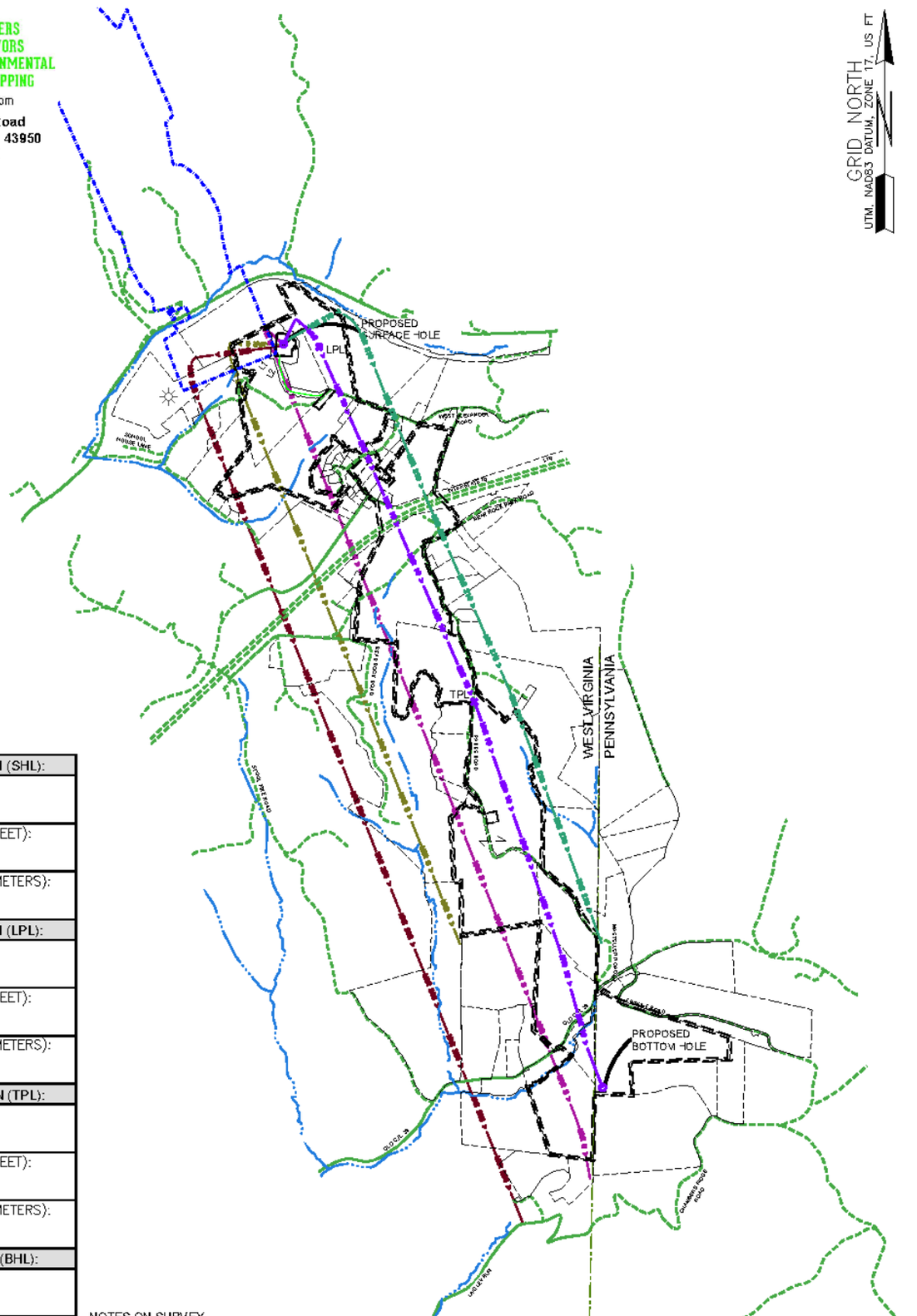
GRID NORTH
UTM, NAD83 DATUM, ZONE 17, US FT



SURFACE HOLE LOCATION (SHL):
GEOGRAPHIC (NAD83): LATITUDE: 40.101553° LONGITUDE: -80.542511°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14564042.39 EASTING: 1768347.16
UTM (NAD83, ZONE 17, METERS): NORTHING: 4439129.00 EASTING: 538993.29
LANDING POINT LOCATION (LPL):
GEOGRAPHIC (NAD83): LATITUDE: 40.101413° LONGITUDE: -80.539897°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14563995.14 EASTING: 1769078.37
UTM (NAD83, ZONE 17, METERS): NORTHING: 4439114.62 EASTING: 539216.20
TURNING POINT LOCATION (TPL):
GEOGRAPHIC (NAD83): LATITUDE: 40.081513° LONGITUDE: -80.528218°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14556765.84 EASTING: 1772382.66
UTM (NAD83, ZONE 17, METERS): NORTHING: 4436911.10 EASTING: 540223.32
BOTTOM HOLE LOCATION (BHL):
GEOGRAPHIC (NAD83): LATITUDE: 40.059880° LONGITUDE: -80.518486°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14548902.77 EASTING: 1775147.55
UTM (NAD83, ZONE 17, METERS): NORTHING: 4434514.43 EASTING: 541066.05

NOTES ON SURVEY

1. 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.
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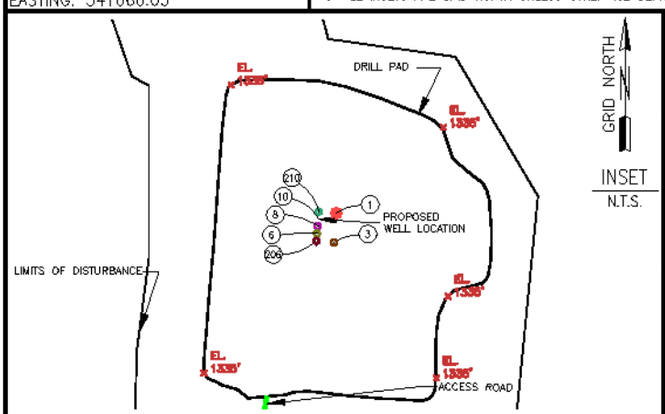
3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.



NOTE: ANY UTILITIES OR IMPROVEMENTS SHOWN ON THIS PLAT ARE FROM REASONABLE VISUAL OBSERVATIONS. NO UTILITY COMPANIES WERE CONTACTED FOR UTILITY LINE LOCATIONS.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- ABANDONED WELL
- PLUGGED & ABANDONED WELL
- LPL LANDING POINT LOCATION
- PRELIMINARY DRILLING UNIT
- LEASE BOUNDARY
- HARDLINE BOUNDARY
- NATURAL WATERWAY
- MAR 2 > MARCELLUS PATH

COMPANY:	SWN Production Company, LLC / SWN Production Company™
OPERATOR'S WELL #:	CARL ROTTER OHI 10H
DISTRICT: LIBERTY	**COUNTY:** OHIO / **STATE:** WV

SWN PRODUCTION COMPANY, LLC
SURFACE HOLES

1. CARL ROTTER OHI 1H
3. CARL ROTTER OHI 3H
6. CARL ROTTER OHI 6H
8. CARL ROTTER OHI 8H
10. CARL ROTTER OHI 10H
206. CARL ROTTER OHI 206H
210. CARL ROTTER OHI 210H

REVISIONS:	DATE: 02-25-2022
	API NO: 47-069-XXXXX
	DRAWN BY:R. GRIMES
	SCALE: 1" = 3000'
	DRAWING NO2018-0153
	INTERNAL WELL PLAT

C:\USERS\RGRIMES\APPDATA\LOCAL\TEMP\ACPUBLISH_7316\CARL ROTTER OHI 10H.DWG
FRIDAY FEBRUARY 25 2022 10:20AM

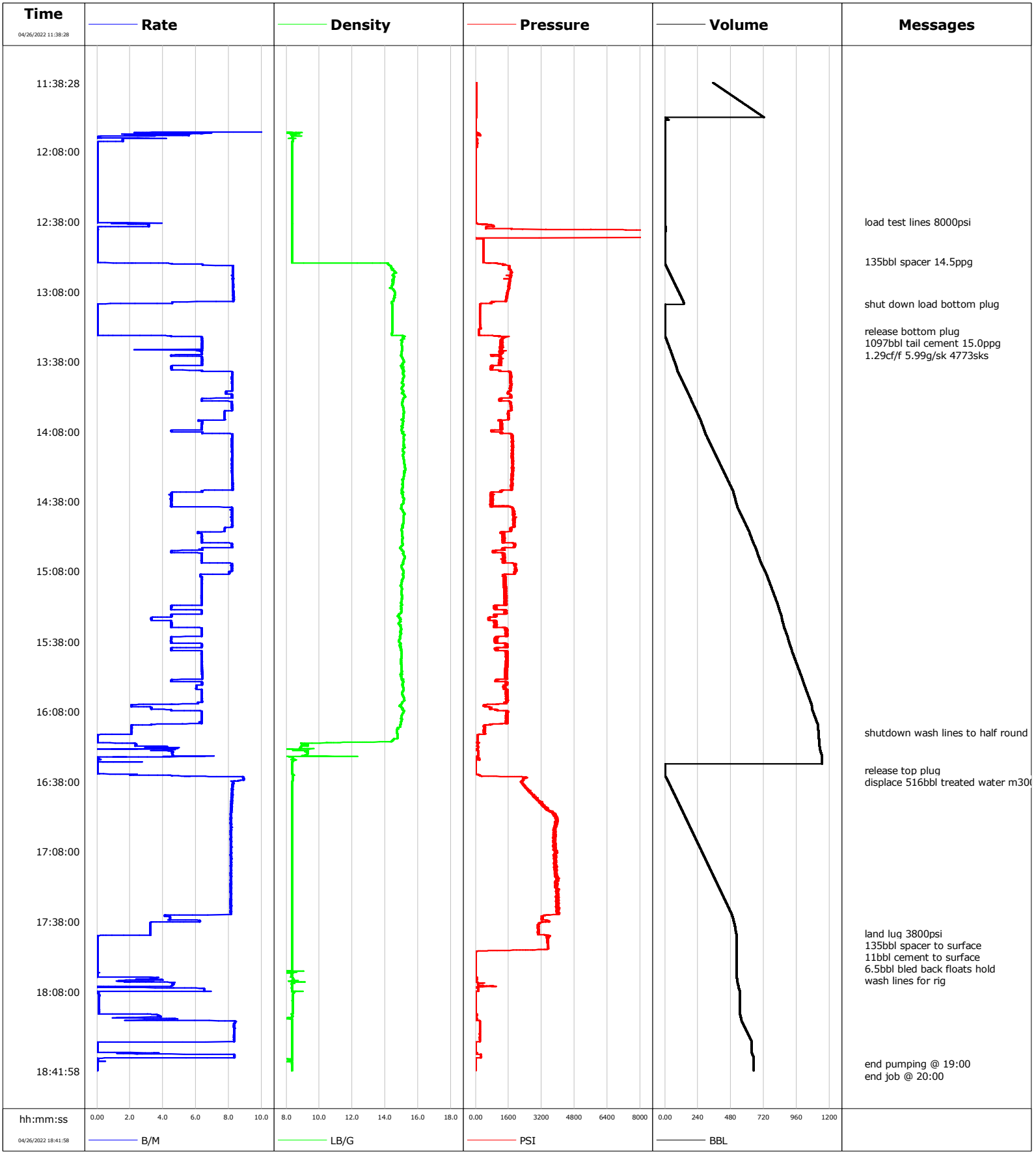
COMPLETION ID 2501171232
PAD ID 3001156596

Schlumberger

Cementing Job Report

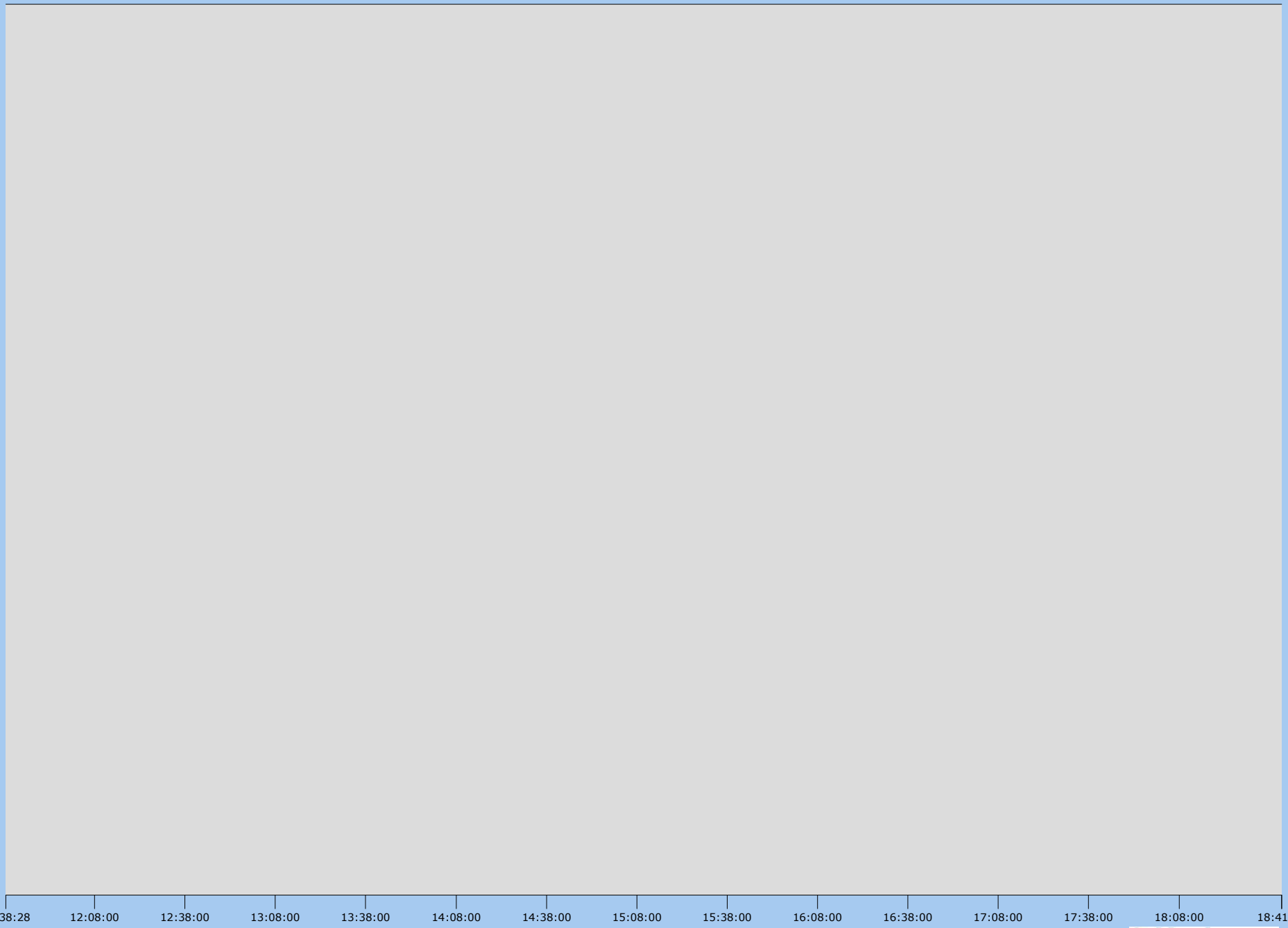
CemCAT v1.8

Well	Carl Rotter10H	**Client**	Southwestern
Field		**SIR No.**	EOHC-00127
Engineer	Danny Cover	**Job Type**	production
Country	United States	**Job Date**	04-26-2022



Cementing

PRD Post Job Plot



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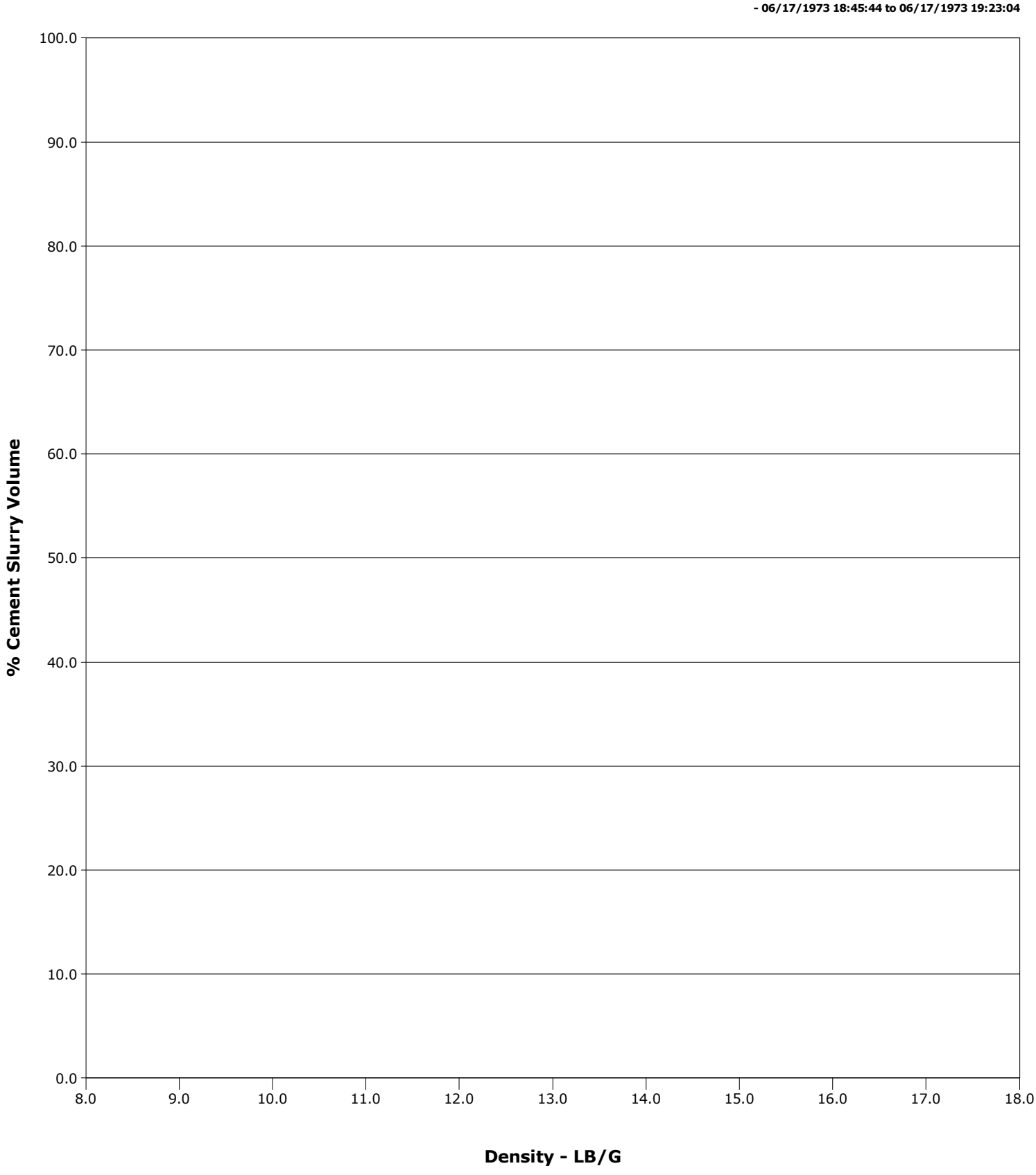
Cementing Qa/Qc Density Report

Well	Carl Rotter10H	**Client**	Southwestern
Field		**SIR No.**	EOHC-00127
Engineer	Danny Cover	**Job Type**	production
Country	United States	**Job Date**	04-26-2022



Schlumberger Cementing Service Report

Customer	Job Number
Southwestern	EOHC-00127

Well	Location (legal)	Schlumberger Location	Job Start
Carl Rotter10H 10H	47-069-00328-00-00	Weston	Apr/26/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
		deg	8.5 in	23337.0 ft	6516.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Ohio	West Virginia	psi	135 degF	134 degF	lb/gal
Well Master 0066497278	**API/UWI** 47-069-00328-00-00				

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	production

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

test lines 8000
135bbl spacer14.5ppg
bottom plug
1097bbl tail 15.0ppg
wash lines
top plug
516bbl treated displacement
land plug 3800psi
11bbl cement to surface

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2206.0	9.6	36.0	110	BUTT
23337.0	5.5	20.0	110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	516.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	518.0 bbl	106.0 bbl	873.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Casing Tools	Squeeze Job
[X]	[ ]		

Lift Pressure	Pipe Rotated	Pipe Reciprocated	Shoe Type	Shoe Depth	Squeeze Type	Tool Type
psi	[ ]	[ ]	Float	22335.0 ft		

No. Centralizers	Top Plugs	Bottom Plugs	Stage Tool Type	Stage Tool Depth	Tool Depth	Tail Pipe Size
	1	1		ft	ft	in

Cement Head Type	Job Scheduled For	Arrived on Location	Leave Location	Collar Type	Collar Depth	Tail Pipe Depth	Sqz. Total Vol.
Single	Apr/26/2022 04:00	Apr/26/2022 12:00	Apr/26/2022 21:00	Float	22986.0 ft	ft	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	11:38:28	33	25.0	0.01	0.0	
04/26/2022	11:38:58	33	25.0	0.01	0.0	
04/26/2022	11:39:28	33	25.0	0.01	0.0	
04/26/2022	11:39:58	33	25.0	0.01	0.0	
04/26/2022	11:40:28	33	25.0	0.01	0.0	
04/26/2022	11:40:58	33	25.0	0.01	0.0	
04/26/2022	11:41:28	33	25.0	0.01	0.0	
04/26/2022	11:41:58	33	25.0	0.01	0.0	
04/26/2022	11:42:28	33	25.0	0.01	0.0	
04/26/2022	11:42:58	33	25.0	0.01	0.0	
04/26/2022	11:43:28	33	25.0	0.01	0.0	
04/26/2022	11:43:58	33	25.0	0.01	0.0	
04/26/2022	11:44:28	33	25.0	0.01	0.0	
04/26/2022	11:45:28	33	25.0	0.01	0.0	
04/26/2022	11:45:58	33	25.0	0.01	0.0	
04/26/2022	11:46:28	33	25.0	0.01	0.0	
04/26/2022	11:46:58	33	25.0	0.01	0.0	
04/26/2022	11:47:28	33	25.0	0.01	0.0	
04/26/2022	11:47:58	33	25.0	0.01	0.0	
04/26/2022	11:48:28	33	25.0	0.01	0.0	
04/26/2022	11:48:58	33	25.0	0.01	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	11:49:58	33	25.0	0.01	0.0	
04/26/2022	11:50:28	33	25.0	0.01	0.0	
04/26/2022	11:50:58	33	25.0	0.01	0.0	
04/26/2022	11:51:28	33	25.0	0.01	0.0	
04/26/2022	11:51:58	33	25.0	0.01	0.0	
04/26/2022	11:52:28	33	25.0	0.01	0.0	
04/26/2022	11:52:58	33	25.0	0.01	0.0	
04/26/2022	11:53:28	33	25.0	0.01	0.0	
04/26/2022	11:53:58	1	25.0	0.01	0.0	
04/26/2022	11:54:28	1	25.0	0.01	0.0	
04/26/2022	11:54:58	1	0.0	0.01	0.0	
04/26/2022	11:55:28	0	0.0	0.01	0.0	
04/26/2022	11:55:58	0	0.0	0.01	0.0	
04/26/2022	11:56:28	1	0.0	0.01	0.0	
04/26/2022	11:56:58	1	0.0	0.01	0.0	
04/26/2022	11:57:28	1	0.0	0.01	0.0	
04/26/2022	11:57:58	1	0.0	0.01	0.0	
04/26/2022	11:58:28	0	0.0	0.01	0.0	
04/26/2022	11:58:58	1	0.0	0.01	0.0	
04/26/2022	11:59:28	0	0.0	0.01	0.0	
04/26/2022	11:59:58	72	4.3	8.91	0.0	
04/26/2022	12:00:28	95	3.3	8.30	0.0	
04/26/2022	12:00:58	223	5.7	8.31	0.0	
04/26/2022	12:01:28	16	0.0	8.38	0.0	
04/26/2022	12:01:58	9	0.0	8.35	0.0	
04/26/2022	12:02:28	64	0.0	8.40	0.0	
04/26/2022	12:02:58	70	0.0	8.40	0.0	
04/26/2022	12:03:28	67	0.0	8.40	0.0	
04/26/2022	12:03:58	72	0.0	8.34	0.0	
04/26/2022	12:04:28	72	0.0	8.34	0.0	
04/26/2022	12:04:58	69	0.0	8.34	0.0	
04/26/2022	12:05:28	62	0.0	8.34	0.0	
04/26/2022	12:05:58	61	0.0	8.34	0.0	
04/26/2022	12:06:28	-3	0.0	8.34	0.0	
04/26/2022	12:06:58	-3	0.0	8.34	0.0	
04/26/2022	12:07:28	-3	0.0	8.34	0.0	
04/26/2022	12:07:58	-3	0.0	8.34	0.0	
04/26/2022	12:08:28	-3	0.0	8.34	0.0	
04/26/2022	12:08:58	-3	0.0	8.34	0.0	
04/26/2022	12:09:28	-3	0.0	8.34	0.0	
04/26/2022	12:09:58	-3	0.0	8.34	0.0	
04/26/2022	12:10:28	-4	0.0	8.34	0.0	
04/26/2022	12:10:58	-4	0.0	8.35	0.0	
04/26/2022	12:11:28	-4	0.0	8.35	0.0	
04/26/2022	12:11:58	-4	0.0	8.35	0.0	
04/26/2022	12:12:28	-3	0.0	8.35	0.0	
04/26/2022	12:12:58	-4	0.0	8.35	0.0	
04/26/2022	12:13:28	-4	0.0	8.35	0.0	
04/26/2022	12:13:58	-4	0.0	8.35	0.0	
04/26/2022	12:14:28	-4	0.0	8.35	0.0	
04/26/2022	12:14:58	-4	0.0	8.35	0.0	
04/26/2022	12:15:28	-4	0.0	8.35	0.0	
04/26/2022	12:15:58	-4	0.0	8.35	0.0	
04/26/2022	12:16:28	-4	0.0	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	12:17:28	-4	0.0	8.35	0.0	
04/26/2022	12:17:58	-4	0.0	8.35	0.0	
04/26/2022	12:18:58	-4	0.0	8.35	0.0	
04/26/2022	12:19:28	-4	0.0	8.35	0.0	
04/26/2022	12:19:58	-4	0.0	8.35	0.0	
04/26/2022	12:20:28	-4	0.0	8.35	0.0	
04/26/2022	12:20:58	-4	0.0	8.35	0.0	
04/26/2022	12:21:28	-4	0.0	8.35	0.0	
04/26/2022	12:21:58	-4	0.0	8.35	0.0	
04/26/2022	12:22:28	-4	0.0	8.35	0.0	
04/26/2022	12:22:58	-4	0.0	8.35	0.0	
04/26/2022	12:23:28	-4	0.0	8.35	0.0	
04/26/2022	12:23:58	-4	0.0	8.35	0.0	
04/26/2022	12:24:28	-4	0.0	8.35	0.0	
04/26/2022	12:24:58	-4	0.0	8.35	0.0	
04/26/2022	12:25:28	-4	0.0	8.35	0.0	
04/26/2022	12:25:58	-4	0.0	8.35	0.0	
04/26/2022	12:26:28	-4	0.0	8.35	0.0	
04/26/2022	12:26:58	-4	0.0	8.35	0.0	
04/26/2022	12:27:28	-5	0.0	8.35	0.0	
04/26/2022	12:27:58	-4	0.0	8.35	0.0	
04/26/2022	12:28:28	-4	0.0	8.35	0.0	
04/26/2022	12:28:58	-4	0.0	8.35	0.0	
04/26/2022	12:29:28	-4	0.0	8.34	0.0	
04/26/2022	12:29:58	-4	0.0	8.35	0.0	
04/26/2022	12:30:28	-4	0.0	8.35	0.0	
04/26/2022	12:30:58	-4	0.0	8.35	0.0	
04/26/2022	12:31:28	-4	0.0	8.34	0.0	
04/26/2022	12:31:58	-4	0.0	8.35	0.0	
04/26/2022	12:32:28	-5	0.0	8.35	0.0	
04/26/2022	12:32:58	-5	0.0	8.35	0.0	
04/26/2022	12:33:28	-5	0.0	8.35	0.0	
04/26/2022	12:33:58	-5	0.0	8.35	0.0	
04/26/2022	12:34:28	-4	0.0	8.35	0.0	
04/26/2022	12:34:58	-4	0.0	8.35	0.0	
04/26/2022	12:35:28	-5	0.0	8.35	0.0	
04/26/2022	12:35:58	-5	0.0	8.35	0.0	
04/26/2022	12:36:28	-5	0.0	8.35	0.0	
04/26/2022	12:36:58	-5	0.0	8.34	0.0	
04/26/2022	12:37:28	-4	0.0	8.34	0.0	
04/26/2022	12:37:58	-4	0.0	8.35	0.0	
04/26/2022	12:38:00	-4	0.0	8.34	0.0	load test lines 8000psi
04/26/2022	12:38:28	-4	0.0	8.34	0.0	
04/26/2022	12:38:58	88	2.0	8.35	0.0	
04/26/2022	12:39:28	764	3.2	8.34	0.0	
04/26/2022	12:39:58	888	3.3	8.34	0.0	
04/26/2022	12:40:28	499	0.0	8.34	0.0	
04/26/2022	12:40:58	496	0.0	8.34	0.0	
04/26/2022	12:41:28	5594	0.1	8.34	0.0	
04/26/2022	12:41:58	8296	0.0	8.34	0.0	
04/26/2022	12:42:28	8180	0.0	8.34	0.0	
04/26/2022	12:42:58	8154	0.0	8.34	0.0	
04/26/2022	12:43:28	8135	0.0	8.34	0.0	
04/26/2022	12:43:58	8119	0.0	8.34	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	12:44:58	17	0.0	8.34	0.0	
04/26/2022	12:45:58	366	0.0	8.34	0.0	
04/26/2022	12:46:28	366	0.0	8.34	0.0	
04/26/2022	12:46:58	366	0.0	8.34	0.0	
04/26/2022	12:47:28	368	0.0	8.34	0.0	
04/26/2022	12:47:58	369	0.0	8.34	0.0	
04/26/2022	12:48:28	368	0.0	8.34	0.0	
04/26/2022	12:48:58	369	0.0	8.34	0.0	
04/26/2022	12:49:28	369	0.0	8.34	0.0	
04/26/2022	12:49:58	371	0.0	8.34	0.0	
04/26/2022	12:50:28	372	0.0	8.34	0.0	
04/26/2022	12:50:58	371	0.0	8.34	0.0	
04/26/2022	12:51:28	371	0.0	8.34	0.0	
04/26/2022	12:51:58	372	0.0	8.34	0.0	
04/26/2022	12:52:28	372	0.0	8.34	0.0	
04/26/2022	12:52:58	372	0.0	8.34	0.0	
04/26/2022	12:53:28	369	0.0	8.34	0.0	
04/26/2022	12:53:58	368	0.0	8.34	0.0	
04/26/2022	12:54:28	367	0.0	8.33	0.0	
04/26/2022	12:54:58	365	0.0	8.34	0.0	
04/26/2022	12:55:00	366	0.0	8.33	0.0	135bbl spacer 14.5ppg
04/26/2022	12:55:28	365	0.0	8.33	0.0	
04/26/2022	12:55:58	1205	4.5	14.14	0.0	
04/26/2022	12:56:28	1416	6.4	14.20	0.0	
04/26/2022	12:56:58	1643	8.3	14.31	0.0	
04/26/2022	12:57:28	1637	8.2	14.36	0.0	
04/26/2022	12:57:58	1637	8.2	14.36	0.0	
04/26/2022	12:58:28	1636	8.2	14.47	0.0	
04/26/2022	12:58:58	1700	8.2	14.49	0.0	
04/26/2022	12:59:28	1715	8.2	14.57	0.0	
04/26/2022	12:59:58	1742	8.2	14.66	0.0	
04/26/2022	13:00:28	1695	8.3	14.50	0.0	
04/26/2022	13:00:58	1699	8.2	14.46	0.0	
04/26/2022	13:01:28	1720	8.2	14.53	0.0	
04/26/2022	13:01:58	1683	8.3	14.51	0.0	
04/26/2022	13:02:28	1658	8.3	14.53	0.0	
04/26/2022	13:02:58	1687	8.2	14.43	0.0	
04/26/2022	13:03:28	1647	8.2	14.51	0.0	
04/26/2022	13:03:58	1639	8.2	14.47	0.0	
04/26/2022	13:04:28	1634	8.2	14.47	0.0	
04/26/2022	13:04:58	1658	8.3	14.44	0.0	
04/26/2022	13:05:28	1596	8.2	14.40	0.0	
04/26/2022	13:05:58	1612	8.2	14.40	0.0	
04/26/2022	13:06:28	1628	8.3	14.29	0.0	
04/26/2022	13:06:58	1602	8.2	14.48	0.0	
04/26/2022	13:07:28	1578	8.3	14.52	0.0	
04/26/2022	13:07:58	1568	8.3	14.55	0.0	
04/26/2022	13:08:28	1562	8.3	14.58	0.0	
04/26/2022	13:08:58	1533	8.3	14.59	0.0	
04/26/2022	13:09:28	1518	8.3	14.58	0.0	
04/26/2022	13:09:58	1512	8.3	14.56	0.0	
04/26/2022	13:10:28	1492	8.3	14.57	0.0	
04/26/2022	13:10:58	1480	8.3	14.53	0.0	
04/26/2022	13:11:28	1462	8.3	14.52	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	13:12:28	886	4.6	14.40	0.0	
04/26/2022	13:12:58	788	4.6	14.40	0.0	
04/26/2022	13:13:00	718	4.6	14.40	0.0	shut down load bottom plug
04/26/2022	13:13:28	194	0.0	14.44	0.0	
04/26/2022	13:13:58	227	0.0	14.44	0.0	
04/26/2022	13:14:28	205	0.0	14.44	0.0	
04/26/2022	13:14:58	206	0.0	14.44	0.0	
04/26/2022	13:15:28	206	0.0	14.44	0.0	
04/26/2022	13:15:58	206	0.0	14.44	0.0	
04/26/2022	13:16:28	207	0.0	14.44	0.0	
04/26/2022	13:16:58	206	0.0	14.43	0.0	
04/26/2022	13:17:28	206	0.0	14.43	0.0	
04/26/2022	13:17:58	206	0.0	14.43	0.0	
04/26/2022	13:18:28	206	0.0	14.43	0.0	
04/26/2022	13:19:28	206	0.0	14.43	0.0	
04/26/2022	13:19:58	205	0.0	14.43	0.0	
04/26/2022	13:20:28	205	0.0	14.43	0.0	
04/26/2022	13:20:58	205	0.0	14.43	0.0	
04/26/2022	13:21:28	205	0.0	14.43	0.0	
04/26/2022	13:21:58	205	0.0	14.43	0.0	
04/26/2022	13:22:28	218	0.0	14.43	0.0	
04/26/2022	13:22:58	220	0.0	14.43	0.0	
04/26/2022	13:23:28	220	0.0	14.43	0.0	
04/26/2022	13:23:58	240	0.0	14.43	0.0	
04/26/2022	13:24:28	150	0.0	14.43	0.0	
04/26/2022	13:24:58	150	0.0	14.43	0.0	
04/26/2022	13:25:00	150	0.0	14.43	0.0	release bottom plug
04/26/2022	13:25:28	149	0.0	14.43	0.0	
04/26/2022	13:25:58	149	0.0	14.42	0.0	
04/26/2022	13:26:00	149	0.0	14.41	0.0	1097bbl tail cement 15.0ppg
04/26/2022	13:26:05	149	0.0	14.41	0.0	1.29cf/f 5.99g/sk 4773sks
04/26/2022	13:26:28	147	0.0	14.41	0.0	
04/26/2022	13:26:58	989	4.4	15.10	0.0	
04/26/2022	13:27:28	1439	6.4	15.10	0.0	
04/26/2022	13:27:58	1286	6.4	15.11	0.0	
04/26/2022	13:28:28	1243	6.4	15.01	0.0	
04/26/2022	13:28:58	1231	6.4	14.97	0.0	
04/26/2022	13:29:28	1299	6.4	15.03	0.0	
04/26/2022	13:29:58	1281	6.4	15.01	0.0	
04/26/2022	13:30:28	1194	6.4	15.00	0.0	
04/26/2022	13:30:58	1279	6.4	15.00	0.0	
04/26/2022	13:31:28	1229	6.4	15.02	0.0	
04/26/2022	13:31:58	1169	6.4	15.04	0.0	
04/26/2022	13:32:28	1262	6.4	15.04	0.0	
04/26/2022	13:33:28	1216	6.2	15.02	0.0	
04/26/2022	13:33:58	1161	6.3	15.00	0.0	
04/26/2022	13:34:28	1251	6.3	15.00	0.0	
04/26/2022	13:34:58	1257	6.3	14.97	0.0	
04/26/2022	13:35:28	842	4.5	14.96	0.0	
04/26/2022	13:35:58	1201	6.4	15.00	0.0	
04/26/2022	13:36:28	1233	6.3	15.04	0.0	
04/26/2022	13:36:58	1158	6.4	15.07	0.0	
04/26/2022	13:37:28	1225	6.4	15.11	0.0	
04/26/2022	13:37:58	1194	6.4	15.14	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	13:38:58	1239	6.4	15.04	0.0	
04/26/2022	13:39:28	1132	6.4	15.06	0.0	
04/26/2022	13:39:58	789	4.5	15.00	0.0	
04/26/2022	13:40:28	720	4.5	15.09	0.0	
04/26/2022	13:40:58	806	4.5	15.04	0.0	
04/26/2022	13:41:28	784	4.5	15.07	0.0	
04/26/2022	13:41:58	1225	6.4	15.12	0.0	
04/26/2022	13:42:28	1668	8.2	15.08	0.0	
04/26/2022	13:42:58	1713	8.2	15.07	0.0	
04/26/2022	13:43:28	1701	8.2	15.09	0.0	
04/26/2022	13:43:58	1714	8.2	15.13	0.0	
04/26/2022	13:44:28	1703	8.2	15.14	0.0	
04/26/2022	13:44:58	1714	8.2	15.10	0.0	
04/26/2022	13:45:28	1693	8.2	15.07	0.0	
04/26/2022	13:45:58	1719	8.2	15.05	0.0	
04/26/2022	13:46:28	1697	8.2	15.05	0.0	
04/26/2022	13:46:58	1705	8.2	15.01	0.0	
04/26/2022	13:47:28	1746	8.2	15.04	0.0	
04/26/2022	13:47:58	1721	8.2	15.11	0.0	
04/26/2022	13:48:28	1735	8.2	15.08	0.0	
04/26/2022	13:48:58	1707	8.2	15.03	0.0	
04/26/2022	13:49:28	1640	8.2	14.99	0.0	
04/26/2022	13:49:58	1733	8.2	15.02	0.0	
04/26/2022	13:50:28	1699	8.2	15.09	0.0	
04/26/2022	13:50:58	1592	7.8	15.08	0.0	
04/26/2022	13:51:28	1593	7.8	15.04	0.0	
04/26/2022	13:51:58	1648	8.1	15.11	0.0	
04/26/2022	13:52:58	1723	8.2	15.20	0.0	
04/26/2022	13:53:28	1697	8.2	15.14	0.0	
04/26/2022	13:53:58	1249	6.4	15.09	0.0	
04/26/2022	13:54:28	1166	6.3	15.06	0.0	
04/26/2022	13:54:58	1641	7.8	15.05	0.0	
04/26/2022	13:55:28	1703	8.2	15.04	0.0	
04/26/2022	13:55:58	1685	8.2	15.02	0.0	
04/26/2022	13:56:28	1707	8.2	15.04	0.0	
04/26/2022	13:56:58	1720	8.2	15.05	0.0	
04/26/2022	13:57:28	1729	8.2	15.07	0.0	
04/26/2022	13:57:58	1736	8.2	15.09	0.0	
04/26/2022	13:58:28	1699	8.2	15.10	0.0	
04/26/2022	13:58:58	1762	8.2	15.11	0.0	
04/26/2022	13:59:28	1576	7.7	15.13	0.0	
04/26/2022	13:59:58	1610	7.7	15.14	0.0	
04/26/2022	14:00:28	1589	7.7	15.10	0.0	
04/26/2022	14:00:58	1606	7.8	15.12	0.0	
04/26/2022	14:01:28	1579	7.7	15.11	0.0	
04/26/2022	14:01:58	1570	7.7	15.10	0.0	
04/26/2022	14:02:28	1588	7.7	15.08	0.0	
04/26/2022	14:02:58	1567	7.8	14.97	0.0	
04/26/2022	14:03:28	1253	6.3	15.10	0.0	
04/26/2022	14:03:58	1220	6.4	15.06	0.0	
04/26/2022	14:04:28	1255	6.4	15.05	0.0	
04/26/2022	14:04:58	1209	6.4	15.07	0.0	
04/26/2022	14:05:28	1182	6.3	15.03	0.0	
04/26/2022	14:05:58	1310	6.4	15.02	0.0	

Well	Field	Job Start	Customer	Job Number
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Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	14:06:58	1221	6.3	15.00	0.0	
04/26/2022	14:07:28	772	4.5	14.99	0.0	
04/26/2022	14:07:58	762	4.5	15.07	0.0	
04/26/2022	14:08:28	1274	6.4	15.06	0.0	
04/26/2022	14:08:58	1755	8.2	15.07	0.0	
04/26/2022	14:09:28	1772	8.2	15.17	0.0	
04/26/2022	14:09:58	1766	8.2	15.12	0.0	
04/26/2022	14:10:28	1786	8.2	15.12	0.0	
04/26/2022	14:10:58	1792	8.2	15.13	0.0	
04/26/2022	14:11:28	1774	8.2	15.13	0.0	
04/26/2022	14:11:58	1780	8.2	15.13	0.0	
04/26/2022	14:12:28	1802	8.2	15.13	0.0	
04/26/2022	14:12:58	1795	8.2	15.13	0.0	
04/26/2022	14:13:28	1805	8.2	15.13	0.0	
04/26/2022	14:13:58	1783	8.2	15.10	0.0	
04/26/2022	14:14:28	1787	8.2	15.14	0.0	
04/26/2022	14:14:58	1783	8.2	15.14	0.0	
04/26/2022	14:15:28	1759	8.2	15.07	0.0	
04/26/2022	14:15:58	1802	8.2	15.06	0.0	
04/26/2022	14:16:28	1781	8.2	15.07	0.0	
04/26/2022	14:16:58	1773	8.2	15.15	0.0	
04/26/2022	14:17:28	1823	8.2	15.11	0.0	
04/26/2022	14:17:58	1768	8.2	15.07	0.0	
04/26/2022	14:18:28	1785	8.2	15.07	0.0	
04/26/2022	14:18:58	1778	8.2	15.08	0.0	
04/26/2022	14:19:58	1788	8.2	15.13	0.0	
04/26/2022	14:20:28	1784	8.2	15.15	0.0	
04/26/2022	14:20:58	1786	8.2	15.15	0.0	
04/26/2022	14:21:28	1819	8.2	15.15	0.0	
04/26/2022	14:21:58	1827	8.2	15.16	0.0	
04/26/2022	14:22:28	1768	8.2	15.18	0.0	
04/26/2022	14:22:58	1801	8.2	15.18	0.0	
04/26/2022	14:23:28	1745	8.2	15.19	0.0	
04/26/2022	14:23:58	1793	8.2	15.20	0.0	
04/26/2022	14:24:28	1818	8.2	15.20	0.0	
04/26/2022	14:24:58	1745	8.2	15.15	0.0	
04/26/2022	14:25:28	1804	8.2	15.18	0.0	
04/26/2022	14:25:58	1761	8.2	15.14	0.0	
04/26/2022	14:26:28	1813	8.2	15.15	0.0	
04/26/2022	14:26:58	1749	8.2	15.14	0.0	
04/26/2022	14:27:28	1765	8.2	15.13	0.0	
04/26/2022	14:27:58	1783	8.2	15.11	0.0	
04/26/2022	14:28:28	1719	8.2	15.06	0.0	
04/26/2022	14:28:58	1804	8.2	15.05	0.0	
04/26/2022	14:29:28	1749	8.2	15.06	0.0	
04/26/2022	14:29:58	1780	8.2	15.06	0.0	
04/26/2022	14:30:28	1753	8.2	15.05	0.0	
04/26/2022	14:30:58	1754	8.2	15.06	0.0	
04/26/2022	14:31:28	1748	8.2	15.06	0.0	
04/26/2022	14:31:58	1733	8.2	15.05	0.0	
04/26/2022	14:32:28	1774	8.2	15.02	0.0	
04/26/2022	14:32:58	1788	8.2	14.99	0.0	
04/26/2022	14:33:28	1270	6.4	15.02	0.0	
04/26/2022	14:33:58	888	4.7	15.08	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	14:34:58	797	4.5	15.05	0.0	
04/26/2022	14:35:28	740	4.5	15.05	0.0	
04/26/2022	14:35:58	732	4.5	15.06	0.0	
04/26/2022	14:36:28	821	4.5	15.11	0.0	
04/26/2022	14:36:58	753	4.5	15.16	0.0	
04/26/2022	14:37:28	802	4.5	15.12	0.0	
04/26/2022	14:37:58	788	4.5	15.10	0.0	
04/26/2022	14:38:28	733	4.5	15.11	0.0	
04/26/2022	14:38:58	749	4.5	15.06	0.0	
04/26/2022	14:39:28	698	4.5	14.97	0.0	
04/26/2022	14:39:58	1659	4.5	14.98	0.0	
04/26/2022	14:40:28	1750	8.2	14.98	0.0	
04/26/2022	14:40:58	1773	8.2	14.95	0.0	
04/26/2022	14:41:28	1780	8.2	15.02	0.0	
04/26/2022	14:41:58	1822	8.2	15.06	0.0	
04/26/2022	14:42:28	1825	8.2	15.09	0.0	
04/26/2022	14:42:58	1885	8.2	15.16	0.0	
04/26/2022	14:43:28	1817	8.2	15.16	0.0	
04/26/2022	14:43:58	1872	8.2	15.13	0.0	
04/26/2022	14:44:28	1825	8.2	15.12	0.0	
04/26/2022	14:44:58	1866	8.2	15.12	0.0	
04/26/2022	14:45:28	1828	8.2	15.11	0.0	
04/26/2022	14:45:58	1869	8.2	15.11	0.0	
04/26/2022	14:46:28	1855	8.2	15.12	0.0	
04/26/2022	14:46:58	1860	8.2	15.12	0.0	
04/26/2022	14:47:28	1880	8.2	15.09	0.0	
04/26/2022	14:47:58	1896	8.2	15.05	0.0	
04/26/2022	14:48:28	1825	8.2	15.06	0.0	
04/26/2022	14:48:58	1884	8.2	15.04	0.0	
04/26/2022	14:49:28	1727	7.8	15.01	0.0	
04/26/2022	14:49:58	1684	7.8	15.00	0.0	
04/26/2022	14:50:28	1728	7.7	15.01	0.0	
04/26/2022	14:50:58	1334	6.4	15.03	0.0	
04/26/2022	14:51:28	1216	6.1	15.04	0.0	
04/26/2022	14:51:58	1302	6.4	15.04	0.0	
04/26/2022	14:52:28	1411	6.3	15.04	0.0	
04/26/2022	14:53:28	1328	6.3	15.05	0.0	
04/26/2022	14:53:58	1403	6.4	15.05	0.0	
04/26/2022	14:54:28	1324	6.4	15.04	0.0	
04/26/2022	14:54:58	1420	6.3	15.04	0.0	
04/26/2022	14:55:28	1422	6.3	15.04	0.0	
04/26/2022	14:55:58	1878	8.2	15.05	0.0	
04/26/2022	14:56:28	1923	8.2	15.05	0.0	
04/26/2022	14:56:58	1920	8.2	14.98	0.0	
04/26/2022	14:57:28	1877	8.2	14.94	0.0	
04/26/2022	14:57:58	1423	6.4	14.90	0.0	
04/26/2022	14:58:28	1366	6.3	14.99	0.0	
04/26/2022	14:58:58	912	4.6	15.01	0.0	
04/26/2022	14:59:28	891	4.5	15.11	0.0	
04/26/2022	14:59:58	1356	6.1	15.09	0.0	
04/26/2022	15:00:28	1336	6.3	15.09	0.0	
04/26/2022	15:00:58	1413	6.3	15.13	0.0	
04/26/2022	15:01:28	1329	6.3	15.17	0.0	
04/26/2022	15:01:58	1328	6.3	15.19	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	15:02:58	1360	6.3	15.12	0.0	
04/26/2022	15:03:28	1388	6.3	15.11	0.0	
04/26/2022	15:03:58	1434	6.3	15.09	0.0	
04/26/2022	15:04:28	1906	8.2	15.07	0.0	
04/26/2022	15:04:58	1867	8.2	15.05	0.0	
04/26/2022	15:05:28	1947	8.2	15.00	0.0	
04/26/2022	15:05:58	1917	8.2	15.00	0.0	
04/26/2022	15:06:28	1978	8.2	15.00	0.0	
04/26/2022	15:06:58	1914	8.2	15.04	0.0	
04/26/2022	15:07:28	2014	8.2	15.08	0.0	
04/26/2022	15:07:58	1893	8.1	15.10	0.0	
04/26/2022	15:08:28	1935	8.0	15.12	0.0	
04/26/2022	15:08:58	1871	8.0	15.07	0.0	
04/26/2022	15:09:28	1476	6.3	15.07	0.0	
04/26/2022	15:09:58	1411	6.3	15.08	0.0	
04/26/2022	15:10:28	1480	6.4	15.09	0.0	
04/26/2022	15:10:58	1389	6.4	15.07	0.0	
04/26/2022	15:11:28	1478	6.4	15.03	0.0	
04/26/2022	15:11:58	1359	6.4	15.02	0.0	
04/26/2022	15:12:28	1360	6.3	15.01	0.0	
04/26/2022	15:12:58	1488	6.3	15.00	0.0	
04/26/2022	15:13:28	1365	6.3	14.97	0.0	
04/26/2022	15:13:58	1389	6.3	14.94	0.0	
04/26/2022	15:14:28	1412	6.4	14.97	0.0	
04/26/2022	15:14:58	1392	6.3	15.01	0.0	
04/26/2022	15:15:28	1489	6.4	15.02	0.0	
04/26/2022	15:15:58	1468	6.4	15.01	0.0	
04/26/2022	15:16:28	1428	6.3	14.99	0.0	
04/26/2022	15:16:58	1486	6.4	14.98	0.0	
04/26/2022	15:17:28	1374	6.3	14.96	0.0	
04/26/2022	15:17:58	1376	6.3	14.99	0.0	
04/26/2022	15:18:28	1505	6.3	15.04	0.0	
04/26/2022	15:18:58	1402	6.3	15.02	0.0	
04/26/2022	15:19:28	1501	6.3	14.99	0.0	
04/26/2022	15:19:58	1411	6.3	15.00	0.0	
04/26/2022	15:20:28	1410	6.3	15.00	0.0	
04/26/2022	15:20:58	1517	6.3	14.98	0.0	
04/26/2022	15:21:28	1403	6.3	14.95	0.0	
04/26/2022	15:21:58	1509	6.4	14.98	0.0	
04/26/2022	15:22:28	1168	5.1	15.00	0.0	
04/26/2022	15:22:58	860	4.5	14.94	0.0	
04/26/2022	15:23:28	949	4.5	14.97	0.0	
04/26/2022	15:23:58	888	4.5	14.96	0.0	
04/26/2022	15:24:28	1415	6.3	14.96	0.0	
04/26/2022	15:24:58	1507	6.3	14.96	0.0	
04/26/2022	15:25:28	1527	6.3	14.95	0.0	
04/26/2022	15:25:58	1396	6.3	14.92	0.0	
04/26/2022	15:26:58	906	4.5	14.82	0.0	
04/26/2022	15:27:28	965	4.5	14.83	0.0	
04/26/2022	15:27:58	660	3.3	14.90	0.0	
04/26/2022	15:28:28	600	3.3	14.93	0.0	
04/26/2022	15:28:58	956	4.2	14.91	0.0	
04/26/2022	15:29:28	889	4.5	14.93	0.0	
04/26/2022	15:29:58	1001	4.5	14.83	0.0	

Well	Field	Job Start	Customer	Job Number
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Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	15:30:58	960	4.5	14.93	0.0	
04/26/2022	15:31:28	1033	4.5	14.91	0.0	
04/26/2022	15:31:58	1338	5.0	14.93	0.0	
04/26/2022	15:32:28	1461	6.3	14.97	0.0	
04/26/2022	15:32:58	1548	6.3	14.96	0.0	
04/26/2022	15:33:28	1440	6.3	14.93	0.0	
04/26/2022	15:33:58	1546	6.4	14.91	0.0	
04/26/2022	15:34:28	1505	6.3	14.96	0.0	
04/26/2022	15:34:58	1503	6.4	14.94	0.0	
04/26/2022	15:35:28	1553	6.3	14.91	0.0	
04/26/2022	15:35:58	1006	4.5	14.89	0.0	
04/26/2022	15:36:28	966	4.5	14.91	0.0	
04/26/2022	15:36:58	1017	4.5	14.88	0.0	
04/26/2022	15:37:28	928	4.5	14.82	0.0	
04/26/2022	15:37:58	1030	4.5	14.81	0.0	
04/26/2022	15:38:28	1000	4.5	14.89	0.0	
04/26/2022	15:38:58	1434	6.3	14.94	0.0	
04/26/2022	15:39:28	1474	6.4	14.88	0.0	
04/26/2022	15:39:58	1506	6.4	14.93	0.0	
04/26/2022	15:40:28	1542	6.3	14.92	0.0	
04/26/2022	15:40:58	1052	4.5	14.94	0.0	
04/26/2022	15:41:28	991	4.5	14.95	0.0	
04/26/2022	15:41:58	1482	6.3	14.98	0.0	
04/26/2022	15:42:28	1502	6.3	14.99	0.0	
04/26/2022	15:42:58	1491	6.4	14.98	0.0	
04/26/2022	15:43:28	1559	6.3	15.01	0.0	
04/26/2022	15:43:58	1578	6.3	15.00	0.0	
04/26/2022	15:44:28	1501	6.4	14.97	0.0	
04/26/2022	15:44:58	1580	6.3	14.98	0.0	
04/26/2022	15:45:28	1461	6.3	14.96	0.0	
04/26/2022	15:45:58	1494	6.3	14.96	0.0	
04/26/2022	15:46:28	1540	6.4	14.94	0.0	
04/26/2022	15:46:58	1504	6.3	14.95	0.0	
04/26/2022	15:47:28	1538	6.4	14.95	0.0	
04/26/2022	15:47:58	1456	6.3	14.97	0.0	
04/26/2022	15:48:28	1461	6.4	14.96	0.0	
04/26/2022	15:48:58	1550	6.4	15.01	0.0	
04/26/2022	15:49:28	1459	6.4	15.00	0.0	
04/26/2022	15:49:58	1463	6.4	14.98	0.0	
04/26/2022	15:50:28	1514	6.4	14.99	0.0	
04/26/2022	15:50:58	1432	6.4	15.01	0.0	
04/26/2022	15:51:28	1430	6.4	14.97	0.0	
04/26/2022	15:51:58	1524	6.4	15.05	0.0	
04/26/2022	15:52:28	1452	6.4	14.95	0.0	
04/26/2022	15:52:58	1523	6.4	14.95	0.0	
04/26/2022	15:53:28	1455	6.4	14.98	0.0	
04/26/2022	15:53:58	1435	6.4	15.03	0.0	
04/26/2022	15:54:28	1073	4.5	15.01	0.0	
04/26/2022	15:54:58	1001	4.5	15.08	0.0	
04/26/2022	15:55:28	1541	6.4	15.08	0.0	
04/26/2022	15:55:58	1567	6.4	15.05	0.0	
04/26/2022	15:56:28	1441	6.4	15.05	0.0	
04/26/2022	15:56:58	1464	6.0	15.05	0.0	
04/26/2022	15:57:28	1420	6.0	15.07	0.0	

Well	Field	Job Start	Customer	Job Number
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Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	15:58:28	1536	6.2	15.13	0.0	
04/26/2022	15:58:58	1564	6.3	15.10	0.0	
04/26/2022	15:59:28	1468	6.3	15.05	0.0	
04/26/2022	16:00:28	1546	6.3	15.02	0.0	
04/26/2022	16:00:58	1486	6.3	15.05	0.0	
04/26/2022	16:01:28	1538	6.4	15.09	0.0	
04/26/2022	16:01:58	1481	6.4	15.12	0.0	
04/26/2022	16:02:28	1459	6.4	15.15	0.0	
04/26/2022	16:02:58	1579	6.3	15.16	0.0	
04/26/2022	16:03:28	1518	6.4	15.12	0.0	
04/26/2022	16:03:58	1550	6.4	15.04	0.0	
04/26/2022	16:04:28	1447	6.1	15.00	0.0	
04/26/2022	16:04:58	564	2.5	14.97	0.0	
04/26/2022	16:05:28	396	2.1	14.88	0.0	
04/26/2022	16:05:58	646	3.2	14.95	0.0	
04/26/2022	16:06:28	762	3.3	15.01	0.0	
04/26/2022	16:06:58	756	3.3	15.02	0.0	
04/26/2022	16:07:28	1020	4.5	15.12	0.0	
04/26/2022	16:07:58	1599	6.4	15.13	0.0	
04/26/2022	16:08:28	1479	6.3	15.09	0.0	
04/26/2022	16:08:58	1498	6.4	15.05	0.0	
04/26/2022	16:09:28	1552	6.3	15.01	0.0	
04/26/2022	16:09:58	1518	6.3	14.99	0.0	
04/26/2022	16:10:28	1542	6.3	14.99	0.0	
04/26/2022	16:10:58	1591	6.4	14.95	0.0	
04/26/2022	16:11:28	1469	6.3	15.02	0.0	
04/26/2022	16:11:58	1542	6.3	14.99	0.0	
04/26/2022	16:12:28	1494	6.3	14.94	0.0	
04/26/2022	16:12:58	1469	6.3	14.95	0.0	
04/26/2022	16:13:28	751	3.3	14.94	0.0	
04/26/2022	16:13:58	413	2.1	14.92	0.0	
04/26/2022	16:14:28	409	2.1	14.92	0.0	
04/26/2022	16:14:58	419	2.1	14.74	0.0	
04/26/2022	16:15:28	442	2.1	14.78	0.0	
04/26/2022	16:15:58	424	2.1	14.71	0.0	
04/26/2022	16:16:28	477	2.1	14.71	0.0	
04/26/2022	16:16:58	436	2.1	14.72	0.0	
04/26/2022	16:17:00	386	2.1	14.72	0.0	shutdown wash lines to half round
04/26/2022	16:17:28	441	2.1	14.72	0.0	
04/26/2022	16:17:58	102	0.0	14.74	0.0	
04/26/2022	16:18:28	78	0.0	14.75	0.0	
04/26/2022	16:18:58	77	0.0	14.75	0.0	
04/26/2022	16:19:28	83	0.0	14.75	0.0	
04/26/2022	16:19:58	83	0.0	14.51	0.0	
04/26/2022	16:20:28	82	0.0	14.44	0.0	
04/26/2022	16:20:58	80	0.0	14.03	0.0	
04/26/2022	16:21:28	102	1.8	9.11	0.0	
04/26/2022	16:21:58	78	2.4	9.29	0.0	
04/26/2022	16:22:28	82	2.3	9.29	0.0	
04/26/2022	16:22:58	115	4.3	8.90	0.0	
04/26/2022	16:23:28	114	5.0	8.87	0.0	
04/26/2022	16:23:58	54	1.4	9.43	0.0	
04/26/2022	16:24:28	94	4.3	8.40	0.0	
04/26/2022	16:24:58	128	4.5	9.30	0.0	

Well	Field	Job Start	Customer	Job Number
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Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	16:25:58	128	4.6	9.28	0.0	
04/26/2022	16:26:28	134	4.6	9.24	0.0	
04/26/2022	16:27:28	14	1.3	8.19	0.0	
04/26/2022	16:27:58	162	0.0	8.38	0.0	
04/26/2022	16:28:28	165	0.1	8.48	0.0	
04/26/2022	16:28:58	12	0.0	8.44	0.0	
04/26/2022	16:29:28	13	0.3	8.39	0.0	
04/26/2022	16:29:58	15	0.0	8.33	0.0	
04/26/2022	16:30:28	9	0.0	8.34	0.0	
04/26/2022	16:30:58	9	0.0	8.34	0.0	
04/26/2022	16:31:28	9	0.0	8.34	0.0	
04/26/2022	16:31:58	9	0.0	8.34	0.0	
04/26/2022	16:32:28	9	0.0	8.34	0.0	
04/26/2022	16:32:58	9	0.0	8.34	0.0	
04/26/2022	16:33:00	9	0.0	8.34	0.0	release top plug
04/26/2022	16:33:28	9	0.0	8.34	0.0	
04/26/2022	16:33:58	9	0.0	8.34	0.0	
04/26/2022	16:34:00	9	0.0	8.34	0.0	displace 516bbl treated water m300
04/26/2022	16:34:28	9	0.0	8.34	0.0	
04/26/2022	16:34:58	148	2.3	8.38	0.0	
04/26/2022	16:35:28	215	4.6	8.40	0.0	
04/26/2022	16:35:58	2222	8.8	8.38	0.0	
04/26/2022	16:36:28	2441	8.9	8.38	0.0	
04/26/2022	16:36:58	2289	8.9	8.39	0.0	
04/26/2022	16:37:28	2272	8.7	8.39	0.0	
04/26/2022	16:37:58	2231	8.2	8.35	0.0	
04/26/2022	16:38:28	2250	8.2	8.35	0.0	
04/26/2022	16:38:58	2271	8.2	8.35	0.0	
04/26/2022	16:39:28	2325	8.3	8.35	0.0	
04/26/2022	16:39:58	2373	8.2	8.35	0.0	
04/26/2022	16:40:28	2458	8.2	8.35	0.0	
04/26/2022	16:40:58	2468	8.3	8.35	0.0	
04/26/2022	16:41:28	2572	8.2	8.35	0.0	
04/26/2022	16:41:58	2536	8.2	8.35	0.0	
04/26/2022	16:42:28	2589	8.2	8.35	0.0	
04/26/2022	16:42:58	2688	8.2	8.35	0.0	
04/26/2022	16:43:28	2707	8.2	8.35	0.0	
04/26/2022	16:43:58	2810	8.2	8.35	0.0	
04/26/2022	16:44:28	2856	8.2	8.35	0.0	
04/26/2022	16:44:58	2925	8.2	8.35	0.0	
04/26/2022	16:45:28	3006	8.2	8.35	0.0	
04/26/2022	16:45:58	2974	8.2	8.35	0.0	
04/26/2022	16:46:28	3060	8.2	8.35	0.0	
04/26/2022	16:46:58	3160	8.2	8.35	0.0	
04/26/2022	16:47:28	3186	8.2	8.35	0.0	
04/26/2022	16:47:58	3279	8.2	8.35	0.0	
04/26/2022	16:48:28	3271	8.2	8.35	0.0	
04/26/2022	16:48:58	3400	8.2	8.35	0.0	
04/26/2022	16:49:28	3439	8.2	8.35	0.0	
04/26/2022	16:49:58	3478	8.2	8.35	0.0	
04/26/2022	16:50:28	3549	8.2	8.35	0.0	
04/26/2022	16:50:58	3682	8.1	8.35	0.0	
04/26/2022	16:51:28	3760	8.1	8.35	0.0	
04/26/2022	16:51:58	3821	8.2	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	16:52:58	3979	8.1	8.35	0.0	
04/26/2022	16:53:28	3939	8.1	8.35	0.0	
04/26/2022	16:53:58	3923	8.1	8.35	0.0	
04/26/2022	16:54:28	3958	8.1	8.35	0.0	
04/26/2022	16:54:58	3937	8.1	8.35	0.0	
04/26/2022	16:55:28	3972	8.1	8.35	0.0	
04/26/2022	16:55:58	3939	8.1	8.35	0.0	
04/26/2022	16:56:28	3971	8.1	8.35	0.0	
04/26/2022	16:56:58	3825	8.1	8.35	0.0	
04/26/2022	16:57:28	3853	8.1	8.35	0.0	
04/26/2022	16:57:58	3834	8.2	8.35	0.0	
04/26/2022	16:58:28	3777	8.1	8.35	0.0	
04/26/2022	16:58:58	3901	8.1	8.35	0.0	
04/26/2022	16:59:28	3885	8.1	8.35	0.0	
04/26/2022	16:59:58	3803	8.1	8.35	0.0	
04/26/2022	17:00:58	3804	8.1	8.35	0.0	
04/26/2022	17:01:28	3876	8.1	8.35	0.0	
04/26/2022	17:01:58	3866	8.1	8.35	0.0	
04/26/2022	17:02:28	3797	8.1	8.35	0.0	
04/26/2022	17:02:58	3880	8.1	8.35	0.0	
04/26/2022	17:03:28	3781	8.1	8.35	0.0	
04/26/2022	17:03:58	3867	8.1	8.35	0.0	
04/26/2022	17:04:28	3780	8.1	8.35	0.0	
04/26/2022	17:04:58	3790	8.1	8.35	0.0	
04/26/2022	17:05:28	3846	8.1	8.35	0.0	
04/26/2022	17:05:58	3797	8.1	8.35	0.0	
04/26/2022	17:06:28	3880	8.1	8.35	0.0	
04/26/2022	17:06:58	3869	8.1	8.35	0.0	
04/26/2022	17:07:28	3906	8.1	8.35	0.0	
04/26/2022	17:07:58	3931	8.1	8.35	0.0	
04/26/2022	17:08:28	3933	8.1	8.35	0.0	
04/26/2022	17:08:58	3805	8.2	8.35	0.0	
04/26/2022	17:09:28	3850	8.1	8.35	0.0	
04/26/2022	17:09:58	3836	8.1	8.35	0.0	
04/26/2022	17:10:28	3834	8.1	8.35	0.0	
04/26/2022	17:10:58	3858	8.1	8.35	0.0	
04/26/2022	17:11:28	3822	8.1	8.35	0.0	
04/26/2022	17:11:58	3915	8.1	8.35	0.0	
04/26/2022	17:12:28	3899	8.1	8.35	0.0	
04/26/2022	17:12:58	3836	8.1	8.35	0.0	
04/26/2022	17:13:28	3855	8.1	8.35	0.0	
04/26/2022	17:13:58	3893	8.1	8.35	0.0	
04/26/2022	17:14:28	3868	8.1	8.35	0.0	
04/26/2022	17:14:58	3886	8.2	8.35	0.0	
04/26/2022	17:15:28	3874	8.1	8.35	0.0	
04/26/2022	17:15:58	3886	8.1	8.35	0.0	
04/26/2022	17:16:28	3906	8.1	8.35	0.0	
04/26/2022	17:16:58	3929	8.1	8.35	0.0	
04/26/2022	17:17:28	3868	8.1	8.35	0.0	
04/26/2022	17:17:58	3926	8.1	8.35	0.0	
04/26/2022	17:18:28	3906	8.1	8.35	0.0	
04/26/2022	17:18:58	4026	8.1	8.35	0.0	
04/26/2022	17:19:28	3898	8.1	8.35	0.0	
04/26/2022	17:19:58	3911	8.1	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	17:20:58	3927	8.1	8.35	0.0	
04/26/2022	17:21:28	3943	8.1	8.35	0.0	
04/26/2022	17:21:58	3907	8.1	8.35	0.0	
04/26/2022	17:22:28	3888	8.1	8.35	0.0	
04/26/2022	17:22:58	3929	8.1	8.35	0.0	
04/26/2022	17:23:28	3948	8.1	8.35	0.0	
04/26/2022	17:23:58	3984	8.1	8.35	0.0	
04/26/2022	17:24:28	4077	8.1	8.35	0.0	
04/26/2022	17:24:58	3884	8.1	8.35	0.0	
04/26/2022	17:25:28	3955	8.1	8.35	0.0	
04/26/2022	17:25:58	3949	8.1	8.35	0.0	
04/26/2022	17:26:28	3922	8.1	8.34	0.0	
04/26/2022	17:26:58	4003	8.1	8.35	0.0	
04/26/2022	17:27:28	3972	8.1	8.35	0.0	
04/26/2022	17:27:58	3961	8.1	8.35	0.0	
04/26/2022	17:28:28	3981	8.1	8.35	0.0	
04/26/2022	17:28:58	4029	8.1	8.35	0.0	
04/26/2022	17:29:28	3970	8.1	8.35	0.0	
04/26/2022	17:29:58	4041	8.2	8.35	0.0	
04/26/2022	17:30:28	3920	8.1	8.35	0.0	
04/26/2022	17:30:58	4009	8.1	8.35	0.0	
04/26/2022	17:31:28	3925	8.1	8.35	0.0	
04/26/2022	17:31:58	3970	8.1	8.34	0.0	
04/26/2022	17:32:28	3982	8.1	8.35	0.0	
04/26/2022	17:32:58	3944	8.1	8.35	0.0	
04/26/2022	17:33:28	3992	8.1	8.34	0.0	
04/26/2022	17:34:28	4046	8.1	8.35	0.0	
04/26/2022	17:34:58	4040	8.1	8.35	0.0	
04/26/2022	17:35:28	3315	4.1	8.34	0.0	
04/26/2022	17:35:58	3254	4.4	8.34	0.0	
04/26/2022	17:36:28	3268	4.4	8.34	0.0	
04/26/2022	17:36:58	3246	4.4	8.34	0.0	
04/26/2022	17:37:28	3498	6.2	8.34	0.0	
04/26/2022	17:37:58	3549	6.2	8.34	0.0	
04/26/2022	17:38:28	3132	3.2	8.34	0.0	
04/26/2022	17:38:58	3099	3.2	8.34	0.0	
04/26/2022	17:39:28	3051	3.3	8.34	0.0	
04/26/2022	17:39:58	3054	3.2	8.34	0.0	
04/26/2022	17:40:28	3054	3.2	8.34	0.0	
04/26/2022	17:40:58	3023	3.2	8.34	0.0	
04/26/2022	17:41:28	3075	3.2	8.34	0.0	
04/26/2022	17:41:58	3034	3.2	8.34	0.0	
04/26/2022	17:42:28	3046	3.2	8.34	0.0	
04/26/2022	17:42:58	3082	3.2	8.34	0.0	
04/26/2022	17:43:00	3042	3.2	8.34	0.0	land lug 3800psi
04/26/2022	17:43:28	3053	3.2	8.34	0.0	
04/26/2022	17:43:58	3500	0.1	8.34	0.0	
04/26/2022	17:44:28	3601	0.0	8.34	0.0	
04/26/2022	17:44:58	3513	0.0	8.35	0.0	
04/26/2022	17:45:28	3475	0.0	8.35	0.0	
04/26/2022	17:45:58	3483	0.0	8.35	0.0	
04/26/2022	17:46:28	3482	0.0	8.35	0.0	
04/26/2022	17:46:58	3486	0.0	8.35	0.0	
04/26/2022	17:47:28	3489	0.0	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	17:48:28	3502	0.0	8.35	0.0	
04/26/2022	17:48:58	3516	0.0	8.35	0.0	
04/26/2022	17:49:00	3514	0.0	8.35	0.0	11bbl cement to surface
04/26/2022	17:49:28	3518	0.0	8.35	0.0	
04/26/2022	17:49:58	3314	0.0	8.35	0.0	
04/26/2022	17:50:00	3181	0.0	8.35	0.0	6.5bbl bled back floats hold
04/26/2022	17:50:28	634	0.0	8.35	0.0	
04/26/2022	17:50:58	10	0.0	8.35	0.0	
04/26/2022	17:51:28	1	0.0	8.35	0.0	
04/26/2022	17:51:58	-1	0.0	8.35	0.0	
04/26/2022	17:52:28	-1	0.0	8.35	0.0	
04/26/2022	17:52:58	-1	0.0	8.35	0.0	
04/26/2022	17:53:28	-2	0.0	8.35	0.0	
04/26/2022	17:53:58	-2	0.0	8.35	0.0	
04/26/2022	17:54:28	-2	0.0	8.35	0.0	
04/26/2022	17:54:58	-2	0.0	8.35	0.0	
04/26/2022	17:55:28	-1	0.0	8.35	0.0	
04/26/2022	17:55:58	-1	0.0	8.35	0.0	
04/26/2022	17:56:28	-2	0.0	8.35	0.0	
04/26/2022	17:56:58	-2	0.0	8.35	0.0	
04/26/2022	17:57:28	-2	0.0	8.35	0.0	
04/26/2022	17:57:58	-2	0.0	8.35	0.0	
04/26/2022	17:58:28	-2	0.0	8.35	0.0	
04/26/2022	17:58:58	1	0.0	8.34	0.0	
04/26/2022	17:59:28	-2	0.0	8.53	0.0	
04/26/2022	17:59:58	-2	0.0	7.33	0.0	
04/26/2022	18:00:00	0	0.0	8.17	0.0	wash lines for rig
04/26/2022	18:00:28	5	0.0	8.32	0.0	
04/26/2022	18:01:28	1	0.0	8.33	0.0	
04/26/2022	18:01:58	50	3.7	8.38	0.0	
04/26/2022	18:02:28	42	3.4	8.39	0.0	
04/26/2022	18:02:58	51	4.0	8.37	0.0	
04/26/2022	18:03:28	2	1.4	8.34	0.0	
04/26/2022	18:03:58	97	4.1	8.65	0.0	
04/26/2022	18:04:28	251	4.5	8.34	0.0	
04/26/2022	18:04:58	106	4.7	8.34	0.0	
04/26/2022	18:05:28	382	4.5	8.34	0.0	
04/26/2022	18:05:58	118	0.0	8.34	0.0	
04/26/2022	18:06:28	73	4.7	8.32	0.0	
04/26/2022	18:06:58	143	6.5	8.34	0.0	
04/26/2022	18:07:28	114	6.5	8.34	0.0	
04/26/2022	18:07:58	-3	0.0	8.49	0.0	
04/26/2022	18:08:28	-5	0.1	8.44	0.0	
04/26/2022	18:08:58	-6	0.1	8.40	0.0	
04/26/2022	18:09:28	-7	0.1	8.38	0.0	
04/26/2022	18:09:58	-9	0.1	8.38	0.0	
04/26/2022	18:10:28	-9	0.1	8.38	0.0	
04/26/2022	18:10:58	-9	0.1	8.38	0.0	
04/26/2022	18:11:28	-9	0.1	8.38	0.0	
04/26/2022	18:11:58	-9	0.1	8.38	0.0	
04/26/2022	18:12:28	-9	0.1	8.37	0.0	
04/26/2022	18:12:58	-9	0.1	8.38	0.0	
04/26/2022	18:13:28	-9	0.1	8.38	0.0	
04/26/2022	18:13:58	-9	0.1	8.37	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/26/2022	18:14:58	-9	0.1	8.38	0.0	
04/26/2022	18:15:28	-9	0.1	8.38	0.0	
04/26/2022	18:15:58	-5	0.1	8.38	0.0	
04/26/2022	18:16:28	-2	0.1	8.38	0.0	
04/26/2022	18:16:58	-2	0.1	8.38	0.0	
04/26/2022	18:17:28	-2	0.1	8.38	0.0	
04/26/2022	18:17:58	49	3.7	8.35	0.0	
04/26/2022	18:18:28	47	3.8	8.36	0.0	
04/26/2022	18:18:58	1	2.3	8.28	0.0	
04/26/2022	18:19:28	66	4.4	8.33	0.0	
04/26/2022	18:19:58	66	4.7	8.34	0.0	
04/26/2022	18:20:28	196	7.8	8.35	0.0	
04/26/2022	18:20:58	204	8.4	8.34	0.0	
04/26/2022	18:21:28	194	8.4	8.34	0.0	
04/26/2022	18:21:58	204	8.3	8.34	0.0	
04/26/2022	18:22:28	201	8.3	8.34	0.0	
04/26/2022	18:22:58	194	8.3	8.34	0.0	
04/26/2022	18:23:28	196	8.3	8.34	0.0	
04/26/2022	18:23:58	198	8.3	8.34	0.0	
04/26/2022	18:24:28	195	8.3	8.34	0.0	
04/26/2022	18:24:58	203	8.3	8.34	0.0	
04/26/2022	18:25:28	205	8.3	8.34	0.0	
04/26/2022	18:25:58	191	8.3	8.34	0.0	
04/26/2022	18:26:28	198	8.3	8.34	0.0	
04/26/2022	18:26:58	195	8.3	8.34	0.0	
04/26/2022	18:27:28	192	8.3	8.34	0.0	
04/26/2022	18:27:58	193	8.3	8.34	0.0	
04/26/2022	18:28:28	201	8.3	8.34	0.0	
04/26/2022	18:28:58	195	8.3	8.34	0.0	
04/26/2022	18:29:28	197	8.3	8.34	0.0	
04/26/2022	18:29:58	-2	0.0	8.34	0.0	
04/26/2022	18:30:28	-2	0.0	8.34	0.0	
04/26/2022	18:30:58	-2	0.0	8.34	0.0	
04/26/2022	18:31:28	-2	0.0	8.34	0.0	
04/26/2022	18:31:58	-3	0.0	8.34	0.0	
04/26/2022	18:32:28	-5	0.0	8.34	0.0	
04/26/2022	18:32:58	-7	0.0	8.34	0.0	
04/26/2022	18:33:28	-7	0.0	8.34	0.0	
04/26/2022	18:33:58	-7	0.0	8.34	0.0	
04/26/2022	18:34:58	254	8.3	8.34	0.0	
04/26/2022	18:35:28	272	8.3	8.34	0.0	
04/26/2022	18:35:58	267	8.3	8.34	0.0	
04/26/2022	18:36:28	5	0.5	8.34	0.0	
04/26/2022	18:36:58	-5	0.0	8.16	0.0	
04/26/2022	18:37:28	-5	0.0	8.34	0.0	
04/26/2022	18:37:58	-5	0.0	7.23	0.0	
04/26/2022	18:38:28	-5	0.0	8.34	0.0	
04/26/2022	18:38:58	-5	0.0	8.32	0.0	
04/26/2022	18:39:00	-6	0.0	8.33	0.0	end pumping @ 19:00
04/26/2022	18:39:28	-5	0.0	8.34	0.0	
04/26/2022	18:39:58	-5	0.0	8.34	0.0	
04/26/2022	18:40:00	-6	0.0	8.34	0.0	end job @ 20:00
04/26/2022	18:40:28	-6	0.0	8.34	0.0	
04/26/2022	18:40:58	-6	0.0	8.34	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter10H 10H		Apr/26/2022	Southwestern	EOHC-00127

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
6.8			397.4	1121.0	0.0	135.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
8438	-8	1598	3800			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	1097.0 bbl	516.0 bbl	69 degF	[X]	11.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Danny Cover	-	[X] -

Service Quality Evaluation

Client:	Southwestern
Field:	
Rig:	SDC 40
Well:	Carl Rotter10H
Service Line:	Cementing
Job Type:	production

Service Order #:	
Date:	Apr/26/2022
Operating Time (hh:mm):	00:00
Client Rep:	
Schlumberger Engineer:	Danny Cover
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** [X] **no** [ ]	5
1b	Free of environmental spill or non-compliant discharge	5	**yes** [X] **no** [ ]	5
1c	Wellsite left clean	4	**yes** [X] **no** [ ]	4
			Sub-total	100%

2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** [X] **no** [ ]	3
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** [X] **no** [ ]	2
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** [X] **no** [ ]	2
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** [X] **no** [ ]	2
			Sub-total	100%

3	**Execution**			
3a	Lost time < 30 mins	3	**yes** [X] **no** [ ]	3
3b	Equipment pressure tested succesfully	3	**yes** [X] **no** [ ]	3
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** [X] **no** [ ]	2
3d	Plugs / darts released and tested succesfully	2	**yes** [X] **no** [ ]	2
3e	Density variation met expectations	2	**yes** [X] **no** [ ]	2
3f	Personnel performed as per expectations	2	**yes** [X] **no** [ ]	2
3g	Equipment performed as per expectations	2	**yes** [X] **no** [ ]	2
3h	Job pumped as per design	3	**yes** [X] **no** [ ]	3
3i	Did job start on time	2	**yes** [X] **no** [ ]	2
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** [X] **no** [ ]	3
			Sub-total	100%

4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** [X] **no** [ ]	10
			Sub-total	100%

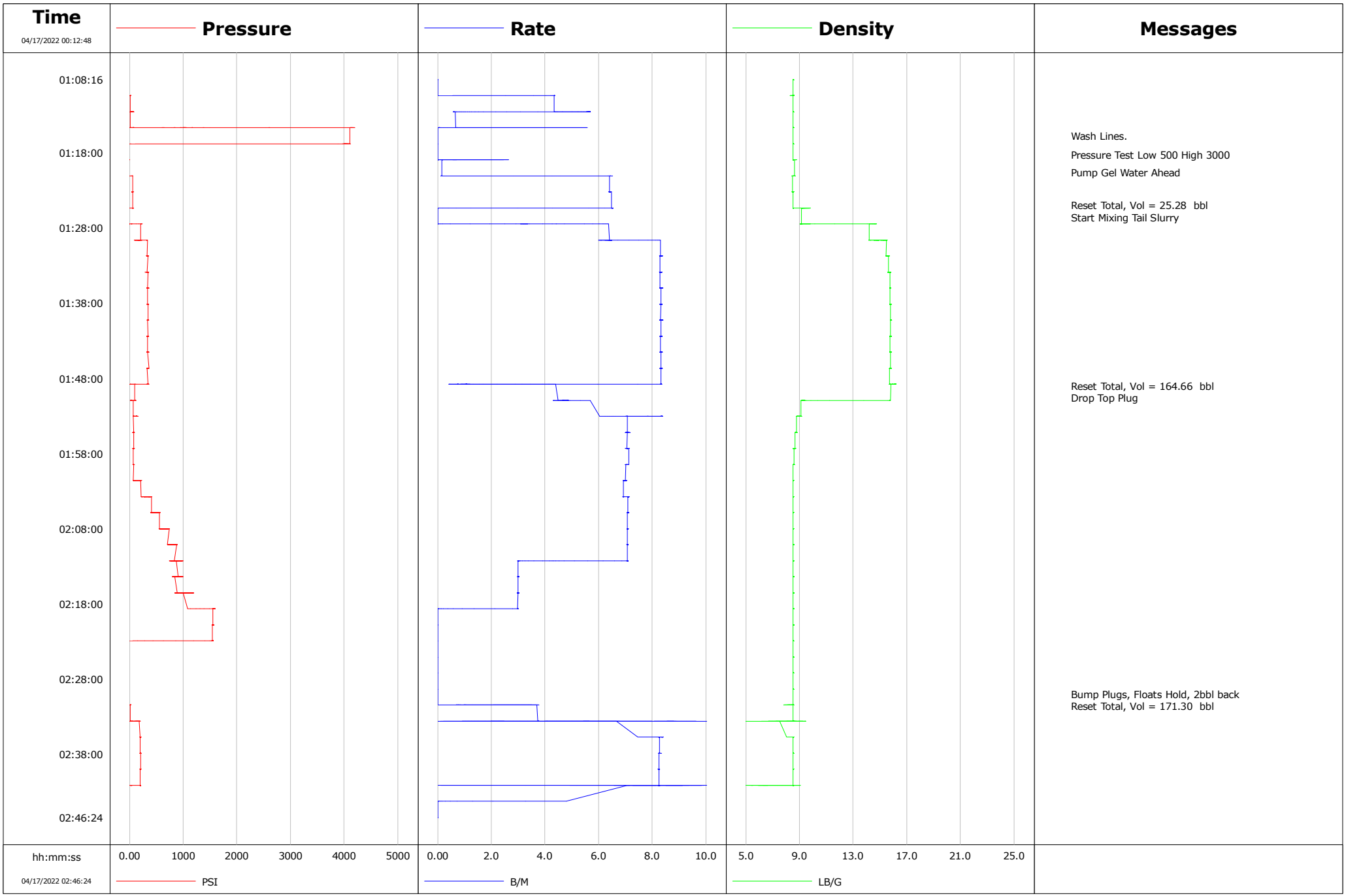
Total 100%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

Schlumberger Cementing Job Report

Well	Carl Rotter 10H	**Client**	Southwestern Energy
Field	Old 10	**SIR No.**	EN82-04783
Engineer	Danny Cover	**Job Type**	Intermediate
Country	United States	**Job Date**	4/17/2022



Schlumberger

Cementing Service Report

Customer	Job Number
Southwestern Energy	EN82-04783

Well	Location (legal)	Schlumberger Location	Job Start
Carl Rotter 10H			Apr/17/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Old 10	Shale	10 deg	12.3 in	2180.0 ft	2136.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Barbour	West Virginia	psi	84 degF	80 degF	lb/gal

Well Master	API/UWI
0066497278	47-069-00328-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Air	lb/gal	cP

Service Line	Job Type
Cementing	Intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

Pumping Order

25BBL Gel ahead

160BBL Tail
Density: 15.6PPG
Yield: 1.19
SKS: 751
Sk Weight: 94
Mix Water: 5.27 gal/sk

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2180.0	9.6	36.0	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	bbl	bbl	bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
[X]	[ ]

Lift Pressure	
500 psi	

Pipe Rotated	Pipe Reciprocated
[ ]	[ ]

No. Centralizers	Top Plugs	Bottom Plugs
4	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Apr/16/2022 17:00	Apr/16/2022 20:00	Apr/17/2022 03:30

Casing Tools

Shoe Type	Float
Shoe Depth	2180.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	2140.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	00:12:48	-1	0.0	8.53	0.0	Started Acquisition
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-2	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-3	0.0	8.53	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	00:12:48	-3	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-4	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-5	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-6	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-7	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-9	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-8	0.0	8.53	0.0	
04/17/2022	00:12:48	0	0.0	8.53	0.0	
04/17/2022	00:12:48	0	0.0	8.53	0.0	
04/17/2022	00:12:48	-10	0.0	8.53	0.0	
04/17/2022	00:12:48	-11	0.0	8.53	0.0	
04/17/2022	00:12:48	-11	0.0	8.53	0.0	
04/17/2022	00:12:48	-11	0.0	8.53	0.0	
04/17/2022	00:12:48	-11	0.0	0.00	0.0	
04/17/2022	00:12:48	-11	0.0	0.00	0.0	
04/17/2022	00:12:48	-11	0.0	0.00	0.0	
04/17/2022	00:12:48	-11	0.0	0.00	0.0	
04/17/2022	00:12:48	-11	0.0	8.53	0.0	
04/17/2022	00:12:48	-11	0.0	8.53	0.0	
04/17/2022	01:16:48	4102	0.0	8.52	0.0	
04/17/2022	01:16:48	4100	0.0	8.52	0.0	
04/17/2022	01:16:48	4098	0.0	8.52	0.0	
04/17/2022	01:16:48	4096	0.0	8.52	0.0	
04/17/2022	01:16:48	4094	0.0	8.52	0.0	
04/17/2022	01:16:48	4092	0.0	8.52	0.0	
04/17/2022	01:16:48	4090	0.0	8.52	0.0	
04/17/2022	01:16:48	4088	0.0	8.52	0.0	
04/17/2022	01:16:48	4085	0.0	8.52	0.0	
04/17/2022	01:16:48	4083	0.0	8.52	0.0	
04/17/2022	01:16:48	4081	0.0	8.52	0.0	
04/17/2022	01:16:48	4079	0.0	8.52	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	01:16:48	4075	0.0	8.52	0.0	
04/17/2022	01:16:48	4073	0.0	8.52	0.0	
04/17/2022	01:16:48	4072	0.0	8.52	0.0	
04/17/2022	01:16:48	4070	0.0	8.52	0.0	
04/17/2022	01:16:48	4068	0.0	8.52	0.0	
04/17/2022	01:16:48	4067	0.0	8.52	0.0	
04/17/2022	01:16:48	4065	0.0	8.52	0.0	
04/17/2022	01:16:48	4063	0.0	8.52	0.0	
04/17/2022	01:16:48	4062	0.0	8.52	0.0	
04/17/2022	01:16:48	4060	0.0	8.52	0.0	
04/17/2022	01:16:48	4058	0.0	8.52	0.0	
04/17/2022	01:16:48	4057	0.0	8.52	0.0	
04/17/2022	01:16:48	4054	0.0	8.52	0.0	
04/17/2022	01:16:48	4053	0.0	8.52	0.0	
04/17/2022	01:16:48	4052	0.0	8.52	0.0	
04/17/2022	01:16:48	4050	0.0	8.52	0.0	
04/17/2022	01:16:48	4049	0.0	8.52	0.0	
04/17/2022	01:16:48	4047	0.0	8.52	0.0	
04/17/2022	01:16:48	4046	0.0	8.52	0.0	
04/17/2022	01:16:48	4044	0.0	8.52	0.0	
04/17/2022	01:16:48	4043	0.0	8.52	0.0	
04/17/2022	01:16:48	4042	0.0	8.52	0.0	
04/17/2022	01:16:48	4040	0.0	8.52	0.0	
04/17/2022	01:16:48	4039	0.0	8.52	0.0	
04/17/2022	01:16:48	4038	0.0	8.52	0.0	
04/17/2022	01:16:48	4036	0.0	8.53	0.0	
04/17/2022	01:16:48	4035	0.0	8.52	0.0	
04/17/2022	01:16:48	4034	0.0	8.52	0.0	
04/17/2022	01:16:48	4032	0.0	8.53	0.0	
04/17/2022	01:16:48	4031	0.0	8.52	0.0	
04/17/2022	01:16:48	4030	0.0	8.52	0.0	
04/17/2022	01:16:48	4028	0.0	8.52	0.0	
04/17/2022	01:16:48	4027	0.0	8.52	0.0	
04/17/2022	01:16:48	4026	0.0	8.52	0.0	
04/17/2022	01:16:48	4025	0.0	8.52	0.0	
04/17/2022	01:16:48	4024	0.0	8.52	0.0	
04/17/2022	01:16:48	4022	0.0	8.52	0.0	
04/17/2022	01:16:48	4021	0.0	8.52	0.0	
04/17/2022	01:16:48	4020	0.0	8.52	0.0	
04/17/2022	01:16:48	4019	0.0	8.52	0.0	
04/17/2022	01:16:48	4018	0.0	8.52	0.0	
04/17/2022	01:16:48	4017	0.0	8.52	0.0	
04/17/2022	01:16:48	4015	0.0	8.52	0.0	
04/17/2022	01:16:48	4014	0.0	8.52	0.0	
04/17/2022	01:16:48	4013	0.0	8.52	0.0	
04/17/2022	01:16:48	4012	0.0	8.52	0.0	
04/17/2022	01:16:48	4011	0.0	8.52	0.0	
04/17/2022	01:16:48	4009	0.0	8.52	0.0	
04/17/2022	01:16:48	4009	0.0	8.52	0.0	
04/17/2022	01:16:48	4007	0.0	8.52	0.0	
04/17/2022	01:16:48	4007	0.0	8.52	0.0	
04/17/2022	01:16:48	4005	0.0	8.52	0.0	
04/17/2022	01:16:48	4004	0.0	8.53	0.0	
04/17/2022	01:16:48	4003	0.0	8.52	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	01:16:48	4000	0.0	8.52	0.0	
04/17/2022	01:16:48	4000	0.0	8.52	0.0	
04/17/2022	01:16:48	3999	0.0	8.52	0.0	
04/17/2022	01:16:48	3997	0.0	8.53	0.0	
04/17/2022	01:16:48	3996	0.0	8.53	0.0	
04/17/2022	01:16:48	3995	0.0	8.52	0.0	
04/17/2022	01:16:48	3994	0.0	8.52	0.0	
04/17/2022	01:16:48	3993	0.0	8.52	0.0	
04/17/2022	01:16:48	3991	0.0	8.52	0.0	
04/17/2022	01:16:48	3990	0.0	8.52	0.0	
04/17/2022	01:16:48	3989	0.0	8.52	0.0	
04/17/2022	01:16:48	3988	0.0	8.52	0.0	
04/17/2022	01:16:48	3987	0.0	8.52	0.0	
04/17/2022	01:16:48	3986	0.0	8.52	0.0	
04/17/2022	01:16:48	3985	0.0	8.52	0.0	
04/17/2022	01:16:48	3984	0.0	8.52	0.0	
04/17/2022	01:16:48	3979	0.0	8.52	0.0	
04/17/2022	01:16:48	3970	0.0	8.52	0.0	
04/17/2022	01:16:48	3969	0.0	8.52	0.0	
04/17/2022	01:16:48	3968	0.0	8.52	0.0	
04/17/2022	01:16:48	3967	0.0	8.52	0.0	
04/17/2022	01:16:48	3879	0.0	8.52	0.0	
04/17/2022	01:16:48	106	0.0	8.52	0.0	
04/17/2022	01:16:48	3	0.0	8.52	0.0	
04/17/2022	01:16:48	9	0.0	8.52	0.0	
04/17/2022	01:16:48	12	0.0	8.52	0.0	
04/17/2022	01:16:48	12	0.0	8.52	0.0	
04/17/2022	01:16:48	12	0.0	8.52	0.0	
04/17/2022	01:16:48	-3	0.0	8.52	0.0	
04/17/2022	01:16:48	-41	0.0	8.52	0.0	
04/17/2022	01:16:48	-24	0.0	8.52	0.0	
04/17/2022	01:16:48	-38	0.0	8.52	0.0	
04/17/2022	01:16:48	-27	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-32	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.53	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-33	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.52	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	01:16:48	-34	0.0	8.52	0.0	
04/17/2022	01:16:48	-34	0.0	8.53	0.0	
04/17/2022	01:48:48	346	8.3	15.70	0.0	
04/17/2022	01:48:48	332	8.3	15.70	0.0	
04/17/2022	01:48:48	333	8.3	15.70	0.0	
04/17/2022	01:48:48	329	8.3	15.70	0.0	
04/17/2022	01:48:48	350	8.3	15.70	0.0	
04/17/2022	01:48:48	336	8.3	15.70	0.0	
04/17/2022	01:48:48	330	8.3	15.70	0.0	
04/17/2022	01:48:48	346	8.3	15.70	0.0	
04/17/2022	01:48:48	339	8.3	15.70	0.0	
04/17/2022	01:48:48	333	8.3	15.70	0.0	
04/17/2022	01:48:48	328	8.3	15.70	0.0	
04/17/2022	01:48:48	346	8.3	15.70	0.0	
04/17/2022	01:48:48	332	8.3	15.70	0.0	
04/17/2022	01:48:48	334	8.3	15.70	0.0	
04/17/2022	01:48:48	332	8.3	15.70	0.0	
04/17/2022	01:48:48	350	8.3	15.70	0.0	
04/17/2022	01:48:48	339	8.3	15.70	0.0	
04/17/2022	01:48:48	335	8.3	15.70	0.0	
04/17/2022	01:48:48	339	8.3	15.70	0.0	
04/17/2022	01:48:48	350	8.3	15.70	0.0	
04/17/2022	01:48:48	332	8.3	15.70	0.0	
04/17/2022	01:48:48	329	8.3	15.70	0.0	
04/17/2022	01:48:48	346	8.3	15.70	0.0	
04/17/2022	01:48:48	334	8.3	15.70	0.0	
04/17/2022	01:48:48	333	8.3	15.70	0.0	
04/17/2022	01:48:48	336	8.3	15.70	0.0	
04/17/2022	01:48:48	350	8.3	15.70	0.0	
04/17/2022	01:48:48	340	8.3	15.70	0.0	
04/17/2022	01:48:48	335	8.3	15.70	0.0	
04/17/2022	01:48:48	342	8.3	15.70	0.0	
04/17/2022	01:48:48	349	8.3	15.70	0.0	
04/17/2022	01:48:48	336	8.3	15.70	0.0	
04/17/2022	01:48:48	330	8.3	15.70	0.0	
04/17/2022	01:48:48	338	8.3	15.71	0.0	
04/17/2022	01:48:48	329	8.3	15.80	0.0	
04/17/2022	01:48:48	334	8.3	15.82	0.0	
04/17/2022	01:48:48	320	8.3	15.85	0.0	
04/17/2022	01:48:48	345	8.3	15.87	0.0	
04/17/2022	01:48:48	351	8.3	15.88	0.0	
04/17/2022	01:48:48	346	8.3	15.89	0.0	
04/17/2022	01:48:48	352	8.3	15.89	0.0	
04/17/2022	01:48:48	349	8.3	15.89	0.0	
04/17/2022	01:48:48	353	8.3	15.89	0.0	
04/17/2022	01:48:48	342	8.3	15.88	0.0	
04/17/2022	01:48:48	354	8.3	15.88	0.0	
04/17/2022	01:48:48	353	8.3	15.88	0.0	
04/17/2022	01:48:48	343	8.3	15.88	0.0	
04/17/2022	01:48:48	133	8.2	15.89	0.0	
04/17/2022	01:48:48	12	7.5	15.90	0.0	
04/17/2022	01:48:48	-1	6.0	15.93	0.0	
04/17/2022	01:48:48	-27	4.1	16.04	0.0	
04/17/2022	01:48:48	-31	3.1	16.09	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	01:48:48	-23	1.7	16.12	0.0	
04/17/2022	01:48:48	-27	1.3	16.12	0.0	
04/17/2022	01:48:48	-31	1.1	16.11	0.0	
04/17/2022	01:48:48	-13	0.9	16.10	0.0	
04/17/2022	01:48:48	12	0.9	16.07	0.0	
04/17/2022	01:48:48	-21	1.1	16.00	0.0	
04/17/2022	01:48:48	-33	1.2	15.98	0.0	
04/17/2022	01:48:48	-30	1.1	16.01	0.0	
04/17/2022	01:48:48	-27	0.9	16.06	0.0	
04/17/2022	01:48:48	-26	0.7	16.08	0.0	
04/17/2022	01:48:48	-27	0.6	16.09	0.0	
04/17/2022	01:48:48	-26	0.5	16.09	0.0	
04/17/2022	01:48:48	-26	0.5	16.09	0.0	
04/17/2022	01:48:48	-26	0.4	16.08	0.0	
04/17/2022	01:48:48	-26	0.4	16.08	0.0	
04/17/2022	01:48:48	-26	0.4	16.08	0.0	
04/17/2022	01:48:48	-16	0.4	16.07	0.0	
04/17/2022	01:48:48	-24	0.5	16.07	0.0	
04/17/2022	01:48:48	-22	0.5	16.07	0.0	
04/17/2022	01:48:48	-18	0.6	16.08	0.0	
04/17/2022	01:48:48	-18	0.6	16.08	0.0	
04/17/2022	01:48:48	-12	0.7	16.08	0.0	
04/17/2022	01:48:48	-7	0.7	16.08	0.0	
04/17/2022	01:48:48	-3	0.7	16.09	0.0	
04/17/2022	01:48:48	15	0.7	16.09	0.0	
04/17/2022	01:48:48	15	0.7	16.09	0.0	
04/17/2022	01:48:48	16	0.7	16.09	0.0	
04/17/2022	01:48:48	15	0.7	16.09	0.0	
04/17/2022	01:48:48	9	0.7	16.10	0.0	
04/17/2022	01:48:48	10	0.7	16.09	0.0	
04/17/2022	01:48:48	9	0.7	16.10	0.0	
04/17/2022	01:48:48	5	0.7	16.10	0.0	
04/17/2022	01:48:48	9	0.7	16.10	0.0	
04/17/2022	01:48:48	3	0.7	16.10	0.0	
04/17/2022	01:48:48	-8	0.7	16.10	0.0	
04/17/2022	01:48:48	-21	0.7	16.10	0.0	
04/17/2022	01:48:48	-15	0.8	16.10	0.0	
04/17/2022	01:48:48	-17	0.8	16.10	0.0	
04/17/2022	01:48:48	-11	0.9	16.11	0.0	
04/17/2022	01:48:48	-15	1.0	16.12	0.0	
04/17/2022	01:48:48	-12	1.0	16.12	0.0	
04/17/2022	01:48:48	-15	1.0	16.13	0.0	
04/17/2022	01:48:48	-15	1.0	16.13	0.0	
04/17/2022	01:48:48	-14	1.0	16.13	0.0	
04/17/2022	01:48:48	-14	1.1	16.13	0.0	
04/17/2022	01:48:48	-13	1.0	16.13	0.0	
04/17/2022	01:48:48	-13	1.1	16.13	0.0	
04/17/2022	01:48:48	-13	1.1	16.14	0.0	
04/17/2022	01:48:48	-14	1.1	16.14	0.0	
04/17/2022	01:48:48	-15	1.1	16.14	0.0	
04/17/2022	01:48:48	-15	1.1	16.14	0.0	
04/17/2022	01:48:48	-15	1.1	16.14	0.0	
04/17/2022	01:48:48	-13	1.1	16.14	0.0	
04/17/2022	01:48:48	-14	1.1	16.14	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	01:48:48	-13	1.1	16.15	0.0	
04/17/2022	01:48:48	-16	1.1	16.14	0.0	
04/17/2022	01:48:48	-16	1.0	16.15	0.0	
04/17/2022	01:48:48	-16	1.0	16.15	0.0	
04/17/2022	01:48:48	-15	1.1	16.15	0.0	
04/17/2022	01:48:48	-16	1.1	16.15	0.0	
04/17/2022	01:48:48	-16	1.1	16.15	0.0	
04/17/2022	01:48:48	-17	1.1	16.15	0.0	
04/17/2022	01:48:48	-17	1.1	16.15	0.0	
04/17/2022	01:48:48	-17	1.1	16.16	0.0	
04/17/2022	01:48:48	-17	1.1	16.16	0.0	
04/17/2022	01:48:48	44	1.1	16.16	0.0	
04/17/2022	01:48:48	63	1.6	16.14	0.0	
04/17/2022	01:48:48	94	2.2	16.06	0.0	
04/17/2022	01:48:48	100	2.9	15.97	0.0	
04/17/2022	01:48:48	106	3.4	15.93	0.0	
04/17/2022	01:48:48	95	3.9	15.91	0.0	
04/17/2022	01:48:48	96	4.2	15.86	0.0	
04/17/2022	01:48:48	98	4.4	15.82	0.0	
04/17/2022	02:20:48	1554	0.0	8.52	0.0	
04/17/2022	02:20:48	1554	0.0	8.53	0.0	
04/17/2022	02:20:48	1554	0.0	8.52	0.0	
04/17/2022	02:20:48	1553	0.0	8.53	0.0	
04/17/2022	02:20:48	1553	0.0	8.52	0.0	
04/17/2022	02:20:48	1554	0.0	8.52	0.0	
04/17/2022	02:20:48	1553	0.0	8.52	0.0	
04/17/2022	02:20:48	1553	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1553	0.0	8.53	0.0	
04/17/2022	02:20:48	1553	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.53	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.53	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1551	0.0	8.52	0.0	
04/17/2022	02:20:48	1551	0.0	8.52	0.0	
04/17/2022	02:20:48	1552	0.0	8.52	0.0	
04/17/2022	02:20:48	1551	0.0	8.53	0.0	
04/17/2022	02:20:48	1551	0.0	8.53	0.0	
04/17/2022	02:20:48	1551	0.0	8.52	0.0	
04/17/2022	02:20:48	1551	0.0	8.52	0.0	
04/17/2022	02:20:48	1551	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.53	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.53	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.53	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1550	0.0	8.52	0.0	
04/17/2022	02:20:48	1549	0.0	8.52	0.0	
04/17/2022	02:20:48	1549	0.0	8.52	0.0	
04/17/2022	02:20:48	1549	0.0	8.53	0.0	
04/17/2022	02:20:48	1549	0.0	8.52	0.0	
04/17/2022	02:20:48	1549	0.0	8.53	0.0	
04/17/2022	02:20:48	1549	0.0	8.53	0.0	
04/17/2022	02:20:48	1548	0.0	8.52	0.0	
04/17/2022	02:20:48	1548	0.0	8.52	0.0	
04/17/2022	02:20:48	1549	0.0	8.52	0.0	
04/17/2022	02:20:48	1548	0.0	8.52	0.0	
04/17/2022	02:20:48	1548	0.0	8.53	0.0	
04/17/2022	02:20:48	1548	0.0	8.53	0.0	
04/17/2022	02:20:48	1548	0.0	8.52	0.0	
04/17/2022	02:20:48	1548	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.53	0.0	
04/17/2022	02:20:48	1548	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.53	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.53	0.0	
04/17/2022	02:20:48	1546	0.0	8.53	0.0	
04/17/2022	02:20:48	1547	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.53	0.0	
04/17/2022	02:20:48	1546	0.0	8.53	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1546	0.0	8.53	0.0	
04/17/2022	02:20:48	1546	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.53	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.52	0.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H	Old 10	Apr/17/2022	Southwestern Energy	EN82-04783

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1545	0.0	8.53	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.53	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.53	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.53	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1544	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1543	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.53	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	
04/17/2022	02:20:48	1542	0.0	8.52	0.0	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
				160.0		25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
	0		1500		FreshWater	bbl	8.34 lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	160.0 bbl	165.4 bbl	75 degF	Cement Circulated to Surface? ☐	Volume 165.4 bbl
				Washed Thru Perfs ☐	To 2180.0 ft

Customer or Authorized Representative	Schlumberger Supervisor		
Mr. Doug Thompson	Danny Cover	Circulation Lost ☐	Job Completed ☐
		-	-

Casing Offload Tally

Well Name: CARL ROTTER OHI 206 **Intermediate, Set Depth: 2,189.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003290000	4001165865	SWN PRODUCTION COMPANY L...	1,335.90	26.00	1,361.90 <elvotherlabel>,9/16/202...	3/2/2022 16:30
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Conductor Set

Casing Strings

Casing Description	Set Depth (ftKB)	Run Date
Intermediate	2,189.00	

Casing Run Tally

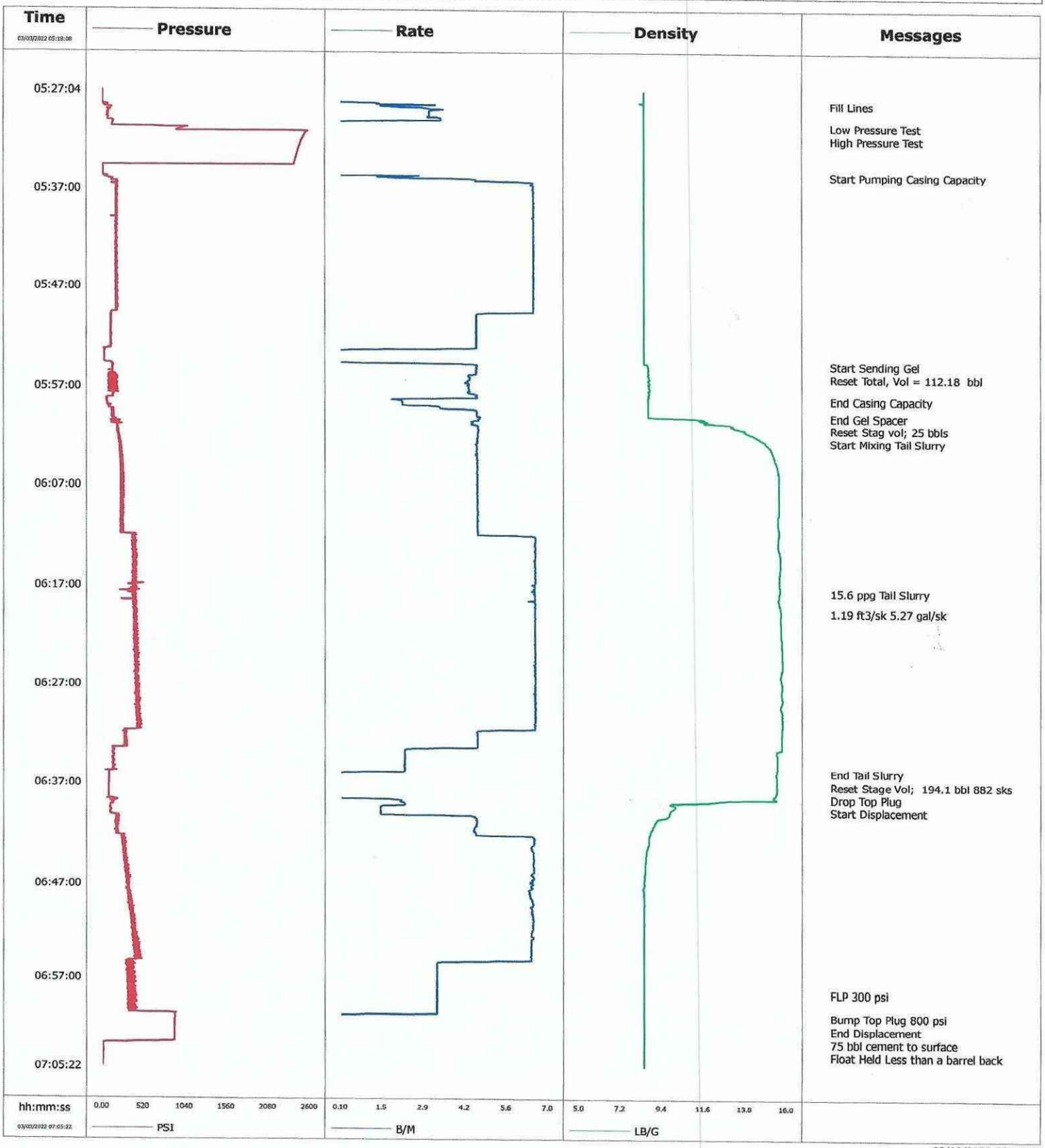
Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
1		Float Shoe	9.625	36.00		Yes	1.88	No	Weatherford Float Shoe		2,187.1	1.88
2	1	Casing Joints	9.625	36.00	J-55	Yes	38.69	Yes	BS 1		2,148.4	40.57
3		Float Collar	9.625	36.00		Yes	1.49	No	Weatherford Float Collar		2,146.9	42.06
4	2	Casing Joints	9.625	36.00	J-55	Yes	38.93	Yes	BS 2		2,108.0	80.99
5	3	Casing Joints	9.625	36.00	J-55	Yes	38.00	Yes	BS 3		2,070.0	118.99
6	4	Casing Joints	9.625	36.00	J-55	Yes	36.68	Yes	BS 4		2,033.3	155.67
7	5	Casing Joints	9.625	36.00	J-55	Yes	38.50	No			1,994.8	194.17
8	6	Casing Joints	9.625	36.00	J-55	Yes	38.74	Yes	BS 5		1,956.1	232.91
9	7	Casing Joints	9.625	36.00	J-55	Yes	37.39	No			1,918.7	270.30
10	8	Casing Joints	9.625	36.00	J-55	Yes	37.44	Yes	BS 6		1,881.3	307.74
11	9	Casing Joints	9.625	36.00	J-55	Yes	36.33	No			1,844.9	344.07
12	10	Casing Joints	9.625	36.00	J-55	Yes	37.90	Yes	BS 7		1,807.0	381.97
13	11	Casing Joints	9.625	36.00	J-55	Yes	37.25	No			1,769.8	419.22
14	12	Casing Joints	9.625	36.00	J-55	Yes	38.09	Yes	BS 8		1,731.7	457.31
15	13	Casing Joints	9.625	36.00	J-55	Yes	37.90	No			1,693.8	495.21
16	14	Casing Joints	9.625	36.00	J-55	Yes	37.84	Yes	BS 9		1,656.0	533.05
17	15	Casing Joints	9.625	36.00	J-55	Yes	35.82	No			1,620.1	568.87
18	16	Casing Joints	9.625	36.00	J-55	Yes	38.50	Yes	BS 10		1,581.6	607.37
19	17	Casing Joints	9.625	36.00	J-55	Yes	36.71	No			1,544.9	644.08
20	18	Casing Joints	9.625	36.00	J-55	Yes	38.58	Yes	BS 11		1,506.3	682.66
21	19	Casing Joints	9.625	36.00	J-55	Yes	39.25	No			1,467.1	721.91
22	20	Casing Joints	9.625	36.00	J-55	Yes	39.05	Yes	BS 12		1,428.0	760.96
23	21	Casing Joints	9.625	36.00	J-55	Yes	37.57	No			1,390.5	798.53
24	22	Casing Joints	9.625	36.00	J-55	Yes	37.16	Yes	BS 13		1,353.3	835.69
25	23	Casing Joints	9.625	36.00	J-55	Yes	36.79	No			1,316.5	872.48
26	24	Casing Joints	9.625	36.00	J-55	Yes	35.57	Yes	BS 14		1,281.0	908.05
27	25	Casing Joints	9.625	36.00	J-55	Yes	37.82	No			1,243.1	945.87
28	26	Casing Joints	9.625	36.00	J-55	Yes	37.37	Yes	BS 15		1,205.8	983.24
29	27	Casing Joints	9.625	36.00	J-55	Yes	35.89	No			1,169.9	1,019.13
30	28	Casing Joints	9.625	36.00	J-55	Yes	38.74	Yes	BS 16		1,131.1	1,057.87
31	29	Casing Joints	9.625	36.00	J-55	Yes	37.87	No			1,093.3	1,095.74
32	30	Casing Joints	9.625	36.00	J-55	Yes	36.66	Yes	BS 17		1,056.6	1,132.40
33	31	Casing Joints	9.625	36.00	J-55	Yes	36.79	No			1,019.8	1,169.19
34	32	Casing Joints	9.625	36.00	J-55	Yes	38.07	Yes	BS 18		981.7	1,207.26
35	33	Casing Joints	9.625	36.00	J-55	Yes	38.33	No			943.4	1,245.59
36	34	Casing Joints	9.625	36.00	J-55	Yes	38.71	Yes	BS 19		904.7	1,284.30
37	35	Casing Joints	9.625	36.00	J-55	Yes	38.71	No			866.0	1,323.01
38	36	Casing Joints	9.625	36.00	J-55	Yes	38.40	Yes	BS 20		827.6	1,361.41
39	37	Casing Joints	9.625	36.00	J-55	Yes	39.37	No			788.2	1,400.78
40	38	Casing Joints	9.625	36.00	J-55	Yes	38.00	Yes	BS 21		750.2	1,438.78
41	39	Casing Joints	9.625	36.00	J-55	Yes	38.49	No			711.7	1,477.27
42	40	Casing Joints	9.625	36.00	J-55	Yes	37.95	Yes	BS 22		673.8	1,515.22
43	41	Casing Joints	9.625	36.00	J-55	Yes	37.95	No			635.8	1,553.17
44	42	Casing Joints	9.625	36.00	J-55	Yes	38.11	Yes	BS 23		597.7	1,591.28
45	43	Casing Joints	9.625	36.00	J-55	Yes	36.66	No			561.1	1,627.94
46	44	Casing Joints	9.625	36.00	J-55	Yes	37.92	Yes	BS 24		523.1	1,665.86
47	45	Casing Joints	9.625	36.00	J-55	Yes	37.21	No			485.9	1,703.07
48	46	Casing Joints	9.625	36.00	J-55	Yes	37.18	Yes	BS 25		448.7	1,740.25
49	47	Casing Joints	9.625	36.00	J-55	Yes	36.69	No			412.1	1,776.94
50	48	Casing Joints	9.625	36.00	J-55	Yes	38.51	Yes	BS 26		373.5	1,815.45
51	49	Casing Joints	9.625	36.00	J-55	Yes	37.91	No			335.6	1,853.36
52	50	Casing Joints	9.625	36.00	J-55	Yes	38.94	Yes	BS 27		296.7	1,892.30
53	51	Casing Joints	9.625	36.00	J-55	Yes	38.71	No			258.0	1,931.01
54	52	Casing Joints	9.625	36.00	J-55	Yes	35.33	Yes	BS 28		222.7	1,966.34
55	53	Casing Joints	9.625	36.00	J-55	Yes	38.50	No			184.2	2,004.84
56	54	Casing Joints	9.625	36.00	J-55	Yes	37.75	Yes	BS 29		146.4	2,042.59
57	55	Casing Joints	9.625	36.00	J-55	Yes	36.41	No			110.0	2,079.00
58	56	Casing Joints	9.625	36.00	J-55	Yes	36.85	Yes	BS 30		73.1	2,115.85
59	57	Casing Joints	9.625	36.00	J-55	Yes	38.56	No			34.6	2,154.41
60		Mandrel Hanger	9.625	36.00		Yes	1.00	No	Mandrel Hanger		33.6	2,155.41
61		Landing Joint	9.625	36.00		Yes	36.70	No	Landing Joint		-3.1	2,192.11
	58	Casing Joints	9.625	36.00	J-55	No	36.17	No	Out #1			
	59	Casing Joints	9.625	36.00	J-55	No	36.80	No	Out #2			
		Casing Joints	9.625	36.00	J-55	No	10.22	No	Pup Joint 1 Out			
		Casing Joints	9.625	36.00	J-55	No	20.98	No	Pup Joint 2 Out			

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	Carl Rotter OHI 206H	**Client**	SWN Production Company
Field	Panhandle	**SIR No.**	EN82-03878
Engineer	Marco Arrnigton	**Job Type**	Cem Surface Casing
Country	United States	**Job Date**	03-03-2022



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Schlumberger Cementing Service Report

Customer	Job Number
SWN Production Company	EN82-03878

Well	Location (legal)	Schlumberger Location	Job Start
Carl Rotter OHI 206H 206H	Carl Rotter Pad		Mar/03/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Panhandle		deg	17.5 in	775.0 ft	775.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Ohio	West Virginia	psi	68 degF	80 degF	lb/gal

Well Master	API/UWI
0066462100	47-069-0329-00-00

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Cem Surface Casing

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
136.0	20.0	94.0	H-40	BUTT
765.0	13.4	54.5	J-55	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	111.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	118.0 bbl	103.0 bbl	77.8 bbl

Service Instructions

Pressure Test Lines L-1000 H-2500
Pump 105 bbls of Freshwater 8.34 ppg
Pump 25 bbls of 6% gel Spacer 8.62 ppg
Pump 194.1 bbls of Class A Slurry 15.6 ppg
1.19 ft3/sk 5.27 gal/sk 882 sks 94 lb/sk
Drop Top Plug
Displace 111 bbls of Freshwater 8.34 ppg
FLP 300 psi Bump Top Plug to 800 psi
75 bbls of Cement to surface Floats Held Less than a bbl back

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
[x]	[ ]

Lift Pressure	300 psi

Pipe Rotated	Pipe Reciprocated
[ ]	[ ]

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type	Single

Job Scheduled For	Arrived on Location	Leave Location
Mar/03/2022 05:00	Mar/03/2022 04:00	Mar/03/2022 08:00

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	765.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	720.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
03/03/2022	05:18:08	3	0.0	8.41	Started Acquisition
03/03/2022	05:20:13	3	0.0	8.41	
03/03/2022	05:22:18	2	0.0	8.41	
03/03/2022	05:24:23	2	0.0	8.41	
03/03/2022	05:26:28	2	0.0	8.41	
03/03/2022	05:28:26	62	2.5	8.41	Fill Lines
03/03/2022	05:28:33	19	1.9	8.42	
03/03/2022	05:30:38	208	0.0	8.42	
03/03/2022	05:30:40	633	0.0	8.42	Low Pressure Test
03/03/2022	05:31:08	2563	0.0	8.42	High Pressure Test
03/03/2022	05:34:48	0	0.0	8.42	
03/03/2022	05:35:40	12	0.1	8.42	Start Pumping Casing Capacity
03/03/2022	05:36:53	179	6.5	8.42	
03/03/2022	05:38:58	177	6.5	8.41	
03/03/2022	05:41:03	172	6.5	8.41	
03/03/2022	05:43:08	166	6.5	8.41	
03/03/2022	05:45:13	179	6.5	8.41	
03/03/2022	05:47:18	173	6.5	8.41	
03/03/2022	05:49:23	184	6.5	8.41	
03/03/2022	05:51:28	111	4.6	8.41	
03/03/2022	05:53:33	26	0.0	8.41	

Well	Field	Job Start	Customer	Job Number
Carl Rotter OHI 206H 206H	Panhandle	Mar/03/2022	SWN Production Company	EN82-03878

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Message
03/03/2022	05:55:06	126	4.6	8.63	Reset Total, Vol = 112.18 bbl
03/03/2022	05:55:38	123	4.6	8.64	
03/03/2022	05:57:43	140	4.5	8.67	
03/03/2022	05:58:16	50	2.0	8.61	End Casing Capacity
03/03/2022	05:59:48	120	4.6	8.63	
03/03/2022	06:00:00	134	4.6	8.63	End Gel Spacer
03/03/2022	06:00:10	140	4.7	10.57	Reset Stag vol; 25 bbls
03/03/2022	06:02:31	211	4.6	14.81	Start Mixing Tail Slurry
03/03/2022	06:03:58	235	4.6	15.27	
03/03/2022	06:06:03	240	4.6	15.53	
03/03/2022	06:08:08	228	4.6	15.54	
03/03/2022	06:10:13	238	4.6	15.49	
03/03/2022	06:12:18	401	6.5	15.52	
03/03/2022	06:14:23	404	6.5	15.63	
03/03/2022	06:16:28	389	6.5	15.56	
03/03/2022	06:17:31	459	6.5	15.58	15.6 ppg Tail Slurry
03/03/2022	06:18:33	410	6.4	15.53	
03/03/2022	06:19:31	434	6.5	15.64	1.19 ft3/sk 5.27 gal/sk
03/03/2022	06:20:38	397	6.5	15.64	
03/03/2022	06:22:43	424	6.5	15.68	
03/03/2022	06:24:48	420	6.5	15.73	
03/03/2022	06:26:53	436	6.5	15.71	
03/03/2022	06:28:58	435	6.5	15.69	
03/03/2022	06:31:03	462	6.5	15.74	
03/03/2022	06:33:08	297	4.6	15.69	
03/03/2022	06:35:13	127	2.2	15.45	
03/03/2022	06:35:52	176	2.2	15.43	End Tail Slurry
03/03/2022	06:35:57	83	0.5	15.41	Reset Stage Vol; 194.1 bbl 882 sks
03/03/2022	06:36:55	80	0.0	15.43	Drop Top Plug
03/03/2022	06:37:18	78	0.0	15.44	
03/03/2022	06:38:29	77	0.0	15.40	Start Displacement
03/03/2022	06:39:23	96	1.4	10.00	
03/03/2022	06:41:28	173	4.5	8.84	
03/03/2022	06:43:33	259	6.4	8.55	
03/03/2022	06:45:38	314	6.5	8.47	
03/03/2022	06:47:43	316	6.3	8.39	
03/03/2022	06:49:48	379	6.4	8.42	
03/03/2022	06:51:53	366	6.5	8.42	
03/03/2022	06:53:58	443	6.4	8.41	
03/03/2022	06:56:03	361	3.3	8.41	
03/03/2022	06:58:08	313	3.3	8.41	
03/03/2022	06:58:27	375	3.3	8.41	FLP 300 psi
03/03/2022	07:00:13	361	3.3	8.41	
03/03/2022	07:00:27	917	1.4	8.41	Bump Top Plug 800 psi
03/03/2022	07:00:37	905	0.0	8.42	End Displacement
03/03/2022	07:00:47	902	0.0	8.42	75 bbl cement to surface
03/03/2022	07:02:18	900	0.0	8.42	
03/03/2022	07:02:56	746	0.0	8.42	Float Held Less than a barrel back

Well	Field	Job Start	Customer	Job Number
Carl Rotter OHI 206H 206H	Panhandle	Mar/03/2022	SWN Production Company	EN82-03878

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.3			6.6	194.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
2564	5	315	800		FreshWater	111.0 bbl	8.34 lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	187.0 bbl	111.0 bbl	65 degF	[x]	75.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Marco Arrnigton	[ ]	[x]
		-	-

Casing Offload Tally

Well Name: CARL ROTTER OHI 206 **Surface, Set Depth: 762.00ftKB**

Well API Number	Well RC Number	Operator	Ground Elevation (ft)	KB Elv - Ground Distance (ft)	KB Elv History Link	Spud Date
47069003290000	4001165865	SWN PRODUCTION COMPANY L...	1,335.90	26.00	1,361.90 <elvotherlabel>,9/16/202...	3/2/2022 16:30
Country	**State/Province**	**County**	**Field**	**Area**	**Prospect**	**Operations Status**
US	WV	OHIO	PANHANDLE FIELD WET	PANHANDLE AREA	PANHANDLE	Conductor Set

Casing Strings

Casing Description	Set Depth (ftKB)	Run Date
Surface	762.00	3/3/2022 00:45

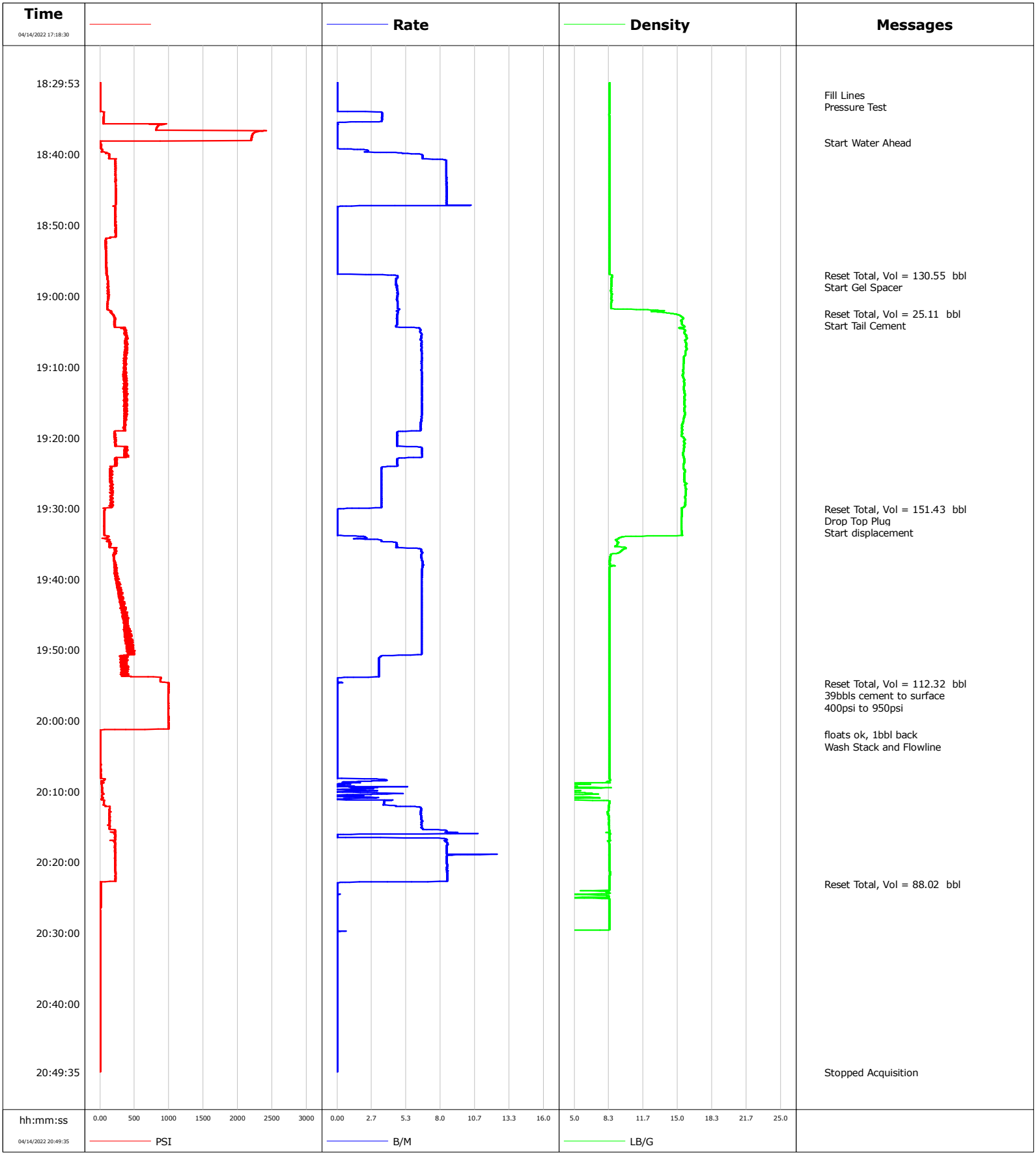
Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwlry	Connections	Top (ftKB)	Cum Len (ft)
1		Float Shoe	13.375	54.50		Yes	1.89	No	Weatherford Float Shoe		760.1	1.89
2	1	Casing Joints	13.375	54.50	J-55	Yes	41.54	Yes			718.6	43.43
3		Float Collar	13.375	54.50		Yes	1.52	No	Weatherford Float Collar		717.1	44.95
4	2	Casing Joints	13.375	54.50	J-55	Yes	41.53	Yes			675.5	86.48
5	3	Casing Joints	13.375	54.50	J-55	Yes	41.55	Yes			634.0	128.03
6	4	Casing Joints	13.375	54.50	J-55	Yes	41.56	Yes			592.4	169.59
7	5	Casing Joints	13.375	54.50	J-55	Yes	41.57	No			550.8	211.16
8	6	Casing Joints	13.375	54.50	J-55	Yes	41.51	Yes			509.3	252.67
9	7	Casing Joints	13.375	54.50	J-55	Yes	41.52	No			467.8	294.19
10	8	Casing Joints	13.375	54.50	J-55	Yes	40.91	Yes			426.9	335.10
11	9	Casing Joints	13.375	54.50	J-55	Yes	41.53	No			385.4	376.63
12	10	Casing Joints	13.375	54.50	J-55	Yes	41.52	Yes			343.9	418.15
13	11	Casing Joints	13.375	54.50	J-55	Yes	41.57	No			302.3	459.72
14	12	Casing Joints	13.375	54.50	J-55	Yes	41.51	Yes			260.8	501.23
15	13	Casing Joints	13.375	54.50	J-55	Yes	41.52	No			219.3	542.75
16	14	Casing Joints	13.375	54.50	J-55	Yes	41.54	Yes			177.7	584.29
17	15	Casing Joints	13.375	54.50	J-55	Yes	41.56	No			136.2	625.85
18	16	Casing Joints	13.375	54.50	J-55	Yes	39.83	Yes			96.3	665.68
19		Casing Joints	13.375	54.50	J-55	Yes	18.07	No	Pup Joint 1		78.3	683.75
20	17	Casing Joints	13.375	54.50	J-55	Yes	41.52	Yes			36.7	725.27
21		Mandrel Hanger	13.375	54.50		Yes	1.20	No	Mandrel Hanger		35.5	726.47
22		Landing Joint	13.375	54.50		Yes	39.00	No	Landing Joint		-3.5	765.47
	18	Casing Joints	13.375	54.50	J-55	No	41.51	No	Out 1			
	19	Casing Joints	13.375	54.50	J-55	No	41.56	No	Out 2			
	20	Casing Joints	13.375	54.50	J-55	No	41.55	No	Out 3			
		Casing Joints	13.375	54.50	J-55	No	9.78	No	Pup Joint 2 Out			

Schlumberger

Cementing Job Report

Well	Carl Rotter 10H	**Client**	SWN
Field		**SIR No.**	EN82-04765
Engineer	Barry Dickerson	**Job Type**	Surface
Country	United States	**Job Date**	04-14-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-04765

Well	Location (legal)	Schlumberger Location	Job Start
Carl Rotter 10H 10H		SOH	Apr/14/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	0 deg	17.5 in	784.0 ft	784.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Babour	WV	psi	68 degF	80 degF	lb/gal

Well Master	API/UWI
0066497278	47-069-00328-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Surface

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

25 bbls gel spacer
147 bbls ,693sks,Y=1.19,Class A
Drop Top Plug
Displace 112 bbls

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
764.0	13.4	54.5	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	112.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	119.0 bbl	103.0 bbl	78.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
[X]	[ ]

Lift Pressure	Pipe Rotated	Pipe Reciprocated
400 psi	[ ]	[ ]

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Apr/14/2022 13:00	Apr/14/2022 13:00	Apr/14/2022 21:00

Casing Tools

Shoe Type	Guide
Shoe Depth	764.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	719.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	17:18:30	34	2.5	8.40	0.0	Started Acquisition
04/14/2022	17:22:30	4	0.0	8.39	1.0	
04/14/2022	17:24:30	3	0.0	8.39	1.0	
04/14/2022	17:26:30	2	0.0	8.39	1.0	
04/14/2022	17:28:30	3	0.0	8.39	1.0	
04/14/2022	17:30:30	3	0.0	8.39	1.0	
04/14/2022	17:32:30	2	0.0	8.40	1.0	
04/14/2022	17:34:30	2	0.0	8.39	1.0	
04/14/2022	17:36:30	2	0.0	8.39	1.0	
04/14/2022	17:38:30	2	0.0	8.39	1.0	
04/14/2022	17:40:30	2	0.0	8.39	1.0	
04/14/2022	17:42:30	2	0.0	8.39	1.0	
04/14/2022	17:44:30	3	0.0	8.39	1.0	
04/14/2022	17:46:30	4	0.0	8.39	1.0	
04/14/2022	17:48:30	4	0.0	8.39	1.0	
04/14/2022	17:50:30	5	0.0	8.39	1.0	
04/14/2022	17:52:30	2	0.0	8.39	1.0	
04/14/2022	17:54:30	3	0.0	8.39	1.0	
04/14/2022	17:56:30	5	0.0	8.39	1.0	
04/14/2022	17:58:30	3	0.0	8.39	1.0	
04/14/2022	18:00:30	2	0.0	8.39	1.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H 10H		Apr/14/2022	SWN	EN82-04765

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	18:04:30	4	0.0	8.39	1.0	
04/14/2022	18:06:30	5	0.0	8.39	1.0	
04/14/2022	18:08:30	3	0.0	8.39	1.0	
04/14/2022	18:10:30	4	0.0	8.39	1.0	
04/14/2022	18:12:30	4	0.0	8.39	1.0	
04/14/2022	18:14:30	3	0.0	8.39	1.0	
04/14/2022	18:16:30	4	0.0	8.39	1.0	
04/14/2022	18:18:30	4	0.0	8.39	1.0	
04/14/2022	18:20:30	4	0.0	8.39	1.0	
04/14/2022	18:22:30	3	0.0	8.39	1.0	
04/14/2022	18:24:30	5	0.0	8.39	1.0	
04/14/2022	18:26:30	5	0.0	8.39	1.0	
04/14/2022	18:28:30	5	0.0	8.39	1.0	
04/14/2022	18:30:30	4	0.0	8.39	1.0	
04/14/2022	18:31:34	2	0.0	8.39	1.0	Fill Lines
04/14/2022	18:31:35	2	0.0	8.39	1.0	Pressure Test
04/14/2022	18:32:30	1	0.0	8.39	1.0	
04/14/2022	18:34:30	51	3.5	8.38	2.8	
04/14/2022	18:36:30	815	0.0	8.39	6.1	
04/14/2022	18:38:22	6	0.0	8.39	6.1	Start Water Ahead
04/14/2022	18:38:30	9	0.0	8.39	6.1	
04/14/2022	18:40:30	132	6.6	8.39	11.9	
04/14/2022	18:42:30	225	8.4	8.39	28.4	
04/14/2022	18:44:30	230	8.5	8.39	45.3	
04/14/2022	18:46:30	236	8.4	8.39	62.2	
04/14/2022	18:48:30	224	0.0	8.39	68.7	
04/14/2022	18:50:30	238	0.0	8.39	68.7	
04/14/2022	18:52:30	80	0.0	8.39	68.7	
04/14/2022	18:56:30	97	0.0	8.39	68.7	
04/14/2022	18:57:03	94	4.2	8.64	69.0	Reset Total, Vol = 130.55 bbl
04/14/2022	18:57:36	110	4.5	8.58	71.6	Start Gel Spacer
04/14/2022	18:58:30	118	4.6	8.58	75.7	
04/14/2022	19:00:30	114	4.6	8.57	85.0	
04/14/2022	19:02:28	182	4.7	14.34	94.2	Reset Total, Vol = 25.11 bbl
04/14/2022	19:02:30	176	4.7	14.50	94.3	
04/14/2022	19:02:31	173	4.7	14.61	94.4	Start Tail Cement
04/14/2022	19:04:30	311	6.3	15.22	103.7	
04/14/2022	19:06:30	396	6.5	15.75	116.6	
04/14/2022	19:08:30	378	6.5	15.65	129.7	
04/14/2022	19:10:30	348	6.5	15.50	142.8	
04/14/2022	19:12:30	380	6.6	15.65	155.9	
04/14/2022	19:14:30	352	6.5	15.66	169.0	
04/14/2022	19:16:30	390	6.6	15.68	182.1	
04/14/2022	19:18:30	359	6.5	15.43	195.1	
04/14/2022	19:20:30	233	4.6	15.58	205.5	
04/14/2022	19:22:30	386	6.6	15.52	217.1	
04/14/2022	19:24:30	156	3.4	15.65	226.5	
04/14/2022	19:26:30	180	3.4	15.87	233.4	
04/14/2022	19:28:30	167	3.4	15.71	240.2	
04/14/2022	19:30:03	65	0.3	15.40	245.3	Reset Total, Vol = 151.43 bbl
04/14/2022	19:30:06	66	0.1	15.41	245.3	Drop Top Plug
04/14/2022	19:30:30	63	0.0	15.41	245.3	
04/14/2022	19:32:30	58	0.0	15.37	245.3	
04/14/2022	19:34:30	127	3.4	9.06	246.7	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H 10H		Apr/14/2022	SWN	EN82-04765

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	19:38:30	208	6.6	8.38	270.5	
04/14/2022	19:40:30	281	6.5	8.39	283.6	
04/14/2022	19:42:30	288	6.5	8.39	296.7	
04/14/2022	19:44:30	334	6.5	8.39	309.7	
04/14/2022	19:46:30	402	6.5	8.39	322.8	
04/14/2022	19:48:30	478	6.5	8.39	335.9	
04/14/2022	19:50:30	430	6.5	8.39	349.0	
04/14/2022	19:52:30	383	3.2	8.39	356.2	
04/14/2022	19:54:30	888	0.0	8.39	360.6	
04/14/2022	19:54:46	995	0.0	8.39	360.6	Reset Total, Vol = 112.32 bbl
04/14/2022	19:54:51	993	0.0	8.39	360.6	39bbls cement to surface
04/14/2022	19:54:52	994	0.0	8.39	360.6	400psi to 950psi
04/14/2022	19:56:30	992	0.0	8.39	360.6	
04/14/2022	19:58:30	992	0.0	8.40	360.6	
04/14/2022	20:00:30	995	0.0	8.40	360.6	
04/14/2022	20:01:58	6	0.0	8.39	360.6	floats ok, 1bbl back
04/14/2022	20:02:30	4	0.0	8.40	360.6	
04/14/2022	20:04:30	5	0.0	8.40	360.6	
04/14/2022	20:06:30	6	0.0	8.40	360.6	
04/14/2022	20:08:30	33	2.7	8.44	361.7	
04/14/2022	20:10:30	25	0.0	2.78	364.6	
04/14/2022	20:12:30	142	6.5	8.33	371.5	
04/14/2022	20:14:30	140	6.5	8.33	384.5	
04/14/2022	20:16:30	220	0.7	8.39	395.6	
04/14/2022	20:18:30	213	8.5	8.39	412.2	
04/14/2022	20:20:30	216	8.5	8.39	429.5	
04/14/2022	20:22:30	224	8.5	8.41	446.5	
04/14/2022	20:23:07	13	0.0	8.41	448.7	Reset Total, Vol = 88.02 bbl
04/14/2022	20:24:30	9	0.0	3.76	448.7	
04/14/2022	20:26:30	1	0.0	8.40	448.7	
04/14/2022	20:30:30	6	0.0	0.05	448.7	
04/14/2022	20:32:30	4	0.0	0.04	448.7	
04/14/2022	20:34:30	4	0.0	0.04	448.7	
04/14/2022	20:36:30	4	0.0	0.04	448.7	
04/14/2022	20:38:30	5	0.0	0.04	448.7	
04/14/2022	20:40:30	4	0.0	0.04	448.7	
04/14/2022	20:42:30	5	0.0	0.04	448.7	
04/14/2022	20:44:30	5	0.0	0.04	448.7	
04/14/2022	20:46:30	5	0.0	0.04	448.7	
04/14/2022	20:48:30	5	0.0	0.04	448.7	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 10H 10H		Apr/14/2022	SWN	EN82-04765

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.6			8.4	147.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
2418	5	154	950			bbl	lb/gal

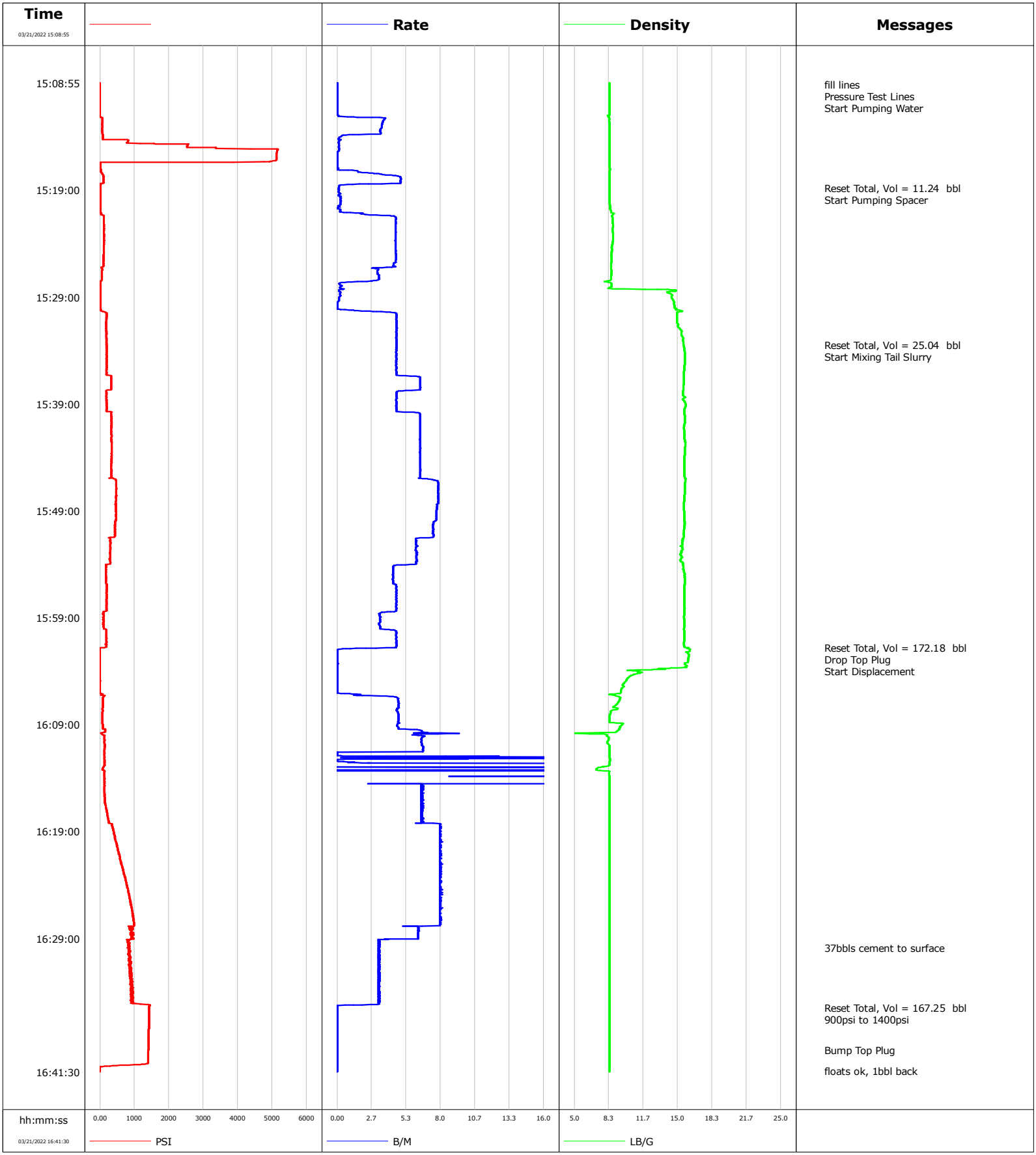
Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	147.0 bbl	112.0 bbl	67 degF	[X]	39.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Barry Dickerson	-	[X] -

Schlumberger

Cementing Job Report

Well	Carl Rotter 6H	**Client**	SWN
Field		**SIR No.**	EN82-04158
Engineer	Barry Dickerson	**Job Type**	Intermediate
Country	United States	**Job Date**	03-21-2022



Schlumberger

Cementing Service Report

Customer	Job Number
SWN	EN82-04158

Well	Location (legal)	Schlumberger Location	Job Start
Carl Rotter 6H 6H		SOH	Mar/21/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	0 deg	12.3 in	2220.0 ft	2220.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Ohio	WV	psi	84 degF	80 degF	lb/gal

Well Master	API/UWI
0066463713	47-069-00327-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

25 bbls gel spacer
171 bbls ,807sks,Y=1.19,Class A
Drop Top Plug
Displace 167 bbls

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2200.0	9.6	36.0	J55	8RD
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	167.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	170.0 bbl	130.0 bbl	80.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
900 psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Mar/21/2022 08:00	Mar/21/2022 08:00	Mar/21/2022 19:00

Casing Tools

Shoe Type	Guide
Shoe Depth	2200.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	2158.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
03/21/2022	15:08:55	-1	0.0	8.38	0.0	Started Acquisition
03/21/2022	15:09:05	-1	0.0	8.39	0.0	fill lines
03/21/2022	15:09:09	-1	0.0	8.38	0.0	Pressure Test Lines
03/21/2022	15:09:17	-1	0.0	8.39	0.0	Start Pumping Water
03/21/2022	15:10:55	-3	0.0	8.38	0.0	
03/21/2022	15:12:55	58	3.5	8.39	2.8	
03/21/2022	15:14:55	2536	0.1	8.39	5.9	
03/21/2022	15:16:55	12	0.1	8.42	6.0	
03/21/2022	15:18:45	12	0.1	8.39	11.2	Reset Total, Vol = 11.24 bbl
03/21/2022	15:18:48	12	0.1	8.39	0.0	Start Pumping Spacer
03/21/2022	15:18:55	12	0.1	8.39	0.0	
03/21/2022	15:20:55	11	0.2	8.54	0.4	
03/21/2022	15:22:55	114	4.5	8.71	8.1	
03/21/2022	15:24:55	100	4.5	8.59	17.2	
03/21/2022	15:26:55	57	3.2	8.57	25.2	
03/21/2022	15:28:55	8	0.2	14.40	27.5	
03/21/2022	15:32:55	193	4.6	15.53	39.6	
03/21/2022	15:33:27	194	4.6	15.57	42.0	Reset Total, Vol = 25.04 bbl
03/21/2022	15:33:30	192	4.6	15.58	0.2	Start Mixing Tail Slurry
03/21/2022	15:34:55	200	4.6	15.69	6.7	
03/21/2022	15:36:55	319	6.4	15.59	16.9	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 6H 6H		Mar/21/2022	SWN	EN82-04158

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
03/21/2022	15:40:55	331	6.4	15.65	38.9	
03/21/2022	15:42:55	343	6.4	15.72	51.7	
03/21/2022	15:44:55	335	6.4	15.63	64.6	
03/21/2022	15:46:55	466	7.8	15.68	78.6	
03/21/2022	15:48:55	456	7.7	15.62	94.2	
03/21/2022	15:50:55	436	7.4	15.61	109.3	
03/21/2022	15:52:55	283	6.2	15.32	122.3	
03/21/2022	15:54:55	176	4.3	15.67	133.0	
03/21/2022	15:56:55	187	4.6	15.65	141.9	
03/21/2022	15:58:55	104	3.3	15.62	150.5	
03/21/2022	16:00:55	181	4.6	15.63	158.1	
03/21/2022	16:01:48	63	4.4	16.11	162.2	Reset Total, Vol = 172.18 bbl
03/21/2022	16:01:50	3	3.0	15.93	0.1	Drop Top Plug
03/21/2022	16:02:55	-1	0.0	16.04	0.3	
03/21/2022	16:04:55	0	0.0	10.01	0.3	
03/21/2022	16:06:55	77	4.8	9.24	3.4	
03/21/2022	16:08:55	69	4.7	9.73	12.8	
03/21/2022	16:10:55	132	6.5	8.37	25.1	
03/21/2022	16:12:55	108	74.0	7.86	53.7	
03/21/2022	16:14:55	130	6.6	8.39	159.4	
03/21/2022	16:16:55	182	6.6	8.39	172.5	
03/21/2022	16:18:55	385	7.9	8.39	186.6	
03/21/2022	16:20:55	531	7.9	8.39	202.5	
03/21/2022	16:22:55	686	7.9	8.39	218.4	
03/21/2022	16:24:55	841	8.2	8.39	234.3	
03/21/2022	16:26:55	957	7.9	8.39	250.2	
03/21/2022	16:28:55	908	6.3	8.39	264.3	
03/21/2022	16:29:55	846	3.3	8.39	268.0	37bbls cement to surface
03/21/2022	16:30:55	824	3.3	8.39	271.3	
03/21/2022	16:32:55	938	3.2	8.39	277.7	
03/21/2022	16:34:55	906	3.3	8.39	284.2	
03/21/2022	16:35:28	1422	0.0	8.39	285.3	Reset Total, Vol = 167.25 bbl
03/21/2022	16:35:40	1425	0.0	8.39	0.0	900psi to 1400psi
03/21/2022	16:36:55	1419	0.0	8.39	0.0	
03/21/2022	16:38:55	1403	0.0	8.40	0.0	
03/21/2022	16:39:26	1400	0.0	8.40	0.0	Bump Top Plug
03/21/2022	16:40:55	482	0.0	8.40	0.0	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
6.1			8.3	171.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
5161	-7	474	1400			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	171.0 bbl	167.0 bbl	68 degF	X	37.0 bbl
				Washed Thru Perfs ☐	To ft

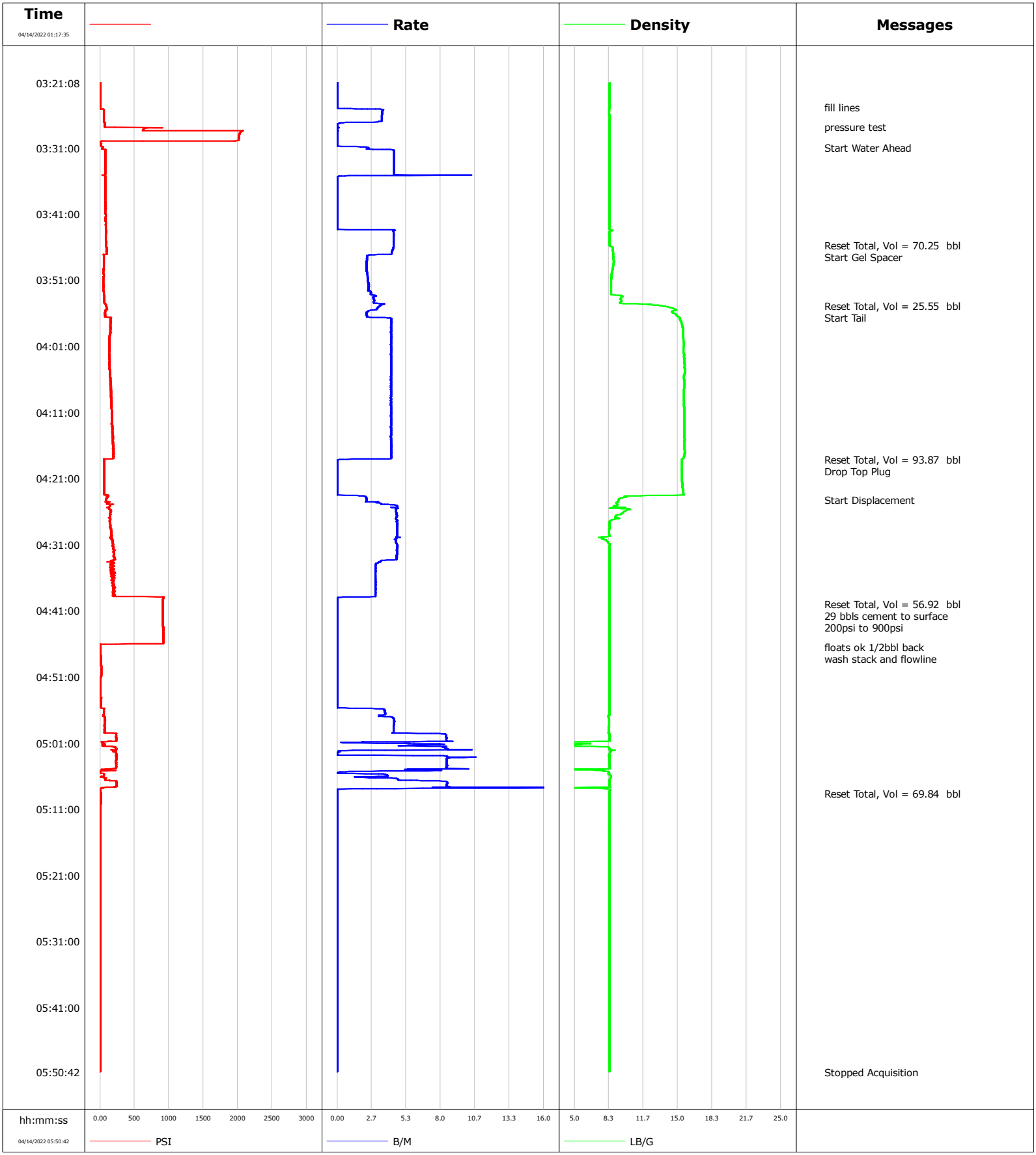
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Barry Dickerson	-	X -

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	Charles Jamison 610H	**Client**	SWN
Field		**SIR No.**	EN82-04550
Engineer	Barry DIckerson	**Job Type**	Surface
Country	United States	**Job Date**	04-14-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-04550

Well	Location (legal)	Schlumberger Location	Job Start
Charles Jamison 610H 610H		SOH	Apr/14/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	0 deg	17.5 in	426.0 ft	426.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	WV	psi	64 degF	80 degF	lb/gal

Well Master	API/UWI
0066495491	47-051-02426-00-00

Rig Name	Drilled For	Service Via
SDC 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Surface

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

25 bbls gel spacer
95 bbls ,442sks,Y=1.2,Class A
Drop Top Plug
Displace 56.5 bbls

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
406.0	13.4	54.5	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	56.5 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	60.0 bbl	59.0 bbl	34.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	☐

Lift Pressure	Pipe Rotated	Pipe Reciprocated
200 psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Apr/14/2022 00:00	Apr/14/2022 00:00	Apr/14/2022 06:00

Casing Tools

Shoe Type	Guide
Shoe Depth	410.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	366.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	01:17:35	51	0.0	0.02	0.0	Started Acquisition
04/14/2022	01:19:35	-1	0.0	0.02	0.0	
04/14/2022	01:21:35	1	0.0	0.02	0.0	
04/14/2022	01:23:35	0	0.0	0.02	0.0	
04/14/2022	01:25:35	146	4.2	8.39	2.9	
04/14/2022	01:27:35	3	0.0	8.39	5.1	
04/14/2022	01:29:35	2	0.0	8.39	5.1	
04/14/2022	01:31:35	3	0.0	8.39	5.1	
04/14/2022	01:33:35	2	0.0	8.39	5.1	
04/14/2022	01:35:35	2	0.0	8.39	5.1	
04/14/2022	01:37:35	3	0.0	8.39	5.1	
04/14/2022	01:39:35	1	0.0	8.39	5.1	
04/14/2022	01:41:35	3	0.0	8.39	5.1	
04/14/2022	01:43:35	4	0.0	8.39	5.1	
04/14/2022	01:45:35	3	0.0	8.39	5.1	
04/14/2022	01:47:35	3	0.0	8.39	5.1	
04/14/2022	01:49:35	3	0.0	8.39	5.1	
04/14/2022	01:51:35	4	0.0	8.39	5.1	
04/14/2022	01:53:35	1	0.0	8.39	5.1	
04/14/2022	01:55:35	2	0.0	8.39	5.1	
04/14/2022	01:57:35	3	0.0	8.39	5.1	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 610H 610H		Apr/14/2022	SWN	EN82-04550

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	02:01:35	4	0.0	8.39	5.1	
04/14/2022	02:03:35	3	0.0	8.39	5.1	
04/14/2022	02:05:35	3	0.0	8.39	5.1	
04/14/2022	02:07:35	4	0.0	8.39	5.1	
04/14/2022	02:09:35	3	0.0	8.39	5.1	
04/14/2022	02:11:35	1	0.0	8.39	5.1	
04/14/2022	02:13:35	4	0.0	8.39	5.1	
04/14/2022	02:15:35	3	0.0	8.39	5.1	
04/14/2022	02:17:35	3	0.0	8.39	5.1	
04/14/2022	02:19:35	1	0.0	8.39	5.1	
04/14/2022	02:21:35	3	0.0	8.39	5.1	
04/14/2022	02:23:35	1	0.0	8.39	5.1	
04/14/2022	02:25:35	2	0.0	8.39	5.1	
04/14/2022	02:27:35	3	0.0	8.39	5.1	
04/14/2022	02:29:35	4	0.0	8.39	5.1	
04/14/2022	02:31:35	3	0.0	8.39	5.1	
04/14/2022	02:33:35	4	0.0	8.39	5.1	
04/14/2022	02:35:35	2	0.0	8.39	5.1	
04/14/2022	02:37:35	5	0.0	8.39	5.1	
04/14/2022	02:39:35	3	0.0	8.39	5.1	
04/14/2022	02:41:35	4	0.0	8.39	5.1	
04/14/2022	02:43:35	4	0.0	8.39	5.1	
04/14/2022	02:45:35	4	0.0	8.39	5.1	
04/14/2022	02:47:35	5	0.0	8.39	5.1	
04/14/2022	02:51:35	2	0.0	8.39	5.1	
04/14/2022	02:53:35	3	0.0	8.39	5.1	
04/14/2022	02:55:35	5	0.0	8.39	5.1	
04/14/2022	02:57:35	5	0.0	8.39	5.1	
04/14/2022	02:59:35	4	0.0	8.39	5.1	
04/14/2022	03:01:35	5	0.0	8.39	5.1	
04/14/2022	03:03:35	4	0.0	8.39	5.1	
04/14/2022	03:05:35	3	0.0	8.39	5.1	
04/14/2022	03:07:35	4	0.0	8.39	5.1	
04/14/2022	03:09:35	3	0.0	8.39	5.1	
04/14/2022	03:11:35	4	0.0	8.39	5.1	
04/14/2022	03:13:35	4	0.0	8.39	5.1	
04/14/2022	03:15:35	5	0.0	8.39	5.1	
04/14/2022	03:17:35	3	0.0	8.39	5.1	
04/14/2022	03:19:35	4	0.0	8.39	5.1	
04/14/2022	03:21:35	6	0.0	8.39	5.1	
04/14/2022	03:23:35	3	0.0	8.39	5.1	
04/14/2022	03:24:48	4	0.0	8.39	5.1	fill lines
04/14/2022	03:25:35	53	3.5	8.37	6.9	
04/14/2022	03:27:35	68	0.0	8.39	12.2	
04/14/2022	03:27:46	68	0.0	8.39	12.2	pressure test
04/14/2022	03:29:35	2014	0.0	8.39	12.2	
04/14/2022	03:30:56	36	2.4	8.39	12.6	Start Water Ahead
04/14/2022	03:31:35	76	4.4	8.39	14.8	
04/14/2022	03:33:35	75	4.4	8.39	23.6	
04/14/2022	03:35:35	74	0.0	8.39	31.0	
04/14/2022	03:37:35	75	0.0	8.39	31.0	
04/14/2022	03:39:35	78	0.0	8.39	31.0	
04/14/2022	03:41:35	79	0.0	8.39	31.0	
04/14/2022	03:43:35	92	4.4	8.47	32.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 610H 610H		Apr/14/2022	SWN	EN82-04550

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	03:45:41	81	4.4	8.39	41.2	Reset Total, Vol = 70.25 bbl
04/14/2022	03:45:44	85	4.4	8.39	41.4	Start Gel Spacer
04/14/2022	03:47:35	54	2.3	8.77	48.5	
04/14/2022	03:49:35	51	2.3	8.66	53.0	
04/14/2022	03:51:35	49	2.4	8.56	57.7	
04/14/2022	03:53:35	61	2.8	9.52	62.9	
04/14/2022	03:54:53	89	3.3	13.51	66.8	Reset Total, Vol = 25.55 bbl
04/14/2022	03:54:55	92	3.3	13.68	66.9	Start Tail
04/14/2022	03:55:35	78	2.5	14.85	68.9	
04/14/2022	03:57:35	145	4.2	15.40	75.3	
04/14/2022	03:59:35	135	4.2	15.51	83.6	
04/14/2022	04:01:35	136	4.2	15.55	92.0	
04/14/2022	04:03:35	135	4.2	15.65	100.3	
04/14/2022	04:05:35	144	4.2	15.61	108.7	
04/14/2022	04:07:35	160	4.2	15.62	117.0	
04/14/2022	04:09:35	171	4.2	15.62	125.3	
04/14/2022	04:11:35	170	4.2	15.63	133.7	
04/14/2022	04:13:35	176	4.2	15.62	142.0	
04/14/2022	04:15:35	185	4.2	15.66	150.3	
04/14/2022	04:17:35	189	4.2	15.63	158.7	
04/14/2022	04:18:06	61	0.5	15.42	160.6	Reset Total, Vol = 93.87 bbl
04/14/2022	04:18:09	62	0.1	15.42	160.6	Drop Top Plug
04/14/2022	04:19:35	62	0.0	15.38	160.6	
04/14/2022	04:21:35	58	0.0	15.43	160.6	
04/14/2022	04:23:35	87	1.7	11.42	160.7	
04/14/2022	04:24:11	88	2.3	9.29	162.1	Start Displacement
04/14/2022	04:25:35	132	4.5	10.34	167.2	
04/14/2022	04:27:35	144	4.6	8.43	176.3	
04/14/2022	04:29:35	171	4.6	8.39	185.6	
04/14/2022	04:31:35	193	4.7	8.40	194.8	
04/14/2022	04:33:35	102	3.2	8.38	203.7	
04/14/2022	04:35:35	195	3.0	8.38	209.7	
04/14/2022	04:37:35	201	3.0	8.39	215.6	
04/14/2022	04:39:35	911	0.0	8.39	219.5	
04/14/2022	04:39:58	910	0.0	8.39	219.5	Reset Total, Vol = 56.92 bbl
04/14/2022	04:40:07	909	0.0	8.39	219.5	29 bbls cement to surface
04/14/2022	04:41:35	912	0.0	8.39	219.5	
04/14/2022	04:43:35	915	0.0	8.39	219.5	
04/14/2022	04:45:35	916	0.0	8.39	219.5	
04/14/2022	04:46:29	4	0.0	8.39	219.5	floats ok 1/2bbl back
04/14/2022	04:47:35	3	0.0	8.39	219.5	
04/14/2022	04:49:35	19	0.0	8.39	219.5	
04/14/2022	04:51:35	0	0.0	8.40	219.5	
04/14/2022	04:53:35	2	0.0	8.39	219.6	
04/14/2022	04:55:35	12	0.0	8.39	219.6	
04/14/2022	04:57:35	70	4.4	8.35	226.6	
04/14/2022	04:59:35	237	8.1	8.39	235.6	
04/14/2022	05:01:35	217	8.2	8.29	249.9	
04/14/2022	05:05:35	11	0.4	8.39	274.1	
04/14/2022	05:07:35	243	8.5	8.42	285.8	
04/14/2022	05:08:33	7	0.0	8.40	289.4	Reset Total, Vol = 69.84 bbl
04/14/2022	05:09:35	9	0.0	8.40	289.4	
04/14/2022	05:11:35	3	0.0	8.40	289.4	
04/14/2022	05:13:35	2	0.0	8.40	289.4	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 610H 610H		Apr/14/2022	SWN	EN82-04550

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/14/2022	05:17:35	3	0.0	8.40	289.4	
04/14/2022	05:19:35	2	0.0	8.40	289.4	
04/14/2022	05:21:35	3	0.0	8.40	289.4	
04/14/2022	05:23:35	2	0.0	8.40	289.4	
04/14/2022	05:25:35	2	0.0	8.40	289.4	
04/14/2022	05:27:35	2	0.0	8.40	289.4	
04/14/2022	05:29:35	2	0.0	8.40	289.4	
04/14/2022	05:31:35	3	0.0	8.40	289.4	
04/14/2022	05:33:35	3	0.0	8.40	289.4	
04/14/2022	05:35:35	3	0.0	8.40	289.4	
04/14/2022	05:37:35	2	0.0	8.40	289.4	
04/14/2022	05:39:35	3	0.0	8.40	289.4	
04/14/2022	05:41:35	2	0.0	8.40	289.4	
04/14/2022	05:43:35	3	0.0	8.40	289.4	
04/14/2022	05:45:35	2	0.0	8.40	289.4	
04/14/2022	05:47:35	1	0.0	8.40	289.4	
04/14/2022	05:49:35	3	0.0	8.40	289.4	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.4			5.5	95.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
2075	4	78	900			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	95.0 bbl	56.5 bbl	67 degF	Cement Circulated to Surface? [X]	Volume 29.0 bbl
				Washed Thru Perfs [ ]	To ft

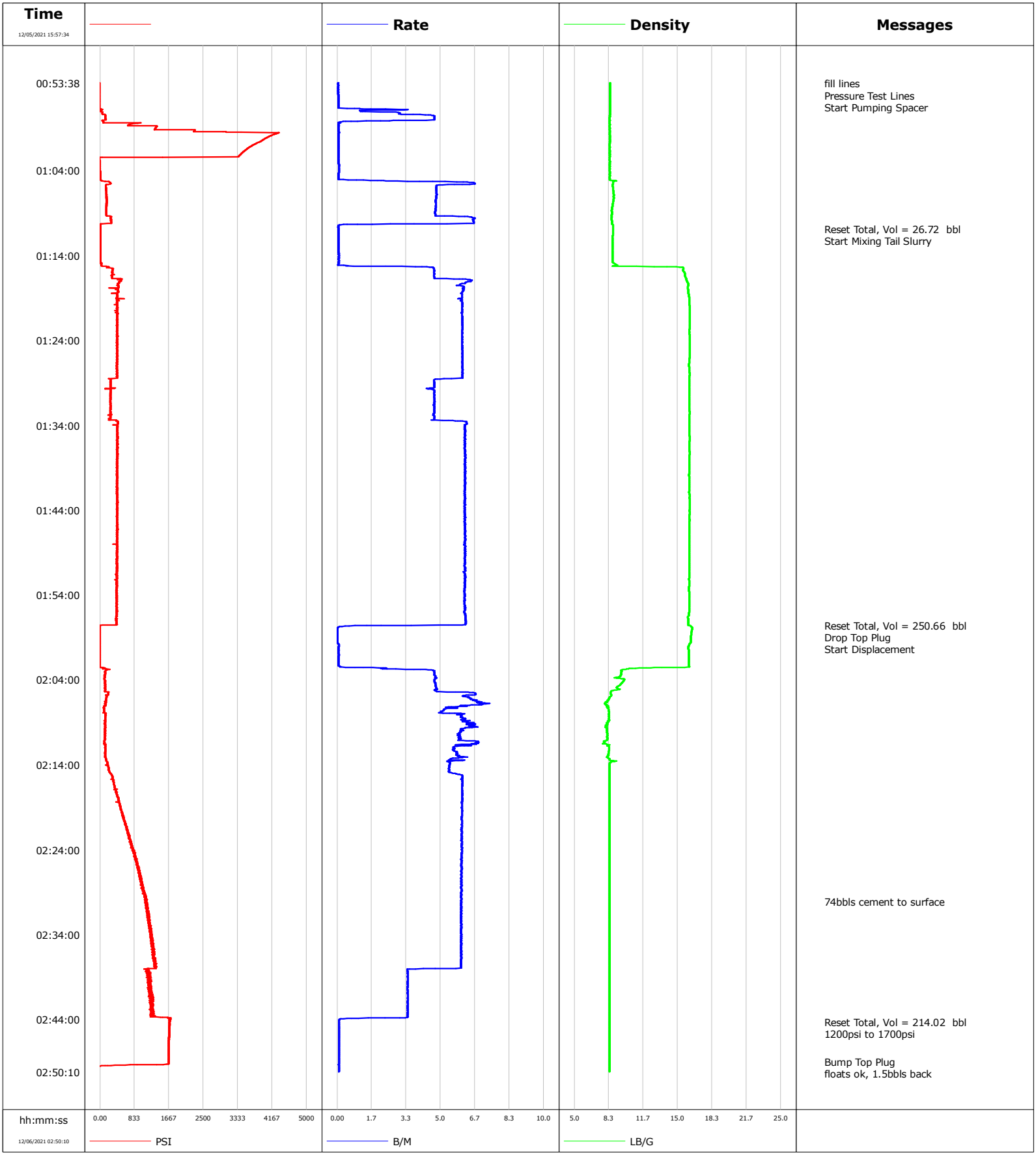
Customer or Authorized Representative	Schlumberger Supervisor		
	Barry DIckerson	Circulation Lost [ ]	Job Completed [X]
		-	-

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	OE Burge 205H	**Client**	SWN
Field		**SIR No.**	EN82-01780
Engineer	Barry Dickerson	**Job Type**	Intermediate
Country	United States	**Job Date**	12-05-2021



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-01780

Well	Location (legal)	Schlumberger Location	Job Start
OE Burge 205H 205H		SOH	Dec/04/2021

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	0 deg	12.3 in	2820.0 ft	2820.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	WV	psi	91 degF	80 degF	lb/gal

Well Master	API/UWI
0066444998	47-051-02413-00-00

Rig Name	Drilled For	Service Via
SDC 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

pressure test 1000/3500psi
25bbls gel spacer, D020@20lb/bbl
250 bbls Tail@16.0ppg,1251sks,Class A,Y=1.12
Drop Top Plug
Displace 214 bbls water

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2800.0	9.6	40.0	J55	8RD
2606.0	9.6	36.0	J55	8RD

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	214.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	217.0 bbl	159.0 bbl	138.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
1200 psi		

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Dec/04/2021 23:00	Dec/04/2021 23:00	Dec/06/2021 04:00

Casing Tools

Shoe Type	Guide
Shoe Depth	2800.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	2760.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
12/05/2021	15:57:34	-13	0.0	8.43	0.0	Started Acquisition
12/06/2021	00:53:44	-14	0.0	8.43	0.0	fill lines
12/06/2021	00:53:50	-13	0.1	8.43	0.0	Pressure Test Lines
12/06/2021	00:53:52	-14	0.1	8.43	0.0	Start Pumping Spacer
12/06/2021	00:55:34	-17	0.1	8.43	0.1	
12/06/2021	00:57:34	128	4.7	8.43	2.6	
12/06/2021	00:59:34	4310	0.1	8.43	5.3	
12/06/2021	01:01:34	3523	0.1	8.43	5.4	
12/06/2021	01:03:34	-4	0.1	8.43	0.0	
12/06/2021	01:05:34	250	6.7	8.72	2.4	
12/06/2021	01:07:34	159	4.8	8.77	12.1	
12/06/2021	01:09:34	265	6.6	8.59	22.0	
12/06/2021	01:10:52	5	0.1	8.73	26.7	Reset Total, Vol = 26.72 bbl
12/06/2021	01:10:54	6	0.1	8.72	0.0	Start Mixing Tail Slurry
12/06/2021	01:11:34	6	0.1	8.71	0.0	
12/06/2021	01:13:34	10	0.1	8.68	0.2	
12/06/2021	01:15:34	310	4.7	15.53	1.7	
12/06/2021	01:17:34	446	6.0	16.00	12.3	
12/06/2021	01:19:34	409	6.0	16.14	24.4	
12/06/2021	01:21:34	409	6.0	16.16	36.5	
12/06/2021	01:23:34	413	6.1	16.15	48.6	

Well	Field	Job Start	Customer	Job Number
OE Burge 205H 205H		Dec/04/2021	SWN	EN82-01780

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
12/06/2021	01:27:34	409	6.1	16.13	72.8	
12/06/2021	01:31:34	246	4.7	16.13	92.8	
12/06/2021	01:33:34	429	6.3	16.14	102.4	
12/06/2021	01:35:34	419	6.2	16.15	114.8	
12/06/2021	01:37:34	416	6.2	16.13	127.1	
12/06/2021	01:39:34	405	6.2	16.11	139.5	
12/06/2021	01:41:34	430	6.2	16.11	151.8	
12/06/2021	01:43:34	413	6.2	16.16	164.2	
12/06/2021	01:45:34	413	6.2	16.14	176.5	
12/06/2021	01:47:34	415	6.2	16.13	188.9	
12/06/2021	01:49:34	409	6.2	16.12	201.3	
12/06/2021	01:51:34	378	6.2	16.10	213.6	
12/06/2021	01:53:34	402	6.2	16.10	225.9	
12/06/2021	01:55:34	403	6.2	16.10	238.3	
12/06/2021	01:57:34	10	3.6	16.04	250.6	
12/06/2021	01:57:35	-3	2.1	16.10	250.7	Reset Total, Vol = 250.66 bbl
12/06/2021	01:57:38	-7	0.6	16.24	0.1	Drop Top Plug
12/06/2021	01:57:39	-7	0.4	16.26	0.1	Start Displacement
12/06/2021	01:59:34	-8	0.0	16.25	0.1	
12/06/2021	02:01:34	-7	0.1	16.06	0.2	
12/06/2021	02:03:34	110	4.8	9.44	4.6	
12/06/2021	02:05:34	205	6.7	8.48	14.4	
12/06/2021	02:07:34	93	5.1	8.33	27.1	
12/06/2021	02:09:34	123	6.7	8.00	39.1	
12/06/2021	02:11:34	115	6.7	8.13	51.4	
12/06/2021	02:13:34	153	5.3	9.10	63.0	
12/06/2021	02:15:34	301	6.1	8.42	74.1	
12/06/2021	02:17:34	421	6.1	8.42	86.2	
12/06/2021	02:19:34	533	6.0	8.42	98.3	
12/06/2021	02:21:34	653	6.0	8.42	110.4	
12/06/2021	02:23:34	761	6.0	8.42	122.4	
12/06/2021	02:25:34	884	6.0	8.42	134.4	
12/06/2021	02:27:34	973	6.0	8.42	146.5	
12/06/2021	02:29:34	1071	6.0	8.42	158.5	
12/06/2021	02:30:08	1105	6.0	8.42	161.9	74bbls cement to surface
12/06/2021	02:31:34	1164	6.0	8.42	170.5	
12/06/2021	02:33:34	1229	6.0	8.42	182.5	
12/06/2021	02:35:34	1307	6.0	8.42	194.5	
12/06/2021	02:37:34	1312	6.0	8.42	206.5	
12/06/2021	02:39:34	1234	3.4	8.42	214.4	
12/06/2021	02:41:34	1199	3.4	8.42	221.3	
12/06/2021	02:43:34	1283	3.4	8.42	228.1	
12/06/2021	02:44:15	1677	0.1	8.42	229.0	Reset Total, Vol = 214.02 bbl
12/06/2021	02:44:32	1683	0.1	8.42	0.0	1200psi to 1700psi
12/06/2021	02:45:34	1670	0.1	8.42	0.1	
12/06/2021	02:47:34	1663	0.1	8.42	0.3	
12/06/2021	02:48:59	1661	0.1	8.42	0.4	Bump Top Plug
12/06/2021	02:49:34	-31	0.1	8.42	0.4	

Well	Field	Job Start	Customer	Job Number
OE Burge 205H 205H		Dec/04/2021	SWN	EN82-01780

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.5			6.4	250.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
4341	-25	649	1700			bbl	lb/gal

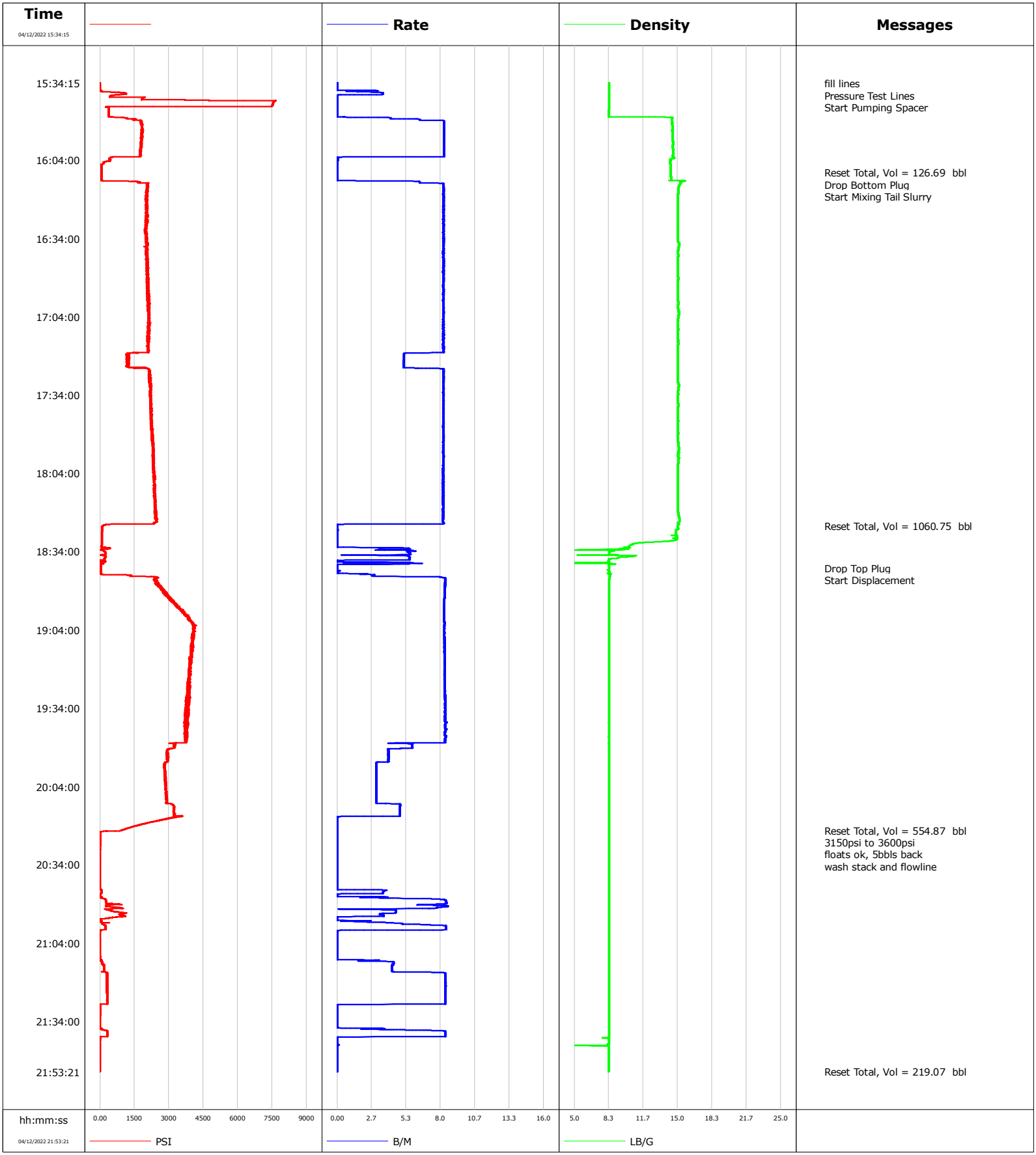
Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	250.0 bbl	214.0 bbl	60 degF	[X]	74.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Barry Dickerson	-	[X] -

Schlumberger

Cementing Job Report

Well	Carl Rotter 8H	**Client**	SWN
Field		**SIR No.**	EN82-04584
Engineer	Barry DIckerson	**Job Type**	Production
Country	United States	**Job Date**	04-12-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-04584

Well	Location (legal)	Schlumberger Location	Job Start
Carl Rotter 8H 8H		SOH	Apr/12/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	90 deg	8.5 in	25001.0 ft	6818.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Ohio	WV	psi	135 degF	134 degF	lb/gal

Well Master	API/UWI
0066494934	47-069-00330-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
Bentonite	14.00 lb/gal	cP

Service Line	Job Type
Cementing	Production

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	CRT

Service Instructions

Pressure Test 1000psi/7000psi
120bbls MPE@14.5ppg, w/B553@0.05 gal/bbl
Drop Bottom Plug
1033bbls Tail@15.0ppg,4497sks,Y=1.29,ClassA
Wash Lines/Drop Top Plug
Displace 554bbls, 100 lbs sugar 1st 20bbls

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
25001.0	5.5	20.0	P110	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	554.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	555.0 bbl	1051.0 bbl	945.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
3150 psi		

No. Centralizers	Top Plugs	Bottom Plugs
	1	1

Cement Head Type
CRT

Job Scheduled For	Arrived on Location	Leave Location
Apr/12/2022 05:00	Apr/12/2022 05:00	Apr/12/2022 23:00

Casing Tools

Shoe Type	Guide
Shoe Depth	25001.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	24948.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/12/2022	15:34:15	-7	0.0	8.34	0.0	Started Acquisition
04/12/2022	15:34:27	-8	0.0	8.34	0.0	fill lines
04/12/2022	15:34:33	-8	0.0	8.34	0.0	Pressure Test Lines
04/12/2022	15:34:35	-8	0.0	8.34	0.0	Start Pumping Spacer
04/12/2022	15:37:55	613	3.0	8.34	1.5	
04/12/2022	15:41:35	7568	0.0	8.34	4.8	
04/12/2022	15:45:15	370	0.0	8.33	4.8	
04/12/2022	15:48:55	1781	8.3	14.45	12.8	
04/12/2022	15:52:35	1886	8.2	14.45	43.1	
04/12/2022	15:56:15	1813	8.3	14.50	73.4	
04/12/2022	15:59:55	1778	8.3	14.53	103.7	
04/12/2022	16:03:35	400	0.0	14.31	126.6	
04/12/2022	16:07:15	61	0.0	14.30	126.7	
04/12/2022	16:08:42	60	0.0	14.31	126.7	Reset Total, Vol = 126.69 bbl
04/12/2022	16:08:45	60	0.0	14.31	0.0	Drop Bottom Plug
04/12/2022	16:08:46	60	0.0	14.31	0.0	Start Mixing Tail Slurry
04/12/2022	16:10:55	62	0.0	14.36	0.0	
04/12/2022	16:14:35	2062	8.2	15.09	20.5	
04/12/2022	16:18:15	2007	8.2	15.03	50.7	
04/12/2022	16:21:55	2066	8.2	15.03	80.9	
04/12/2022	16:25:35	2028	8.2	15.04	111.0	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 8H 8H		Apr/12/2022	SWN	EN82-04584

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/12/2022	16:32:55	1994	8.2	15.03	171.3	
04/12/2022	16:36:35	2067	8.2	15.13	201.5	
04/12/2022	16:40:15	2016	8.2	15.05	231.6	
04/12/2022	16:43:55	2080	8.2	15.03	261.7	
04/12/2022	16:47:35	2059	8.2	15.03	291.9	
04/12/2022	16:51:15	2091	8.2	15.03	322.0	
04/12/2022	16:54:55	2042	8.2	15.01	352.1	
04/12/2022	16:58:35	2108	8.2	15.08	382.3	
04/12/2022	17:02:15	2106	8.2	15.11	412.4	
04/12/2022	17:05:55	2115	8.2	15.04	442.5	
04/12/2022	17:09:35	2120	8.2	15.04	472.6	
04/12/2022	17:13:15	2101	8.2	15.05	502.8	
04/12/2022	17:16:55	2123	8.2	15.02	532.9	
04/12/2022	17:20:35	1248	5.2	15.01	554.5	
04/12/2022	17:24:15	2171	8.2	15.03	575.2	
04/12/2022	17:27:55	2207	8.2	15.03	605.3	
04/12/2022	17:31:35	2206	8.2	15.07	635.4	
04/12/2022	17:35:15	2208	8.2	15.04	665.6	
04/12/2022	17:38:55	2257	8.2	15.03	695.7	
04/12/2022	17:42:35	2239	8.2	15.01	725.8	
04/12/2022	17:46:15	2248	8.2	15.02	755.9	
04/12/2022	17:49:55	2279	8.2	15.03	786.0	
04/12/2022	17:53:35	2312	8.2	15.08	816.1	
04/12/2022	17:57:15	2324	8.2	15.04	846.2	
04/12/2022	18:00:55	2338	8.2	15.03	876.3	
04/12/2022	18:04:35	2333	8.2	15.04	906.4	
04/12/2022	18:08:15	2368	8.2	15.02	936.4	
04/12/2022	18:11:55	2376	8.2	15.02	966.5	
04/12/2022	18:15:35	2392	8.2	15.02	996.6	
04/12/2022	18:19:15	2469	8.2	15.07	1026.6	
04/12/2022	18:22:55	2349	8.2	15.02	1056.7	
04/12/2022	18:24:09	114	0.0	15.03	1060.7	Reset Total, Vol = 1060.75 bbl
04/12/2022	18:26:35	84	0.0	14.83	1060.8	
04/12/2022	18:30:15	80	0.0	12.91	1060.8	
04/12/2022	18:33:55	201	5.6	8.51	1068.5	
04/12/2022	18:37:35	39	0.0	8.26	1086.1	
04/12/2022	18:40:17	27	0.0	8.34	1089.9	Drop Top Plug
04/12/2022	18:40:32	26	0.0	8.34	1089.9	Start Displacement
04/12/2022	18:41:15	26	0.0	8.30	1089.9	
04/12/2022	18:44:55	2436	8.3	8.34	1104.3	
04/12/2022	18:48:35	2673	8.3	8.35	1134.9	
04/12/2022	18:52:15	3056	8.3	8.35	1165.4	
04/12/2022	18:55:55	3482	8.3	8.35	1195.8	
04/12/2022	18:59:35	3832	8.2	8.35	1226.0	
04/12/2022	19:03:15	4100	8.3	8.35	1256.4	
04/12/2022	19:06:55	3985	8.3	8.35	1286.8	
04/12/2022	19:14:15	3991	8.3	8.35	1347.8	
04/12/2022	19:17:55	3885	8.3	8.35	1378.3	
04/12/2022	19:21:35	3899	8.3	8.35	1408.7	
04/12/2022	19:25:15	3869	8.3	8.35	1439.2	
04/12/2022	19:28:55	3877	8.3	8.35	1469.8	
04/12/2022	19:32:35	3752	8.4	8.35	1500.4	
04/12/2022	19:36:15	3822	8.4	8.35	1531.0	
04/12/2022	19:39:55	3766	8.4	8.35	1561.6	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 8H 8H		Apr/12/2022	SWN	EN82-04584

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/12/2022	19:47:15	3348	6.7	8.35	1622.9	
04/12/2022	19:50:55	2903	4.0	8.35	1641.1	
04/12/2022	19:54:35	2893	3.9	8.35	1655.6	
04/12/2022	19:58:15	2855	3.0	8.35	1666.8	
04/12/2022	20:01:55	2853	3.0	8.35	1677.9	
04/12/2022	20:05:35	2853	3.0	8.35	1689.0	
04/12/2022	20:09:15	2872	3.0	8.34	1700.1	
04/12/2022	20:12:55	3215	4.9	8.35	1715.5	
04/12/2022	20:16:35	2762	0.0	8.35	1727.6	
04/12/2022	20:20:15	1109	0.0	8.35	1727.6	
04/12/2022	20:20:55	904	0.0	8.35	1727.6	Reset Total, Vol = 554.87 bbl
04/12/2022	20:21:13	51	0.0	8.35	0.0	3150psi to 3600psi
04/12/2022	20:22:48	0	0.0	8.35	0.0	floats ok, 5bbls back
04/12/2022	20:23:08	1	0.0	8.35	0.0	wash stack and flowline
04/12/2022	20:23:55	0	0.0	8.35	0.0	
04/12/2022	20:27:35	-0	0.0	8.35	0.0	
04/12/2022	20:31:15	-2	0.0	8.35	0.0	
04/12/2022	20:34:55	-1	0.0	8.35	0.0	
04/12/2022	20:38:35	-1	0.0	8.35	0.0	
04/12/2022	20:42:15	-1	0.0	8.35	0.0	
04/12/2022	20:45:55	-2	0.0	8.35	5.4	
04/12/2022	20:49:35	263	8.0	8.35	29.2	
04/12/2022	20:53:15	934	3.5	8.34	48.2	
04/12/2022	20:56:55	157	6.7	8.35	55.7	
04/12/2022	21:00:35	-3	0.0	8.35	73.0	
04/12/2022	21:04:15	-5	0.0	8.35	73.0	
04/12/2022	21:07:55	-5	0.0	8.35	73.0	
04/12/2022	21:11:35	87	4.4	8.35	76.9	
04/12/2022	21:15:15	264	7.6	8.35	93.0	
04/12/2022	21:18:55	295	8.4	8.34	123.6	
04/12/2022	21:22:35	309	8.4	8.34	154.3	
04/12/2022	21:26:15	308	8.4	8.34	185.0	
04/12/2022	21:29:55	2	0.0	8.34	195.3	
04/12/2022	21:33:35	-2	0.0	8.34	195.3	
04/12/2022	21:37:15	148	4.9	8.34	197.3	
04/12/2022	21:40:55	-1	0.0	8.31	219.0	
04/12/2022	21:44:35	-1	0.0	8.33	219.1	
04/12/2022	21:48:15	-9	0.0	8.33	219.1	
04/12/2022	21:51:55	-7	0.0	8.33	219.1	

Well	Field	Job Start	Customer	Job Number
Carl Rotter 8H 8H		Apr/12/2022	SWN	EN82-04584

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
7.0			8.6	1033.0	0.0	120.0	

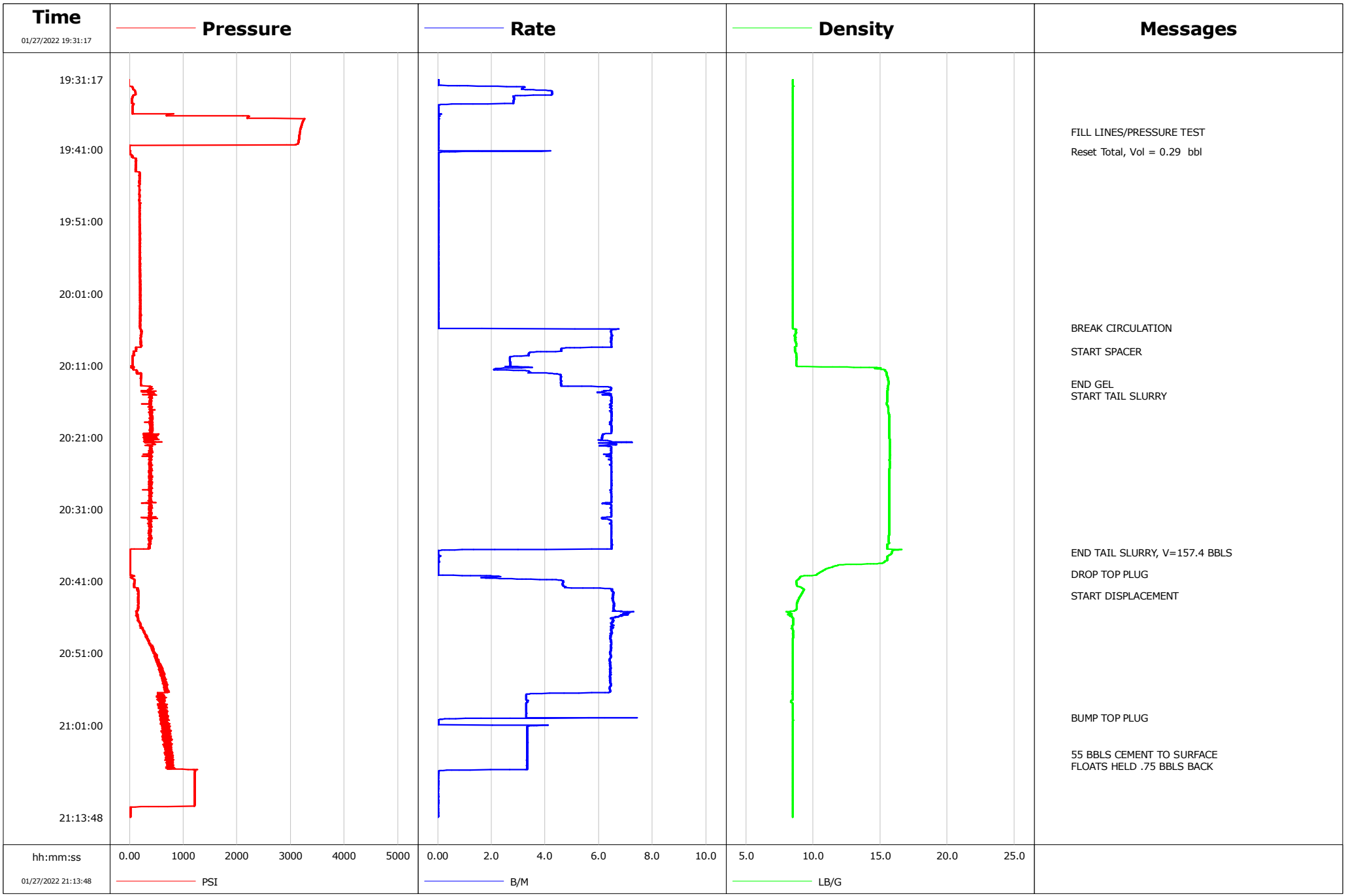
Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
7634	-8	2040	3600			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	1033.0 bbl	554.0 bbl	72 degF	Cement Circulated to Surface? ☐	Volume bbl
				Washed Thru Perfs ☐	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost ☐	Job Completed ☒
	Barry DIckerson	-	-

Schlumberger Cementing Job Report

Well	BETTY SCHAFER MSH 3H	**Client**	SOUTHWESTERN
Field	PANHANDLE	**SIR No.**	EN82-03017
Engineer	JOSHUA NEDROW	**Job Type**	INTERMEDIATE
Country	UNITED STATES	**Job Date**	1/27/2022



Schlumberger Cementing Service Report

Customer	Job Number
SOUTHWESTERN	EN82-03017

Well	Location (legal)	Schlumberger Location	Job Start
BETTY SCHAFER MSH 3H 3H	BETTY SCHAFER PAD	STRASBURG	Jan/27/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
PANHANDLE	Dirty-Sandstone	0 deg	12.3 in	1740.0 ft	1740.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHALL	WEST VIRGINIA	psi	80 degF	80 degF	lb/gal
Well Master 0066459737	**API/UWI** 47-051-02417-00-00				

Rig Name	Drilled For	Service Via
SDC #40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Clear Brine	9.20 lb/gal	cP

Service Line	Job Type
Cementing	INTERMEDIATE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

FILL LINES/PRESSURE TEST
BREAK CIRCULATION
PUMP 25 BBLS GEL SPACER
PUMP 157.4 BBLS TAIL @ 15.6 PPG
SKS:689 YLD: 1.19 MW:5.27
DROP TOP PLUG
DISPLACE 129.8 BBLS FRESH WATER
55 BBLS CEMENT TO SURFACE
FLOATS HELD .75 BBLS BACK

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
1723.6	9.6	36.0	J55	8RD
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	129.8 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	133.0 bbl	24.0 bbl	75.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
[X]	[X]

Lift Pressure	Pipe Rotated	Pipe Reciprocated
661 psi	[ ]	[ ]

No. Centralizers	Top Plugs	Bottom Plugs
47	1	0

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Jan/27/2022 12:00	Jan/27/2022 12:00	Jan/27/2022 22:30

Casing Tools		Squeeze Job	
Shoe Type	Guide	Squeeze Type	
Shoe Depth	1723.6 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	1680.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/27/2022	19:31:17	0.0	0.0	0.0	0.0	End Job
01/27/2022	19:31:47	0.0	0.0	0.0	0.0	
01/27/2022	19:32:17	0.0	0.0	0.0	0.0	
01/27/2022	19:32:47	0.0	0.0	0.0	0.0	
01/27/2022	19:33:17	0.0	0.0	0.0	0.0	
01/27/2022	19:33:47	0.0	0.0	0.0	0.0	
01/27/2022	19:34:17	0.0	0.0	0.0	0.0	
01/27/2022	19:34:47	0.0	0.0	0.0	0.0	
01/27/2022	19:35:17	0.0	0.0	0.0	0.0	
01/27/2022	19:35:47	0.0	0.0	0.0	0.0	
01/27/2022	19:36:17	0.0	0.0	0.0	0.0	
01/27/2022	19:36:47	0.0	0.0	0.0	0.0	
01/27/2022	19:37:17	0.0	0.0	0.0	0.0	
01/27/2022	19:37:47	0.0	0.0	0.0	0.0	
01/27/2022	19:38:17	0.0	0.0	0.0	0.0	
01/27/2022	19:38:31	0.0	0.0	0.0	0.0	FILL LINES/PRESSURE TEST
01/27/2022	19:38:47	0.0	0.0	0.0	0.0	
01/27/2022	19:39:47	0.0	0.0	0.0	0.0	
01/27/2022	19:40:17	0.0	0.0	0.0	0.0	
01/27/2022	19:40:47	0.0	0.0	0.0	0.0	
01/27/2022	19:41:15	0.0	0.0	0.0	0.0	Reset Total, Vol = 0.29 bbl

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Jan/27/2022	SOUTHWESTERN	EN82-03017

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/27/2022	19:41:47	0.0	0.0	0.0	0.0	
01/27/2022	19:42:17	0.0	0.0	0.0	0.0	
01/27/2022	19:42:47	0.0	0.0	0.0	0.0	
01/27/2022	19:43:17	0.0	0.0	0.0	0.0	
01/27/2022	19:43:47	0.0	0.0	0.0	0.0	
01/27/2022	19:44:17	0.0	0.0	0.0	0.0	
01/27/2022	19:44:47	0.0	0.0	0.0	0.0	
01/27/2022	19:45:17	0.0	0.0	0.0	0.0	
01/27/2022	19:45:47	0.0	0.0	0.0	0.0	
01/27/2022	19:46:17	0.0	0.0	0.0	0.0	
01/27/2022	19:46:47	0.0	0.0	0.0	0.0	
01/27/2022	19:47:17	0.0	0.0	0.0	0.0	
01/27/2022	19:47:47	0.0	0.0	0.0	0.0	
01/27/2022	19:48:17	0.0	0.0	0.0	0.0	
01/27/2022	19:48:47	0.0	0.0	0.0	0.0	
01/27/2022	19:49:17	0.0	0.0	0.0	0.0	
01/27/2022	19:49:47	0.0	0.0	0.0	0.0	
01/27/2022	19:50:17	0.0	0.0	0.0	0.0	
01/27/2022	19:50:47	0.0	0.0	0.0	0.0	
01/27/2022	19:51:17	0.0	0.0	0.0	0.0	
01/27/2022	19:51:47	0.0	0.0	0.0	0.0	
01/27/2022	19:52:17	0.0	0.0	0.0	0.0	
01/27/2022	19:52:47	0.0	0.0	0.0	0.0	
01/27/2022	19:53:17	0.0	0.0	0.0	0.0	
01/27/2022	19:53:47	0.0	0.0	0.0	0.0	
01/27/2022	19:54:17	0.0	0.0	0.0	0.0	
01/27/2022	19:54:47	0.0	0.0	0.0	0.0	
01/27/2022	19:55:17	0.0	0.0	0.0	0.0	
01/27/2022	19:55:47	0.0	0.0	0.0	0.0	
01/27/2022	19:56:17	0.0	0.0	0.0	0.0	
01/27/2022	19:56:47	0.0	0.0	0.0	0.0	
01/27/2022	19:57:17	0.0	0.0	0.0	0.0	
01/27/2022	19:57:47	0.0	0.0	0.0	0.0	
01/27/2022	19:58:17	0.0	0.0	0.0	0.0	
01/27/2022	19:58:47	0.0	0.0	0.0	0.0	
01/27/2022	19:59:17	0.0	0.0	0.0	0.0	
01/27/2022	19:59:47	0.0	0.0	0.0	0.0	
01/27/2022	20:00:17	0.0	0.0	0.0	0.0	
01/27/2022	20:00:47	0.0	0.0	0.0	0.0	
01/27/2022	20:01:17	0.0	0.0	0.0	0.0	
01/27/2022	20:01:47	0.0	0.0	0.0	0.0	
01/27/2022	20:02:17	0.0	0.0	0.0	0.0	
01/27/2022	20:02:47	0.0	0.0	0.0	0.0	
01/27/2022	20:03:17	0.0	0.0	0.0	0.0	
01/27/2022	20:03:47	0.0	0.0	0.0	0.0	
01/27/2022	20:04:17	0.0	0.0	0.0	0.0	
01/27/2022	20:04:47	0.0	0.0	0.0	0.0	
01/27/2022	20:05:17	0.0	0.0	0.0	0.0	
01/27/2022	20:05:45	0.0	0.0	0.0	0.0	BREAK CIRCULATION
01/27/2022	20:05:47	0.0	0.0	0.0	0.0	
01/27/2022	20:06:17	0.0	0.0	0.0	0.0	
01/27/2022	20:06:47	0.0	0.0	0.0	0.0	
01/27/2022	20:07:17	0.0	0.0	0.0	0.0	
01/27/2022	20:07:47	0.0	0.0	0.0	0.0	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Jan/27/2022	SOUTHWESTERN	EN82-03017

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/27/2022	20:08:47	0.0	0.0	0.0	0.0	
01/27/2022	20:09:00	0.0	0.0	0.0	0.0	START SPACER
01/27/2022	20:09:17	0.0	0.0	0.0	0.0	
01/27/2022	20:09:47	0.0	0.0	0.0	0.0	
01/27/2022	20:10:17	0.0	0.0	0.0	0.0	
01/27/2022	20:10:47	0.0	0.0	0.0	0.0	
01/27/2022	20:11:17	0.0	0.0	0.0	0.0	
01/27/2022	20:11:47	0.0	0.0	0.0	0.0	
01/27/2022	20:12:17	0.0	0.0	0.0	0.0	
01/27/2022	20:12:47	0.0	0.0	0.0	0.0	
01/27/2022	20:13:17	0.0	0.0	0.0	0.0	
01/27/2022	20:13:33	0.0	0.0	0.0	0.0	END GEL
01/27/2022	20:13:47	0.0	0.0	0.0	0.0	
01/27/2022	20:14:00	0.0	0.0	0.0	0.0	START TAIL SLURRY
01/27/2022	20:14:47	0.0	0.0	0.0	0.0	
01/27/2022	20:15:17	0.0	0.0	0.0	0.0	
01/27/2022	20:15:47	0.0	0.0	0.0	0.0	
01/27/2022	20:16:17	0.0	0.0	0.0	0.0	
01/27/2022	20:16:47	0.0	0.0	0.0	0.0	
01/27/2022	20:17:17	0.0	0.0	0.0	0.0	
01/27/2022	20:17:47	0.0	0.0	0.0	0.0	
01/27/2022	20:18:17	0.0	0.0	0.0	0.0	
01/27/2022	20:18:47	0.0	0.0	0.0	0.0	
01/27/2022	20:19:17	0.0	0.0	0.0	0.0	
01/27/2022	20:19:47	0.0	0.0	0.0	0.0	
01/27/2022	20:20:17	0.0	0.0	0.0	0.0	
01/27/2022	20:20:47	0.0	0.0	0.0	0.0	
01/27/2022	20:21:17	0.0	0.0	0.0	0.0	
01/27/2022	20:21:47	0.0	0.0	0.0	0.0	
01/27/2022	20:22:17	0.0	0.0	0.0	0.0	
01/27/2022	20:22:47	0.0	0.0	0.0	0.0	
01/27/2022	20:23:17	0.0	0.0	0.0	0.0	
01/27/2022	20:23:47	0.0	0.0	0.0	0.0	
01/27/2022	20:24:17	0.0	0.0	0.0	0.0	
01/27/2022	20:24:47	0.0	0.0	0.0	0.0	
01/27/2022	20:25:17	0.0	0.0	0.0	0.0	
01/27/2022	20:25:47	0.0	0.0	0.0	0.0	
01/27/2022	20:26:17	0.0	0.0	0.0	0.0	
01/27/2022	20:26:47	0.0	0.0	0.0	0.0	
01/27/2022	20:27:17	0.0	0.0	0.0	0.0	
01/27/2022	20:27:47	0.0	0.0	0.0	0.0	
01/27/2022	20:28:17	0.0	0.0	0.0	0.0	
01/27/2022	20:28:47	0.0	0.0	0.0	0.0	
01/27/2022	20:29:17	0.0	0.0	0.0	0.0	
01/27/2022	20:29:47	0.0	0.0	0.0	0.0	
01/27/2022	20:30:17	0.0	0.0	0.0	0.0	
01/27/2022	20:30:47	0.0	0.0	0.0	0.0	
01/27/2022	20:31:17	0.0	0.0	0.0	0.0	
01/27/2022	20:31:47	0.0	0.0	0.0	0.0	
01/27/2022	20:32:17	0.0	0.0	0.0	0.0	
01/27/2022	20:32:47	0.0	0.0	0.0	0.0	
01/27/2022	20:33:17	0.0	0.0	0.0	0.0	
01/27/2022	20:33:47	0.0	0.0	0.0	0.0	
01/27/2022	20:34:17	0.0	0.0	0.0	0.0	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Jan/27/2022	SOUTHWESTERN	EN82-03017

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/27/2022	20:35:17	0.0	0.0	0.0	0.0	
01/27/2022	20:35:47	0.0	0.0	0.0	0.0	
01/27/2022	20:36:17	0.0	0.0	0.0	0.0	
01/27/2022	20:36:47	0.0	0.0	0.0	0.0	
01/27/2022	20:36:59	0.0	0.0	0.0	0.0	END TAIL SLURRY, V=157.4 BBLS
01/27/2022	20:37:17	0.0	0.0	0.0	0.0	
01/27/2022	20:37:47	0.0	0.0	0.0	0.0	
01/27/2022	20:38:17	0.0	0.0	0.0	0.0	
01/27/2022	20:38:47	0.0	0.0	0.0	0.0	
01/27/2022	20:39:17	0.0	0.0	0.0	0.0	
01/27/2022	20:39:47	0.0	0.0	0.0	0.0	
01/27/2022	20:40:00	0.0	0.0	0.0	0.0	DROP TOP PLUG
01/27/2022	20:40:17	0.0	0.0	0.0	0.0	
01/27/2022	20:40:47	0.0	0.0	0.0	0.0	
01/27/2022	20:41:17	0.0	0.0	0.0	0.0	
01/27/2022	20:41:47	0.0	0.0	0.0	0.0	
01/27/2022	20:42:17	0.0	0.0	0.0	0.0	
01/27/2022	20:42:47	0.0	0.0	0.0	0.0	
01/27/2022	20:43:00	0.0	0.0	0.0	0.0	START DISPLACEMENT
01/27/2022	20:43:17	0.0	0.0	0.0	0.0	
01/27/2022	20:43:47	0.0	0.0	0.0	0.0	
01/27/2022	20:44:17	0.0	0.0	0.0	0.0	
01/27/2022	20:44:47	0.0	0.0	0.0	0.0	
01/27/2022	20:45:17	0.0	0.0	0.0	0.0	
01/27/2022	20:45:47	0.0	0.0	0.0	0.0	
01/27/2022	20:46:17	0.0	0.0	0.0	0.0	
01/27/2022	20:46:47	0.0	0.0	0.0	0.0	
01/27/2022	20:47:17	0.0	0.0	0.0	0.0	
01/27/2022	20:47:47	0.0	0.0	0.0	0.0	
01/27/2022	20:48:17	0.0	0.0	0.0	0.0	
01/27/2022	20:48:47	0.0	0.0	0.0	0.0	
01/27/2022	20:49:47	0.0	0.0	0.0	0.0	
01/27/2022	20:50:17	0.0	0.0	0.0	0.0	
01/27/2022	20:50:47	0.0	0.0	0.0	0.0	
01/27/2022	20:51:17	0.0	0.0	0.0	0.0	
01/27/2022	20:51:47	0.0	0.0	0.0	0.0	
01/27/2022	20:52:17	0.0	0.0	0.0	0.0	
01/27/2022	20:52:47	0.0	0.0	0.0	0.0	
01/27/2022	20:53:17	0.0	0.0	0.0	0.0	
01/27/2022	20:53:47	0.0	0.0	0.0	0.0	
01/27/2022	20:54:17	0.0	0.0	0.0	0.0	
01/27/2022	20:54:47	0.0	0.0	0.0	0.0	
01/27/2022	20:55:17	0.0	0.0	0.0	0.0	
01/27/2022	20:55:47	0.0	0.0	0.0	0.0	
01/27/2022	20:56:17	0.0	0.0	0.0	0.0	
01/27/2022	20:56:47	0.0	0.0	0.0	0.0	
01/27/2022	20:57:17	0.0	0.0	0.0	0.0	
01/27/2022	20:57:47	0.0	0.0	0.0	0.0	
01/27/2022	20:58:17	0.0	0.0	0.0	0.0	
01/27/2022	20:58:47	0.0	0.0	0.0	0.0	
01/27/2022	20:59:17	0.0	0.0	0.0	0.0	
01/27/2022	20:59:47	0.0	0.0	0.0	0.0	
01/27/2022	21:00:00	0.0	0.0	0.0	0.0	BUMP TOP PLUG
01/27/2022	21:00:17	0.0	0.0	0.0	0.0	

Well	Field	Job Start	Customer	Job Number
BETTY SCHAFER MSH 3H 3H	PANHANDLE	Jan/27/2022	SOUTHWESTERN	EN82-03017

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
01/27/2022	21:01:17	0.0	0.0	0.0	0.0	
01/27/2022	21:01:47	0.0	0.0	0.0	0.0	
01/27/2022	21:02:17	0.0	0.0	0.0	0.0	
01/27/2022	21:02:47	0.0	0.0	0.0	0.0	
01/27/2022	21:03:17	0.0	0.0	0.0	0.0	
01/27/2022	21:03:47	0.0	0.0	0.0	0.0	
01/27/2022	21:04:17	0.0	0.0	0.0	0.0	
01/27/2022	21:04:47	0.0	0.0	0.0	0.0	
01/27/2022	21:05:00	0.0	0.0	0.0	0.0	55 BBLS CEMENT TO SURFACE
01/27/2022	21:05:17	0.0	0.0	0.0	0.0	
01/27/2022	21:05:47	0.0	0.0	0.0	0.0	
01/27/2022	21:06:00	0.0	0.0	0.0	0.0	FLOATS HELD .75 BBLS BACK
01/27/2022	21:06:17	0.0	0.0	0.0	0.0	
01/27/2022	21:06:47	0.0	0.0	0.0	0.0	
01/27/2022	21:07:17	0.0	0.0	0.0	0.0	
01/27/2022	21:07:47	0.0	0.0	0.0	0.0	
01/27/2022	21:08:17	0.0	0.0	0.0	0.0	
01/27/2022	21:08:47	0.0	0.0	0.0	0.0	
01/27/2022	21:09:17	0.0	0.0	0.0	0.0	
01/27/2022	21:10:17	0.0	0.0	0.0	0.0	
01/27/2022	21:10:47	0.0	0.0	0.0	0.0	
01/27/2022	21:11:17	0.0	0.0	0.0	0.0	
01/27/2022	21:11:47	0.0	0.0	0.0	0.0	
01/27/2022	21:12:17	0.0	0.0	0.0	0.0	
01/27/2022	21:12:47	0.0	0.0	0.0	0.0	
01/27/2022	21:13:17	0.0	0.0	0.0	0.0	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.2			6.5	157.4		25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
3300	0	423	1300			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	146.0 bbl	129.9 bbl	58 degF	Cement Circulated to Surface? [X]	Volume 55.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
JACK HAMM	JOSHUA NEDROW	-	[X] -

Service Quality Evaluation

Client:	SOUTHWESTERN
Field:	PANHANDLE
Rig:	SDC #40
Well:	BETTY SCHAFER MSH 3H
Service Line:	Cementing
Job Type:	INTERMEDIATE

Service Order #:	
Date:	Jan/27/2022
Operating Time (hh:mm):	00:00
Client Rep:	JACK HAMM
Schlumberger Engineer:	JOSHUA NEDROW
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** ☐ **no** ☒	0
1b	Free of environmental spill or non-compliant discharge	5	**yes** ☐ **no** ☒	0
1c	Wellsite left clean	4	**yes** ☐ **no** ☒	0
			Sub-total	0%

2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** ☐ **no** ☒	0
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** ☐ **no** ☒	0
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** ☐ **no** ☒	0
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** ☐ **no** ☒	0
			Sub-total	0%

3	**Execution**			
3a	Lost time < 30 mins	3	**yes** ☐ **no** ☒	0
3b	Equipment pressure tested succesfully	3	**yes** ☐ **no** ☒	0
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** ☐ **no** ☒	0
3d	Plugs / darts released and tested succesfully	2	**yes** ☐ **no** ☒	0
3e	Density variation met expectations	2	**yes** ☐ **no** ☒	0
3f	Personnel performed as per expectations	2	**yes** ☐ **no** ☒	0
3g	Equipment performed as per expectations	2	**yes** ☐ **no** ☒	0
3h	Job pumped as per design	3	**yes** ☐ **no** ☒	0
3i	Did job start on time	2	**yes** ☐ **no** ☒	0
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** ☐ **no** ☒	0
			Sub-total	0%

4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** ☐ **no** ☒	0
			Sub-total	0%

Total 0%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

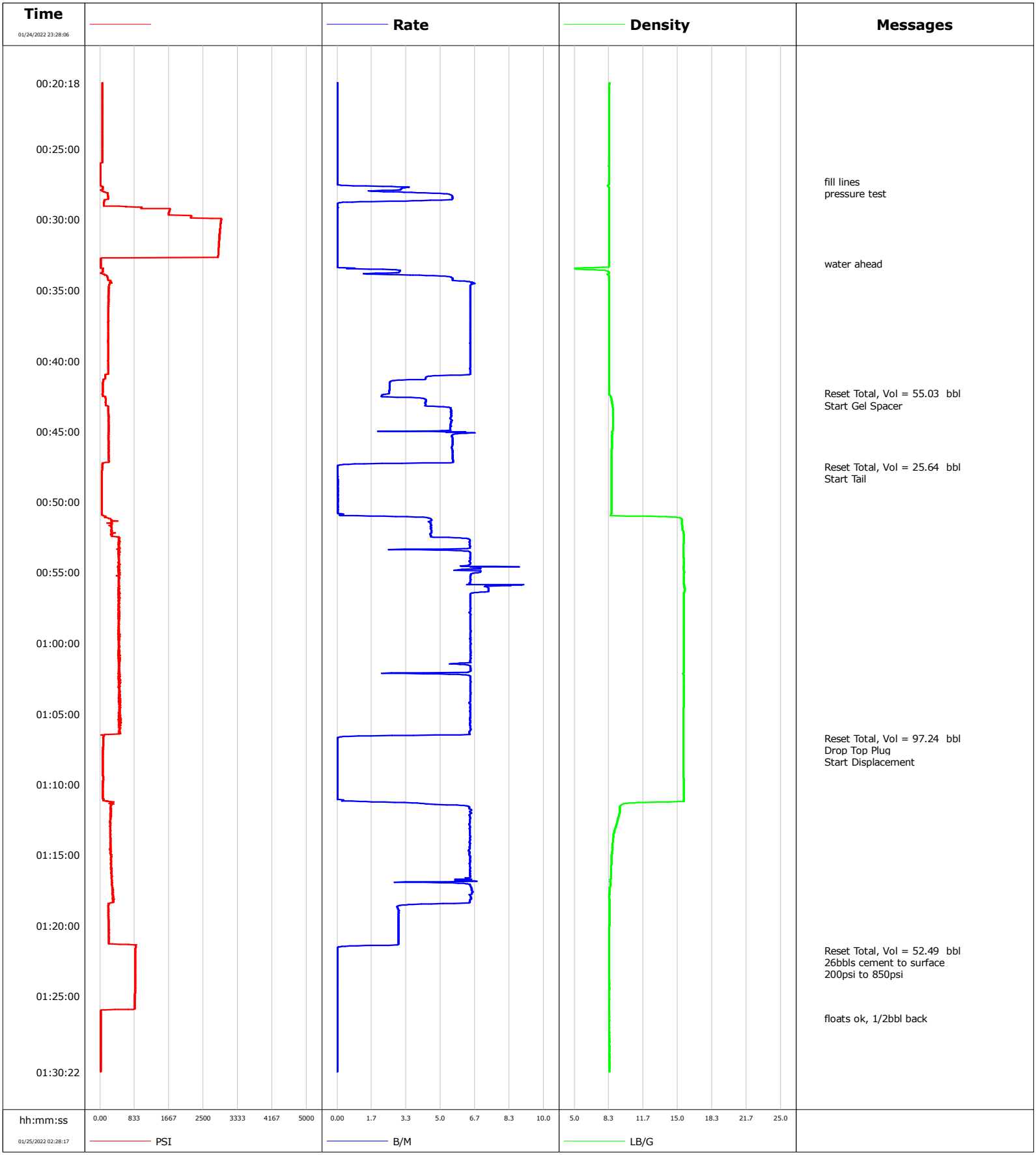
Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	Betty Schaffer	**Client**	SWN
Field		**SIR No.**	EN82-03016
Engineer	Barry Dickerson	**Job Type**	Surface
Country	United States	**Job Date**	01-25-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-03016

Well	Location (legal)	Schlumberger Location	Job Start
Betty Schaffer 3H		SOH	Jan/24/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	0 deg	17.5 in	386.0 ft	386.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	WV	psi	64 degF	80 degF	lb/gal

Well Master	API/UWI
0066459737	47-051-02417-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	Surface

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

25bbls gel spacer
95bbls Tail@15.6ppg,444sks,y=1.2,Class A
drop top plug
Displace 52bbls water

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
376.0	13.4	54.5	J55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	52.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	59.0 bbl	62.0 bbl	25.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
[X]	[ ]

Lift Pressure	Pipe Rotated	Pipe Reciprocated
200 psi	[ ]	[ ]

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Jan/24/2022 16:00	Jan/24/2022 16:00	Jan/25/2022 02:00

Casing Tools

Shoe Type	Guide
Shoe Depth	376.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	334.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
01/24/2022	23:28:06	-1	0.0	0.01	0.0	Started Acquisition
01/24/2022	23:31:46	0	0.0	0.01	0.0	
01/24/2022	23:35:26	1	0.0	0.01	0.0	
01/24/2022	23:39:06	0	0.0	0.01	0.0	
01/24/2022	23:42:46	1	0.0	0.01	0.0	
01/24/2022	23:46:26	0	0.0	0.01	0.0	
01/24/2022	23:50:06	0	0.0	0.01	0.0	
01/24/2022	23:53:46	1	0.0	0.01	0.0	
01/24/2022	23:57:26	0	0.0	0.01	0.0	
01/25/2022	00:01:06	0	0.0	0.01	0.0	
01/25/2022	00:04:46	0	0.0	0.01	0.0	
01/25/2022	00:08:26	0	0.0	0.01	0.0	
01/25/2022	00:12:06	149	0.0	8.46	3.4	
01/25/2022	00:15:46	73	0.0	8.38	9.4	
01/25/2022	00:19:26	57	0.0	8.37	9.5	
01/25/2022	00:23:06	51	0.0	8.37	9.6	
01/25/2022	00:26:46	5	0.0	8.38	9.6	
01/25/2022	00:27:17	5	0.0	8.38	9.6	fill lines
01/25/2022	00:27:18	5	0.0	8.38	9.6	pressure test
01/25/2022	00:30:26	2912	0.0	8.38	14.2	
01/25/2022	00:33:07	22	0.0	8.38	14.2	water ahead

Well	Field	Job Start	Customer	Job Number
Betty Schaffer 3H		Jan/24/2022	SWN	EN82-03016

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
01/25/2022	00:37:46	193	6.4	8.38	39.8	
01/25/2022	00:41:26	74	2.6	8.37	62.4	
01/25/2022	00:42:19	62	2.5	8.37	64.6	Reset Total, Vol = 55.03 bbl
01/25/2022	00:42:23	59	2.2	8.38	64.8	Start Gel Spacer
01/25/2022	00:45:06	206	6.7	8.64	78.1	
01/25/2022	00:47:31	51	0.0	8.58	90.2	Reset Total, Vol = 25.64 bbl
01/25/2022	00:48:00	46	0.0	8.59	90.2	Start Tail
01/25/2022	00:48:46	45	0.0	8.59	90.3	
01/25/2022	00:52:26	285	4.5	15.58	96.8	
01/25/2022	00:56:06	463	7.3	15.67	120.4	
01/25/2022	00:59:46	446	6.5	15.58	144.3	
01/25/2022	01:03:26	487	6.4	15.60	167.6	
01/25/2022	01:06:43	79	0.0	15.56	187.5	Reset Total, Vol = 97.24 bbl
01/25/2022	01:06:46	78	0.0	15.55	187.5	Drop Top Plug
01/25/2022	01:06:53	76	0.0	15.56	187.5	Start Displacement
01/25/2022	01:07:06	74	0.0	15.55	187.5	
01/25/2022	01:10:46	71	0.0	15.59	187.5	
01/25/2022	01:14:26	255	6.4	8.68	207.6	
01/25/2022	01:18:06	306	6.5	8.38	230.9	
01/25/2022	01:21:45	855	0.0	8.38	242.0	Reset Total, Vol = 52.49 bbl
01/25/2022	01:21:46	855	0.0	8.38	242.0	
01/25/2022	01:21:48	855	0.0	8.38	242.0	26bbls cement to surface
01/25/2022	01:21:49	855	0.0	8.38	242.0	200psi to 850psi
01/25/2022	01:25:26	844	0.0	8.38	242.0	
01/25/2022	01:26:35	19	0.0	8.38	242.0	floats ok, 1/2bbl back
01/25/2022	01:29:06	17	0.0	8.38	242.0	
01/25/2022	01:32:46	17	0.0	8.38	242.0	
01/25/2022	01:36:26	17	0.0	8.38	242.0	
01/25/2022	01:40:06	17	0.9	8.32	243.0	
01/25/2022	01:43:46	269	0.0	8.52	248.0	
01/25/2022	01:47:26	294	8.3	8.44	274.1	
01/25/2022	01:51:06	298	8.3	8.42	304.6	
01/25/2022	01:54:46	29	0.0	8.38	327.3	
01/25/2022	01:58:26	28	0.0	5.62	327.4	
01/25/2022	02:02:06	20	0.0	0.03	328.7	
01/25/2022	02:05:46	15	0.0	0.03	328.7	
01/25/2022	02:09:26	15	0.0	0.03	328.7	
01/25/2022	02:13:06	15	0.0	0.03	328.7	
01/25/2022	02:16:46	15	0.0	0.02	328.7	
01/25/2022	02:20:26	16	0.0	0.02	328.7	
01/25/2022	02:24:06	15	0.0	0.02	328.7	
01/25/2022	02:27:46	16	0.0	0.02	328.7	

Well	Field	Job Start	Customer	Job Number
Betty Schaffer 3H		Jan/24/2022	SWN	EN82-03016

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.8			5.6	95.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
2935	16	182	850			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp				
%	95.0 bbl	52.0 bbl	68 degF	Cement Circulated to Surface?	X	Volume	26.0 bbl
				Washed Thru Perfs		To	ft

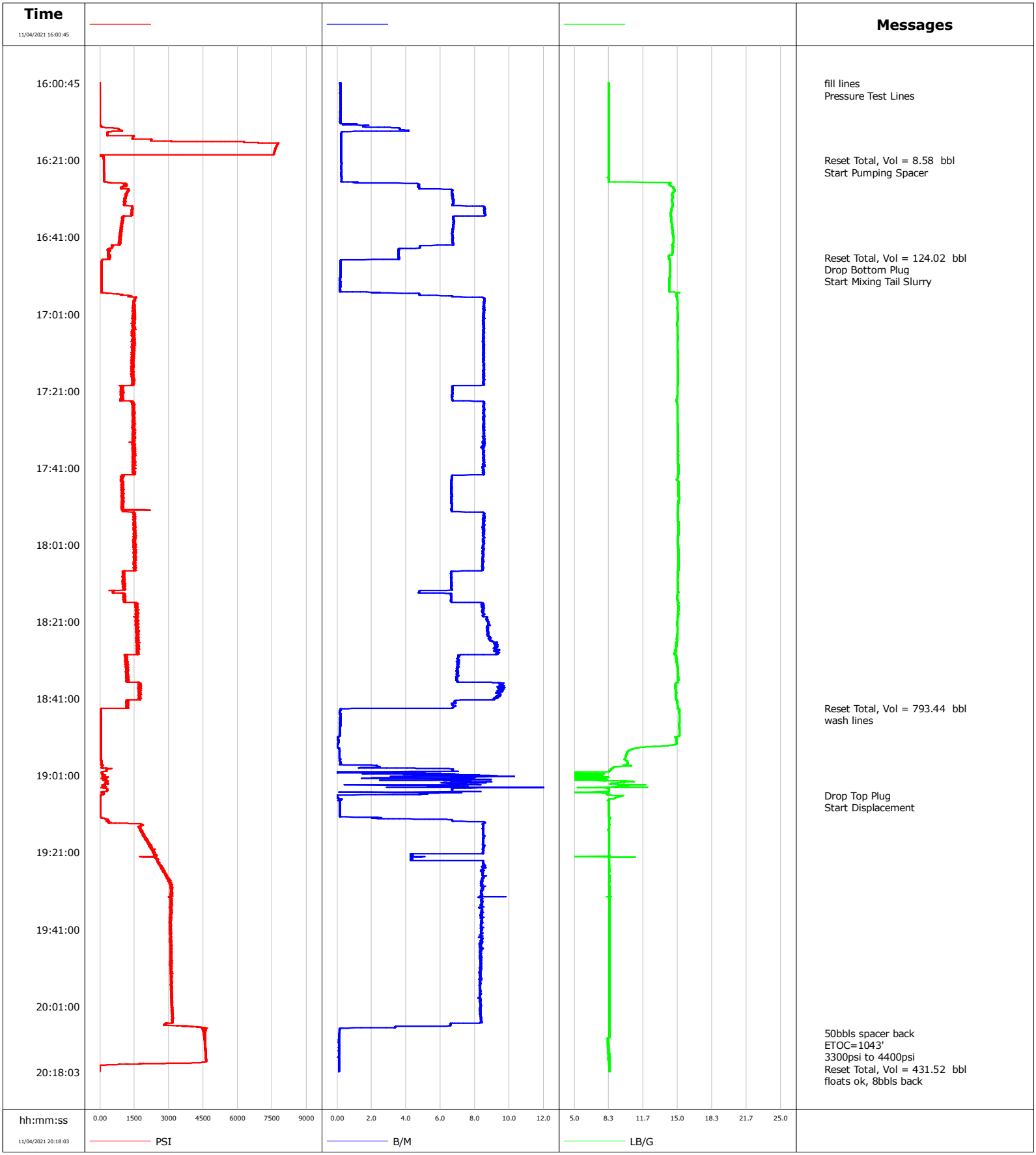
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost		Job Completed	
	Barry Dickerson	-		-	

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	Brian Teslovich	**Client**	SWN
Field		**SIR No.**	EN82-01297
Engineer	Barry DIckerson	**Job Type**	Production
Country	United States	**Job Date**	11-04-2021



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-01297

Well	Location (legal)	Schlumberger Location	Job Start
Brian Teslovich 5		SOH	Nov/04/2021

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	deg	8.5 in	19487.0 ft	5787.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Brooke	WV	psi	121 degF	121 degF	lb/gal

Well Master	API/UWI
0066091964	47-009-00317-00-00

Rig Name	Drilled For	Service Via
SDC 40	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
Bentonite	13.45 lb/gal	cP

Service Line	Job Type
Cementing	Production

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	CRT

Service Instructions

Pressure Test 1000psi/7000psi
120bbls MPE@14.5ppg, w/B553@0.05 gal/bbl
Drop Bottom Plug
783bbls Tail@15.0ppg,3410sks,Y=1.29,ClassA
Wash Lines/Drop Top Plug
Displace 431bbls, 100 lbs sugar 1st 20bbls
M300@0.08gal/bbl,L064@0.02gal/bbl

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
19487.0	5.5	20.0	P110	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	431.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	432.0 bbl	821.0 bbl	743.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
3300 psi		

No. Centralizers	Top Plugs	Bottom Plugs
	1	1

Cement Head Type
CRT

Job Scheduled For	Arrived on Location	Leave Location
Nov/04/2021 14:00	Nov/04/2021 14:00	Nov/04/2021 21:00

Casing Tools

Shoe Type	Guide
Shoe Depth	19487.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	19418.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
11/04/2021	16:00:45	-13	0.2	8.32	0.0	Started Acquisition
11/04/2021	16:00:57	-13	0.2	8.32	0.0	fill lines
11/04/2021	16:00:59	-13	0.2	8.32	0.0	Pressure Test Lines
11/04/2021	16:02:45	-13	0.2	8.32	0.4	
11/04/2021	16:04:45	-13	0.2	8.32	0.7	
11/04/2021	16:06:45	-13	0.2	8.33	1.1	
11/04/2021	16:08:45	-13	0.2	8.33	1.4	
11/04/2021	16:10:45	-13	0.2	8.33	1.7	
11/04/2021	16:12:45	803	3.6	8.33	4.4	
11/04/2021	16:14:45	1451	0.2	8.33	7.3	
11/04/2021	16:16:45	7732	0.2	8.33	7.7	
11/04/2021	16:18:45	7589	0.2	8.32	8.1	
11/04/2021	16:20:45	153	0.2	8.32	8.6	
11/04/2021	16:20:53	154	0.2	8.32	8.6	Reset Total, Vol = 8.58 bbl
11/04/2021	16:20:56	154	0.2	8.32	0.0	Start Pumping Spacer
11/04/2021	16:22:45	166	0.2	8.32	0.4	
11/04/2021	16:24:45	175	0.2	8.32	0.9	
11/04/2021	16:26:45	385	0.9	14.28	1.5	
11/04/2021	16:28:45	1204	6.7	14.66	11.1	
11/04/2021	16:30:45	1121	6.7	14.52	24.5	
11/04/2021	16:32:45	1053	6.7	14.50	37.9	

Well	Field	Job Start	Customer	Job Number
Brian Teslovich 5		Nov/04/2021	SWN	EN82-01297

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
11/04/2021	16:36:45	1007	6.8	14.37	69.5	
11/04/2021	16:38:45	928	6.7	14.46	83.0	
11/04/2021	16:40:45	905	6.7	14.57	96.4	
11/04/2021	16:44:45	328	3.5	14.49	118.9	
11/04/2021	16:46:11	420	3.6	14.14	124.0	Reset Total, Vol = 124.02 bbl
11/04/2021	16:46:13	455	3.6	14.14	0.1	Drop Bottom Plug
11/04/2021	16:46:14	394	3.6	14.14	0.2	Start Mixing Tail Slurry
11/04/2021	16:46:45	255	2.7	14.15	2.0	
11/04/2021	16:48:45	49	0.2	14.26	2.5	
11/04/2021	16:50:45	49	0.2	14.26	2.8	
11/04/2021	16:52:45	48	0.2	14.19	3.2	
11/04/2021	16:54:45	55	0.2	14.15	3.5	
11/04/2021	16:56:45	1534	8.5	14.93	11.8	
11/04/2021	16:58:45	1450	8.5	14.96	28.8	
11/04/2021	17:00:45	1458	8.5	15.00	45.9	
11/04/2021	17:02:45	1496	8.5	14.98	62.9	
11/04/2021	17:04:45	1458	8.5	14.96	79.9	
11/04/2021	17:06:45	1441	8.5	15.02	96.9	
11/04/2021	17:08:45	1489	8.5	14.98	113.8	
11/04/2021	17:10:45	1469	8.5	15.01	130.8	
11/04/2021	17:12:45	1422	8.5	15.01	147.8	
11/04/2021	17:14:45	1364	8.5	15.03	164.8	
11/04/2021	17:16:45	1441	8.5	15.01	181.8	
11/04/2021	17:18:45	1443	8.5	15.00	198.8	
11/04/2021	17:20:45	925	6.7	14.99	213.6	
11/04/2021	17:22:45	946	6.7	14.95	226.9	
11/04/2021	17:24:45	1427	8.5	14.97	242.5	
11/04/2021	17:26:45	1439	8.5	14.99	259.5	
11/04/2021	17:28:45	1452	8.5	14.99	276.5	
11/04/2021	17:30:45	1516	8.5	15.03	293.5	
11/04/2021	17:32:45	1488	8.4	15.03	310.5	
11/04/2021	17:34:45	1416	8.5	15.04	327.5	
11/04/2021	17:36:45	1479	8.5	15.04	344.5	
11/04/2021	17:38:45	1425	8.5	15.03	361.5	
11/04/2021	17:40:45	1468	8.5	15.07	378.5	
11/04/2021	17:42:45	1440	8.5	15.06	395.5	
11/04/2021	17:44:45	948	6.6	15.07	408.8	
11/04/2021	17:46:45	956	6.6	15.06	422.1	
11/04/2021	17:48:45	976	6.6	15.13	435.4	
11/04/2021	17:50:45	972	6.7	15.02	448.6	
11/04/2021	17:52:45	1461	8.5	15.02	462.5	
11/04/2021	17:54:45	1498	8.6	15.04	479.6	
11/04/2021	17:56:45	1505	8.5	15.06	496.6	
11/04/2021	17:58:45	1458	8.5	15.02	513.5	
11/04/2021	18:00:45	1495	8.5	15.04	530.5	
11/04/2021	18:02:45	1486	8.5	15.07	547.5	
11/04/2021	18:04:45	1515	8.4	15.07	564.4	
11/04/2021	18:06:45	1483	8.5	15.07	581.3	
11/04/2021	18:08:45	1078	6.6	15.01	596.4	
11/04/2021	18:10:45	1056	6.6	15.01	609.6	
11/04/2021	18:12:45	1079	6.7	15.03	622.9	
11/04/2021	18:14:45	1061	6.6	14.94	634.8	
11/04/2021	18:18:45	1580	8.5	15.05	666.5	
11/04/2021	18:20:45	1629	8.7	14.96	683.7	

Well	Field	Job Start	Customer	Job Number
Brian Teslovich 5		Nov/04/2021	SWN	EN82-01297

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
11/04/2021	18:24:45	1653	8.8	14.94	718.7	
11/04/2021	18:26:45	1657	9.1	14.89	736.6	
11/04/2021	18:28:45	1655	9.2	14.77	755.1	
11/04/2021	18:30:45	1199	7.0	14.87	770.9	
11/04/2021	18:32:45	1194	7.1	14.97	784.9	
11/04/2021	18:34:45	1206	7.0	15.04	798.9	
11/04/2021	18:36:45	1686	8.8	15.00	812.9	
11/04/2021	18:38:45	1712	9.5	14.82	831.9	
11/04/2021	18:40:45	1717	9.2	14.83	850.7	
11/04/2021	18:42:45	1243	6.8	14.98	865.7	
11/04/2021	18:43:27	1259	6.7	15.01	870.4	Reset Total, Vol = 793.44 bbl
11/04/2021	18:43:34	45	0.6	14.98	0.4	wash lines
11/04/2021	18:44:45	27	0.1	15.14	0.6	
11/04/2021	18:46:45	29	0.2	15.14	0.9	
11/04/2021	18:48:45	30	0.2	15.14	1.3	
11/04/2021	18:50:45	31	0.1	15.04	1.6	
11/04/2021	18:52:45	32	0.1	14.87	1.7	
11/04/2021	18:54:45	31	0.1	10.16	1.8	
11/04/2021	18:56:45	27	0.2	9.82	2.1	
11/04/2021	18:58:45	73	2.5	8.90	3.5	
11/04/2021	19:00:45	122	5.4	3.08	12.5	
11/04/2021	19:02:45	266	7.5	9.61	25.8	
11/04/2021	19:04:45	313	6.7	8.32	39.4	
11/04/2021	19:06:14	22	0.0	9.74	0.0	Drop Top Plug
11/04/2021	19:06:16	21	0.0	9.68	0.0	Start Displacement
11/04/2021	19:06:45	13	0.0	9.01	0.0	
11/04/2021	19:08:45	7	0.1	8.33	0.3	
11/04/2021	19:10:45	5	0.1	8.33	0.6	
11/04/2021	19:12:45	294	6.7	8.34	5.0	
11/04/2021	19:14:45	1744	8.4	8.35	21.6	
11/04/2021	19:16:45	1887	8.5	8.35	38.6	
11/04/2021	19:18:45	2154	8.5	8.35	55.5	
11/04/2021	19:20:45	2374	8.5	8.36	72.5	
11/04/2021	19:22:45	2552	4.3	8.36	83.5	
11/04/2021	19:24:45	2635	8.4	8.38	98.8	
11/04/2021	19:26:45	2899	8.4	8.38	115.8	
11/04/2021	19:28:45	3079	8.4	8.38	132.7	
11/04/2021	19:30:45	3111	8.4	8.38	149.5	
11/04/2021	19:32:45	3082	8.4	8.38	166.3	
11/04/2021	19:34:45	3099	8.4	8.39	183.1	
11/04/2021	19:36:45	3114	8.3	8.39	199.9	
11/04/2021	19:38:45	3076	8.4	8.39	216.6	
11/04/2021	19:40:45	3058	8.3	8.38	233.4	
11/04/2021	19:42:45	3078	8.4	8.39	250.1	
11/04/2021	19:44:45	3061	8.3	8.39	266.9	
11/04/2021	19:46:45	3054	8.3	8.39	283.5	
11/04/2021	19:48:45	3058	8.3	8.39	300.2	
11/04/2021	19:50:45	3085	8.3	8.39	316.8	
11/04/2021	19:52:45	3123	8.3	8.39	333.4	
11/04/2021	19:54:45	3092	8.3	8.40	350.1	
11/04/2021	19:56:45	3138	8.3	8.40	366.6	
11/04/2021	19:58:45	3132	8.3	8.40	383.2	
11/04/2021	20:00:45	3125	8.3	8.40	399.8	
11/04/2021	20:02:45	3159	8.3	8.40	416.5	

Well	Field	Job Start	Customer	Job Number
Brian Teslovich 5		Nov/04/2021	SWN	EN82-01297

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
11/04/2021	20:06:45	4446	0.2	8.41	445.1	
11/04/2021	20:07:58	4511	0.1	8.41	445.3	50bbls spacer back
11/04/2021	20:08:11	4588	0.1	8.40	445.3	ETOC=1043'
11/04/2021	20:08:30	4518	0.1	8.40	445.3	3300psi to 4400psi
11/04/2021	20:08:45	4537	0.1	8.40	445.4	
11/04/2021	20:10:20	4581	0.1	8.31	445.5	Reset Total, Vol = 431.52 bbl
11/04/2021	20:10:45	4580	0.1	8.25	0.0	
11/04/2021	20:12:45	4593	0.1	8.32	0.2	
11/04/2021	20:14:45	4607	0.1	8.40	0.4	
11/04/2021	20:16:45	-31	0.1	8.40	0.6	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
6.8			8.6	783.0	0.0	120.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
7767	-23	1625	4400			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	783.0 bbl	431.0 bbl	66 degF	☐	bbl
				Washed Thru Perfs ☐	To ft

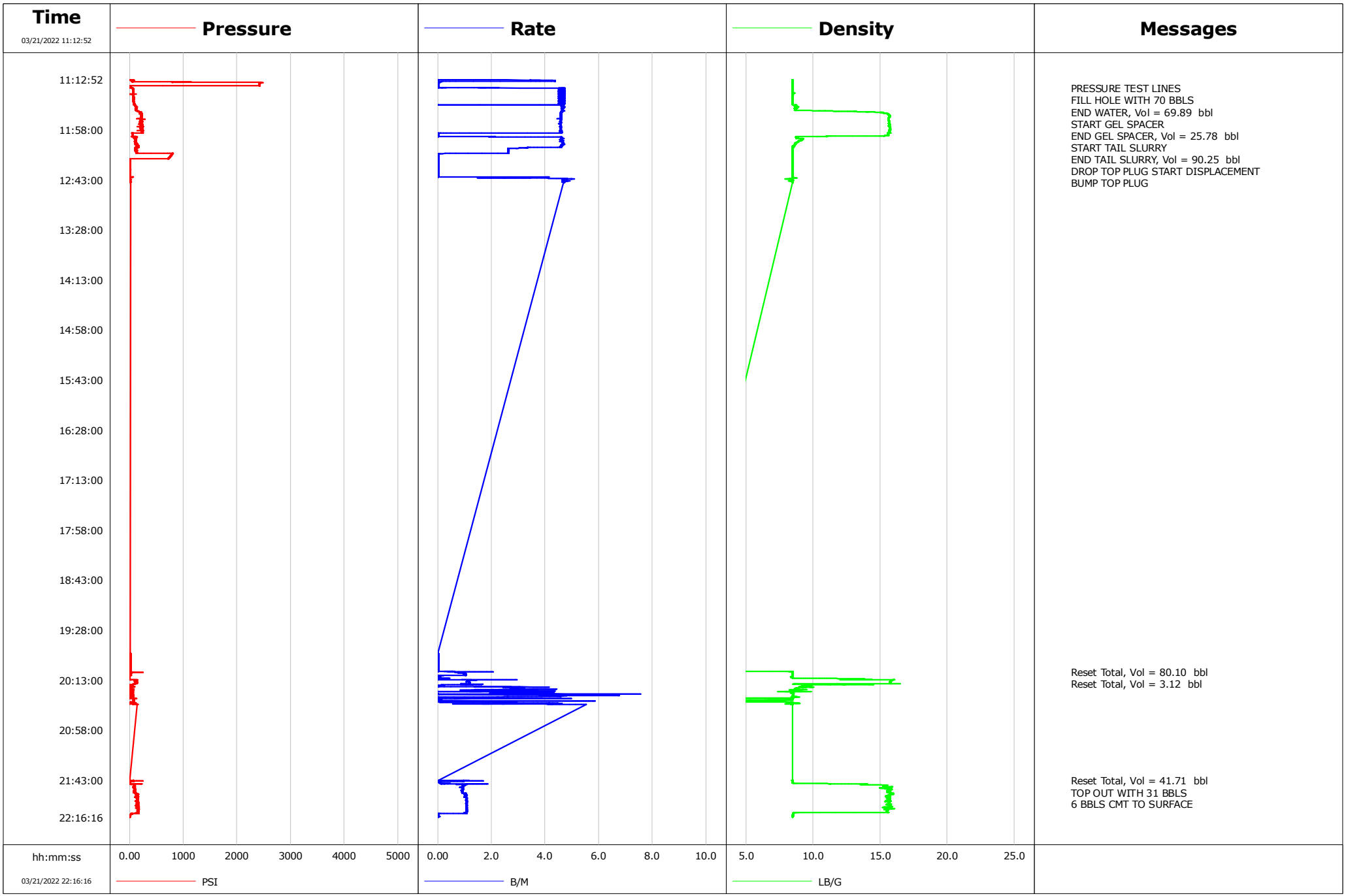
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Barry DIckerson	-	-

Schlumberger

Cementing Job Report

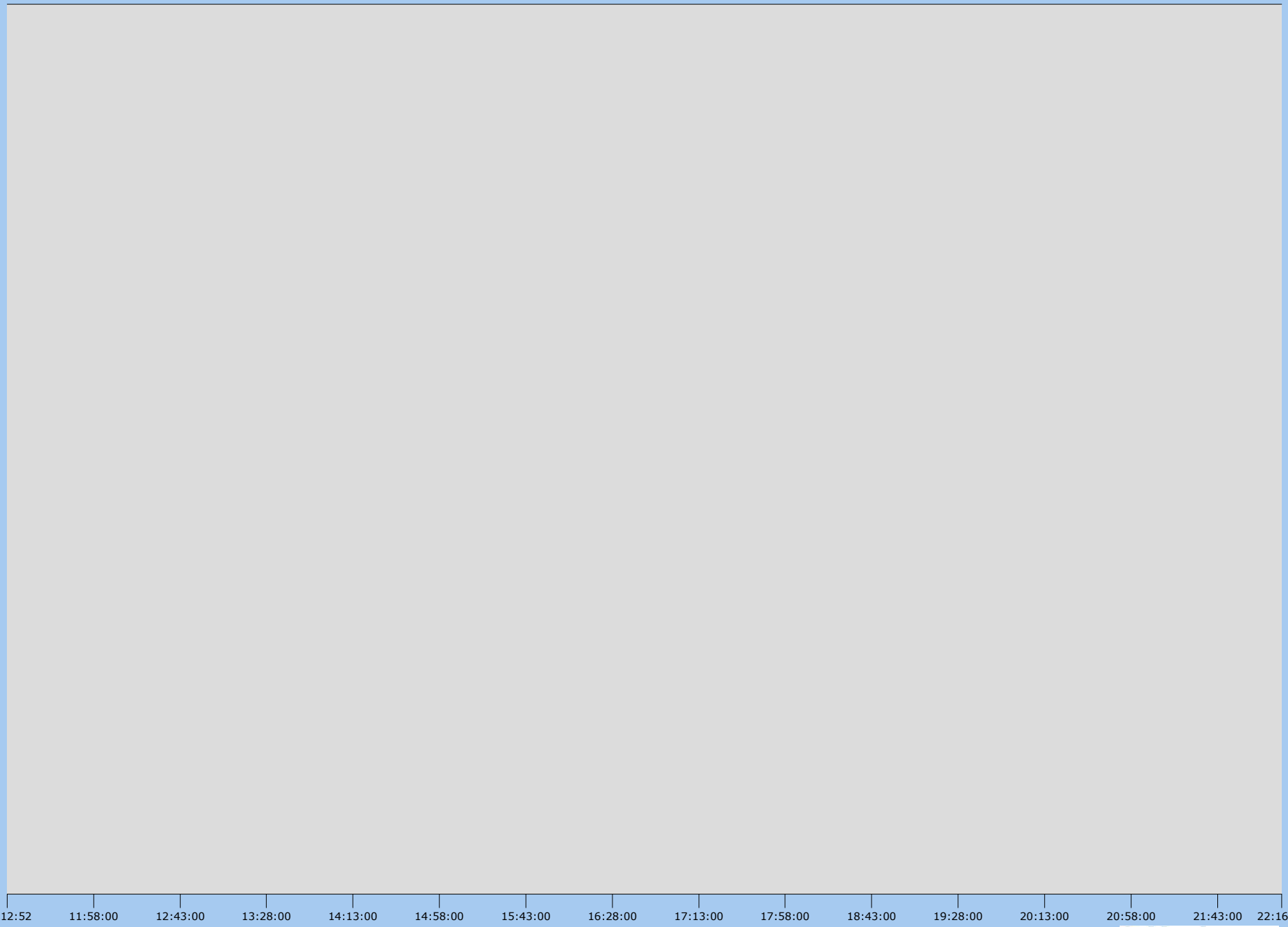
CemCAT v1.7

Well	CHARLES JAMISON MSH 410H	**Client**	SWN
Field	CAMERON-GARNER	**SIR No.**	EN82-03974
Engineer	JOSHUA NEDROW	**Job Type**	SURFACE
Country	UNITED STATES	**Job Date**	3/21/2022



Cementing

PRD Post Job Plot



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Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-03974

Well	Location (legal)	Schlumberger Location	Job Start
CHARLES JAMISON MSH 410H 410H	CHARLES JAMISON PAD	STRASBURG	Mar/21/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
CAMERON-GARNER	Dirty-Sandstone	0 deg	17.5 in	407.0 ft	407.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHALL	WEST VIRGINIA	psi	80 degF	64 degF	lb/gal
Well Master 0066462174	**API/UWI** 47-051-02425-00-00				

Rig Name	Drilled For	Service Via
SDC 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	SURFACE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

FILL LINES/PRESSURE TEST
FILL HOLE WITH 70 BBLS FRESH WATER
PUMP 25 BBLS GEL SPACER
PUMP 90 BBLS TAIL CEMENT @ 15.6 PPG
SKS 411 YLD 1.2
DROP TOP PLUG
DISPLACE 56 BBLS FRESH WATER
FLOATS NOT HOLDING.
TOPPED OUT WITH 31 BBLS CLASS A NEAT
6 BBLS CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
407.0	13.4	54.5	110	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	55.6 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	63.4 bbl	24.6 bbl	33.5 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
150 psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
5	1	0

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Mar/21/2022 00:00	Mar/21/2022 00:00	Mar/21/2022 23:00

Casing Tools

Shoe Type	Guide
Shoe Depth	407.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	362.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/21/2022	11:12:52	7	0.0	8.49	0.0	End Job
03/21/2022	11:20:31	52	4.7	8.49	6.1	PRESSURE TEST LINES
03/21/2022	11:23:00	61	4.6	8.49	17.6	FILL HOLE WITH 70 BBLS
03/21/2022	11:35:37	86	0.0	8.47	76.1	END WATER, Vol = 69.89 bbl
03/21/2022	11:36:00	98	4.6	8.72	77.1	START GEL SPACER
03/21/2022	11:41:19	150	4.6	11.76	101.8	END GEL SPACER, Vol = 25.78 bbl
03/21/2022	11:42:00	199	4.6	14.19	104.9	START TAIL SLURRY
03/21/2022	12:03:53	49	0.0	11.09	192.1	END TAIL SLURRY, Vol = 90.25 bbl
03/21/2022	12:04:00	47	0.0	10.91	192.1	DROP TOP PLUG START DISPLACEMENT
03/21/2022	12:35:00	6	0.0	8.50	251.1	BUMP TOP PLUG
03/21/2022	20:05:28	22	1.0	8.47	272.2	Reset Total, Vol = 80.10 bbl
03/21/2022	20:09:08	-11	0.1	8.49	275.3	Reset Total, Vol = 3.12 bbl
03/21/2022	21:43:15	69	1.0	8.48	317.0	Reset Total, Vol = 41.71 bbl
03/21/2022	21:46:00	5	0.2	10.45	318.2	TOP OUT WITH 31 BBLS

Well	Field	Job Start	Customer	Job Number
CHARLES JAMISON MSH 410H 410H	CAMERON-GARNER	Mar/21/2022	SWN	EN82-03974

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
4.5			4.5	90.0		25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
2500	0	90	650			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	88.0 bbl	55.6 bbl	55 degF	X	6.0 bbl
				Washed Thru Perfs ☐	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
JEFF HILL	JOSHUA NEDROW	X	X
		-	-

Service Quality Evaluation

Client:	SWN
Field:	CAMERON-GARNER
Rig:	SDC 41
Well:	CHARLES JAMISON MSH 410H
Service Line:	Cementing
Job Type:	SURFACE

Service Order #:	
Date:	Mar/21/2022
Operating Time (hh:mm):	00:00
Client Rep:	JEFF HILL
Schlumberger Engineer:	JOSHUA NEDROW
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No		Result
1	**HSE**				
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** ☐	**no** ☒	0
1b	Free of environmental spill or non-compliant discharge	5	**yes** ☐	**no** ☒	0
1c	Wellsite left clean	4	**yes** ☐	**no** ☒	0
				Sub-total	0%
2	**Design / Preparation**				
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** ☐	**no** ☒	0
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** ☐	**no** ☒	0
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** ☐	**no** ☒	0
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** ☐	**no** ☒	0
				Sub-total	0%
3	**Execution**				
3a	Lost time < 30 mins	3	**yes** ☐	**no** ☒	0
3b	Equipment pressure tested succesfully	3	**yes** ☐	**no** ☒	0
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** ☐	**no** ☒	0
3d	Plugs / darts released and tested succesfully	2	**yes** ☐	**no** ☒	0
3e	Density variation met expectations	2	**yes** ☐	**no** ☒	0
3f	Personnel performed as per expectations	2	**yes** ☐	**no** ☒	0
3g	Equipment performed as per expectations	2	**yes** ☐	**no** ☒	0
3h	Job pumped as per design	3	**yes** ☐	**no** ☒	0
3i	Did job start on time	2	**yes** ☐	**no** ☒	0
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** ☐	**no** ☒	0
				Sub-total	0%
4	**Evaluation**				
4a	Main job objective achieved with no consequential non-productive time	10	**yes** ☐	**no** ☒	0
				Sub-total	0%

Total 0%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

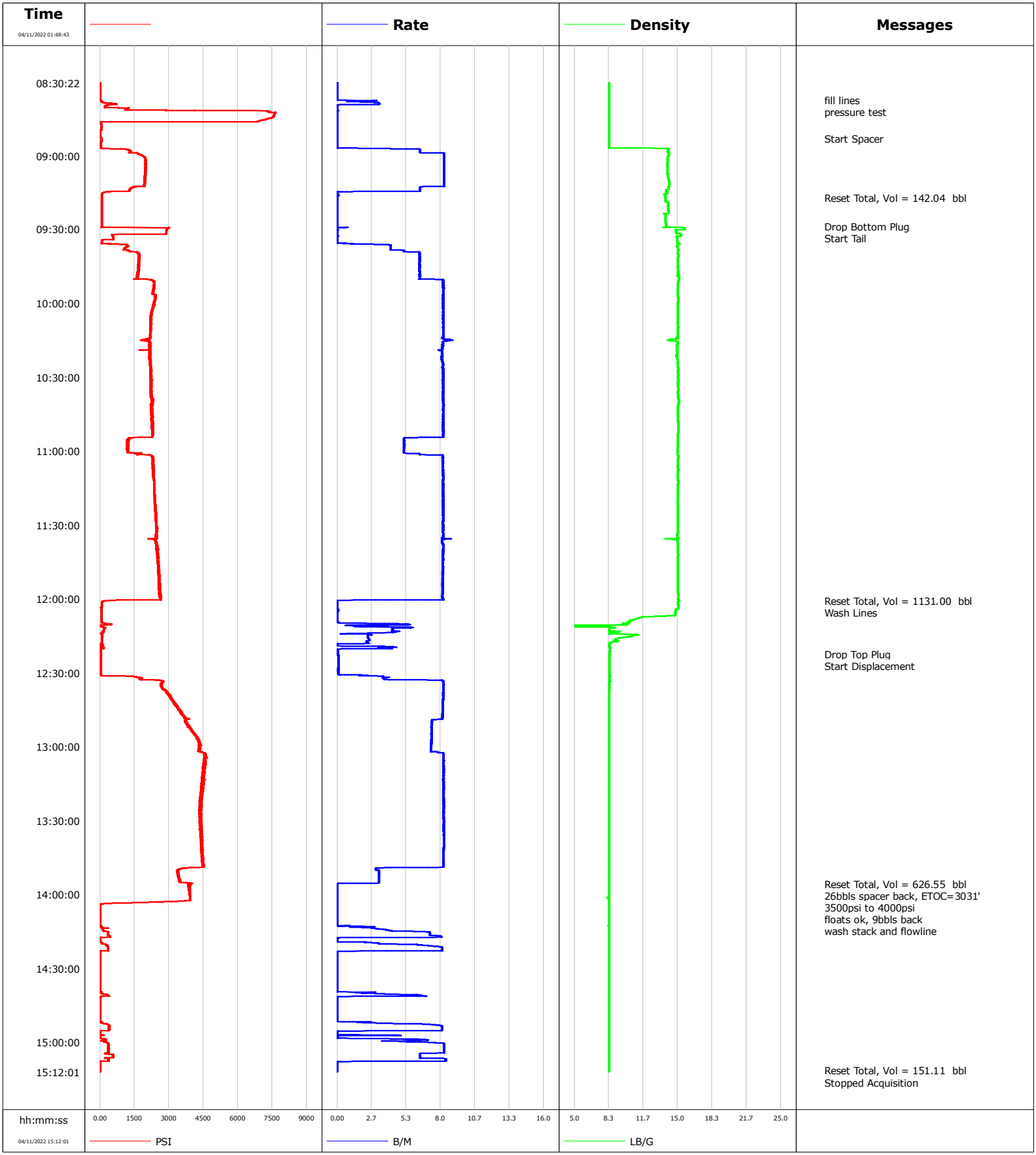
Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	Charles Jamison 410H	**Client**	SWN
Field		**SIR No.**	EN82-04337
Engineer	Barry Dickerson	**Job Type**	Production
Country	United States	**Job Date**	04-11-2022



Schlumberger Cementing Service Report

Customer	Job Number
SWN	EN82-04337

Well	Location (legal)	Schlumberger Location	Job Start
Charles Jamison 410H 410H		SOH	Apr/10/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
	Clean-Sandstone	90 deg	8.5 in	27375.0 ft	7413.0 ft

County	State/Province	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	WV	psi	142 degF	141 degF	lb/gal

Well Master	API/UWI
0066462174	47-051-02425-00-00

Rig Name	Drilled For	Service Via
SDC 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	New Well Completion

Drilling Fluid Type	Max. Density	Plastic Viscosity
Bentonite	13.80 lb/gal	cP

Service Line	Job Type
Cementing	Production

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	CRT

Service Instructions

150bbls MPE@13.9ppg, w/B553@0.05 gal/bbl
Drop Bottom Plug
1109bbls Tail@15.0ppg,4821sks,Y=1.29,ClassA
Wash Lines/Drop Top Plug
Displace 626bbls, 100 lbs sugar 1st 20bbls
M300@0.08gal/bbl,L064@0.02gal/bbl

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
4957.0	6.0	24.5	P110	BUTT
27375.0	5.5	20.0	P110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	626.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	627.0 bbl	1122.0 bbl	1006.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
3500 psi		

No. Centralizers	Top Plugs	Bottom Plugs
	1	1

Cement Head Type
CRT

Job Scheduled For	Arrived on Location	Leave Location
Apr/10/2022 23:00	Apr/10/2022 23:00	Apr/11/2022 16:00

Casing Tools

Shoe Type	Guide
Shoe Depth	27375.0 ft
Stage Tool Type	
Stage Tool Depth	ft
Collar Type	Float
Collar Depth	27327.0 ft

Squeeze Job

Squeeze Type	
Tool Type	
Tool Depth	ft
Tail Pipe Size	in
Tail Pipe Depth	ft
Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/11/2022	01:48:43	2	0.0	0.01	0.0	Started Acquisition
04/11/2022	01:52:23	2	0.0	0.01	0.0	
04/11/2022	01:56:03	3	0.0	0.01	0.0	
04/11/2022	01:59:43	3	0.0	0.01	0.0	
04/11/2022	02:03:23	3	0.0	0.01	0.0	
04/11/2022	02:07:03	3	0.0	0.01	0.0	
04/11/2022	02:10:43	223	5.2	8.35	3.4	
04/11/2022	02:14:23	5	0.0	8.35	9.5	
04/11/2022	02:18:03	6	0.0	8.36	9.6	
04/11/2022	02:21:43	6	0.0	8.36	9.6	
04/11/2022	02:25:23	6	0.0	8.36	9.6	
04/11/2022	02:29:03	5	0.0	8.35	9.6	
04/11/2022	02:32:43	6	0.0	8.35	9.6	
04/11/2022	02:36:23	5	0.0	8.35	9.7	
04/11/2022	02:40:03	5	0.0	8.35	9.7	
04/11/2022	02:43:43	6	0.0	8.35	9.7	
04/11/2022	02:47:23	6	0.0	8.35	9.7	
04/11/2022	02:51:03	7	0.0	8.35	9.7	
04/11/2022	02:54:43	7	0.0	8.35	9.7	
04/11/2022	02:58:23	6	0.0	8.36	9.7	
04/11/2022	03:02:03	6	0.0	8.36	9.7	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H		Apr/10/2022	SWN	EN82-04337

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/11/2022	03:09:23	7	0.0	8.35	9.7	
04/11/2022	03:13:03	6	0.0	8.36	9.7	
04/11/2022	03:16:43	6	0.0	8.36	9.8	
04/11/2022	03:20:23	6	0.0	8.36	9.8	
04/11/2022	03:24:03	6	0.0	8.36	9.9	
04/11/2022	03:27:43	7	0.0	8.36	9.9	
04/11/2022	03:31:23	7	0.0	8.36	10.0	
04/11/2022	03:35:03	7	0.0	8.36	10.1	
04/11/2022	03:38:43	7	0.0	8.36	10.2	
04/11/2022	03:42:23	7	0.0	8.36	10.2	
04/11/2022	03:46:03	7	0.0	8.35	10.3	
04/11/2022	03:49:43	7	0.0	8.36	10.4	
04/11/2022	03:53:23	7	0.0	8.36	10.5	
04/11/2022	03:57:03	7	0.0	8.36	10.6	
04/11/2022	04:00:43	7	0.0	8.35	10.7	
04/11/2022	04:04:23	7	0.0	8.36	10.9	
04/11/2022	04:08:03	7	0.0	8.36	11.0	
04/11/2022	04:11:43	6	0.0	8.36	11.1	
04/11/2022	04:15:23	7	0.0	8.36	11.3	
04/11/2022	04:19:03	7	0.0	8.36	11.4	
04/11/2022	04:22:43	6	0.0	8.36	11.5	
04/11/2022	04:26:23	7	0.0	8.36	11.7	
04/11/2022	04:30:03	7	0.0	8.36	11.8	
04/11/2022	04:33:43	6	0.0	8.36	11.9	
04/11/2022	04:37:23	7	0.0	8.36	12.0	
04/11/2022	04:41:03	7	0.0	8.36	12.2	
04/11/2022	04:44:43	6	0.0	8.35	12.3	
04/11/2022	04:48:23	7	0.0	8.35	12.4	
04/11/2022	04:52:03	7	0.0	8.36	12.5	
04/11/2022	04:59:23	7	0.0	8.36	12.8	
04/11/2022	05:03:03	6	0.0	8.35	12.9	
04/11/2022	05:06:43	7	0.0	8.36	13.0	
04/11/2022	05:10:23	6	0.0	8.36	13.1	
04/11/2022	05:14:03	7	0.0	8.36	13.2	
04/11/2022	05:17:43	6	0.0	8.36	13.3	
04/11/2022	05:21:23	6	0.0	8.36	13.4	
04/11/2022	05:25:03	7	0.0	8.36	13.6	
04/11/2022	05:28:43	7	0.0	8.36	13.7	
04/11/2022	05:32:23	7	0.0	8.36	13.8	
04/11/2022	05:36:03	6	0.0	8.36	13.9	
04/11/2022	05:39:43	6	0.0	8.36	14.0	
04/11/2022	05:43:23	6	0.0	8.36	14.1	
04/11/2022	05:47:03	7	0.0	8.36	14.2	
04/11/2022	05:50:43	24	0.0	8.36	22.6	
04/11/2022	05:54:23	23	0.0	8.36	22.6	
04/11/2022	05:58:03	22	0.0	8.36	22.6	
04/11/2022	06:01:43	21	0.0	8.36	22.6	
04/11/2022	06:05:23	21	0.0	8.36	22.6	
04/11/2022	06:09:03	20	0.0	8.36	22.6	
04/11/2022	06:12:43	21	0.0	8.36	22.6	
04/11/2022	06:16:23	20	0.0	8.35	22.6	
04/11/2022	06:20:03	19	0.0	8.35	22.6	
04/11/2022	06:23:43	19	0.0	8.36	22.7	
04/11/2022	06:27:23	19	0.0	8.36	22.7	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H		Apr/10/2022	SWN	EN82-04337

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/11/2022	06:34:43	19	0.0	8.35	22.7	
04/11/2022	06:38:23	18	0.0	8.36	22.7	
04/11/2022	06:42:03	19	0.0	8.35	22.7	
04/11/2022	06:45:43	19	0.0	8.35	22.7	
04/11/2022	06:49:23	19	0.0	8.35	22.7	
04/11/2022	06:53:03	19	0.0	8.35	22.7	
04/11/2022	07:00:23	17	0.0	8.36	22.7	
04/11/2022	07:04:03	18	0.0	8.35	22.7	
04/11/2022	07:07:43	17	0.0	8.35	22.7	
04/11/2022	07:11:23	17	0.0	8.36	22.7	
04/11/2022	07:15:03	17	0.0	8.36	22.7	
04/11/2022	07:18:43	17	0.0	8.36	22.7	
04/11/2022	07:22:23	17	0.0	8.36	22.7	
04/11/2022	07:26:03	17	0.0	8.35	22.7	
04/11/2022	07:29:43	17	0.0	8.36	22.7	
04/11/2022	07:33:23	17	0.0	8.36	22.7	
04/11/2022	07:37:03	17	0.0	8.36	22.7	
04/11/2022	07:40:43	16	0.0	8.36	22.7	
04/11/2022	07:44:23	17	0.0	8.36	22.7	
04/11/2022	07:48:03	16	0.0	8.36	22.7	
04/11/2022	07:51:43	16	0.0	8.36	22.7	
04/11/2022	07:55:23	16	0.0	8.36	22.7	
04/11/2022	07:59:03	16	0.0	8.36	22.7	
04/11/2022	08:02:43	5	0.0	8.36	22.7	
04/11/2022	08:06:23	5	0.0	8.36	22.7	
04/11/2022	08:10:03	5	0.0	8.36	22.7	
04/11/2022	08:13:43	5	0.0	8.36	22.7	
04/11/2022	08:17:23	5	0.0	8.35	22.7	
04/11/2022	08:21:03	5	0.0	8.35	22.7	
04/11/2022	08:24:43	5	0.0	8.35	22.7	
04/11/2022	08:28:23	4	0.0	8.35	22.7	
04/11/2022	08:32:03	4	0.0	8.35	22.7	
04/11/2022	08:35:43	5	0.0	8.35	22.7	
04/11/2022	08:37:26	5	0.0	8.35	22.7	fill lines
04/11/2022	08:39:23	375	0.1	8.35	27.2	
04/11/2022	08:43:03	7592	0.0	8.36	27.2	
04/11/2022	08:46:43	13	0.0	8.35	27.2	
04/11/2022	08:50:23	8	0.0	8.35	27.2	
04/11/2022	08:53:08	46	0.0	8.35	27.2	Start Spacer
04/11/2022	08:54:03	44	0.0	8.35	27.2	
04/11/2022	08:57:43	1267	6.4	14.14	31.2	
04/11/2022	09:01:23	1976	8.3	14.03	59.4	
04/11/2022	09:05:03	1975	8.3	13.99	89.7	
04/11/2022	09:08:43	1967	8.3	14.09	120.0	
04/11/2022	09:12:23	1913	8.3	14.16	150.4	
04/11/2022	09:16:03	77	0.1	13.81	164.7	
04/11/2022	09:17:04	74	0.0	13.82	164.7	Reset Total, Vol = 142.04 bbl
04/11/2022	09:19:43	73	0.0	14.06	164.7	
04/11/2022	09:23:23	74	0.0	14.12	164.7	
04/11/2022	09:27:03	75	0.0	13.83	164.7	
04/11/2022	09:28:48	75	0.0	13.86	164.7	Drop Bottom Plug
04/11/2022	09:28:49	76	0.0	13.85	164.7	Start Tail
04/11/2022	09:30:43	2883	0.0	14.82	164.9	
04/11/2022	09:34:23	74	0.0	14.94	164.9	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H		Apr/10/2022	SWN	EN82-04337

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/11/2022	09:41:43	1729	6.4	15.04	195.6	
04/11/2022	09:45:23	1694	6.4	15.01	219.0	
04/11/2022	09:49:03	1635	6.4	15.11	242.3	
04/11/2022	09:52:43	2362	8.3	15.03	270.3	
04/11/2022	09:56:23	2400	8.2	15.00	300.4	
04/11/2022	10:00:03	2351	8.2	15.04	330.4	
04/11/2022	10:03:43	2226	8.2	15.02	360.5	
04/11/2022	10:07:23	2209	8.2	15.04	390.6	
04/11/2022	10:11:03	2208	8.2	14.99	420.7	
04/11/2022	10:14:43	2080	8.5	14.22	450.8	
04/11/2022	10:18:23	2162	8.1	14.95	481.0	
04/11/2022	10:22:03	2176	8.1	14.95	510.7	
04/11/2022	10:25:43	2176	8.2	15.04	540.6	
04/11/2022	10:29:23	2204	8.2	15.04	570.6	
04/11/2022	10:33:03	2206	8.2	15.04	600.7	
04/11/2022	10:36:43	2216	8.2	15.03	630.8	
04/11/2022	10:40:23	2271	8.2	15.11	660.8	
04/11/2022	10:44:03	2237	8.2	15.02	690.9	
04/11/2022	10:47:43	2305	8.2	15.03	721.0	
04/11/2022	10:51:23	2260	8.2	15.05	751.1	
04/11/2022	10:55:03	1255	5.2	15.02	779.2	
04/11/2022	10:58:43	1187	5.2	14.99	798.2	
04/11/2022	11:02:23	2280	8.2	15.07	820.5	
04/11/2022	11:06:03	2325	8.2	15.03	850.5	
04/11/2022	11:09:43	2314	8.2	15.00	880.5	
04/11/2022	11:13:23	2351	8.2	15.04	910.6	
04/11/2022	11:17:03	2363	8.2	15.02	940.6	
04/11/2022	11:20:43	2388	8.2	14.99	970.7	
04/11/2022	11:24:23	2404	8.2	15.00	1000.7	
04/11/2022	11:28:03	2434	8.2	15.02	1030.8	
04/11/2022	11:31:43	2462	8.2	15.02	1060.8	
04/11/2022	11:35:23	2437	8.1	15.13	1090.9	
04/11/2022	11:39:03	2475	8.2	15.03	1120.8	
04/11/2022	11:42:43	2507	8.2	15.04	1150.9	
04/11/2022	11:46:23	2527	8.2	15.01	1180.9	
04/11/2022	11:50:03	2545	8.2	15.03	1210.9	
04/11/2022	11:53:43	2572	8.2	15.03	1240.8	
04/11/2022	11:57:23	2633	8.2	15.03	1270.7	
04/11/2022	12:00:45	253	0.0	15.14	1295.7	Reset Total, Vol = 1131.00 bbl
04/11/2022	12:00:49	197	0.0	15.14	1295.7	Wash Lines
04/11/2022	12:01:03	94	0.0	15.08	1295.7	
04/11/2022	12:04:43	62	0.1	14.78	1295.7	
04/11/2022	12:08:23	60	0.0	10.78	1295.8	
04/11/2022	12:12:03	168	4.3	8.41	1304.6	
04/11/2022	12:15:43	81	2.4	9.57	1316.5	
04/11/2022	12:19:23	116	3.7	8.37	1323.1	
04/11/2022	12:22:19	38	0.1	8.42	1326.6	Drop Top Plug
04/11/2022	12:22:22	38	0.1	8.42	1326.6	Start Displacement
04/11/2022	12:23:03	38	0.1	8.42	1326.6	
04/11/2022	12:26:43	38	0.1	8.41	1326.9	
04/11/2022	12:30:23	39	0.1	8.41	1327.2	
04/11/2022	12:34:03	2710	8.2	8.40	1343.5	
04/11/2022	12:37:43	2925	8.2	8.37	1373.6	
04/11/2022	12:45:03	3434	8.2	8.36	1433.7	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H		Apr/10/2022	SWN	EN82-04337

Date	Time 24-hr clock	CMT_TREAT_PRES PSI	CMT_RATE B/M	CMT_DENS LB/G	Volume BBL	Message
04/11/2022	12:52:23	3927	7.3	8.36	1490.5	
04/11/2022	12:56:03	4210	7.3	8.36	1517.3	
04/11/2022	12:59:43	4327	7.3	8.36	1544.0	
04/11/2022	13:03:23	4562	8.2	8.36	1571.7	
04/11/2022	13:07:03	4560	8.2	8.36	1601.8	
04/11/2022	13:10:43	4551	8.2	8.36	1632.0	
04/11/2022	13:14:23	4460	8.2	8.36	1662.2	
04/11/2022	13:18:03	4434	8.2	8.36	1692.3	
04/11/2022	13:21:43	4417	8.2	8.36	1722.5	
04/11/2022	13:25:23	4394	8.2	8.36	1752.7	
04/11/2022	13:29:03	4399	8.2	8.36	1782.8	
04/11/2022	13:32:43	4357	8.2	8.36	1813.0	
04/11/2022	13:36:23	4397	8.2	8.36	1843.2	
04/11/2022	13:40:03	4436	8.2	8.36	1873.4	
04/11/2022	13:43:43	4431	8.2	8.36	1903.6	
04/11/2022	13:47:23	4497	8.2	8.36	1933.7	
04/11/2022	13:51:03	3373	3.2	8.36	1953.6	
04/11/2022	13:54:43	3461	3.2	8.36	1965.5	
04/11/2022	13:55:44	3968	0.0	8.36	1967.8	Reset Total, Vol = 626.55 bbl
04/11/2022	13:55:46	3895	0.0	8.36	1967.8	26bbls spacer back, ETOC=3031'
04/11/2022	13:55:49	3852	0.0	8.36	1967.8	3500psi to 4000psi
04/11/2022	13:58:23	3874	0.0	8.36	1967.8	
04/11/2022	14:02:03	3916	0.0	8.33	1967.8	
04/11/2022	14:05:34	15	0.0	8.35	1967.8	floats ok, 9bbls back
04/11/2022	14:05:35	13	0.0	8.35	1967.8	wash stack and flowline
04/11/2022	14:05:43	14	0.0	8.35	1967.8	
04/11/2022	14:09:23	13	0.0	8.35	1967.8	
04/11/2022	14:13:03	73	2.9	8.36	1968.2	
04/11/2022	14:16:43	393	7.6	8.35	1986.8	
04/11/2022	14:20:23	243	6.2	8.36	1996.4	
04/11/2022	14:24:03	12	0.0	8.36	2016.3	
04/11/2022	14:27:43	11	0.0	8.36	2016.3	
04/11/2022	14:31:23	12	0.0	8.36	2016.3	
04/11/2022	14:35:03	12	0.0	8.36	2016.3	
04/11/2022	14:38:43	13	0.0	8.36	2016.3	
04/11/2022	14:42:23	19	0.0	8.36	2023.9	
04/11/2022	14:46:03	7	0.0	8.36	2023.9	
04/11/2022	14:49:43	7	0.0	8.36	2023.9	
04/11/2022	14:53:23	414	8.1	8.36	2032.9	
04/11/2022	14:57:03	67	2.7	8.36	2049.2	
04/11/2022	15:00:43	382	8.3	8.36	2064.5	
04/11/2022	15:04:23	341	8.2	8.36	2094.9	
04/11/2022	15:08:03	15	0.0	8.36	2118.9	
04/11/2022	15:11:28	9	0.0	8.36	2118.9	Reset Total, Vol = 151.11 bbl
04/11/2022	15:11:43	8	0.0	8.36	2118.9	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H		Apr/10/2022	SWN	EN82-04337

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
7.3			8.3	1109.0	0.0	150.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
7657	1	972	4000			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	1109.0 bbl	626.0 bbl	60 degF	Cement Circulated to Surface? ☐	Volume bbl
				Washed Thru Perfs ☐	To ft

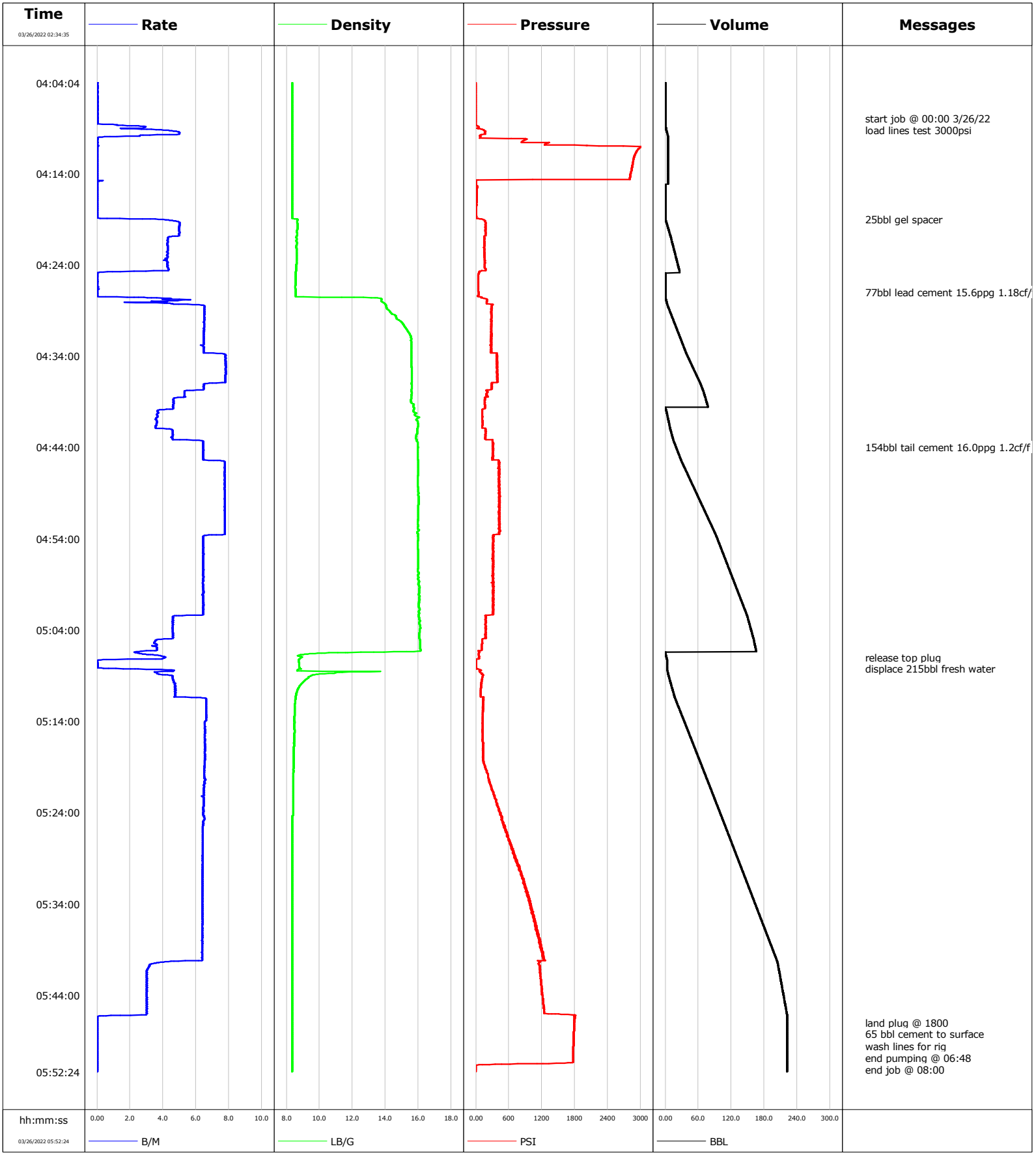
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost ☐	Job Completed ☒
	Barry Dickerson	-	-

Schlumberger

Cementing Job Report

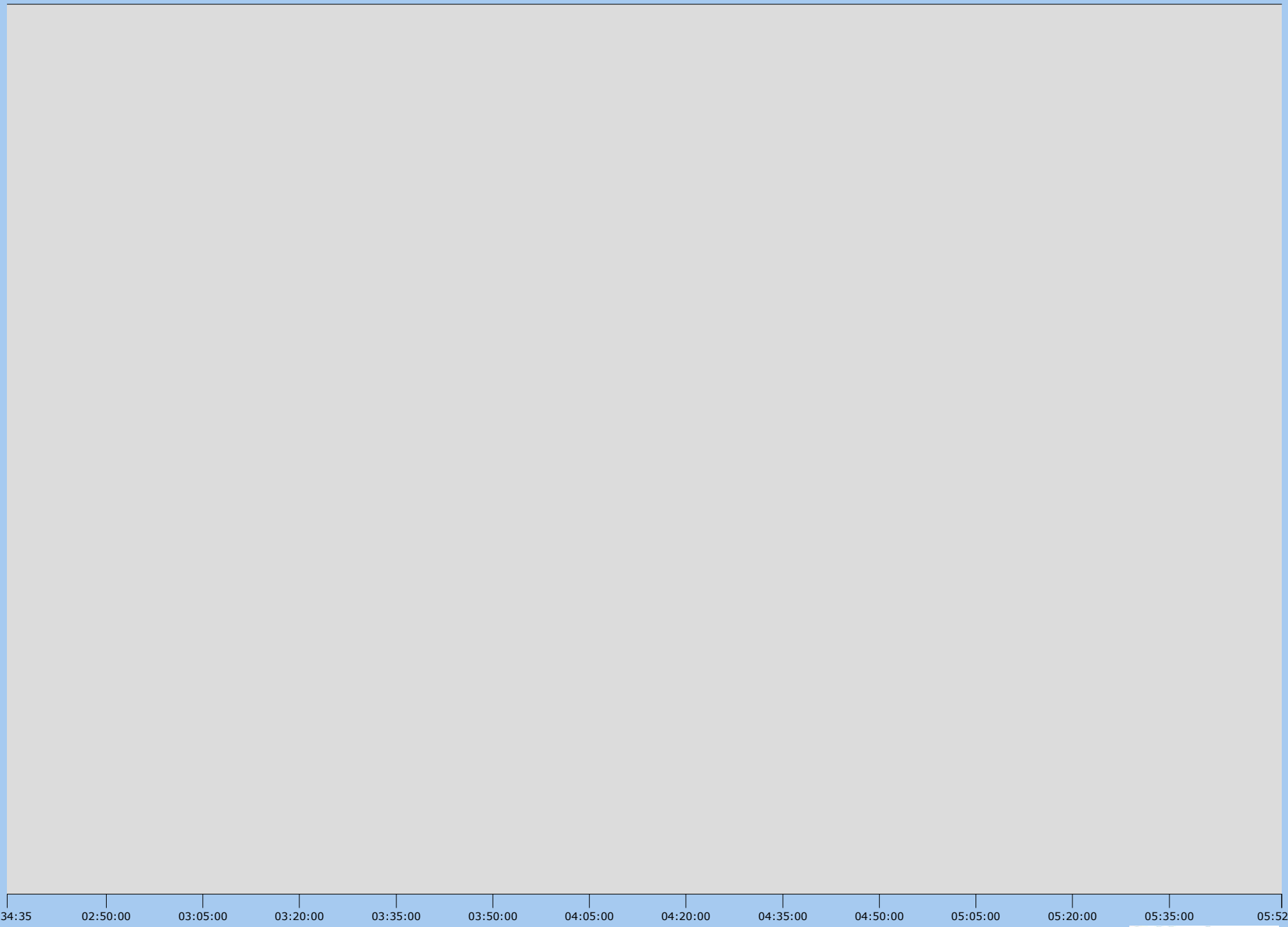
CemCAT v1.8

Well	Charles Jamison 410H	**Client**	Southwestern
Field	Camron Garner	**SIR No.**	EN82-03975
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	03-26-2022



Cementing

PRD Post Job Plot



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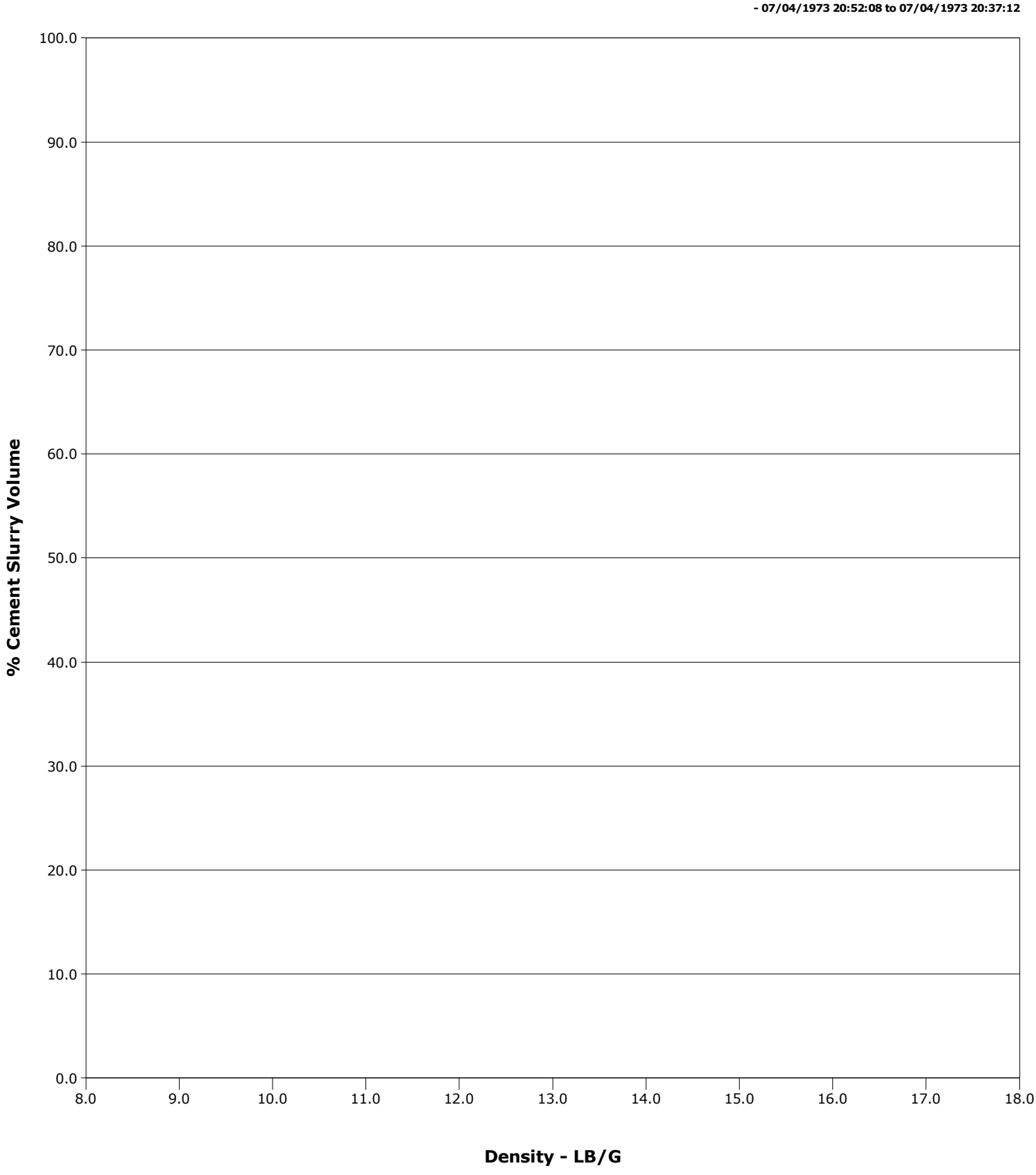
Schlumberger

Cementing Qa/Qc Density Report

Well	Charles Jamison 410H	**Client**	Southwestern
Field	Camron Garner	**SIR No.**	EN82-03975
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	03-26-2022



Schlumberger Cementing Service Report

Customer	Job Number
Southwestern	EN82-03975

Well	Location (legal)	Schlumberger Location	Job Start
Charles Jamison 410H 410H	47-051-02425-00-00	Weston	Mar/26/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Camron Garner		deg	12.3 in	2828.0 ft	2828.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	West Virginia	psi	91 degF	80 degF	lb/gal

Well Master	API/UWI
0066462174	47-051-02425-00-00

Rig Name	Drilled For	Service Via
sdc41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

load test lines 2500psi
25bbl gel spacer
77bbl lead 15.6ppg 1.18cf/f5.27g/sk
154bbl tail 16.0ppg 1.12cf/f 4.8g/sk
top plug
displace 215bbl fresh water
land plug 1800psi
65bbl cement to surface

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
407.0	13.4	54.5	110	BUTT
2828.0	9.6	40.0	110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	215.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	219.0 bbl	27.0 bbl	136.0 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type

Job Scheduled For	Arrived on Location	Leave Location
Mar/26/2022 00:00	Mar/26/2022 00:00	Mar/26/2022 08:00

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	2828.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	2782.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	02:34:35	-3	0.0	0.00	0.0	
03/26/2022	02:35:05	-3	0.0	0.00	0.0	
03/26/2022	02:36:05	-4	0.0	0.00	0.0	
03/26/2022	02:36:35	-4	0.0	0.00	0.0	
03/26/2022	02:37:05	-3	0.0	0.00	0.0	
03/26/2022	02:37:35	-3	0.0	0.00	0.0	
03/26/2022	02:38:05	-3	0.0	0.00	0.0	
03/26/2022	02:38:35	-3	0.0	0.00	0.0	
03/26/2022	02:39:05	-3	0.0	0.00	0.0	
03/26/2022	02:39:35	-3	0.0	0.00	0.0	
03/26/2022	02:40:05	-3	0.0	0.00	0.0	
03/26/2022	02:40:35	-3	0.0	0.00	0.0	
03/26/2022	02:41:05	-3	0.0	0.01	0.0	
03/26/2022	02:41:35	-3	0.0	0.01	0.0	
03/26/2022	02:42:05	-3	0.0	0.00	0.0	
03/26/2022	02:42:35	-3	0.0	0.00	0.0	
03/26/2022	02:43:05	-3	0.0	0.00	0.0	
03/26/2022	02:43:35	-4	0.0	0.00	0.0	
03/26/2022	02:44:05	-4	0.0	0.00	0.0	
03/26/2022	02:44:35	-3	0.0	0.00	0.0	
03/26/2022	02:45:05	-3	0.0	0.01	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	02:46:05	-5	0.0	1.04	0.0	
03/26/2022	02:46:35	-4	0.0	8.24	0.0	
03/26/2022	02:47:05	56	2.9	8.34	0.0	
03/26/2022	02:47:35	-1	0.9	8.34	0.0	
03/26/2022	02:48:05	75	0.0	8.35	0.0	
03/26/2022	02:48:35	290	0.0	8.35	0.0	
03/26/2022	02:49:05	182	12.1	8.42	0.0	
03/26/2022	02:49:35	91	3.9	8.34	0.0	
03/26/2022	02:50:05	252	5.6	8.34	0.0	
03/26/2022	02:50:35	75	2.9	8.34	0.0	
03/26/2022	02:51:05	64	0.0	8.34	0.0	
03/26/2022	02:51:35	61	0.0	8.34	0.0	
03/26/2022	02:52:05	73	0.0	8.34	0.0	
03/26/2022	02:52:35	74	0.0	8.34	0.0	
03/26/2022	02:53:05	73	0.0	8.34	0.0	
03/26/2022	02:53:35	73	0.0	8.34	0.0	
03/26/2022	02:54:05	74	0.0	8.34	0.0	
03/26/2022	02:54:35	52	0.0	8.34	0.0	
03/26/2022	02:55:05	51	0.0	8.34	0.0	
03/26/2022	02:55:35	51	0.0	8.34	0.0	
03/26/2022	02:56:05	50	0.0	8.34	0.0	
03/26/2022	02:56:35	47	0.0	8.34	0.0	
03/26/2022	02:57:05	48	0.0	8.34	0.0	
03/26/2022	02:57:35	37	0.0	8.34	0.0	
03/26/2022	02:58:05	34	0.0	8.33	0.0	
03/26/2022	02:58:35	37	0.0	8.32	0.0	
03/26/2022	02:59:05	31	0.0	8.32	0.0	
03/26/2022	02:59:35	31	0.0	8.32	0.0	
03/26/2022	03:00:05	30	0.0	8.32	0.0	
03/26/2022	03:00:35	29	0.0	8.32	0.0	
03/26/2022	03:01:05	30	0.0	8.32	0.0	
03/26/2022	03:01:35	29	0.0	8.32	0.0	
03/26/2022	03:02:05	29	0.0	8.33	0.0	
03/26/2022	03:02:35	29	0.0	8.33	0.0	
03/26/2022	03:03:05	28	0.0	8.33	0.0	
03/26/2022	03:03:35	29	0.0	8.33	0.0	
03/26/2022	03:04:05	28	0.0	8.33	0.0	
03/26/2022	03:04:35	28	0.0	8.33	0.0	
03/26/2022	03:05:05	28	0.0	8.33	0.0	
03/26/2022	03:05:35	28	0.0	8.34	0.0	
03/26/2022	03:06:05	27	0.0	8.33	0.0	
03/26/2022	03:06:35	28	0.0	8.34	0.0	
03/26/2022	03:07:05	28	0.0	8.34	0.0	
03/26/2022	03:07:35	28	0.0	8.34	0.0	
03/26/2022	03:08:05	27	0.0	8.34	0.0	
03/26/2022	03:08:35	27	0.0	8.34	0.0	
03/26/2022	03:09:35	27	0.0	8.34	0.0	
03/26/2022	03:10:05	27	0.0	8.34	0.0	
03/26/2022	03:10:35	26	0.0	8.34	0.0	
03/26/2022	03:11:05	26	0.0	8.34	0.0	
03/26/2022	03:11:35	26	0.0	8.34	0.0	
03/26/2022	03:12:05	26	0.0	8.34	0.0	
03/26/2022	03:12:35	26	0.0	8.34	0.0	
03/26/2022	03:13:05	26	0.0	8.34	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	03:14:05	26	0.0	8.34	0.0	
03/26/2022	03:14:35	26	0.0	8.34	0.0	
03/26/2022	03:15:05	25	0.0	8.34	0.0	
03/26/2022	03:15:35	25	0.0	8.34	0.0	
03/26/2022	03:16:05	25	0.0	8.34	0.0	
03/26/2022	03:16:35	25	0.0	8.34	0.0	
03/26/2022	03:17:05	25	0.0	8.34	0.0	
03/26/2022	03:17:35	25	0.0	8.34	0.0	
03/26/2022	03:18:05	25	0.0	8.34	0.0	
03/26/2022	03:18:35	25	0.0	8.34	0.0	
03/26/2022	03:19:05	25	0.0	8.34	0.0	
03/26/2022	03:19:35	25	0.0	8.34	0.0	
03/26/2022	03:20:05	25	0.0	8.34	0.0	
03/26/2022	03:20:35	24	0.0	8.34	0.0	
03/26/2022	03:21:05	24	0.1	8.34	0.0	
03/26/2022	03:21:35	24	0.0	8.34	0.0	
03/26/2022	03:22:05	24	0.0	8.34	0.0	
03/26/2022	03:22:35	24	0.0	8.34	0.0	
03/26/2022	03:23:05	24	0.1	8.34	0.0	
03/26/2022	03:23:35	24	0.0	8.34	0.0	
03/26/2022	03:24:05	24	0.0	8.34	0.0	
03/26/2022	03:24:35	24	0.0	8.34	0.0	
03/26/2022	03:25:05	24	0.0	8.34	0.0	
03/26/2022	03:25:35	24	0.0	8.34	0.0	
03/26/2022	03:26:05	24	0.1	8.34	0.0	
03/26/2022	03:26:35	24	0.1	8.34	0.0	
03/26/2022	03:27:05	23	0.0	8.34	0.0	
03/26/2022	03:27:35	23	0.1	8.34	0.0	
03/26/2022	03:28:05	24	0.0	8.34	0.0	
03/26/2022	03:28:35	23	0.0	8.34	0.0	
03/26/2022	03:29:05	24	0.0	8.34	0.0	
03/26/2022	03:29:35	23	0.0	8.34	0.0	
03/26/2022	03:30:05	23	0.0	8.34	0.0	
03/26/2022	03:30:35	23	0.0	8.34	0.0	
03/26/2022	03:31:05	23	0.1	8.34	0.0	
03/26/2022	03:31:35	23	0.0	8.34	0.0	
03/26/2022	03:32:05	23	0.1	8.34	0.0	
03/26/2022	03:32:35	23	0.0	8.34	0.0	
03/26/2022	03:33:05	23	0.1	8.34	0.0	
03/26/2022	03:33:35	23	0.0	8.34	0.0	
03/26/2022	03:34:05	23	0.0	8.34	0.0	
03/26/2022	03:34:35	23	0.0	8.34	0.0	
03/26/2022	03:35:05	23	0.0	8.34	0.0	
03/26/2022	03:35:35	23	0.0	8.34	0.0	
03/26/2022	03:36:05	23	0.0	8.34	0.0	
03/26/2022	03:36:35	23	0.0	8.34	0.0	
03/26/2022	03:37:05	23	0.0	8.34	0.0	
03/26/2022	03:37:35	23	0.0	8.34	0.0	
03/26/2022	03:38:05	23	0.0	8.34	0.0	
03/26/2022	03:38:35	23	0.0	8.34	0.0	
03/26/2022	03:39:05	23	0.0	8.34	0.0	
03/26/2022	03:39:35	23	0.0	8.34	0.0	
03/26/2022	03:40:05	22	0.0	8.34	0.0	
03/26/2022	03:40:35	22	0.1	8.34	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	03:41:35	22	0.0	8.35	0.0	
03/26/2022	03:42:05	22	0.0	8.34	0.0	
03/26/2022	03:43:05	22	0.0	8.34	0.0	
03/26/2022	03:43:35	23	0.0	8.35	0.0	
03/26/2022	03:44:05	22	0.0	8.34	0.0	
03/26/2022	03:44:35	22	0.0	8.34	0.0	
03/26/2022	03:45:05	22	0.0	8.34	0.0	
03/26/2022	03:45:35	22	0.1	8.34	0.0	
03/26/2022	03:46:05	22	0.0	8.35	0.0	
03/26/2022	03:46:35	22	0.0	8.34	0.0	
03/26/2022	03:47:05	22	0.0	8.34	0.0	
03/26/2022	03:47:35	21	0.0	8.34	0.0	
03/26/2022	03:48:05	22	0.0	8.34	0.0	
03/26/2022	03:48:35	22	0.1	8.35	0.0	
03/26/2022	03:49:05	22	0.0	8.34	0.0	
03/26/2022	03:49:35	21	0.0	8.34	0.0	
03/26/2022	03:50:05	21	0.0	8.34	0.0	
03/26/2022	03:50:35	21	0.0	8.34	0.0	
03/26/2022	03:51:05	22	0.0	8.34	0.0	
03/26/2022	03:51:35	22	0.0	8.35	0.0	
03/26/2022	03:52:05	21	0.0	8.34	0.0	
03/26/2022	03:52:35	21	0.0	8.35	0.0	
03/26/2022	03:53:05	21	0.0	8.34	0.0	
03/26/2022	03:53:35	21	0.0	8.35	0.0	
03/26/2022	03:54:05	21	0.0	8.34	0.0	
03/26/2022	03:54:35	21	0.0	8.35	0.0	
03/26/2022	03:55:05	22	0.0	8.34	0.0	
03/26/2022	03:55:35	21	0.0	8.35	0.0	
03/26/2022	03:56:05	21	0.0	8.34	0.0	
03/26/2022	03:56:35	21	0.0	8.35	0.0	
03/26/2022	03:57:05	21	0.0	8.35	0.0	
03/26/2022	03:57:35	21	0.0	8.35	0.0	
03/26/2022	03:58:05	21	0.0	8.35	0.0	
03/26/2022	03:58:35	21	0.0	8.34	0.0	
03/26/2022	03:59:05	21	0.0	8.35	0.0	
03/26/2022	03:59:35	21	0.0	8.34	0.0	
03/26/2022	04:00:05	20	0.0	8.35	0.0	
03/26/2022	04:00:35	21	0.0	8.35	0.0	
03/26/2022	04:01:05	21	0.0	8.35	0.0	
03/26/2022	04:01:35	-8	0.0	8.34	0.0	
03/26/2022	04:02:05	-8	0.0	8.35	0.0	
03/26/2022	04:02:35	-9	0.0	8.35	0.0	
03/26/2022	04:03:05	-9	0.0	8.35	0.0	
03/26/2022	04:03:35	-8	0.0	8.35	0.0	
03/26/2022	04:04:05	-9	0.0	8.35	0.0	
03/26/2022	04:04:35	-9	0.0	8.34	0.0	
03/26/2022	04:05:05	-7	0.0	8.35	0.0	
03/26/2022	04:05:35	-8	0.0	8.35	0.0	
03/26/2022	04:06:05	-8	0.0	8.35	0.0	
03/26/2022	04:06:35	-7	0.0	8.35	0.0	
03/26/2022	04:07:05	-8	0.1	8.35	0.0	
03/26/2022	04:07:35	-8	0.0	8.34	0.0	
03/26/2022	04:08:00	-8	0.0	8.34	0.0	start job @ 00:00 3/26/22
03/26/2022	04:08:05	-8	0.0	8.34	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	04:09:00	47	2.9	8.34	0.0	load lines test 3000psi
03/26/2022	04:09:05	40	2.0	8.34	0.0	
03/26/2022	04:09:35	162	5.0	8.34	0.0	
03/26/2022	04:10:05	73	0.1	8.34	0.0	
03/26/2022	04:10:35	832	0.0	8.34	0.0	
03/26/2022	04:11:05	3017	0.0	8.34	0.0	
03/26/2022	04:11:35	2925	0.0	8.34	0.0	
03/26/2022	04:12:05	2884	0.0	8.34	0.0	
03/26/2022	04:12:35	2863	0.0	8.34	0.0	
03/26/2022	04:13:05	2848	0.0	8.34	0.0	
03/26/2022	04:13:35	2833	0.0	8.34	0.0	
03/26/2022	04:14:05	2812	0.0	8.34	0.0	
03/26/2022	04:14:35	2799	0.0	8.34	0.0	
03/26/2022	04:15:05	2	0.0	8.34	0.0	
03/26/2022	04:15:35	18	0.0	8.34	0.0	
03/26/2022	04:16:35	14	0.0	8.34	0.0	
03/26/2022	04:17:05	16	0.0	8.34	0.0	
03/26/2022	04:17:35	9	0.0	8.34	0.0	
03/26/2022	04:18:05	9	0.0	8.34	0.0	
03/26/2022	04:18:35	9	0.0	8.34	0.0	
03/26/2022	04:19:00	96	2.7	8.60	0.0	25bbl gel spacer
03/26/2022	04:19:05	141	4.1	8.68	0.0	
03/26/2022	04:19:35	175	5.0	8.68	0.0	
03/26/2022	04:20:05	174	5.0	8.67	0.0	
03/26/2022	04:20:35	176	5.0	8.64	0.0	
03/26/2022	04:21:05	157	4.3	8.60	0.0	
03/26/2022	04:21:35	153	4.3	8.63	0.0	
03/26/2022	04:22:05	153	4.3	8.57	0.0	
03/26/2022	04:22:35	153	4.2	8.61	0.0	
03/26/2022	04:23:05	156	4.3	8.61	0.0	
03/26/2022	04:23:35	162	4.2	8.61	0.0	
03/26/2022	04:24:05	161	4.3	8.59	0.0	
03/26/2022	04:24:35	175	4.3	8.58	0.0	
03/26/2022	04:25:05	44	0.0	8.55	0.0	
03/26/2022	04:25:35	39	0.0	8.55	0.0	
03/26/2022	04:26:05	41	0.0	8.54	0.0	
03/26/2022	04:26:35	43	0.0	8.54	0.0	
03/26/2022	04:27:00	45	0.0	8.54	0.0	77bbl lead cement 15.6ppg 1.18cf/f 5.2g/sk
03/26/2022	04:27:05	45	0.0	8.54	0.0	
03/26/2022	04:27:35	106	2.2	11.35	0.0	
03/26/2022	04:28:05	192	4.2	13.80	0.0	
03/26/2022	04:28:35	288	6.5	14.05	0.0	
03/26/2022	04:29:05	275	6.5	14.25	0.0	
03/26/2022	04:29:35	288	6.5	14.60	0.0	
03/26/2022	04:30:05	278	6.5	14.83	0.0	
03/26/2022	04:30:35	282	6.5	15.09	0.0	
03/26/2022	04:31:05	278	6.5	15.28	0.0	
03/26/2022	04:31:35	279	6.5	15.46	0.0	
03/26/2022	04:32:05	291	6.5	15.56	0.0	
03/26/2022	04:32:35	284	6.5	15.57	0.0	
03/26/2022	04:33:05	276	6.5	15.56	0.0	
03/26/2022	04:33:35	280	6.5	15.56	0.0	
03/26/2022	04:34:05	373	7.8	15.56	0.0	
03/26/2022	04:34:35	375	7.8	15.56	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	04:35:35	390	7.8	15.59	0.0	
03/26/2022	04:36:05	396	7.8	15.59	0.0	
03/26/2022	04:36:35	379	7.8	15.61	0.0	
03/26/2022	04:37:05	293	6.5	15.58	0.0	
03/26/2022	04:37:35	297	6.5	15.59	0.0	
03/26/2022	04:38:05	203	5.3	15.59	0.0	
03/26/2022	04:38:35	160	4.8	15.57	0.0	
03/26/2022	04:39:05	158	4.6	15.55	0.0	
03/26/2022	04:39:35	171	4.6	15.68	0.0	
03/26/2022	04:40:05	113	3.7	15.69	0.0	
03/26/2022	04:40:35	114	3.7	15.84	0.0	
03/26/2022	04:41:05	117	3.6	15.91	0.0	
03/26/2022	04:41:35	118	3.6	16.00	0.0	
03/26/2022	04:42:05	174	4.5	15.93	0.0	
03/26/2022	04:42:35	165	4.6	15.90	0.0	
03/26/2022	04:43:05	179	4.6	15.86	0.0	
03/26/2022	04:43:35	326	6.4	15.97	0.0	
03/26/2022	04:44:00	298	6.4	15.97	0.0	154bbl tail cement 16.0ppg 1.2cf/f 4.8g/sk
03/26/2022	04:44:05	304	6.4	15.97	0.0	
03/26/2022	04:44:35	303	6.4	15.96	0.0	
03/26/2022	04:45:05	300	6.4	15.96	0.0	
03/26/2022	04:45:35	414	7.7	15.98	0.0	
03/26/2022	04:46:05	436	7.8	15.99	0.0	
03/26/2022	04:46:35	437	7.7	15.99	0.0	
03/26/2022	04:47:05	423	7.7	15.97	0.0	
03/26/2022	04:47:35	430	7.7	15.97	0.0	
03/26/2022	04:48:05	421	7.7	15.97	0.0	
03/26/2022	04:48:35	429	7.7	15.98	0.0	
03/26/2022	04:49:05	430	7.7	16.00	0.0	
03/26/2022	04:50:05	432	7.7	16.01	0.0	
03/26/2022	04:50:35	423	7.7	15.99	0.0	
03/26/2022	04:51:05	422	7.7	15.99	0.0	
03/26/2022	04:51:35	440	7.8	15.98	0.0	
03/26/2022	04:52:05	416	7.8	15.97	0.0	
03/26/2022	04:52:35	421	7.7	15.98	0.0	
03/26/2022	04:53:05	449	7.7	16.03	0.0	
03/26/2022	04:53:35	317	7.6	15.99	0.0	
03/26/2022	04:54:05	318	6.4	15.99	0.0	
03/26/2022	04:54:35	309	6.4	15.96	0.0	
03/26/2022	04:55:05	300	6.4	15.97	0.0	
03/26/2022	04:55:35	323	6.5	15.98	0.0	
03/26/2022	04:56:05	311	6.4	15.98	0.0	
03/26/2022	04:56:35	314	6.4	15.99	0.0	
03/26/2022	04:57:05	305	6.4	15.98	0.0	
03/26/2022	04:57:35	303	6.4	15.95	0.0	
03/26/2022	04:58:05	319	6.4	15.97	0.0	
03/26/2022	04:58:35	321	6.4	16.03	0.0	
03/26/2022	04:59:05	310	6.4	16.00	0.0	
03/26/2022	04:59:35	310	6.4	16.06	0.0	
03/26/2022	05:00:05	305	6.4	16.03	0.0	
03/26/2022	05:00:35	302	6.4	16.04	0.0	
03/26/2022	05:01:05	318	6.5	16.03	0.0	
03/26/2022	05:01:35	299	6.4	16.03	0.0	
03/26/2022	05:02:05	316	6.4	16.02	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	05:03:05	182	4.6	16.08	0.0	
03/26/2022	05:03:35	180	4.6	16.10	0.0	
03/26/2022	05:04:05	174	4.6	16.08	0.0	
03/26/2022	05:04:35	178	4.6	16.05	0.0	
03/26/2022	05:05:05	115	3.6	16.09	0.0	
03/26/2022	05:05:35	106	3.6	16.11	0.0	
03/26/2022	05:06:05	104	3.6	16.12	0.0	
03/26/2022	05:06:35	52	2.5	9.90	0.0	
03/26/2022	05:07:00	55	4.1	8.95	0.0	release top plug
03/26/2022	05:07:05	55	4.1	8.87	0.0	
03/26/2022	05:07:35	4	0.0	8.77	0.0	
03/26/2022	05:08:00	4	0.1	8.78	0.0	displace 215bbl fresh water
03/26/2022	05:08:05	4	0.1	8.77	0.0	
03/26/2022	05:08:35	80	3.9	13.71	0.0	
03/26/2022	05:09:05	123	4.6	9.46	0.0	
03/26/2022	05:09:35	107	4.6	9.09	0.0	
03/26/2022	05:10:05	98	4.7	8.82	0.0	
03/26/2022	05:10:35	88	4.8	8.66	0.0	
03/26/2022	05:11:05	85	4.7	8.58	0.0	
03/26/2022	05:11:35	130	6.6	8.54	0.0	
03/26/2022	05:12:05	128	6.6	8.51	0.0	
03/26/2022	05:12:35	131	6.6	8.49	0.0	
03/26/2022	05:13:05	123	6.6	8.48	0.0	
03/26/2022	05:13:35	123	6.6	8.48	0.0	
03/26/2022	05:14:05	120	6.5	8.48	0.0	
03/26/2022	05:14:35	124	6.5	8.47	0.0	
03/26/2022	05:15:05	126	6.5	8.49	0.0	
03/26/2022	05:15:35	120	6.5	8.47	0.0	
03/26/2022	05:16:05	120	6.5	8.46	0.0	
03/26/2022	05:16:35	131	6.5	8.45	0.0	
03/26/2022	05:17:05	131	6.5	8.44	0.0	
03/26/2022	05:17:35	136	6.5	8.42	0.0	
03/26/2022	05:18:05	128	6.5	8.42	0.0	
03/26/2022	05:18:35	141	6.5	8.42	0.0	
03/26/2022	05:19:05	170	6.5	8.42	0.0	
03/26/2022	05:19:35	193	6.5	8.42	0.0	
03/26/2022	05:20:05	223	6.5	8.41	0.0	
03/26/2022	05:20:35	244	6.5	8.41	0.0	
03/26/2022	05:21:05	270	6.5	8.40	0.0	
03/26/2022	05:21:35	306	6.5	8.40	0.0	
03/26/2022	05:22:05	334	6.5	8.41	0.0	
03/26/2022	05:22:35	369	6.5	8.41	0.0	
03/26/2022	05:23:35	410	6.5	8.40	0.0	
03/26/2022	05:24:05	453	6.4	8.40	0.0	
03/26/2022	05:24:35	487	6.5	8.35	0.0	
03/26/2022	05:25:05	478	6.4	8.34	0.0	
03/26/2022	05:25:35	527	6.4	8.34	0.0	
03/26/2022	05:26:05	539	6.4	8.34	0.0	
03/26/2022	05:26:35	558	6.4	8.34	0.0	
03/26/2022	05:27:05	623	6.4	8.34	0.0	
03/26/2022	05:27:35	636	6.4	8.34	0.0	
03/26/2022	05:28:05	675	6.4	8.34	0.0	
03/26/2022	05:28:35	711	6.4	8.34	0.0	
03/26/2022	05:29:05	718	6.4	8.34	0.0	

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Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
03/26/2022	05:30:05	793	6.4	8.34	0.0	
03/26/2022	05:30:35	828	6.4	8.34	0.0	
03/26/2022	05:31:05	859	6.4	8.34	0.0	
03/26/2022	05:31:35	863	6.4	8.34	0.0	
03/26/2022	05:32:05	896	6.4	8.34	0.0	
03/26/2022	05:32:35	914	6.4	8.34	0.0	
03/26/2022	05:33:05	927	6.4	8.34	0.0	
03/26/2022	05:33:35	991	6.4	8.34	0.0	
03/26/2022	05:34:05	992	6.4	8.34	0.0	
03/26/2022	05:34:35	1023	6.4	8.34	0.0	
03/26/2022	05:35:05	1046	6.4	8.34	0.0	
03/26/2022	05:35:35	1040	6.4	8.34	0.0	
03/26/2022	05:36:05	1085	6.4	8.34	0.0	
03/26/2022	05:36:35	1095	6.4	8.34	0.0	
03/26/2022	05:37:05	1134	6.4	8.34	0.0	
03/26/2022	05:37:35	1154	6.4	8.34	0.0	
03/26/2022	05:38:05	1150	6.4	8.34	0.0	
03/26/2022	05:38:35	1168	6.4	8.34	0.0	
03/26/2022	05:39:05	1208	6.4	8.34	0.0	
03/26/2022	05:39:35	1213	6.4	8.34	0.0	
03/26/2022	05:40:05	1245	6.4	8.34	0.0	
03/26/2022	05:40:35	1141	3.3	8.34	0.0	
03/26/2022	05:41:05	1162	3.1	8.34	0.0	
03/26/2022	05:41:35	1167	3.0	8.34	0.0	
03/26/2022	05:42:05	1176	3.0	8.34	0.0	
03/26/2022	05:42:35	1185	3.0	8.34	0.0	
03/26/2022	05:43:05	1197	3.0	8.35	0.0	
03/26/2022	05:43:35	1196	3.0	8.34	0.0	
03/26/2022	05:44:05	1209	3.0	8.35	0.0	
03/26/2022	05:44:35	1220	3.0	8.34	0.0	
03/26/2022	05:45:05	1230	3.0	8.35	0.0	
03/26/2022	05:45:35	1239	3.0	8.35	0.0	
03/26/2022	05:46:05	1507	3.0	8.35	0.0	
03/26/2022	05:46:35	1794	0.0	8.35	0.0	
03/26/2022	05:47:00	1787	0.0	8.35	0.0	land plug @ 1800
03/26/2022	05:47:05	1790	0.0	8.35	0.0	
03/26/2022	05:47:35	1785	0.0	8.35	0.0	
03/26/2022	05:48:00	1781	0.0	8.35	0.0	65 bbl cement to surface
03/26/2022	05:48:05	1782	0.0	8.35	0.0	
03/26/2022	05:48:35	1778	0.0	8.35	0.0	
03/26/2022	05:49:00	1776	0.0	8.35	0.0	wash lines for rig
03/26/2022	05:49:05	1776	0.0	8.35	0.0	
03/26/2022	05:49:35	1774	0.0	8.35	0.0	
03/26/2022	05:50:00	1772	0.0	8.35	0.0	end pumping @ 06:48
03/26/2022	05:50:05	1771	0.0	8.35	0.0	
03/26/2022	05:50:35	1769	0.0	8.35	0.0	
03/26/2022	05:51:00	1767	0.0	8.35	0.0	end job @ 08:00
03/26/2022	05:51:05	1766	0.0	8.35	0.0	
03/26/2022	05:51:35	350	0.0	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 410H 410H	Camron Garner	Mar/26/2022	Southwestern	EN82-03975

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
3.0			13.3	229.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
3034	-3	342	1800			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	229.0 bbl	215.0 bbl	61 degF	[X]	65.0 bbl
				Washed Thru Perfs [ ]	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Danny Cover	-	[X] -

Service Quality Evaluation

Client:	Southwestern
Field:	Camron Garner
Rig:	sdc41
Well:	Charles Jamison 410H
Service Line:	Cementing
Job Type:	intermediate

Service Order #:	
Date:	Mar/26/2022
Operating Time (hh:mm):	00:00
Client Rep:	
Schlumberger Engineer:	Danny Cover
Schlumberger FSM:	

Main Objective:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No	Result
1	**HSE**			
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	**yes** [X] **no** [ ]	5
1b	Free of environmental spill or non-compliant discharge	5	**yes** [X] **no** [ ]	5
1c	Wellsite left clean	4	**yes** [X] **no** [ ]	4
			Sub-total	100%

2	**Design / Preparation**			
2a	Program incl. job simulation (CemCADE) & pump schedule / tool hydraulic calcs	3	**yes** [X] **no** [ ]	3
2b	Equipment maintenance schedule completed / Green tagged	2	**yes** [X] **no** [ ]	2
2c	All materials and equipment required for job/contingency checked & on location	2	**yes** [X] **no** [ ]	2
2d	Safety / pre-job meeting conducted with all involved present	2	**yes** [X] **no** [ ]	2
			Sub-total	100%

3	**Execution**			
3a	Lost time < 30 mins	3	**yes** [X] **no** [ ]	3
3b	Equipment pressure tested succesfully	3	**yes** [X] **no** [ ]	3
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	**yes** [X] **no** [ ]	2
3d	Plugs / darts released and tested succesfully	2	**yes** [X] **no** [ ]	2
3e	Density variation met expectations	2	**yes** [X] **no** [ ]	2
3f	Personnel performed as per expectations	2	**yes** [X] **no** [ ]	2
3g	Equipment performed as per expectations	2	**yes** [X] **no** [ ]	2
3h	Job pumped as per design	3	**yes** [X] **no** [ ]	3
3i	Did job start on time	2	**yes** [X] **no** [ ]	2
3j	Free of Operational failures (screen out, Cementing Example, etc.)	3	**yes** [X] **no** [ ]	3
			Sub-total	100%

4	**Evaluation**			
4a	Main job objective achieved with no consequential non-productive time	10	**yes** [X] **no** [ ]	10
			Sub-total	100%

Total 100%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	**Schlumberger:**
Client Signature:	**Schlumberger Signature:**

APPALACHIAN WELL SURVEYS

GAMMA RAY / CCL
RADIAL BOND
ON 13 3/8

Company SWN RIG 41
Well CHARLES JAMISON MSH 410
Field CAMERON
County MARSHALL
State WV

Company SWN RIG 41
Well CHARLES JAMISON MSH 410
Field CAMERON
County MARSHALL State WV
Location: API # : 47051-02425-0000
LAT: 39.79186638
LONG: -80.60749933
SEC: TWP: RGE:
Permanent Datum: Ground Level Elevation: 1337
Log Measured From: Top of Casing
Drilling Measured From: K.B.

Other Services

Elevation
K.B. 1363
D.F.
G.L. 1337

Date	3-22-2022
Run Number	One
Depth Driller	
Depth Logger	337
Bottom Logged Interval	337
Top Log Interval	0
Type Log	GR / CCL
Type Fluid	
Fluid Level	
Estimated Cement Top	TOP OF HOLE
Time Well Ready	
Time Logger On Bottom	
Equipment Number	26
Location	CAMBRIDGE
Crew	MARSHALL
Recorded By	LARRICK
Witnessed By	

Casing Record	Size	Wgt/Ft	Top
Surface String			
Prot. String			
Production String			
Liner			

Plug Records

Description	Plug @	Casing Size	Type	Size	Weight	From	To

Tubing Record

Bottom

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Shot Specifications		Shooting Record			
Jet Perforator		Shot From	To	With	Holes
Type of Carrier		Shot From	To	With	Holes
Gun O.D. Size		Shot From	To	With	Holes
Charge Case Material		Shot From	To	With	Holes
Charge Gram Weight		Shot From	To	With	Holes
Entry Hole Diameter		Shot From	To	With	Holes
Penetration Depth		Shot From	To	With	Holes
Total Number of Holes		Shot From	To	With	Holes

Database File: 3-22-2022 swn jamisom msh 410.db
Dataset Pathname: pass1.2
Presentation Format: l45obm9
Dataset Creation: Tue Mar 22 22:13:24 2022 by Calc Open-Cased 110302
Charted by: Depth in Feet scaled 1:240

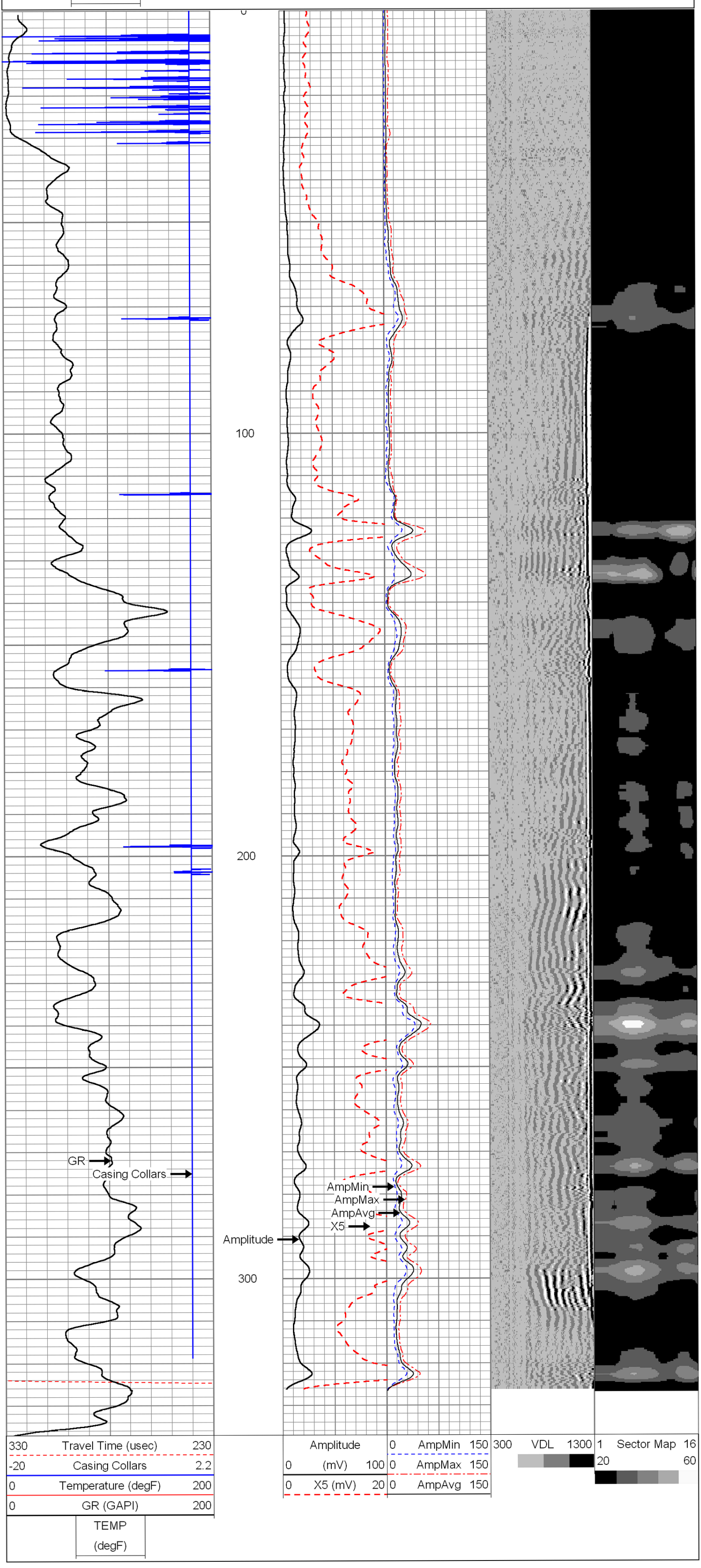
330 Travel Time (usec) 230
-20 Casing Collars 2.2
0 Temperature (degF) 200
0 GR (GAPI) 200
TEMP (degF)

Amplitude
0 (mV) 100
0 X5 (mV) 20

0 AmpMin 150
0 AmpMax 150
0 AmpAvg 150

300 VDL 1300

1 Sector Map 16
20 60



330 Travel Time (usec) 230
-20 Casing Collars 2.2
0 Temperature (degF) 200
0 GR (GAPI) 200
TEMP (degF)

Amplitude
0 (mV) 100
0 X5 (mV) 20

0 AmpMin 150
0 AmpMax 150
0 AmpAvg 150

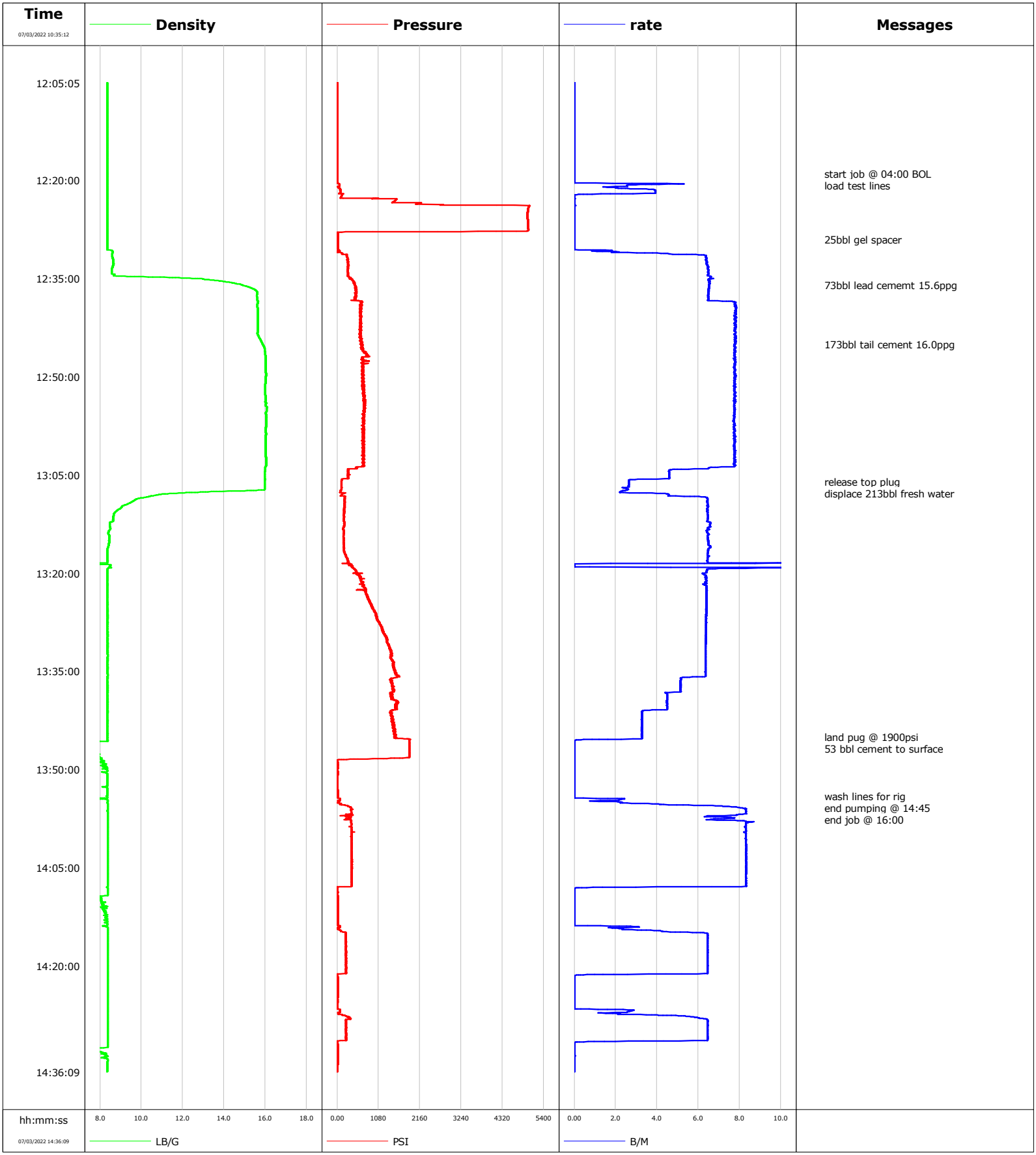
300 VDL 1300

1 Sector Map 16
20 60

Schlumberger

Cementing Job Report

Well	Charles Jamison 606H	**Client**	Southwestern
Field	Camron Garner	**SIR No.**	EOHC-01553
Engineer	Danny Cover	**Job Type**	intermediate
Country	United States	**Job Date**	07-03-2022



Schlumberger Cementing Service Report

Customer	Job Number
Southwestern	EOHC-01553

Well	Location (legal)	Schlumberger Location	Job Start
Charles Jamison 606H 606H	47-051-02436-00-00	Weston	Jul/03/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Camron Garner		deg	in	2798.0 ft	2798.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	West Virginia	psi	90 degF	80 degF	lb/gal

Well Master	API/UWI
006646571	47-051-02436-00-00

Rig Name	Drilled For	Service Via
sdc 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
	lb/gal	cP

Service Line	Job Type
Cementing	intermediate

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
394.0	13.4	54.5	110	BUTT
2798.0	9.6	36.0	110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	213.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	219.0 bbl	bbl	bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement
X	X

Lift Pressure	Pipe Rotated	Pipe Reciprocated
psi	☐	☐

No. Centralizers	Top Plugs	Bottom Plugs
	1	

Cement Head Type
Single

Job Scheduled For	Arrived on Location	Leave Location
Jul/03/2022 04:00	Jul/03/2022 04:00	Jul/03/2022 16:00

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	2798.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	2758.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	10:35:12	281	0.0	0.01	0.0	Start Job
07/03/2022	10:35:42	280	0.0	0.01	0.0	
07/03/2022	10:36:12	282	0.0	0.01	0.0	
07/03/2022	10:36:42	281	0.0	0.01	0.0	
07/03/2022	10:37:12	282	0.0	0.01	0.0	
07/03/2022	10:37:42	282	0.0	0.01	0.0	
07/03/2022	10:38:12	280	0.0	0.01	0.0	
07/03/2022	10:38:42	281	0.0	0.01	0.0	
07/03/2022	10:39:12	281	0.0	0.01	0.0	
07/03/2022	10:39:42	282	0.0	0.01	0.0	
07/03/2022	10:40:12	281	0.0	0.01	0.0	
07/03/2022	10:40:42	282	0.0	0.01	0.0	
07/03/2022	10:41:12	280	0.0	0.01	0.0	
07/03/2022	10:41:42	280	0.0	0.01	0.0	
07/03/2022	10:42:12	280	0.0	0.01	0.0	
07/03/2022	10:42:42	279	0.0	0.01	0.0	
07/03/2022	10:43:12	279	0.0	0.01	0.0	
07/03/2022	10:43:42	281	0.0	0.01	0.0	
07/03/2022	10:44:12	280	0.0	0.01	0.0	
07/03/2022	10:44:42	281	0.0	0.01	0.0	
07/03/2022	10:45:12	282	0.0	0.01	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	10:46:42	283	0.0	0.01	0.0	
07/03/2022	10:47:12	283	0.0	0.01	0.0	
07/03/2022	10:47:42	284	0.0	0.01	0.0	
07/03/2022	10:48:12	283	0.0	0.01	0.0	
07/03/2022	10:48:42	283	0.0	0.01	0.0	
07/03/2022	10:49:12	284	0.0	0.01	0.0	
07/03/2022	10:49:42	283	0.0	0.01	0.0	
07/03/2022	10:50:12	283	0.0	0.01	0.0	
07/03/2022	10:50:42	284	0.0	0.01	0.0	
07/03/2022	10:51:12	282	0.0	0.01	0.0	
07/03/2022	10:51:42	284	0.0	0.01	0.0	
07/03/2022	10:52:12	283	0.0	0.01	0.0	
07/03/2022	10:52:42	283	0.0	0.01	0.0	
07/03/2022	10:53:12	282	0.0	0.01	0.0	
07/03/2022	10:53:42	282	0.0	0.01	0.0	
07/03/2022	10:54:12	283	0.0	0.01	0.0	
07/03/2022	10:54:42	284	0.0	0.01	0.0	
07/03/2022	10:55:12	283	0.0	0.01	0.0	
07/03/2022	10:55:42	283	0.0	0.01	0.0	
07/03/2022	10:56:12	283	0.0	0.01	0.0	
07/03/2022	10:56:42	284	0.0	0.01	0.0	
07/03/2022	10:57:12	283	0.0	0.01	0.0	
07/03/2022	10:57:42	-0	0.0	0.01	0.0	
07/03/2022	10:58:12	1	0.0	0.01	0.0	
07/03/2022	10:58:42	0	0.0	0.01	0.0	
07/03/2022	10:59:12	1	0.0	0.01	0.0	
07/03/2022	10:59:42	-1	0.0	0.01	0.0	
07/03/2022	11:00:12	0	0.0	0.01	0.0	
07/03/2022	11:00:42	-0	0.8	7.78	0.0	
07/03/2022	11:01:12	1	0.0	0.42	0.0	
07/03/2022	11:01:42	9	2.4	8.35	0.0	
07/03/2022	11:02:12	88	4.5	8.35	0.0	
07/03/2022	11:02:42	96	4.9	8.35	0.0	
07/03/2022	11:03:12	189	4.8	8.35	0.0	
07/03/2022	11:03:42	101	4.5	8.35	0.0	
07/03/2022	11:04:12	-5	0.0	8.35	0.0	
07/03/2022	11:04:42	-0	0.0	8.35	0.0	
07/03/2022	11:05:12	1	0.0	8.35	0.0	
07/03/2022	11:05:42	-3	0.0	8.35	0.0	
07/03/2022	11:06:12	-0	0.0	8.35	0.0	
07/03/2022	11:06:42	2	0.0	8.35	0.0	
07/03/2022	11:07:12	2	0.0	8.35	0.0	
07/03/2022	11:07:42	2	0.0	8.35	0.0	
07/03/2022	11:08:12	0	0.0	8.35	0.0	
07/03/2022	11:08:42	2	0.0	8.35	0.0	
07/03/2022	11:09:12	1	0.0	8.35	0.0	
07/03/2022	11:09:42	1	0.0	8.35	0.0	
07/03/2022	11:10:12	2	0.0	8.35	0.0	
07/03/2022	11:10:42	1	0.0	8.35	0.0	
07/03/2022	11:11:12	1	0.0	8.35	0.0	
07/03/2022	11:11:42	2	0.0	8.35	0.0	
07/03/2022	11:12:12	3	0.0	8.35	0.0	
07/03/2022	11:13:12	-2	0.0	8.35	0.0	
07/03/2022	11:13:42	-6	0.0	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	11:14:42	-4	0.0	8.35	0.0	
07/03/2022	11:15:12	-0	0.0	8.35	0.0	
07/03/2022	11:15:42	-1	0.0	8.35	0.0	
07/03/2022	11:16:12	0	0.0	8.35	0.0	
07/03/2022	11:16:42	-2	0.0	8.35	0.0	
07/03/2022	11:17:12	-0	0.0	8.35	0.0	
07/03/2022	11:17:42	1	0.0	8.35	0.0	
07/03/2022	11:18:12	3	0.0	8.35	0.0	
07/03/2022	11:18:42	2	0.0	8.35	0.0	
07/03/2022	11:19:12	3	0.0	8.35	0.0	
07/03/2022	11:19:42	2	0.0	8.35	0.0	
07/03/2022	11:20:12	3	0.0	8.35	0.0	
07/03/2022	11:20:42	3	0.0	8.35	0.0	
07/03/2022	11:21:12	4	0.0	8.35	0.0	
07/03/2022	11:21:42	4	0.0	8.35	0.0	
07/03/2022	11:22:12	4	0.0	8.35	0.0	
07/03/2022	11:22:42	3	0.0	8.35	0.0	
07/03/2022	11:23:12	4	0.0	8.35	0.0	
07/03/2022	11:23:42	4	0.0	8.35	0.0	
07/03/2022	11:24:12	4	0.0	8.35	0.0	
07/03/2022	11:24:42	5	0.0	8.35	0.0	
07/03/2022	11:25:12	4	0.0	8.35	0.0	
07/03/2022	11:25:42	5	0.0	8.35	0.0	
07/03/2022	11:26:12	5	0.0	8.35	0.0	
07/03/2022	11:26:42	4	0.0	8.35	0.0	
07/03/2022	11:27:12	5	0.0	8.35	0.0	
07/03/2022	11:27:42	4	0.0	8.35	0.0	
07/03/2022	11:28:12	4	0.0	8.35	0.0	
07/03/2022	11:28:42	4	0.0	8.35	0.0	
07/03/2022	11:29:12	4	0.0	8.35	0.0	
07/03/2022	11:29:42	5	0.0	8.35	0.0	
07/03/2022	11:30:12	3	0.0	8.35	0.0	
07/03/2022	11:30:42	4	0.0	8.35	0.0	
07/03/2022	11:31:12	4	0.0	8.35	0.0	
07/03/2022	11:31:42	4	0.0	8.35	0.0	
07/03/2022	11:32:12	4	0.0	8.35	0.0	
07/03/2022	11:32:42	4	0.0	8.35	0.0	
07/03/2022	11:33:12	3	0.0	8.35	0.0	
07/03/2022	11:33:42	3	0.0	8.35	0.0	
07/03/2022	11:34:12	4	0.0	8.35	0.0	
07/03/2022	11:34:42	3	0.0	8.35	0.0	
07/03/2022	11:35:12	3	0.0	8.35	0.0	
07/03/2022	11:35:42	3	0.0	8.35	0.0	
07/03/2022	11:36:12	4	0.0	8.35	0.0	
07/03/2022	11:36:42	3	0.0	8.35	0.0	
07/03/2022	11:37:12	3	0.0	8.35	0.0	
07/03/2022	11:37:42	3	0.0	8.35	0.0	
07/03/2022	11:38:12	3	0.0	8.35	0.0	
07/03/2022	11:38:42	3	0.0	8.35	0.0	
07/03/2022	11:39:12	3	0.0	8.35	0.0	
07/03/2022	11:39:42	2	0.0	8.35	0.0	
07/03/2022	11:40:12	3	0.0	8.35	0.0	
07/03/2022	11:40:42	3	0.0	8.35	0.0	
07/03/2022	11:41:12	3	0.0	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	11:42:12	3	0.0	8.35	0.0	
07/03/2022	11:42:42	3	0.0	8.35	0.0	
07/03/2022	11:43:12	3	0.0	8.35	0.0	
07/03/2022	11:43:42	3	0.0	8.35	0.0	
07/03/2022	11:44:12	4	0.0	8.35	0.0	
07/03/2022	11:44:42	3	0.0	8.35	0.0	
07/03/2022	11:45:12	3	0.0	8.35	0.0	
07/03/2022	11:45:42	5	0.0	8.35	0.0	
07/03/2022	11:46:42	4	0.0	8.35	0.0	
07/03/2022	11:47:12	4	0.0	8.35	0.0	
07/03/2022	11:47:42	4	0.0	8.35	0.0	
07/03/2022	11:48:12	4	0.0	8.35	0.0	
07/03/2022	11:48:42	4	0.0	8.35	0.0	
07/03/2022	11:49:12	3	0.0	8.35	0.0	
07/03/2022	11:49:42	3	0.0	8.35	0.0	
07/03/2022	11:50:12	3	0.0	8.35	0.0	
07/03/2022	11:50:42	4	0.0	8.35	0.0	
07/03/2022	11:51:12	3	0.0	8.35	0.0	
07/03/2022	11:51:42	3	0.0	8.35	0.0	
07/03/2022	11:52:12	3	0.0	8.35	0.0	
07/03/2022	11:52:42	3	0.0	8.35	0.0	
07/03/2022	11:53:12	3	0.0	8.35	0.0	
07/03/2022	11:53:42	3	0.0	8.35	0.0	
07/03/2022	11:54:12	2	0.0	8.35	0.0	
07/03/2022	11:54:42	3	0.0	8.35	0.0	
07/03/2022	11:55:12	3	0.0	8.35	0.0	
07/03/2022	11:55:42	2	0.0	8.35	0.0	
07/03/2022	11:56:12	2	0.0	8.35	0.0	
07/03/2022	11:56:42	3	0.0	8.35	0.0	
07/03/2022	11:57:12	2	0.0	8.35	0.0	
07/03/2022	11:57:42	3	0.0	8.35	0.0	
07/03/2022	11:58:12	3	0.0	8.35	0.0	
07/03/2022	11:58:42	3	0.0	8.35	0.0	
07/03/2022	11:59:12	1	0.0	8.35	0.0	
07/03/2022	11:59:42	3	0.0	8.35	0.0	
07/03/2022	12:00:12	2	0.0	8.35	0.0	
07/03/2022	12:00:42	2	0.0	8.35	0.0	
07/03/2022	12:01:12	3	0.0	8.35	0.0	
07/03/2022	12:01:42	3	0.0	8.35	0.0	
07/03/2022	12:02:12	4	0.0	8.35	0.0	
07/03/2022	12:02:42	5	0.0	8.35	0.0	
07/03/2022	12:03:12	5	0.0	8.35	0.0	
07/03/2022	12:03:42	4	0.0	8.35	0.0	
07/03/2022	12:04:12	5	0.0	8.35	0.0	
07/03/2022	12:04:42	3	0.0	8.35	0.0	
07/03/2022	12:05:12	4	0.0	8.35	0.0	
07/03/2022	12:05:42	4	0.0	8.35	0.0	
07/03/2022	12:06:12	4	0.0	8.35	0.0	
07/03/2022	12:06:42	4	0.0	8.35	0.0	
07/03/2022	12:07:12	4	0.0	8.35	0.0	
07/03/2022	12:07:42	4	0.0	8.35	0.0	
07/03/2022	12:08:12	5	0.0	8.35	0.0	
07/03/2022	12:08:42	4	0.0	8.35	0.0	
07/03/2022	12:09:12	3	0.0	8.35	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	12:10:12	4	0.0	8.35	0.0	
07/03/2022	12:10:42	4	0.0	8.35	0.0	
07/03/2022	12:11:12	4	0.0	8.35	0.0	
07/03/2022	12:11:42	4	0.0	8.35	0.0	
07/03/2022	12:12:12	4	0.0	8.35	0.0	
07/03/2022	12:12:42	4	0.0	8.35	0.0	
07/03/2022	12:13:12	4	0.0	8.35	0.0	
07/03/2022	12:13:42	5	0.0	8.35	0.0	
07/03/2022	12:14:12	3	0.0	8.35	0.0	
07/03/2022	12:14:42	3	0.0	8.35	0.0	
07/03/2022	12:15:12	4	0.0	8.35	0.0	
07/03/2022	12:15:42	3	0.0	8.35	0.0	
07/03/2022	12:16:12	4	0.0	8.35	0.0	
07/03/2022	12:16:42	3	0.0	8.35	0.0	
07/03/2022	12:17:12	3	0.0	8.35	0.0	
07/03/2022	12:17:42	3	0.0	8.35	0.0	
07/03/2022	12:18:12	3	0.0	8.35	0.0	
07/03/2022	12:18:42	4	0.0	8.35	0.0	
07/03/2022	12:19:00	4	0.0	8.35	0.0	start job @ 04:00 BOL
07/03/2022	12:19:12	4	0.0	8.35	0.0	
07/03/2022	12:20:00	1	0.0	8.35	0.0	load test lines
07/03/2022	12:20:12	1	0.0	8.35	0.0	
07/03/2022	12:20:42	60	2.9	8.35	0.0	
07/03/2022	12:21:12	79	2.0	8.35	0.0	
07/03/2022	12:21:42	81	3.9	8.35	0.0	
07/03/2022	12:22:12	128	0.1	8.35	0.0	
07/03/2022	12:22:42	88	0.0	8.35	0.0	
07/03/2022	12:23:12	1493	0.0	8.35	0.0	
07/03/2022	12:23:42	2757	0.0	8.35	0.0	
07/03/2022	12:24:12	4994	0.0	8.35	0.0	
07/03/2022	12:24:42	4977	0.0	8.35	0.0	
07/03/2022	12:25:12	4975	0.0	8.35	0.0	
07/03/2022	12:25:42	4975	0.0	8.35	0.0	
07/03/2022	12:26:12	4977	0.0	8.35	0.0	
07/03/2022	12:26:42	4982	0.0	8.35	0.0	
07/03/2022	12:27:12	4987	0.0	8.35	0.0	
07/03/2022	12:27:42	4980	0.0	8.35	0.0	
07/03/2022	12:28:12	17	0.0	8.35	0.0	
07/03/2022	12:28:42	18	0.0	8.35	0.0	
07/03/2022	12:29:00	18	0.0	8.35	0.0	25bbl gel spacer
07/03/2022	12:29:12	18	0.0	8.35	0.0	
07/03/2022	12:29:42	18	0.0	8.35	0.0	
07/03/2022	12:30:12	17	0.0	8.35	0.0	
07/03/2022	12:30:42	43	1.7	8.55	0.0	
07/03/2022	12:31:12	142	4.5	8.59	0.0	
07/03/2022	12:31:42	259	6.4	8.59	0.0	
07/03/2022	12:32:12	284	6.4	8.62	0.0	
07/03/2022	12:32:42	290	6.4	8.65	0.0	
07/03/2022	12:33:12	286	6.5	8.61	0.0	
07/03/2022	12:33:42	276	6.5	8.56	0.0	
07/03/2022	12:34:12	272	6.5	8.55	0.0	
07/03/2022	12:34:42	303	6.6	9.69	0.0	
07/03/2022	12:35:12	411	6.5	13.35	0.0	
07/03/2022	12:35:42	447	6.5	14.48	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	12:36:12	486	6.5	15.10	0.0	
07/03/2022	12:36:42	471	6.5	15.50	0.0	
07/03/2022	12:37:12	482	6.5	15.62	0.0	
07/03/2022	12:37:42	490	6.5	15.59	0.0	
07/03/2022	12:38:12	466	6.5	15.61	0.0	
07/03/2022	12:38:42	636	7.8	15.63	0.0	
07/03/2022	12:39:12	649	7.8	15.62	0.0	
07/03/2022	12:39:42	592	7.8	15.62	0.0	
07/03/2022	12:40:12	620	7.8	15.63	0.0	
07/03/2022	12:40:42	593	7.7	15.63	0.0	
07/03/2022	12:41:12	627	7.8	15.64	0.0	
07/03/2022	12:41:42	626	7.8	15.63	0.0	
07/03/2022	12:42:12	618	7.8	15.63	0.0	
07/03/2022	12:42:42	621	7.8	15.63	0.0	
07/03/2022	12:43:12	602	7.8	15.62	0.0	
07/03/2022	12:43:42	618	7.8	15.65	0.0	
07/03/2022	12:44:12	616	7.8	15.74	0.0	
07/03/2022	12:44:42	625	7.8	15.81	0.0	
07/03/2022	12:45:00	610	7.8	15.86	0.0	173bbl tail cement 16.0ppg
07/03/2022	12:45:12	692	7.7	15.90	0.0	
07/03/2022	12:45:42	692	7.8	15.96	0.0	
07/03/2022	12:46:12	741	7.8	15.98	0.0	
07/03/2022	12:46:42	759	7.8	16.00	0.0	
07/03/2022	12:47:12	654	7.7	16.00	0.0	
07/03/2022	12:47:42	687	7.8	16.01	0.0	
07/03/2022	12:48:12	666	7.8	16.01	0.0	
07/03/2022	12:48:42	670	7.7	16.01	0.0	
07/03/2022	12:49:12	651	7.8	16.02	0.0	
07/03/2022	12:49:42	664	7.8	16.03	0.0	
07/03/2022	12:50:12	644	7.7	16.02	0.0	
07/03/2022	12:50:42	717	7.8	16.02	0.0	
07/03/2022	12:51:12	651	7.7	15.98	0.0	
07/03/2022	12:51:42	684	7.8	15.98	0.0	
07/03/2022	12:52:12	717	7.7	15.98	0.0	
07/03/2022	12:52:42	681	7.8	16.00	0.0	
07/03/2022	12:53:12	700	7.8	16.00	0.0	
07/03/2022	12:53:42	706	7.7	16.01	0.0	
07/03/2022	12:54:12	716	7.7	16.02	0.0	
07/03/2022	12:54:42	735	7.7	16.08	0.0	
07/03/2022	12:55:12	704	7.8	16.06	0.0	
07/03/2022	12:55:42	693	7.7	16.03	0.0	
07/03/2022	12:56:12	666	7.7	16.05	0.0	
07/03/2022	12:56:42	698	7.7	16.04	0.0	
07/03/2022	12:57:12	690	7.8	16.03	0.0	
07/03/2022	12:57:42	676	7.7	16.02	0.0	
07/03/2022	12:58:12	663	7.8	16.02	0.0	
07/03/2022	12:58:42	701	7.7	16.02	0.0	
07/03/2022	12:59:12	678	7.8	16.02	0.0	
07/03/2022	12:59:42	662	7.8	16.02	0.0	
07/03/2022	13:00:12	708	7.8	16.01	0.0	
07/03/2022	13:00:42	697	7.7	16.01	0.0	
07/03/2022	13:01:12	678	7.7	16.00	0.0	
07/03/2022	13:01:42	679	7.8	16.00	0.0	
07/03/2022	13:02:12	673	7.8	16.02	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	13:03:12	689	7.8	16.04	0.0	
07/03/2022	13:03:42	709	7.7	16.02	0.0	
07/03/2022	13:04:12	308	4.7	15.99	0.0	
07/03/2022	13:04:42	284	4.6	15.98	0.0	
07/03/2022	13:05:12	305	4.6	15.97	0.0	
07/03/2022	13:05:42	118	2.9	15.98	0.0	
07/03/2022	13:06:00	114	2.6	15.97	0.0	release top plug
07/03/2022	13:06:12	110	2.6	15.97	0.0	
07/03/2022	13:06:42	110	2.6	15.96	0.0	
07/03/2022	13:07:00	112	2.4	15.96	0.0	displace 213bbl fresh water
07/03/2022	13:07:12	108	2.6	15.96	0.0	
07/03/2022	13:07:42	76	2.2	12.18	0.0	
07/03/2022	13:08:12	97	4.6	10.50	0.0	
07/03/2022	13:08:42	201	6.4	9.75	0.0	
07/03/2022	13:09:12	199	6.4	9.49	0.0	
07/03/2022	13:09:42	201	6.4	9.12	0.0	
07/03/2022	13:10:12	177	6.4	8.94	0.0	
07/03/2022	13:10:42	181	6.5	8.73	0.0	
07/03/2022	13:11:12	186	6.5	8.65	0.0	
07/03/2022	13:11:42	173	6.5	8.63	0.0	
07/03/2022	13:12:12	185	6.5	8.51	0.0	
07/03/2022	13:12:42	197	6.6	8.46	0.0	
07/03/2022	13:13:12	175	6.5	8.50	0.0	
07/03/2022	13:13:42	171	6.4	8.41	0.0	
07/03/2022	13:14:12	162	6.5	8.44	0.0	
07/03/2022	13:14:42	171	6.4	8.44	0.0	
07/03/2022	13:15:12	166	6.5	8.43	0.0	
07/03/2022	13:15:42	173	6.5	8.42	0.0	
07/03/2022	13:16:12	175	6.5	8.36	0.0	
07/03/2022	13:16:42	176	6.5	8.35	0.0	
07/03/2022	13:17:12	215	6.5	8.35	0.0	
07/03/2022	13:17:42	269	6.4	8.35	0.0	
07/03/2022	13:18:12	281	6.4	8.35	0.0	
07/03/2022	13:18:42	379	6.5	8.46	0.0	
07/03/2022	13:19:12	426	6.5	8.45	0.0	
07/03/2022	13:19:42	490	6.4	8.35	0.0	
07/03/2022	13:20:42	586	6.4	8.36	0.0	
07/03/2022	13:21:12	645	6.4	8.36	0.0	
07/03/2022	13:21:42	667	6.3	8.36	0.0	
07/03/2022	13:22:12	732	6.4	8.36	0.0	
07/03/2022	13:22:42	741	6.4	8.36	0.0	
07/03/2022	13:23:12	783	6.4	8.36	0.0	
07/03/2022	13:23:42	819	6.4	8.36	0.0	
07/03/2022	13:24:12	825	6.4	8.36	0.0	
07/03/2022	13:24:42	896	6.4	8.36	0.0	
07/03/2022	13:25:12	906	6.4	8.36	0.0	
07/03/2022	13:25:42	954	6.4	8.36	0.0	
07/03/2022	13:26:12	1025	6.4	8.36	0.0	
07/03/2022	13:26:42	1023	6.4	8.36	0.0	
07/03/2022	13:27:12	1073	6.4	8.36	0.0	
07/03/2022	13:27:42	1095	6.4	8.36	0.0	
07/03/2022	13:28:12	1152	6.4	8.36	0.0	
07/03/2022	13:28:42	1178	6.4	8.36	0.0	
07/03/2022	13:29:12	1206	6.4	8.36	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	13:30:12	1320	6.4	8.36	0.0	
07/03/2022	13:30:42	1316	6.4	8.36	0.0	
07/03/2022	13:31:12	1381	6.4	8.36	0.0	
07/03/2022	13:31:42	1383	6.4	8.36	0.0	
07/03/2022	13:32:12	1406	6.4	8.36	0.0	
07/03/2022	13:32:42	1415	6.4	8.36	0.0	
07/03/2022	13:33:12	1431	6.4	8.36	0.0	
07/03/2022	13:33:42	1488	6.3	8.36	0.0	
07/03/2022	13:34:12	1452	6.3	8.36	0.0	
07/03/2022	13:34:42	1486	6.4	8.36	0.0	
07/03/2022	13:35:12	1520	6.3	8.36	0.0	
07/03/2022	13:35:42	1584	6.4	8.36	0.0	
07/03/2022	13:36:12	1400	5.1	8.36	0.0	
07/03/2022	13:36:42	1421	5.1	8.36	0.0	
07/03/2022	13:37:12	1461	5.1	8.36	0.0	
07/03/2022	13:37:42	1491	5.1	8.36	0.0	
07/03/2022	13:38:12	1399	4.6	8.36	0.0	
07/03/2022	13:38:42	1425	4.5	8.36	0.0	
07/03/2022	13:39:12	1420	4.5	8.36	0.0	
07/03/2022	13:39:42	1548	4.5	8.36	0.0	
07/03/2022	13:40:12	1576	4.5	8.36	0.0	
07/03/2022	13:40:42	1521	4.5	8.36	0.0	
07/03/2022	13:41:12	1410	3.3	8.36	0.0	
07/03/2022	13:41:42	1394	3.3	8.36	0.0	
07/03/2022	13:42:12	1413	3.3	8.36	0.0	
07/03/2022	13:42:42	1430	3.3	8.36	0.0	
07/03/2022	13:43:12	1429	3.3	8.36	0.0	
07/03/2022	13:43:42	1476	3.3	8.36	0.0	
07/03/2022	13:44:12	1489	3.3	8.35	0.0	
07/03/2022	13:44:42	1514	3.3	8.36	0.0	
07/03/2022	13:45:00	1501	3.3	8.36	0.0	land pug @ 1900psi
07/03/2022	13:45:12	1542	3.3	8.36	0.0	
07/03/2022	13:45:42	1889	0.0	8.36	0.0	
07/03/2022	13:46:00	1883	0.0	6.53	0.0	53 bbl cement to surface
07/03/2022	13:46:12	1883	0.0	6.86	0.0	
07/03/2022	13:46:42	1881	0.0	7.29	0.0	
07/03/2022	13:47:12	1879	0.0	7.71	0.0	
07/03/2022	13:47:42	1879	0.0	7.95	0.0	
07/03/2022	13:48:12	1832	0.0	8.01	0.0	
07/03/2022	13:48:42	12	0.0	8.21	0.0	
07/03/2022	13:49:12	13	0.0	8.13	0.0	
07/03/2022	13:49:42	13	0.0	8.32	0.0	
07/03/2022	13:50:12	12	0.0	8.35	0.0	
07/03/2022	13:50:42	13	0.0	8.35	0.0	
07/03/2022	13:51:12	7	0.0	8.35	0.0	
07/03/2022	13:51:42	7	0.0	8.35	0.0	
07/03/2022	13:52:12	7	0.0	8.35	0.0	
07/03/2022	13:52:42	6	0.0	8.25	0.0	
07/03/2022	13:53:12	14	0.0	8.35	0.0	
07/03/2022	13:54:00	14	0.0	8.35	0.0	wash lines for rig
07/03/2022	13:54:12	15	0.0	8.35	0.0	
07/03/2022	13:54:42	70	2.1	8.36	0.0	
07/03/2022	13:55:00	23	2.3	8.36	0.0	end pumping @ 14:45
07/03/2022	13:55:12	102	3.6	8.36	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	13:56:00	362	8.3	8.36	0.0	end job @ 16:00
07/03/2022	13:56:12	358	8.3	8.36	0.0	
07/03/2022	13:56:42	374	8.3	8.36	0.0	
07/03/2022	13:57:12	300	6.6	8.36	0.0	
07/03/2022	13:57:42	355	6.9	8.36	0.0	
07/03/2022	13:58:12	371	8.3	8.36	0.0	
07/03/2022	13:58:42	364	8.3	8.36	0.0	
07/03/2022	13:59:12	373	8.3	8.36	0.0	
07/03/2022	13:59:42	369	8.3	8.36	0.0	
07/03/2022	14:00:12	372	8.3	8.36	0.0	
07/03/2022	14:00:42	367	8.3	8.36	0.0	
07/03/2022	14:01:12	377	8.3	8.36	0.0	
07/03/2022	14:01:42	372	8.3	8.36	0.0	
07/03/2022	14:02:12	376	8.3	8.36	0.0	
07/03/2022	14:02:42	378	8.3	8.36	0.0	
07/03/2022	14:03:12	385	8.3	8.36	0.0	
07/03/2022	14:03:42	379	8.3	8.36	0.0	
07/03/2022	14:04:12	389	8.3	8.36	0.0	
07/03/2022	14:04:42	391	8.3	8.36	0.0	
07/03/2022	14:05:12	382	8.3	8.36	0.0	
07/03/2022	14:05:42	389	8.3	8.36	0.0	
07/03/2022	14:06:12	384	8.3	8.36	0.0	
07/03/2022	14:06:42	381	8.3	8.36	0.0	
07/03/2022	14:07:12	377	8.3	8.36	0.0	
07/03/2022	14:07:42	378	8.3	8.36	0.0	
07/03/2022	14:08:12	12	0.0	8.36	0.0	
07/03/2022	14:08:42	13	0.0	8.36	0.0	
07/03/2022	14:09:12	13	0.0	8.36	0.0	
07/03/2022	14:09:42	14	0.0	8.06	0.0	
07/03/2022	14:10:12	13	0.0	8.13	0.0	
07/03/2022	14:10:42	13	0.0	8.09	0.0	
07/03/2022	14:11:12	14	0.0	8.32	0.0	
07/03/2022	14:11:42	14	0.0	8.21	0.0	
07/03/2022	14:12:12	15	0.0	8.35	0.0	
07/03/2022	14:12:42	14	0.0	8.33	0.0	
07/03/2022	14:13:12	15	0.0	8.35	0.0	
07/03/2022	14:13:42	15	0.0	8.35	0.0	
07/03/2022	14:14:12	47	2.0	8.36	0.0	
07/03/2022	14:14:42	95	4.3	8.36	0.0	
07/03/2022	14:15:12	224	6.5	8.36	0.0	
07/03/2022	14:15:42	233	6.5	8.36	0.0	
07/03/2022	14:16:12	221	6.4	8.36	0.0	
07/03/2022	14:16:42	227	6.5	8.36	0.0	
07/03/2022	14:17:12	219	6.5	8.36	0.0	
07/03/2022	14:17:42	225	6.4	8.36	0.0	
07/03/2022	14:18:12	236	6.5	8.36	0.0	
07/03/2022	14:18:42	225	6.5	8.36	0.0	
07/03/2022	14:19:12	230	6.4	8.36	0.0	
07/03/2022	14:19:42	234	6.5	8.36	0.0	
07/03/2022	14:20:12	229	6.4	8.36	0.0	
07/03/2022	14:20:42	245	6.5	8.36	0.0	
07/03/2022	14:21:12	30	5.2	8.36	0.0	
07/03/2022	14:21:42	14	0.0	8.36	0.0	
07/03/2022	14:22:12	16	0.0	8.36	0.0	

Well	Field	Job Start	Customer	Job Number
Charles Jamison 606H 606H	Camron Garner	Jul/03/2022	Southwestern	EOHC-01553

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
07/03/2022	14:23:12	16	0.0	8.36	0.0	
07/03/2022	14:23:42	16	0.0	8.36	0.0	
07/03/2022	14:24:12	16	0.0	8.36	0.0	
07/03/2022	14:24:42	13	0.0	8.36	0.0	
07/03/2022	14:25:12	12	0.0	8.36	0.0	
07/03/2022	14:25:42	12	0.0	8.36	0.0	
07/03/2022	14:26:12	12	0.0	8.36	0.0	
07/03/2022	14:26:42	74	2.8	8.36	0.0	
07/03/2022	14:27:42	250	5.6	8.36	0.0	
07/03/2022	14:28:12	227	6.4	8.36	0.0	
07/03/2022	14:28:42	223	6.5	8.36	0.0	
07/03/2022	14:29:12	240	6.4	8.36	0.0	
07/03/2022	14:29:42	229	6.5	8.36	0.0	
07/03/2022	14:30:12	249	6.5	8.36	0.0	
07/03/2022	14:30:42	244	6.5	8.36	0.0	
07/03/2022	14:31:12	238	6.5	8.36	0.0	
07/03/2022	14:31:42	11	0.0	8.36	0.0	
07/03/2022	14:32:12	14	0.0	8.36	0.0	
07/03/2022	14:32:42	15	0.0	6.73	0.0	
07/03/2022	14:33:12	15	0.0	8.15	0.0	
07/03/2022	14:33:42	15	0.0	8.34	0.0	
07/03/2022	14:34:12	16	0.0	8.35	0.0	
07/03/2022	14:34:42	18	0.0	8.36	0.0	
07/03/2022	14:35:12	8	0.0	8.35	0.0	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.7			8.7	220.0	0.0	25.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
5024	9	417	1900			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp			
%	220.0 bbl	213.0 bbl	73 degF	Cement Circulated to Surface? [X]	Volume	53.0 bbl
				Washed Thru Perfs [ ]	To	ft

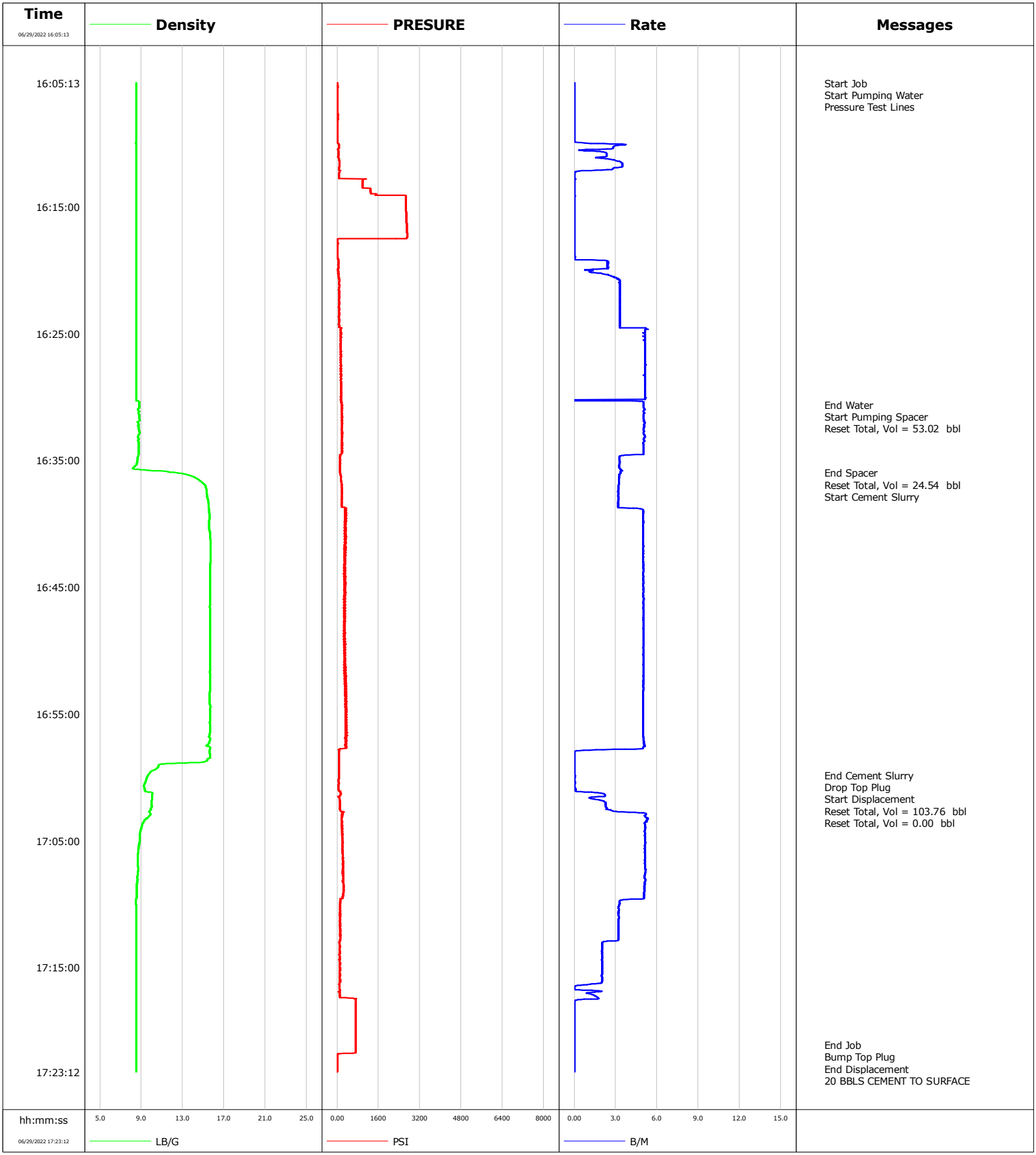
Customer or Authorized Representative	Schlumberger Supervisor		
	Danny Cover	Circulation Lost [ ]	Job Completed [X]
		-	-

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	CHARLES JAMISON MSH 606H	**Client**	SWN
Field	CAMARON GARNER	**SIR No.**	EOHC-01551
Engineer	BRIAN FOOTE	**Job Type**	SURFACE
Country	United States	**Job Date**	06-29-2022



Schlumberger

Cementing Service Report

Customer	Job Number
SWN	EOHC-01551

Well	Location (legal)	Schlumberger Location	Job Start
CHARLES JAMISON MSH 606H 606H	MOUNDSVILLE ,WV	STRASBURG	Jun/29/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
CAMARON GARNER	Clean-Sandstone	1 deg	17.5 in	414.0 ft	414.0 ft

County	State/Provin	BHP	BHST	BHCT	Pore Press. Gradient
MARSHAL COUNTY	West Virginia	psi	65 degF	81 degF	lb/gal

Well Mast	API/UWI
47-051-02436-00-00	47-051-02436-00-00

Rig Name	Drilled For	Service Via
SDC 41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
AIR	lb/gal	cP

Service Line	Job Type
Cementing	SURFACE

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	Single Cement head

Service Instructions

CEMENT 392' OF 13 3/8 WITH
50 BBLS H20
25 BBL GEL
99.3 BBLS 15.6 PPG
465 SK 1.2 YLD 5.27 H20
DROP TOP PLUG
DISP 54 BBL H20
FLOATS HELD 1 BBL BACK
20 BBL CEMENT TO SURFACE

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
392.0	13.4	54.5	K55	BUTT
0.0	0.0	0.0		

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	54.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	60.8 bbl	22.8 bbl	32.9 bbl

Casing/Tubing Secured	1 Hole Vol. Circulated prior to Cement	Casing Tools	Squeeze Job
[X]	[ ]		

Lift Pressure	Pipe Rotated	Pipe Reciprocated	Shoe Type	Shoe Depth	Squeeze Type	Tool Type
150 psi	[ ]	[ ]	Float	392.0 ft		

No. Centralizers	Top Plugs	Bottom Plugs	Stage Tool Type	Stage Tool Depth	Tool Depth	Tail Pipe Size
6	1			ft	ft	in

Cement Head Type	Collar Type	Collar Depth	Tail Pipe Depth	Sqz. Total Vol.
Single	Float	3499.0 ft	ft	bbl

Job Scheduled For	Arrived on Location	Leave Location
Jun/29/2022	Jun/29/2022	Jun/29/2022

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
06/29/2022	16:05:13	19	0.0	0.0	8.50	Started Acquisition
06/29/2022	16:05:14	18	0.0	0.0	8.50	Start Job
06/29/2022	16:05:37	19	0.0	0.0	8.50	Start Pumping Water
06/29/2022	16:05:40	19	0.0	0.0	8.50	Pressure Test Lines
06/29/2022	16:05:45	19	0.0	0.0	8.50	
06/29/2022	16:06:17	19	0.0	0.0	8.50	
06/29/2022	16:06:49	18	0.0	0.0	8.50	
06/29/2022	16:07:21	19	0.0	0.0	8.50	
06/29/2022	16:07:53	19	0.0	0.0	8.50	
06/29/2022	16:08:25	17	0.0	0.0	8.50	
06/29/2022	16:08:57	16	0.0	0.0	8.50	
06/29/2022	16:09:29	17	0.0	0.0	8.50	
06/29/2022	16:10:01	33	1.7	0.1	8.48	
06/29/2022	16:10:33	62	0.3	1.5	8.50	
06/29/2022	16:11:05	28	2.1	2.6	8.50	
06/29/2022	16:11:37	87	3.5	4.1	8.50	
06/29/2022	16:12:09	113	0.9	5.7	8.49	
06/29/2022	16:12:41	62	0.0	5.8	8.50	
06/29/2022	16:13:13	978	0.0	5.8	8.50	
06/29/2022	16:13:45	1281	0.0	5.8	8.50	
06/29/2022	16:14:17	2653	0.0	5.8	8.50	

Well	Field	Job Start	Customer	Job Number
CHARLES JAMISON MSH 606H 606H	CAMARON GARNER	Jun/29/2022	SWN	EOHC-01551

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
06/29/2022	16:15:53	2678	0.0	5.8	8.50	
06/29/2022	16:16:25	2690	0.0	5.9	8.49	
06/29/2022	16:16:57	2703	0.0	5.9	8.49	
06/29/2022	16:17:29	2695	0.0	5.9	8.50	
06/29/2022	16:18:01	18	0.0	5.9	8.50	
06/29/2022	16:18:33	18	0.0	5.9	8.49	
06/29/2022	16:19:05	20	0.0	5.9	8.49	
06/29/2022	16:19:37	50	2.4	6.9	8.51	
06/29/2022	16:20:09	43	1.1	7.9	8.50	
06/29/2022	16:20:41	61	3.1	9.2	8.50	
06/29/2022	16:21:13	79	3.3	10.9	8.50	
06/29/2022	16:21:45	67	3.3	12.7	8.50	
06/29/2022	16:22:17	58	3.3	14.5	8.50	
06/29/2022	16:22:49	60	3.3	16.2	8.50	
06/29/2022	16:23:21	72	3.3	18.0	8.50	
06/29/2022	16:23:53	94	3.3	19.8	8.50	
06/29/2022	16:24:25	89	3.3	21.5	8.50	
06/29/2022	16:24:57	128	5.1	24.0	8.50	
06/29/2022	16:25:29	133	5.1	26.8	8.50	
06/29/2022	16:26:01	129	5.1	29.5	8.50	
06/29/2022	16:26:33	138	5.1	32.2	8.50	
06/29/2022	16:27:05	122	5.1	34.9	8.50	
06/29/2022	16:27:37	141	5.1	37.7	8.49	
06/29/2022	16:28:09	133	5.1	40.4	8.49	
06/29/2022	16:28:41	142	5.1	43.1	8.49	
06/29/2022	16:29:13	146	5.1	45.9	8.49	
06/29/2022	16:29:45	136	5.1	48.6	8.49	
06/29/2022	16:30:17	157	0.0	50.9	8.51	
06/29/2022	16:30:37	182	5.0	52.5	8.77	End Water
06/29/2022	16:30:40	197	5.0	52.8	8.77	Start Pumping Spacer
06/29/2022	16:30:43	184	5.0	53.0	8.77	Reset Total, Vol = 53.02 bbl
06/29/2022	16:30:49	179	5.0	0.5	8.78	
06/29/2022	16:31:21	198	5.0	3.2	8.76	
06/29/2022	16:31:53	179	5.0	5.9	8.83	
06/29/2022	16:32:25	190	5.0	8.6	8.75	
06/29/2022	16:32:57	176	5.1	11.3	8.75	
06/29/2022	16:33:29	193	5.1	14.0	8.69	
06/29/2022	16:34:01	197	5.0	16.7	8.74	
06/29/2022	16:34:33	120	4.4	19.3	8.72	
06/29/2022	16:35:05	108	3.3	21.1	8.60	
06/29/2022	16:35:37	116	3.3	22.9	8.16	
06/29/2022	16:35:59	114	3.4	24.1	12.49	End Spacer
06/29/2022	16:36:07	124	3.2	24.5	13.43	Reset Total, Vol = 24.54 bbl
06/29/2022	16:36:09	140	3.3	0.1	13.57	
06/29/2022	16:36:10	130	3.3	0.2	13.65	Start Cement Slurry
06/29/2022	16:36:41	167	3.2	1.8	14.81	
06/29/2022	16:37:13	184	3.2	3.6	15.28	
06/29/2022	16:38:17	191	3.2	7.0	15.48	
06/29/2022	16:38:49	349	4.8	8.7	15.53	
06/29/2022	16:39:21	307	5.0	11.4	15.59	
06/29/2022	16:39:53	334	5.0	14.1	15.55	
06/29/2022	16:40:25	306	5.0	16.7	15.56	
06/29/2022	16:40:57	333	5.0	19.4	15.63	
06/29/2022	16:41:29	309	5.0	22.1	15.68	

Well	Field	Job Start	Customer	Job Number
CHARLES JAMISON MSH 606H 606H	CAMARON GARNER	Jun/29/2022	SWN	EOHC-01551

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
06/29/2022	16:42:33	327	5.0	27.4	15.68	
06/29/2022	16:43:05	298	5.0	30.1	15.67	
06/29/2022	16:43:37	314	5.0	32.7	15.66	
06/29/2022	16:44:09	296	5.0	35.4	15.65	
06/29/2022	16:44:41	307	5.0	38.1	15.65	
06/29/2022	16:45:13	251	5.0	40.7	15.64	
06/29/2022	16:45:45	296	5.0	43.4	15.64	
06/29/2022	16:46:17	283	5.0	46.1	15.62	
06/29/2022	16:46:49	290	5.0	48.7	15.62	
06/29/2022	16:47:21	307	5.0	51.4	15.64	
06/29/2022	16:47:53	270	5.0	54.1	15.64	
06/29/2022	16:48:25	296	5.0	56.8	15.64	
06/29/2022	16:48:57	284	5.0	59.4	15.65	
06/29/2022	16:49:29	326	5.0	62.1	15.65	
06/29/2022	16:50:01	275	5.0	64.8	15.66	
06/29/2022	16:50:33	292	5.0	67.5	15.66	
06/29/2022	16:51:05	262	5.0	70.1	15.63	
06/29/2022	16:51:37	294	5.0	72.8	15.63	
06/29/2022	16:52:09	356	5.0	75.5	15.63	
06/29/2022	16:52:41	303	5.0	78.2	15.63	
06/29/2022	16:53:13	317	5.0	80.8	15.62	
06/29/2022	16:53:45	336	5.0	83.5	15.59	
06/29/2022	16:54:17	315	5.0	86.2	15.63	
06/29/2022	16:54:49	326	5.0	88.8	15.64	
06/29/2022	16:55:21	324	5.0	91.5	15.65	
06/29/2022	16:55:53	335	5.0	94.1	15.63	
06/29/2022	16:56:25	341	5.0	96.8	15.63	
06/29/2022	16:56:57	323	5.0	99.5	15.64	
06/29/2022	16:57:29	368	5.1	102.2	15.26	
06/29/2022	16:58:01	74	0.0	103.7	15.61	
06/29/2022	16:58:33	65	0.0	103.7	15.39	
06/29/2022	16:59:05	60	0.0	103.7	10.64	
06/29/2022	16:59:37	60	0.0	103.8	9.84	
06/29/2022	16:59:50	59	0.0	103.8	9.64	End Cement Slurry
06/29/2022	16:59:54	59	0.0	103.8	9.59	Drop Top Plug
06/29/2022	16:59:56	58	0.0	103.8	9.58	Start Displacement
06/29/2022	17:00:01	58	0.0	103.8	9.52	Reset Total, Vol = 103.76 bbl
06/29/2022	17:00:03	58	0.0	0.0	9.51	Reset Total, Vol = 0.00 bbl
06/29/2022	17:00:09	57	0.0	0.0	9.47	
06/29/2022	17:01:13	137	1.9	0.2	10.09	
06/29/2022	17:01:45	93	1.7	1.1	10.00	
06/29/2022	17:02:17	101	2.3	2.3	10.00	
06/29/2022	17:02:49	219	5.1	3.9	9.85	
06/29/2022	17:03:21	187	5.2	6.7	9.31	
06/29/2022	17:03:53	223	5.1	9.4	9.03	
06/29/2022	17:04:25	192	5.1	12.1	8.85	
06/29/2022	17:04:57	228	5.1	14.9	8.81	
06/29/2022	17:05:29	200	5.1	17.6	8.74	
06/29/2022	17:06:01	246	5.1	20.3	8.66	
06/29/2022	17:06:33	230	5.1	23.1	8.66	
06/29/2022	17:07:05	242	5.1	25.8	8.67	
06/29/2022	17:07:37	198	5.1	28.5	8.64	
06/29/2022	17:08:09	239	5.2	31.3	8.62	
06/29/2022	17:08:41	245	5.1	34.0	8.55	

Well	Field	Job Start	Customer	Job Number
CHARLES JAMISON MSH 606H 606H	CAMARON GARNER	Jun/29/2022	SWN	EOHC-01551

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Volume BBL	Density LB/G	Message
06/29/2022	17:09:45	126	3.3	39.1	8.46	
06/29/2022	17:10:17	101	3.2	40.9	8.50	
06/29/2022	17:10:49	101	3.2	42.6	8.51	
06/29/2022	17:11:21	127	3.2	44.3	8.50	
06/29/2022	17:11:53	101	3.2	46.0	8.50	
06/29/2022	17:12:25	154	3.2	47.7	8.50	
06/29/2022	17:12:57	93	2.1	49.3	8.50	
06/29/2022	17:13:29	95	2.0	50.4	8.50	
06/29/2022	17:14:01	78	2.0	51.5	8.50	
06/29/2022	17:14:33	104	2.0	52.6	8.50	
06/29/2022	17:15:05	101	2.0	53.6	8.50	
06/29/2022	17:15:37	124	2.0	54.7	8.50	
06/29/2022	17:16:09	96	2.0	55.8	8.50	
06/29/2022	17:16:41	78	0.0	56.1	8.50	
06/29/2022	17:17:13	91	1.5	56.8	8.50	
06/29/2022	17:17:45	721	0.0	57.2	8.50	
06/29/2022	17:18:17	721	0.0	57.2	8.50	
06/29/2022	17:18:49	721	0.0	57.2	8.50	
06/29/2022	17:19:21	721	0.0	57.3	8.50	
06/29/2022	17:19:53	720	0.0	57.3	8.50	
06/29/2022	17:20:25	721	0.0	57.3	8.50	
06/29/2022	17:20:57	720	0.0	57.3	8.50	
06/29/2022	17:21:06	721	0.0	57.3	8.50	End Job
06/29/2022	17:21:29	720	0.0	57.3	8.50	
06/29/2022	17:21:48	21	0.0	57.3	8.50	Bump Top Plug
06/29/2022	17:21:50	19	0.0	57.3	8.50	End Displacement
06/29/2022	17:22:01	19	0.0	57.3	8.50	
06/29/2022	17:22:05	18	0.0	57.3	8.50	20 BBLS CEMENT TO SURFACE
06/29/2022	17:22:33	19	0.0	57.3	8.50	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
3.1			5.4	103.5	0.0	24.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
700	150	325	700			bbl	lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface?	Volume
%	99.3 bbl	54.0 bbl	78 degF	X	10.0 bbl
				Washed Thru Perfs ☐	To ft

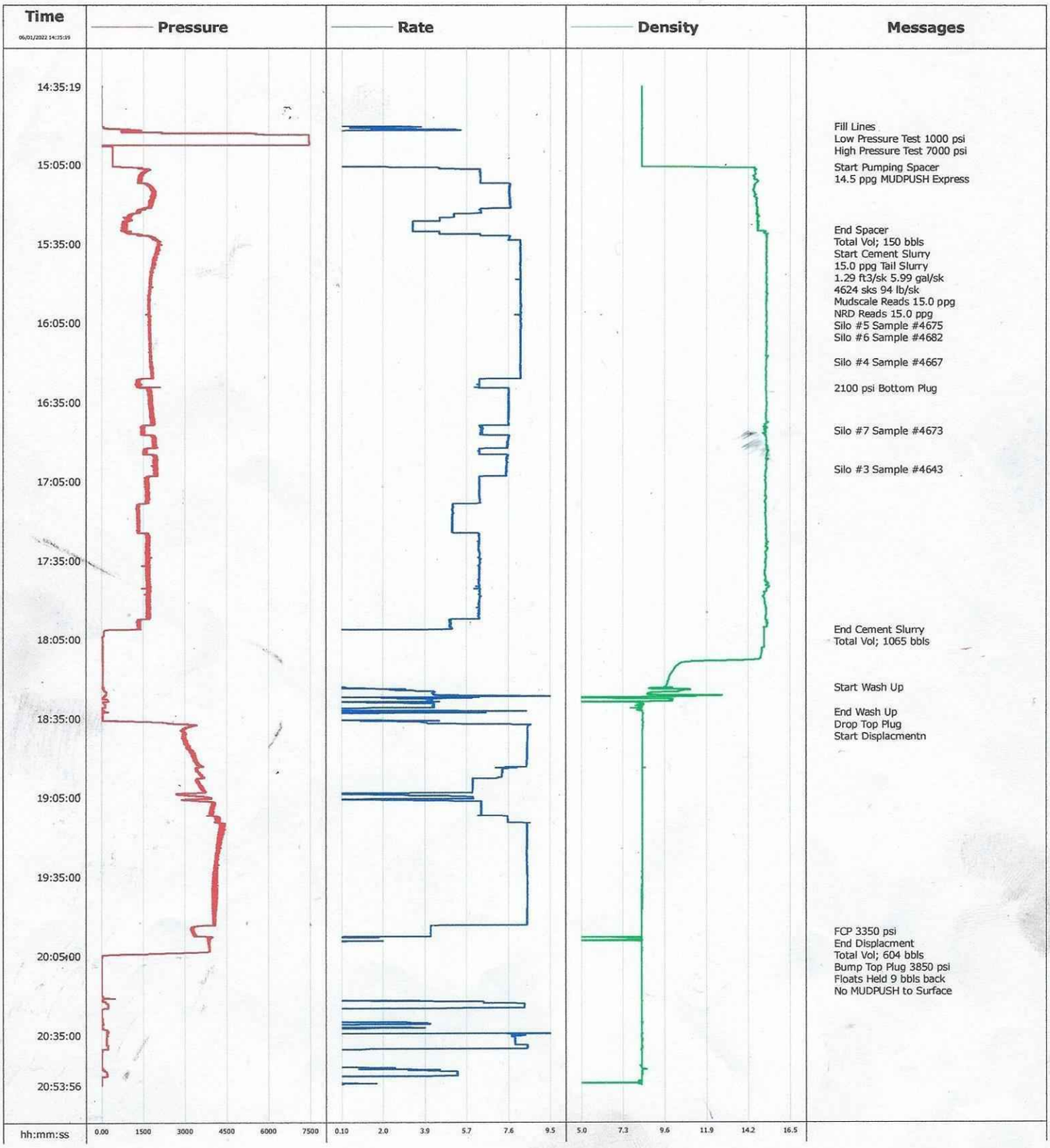
Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
COMAPNY MAN	BRIAN FOOTE	-	X -

Schlumberger

Cementing Job Report

CemCAT v1.7

Well	Charles Jamison MSH 810H	**Client**	SWN Production Company
Field	Panhandle	**SIR No.**	EOHC-00667
Engineer	Marco Arrington	**Job Type**	Cem Prod Casing
Country	US	**Job Date**	06-01-2022



Schlumberger

Cementing Service Report

Customer	Job Number
SWN Production Company	EOHC-00667

Well	Location (legal)	Schlumberger Location	Job Start
Charles Jamison MSH 810H 810H	Charles Jamison Pad		Jun/01/2022

Field	Formation Name/Type	Deviation	Bit Size	Well MD	Well TVD
Panhandle		deg	8.5 in	26410.0 ft	7330.0 ft

County	State/Provinc	BHP	BHST	BHCT	Pore Press. Gradient
Marshall	West Virgina	psi	141 degF	140 degF	lb/gal
Well Master 0066499233	**API/UWI** 47-051-02427-00-00				

Rig Name	Drilled For	Service Via
SDC #41	Gas	Land

Offshore Zone	Well Class	Well Type
	New	Development

Drilling Fluid Type	Max. Density	Plastic Viscosity
Oil Mud	14.00 lb/gal	cP

Service Line	Job Type
Cementing	Cem Prod Casing

Max. Allowed Tub. Press	Max. Allowed Ann. Press	WH Connection
psi	psi	

Service Instructions

Provide equipment, product, and service to cement 6" x 5 1/2" production casing in 8.75" x 8.5" OH at 26,410'.
XS = 15%
MPE = 150 bbls @ 14.5 ppg
TOC = 3,000' @ 15 ppg

Casing/Liner

Depth, ft	Size, in	Weight, lb/ft	Grade	Thread
2801.0	9.6	36.0	J-55	BUTT
26410.0	5.5	20.0	P-110	BUTT

Tubing/Drill Pipe

T/D	Depth, ft	Size, in	Weight, lb/ft	Grade	Thread

Perforations/Open Hole

Top, ft	Bottom, ft	shot/ft	No. of Shots	Total Interval
ft	ft			ft
ft	ft			Diameter
ft	ft			in

Treat Down	Displacement	Packer Type	Packer Depth
Casing	604.0 bbl		ft

Tubing Vol.	Casing Vol.	Annular Vol.	Openhole Vol.
bbl	607.0 bbl	1155.0 bbl	1040.0 bbl

Casing/Tubing Secured	☐	1 Hole Vol. Circulated prior to Cement	☒
Lift Pressure	3350 psi		
Pipe Rotated	☐	Pipe Reciprocated	☐
No. Centralizers	Top Plugs	Bottom Plugs	
Cement Head Type			

Job Scheduled For	Arrived on Location	Leave Location
Jun/01/2022 01:00	Jun/01/2022 07:00	Jun/01/2022 21:50

Casing Tools		Squeeze Job	
Shoe Type	Float	Squeeze Type	
Shoe Depth	26410.0 ft	Tool Type	
Stage Tool Type		Tool Depth	ft
Stage Tool Depth	ft	Tail Pipe Size	in
Collar Type	Float	Tail Pipe Depth	ft
Collar Depth	26365.0 ft	Sqz. Total Vol.	bbl

Date	Time 24-hr clock	CPF1_PRESS PSI	CPF1_TTL_RATE B/M	CPF1_DENSITY LB/G	Message
06/01/2022	14:35:19	2	0.0	8.33	Started Acquisition
06/01/2022	14:36:59	-1	0.0	8.33	
06/01/2022	14:38:39	-2	0.0	8.33	
06/01/2022	14:40:19	-3	0.0	8.33	
06/01/2022	14:41:59	-2	0.0	8.33	
06/01/2022	14:43:39	-3	0.0	8.33	
06/01/2022	14:45:19	-2	0.0	8.33	
06/01/2022	14:46:59	-3	0.0	8.33	
06/01/2022	14:48:39	-3	0.0	8.33	
06/01/2022	14:50:19	-3	0.0	8.33	
06/01/2022	14:50:30	-3	0.0	8.33	Fill Lines
06/01/2022	14:51:59	1414	5.4	8.34	
06/01/2022	14:52:14	790	0.0	8.34	Low Pressure Test 1000 psi
06/01/2022	14:53:39	6398	0.0	8.33	
06/01/2022	14:53:44	6397	0.0	8.34	High Pressure Test 7000 psi
06/01/2022	14:55:19	7416	0.0	8.34	
06/01/2022	14:56:59	7438	0.0	8.33	
06/01/2022	14:58:39	378	0.0	8.33	
06/01/2022	15:00:19	387	0.0	8.33	
06/01/2022	15:01:59	388	0.0	8.33	
06/01/2022	15:03:39	389	0.0	8.33	

Well	Field	Job Start	Customer	Job Number
Charles Jamison MSH 810H 810H	Panhandle	Jun/01/2022	SWN Production Company	EOHC-00667

Date	Time 24-hr clock	CPF1_PRESS PSI	CPF1_TTL_RATE B/M	CPF1_DENSITY LB/G	Message
06/01/2022	15:05:52	662	1.8	10.87	Start Pumping Spacer
06/01/2022	15:06:10	1265	4.5	14.54	14.5 ppg MUDPUSH Express
06/01/2022	15:06:59	1599	6.3	14.58	
06/01/2022	15:08:39	1369	6.3	14.54	
06/01/2022	15:10:19	1320	6.3	14.48	
06/01/2022	15:11:59	1394	6.4	14.59	
06/01/2022	15:13:39	1812	7.6	14.48	
06/01/2022	15:15:19	1861	7.6	14.51	
06/01/2022	15:16:59	1885	7.6	14.50	
06/01/2022	15:18:39	1713	7.7	14.65	
06/01/2022	15:20:19	1721	7.7	14.65	
06/01/2022	15:21:59	1392	6.4	14.67	
06/01/2022	15:23:39	1158	5.2	14.65	
06/01/2022	15:25:19	881	4.5	14.71	
06/01/2022	15:26:59	868	3.3	14.69	
06/01/2022	15:28:39	795	3.3	14.69	
06/01/2022	15:29:36	835	3.3	14.69	End Spacer
06/01/2022	15:29:45	684	3.3	14.69	Total Vol; 150 bbls
06/01/2022	15:31:16	1296	6.2	15.19	Start Cement Slurry
06/01/2022	15:31:20	1254	6.3	15.19	15.0 ppg Tail Slurry
06/01/2022	15:31:30	1399	6.3	15.19	1.29 ft3/sk 5.99 gal/sk
06/01/2022	15:31:50	1671	6.7	15.16	4624 sks 94 lb/sk
06/01/2022	15:31:59	1599	7.7	15.20	
06/01/2022	15:33:00	1846	7.6	15.19	Mudscale Reads 15.0 ppg
06/01/2022	15:33:10	1903	7.6	15.19	NRD Reads 15.0 ppg
06/01/2022	15:33:39	2025	8.1	15.20	
06/01/2022	15:35:19	2007	8.2	15.18	
06/01/2022	15:36:59	1990	8.1	15.19	
06/01/2022	15:38:39	1930	8.2	15.18	
06/01/2022	15:39:12	1901	8.1	15.18	Silo #5 Sample #4675
06/01/2022	15:40:19	1884	8.2	15.18	
06/01/2022	15:41:59	1887	8.1	15.19	
06/01/2022	15:43:39	1854	8.1	15.21	
06/01/2022	15:45:19	1838	8.2	15.19	
06/01/2022	15:46:59	1807	8.1	15.18	
06/01/2022	15:48:39	1735	8.1	15.19	
06/01/2022	15:50:19	1738	8.2	15.23	
06/01/2022	15:51:59	1754	8.2	15.20	
06/01/2022	15:53:39	1699	8.1	15.24	
06/01/2022	15:55:19	1691	8.2	15.18	
06/01/2022	15:56:28	1698	8.2	15.18	Silo #6 Sample #4682
06/01/2022	15:56:59	1715	8.2	15.18	
06/01/2022	15:58:39	1675	8.2	15.17	
06/01/2022	16:00:19	1710	8.2	15.18	
06/01/2022	16:01:59	1687	8.1	15.18	
06/01/2022	16:03:39	1704	8.2	15.20	
06/01/2022	16:05:19	1694	8.2	15.17	
06/01/2022	16:06:59	1689	8.2	15.21	
06/01/2022	16:08:39	1704	8.2	15.20	
06/01/2022	16:10:19	1747	8.2	15.19	
06/01/2022	16:11:59	1718	8.2	15.19	
06/01/2022	16:13:39	1712	8.2	15.21	
06/01/2022	16:15:19	1759	8.2	15.19	
06/01/2022	16:16:59	1753	8.1	15.16	

Well	Field	Job Start	Customer	Job Number
Charles Jamison MSH 810H 810H	Panhandle	Jun/01/2022	SWN Production Company	EOHC-00667

Date	Time 24-hr clock	CPF1_PRESS PSI	CPF1_TTL_RATE B/M	CPF1_DENSITY LB/G	Message
06/01/2022	16:19:44	1764	8.2	15.17	Silo #4 Sample #4667
06/01/2022	16:20:19	1772	8.1	15.18	
06/01/2022	16:21:59	1792	8.1	15.15	
06/01/2022	16:23:39	1790	8.2	15.17	
06/01/2022	16:25:19	1841	8.2	15.17	
06/01/2022	16:26:59	1259	6.3	15.16	
06/01/2022	16:29:28	1503	6.3	15.15	2100 psi Bottom Plug
06/01/2022	16:30:19	1667	7.6	15.15	
06/01/2022	16:31:59	1785	7.6	15.17	
06/01/2022	16:33:39	1808	7.6	15.17	
06/01/2022	16:35:19	1733	7.6	15.19	
06/01/2022	16:36:59	1813	7.6	15.18	
06/01/2022	16:38:39	1717	7.6	15.16	
06/01/2022	16:40:19	1773	7.6	15.15	
06/01/2022	16:41:59	1863	7.6	15.16	
06/01/2022	16:43:39	1817	7.6	15.11	
06/01/2022	16:45:19	1473	6.4	15.07	
06/01/2022	16:45:50	1534	6.4	15.12	Silo #7 Sample #4673
06/01/2022	16:46:59	1502	6.4	15.07	
06/01/2022	16:48:39	1921	7.6	15.18	
06/01/2022	16:50:19	1876	7.6	15.18	
06/01/2022	16:51:59	1861	7.5	15.25	
06/01/2022	16:53:39	1551	6.3	15.26	
06/01/2022	16:55:19	1891	7.6	15.19	
06/01/2022	16:56:59	1960	7.5	15.18	
06/01/2022	16:58:39	1982	7.5	15.16	
06/01/2022	17:00:19	1899	7.5	15.17	
06/01/2022	17:00:31	1905	7.5	15.16	Silo #3 Sample #4643
06/01/2022	17:01:59	1962	7.5	15.12	
06/01/2022	17:03:39	1586	6.3	15.14	
06/01/2022	17:05:19	1576	6.3	15.13	
06/01/2022	17:06:59	1647	6.3	15.13	
06/01/2022	17:08:39	1681	6.3	15.11	
06/01/2022	17:10:19	1678	6.3	15.14	
06/01/2022	17:11:59	1655	6.3	15.13	
06/01/2022	17:13:39	1308	5.1	15.15	
06/01/2022	17:15:19	1319	5.1	15.13	
06/01/2022	17:16:59	1283	5.1	15.13	
06/01/2022	17:18:39	1319	5.1	15.14	
06/01/2022	17:20:19	1346	5.1	15.15	
06/01/2022	17:21:59	1301	5.1	15.16	
06/01/2022	17:23:39	1330	5.1	15.18	
06/01/2022	17:25:19	1607	6.3	15.15	
06/01/2022	17:26:59	1707	6.3	15.20	
06/01/2022	17:28:39	1633	6.3	15.16	
06/01/2022	17:30:19	1697	6.3	15.23	
06/01/2022	17:31:59	1681	6.3	15.12	
06/01/2022	17:33:39	1607	6.3	15.17	
06/01/2022	17:35:19	1671	6.3	15.13	
06/01/2022	17:36:59	1654	6.3	15.14	
06/01/2022	17:38:39	1597	6.3	15.10	
06/01/2022	17:40:19	1689	6.3	15.10	
06/01/2022	17:41:59	1666	6.3	15.14	
06/01/2022	17:43:39	1744	6.3	15.29	

Well	Field	Job Start	Customer	Job Number
Charles Jamison MSH 810H 810H	Panhandle	Jun/01/2022	SWN Production Company	EOHC-00667

Date	Time 24-hr clock	CPF1_PRESS PSI	CPF1_TTL_RATE B/M	CPF1_DENSITY LB/G	Message
06/01/2022	17:46:59	1718	6.3	15.05	
06/01/2022	17:48:39	1710	6.3	15.02	
06/01/2022	17:50:19	1631	6.3	15.10	
06/01/2022	17:51:59	1623	6.3	15.12	
06/01/2022	17:53:39	1712	6.3	15.17	
06/01/2022	17:55:19	1730	6.3	15.16	
06/01/2022	17:56:59	1668	6.3	15.13	
06/01/2022	17:58:39	1320	5.0	15.25	
06/01/2022	18:00:19	1372	5.0	15.02	
06/01/2022	18:01:15	358	0.1	15.06	End Cement Slurry
06/01/2022	18:01:30	127	0.0	15.06	Total Vol; 1065 bbls
06/01/2022	18:01:59	89	0.0	15.06	
06/01/2022	18:03:39	78	0.0	15.07	
06/01/2022	18:05:19	27	0.0	15.07	
06/01/2022	18:06:59	31	0.0	15.07	
06/01/2022	18:08:39	37	0.0	14.94	
06/01/2022	18:10:19	35	0.0	14.91	
06/01/2022	18:11:59	36	0.0	14.85	
06/01/2022	18:13:39	37	0.0	10.63	
06/01/2022	18:15:19	38	0.0	10.21	
06/01/2022	18:16:59	37	0.0	10.05	
06/01/2022	18:18:39	37	0.1	9.88	
06/01/2022	18:20:19	37	0.1	9.80	
06/01/2022	18:21:59	37	0.1	9.72	
06/01/2022	18:23:02	37	0.1	9.65	Start Wash Up
06/01/2022	18:23:39	39	0.9	8.73	
06/01/2022	18:26:59	62	2.6	5.69	
06/01/2022	18:28:39	104	0.0	2.58	
06/01/2022	18:30:19	142	4.2	8.31	
06/01/2022	18:31:59	76	3.3	8.36	
06/01/2022	18:32:27	239	0.0	8.35	End Wash Up
06/01/2022	18:33:00	10	0.0	8.40	Drop Top Plug
06/01/2022	18:33:39	35	0.0	8.39	
06/01/2022	18:35:19	36	0.0	8.37	
06/01/2022	18:35:33	31	0.2	8.37	Start Displacmentn
06/01/2022	18:36:59	2599	5.2	8.38	
06/01/2022	18:38:39	2961	8.5	8.37	
06/01/2022	18:40:19	2942	8.5	8.35	
06/01/2022	18:41:59	3017	8.5	8.35	
06/01/2022	18:43:39	3039	8.5	8.35	
06/01/2022	18:45:19	3106	8.4	8.34	
06/01/2022	18:46:59	3165	8.4	8.34	
06/01/2022	18:48:39	3220	8.4	8.35	
06/01/2022	18:50:19	3351	8.4	8.35	
06/01/2022	18:51:59	3412	8.4	8.35	
06/01/2022	18:53:39	3419	7.4	8.35	
06/01/2022	18:55:19	3493	7.3	8.34	
06/01/2022	18:56:59	3610	7.3	8.35	
06/01/2022	18:58:39	3413	6.0	8.34	
06/01/2022	19:00:19	3559	6.0	8.35	
06/01/2022	19:01:59	3622	6.0	8.34	
06/01/2022	19:03:39	2711	0.5	8.34	
06/01/2022	19:06:59	4085	6.4	8.34	
06/01/2022	19:08:39	3957	6.4	8.34	

Well	Field	Job Start	Customer	Job Number
Charles Jamison MSH 810H 810H	Panhandle	Jun/01/2022	SWN Production Company	EOHC-00667

Date	Time 24-hr clock	CPF1_PRESS PSI	CPF1_TTL_RATE B/M	CPF1_DENSITY LB/G	Message
06/01/2022	19:11:59	4031	7.6	8.34	
06/01/2022	19:13:39	4105	7.6	8.34	
06/01/2022	19:15:19	4361	8.4	8.34	
06/01/2022	19:16:59	4282	8.4	8.34	
06/01/2022	19:18:39	4269	8.4	8.35	
06/01/2022	19:20:19	4295	8.4	8.35	
06/01/2022	19:21:59	4159	8.4	8.35	
06/01/2022	19:23:39	4150	8.4	8.34	
06/01/2022	19:25:19	4165	8.4	8.34	
06/01/2022	19:26:59	4154	8.4	8.34	
06/01/2022	19:28:39	4146	8.4	8.34	
06/01/2022	19:30:19	4102	8.4	8.34	
06/01/2022	19:31:59	4060	8.4	8.34	
06/01/2022	19:33:39	4053	8.4	8.34	
06/01/2022	19:35:19	4029	8.4	8.34	
06/01/2022	19:36:59	4078	8.4	8.34	
06/01/2022	19:38:39	4031	8.5	8.34	
06/01/2022	19:40:19	4083	8.5	8.34	
06/01/2022	19:41:59	4119	8.5	8.34	
06/01/2022	19:43:39	4012	8.5	8.34	
06/01/2022	19:45:19	4043	8.5	8.34	
06/01/2022	19:46:59	4066	8.5	8.34	
06/01/2022	19:48:39	4100	8.4	8.34	
06/01/2022	19:50:19	4078	8.4	8.34	
06/01/2022	19:51:59	4009	8.4	8.34	
06/01/2022	19:53:39	3390	4.1	8.34	
06/01/2022	19:55:19	3218	4.1	8.34	
06/01/2022	19:56:00	3279	4.1	8.34	FCP 3350 psi
06/01/2022	19:56:59	3315	4.1	8.34	
06/01/2022	19:57:39	3804	1.4	8.34	End Displacment
06/01/2022	19:57:45	3852	0.1	8.34	Total Vol; 604 bbls
06/01/2022	19:57:58	3953	0.0	8.03	Bump Top Plug 3850 psi
06/01/2022	19:58:39	3809	0.0	8.33	
06/01/2022	20:00:19	3847	0.0	8.34	
06/01/2022	20:01:59	3864	0.0	8.34	
06/01/2022	20:03:39	3093	0.0	8.34	
06/01/2022	20:04:39	60	0.0	8.34	Floats Held 9 bbls back
06/01/2022	20:05:00	25	0.0	8.34	No MUDPUSH to Surface
06/01/2022	20:05:19	19	0.0	8.34	
06/01/2022	20:06:59	16	0.0	8.34	
06/01/2022	20:08:39	15	0.0	8.34	
06/01/2022	20:10:19	15	0.0	8.34	
06/01/2022	20:11:59	15	0.0	8.34	
06/01/2022	20:13:39	15	0.0	8.34	
06/01/2022	20:15:19	15	0.0	8.34	
06/01/2022	20:16:59	15	0.0	8.34	
06/01/2022	20:18:39	15	0.0	8.34	
06/01/2022	20:20:19	45	0.0	8.34	
06/01/2022	20:21:59	17	0.2	8.34	
06/01/2022	20:23:39	231	8.3	8.33	
06/01/2022	20:25:19	13	0.0	8.34	
06/01/2022	20:26:59	9	0.0	8.34	
06/01/2022	20:28:39	19	0.0	8.34	
06/01/2022	20:30:19	52	3.2	8.33	

Well	Field	Job Start	Customer	Job Number
Charles Jamison MSH 810H 810H	Panhandle	Jun/01/2022	SWN Production Company	EOHC-00667

Date	Time 24-hr clock	CPF1_PRESS PSI	CPF1_TTL_RATE B/M	CPF1_DENSITY LB/G	Message
06/01/2022	20:33:39	183	0.0	8.34	
06/01/2022	20:35:19	183	7.9	8.32	
06/01/2022	20:36:59	181	7.9	8.34	
06/01/2022	20:38:39	181	7.9	8.34	
06/01/2022	20:40:19	59	3.7	8.32	
06/01/2022	20:41:59	14	0.0	8.33	
06/01/2022	20:43:39	13	0.0	8.33	
06/01/2022	20:45:19	13	0.0	8.33	
06/01/2022	20:46:59	14	0.0	8.32	
06/01/2022	20:48:39	128	4.3	8.34	
06/01/2022	20:50:19	187	5.3	8.34	
06/01/2022	20:51:59	11	0.0	8.32	

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
5.5			15.7	1065.0	0.0	150.0	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
7446	13	1819	3850		Freshwater	604.0 bbl	8.34 lb/gal

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp		
%	1065.0 bbl	604.0 bbl	74 degF	Cement Circulated to Surface? ☐	Volume bbl
				Washed Thru Perfs ☐	To ft

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost	Job Completed
	Marco Arrington	-	- ☒

Incident Investigation Report
Location: David Reinbeau Pad
Division: SW Appalachia
Team: Production
Incident #: 16959936
Type of Incident: Property Damage / Compressor Fire
Date of Incident: 10/22/2021
Date of Investigation: 10/23/2021

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Summary

Incident Location: David Reinbeau Well Pad
Division: SW Appalachia
Team: Production
Incident Date: 10/22/2021
Incident Time: 6:50 pm
Date Investigation Began: 10/23/2021

Summary of Events:

On the evening of Friday, October 22, 2021 around 19:17 on the David Reinbeau well pad in Marshall County, West Virginia, the Division experienced a fire on the Sales Gas Compressor while bringing the compressor online. At approximately 18:40, the field operator and a trainee arrived on site to start up the compressor. Prior to their arrival on site, the wells had been free flowing to the pipeline system and operating around 1,000 psig. The operator started up the compressor unloaded to let it warm up as is standard operating procedure. After checking the wells, the operator loaded the compressor at 18:50 by closing the compressor bypass and opening the manual valve on the compressor suction. The operator and trainee then went to the GPU area to check flow rates. During that time a hydrate formed downstream of the suction controller at the suction strainer (Figures 1 and 2) due to the gas being cold and having a large pressure drop (1,000 psig to 100 psig) across the suction controller (Figure 3). Unknown at this time by whom and when, but the compressor low suction pressure switches had been disabled by adjusting the setpoints to below zero (Figure 4). This allowed the compressor to pull a vacuum on the First Stage Suction Scrubber. Not being rated for vacuum, one of the bullseye sight glasses on the scrubber failed, allowing air to enter the compressor (Figure 5). The air and natural gas mixture reached its autoignition pressure and temperature at the outlet of the Third Stage Discharge Bottle resulting in a pressure surge within the compressor piping and Third Stage Discharge Cooler, rupturing the pipe and cooler header box (Figures 6 and 7). A subsequent ignition and pressure surge resulted in damage to the outlet of the Third Stage Discharge Cooler and the failure of a check valve on the discharge line (Figures 8 and 9). The trainee ESD'd the pad to shut in the wells and the operator and trainee secured the site.

Root Cause(s):

1. A Field Operator disabled the compressor low suction pressure switches by adjusting the setpoints to below 0 psig.
    a. As a note, at the time of writing this report, the compressor start-up procedures in NE Appalachia have been updated to not set the compressor low pressure suction switches to zero and to ensure positive pressure is maintained on the First Stage Suction Scrubber.
2. Operations training and start up procedures were inadequate to identify potential hydrate formation steps involved with starting up a well site or compressor.

Potential Contributing Factors:

1. The recycle gas tied in upstream of the suction control valve, which is common for larger gas compression facilities. Another standard practice is to have the recycle gas tie in downstream of the suction controller.

Recommended Corrective Actions:

1. Develop and implement an operator training and certification program. The certification program needs to include classroom and field-based competency assessments for all major types of equipment within that Division. The certification program should also include a re-certification process.
2. Develop start up procedures for pads that have the ability to free flow to the gathering system and have pad compression installed. The procedure should outline pressure management to prevent the likelihood of hydrate formation due to large pressure drops in the system.
3. Complete a design review of the compressor suction/recycle control scheme to identify piping, gas clean-up, and instrumentation requirements and develop standard installation drawings.

Additional Findings:

1. Throughout the investigation it was determined there are some documentation requirements that are needed as part of the overall compressor “make ready” process from order submittal to commissioning. As examples, some of this documentation includes Factory Acceptance Testing for the compressor and shutdown system, PSV documentation, and field commissioning requirements. The Asset and Operating Integrity team will work with the Divisions to develop and implement a workflow of the compressor make ready process.

Team Members:

Bruce Carpenter, *HS&E Specialist (Lead)*
Ben Flowers, *Production Foreman*
Sam Hirtz, *Facilities Superintendent*
Jon Kizer, *Operations Advisor*
Greg Lisewsky, *Director Asset and Operating Integrity*
Kurt McCreary, *Construction Foreman*
Derrick Pottmeyer, *Senior Production Foreman*

Contributing Factors and Root Cause Analysis

Reinbeau Compressor Fire

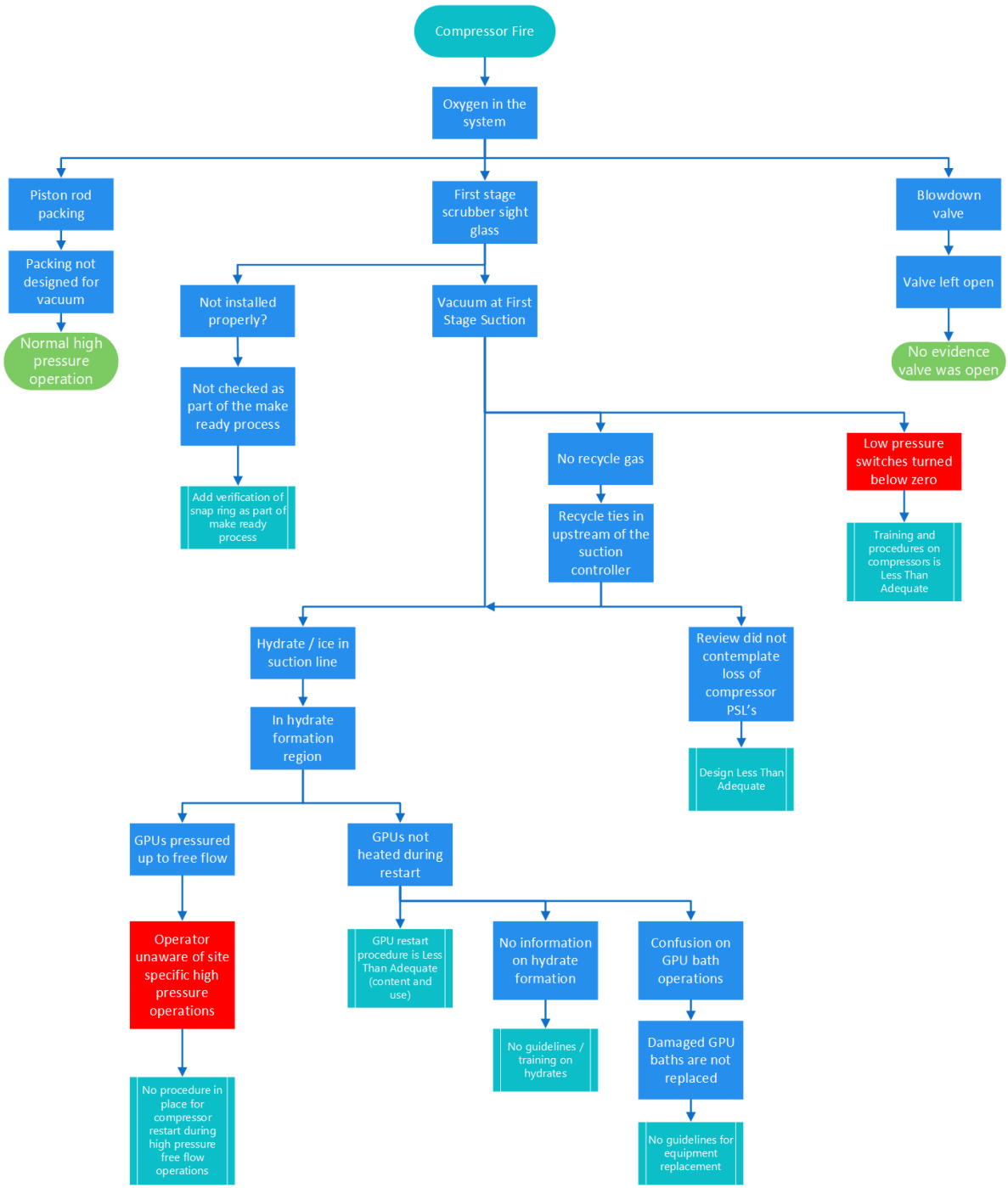


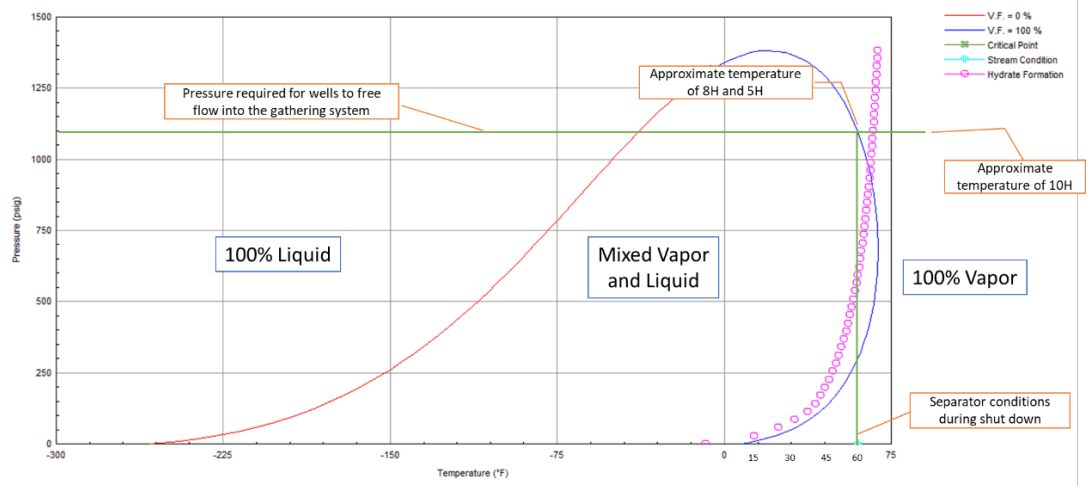
Photo Documentation

Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**			
Figure #	1	**of**	10	**Date:**		**Time:**	
Description:	Compressor suction piping including the suction controller, manual suction block valve, and suction strainer						

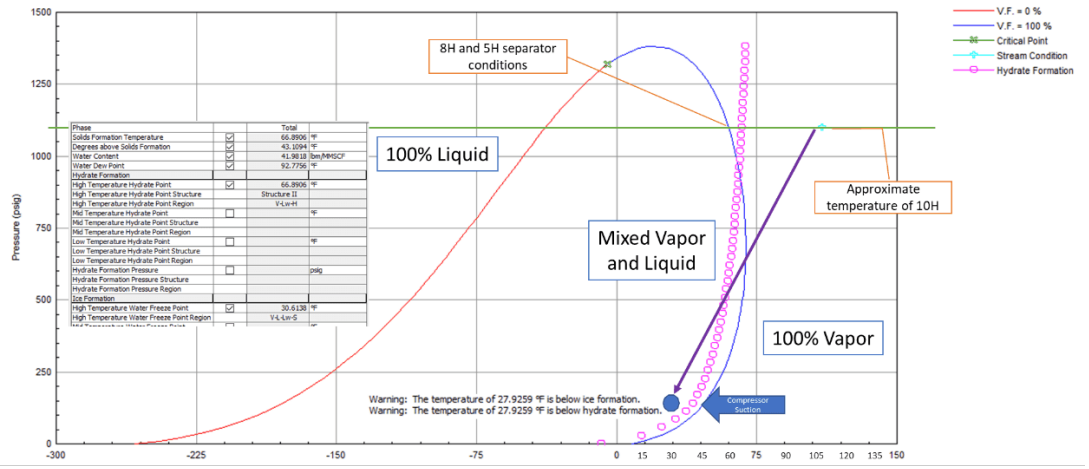
Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**	N/A		
Figure #	2	**of**	10	**Date:**		**Time:**	
Description:	Collapsed compressor suction strainer						

Location:	David Reinbeau Well Pad						
Photographer:	N/A			**Witness:**	N/A		
Figure #	3	**of**	10	**Date:**	N/A	**Time:**	N/A
Description:	Top image: Phase envelope of GPUs during shutdown showing cross over into potential hydrate formation. Bottom image: Phase envelope of GPUs after restart to free flow into the gathering system.						

Phase Envelope of Gas in Separators Before Thursday, October 21 7 PM EDT



Phase Envelope of Gas in Separators After Thursday, October 21 7 PM EDT

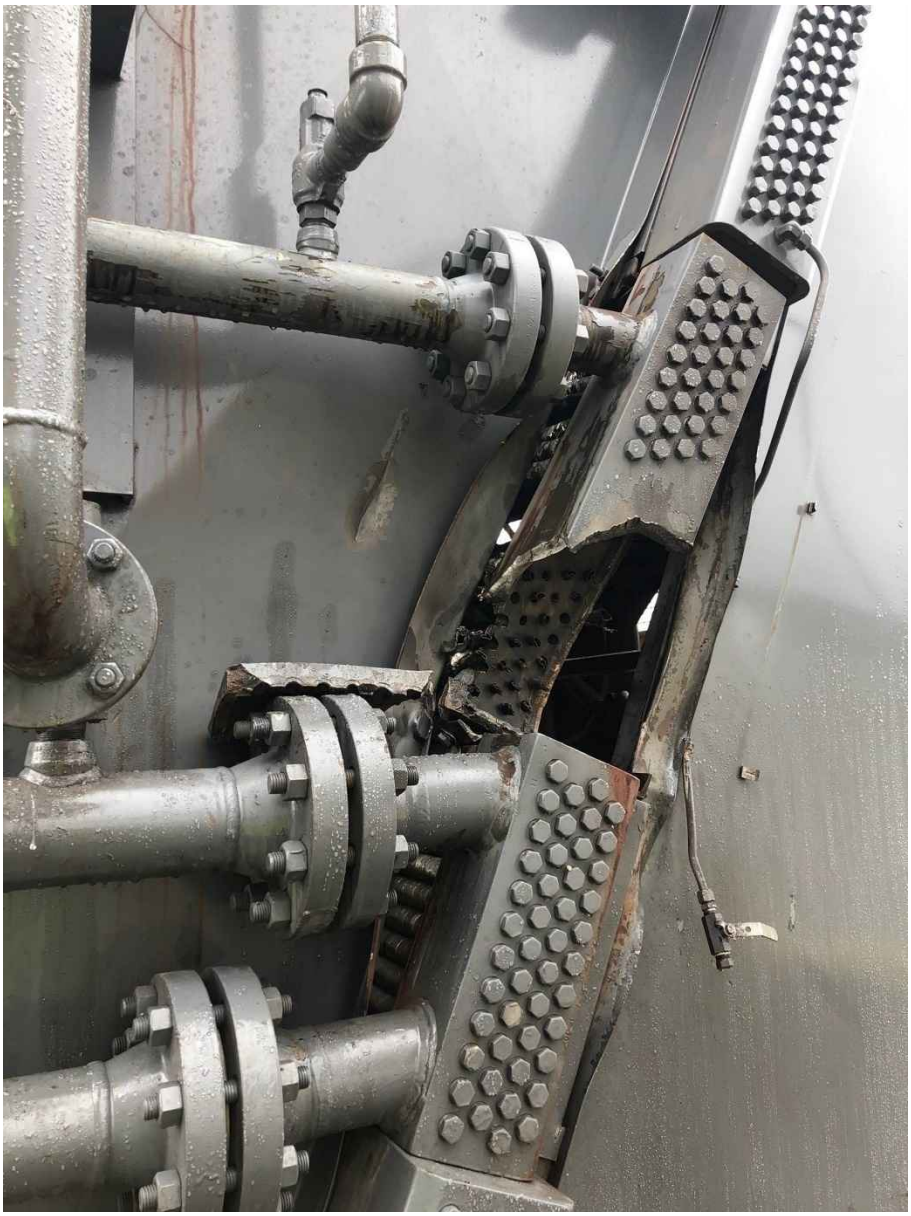


Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**			
Figure #	4	**of**	10	**Date:**		**Time:**	
Description:	Compressor pressure switches						

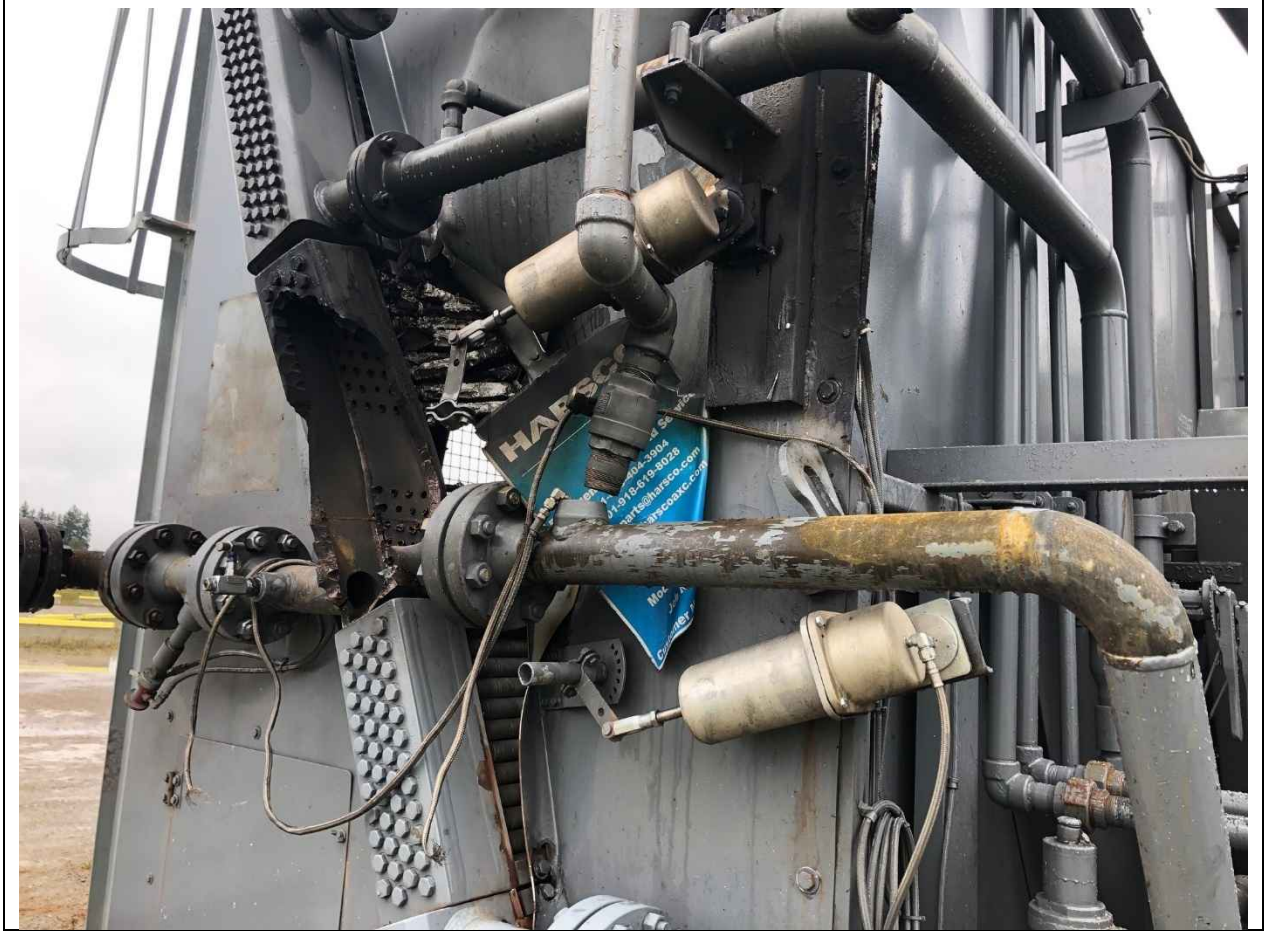
Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**	N/A		
Figure #	5	**of**	10	**Date:**		**Time:**	
Description:	First Stage Suction Scrubber with the missing bullseye sight glass						

Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**			
Figure #	6	**of**	10	**Date:**		**Time:**	
Description:	Third Stage Discharge Bottle outlet piping						

Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**			
Figure #	7	**of**	10	**Date:**		**Time:**	
Description:	Damage to Third Stage Discharge Cooler inlet header box						

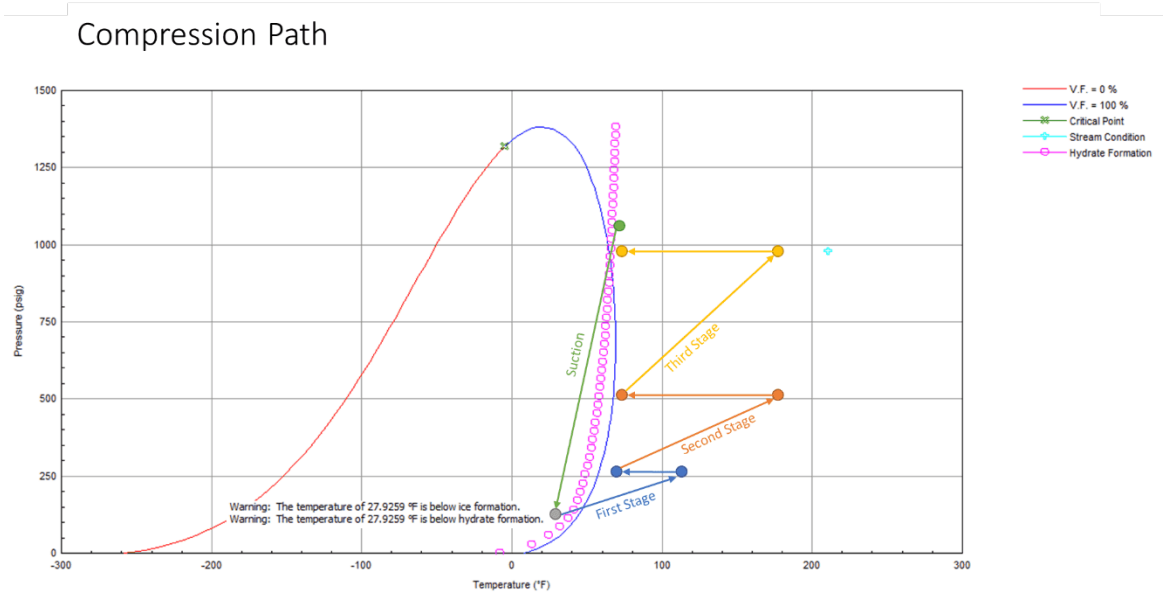


Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**	N/A		
Figure #	8	**of**	10	**Date:**		**Time:**	
Description:	Damage to Third Stage Discharge Cooler outlet header box						



Location:	David Reinbeau Well Pad						
Photographer:				**Witness:**			
Figure #	9	**of**	10	**Date:**		**Time:**	
Description:	Top Image: Top of discharge check valve. Bottom Image: Bottom of discharge check valve.						

Location:	David Reinbeau Well Pad						
Photographer:	N/A			**Witness:**	N/A		
Figure #	10	**of**	10	**Date:**	N/A	**Time:**	N/A
Description:	Estimated pressure and temperature path of the gas through the Sales Gas Compressor						



iScout Report

Property Damage or Vehicle Incident		Location
Submitted By	Kenneth Durst	*Location was not collected for this report.*
Surrogate	Matt Boggs	
Started On	October 23 2021, 11:06pm	
Submitted On	October 23 2021, 11:20pm (14 minutes)	
Weather	NaN°,	
Version	V5 (latest)	
Updated	November 1 2021, 11:05am	
Report No.	16959936	

Property Damage or Vehicle Incident

BASIC INFORMATION	
Incident Title	David Reinbeau Pad Compressor Fire
Asset	Southwest Appalachia
Team	SWAPP- Production
Appalachia Location	DAVID REINBEAU-MSH-PAD1
Incident Description	On 10/22/2021 at approximately 6:50 PM, shortly after starting the pad compressor a fire occurred in the area of the compressor causing significant damage to the unit. Incident is currently under investigation.
Immediate Actions Taken	Contract operators onsite immediately reported to the site entrance and activated the emergency shut down. 911 was used to contact emergency services, and SWN supervision was contacted.
Location Details	ArchRock pad compressor
Date of Incident	October 22nd 2021
Time of Incident	06:50
Type of Incident	Property Damage
Property Damage Severity	$100,000-$500,000
Severity Tier	T2

PROPERTY DAMAGE INCIDENT SPECIFICS	
Property Owner(s)	Contractor
Property Damage Contractor	ARCHROCK PARTNERS OPERATING LLC
Damage Mechanism	Pressure, Fire/Explosion

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 1H
Well Pad Name: David Reinbeau MSH

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	051-MArsha	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 1H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.05.26 09:16:06 -04'00'

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6312', Target Base TVD- 6363', Anticipated Thickness- 51', Associated Pressure- 4137

8) Proposed Total Vertical Depth: 6345'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 28272'

11) Proposed Horizontal Leg Length: 21444.81'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

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

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 1H
Well Pad Name: David Reinbeau MSH

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	~~13 3/8"~~	~~New~~	~~H-40~~	~~48#~~	~~506'~~	~~506'~~	~~541 sx/CTS~~
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	6"	New	P-110	24.5#	0'	6000'	
Production	~~5 1/2"~~	~~New~~	~~P 110 HP~~	~~20#~~	~~6000'~~	28272'	~~Tail 6000' 1500' Inside Intermediate~~
Liners							

Gayne Knitowski
Digitally signed by Gayne Knitowski
Date: 2022.05.26 09:16:27 -04'00'

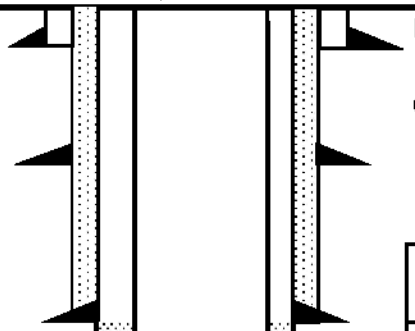
TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	~~13 3/8"~~	~~17.5"~~	~~0.380~~	~~2730~~	~~633~~	~~Class A~~	~~1.20/30% Excess~~
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well:	DAVID REINBEAU MSH 1	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9928 Latitude	-80.6615 Longitude	
BHL:	40.0482 Latitude	-80.6890 Longitude	
KB Elev:	1,277 ft MSL	KB: 26 ft AGL	**GL Elev:** 1,251 ft MSL



No COAL VOID Anticipated

Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,499 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	6	24.5 #	P-110	0 '	6,000 '
Production	5.5	20.0 #	P-110 HP	6,000 '	28,272 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	9404	A	14.5-15.0

KOP at 5,599 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,345 '
TMD - 28,272 '

TD at 28,272 ' MD
6,086 ' TVD

6,345 ' Target Center

EOB at 6,817 ' MD
SHL Onondaga 6,364 ' TVD

Onondaga 6,105 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,599 '
Air/Mist
↓
Air
TD at 5,599 '

5,599 ' to 6,817 '
12.5-13.5 ppg
↓

6,817 ' to 28,272 '
12.5-13.9 ppg

Created by: C R Hall on 05/24/2022

Latitude: 40°00'00" — SURFACE HOLE 10,214'

Latitude: 40°05'00" — BOTTOM HOLE 6,241'

SURFACE HOLE 2,614'

Longitude: 80°37'30"

BOTTOM HOLE 12,814'

Longitude: 80°40'00"

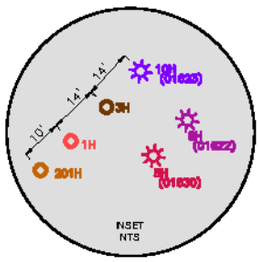
JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

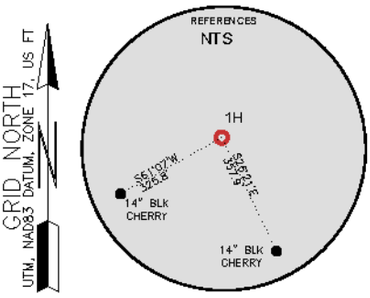
DRAFT
OPERATIONS TEAM Review
05-21-2022

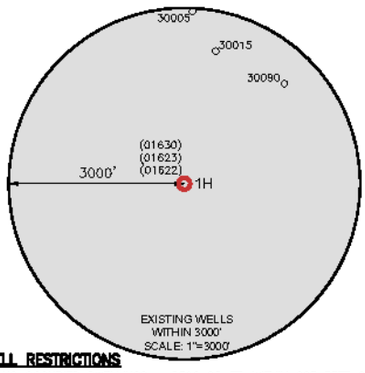
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,015.781 EASTING: 528,901.161
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,969.990 EASTING: 528,663.252
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,433,148.759 EASTING: 526,530.831

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 19°09'26" W	1,046.62'	SHL TO LANDMARK	FD. FENCE CORNER
L2	N 59°33'42" W	1,277.75'	SHL TO LANDMARK	FD. FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 79°06'20" W	794.87'	1,592.45'	SHL TO LP







BHL

WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 1H

API WELL #: 47 (STATE) 051 (COUNTY) (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1,250.9'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,345 TVD 28,272 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

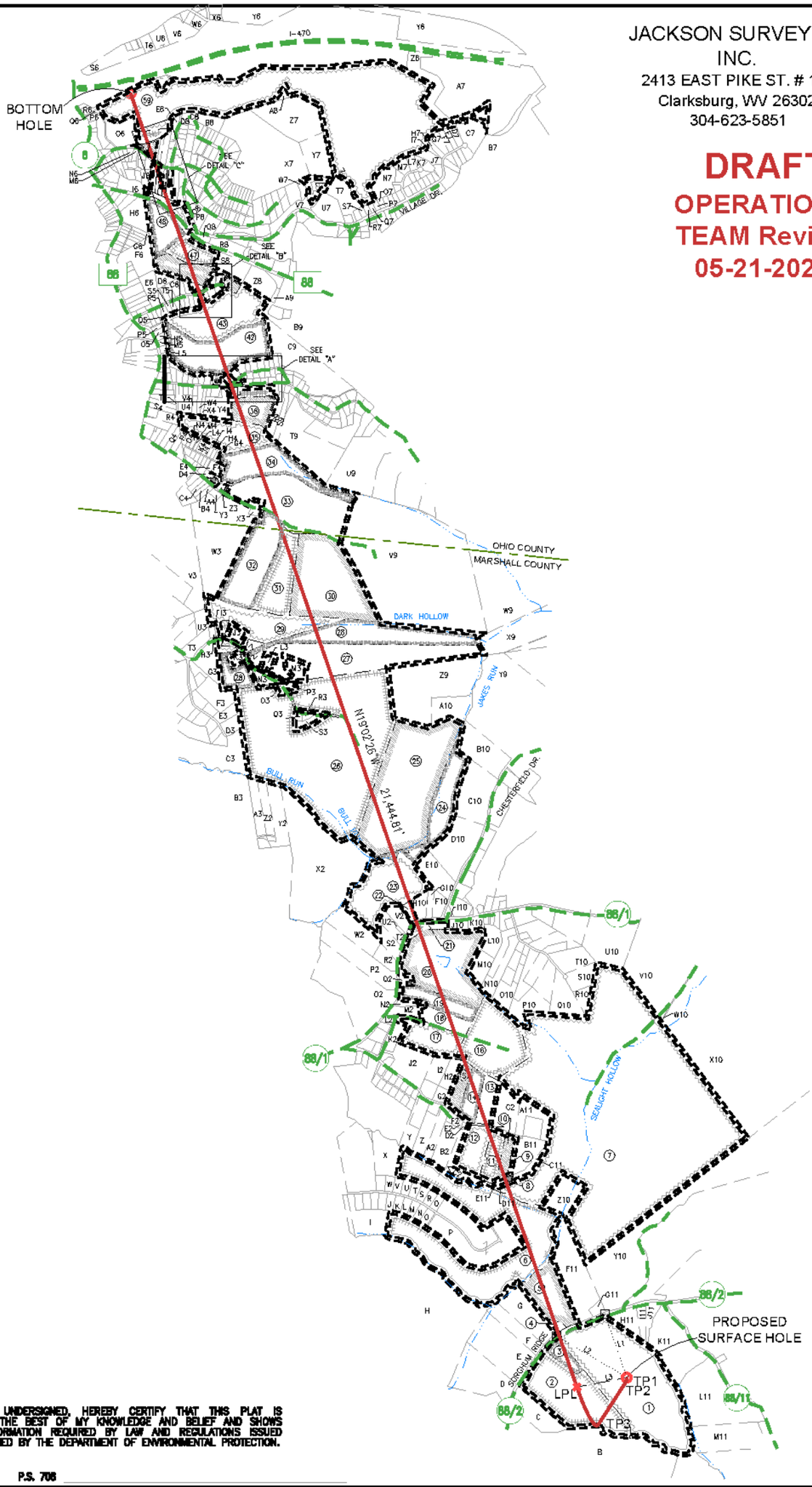
DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 05-21-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
05-21-2022



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. 708

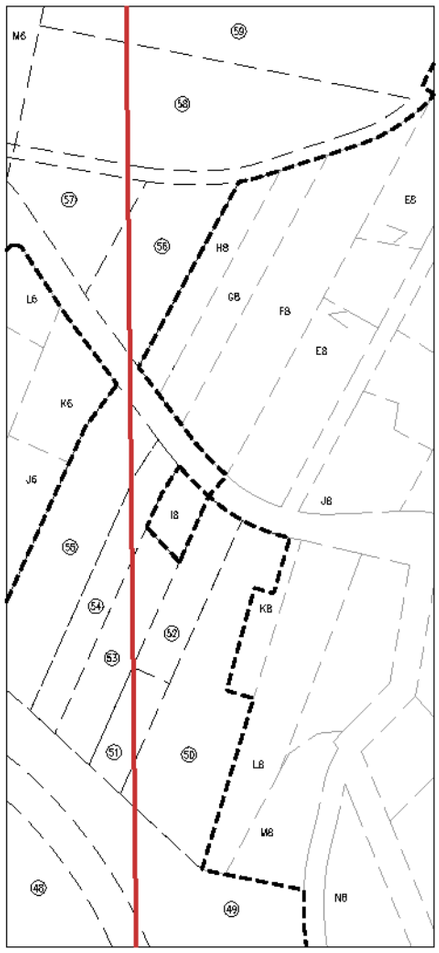
REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
⚠ REVISED DHP 05-21-2022			
	OPERATOR'S WELL #: DAVID REINBEAU MSH 1H		**DATE:** 03-09-2022
			DRAWN BY: N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\1H\FINAL\REINBEAU 1H MSH 05-21-22\REINBEAU 1H MSH WELL PLAT 5-21-22.DWG
SATURDAY MAY 21 2022 09:50AM

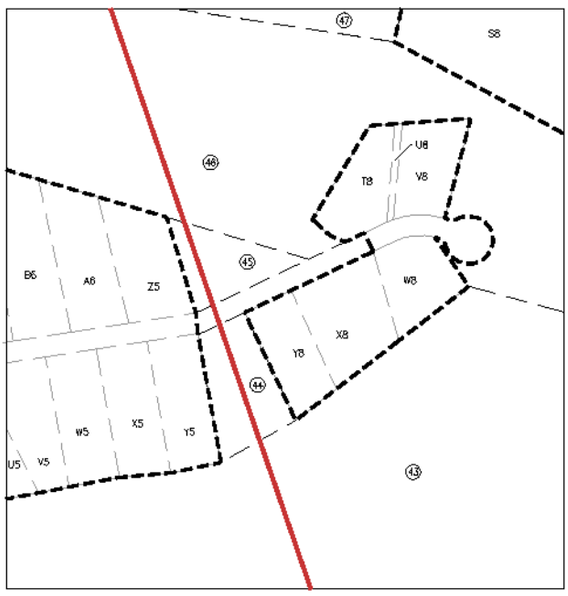
JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
05-21-2022

DETAIL "C"



DETAIL "B"



DETAIL "A"

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. 708 _____

REVISIONS: ⚠ REVISED DHP 05-21-2022	COMPANY: SWN Production Company, LLC / SWN Production Company™			
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 1H		**DATE:** 03-09-2022 **DRAWN BY:** N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV	**SCALE:** N/A **DRAWING NO:** WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\1H\FINAL\REINBEAU 1H MSH 05-21-22\REINBEAU 1H MSH WELL PLAT 5-21-22.DWG
SATURDAY MAY 21 2022 09:51AM

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DRAFT
OPERATIONS
TEAM Review
05-21-2022

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

3000 0 3000
GRAPHIC SCALE IN FEET

SURFACE HOLE LOCATION (SHL):
GEOGRAPHIC (NAD83): LATITUDE: 39.992825° LONGITUDE: −80.661455°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,300.940 EASTING: 1,735,236.560
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,015.781 EASTING: 528,901.161
TURNING POINT LOCATION-1 (TP1):
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TURNING POINT LOCATION-2 (TP2):	LANDING POINT LOCATION (LPL):
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UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,993.158 EASTING: 528,896.035	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,969.990 EASTING: 528,663.252
TURNING POINT LOCATION-3 (TP3):	**BOTTOM HOLE LOCATION (BHL):**
GEOGRAPHIC (NAD83): LATITUDE: 39.990787° LONGITUDE: −80.663068°	GEOGRAPHIC (NAD83): LATITUDE: 40.048159° LONGITUDE: −80.688970°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,523,557.090 EASTING: 1,734,787.670	UTM (NAD83, ZONE 17, FEET): NORTHING: 14,544,422.220 EASTING: 1,727,459.900
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,789.055 EASTING: 528,764.339	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,433,148.759 EASTING: 526,530.831

NOTES ON SURVEY
1. 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.
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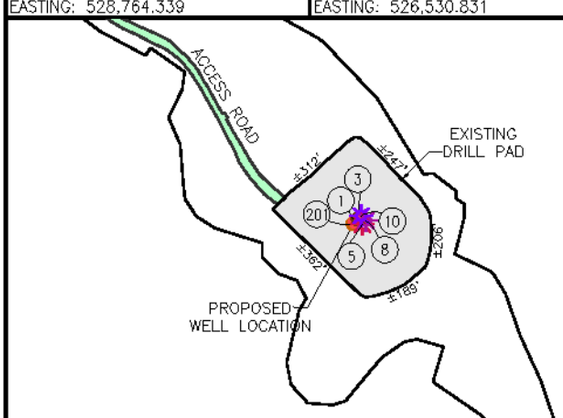


NOTE: ANY UTILITIES OR IMPROVEMENTS SHOWN ON THIS PLAT ARE FROM REASONABLE VISUAL OBSERVATIONS. NO UTILITY COMPANIES WERE CONTACTED FOR UTILITY LINE LOCATIONS.

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- ABANDONED WELL
- PLUGGED & ABANDONED WELL
- LPL LANDING POINT LOCATION
- DRILLING UNIT
- LEASE BOUNDARY
- HARDLINE BOUNDARY
- UPP 2 > UPPER POINT PLEASANT PATH
- MAR 2 > MARCELLUS PATH

COMPANY: SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #: DAVID REINBEAU MSH 1H

DISTRICT:	COUNTY:	STATE:
UNION	MARSHALL	WV

SWN PRODUCTION COMPANY, LLC
SURFACE HOLES
1. "DAVID REINBEAU MSH 1H"
3. "DAVID REINBEAU MSH 3H"
5. "DAVID REINBEAU MSH 5H"
8. "DAVID REINBEAU MSH 8H"
10. "DAVID REINBEAU MSH 10H"
201. "DAVID REINBEAU MSH 201H"

REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 05-21-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	INTERNAL WELL PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\1H\FINAL\REINBEAU 1H MSH 05-21-22\REINBEAU 1H MSH WELL PLAT 5-21-22.DWG
SATURDAY MAY 21 2022 09:52AM

PROPERTY NUMBER 2501188044
PAD ID 3001156582

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 1H
Well Pad Name: David Reinbeau MSH

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	051-MArsha	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 1H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6312', Target Base TVD- 6363', Anticipated Thickness- 51', Associated Pressure- 4137

8) Proposed Total Vertical Depth: 6345'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 28272'

11) Proposed Horizontal Leg Length: 21444.81'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

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

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	6"	New	P-110	24.5#	0'	6000'	
Production	5 1/2"	New	P 110 HP	20#	6000'	28272'	Tail 6000' to 1500' Inside Intermediate
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well:	DAVID REINBEAU MSH 1	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9928 Latitude	-80.6615 Longitude	
BHL:	40.0482 Latitude	-80.6890 Longitude	
KB Elev:	1,277 ft MSL	KB: 26 ft AGL	**GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,499 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	6	24.5 #	P-110	0 '	6,000 '
Production	5.5	20.0 #	P-110 HP	6,000 '	28,272 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	9404	A	14.5-15.0

KOP at 5,599 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,345 '
TMD - 28,272 '

TD at 28,272 ' MD
6,086 ' TVD

6,345 ' Target Center

EOB at 6,817 ' MD

SHL Onondaga 6,364 ' TVD

Onondaga 6,105 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,599 '
Air/Mist
↓
Air
TD at 5,599 '

5,599 ' to 6,817 '
12.5-13.5 ppg

6,817 ' to 28,272 '
12.5-13.9 ppg

Created by: C R Hall on 05/24/2022

Latitude: 40°00'00" — SURFACE HOLE 10,214'

Latitude: 40°05'00" — BOTTOM HOLE 6,241'

SURFACE HOLE 2,614'

Longitude: 80°37'30"

BOTTOM HOLE 12,814'

Longitude: 80°40'00"

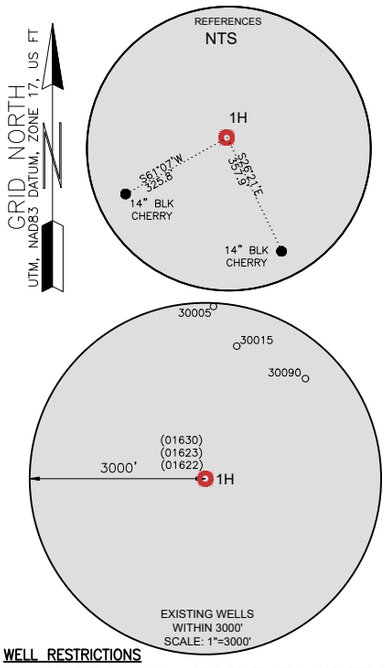
JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

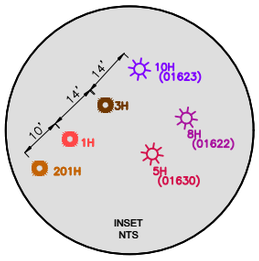
DRAFT
OPERATIONS TEAM Review
05-21-2022

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,015.781 EASTING: 528,901.161
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,969.990 EASTING: 528,663.252
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,433,148.759 EASTING: 526,530.831

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 19°09'26" W	1,046.62'	SHL TO LANDMARK	FD. FENCE CORNER
L2	N 59°33'42" W	1,277.75'	SHL TO LANDMARK	FD. FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 79°06'20" W	794.87'	1,592.45'	SHL TO LP





BHL

WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

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2000 0 2000
GRAPHIC SCALE IN FEET

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P.S. 708

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 1H

API WELL #: 47 (STATE) 051 (COUNTY) (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1,250.9'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,345 TVD 28,272 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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: 03-09-2022
⚠ REVISED DHP 05-21-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

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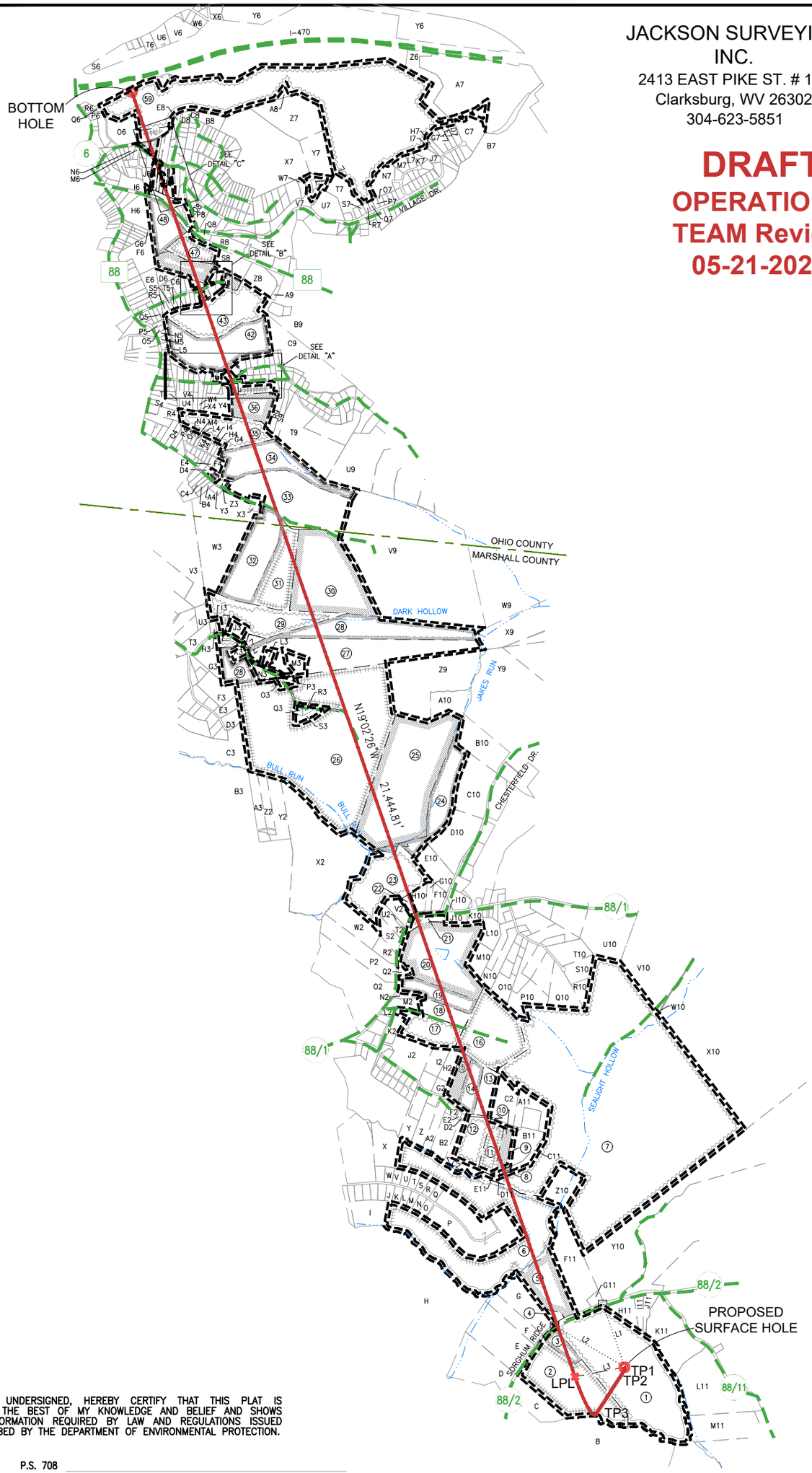
SATURDAY MAY 21 2022 09:45AM

PROPERTY NUMBER 2501166044
PAD ID 3001156592

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review 05-21-2022



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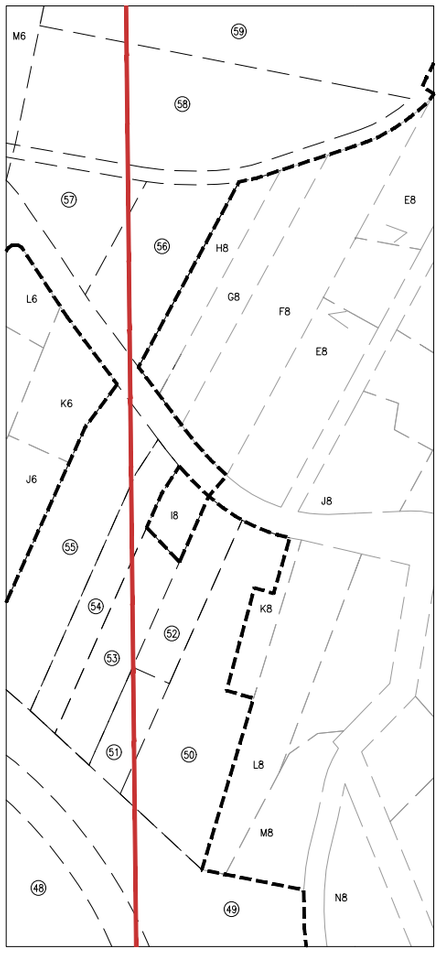
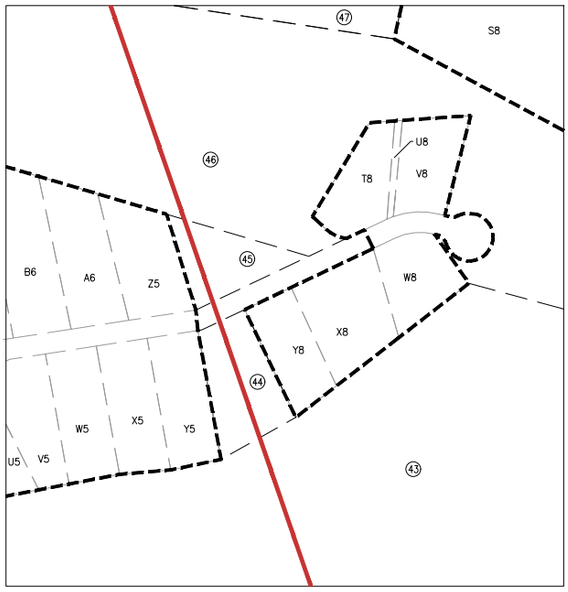


DETAIL "B"



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	OPERATOR'S WELL #:	DAVID REINBEAU MSH 1H	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV SCALE: N/A DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\1H\FINAL\REINBEAU 1H MSH 05-21-22\REINBEAU 1H MSH WELL PLAT 5-21-22.DWG
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05-21-2022

GRID NORTH
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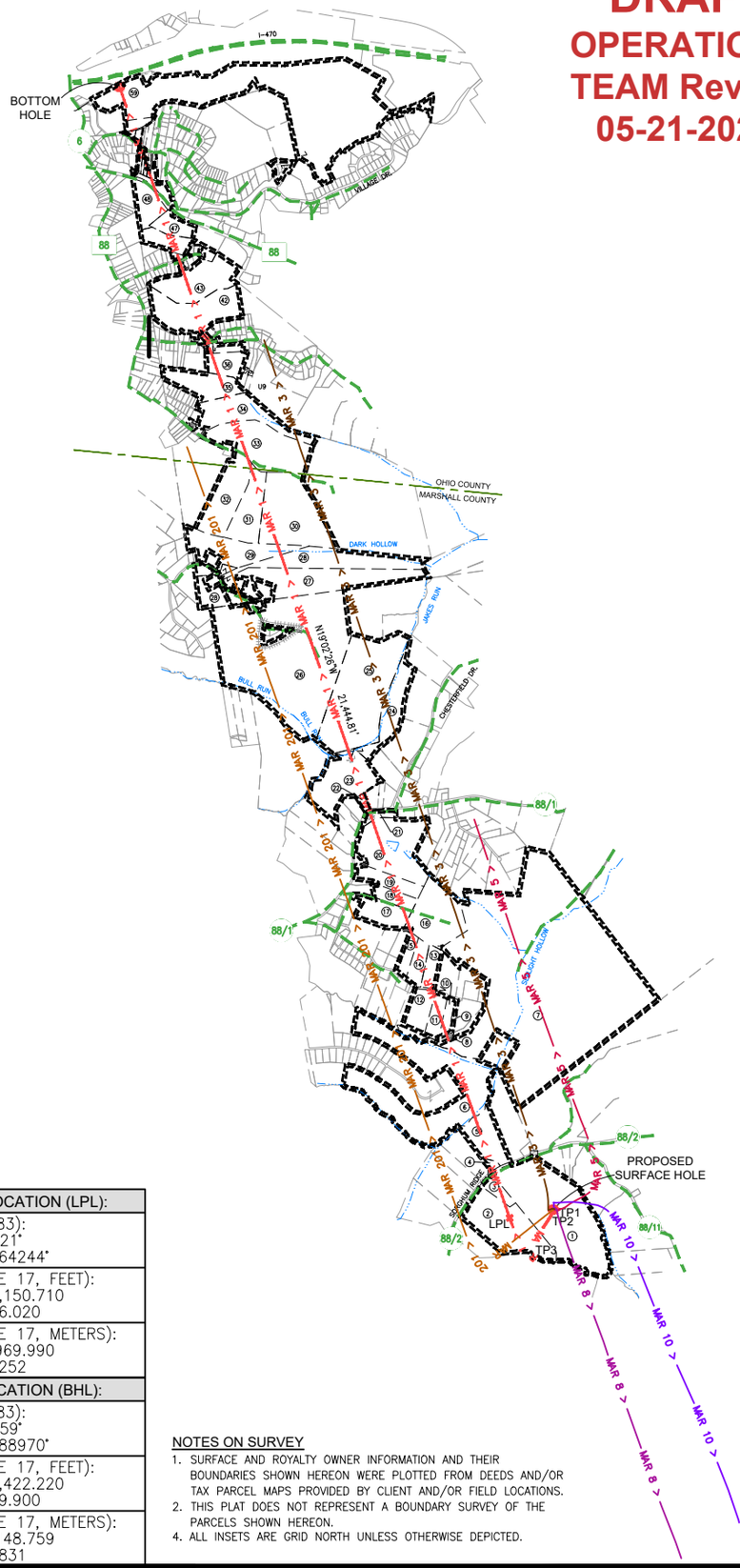

3000 0 3000
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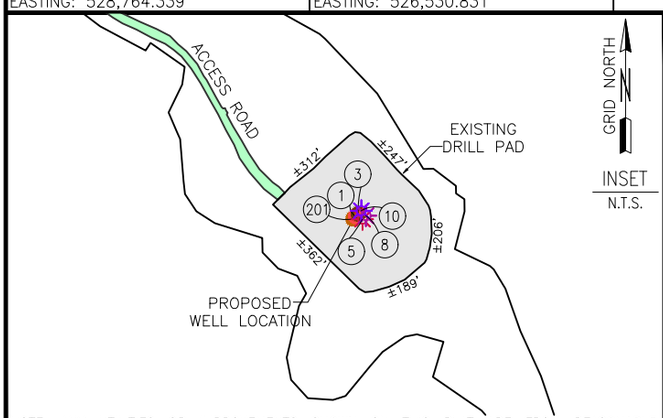
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,993.158 EASTING: 528,896.035	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,969.990 EASTING: 528,663.252
TURNING POINT LOCATION-3 (TP3):	**BOTTOM HOLE LOCATION (BHL):**
GEOGRAPHIC (NAD83): LATITUDE: 39.990787° LONGITUDE: −80.663068°	GEOGRAPHIC (NAD83): LATITUDE: 40.048159° LONGITUDE: −80.688970°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,523,557.090 EASTING: 1,734,787.670	UTM (NAD83, ZONE 17, FEET): NORTHING: 14,544,422.220 EASTING: 1,727,459.900
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,789.055 EASTING: 528,764.339	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,433,148.759 EASTING: 526,530.831

NOTES ON SURVEY
1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.



NOTE: ANY UTILITIES OR IMPROVEMENTS SHOWN ON THIS PLAT ARE FROM REASONABLE VISUAL OBSERVATIONS. NO UTILITY COMPANIES WERE CONTACTED FOR UTILITY LINE LOCATIONS.

COMPANY: SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #: DAVID REINBEAU MSH 1H

DISTRICT:	COUNTY:	STATE:
UNION	MARSHALL	WV

SWN PRODUCTION COMPANY, LLC
SURFACE HOLES
1. "DAVID REINBEAU MSH 1H"
3. "DAVID REINBEAU MSH 3H"
5. "DAVID REINBEAU MSH 5H"
8. "DAVID REINBEAU MSH 8H"
10. "DAVID REINBEAU MSH 10H"
201. "DAVID REINBEAU MSH 201H"

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- ABANDONED WELL
- PLUGGED & ABANDONED WELL
- LPL LANDING POINT LOCATION
- DRILLING UNIT
- LEASE BOUNDARY
- HARDLINE BOUNDARY
- UPP 2 > UPPER POINT PLEASANT PATH
- MAR 2 > MARCELLUS PATH

REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 05-21-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	INTERNAL WELL PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\1H\FINAL\REINBEAU 1H MSH 05-21-22\REINBEAU 1H MSH WELL PLAT 5-21-22.DWG
SATURDAY MAY 21 2022 09:52AM

PROPERTY NUMBER 2501166044
PAD ID 3001156592

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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	051-Marshal	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.05.26 09:14:55 -04'00'

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 25274'

11) Proposed Horizontal Leg Length: 18258.48'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	~~13 3/8"~~	~~New~~	~~H-40~~	~~48#~~	~~506'~~	~~506'~~	~~541 sx/CTS~~
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	25274'	25274'	Tail 8330sx/ 100' Inside Intermediate
Tubing							
Liners							

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.05.26 09:15:15 -04'00'

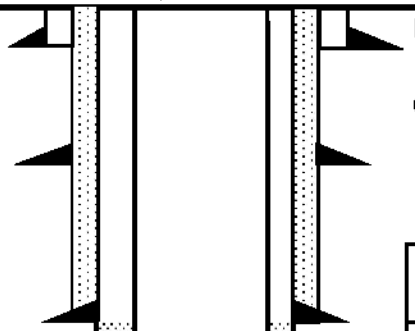
TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	~~13 3/8"~~	~~17.5"~~	~~0.380~~	~~2730~~	~~633~~	~~Class A~~	~~1.20/30% Excess~~
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well:	DAVID REINBEAU MSH 201	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9928 Latitude -80.6615 Longitude		
BHL:	40.0386 Latitude -80.6880 Longitude		
KB Elev:	1,277 ft MSL KB: 26 ft AGL	**GL Elev:**	1,251 ft MSL



No COAL VOID Anticipated

Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	25,274 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8330	A	14.5-15.0

KOP at 5,739 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 25,274 '

TD at 25,274 ' MD
6,121 ' TVD

6,346 ' Target Center

EOB at 7,007 ' MD

SHL Onondaga 6,364 ' TVD

Onondaga 6,139 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,739 '
Air/Mist
↓
Air
TD at 5,739 '

5,739 ' to 7,007 '
12.5-13.5 ppg

7,007 ' to 25,274 '
12.5-13.9 ppg

Created by: C R Hall on 05/24/2022

Latitude: 40°00'00" — SURFACE HOLE 10,221'

Latitude: 40°02'30" — BOTTOM HOLE — 5,863'

BOTTOM HOLE 1,417'

SURFACE HOLE 2621'

Longitude: 80°40'00"

Longitude: 80°37'30"

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

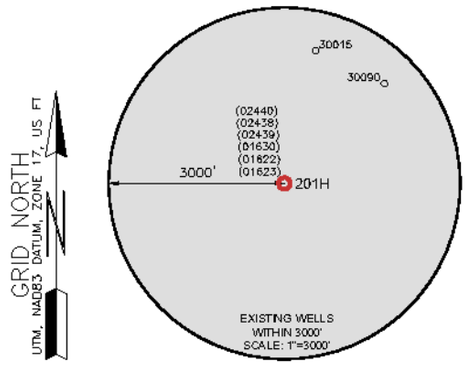
DRAFT
OPERATIONS TEAM Review
05-23-2022

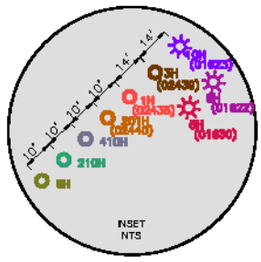
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,427,013.674
EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,426,843.663
EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,431,996.911
EASTING: 526,651.084

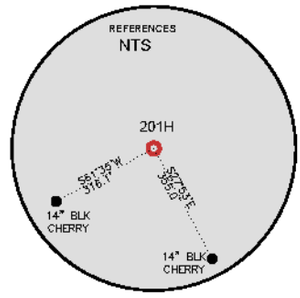
BHL

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 18°39'42" W	1050.82'	SHL TO LANDMARK	FENCE CORNER
L2	N 59°07'47" W	1275.06'	SHL TO LANDMARK	FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 68°10'48" W	1500.64'	2775.12'	SHL TO LPL







WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708 _____

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 25,274 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

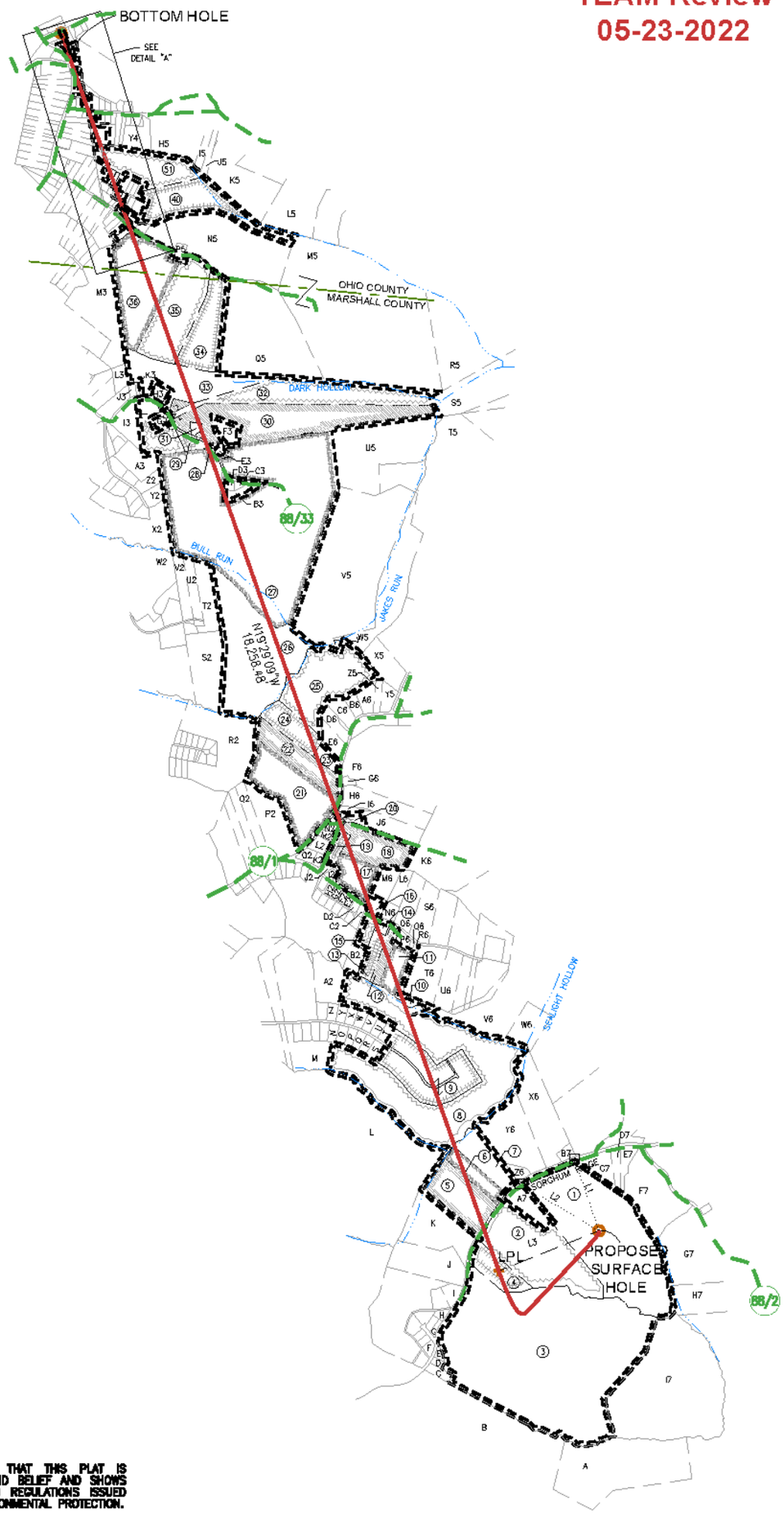
REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 05-18-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

2:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 05-23-22\REINBEAU 201H MSH WELL PLAT 05-23-22.DWG
MONDAY MAY 23 2022 11:07AM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
05-23-2022



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. 708

REVISIONS:	COMPANY: SWN Production Company, LLC / SWN Production Company™		
⚠ REVISED DHP 05-18-2022			
	OPERATOR'S DAVID REINBEAU MSH	**API #:** 47-051-02440	**DATE:** 03-09-2022
	WELL #: 201H		**DRAWN BY:** N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV	**SCALE:** N/A
			DRAWING NO: WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 05-23-22\REINBEAU 201H MSH WELL PLAT 05-23-22.DWG
MONDAY MAY 23 2022 11:07AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
05-23-2022

DETAIL "A"

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. 708 _____

REVISIONS: ⚠ REVISED DHP 05-18-2022	COMPANY: SWN Production Company, LLC / SWN Production Company™			
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 201H	API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV	SCALE: N/A DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 05-23-22\REINBEAU 201H MSH WELL PLAT 05-23-22.DWG
MONDAY MAY 23 2022 11:08AM

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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	051-Marshal	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 25274'

11) Proposed Horizontal Leg Length: 18258.48'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	~~13 3/8"~~	~~New~~	~~H-40~~	~~48#~~	~~506'~~	~~506'~~	~~541 sx/CTS~~
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	25274'	25274'	Tail 8330sx/ 100' Inside Intermediate
Tubing							
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
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Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well: DAVID REINBEAU MSH 201 **Re-entry Rig:** TBD
Field: NORTH VICTORY FIELD WET **Prospect:** Marcellus Shale
County: MARSHALL **State:** WV
SHL: 39.9928 Latitude -80.6615 Longitude
BHL: 40.0386 Latitude -80.6880 Longitude
KB Elev: 1,277 ft MSL **KB:** 26 ft AGL **GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A
PROD TOC Lead @ 2,300 ' MD
PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	25,274 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8330	A	14.5-15.0

KOP at 5,739 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 25,274 '

TD at 25,274 ' MD
6,121 ' TVD

6,346 ' Target Center

EOB at 7,007 ' MD
SHL Onondaga 6,364 ' TVD

Onondaga 6,139 ' TVD

126 ' to 526 '
Air/Mist

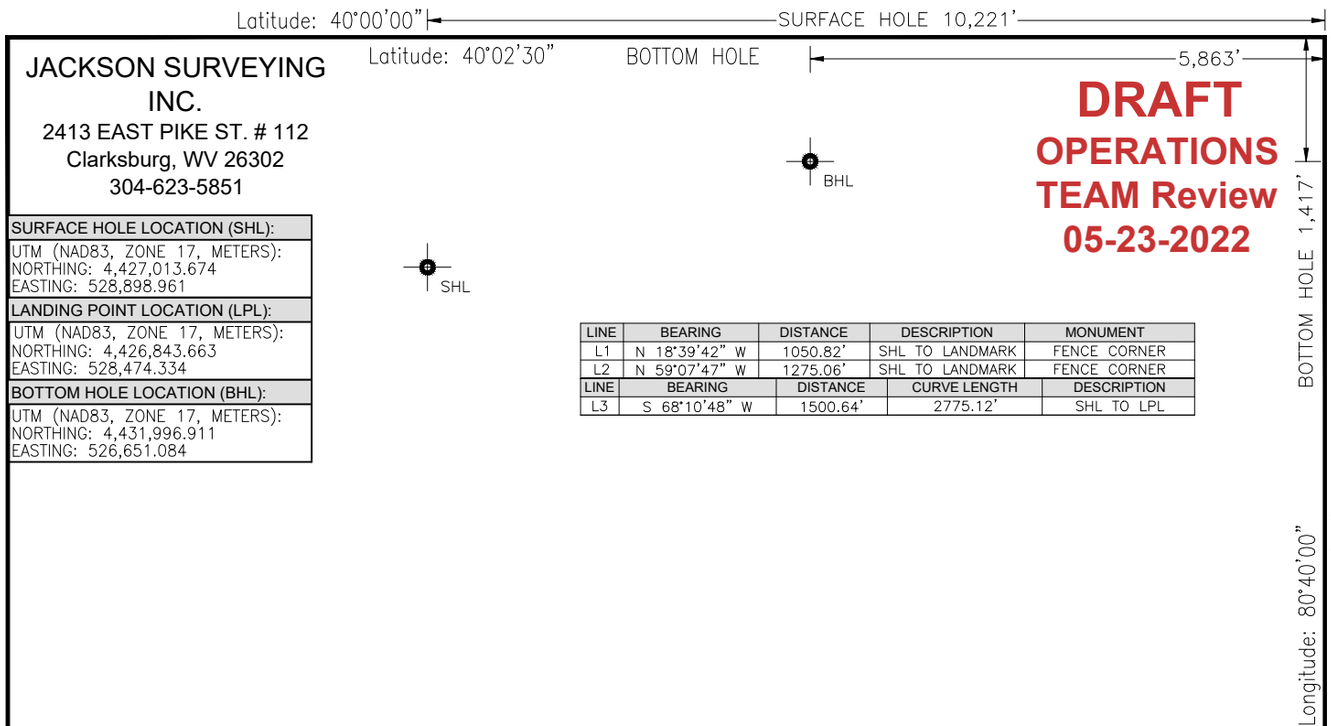
526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,739 '
Air/Mist
↓
Air
TD at 5,739 '

5,739 ' to 7,007 '
12.5-13.5 ppg
↓

7,007 ' to 25,274 '
12.5-13.9 ppg

Created by: C R Hall on 05/24/2022

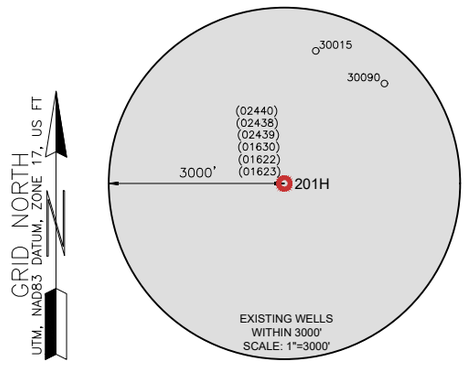


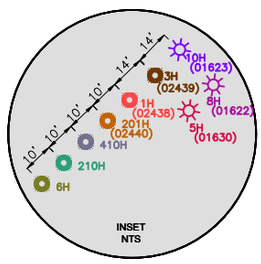
JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

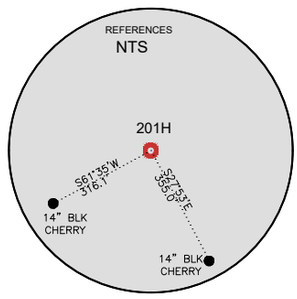
DRAFT
OPERATIONS TEAM Review 05-23-2022

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,996.911 EASTING: 526,651.084

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 18°39'42" W	1050.82'	SHL TO LANDMARK	FENCE CORNER
L2	N 59°07'47" W	1275.06'	SHL TO LANDMARK	FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 68°10'48" W	1500.64'	2775.12'	SHL TO LPL







WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 25,274 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

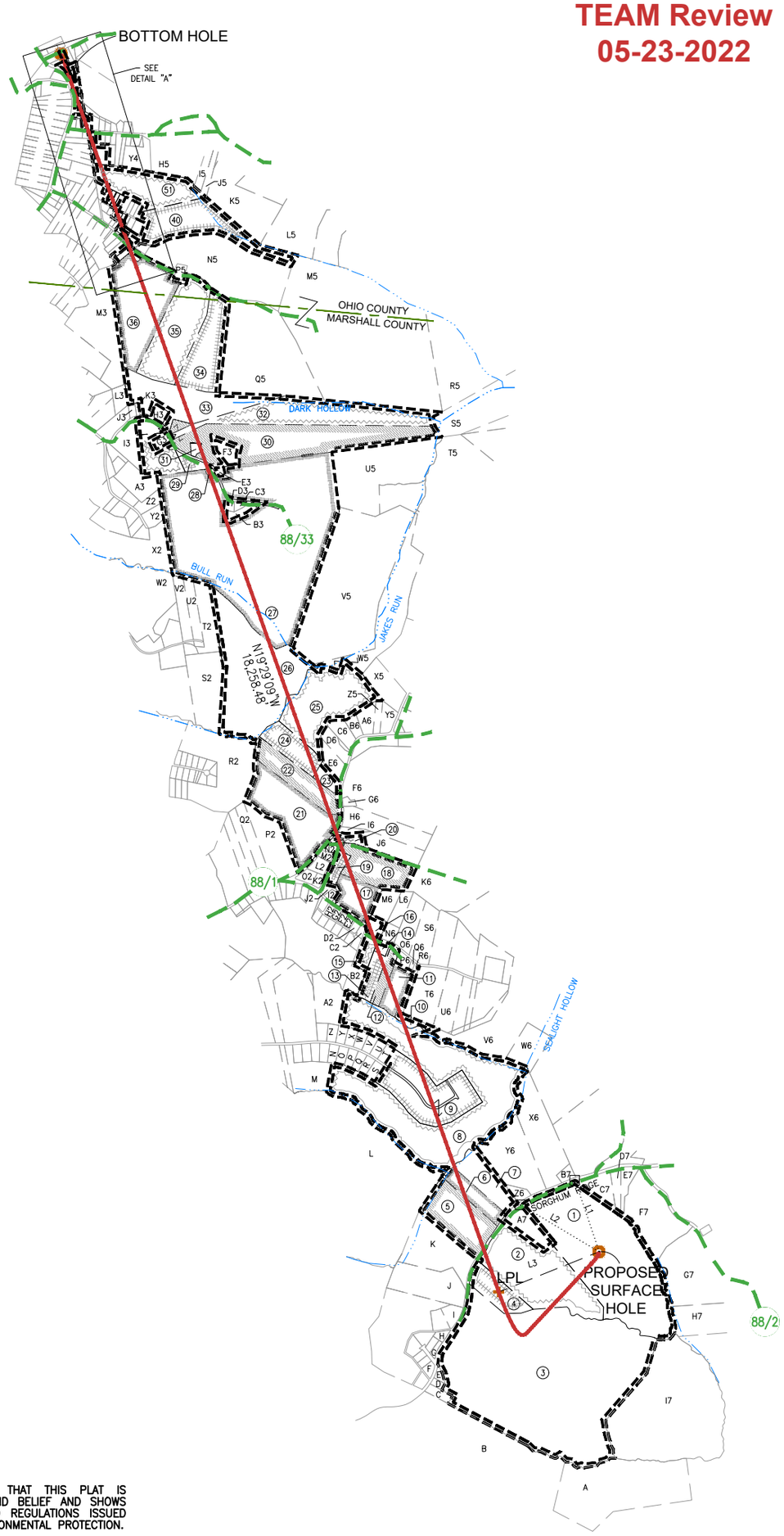
REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 05-18-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 05-23-22\REINBEAU 201H MSH WELL PLAT 05-23-22.DWG
MONDAY MAY 23 2022 11:07AM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
05-23-2022



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P.S. 708

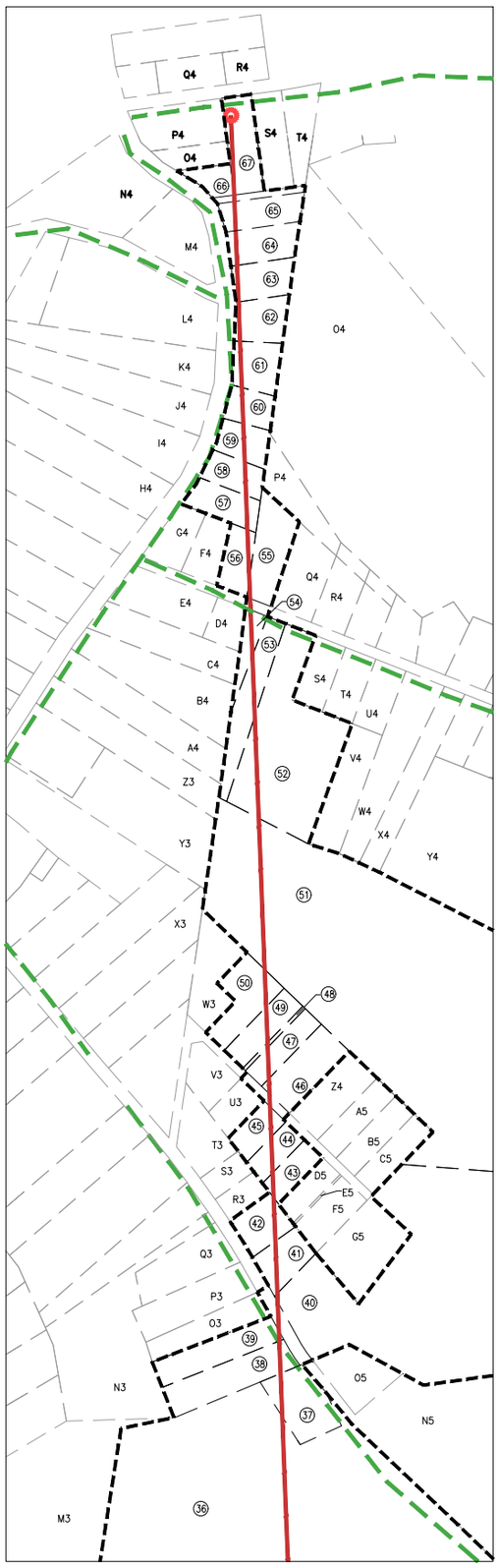
REVISIONS: ⚠ REVISED DHP 05-18-2022	COMPANY: SWN Production Company, LLC SWN Production Company™		
	OPERATOR'S DAVID REINBEAU MSH WELL #: 201H	API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV SCALE: N/A DRAWING NO: WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 05-23-22\REINBEAU 201H MSH WELL PLAT 05-23-22.DWG
MONDAY MAY 23 2022 11:07AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
05-23-2022

DETAIL "A"



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P.S. 708

REVISIONS: ⚠ REVISED DHP 05-18-2022	COMPANY: SWN Production Company, LLC		SWN Production Company™
	OPERATOR'S WELL #: DAVID REINBEAU MSH 201H	API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV SCALE: N/A DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 05-23-22\REINBEAU 201H MSH WELL PLAT 05-23-22.DWG
MONDAY MAY 23 2022 11:08AM

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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	051-Marshal	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.06.16 16:07:20 -04'00'

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 26514'

11) Proposed Horizontal Leg Length: 19497.80'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	26514'	26514'	Tail 8776sx/ 100' inside Intermediate
Tubing							
Liners							

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.06.16 16:07:36 -04'00'

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company	Proposed Drilling Program

Well:	DAVID REINBEAU MSH 201	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9928 Latitude	-80.6615 Longitude	
BHL:	40.0418 Latitude	-80.6895 Longitude	
KB Elev:	1,277 ft MSL	KB: 26 ft AGL	**GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	26,514 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8776	A	14.5-15.0

KOP at 5,739 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 26,514 '

TD at 26,514 ' MD
6,103 ' TVD

6,346 ' Target Center

EOB at 7,007 ' MD

SHL Onondaga 6,357 ' TVD

Onondaga 6,114 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,739 '
Air/Mist
↓
Air
TD at 5,739 '

5,739 ' to 7,007 '
12.5-13.5 ppg

7,007 ' to 26,514 '
12.5-13.9 ppg

Created by: C R Hall on 06/16/2022

Gayne Knitowski

Digitally signed by Gayne Knitowski
Date: 2022.06.16 16:07:55 -04'00'

Latitude: 40°00'00" — SURFACE HOLE 10,221'

Latitude: 40°05'00" — BOTTOM HOLE — 6,380'

Longitude: 80°40'00" — BOTTOM HOLE 15,119'

Longitude: 80°37'30" — SURFACE HOLE 2621'

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review
06-15-2022

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,432,446.285 EASTING: 526,492.121

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
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LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
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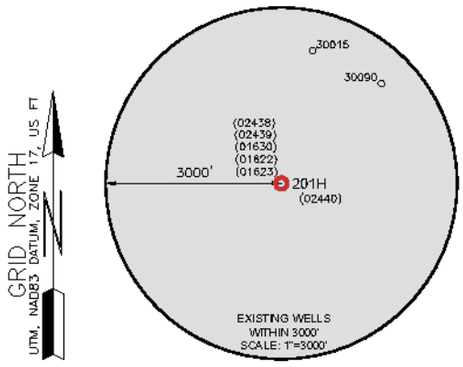

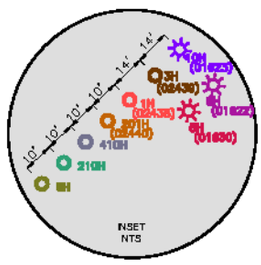

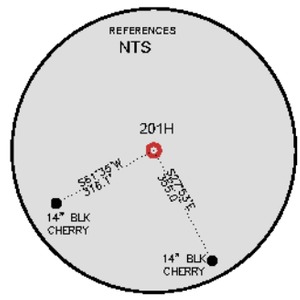

BHL

WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
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2000 0 2000
GRAPHIC SCALE IN FEET

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. 708 _____

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 26,514 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

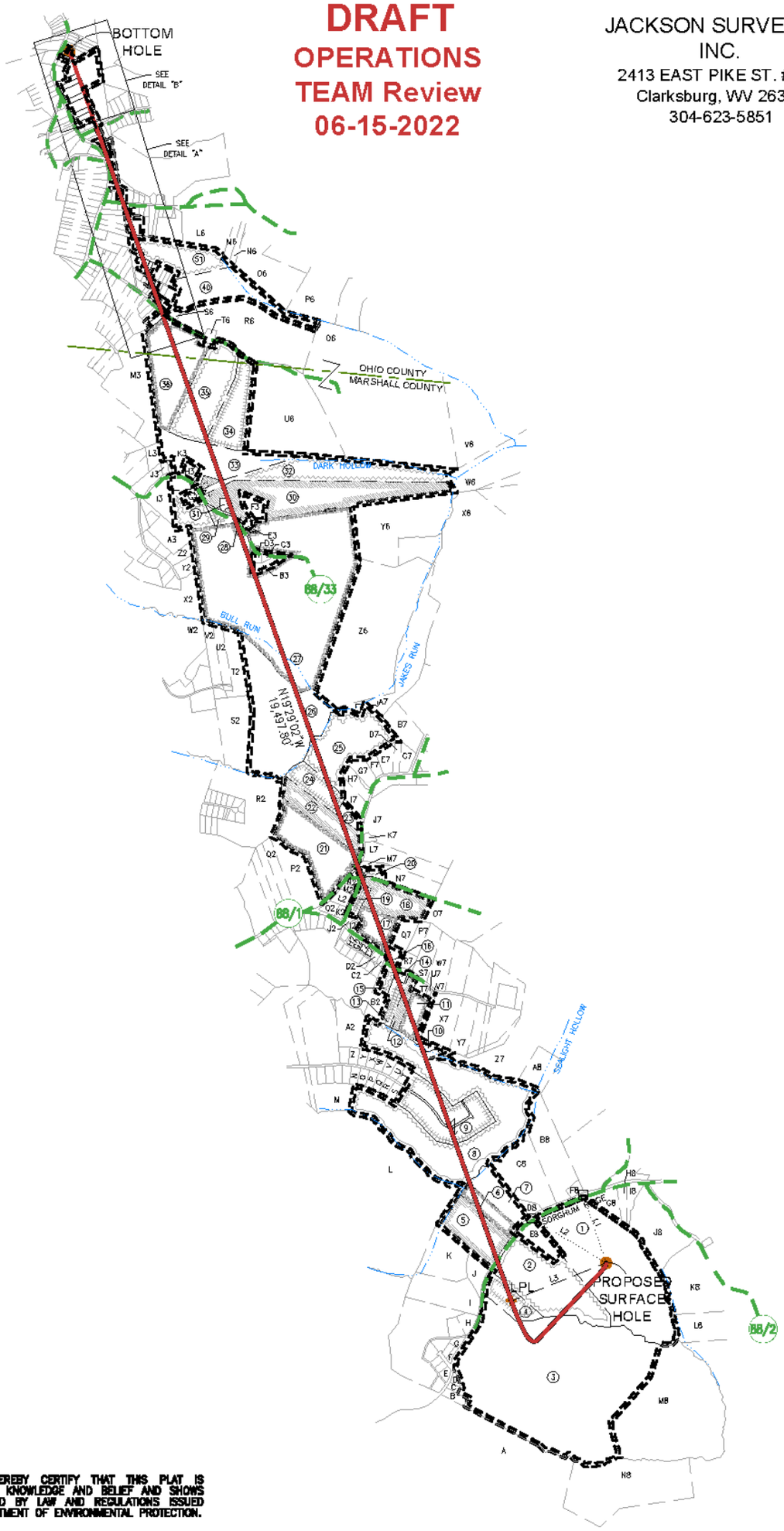
REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 06-15-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

2:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:27PM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

DRAFT
OPERATIONS TEAM Review 06-15-2022

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



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P.S. 708

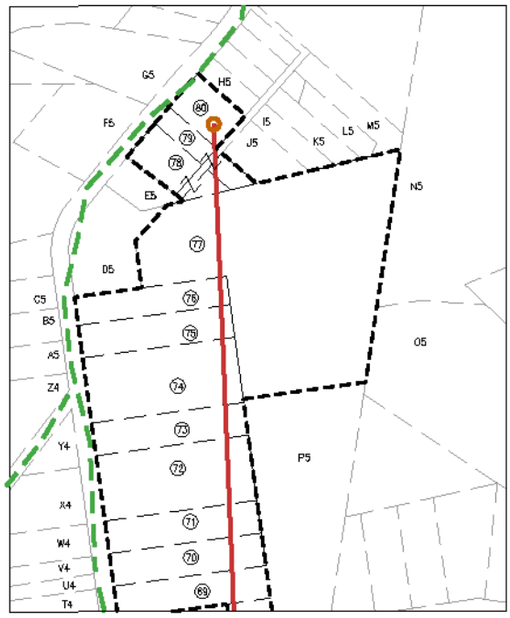
REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
⚠ REVISED DHP 06-15-2022			
	OPERATOR'S DAVID REINBEAU MSH	API #: 47-051-02440	DATE: 03-09-2022
	WELL #: 201H		DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:04PM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
06-15-2022

DETAIL "B"



DETAIL "A"

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P.S. 708 _____

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™			
⚠ REVISED DHP 06-15-2022				
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 201H	**API #:** 47-051-02440	**DATE:** 03-09-2022
				DRAWN BY: N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV	**SCALE:** N/A
				DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:04PM

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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	051-Marshal	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 26514'

11) Proposed Horizontal Leg Length: 19497.80'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	26514'	26514'	Tail 8776sx/ 100' inside Intermediate
Tubing							
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well: DAVID REINBEAU MSH 201 **Re-entry Rig:** TBD
Field: NORTH VICTORY FIELD WET **Prospect:** Marcellus Shale
County: MARSHALL **State:** WV
SHL: 39.9928 Latitude -80.6615 Longitude
BHL: 40.0418 Latitude -80.6895 Longitude
KB Elev: 1,277 ft MSL **KB:** 26 ft AGL **GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A
PROD TOC Lead @ 2,300 ' MD
PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	26,514 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8776	A	14.5-15.0

KOP at 5,739 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 26,514 '

TD at 26,514 ' MD
6,103 ' TVD

6,346 ' Target Center

EOB at 7,007 ' MD
SHL Onondaga 6,357 ' TVD

Onondaga 6,114 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,739 '
Air/Mist
↓
Air
TD at 5,739 '

5,739 ' to 7,007 '
12.5-13.5 ppg

7,007 ' to 26,514 '
12.5-13.9 ppg

Created by: C R Hall on 06/16/2022

Latitude: 40°00'00" — SURFACE HOLE 10,221'

Latitude: 40°05'00" — BOTTOM HOLE — 6,380'

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review
06-15-2022

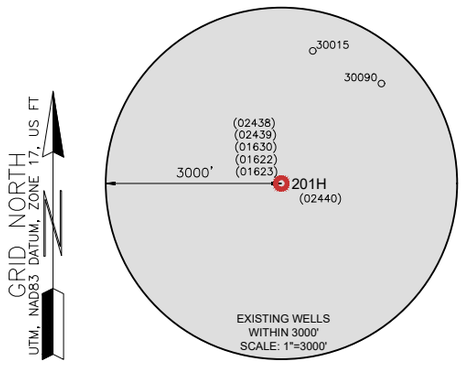
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,432,446.285 EASTING: 526,492.121

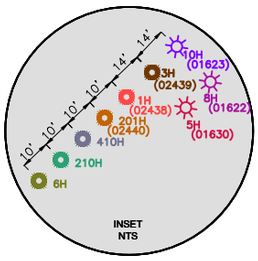
SHL

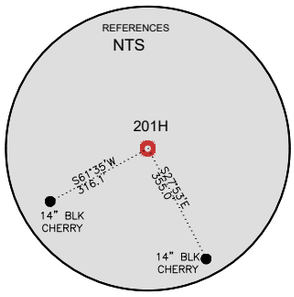
LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 18°39'42" W	1050.82'	SHL TO LANDMARK	FENCE CORNER
L2	N 59°07'47" W	1275.06'	SHL TO LANDMARK	FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 68°10'48" W	1500.64'	2287.58'	SHL TO LPL

Longitude: 80°40'00" — BOTTOM HOLE 15,119'

Longitude: 80°37'30" — SURFACE HOLE 2621'







BHL

WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 26,514 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

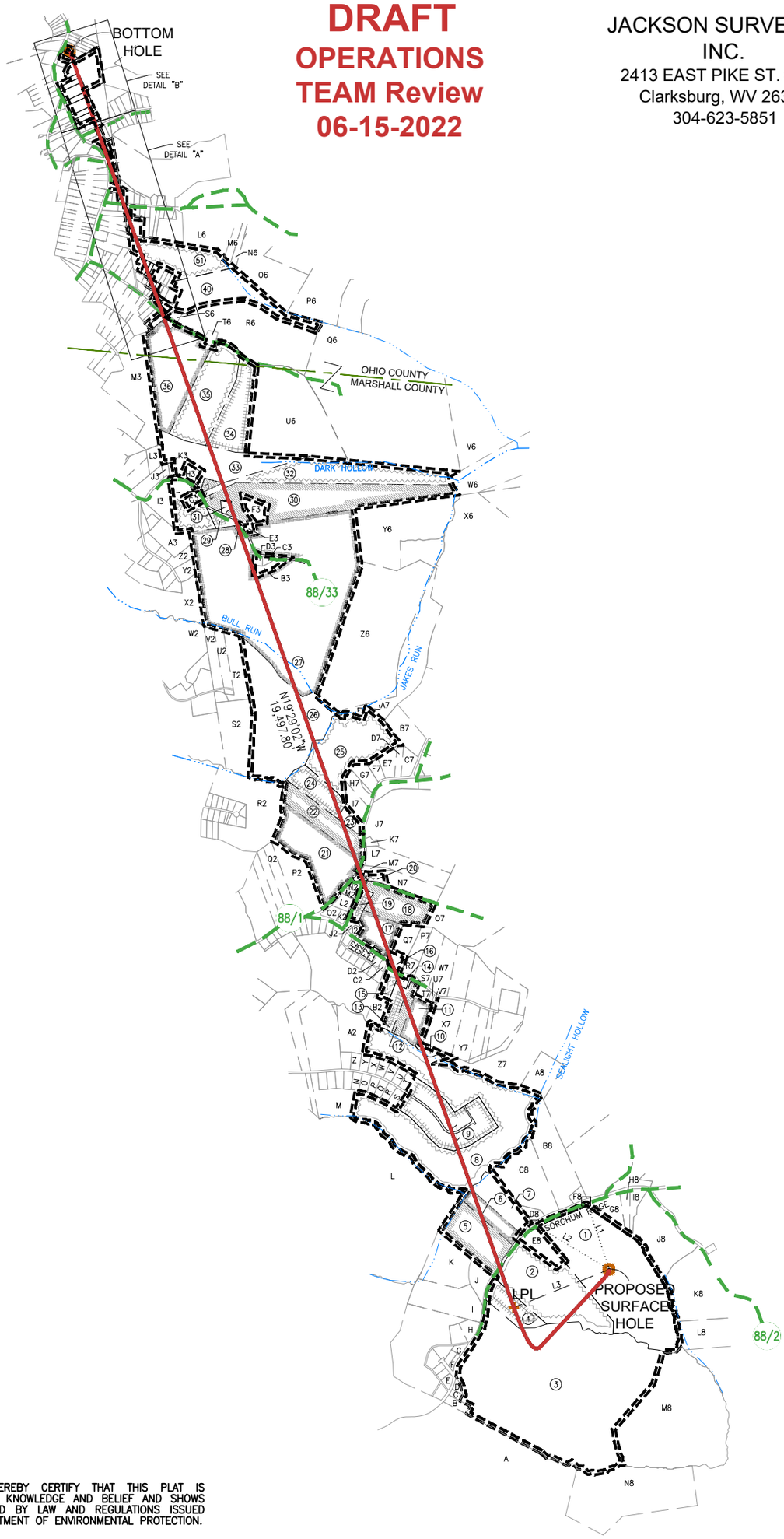
REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 06-15-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:27PM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

DRAFT
OPERATIONS TEAM Review 06-15-2022

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



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. 708

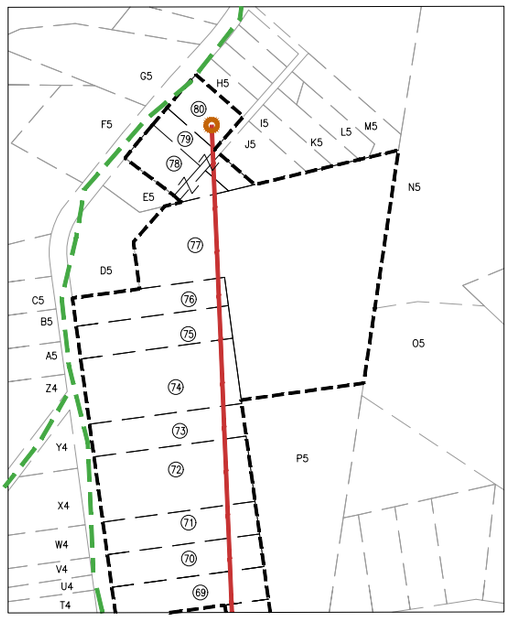
REVISIONS: ⚠ REVISED DHP 06-15-2022	COMPANY: SWN Production Company, LLC		SWN Production Company™
OPERATOR'S WELL #: DAVID REINBEAU MSH 201H		API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV	SCALE: N/A DRAWING NO: WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:04PM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
06-15-2022

DETAIL "B"



DETAIL "A"

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. 708

REVISIONS: ⚠ REVISED DHP 06-15-2022	COMPANY: SWN Production Company, LLC SWN Production Company™		
	OPERATOR'S WELL #: DAVID REINBEAU MSH 201H	API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV SCALE: N/A DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:04PM

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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	051-MArsha	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 24949'

11) Proposed Horizontal Leg Length: 17,933.95'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	24949'	24949'	Tail 8214sx/ 100' Inside Intermediate
Tubing							
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well: DAVID REINBEAU MSH 201 **Re-entry Rig:** TBD
Field: NORTH VICTORY FIELD WET **Prospect:** Marcellus Shale
County: MARSHALL **State:** WV
SHL: 39.9928 Latitude -80.6615 Longitude
BHL: 40.0378 Latitude -80.6876 Longitude
KB Elev: 1,277 ft MSL **KB:** 26 ft AGL **GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A
PROD TOC Lead @ 2,300 ' MD
PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	24,949 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8214	A	14.5-15.0

KOP at 5,739 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 24,949 '

TD at 24,949 ' MD
6,127 ' TVD

6,346 ' Target Center

EOB at 7,007 ' MD
SHL Onondaga 6,364 ' TVD

Onondaga 6,145 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,739 '
Air/Mist
↓
Air
TD at 5,739 '

5,739 ' to 7,007 '
12.5-13.5 ppg

7,007 ' to 24,949 '
12.5-13.9 ppg

Created by: C R Hall on 04/13/2022

Latitude: 40°00'00" — SURFACE HOLE 10,221'

Latitude: 40°02'30" — BOTTOM HOLE — 5,863'

BOTTOM HOLE 1,417'

SURFACE HOLE 2621'

Longitude: 80°40'00"

Longitude: 80°37'30"

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

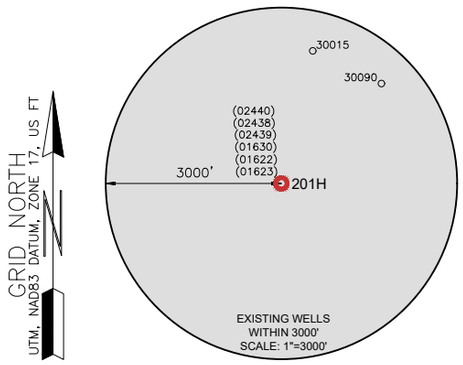
DRAFT
OPERATIONS TEAM Review 04-18-2022

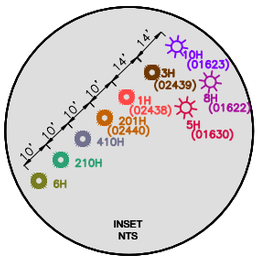
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,996.911 EASTING: 526,651.084

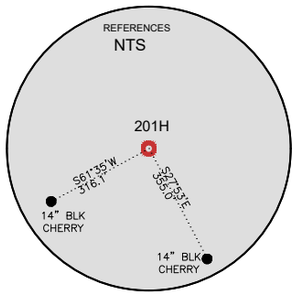
BHL

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 18°39'42" W	1050.82'	SHL TO LANDMARK	FENCE CORNER
L2	N 59°07'47" W	1275.06'	SHL TO LANDMARK	FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 68°10'47" W	1500.64'	2775.12'	SHL TO LPL







WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8' STAKED

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 24,949 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

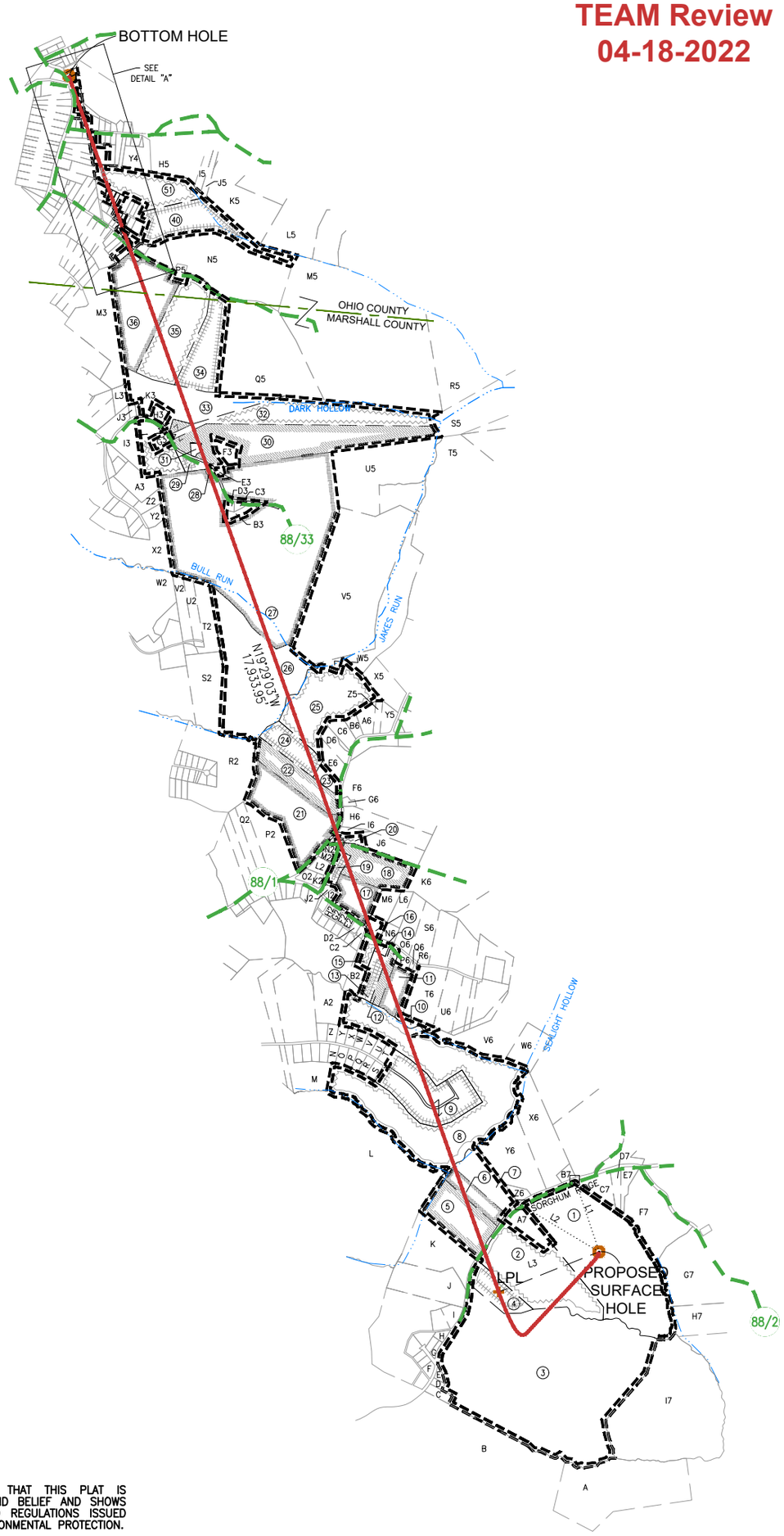
REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 04-18-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:48AM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
04-18-2022



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. 708

REVISIONS: ⚠ REVISED DHP 04-18-2022	COMPANY: SWN Production Company, LLC SWN Production Company™		
	OPERATOR'S DAVID REINBEAU MSH WELL #: 201H	API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV SCALE: N/A DRAWING NO: WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:50AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
04-18-2022

DETAIL "A"

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. 708

REVISIONS: ⚠ REVISED DHP 04-18-2022	COMPANY: SWN Production Company, LLC		SWN Production Company™
	OPERATOR'S WELL #: DAVID REINBEAU MSH 201H	API #: 47-051-02440	DATE: 03-09-2022
			DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			SCALE: N/A
			DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:51AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review
04-18-2022

	WELL BORE TRACTS	
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	REINBEAU SHELLY A & DAVID W (S/R)	13-8-29
TRACT	SURFACE OWNER (S)	TAX PARCEL
2	REINBEAU SHELLY A & DAVID W (S)	13-8-27
3	MCCOMBS JOHN A SR, THOMAS E & BETH (S)	13-8-26
4	REINBEAU RONALD W & FRIEDA A - LIFE (S)	13-7-22.2
5	REINBEAU DAVID W & SHELLY A (S)	13-7-22.3
6	REINBEAU DAVID W & SHELLY A (S)	13-7-21.1
7	BOWMAN MICHAEL J & CONSTANCE G (S)	13-7-21
8	WARD CYNTHIA J & DALE P (S)	13-4-23.6
9	BLANEY FARMS LLC (S)	13-4-23
10	WEST VALLIE JAMES ET AL (S)	13-4-22
11	FISHER DEBRA ANN GAMES & GALEN E (S)	13-4-22.9
12	GARRISON ASHLEY (S)	13-4-22.12
13	GAMES FREDERICK LOUIS II ET UX (S)	13-4-22.10
14	GAMES FREDERICK LOUIS II ET UX (S)	13-4-22.4
15	ORLOFSKE SEAN A & JENNIFER L (S)	13-4-22.6
16	WEST RICHARD D JR (S)	13-4-22.1
17	FISHER GALEN E & DEBRA A (S)	13-4-21
18	MCGUIRE PHILIP C (S)	13-4-21.9
19	HILL CHARLES S ET UX (S)	13-4-21.7
20	GARVIN CORRINE A EST (S)	13-2-101.2
21	GARVIN CORRINE A EST (S)	13-4-20
22	GARVIN CORRINE A EST (S)	13-2-70
23	GARVIN CORRINE A EST (S)	13-2-71
24	GARVIN CORRINE A EST (S)	13-2-69
25	GARVIN CORRINE A EST (S)	13-2-68
26	ST MYERS MICHAEL W (S)	13-2-67
27	ROGERSON GEORGE C EST(S)	13-2-39
28	COFFIELD RONALD J (S)	13-2-39.5
29	SEIDLER TIMOTHY I ET UX (S)	13-2-14.2
30	SEIDLER E DALE JR (S)	13-2-14.9
31	SEIDLER NETTIE (S)	13-2-14
32	SEIDLER PATRICIA L IRREVOCABLE TRUST (S)	13-2-14.7
33	SHIVELY JOYCE (S)	13-2-14.6
34	RAHBAR AHMAD CREDIT SHELTER TRUST (S)	P/O 13-2-102
35	BANE RYAN A & JULIE A (S)	13-2-102.2
36	TURNER JASON & TFFANY (S)	13-2-102.1
37	WEISNER RANDY P (S)	1-RB2-33.3
38	PRASCIK LORI JEAN (S)	1-RB2Q-33
39	MULARCIK BRYAN & TIFFANY (S)	1-RB2Q-32
40	ANDREWS JANET M TRUSTEE (S)	1-RB2-32
41	KNORR WILLIAM JOHN & KNORR ELIZABETH VIRGINIA (S)	1-RB2L-81.1
42	CONLEY CRAIG & CONLEY SCOTT CONLEY MARJORIE P (LE) (S)	1-RB2L-82
43	COSS RENEE DARLENE & PARKS GEORGE B JR (S)	1-RB2L-79
44	WARD MICHELE L & JEFFREY L SR (S)	1-RB2L-78
45	BREIDING BERNARD L JR & K L (S)	1-RB2L-77
46	STINGLE KEVIN W; GRAY FLORA L (RT TO OCC) (S)	1-RB2L-70
47	WEST VIRGINIA HOUSING DEV FUND (S)	1-RB2L-69
48	METZ BARBARA JANE (S)	1-RB2L-69.1
49	METZ BARBARA J (S)	1-RB2L-68
50	LLOYD JENNIFER L & DAVID A (S)	1-RB2L-67
51	SCHMIDT THOMAS (S)	1-RB2-28
52	SCHMIDT THOMAS L & L E (S)	1-RB2L-55
53	ARMSTRONG SHELLEE JEAN (S)	1-RB2L-57
54	DRANE BROOKE NICOLE (S)	1-RB2L-57.1
55	CLEGG AUBREI L (S)	1-RB2L-42
56	SCHMIDT TRACY LYNNE (S)	1-RB2L-41
57	KEEFER ROBERT M & DONNA J IRREVOCABLE TRUST (S)	1-RB2L-39
58	GAMBLE IAN & SARAH (S)	1-RB2L-38
59	GARY MARK C & P S (S)	1-RB2L-37
60	BLAZIER BRIAN T (S)	1-RB2G-78
61	MURAD CHRIS R & TRACY (S)	1-RB2G-77
62	DESANTIS JAMES P & JANE V & DESANTIS MICHAEL V (S)	1-RB2G-76
63	VILLAGE OF BETHLEHEM (S)	1-RB2G-75
64	KONDRAD SCOTT F & DEVYN S (S)	1-RB2G-74

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
A	CONNER AMBER D & DAVID HANES JR	13-8-14
B	HIERONIMUS C KEITH ET UX	13-8-15
C	MCLAUGHLIN SHAWN & ELIZABETH	13-8-23
D	HOUGH BRANDON W & ALYSSA N	13-8-24
E	THORN JACLYN A & JASON K	13-8-25
F	SBERNA JOSEPH L JR & TAMMY	13-7E-1
G	CRAWFORD GARY J	13-7E-7
H	JOSEPH WILLIAM F & SUSAN L	13-7E-8
I	CAIN ROGER L II	13-7E-10
J	MCCLINTOCK JOSIE & LARRY	13-7-22.4
K	MCCOMBS JOHN A SR & MARILYN S	13-7-22.1
L	BOARD OF EDUCATION	13-7-17
M	BLANEY TIMOTHY O ET UX	13-4-24.5
N	WARD CYNTHIA J	13-4-23.16
O	SMITH JOANN H	13-4-23.2
P	DUNCAN ELMER E & SUSAN L	13-04-23.1
Q	STAN, TYLER P & CASEY K	13-4-23.5
R	OSER FREDERICK P & MALLORY A	13-4-23.10
S	OSER FREDERICK P & MALLORY	13-4-23.15
T	WARD CYNTHIA J	13-4-23.14
U	BLANEY RODNEY A	13-4-23.13
V	SZELIGO RICHARD & ASHLEY	13-4-23.8
W	SZELIGO RICHARD L JR & ASHLEY E	13-4-23.11
X	ETZEL JAMIE P & ANTHONY EVICK II	13-4-23.12
Y	ETZEL JAMIE P & ANTHONY EVICK II	13-4-23.7
Z	FITZPATRICK BRYAN A & HEIDI A	13-4-23.4
A2	WARD CYNTHIA J & DALE P	13-4-24
B2	ORLOFSKE SEAN A & JENNIFER L	13-4-22.11
C2	OCHSENBEIN RICHARD L & HOLLY L	13-4C-14
D2	MORANDO THOMAS L ET UX	13-4C-1
E2	BENTZ CAROLEE K - TOD	13-4C-2
F2	THOMPSON BRUCE K	13-4C-3
G2	HARTO BRIAN D ET UX	13-4C-4
H2	TOMCZYK JOSEPH ET UX	13-4C-5
I2	BROWN JUSTIN D & JULIE L	13-4-21.3
J2	BROWN JUSTIN D & JULIE L	13-4-21.10
K2	GEYER ROBERT J & CHARLENE M	13-4-21.5
L2	CAMPETI JOSEPH M ET UX	13-4-21.8
M2	WRIGHT JOSEPH E & CONNIE S	13-4-21.2
N2	WALTERS SAMANTHA J & RICHARDS JENNIFER L	13-4-21.1
O2	GEYER ROBERT J & CHARLENE M	13-4-21.6
P2	AGAR MYRNA L	13-4-19
Q2	COLE RANDALL M ET UX	13-4-18
R2	ANDERSON MARY KATHRYN EST	13-4-14
S2	PELLEY LUKE E	13-2-66
T2	MEGALE GARNET JANE & VICKIE WALTERS	13-2-66.1
U2	WALTERS VICKIE	13-2-65
V2	GREEN JAMES L	13-2-64
W2	WALTERS THOMAS C & KATRINA A	13-2-41.7
X2	TUCKER NATHAN JOSEPH & LINDSEY RENEE	13-2-42.5
Y2	COOLEY CHARLES E & CAROL J	13-2-42
Z2	RICHTER FAMILY TRUST	13-2-42.17
A3	BLATT JAMES E ET UX	13-2-42.7
B3	ROGERSON WAYNE R	13-2-39.4
C3	ROGERSON WAYNE R	13-2-39.1
D3	SCARBRO JENNI M	13-2-39.2
E3	COFFIELD RONALD J	13-2-39.3
F3	SEIDLER E DALE JR ET UX	13-2-14.3
G3	NUGENT LINDA S ET AL	13-2-14.8
H3	BRADCOVICH JOSEPH EARL EST	13-2-14.4
I3	MAGERS GARY E ET UX	13-2-2.2
J3	SHIVELY JOYCE	13-2-14.1
K3	SHIVELY JOYCE	13-2-14.5
L3	PYSH WAYNE ET UX	13-2-13.8
M3	PASCOLI KENT A	13-2-13
N3	BROWN BETHANN K	1-RB2Q-34.1
O3	SHREVES HOLLIE L	1-RB2Q-31.1
P3	SHREVES HOLLIE L	1-RB2Q-31

REVISIONS:
⚠ REVISED DHP 04-18-2022

COMPANY: SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API #: 47-051-02440

DISTRICT: UNION

COUNTY: MARSHALL

STATE: WV

DATE: 03-09-2022
DRAWN BY: N. MANO
SCALE: N/A
DRAWING NO:
WELL LOCATION PLAT 4

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:52AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review
04-18-2022

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
Q3	BROWN BETHANN K	1-RB2Q-34
R3	LASH FRANKLIN W	1-RB2L-83
S3	WODESKY JANET L	1-RB2L-84
T3	HUNTLEY CHAD D & SUSAN L	1-RB2L-85
U3	ROTRIGA MARY RUTH ESTATE	1-RB2L-76
V3	JOSEPH KENNETH M & N E	1-RB2L-75
W3	VILLAGE OF BETHLEHEM	1-RB2L-66
X3	SCHNUPP JAMES P & M A	1-RB2L-88
Y3	PICKETT VALERIE & GARY B	1-RB2L-64
Z3	MARTIN KIMBERLEE GEORGETTE	1-RB2L-62
A4	WEST MAX L M D & M A	1-RB2L-61
B4	MARTIN DONALD L & L J	1-RB2L-60
C4	PICKETT VALERIE A	1-RB2L-59
D4	JUNKINS DONALD A	1-RB2L-58.1
E4	JUNKINS DONALD A	1-RB2L-58
F4	DONAHUE DEREK A & ABBEY M	1-RB2L-40.1
G4	DONAHUE DEREK A & ABBEY M	1-RB2L-40
H4	TROOP JASON P & COURTNEY	1-RB2L-35
I4	FRY FRANCIS H	1-RB2L-36
J4	DAMICO GREGORY B	1-RB2G-20
K4	SMITH SANDRA S	1-RB2G-21
L4	GARDNER RICHARD L SR & GARDNER CONNIE L	1-RB2G-23
M4	STENGER WILLIAM JR	1-RB2G-24
N4	CUNNINGHAM WAYNE D & G K	1-RB2G-73
O4	CONRAD JOSHUA D & TRISHA J	1-RB2-27.3
P4	CLEGG AUBREI L	1-RB2L-112
Q4	COMBS ANTHONY & QUINN AMBER	1-RB2L-43
R4	BLAZIER HOWARD T JR & S L	1-RB2L-44
S4	SCHMIDT THOMAS L & L E	1-RB2L-56
T4	SCHMIDT JOSEPH L (OCC) SCHMIDT THOMAS G (OCC)	1-RB2L-52
U4	KOMOROWSKI MICHAEL C & KOMOROWSKI REBECCA L	1-RB2L-51
V4	WILSON R & J (LIFE EST) MARSHALL S & SUTTON C	1-RB2L-54
W4	TOWNSEND CARL A	1-RB2L-50
X4	SNYDER CHRISTINE LEE	1-RB2L-50.1
Y4	GARVIN DALE C & E	1-RB2L-49.1
Z4	TROUTEN JENNA MICHELLE	1-RB2L-71
A5	BECK SANDRA M	1-RB2L-72
B5	YOHO PATRICK A	1-RB2L-73
C5	PAULEY SCOTT F & ECHEMANN CHRISTINA	1-RB2L-74
D5	BREIDING BERNARD D & APRIL	1-RB2L-80
E5	BREIDING BERNARD D & APRIL	1-RB2L-80.1
F5	NEIMAN CHARLES AND MARK	1-RB2L-81
G5	ANDREWS JEREMY	1-RB2-32.1
H5	GARVIN D CRAIG & EYDIE M	1-RB2M-54.2
I5	RICHTER ELWOOD F JR & C A	1-RB2M-56.1
J5	RICHTER ELWOOD F JR	1-RB2M-56
K5	ASBURY RYAN & ANNE	1-RB2-31.5
L5	POTTS JOHN W & ROSE A	1-RB2-31.2
M5	BRAUNLICH EARL FRITZ & JAMIE LYNN	13-2-102.4
N5	RAHBAR AHMAD CREDIT SHELTER TRUST	13-2-102
O5	PINTER EUGENE M & JOAN	1-RB2-33.2
P5	BRAUNLICH EARL FRITZ & JAMIE LYNN	13-2-104
Q5	WOLEN JOHN & MICHELLE	13-2-102.3
R5	RENFORTH GEORGE III	13-2-16.2
S5	PERONI CONSTRUCTION INC	10-W95-112
T5	LONG RICHARD E ET UX	13-2-35
U5	LAUTER FRANK ET AL	13-2-36
V5	POLLACK RICHARD J ET UX	13-2-38.1
W5	GARVIN CORRINE A EST	13-2-38
X5	BURKE RICHARD & FITZPATRICK DEBRA	13-2-31.2
Y5	MILLER GEORGE W ET AL	13-2-79
Z5	GARVIN JOHN A & KAREN L	13-2-78
A6	ROMINE WANDA KAY	13-2-77
B6	BOWSER MARY ANNE	13-2-76
C6	GARVIN JOHN ARTHUR & KAREN L	13-2-75
D6	GARVIN JOHN A & KAREN L	13-2-73
E6	MUSTACHIO EMILY A & GARVIN GRANT W	13-2-72
F6	GARVIN CORRINE A EST	13-2-98
G6	GARVIN CORRINE A EST	13-2-99
H6	GARVIN CORRINE A EST	13-2-100

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
I6	GARVIN CORRINE A EST	13-2-101.1
J6	GARVIN CORRINE A EST	13-2-101
K6	MCGUIRE PHILIP C	13-4-21.4
L6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.5
M6	WEST RICHARD D JR	13-4-22.24
N6	GAMES MARY VIRGINIA - TOD	13-4-22.2
O6	GAMES FRED & MARY V	13-4-22.17
P6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.3
Q6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.5
R6	ORLOFSKE SEAN A & JENNIFER L	13-4-22.6
S6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.3
T6	HOFFMASTER KEVIN & CRYSTAL	13-4-22.27
U6	BRINKMEIER BRUCE & TAMARA	13-4-22.14
V6	COULLING LOUISE S ET AL	13-3-3
W6	OHIO COUNTY COAL RESOURCES INC	13-3-3.1
X6	ALEXANDER LORRAINE	13-7-18
Y6	ALEXANDER LORRAINE	13-7-18.1
Z6	ALEXANDER LORRAINE	13-7-20
A7	BOWMAN MICHAEL ET UX	13-8-28
B7	SAMPSON EDITH VIRGINIA EST	13-7-19
C7	NARRISH KEVIN	13-8-30
D7	SOUTH CHRISTOPHER C	13-8-31
E7	KOSTELECSKY JOSEPH J JR & CAROLYN - TOD	13-8-31.1
F7	FUNK CHARLES D ET UX	13-8-32
G7	LOY EUGENE EST ET AL	13-8-1
H7	LIBERTY JOHN ET UX	13-8-10
I7	MCCOMBS JOHN A SR, THOMAS E & BETH	13-8-11

REVISIONS:
⚠ REVISED DHP 04-18-2022

COMPANY: SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API #: 47-051-02440

DISTRICT: UNION

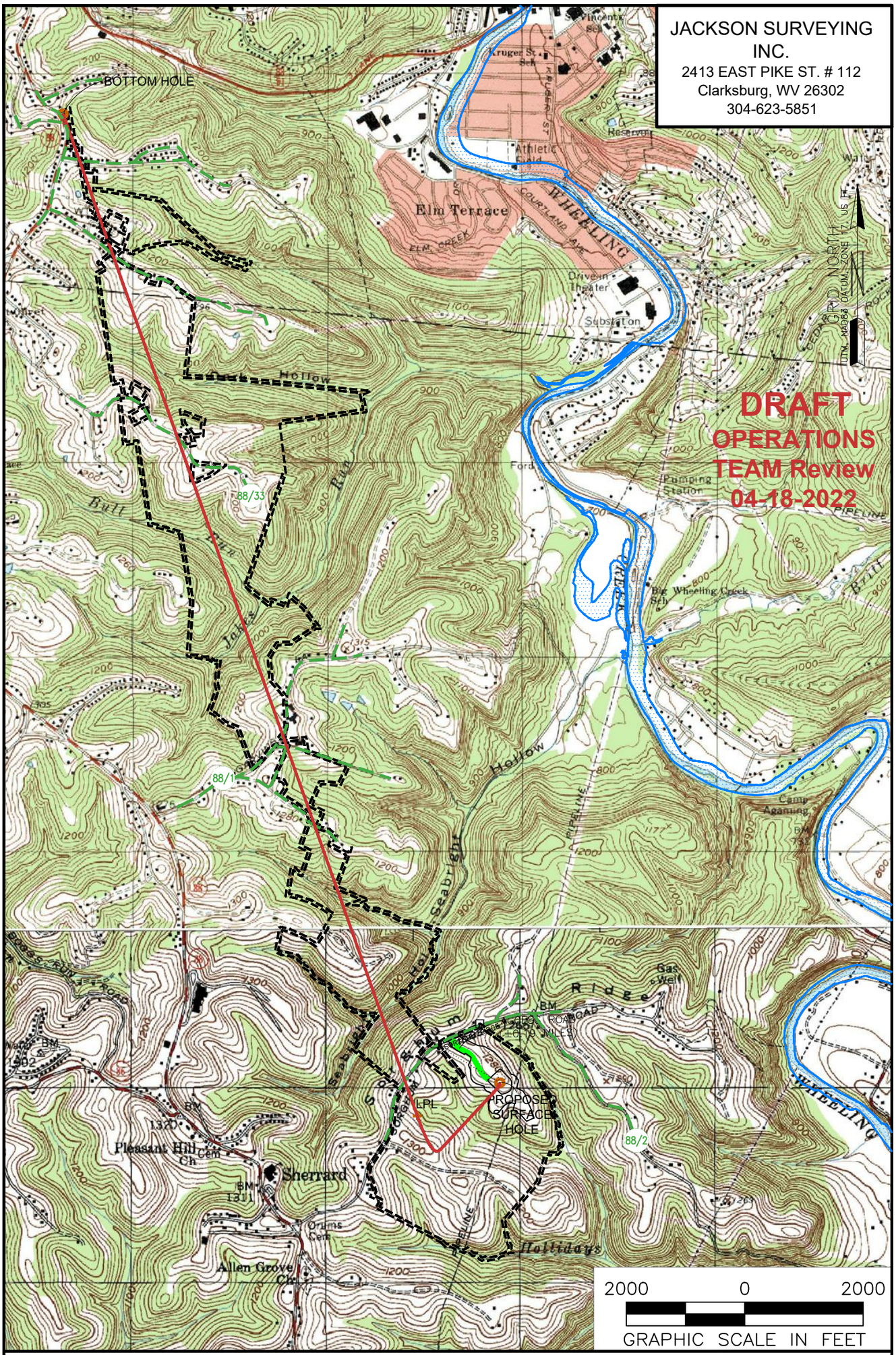
COUNTY: MARSHALL

STATE: WV

DATE: 03-09-2022
DRAWN BY: N. MANO
SCALE: N/A
DRAWING NO:
WELL LOCATION PLAT 5

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 09:59AM

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- PROPOSED PATH

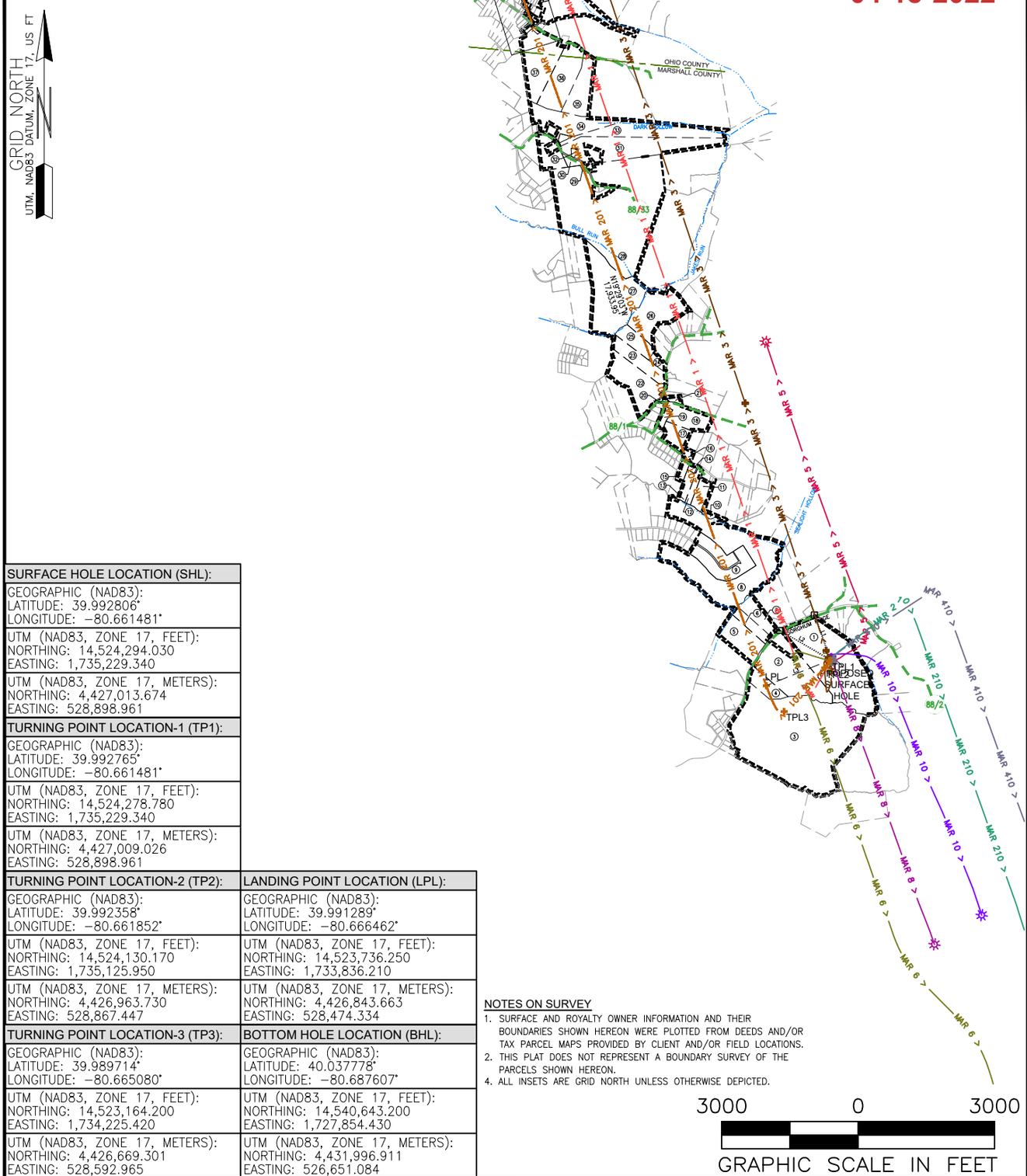
WELL OPERATOR: SWN PRODUCTION COMPANY, LLC	WELL (FARM) NAME: DAVID REINBEAU MSH	WELL # 201H	SERIAL #
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200 MORGANTOWN, WV 26508	COUNTY – CODE MARSHALL – 051	DISTRICT; UNION	
SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU	USGS 7 1/2 QUADRANGLE MAP NAME MOUNDSVILLE, WV	API #: 47-051-02440	

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-2022.DWG
MONDAY APRIL 18 2022 08:54AM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review 04-18-2022

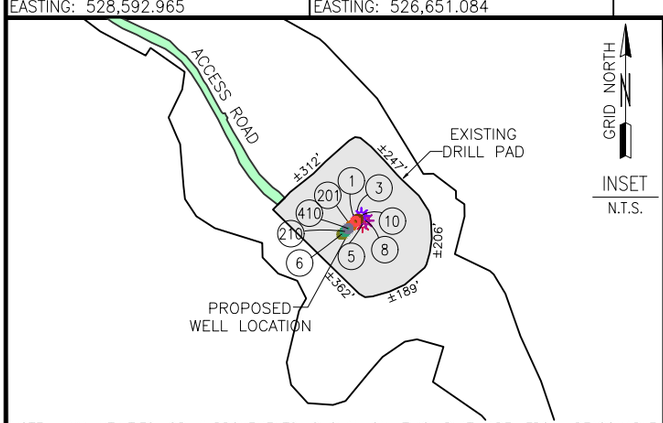


SURFACE HOLE LOCATION (SHL):
GEOGRAPHIC (NAD83): LATITUDE: 39.992806° LONGITUDE: −80.661481°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,294.030 EASTING: 1,735,229.340
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
TURNING POINT LOCATION-1 (TP1):
GEOGRAPHIC (NAD83): LATITUDE: 39.992765° LONGITUDE: −80.661481°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,278.780 EASTING: 1,735,229.340
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,009.026 EASTING: 528,898.961

TURNING POINT LOCATION-2 (TP2):	LANDING POINT LOCATION (LPL):
GEOGRAPHIC (NAD83): LATITUDE: 39.992358° LONGITUDE: −80.661852°	GEOGRAPHIC (NAD83): LATITUDE: 39.991289° LONGITUDE: −80.666462°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,130.170 EASTING: 1,735,125.950	UTM (NAD83, ZONE 17, FEET): NORTHING: 14,523,736.250 EASTING: 1,733,836.210
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,963.730 EASTING: 528,867.447	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
TURNING POINT LOCATION-3 (TP3):	**BOTTOM HOLE LOCATION (BHL):**
GEOGRAPHIC (NAD83): LATITUDE: 39.989714° LONGITUDE: −80.665080°	GEOGRAPHIC (NAD83): LATITUDE: 40.037778° LONGITUDE: −80.687607°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,523,164.200 EASTING: 1,734,225.420	UTM (NAD83, ZONE 17, FEET): NORTHING: 14,540,643.200 EASTING: 1,727,854.430
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,669.301 EASTING: 528,592.965	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,996.911 EASTING: 526,651.084

NOTES ON SURVEY
1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

3000 0 3000
GRAPHIC SCALE IN FEET



NOTE: ANY UTILITIES OR IMPROVEMENTS SHOWN ON THIS PLAT ARE FROM REASONABLE VISUAL OBSERVATIONS. NO UTILITY COMPANIES WERE CONTACTED FOR UTILITY LINE LOCATIONS.

COMPANY: SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #:	DAVID REINBEAU MSH 201H	API #: 47-051-02440
DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV

SWN PRODUCTION COMPANY, LLC
SURFACE HOLES
1. "DAVID REINBEAU MSH 1H"
3. "DAVID REINBEAU MSH 3H"
5. "DAVID REINBEAU MSH 5H"
6. "DAVID REINBEAU MSH 6H"
8. "DAVID REINBEAU MSH 8H"
10. "DAVID REINBEAU MSH 10H"
201. "DAVID REINBEAU MSH 201H"
210. "DAVID REINBEAU MSH 210H"
410. "DAVID REINBEAU MSH 410H"

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- ABANDONED WELL
- PLUGGED & ABANDONED WELL
- LPL LANDING POINT LOCATION
- DRILLING UNIT
- LEASE BOUNDARY
- HARDLINE BOUNDARY
- UPP 2 > UPPER POINT PLEASANT PATH
- MAR 2 > MARCELLUS PATH

REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 04-18-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 3000'
	DRAWING NO:
	INTERNAL WELL PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-2022.DWG
MONDAY APRIL 18 2022 08:54AM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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 (Operator ID) | 051-MArsha (County) | 07-Union (District) | 486-Moundsville (Quadrangle)

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.04.18 17:41:59 -04'00'

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 24949'

11) Proposed Horizontal Leg Length: 17,933.95'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	24949'	24949'	Tail 8214sx/ 100' Inside Intermediate
Tubing							
Liners							

Gayne Knitowski

Digitally signed by Gayne Knitowski
Date: 2022.04.18 17:42:19 -04'00'

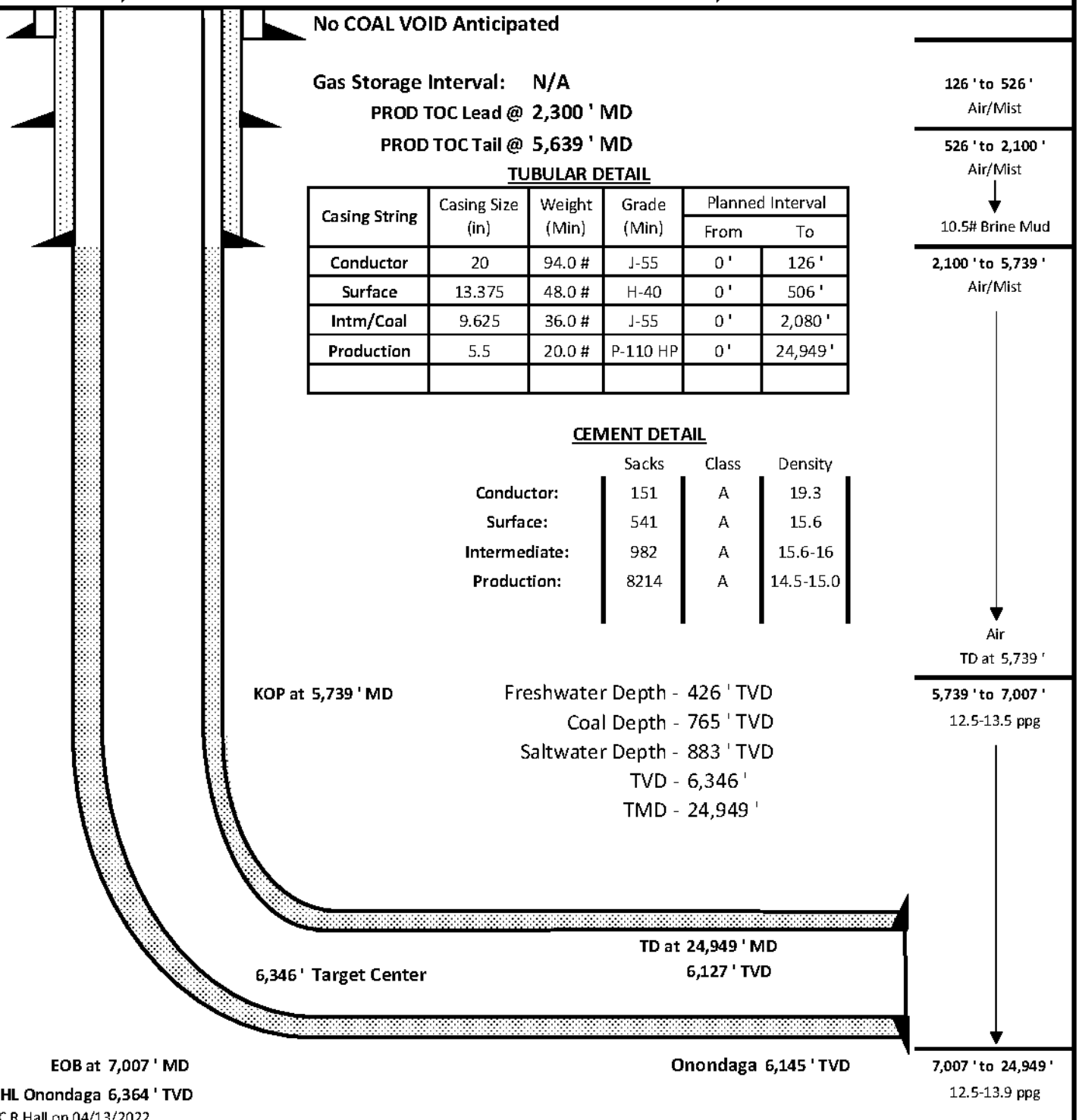
TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well:	DAVID REINBEAU MSH 201	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9928 Latitude -80.6615 Longitude		
BHL:	40.0378 Latitude -80.6876 Longitude		
KB Elev:	1,277 ft MSL KB: 26 ft AGL	**GL Elev:**	1,251 ft MSL



Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	24,949 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8214	A	14.5-15.0

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 24,949 '

Created by: C R Hall on 04/13/2022

Latitude: 40°00'00" — SURFACE HOLE 10,221'

Latitude: 40°02'30" — BOTTOM HOLE — 5,863'

BOTTOM HOLE 1,417'

SURFACE HOLE 2621'

Longitude: 80°40'00"

Longitude: 80°37'30"

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

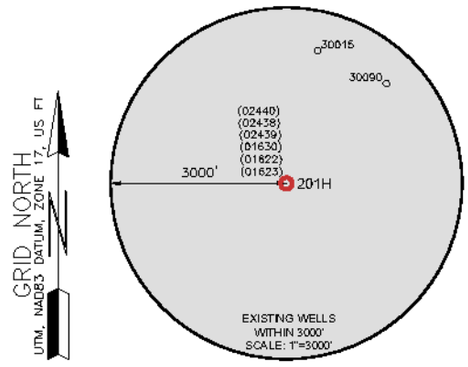
DRAFT
OPERATIONS TEAM Review
04-18-2022

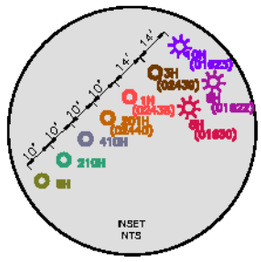
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,996.911 EASTING: 526,651.084

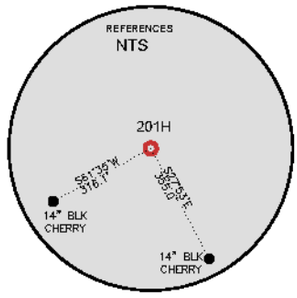
BHL

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 18°39'42" W	1050.82'	SHL TO LANDMARK	FENCE CORNER
L2	N 59°07'47" W	1275.06'	SHL TO LANDMARK	FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 68°10'47" W	1500.64'	2775.12'	SHL TO LPL







WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708 _____

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8' STAKED

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 24,949 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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: 03-09-2022
⚠ REVISED DHP 04-18-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

2:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:48AM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

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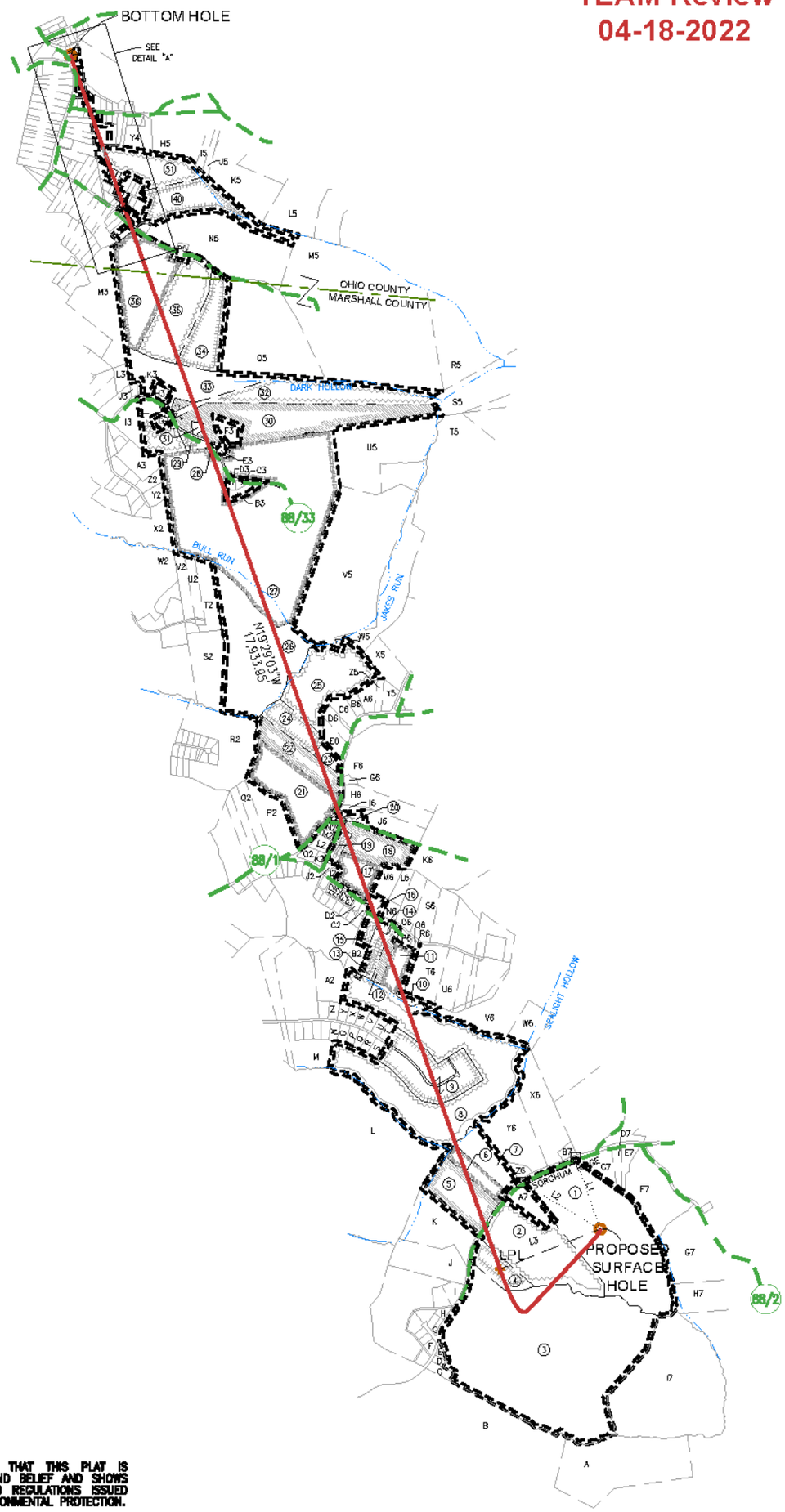

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 708

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
⚠ REVISED DHP 04-18-2022			
	OPERATOR'S DAVID REINBEAU MSH	**API #:** 47-051-02440	**DATE:** 03-09-2022
	WELL #: 201H		**DRAWN BY:** N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 2

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MONDAY APRIL 18 2022 08:50AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
04-18-2022

DETAIL "A"

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. 708 _____

REVISIONS: ⚠ REVISED DHP 04-18-2022	COMPANY: SWN Production Company, LLC — SWN Production Company™		
	OPERATOR'S WELL #: DAVID REINBEAU MSH 201H	API #: 47-051-02440	DATE: 03-09-2022 DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV SCALE: N/A DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:51AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
04-18-2022

	WELL BORE TRACTS	
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	REINBEAU SHELLY A & DAVID W (S/R)	13-8-29
TRACT	SURFACE OWNER (S)	TAX PARCEL
2	REINBEAU SHELLY A & DAVID W (S)	13-8-27
3	MCCOMBS JOHN A SR, THOMAS E & BETH (S)	13-8-26
4	REINBEAU RONALD W & FRIEDA A - LIFE (S)	13-7-22.2
5	REINBEAU DAVID W & SHELLY A (S)	13-7-22.3
6	REINBEAU DAVID W & SHELLY A (S)	13-7-21.1
7	BOWMAN MICHAEL J & CONSTANCE G (S)	13-7-21
8	WARD CYNTHIA J & DALE P (S)	13-4-23.6
9	BLANEY FARMS LLC (S)	13-4-23
10	WEST VALLIE JAMES ET AL (S)	13-4-22
11	FISHER DEBRA ANN GAMES & GALEN E (S)	13-4-22.9
12	GARBISON ASHLEY (S)	13-4-22.12
13	GAMES FREDERICK LOUIS II ET UX (S)	13-4-22.10
14	GAMES FREDERICK LOUIS II ET UX (S)	13-4-22.4
15	ORLOFSKE SEAN A & JENNIFER L (S)	13-4-22.6
16	WEST RICHARD D JR (S)	13-4-22.1
17	FISHER GALEN E & DEBRA A (S)	13-4-21
18	MCGUIRE PHILIP C (S)	13-4-21.9
19	HILL CHARLES S ET UX (S)	13-4-21.7
20	GARVIN CORRINE A EST (S)	13-2-101.2
21	GARVIN CORRINE A EST (S)	13-4-20
22	GARVIN CORRINE A EST (S)	13-2-70
23	GARVIN CORRINE A EST (S)	13-2-71
24	GARVIN CORRINE A EST (S)	13-2-69
25	GARVIN CORRINE A EST (S)	13-2-68
26	ST MYERS MICHAEL W (S)	13-2-67
27	ROGERSON GEORGE C EST (S)	13-2-39
28	COFFIELD RONALD J (S)	13-2-39.5
29	SEIDLER TIMOTHY J ET UX (S)	13-2-14.2
30	SEIDLER E DALE JR (S)	13-2-14.9
31	SEIDLER NETTIE (S)	13-2-14
32	SEIDLER PATRICIA J IRREVOCABLE TRUST (S)	13-2-14.7
33	SHIVELY JOYCE (S)	13-2-14.6
34	RAHBAR AHMAD CREDIT SHELTER TRUST (S)	P/O 13-2-102
35	BANE RYAN A & JULIE A (S)	13-2-102.2
36	TURNER JASON & TIFFANY (S)	13-2-102.1
37	WEISNER RANDY P (S)	1-RB2-33.3
38	PRASCIK LORI JEAN (S)	1-RB2Q-33
39	MULARCIK BRYAN & TIFFANY (S)	1-RB2Q-32
40	ANDREWS JANET M TRUSTEE (S)	1-RB2-32
41	KNORR WILLIAM JOHN & KNORR ELIZABETH VIRGINIA (S)	1-RB2L-81.1
42	CONLEY CRAIG & CONLEY SCOTT CONLEY MARJORIE P (LE) (S)	1-RB2L-82
43	COSS RENEE DARLENE & PARKS GEORGE B JR (S)	1-RB2L-79
44	WARD MICHELE L & JEFFREY L SR (S)	1-RB2L-78
45	BREIDING BERNARD L JR & K L (S)	1-RB2L-77
46	STINGLE KEVIN W; GRAY FLORA L (RT TO OCC) (S)	1-RB2L-70
47	WEST VIRGINIA HOUSING DEV FUND (S)	1-RB2L-69
48	METZ BARBARA JANE (S)	1-RB2L-69.1
49	METZ BARBARA J (S)	1-RB2L-68
50	LLOYD JENNIFER L & DAVID A (S)	1-RB2L-67
51	SCHMIDT THOMAS (S)	1-RB2-28
52	SCHMIDT THOMAS L & L E (S)	1-RB2L-55
53	ARMSTRONG SHELLEE JEAN (S)	1-RB2L-57
54	DRANE BROOKE NICOLE (S)	1-RB2L-57.1
55	CLEGG AUBREY L (S)	1-RB2L-42
56	SCHMIDT TRACY LYNNE (S)	1-RB2L-41
57	KEEFER ROBERT M & DONNA J IRREVOCABLE TRUST (S)	1-RB2L-39
58	GAMBLE IAN & SARAH (S)	1-RB2L-38
59	GARY MARK C & P S (S)	1-RB2L-37
60	BLAZIER BRIAN T (S)	1-RB2G-78
61	MURAD CHRIS R & TRACY (S)	1-RB2G-77
62	DESANTIS JAMES P & JANE V & DESANTIS MICHAEL V (S)	1-RB2G-76
63	VILLAGE OF BETHLEHEM (S)	1-RB2G-75
64	KONDRAD SCOTT F & DEVYN S (S)	1-RB2G-74

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
A	CONNER AMBER D & DAVID HANES JR	13-8-14
B	HIERONIMUS C KEITH ET UX	13-8-15
C	MCLAUGHLIN SHAWN & ELIZABETH	13-8-23
D	HOUGH BRANDON W & ALYSSA N	13-8-24
E	THORN JACLYN A & JASON K	13-8-25
F	SBERNA JOSEPH L JR & TAMMY	13-7E-1
G	CRAWFORD GARY J	13-7E-7
H	JOSEPH WILLIAM F & SUSAN L	13-7E-8
I	CAIN ROGER L II	13-7E-10
J	MCCLINTOCK JOSIE & LARRY	13-7-22.4
K	MCCOMBS JOHN A SR & MARILYN S	13-7-22.1
L	BOARD OF EDUCATION	13-7-17
M	BLANEY TIMOTHY O ET UX	13-4-24.5
N	WARD CYNTHIA J	13-4-23.16
O	SMITH JOANN H	13-4-23.2
P	DUNCAN ELMER E & SUSAN L	13-04-23.1
Q	STAN, TYLER P & CASEY K	13-4-23.5
R	OSER FREDERICK P & MALLORY A	13-4-23.10
S	OSER FREDERICK P & MALLORY	13-4-23.15
T	WARD CYNTHIA J	13-4-23.14
U	BLANEY RODNEY A	13-4-23.13
V	SZELIGO RICHARD & ASHLEY	13-4-23.8
W	SZELIGO RICHARD L JR & ASHLEY E	13-4-23.11
X	ETZEL JAMIE P & ANTHONY EVICK II	13-4-23.12
Y	ETZEL JAMIE P & ANTHONY EVICK II	13-4-23.7
Z	FITZPATRICK BRYAN A & HEIDI A	13-4-23.4
A2	WARD CYNTHIA J & DALE P	13-4-24
B2	ORLOFSKE SEAN A & JENNIFER L	13-4-22.11
C2	OCHSENBEIN RICHARD L & HOLLY L	13-4C-14
D2	MORANDO THOMAS L ET UX	13-4C-1
E2	BENTZ CAROLEE K - TOD	13-4C-2
F2	THOMPSON BRUCE K	13-4C-3
G2	HARTO BRIAN D ET UX	13-4C-4
H2	TOMCZYK JOSEPH ET UX	13-4C-5
I2	BROWN JUSTIN D & JULIE L	13-4-21.3
J2	BROWN JUSTIN D & JULIE L	13-4-21.10
K2	GEYER ROBERT J & CHARLENE M	13-4-21.5
L2	CAMPETI JOSEPH M ET UX	13-4-21.8
M2	WRIGHT JOSEPH E & CONNIE S	13-4-21.2
N2	WALTERS SAMANTHA J & RICHARDS JENNIFER L	13-4-21.1
O2	GEYER ROBERT J & CHARLENE M	13-4-21.6
P2	AGAR MYRNA L	13-4-19
Q2	COLE RANDALL M ET UX	13-4-18
R2	ANDERSON MARY KATHRYN EST	13-4-14
S2	PELLEY LUKE E	13-2-66
T2	MEGALE GARNET JANE & VICKIE WALTERS	13-2-66.1
U2	WALTERS VICKIE	13-2-65
V2	GREEN JAMES L	13-2-64
W2	WALTERS THOMAS C & KATRINA A	13-2-41.7
X2	TUCKER NATHAN JOSEPH & LINDSEY RENEE	13-2-42.5
Y2	COOLEY CHARLES E & CAROL J	13-2-42
Z2	RICHTER FAMILY TRUST	13-2-42.17
A3	BLATT JAMES E ET UX	13-2-42.7
B3	ROGERSON WAYNE R	13-2-39.4
C3	ROGERSON WAYNE R	13-2-39.1
D3	SCARBRO JENNI M	13-2-39.2
E3	COFFIELD RONALD J	13-2-39.3
F3	SEIDLER E DALE JR ET UX	13-2-14.3
G3	NUGENT LINDA S ET AL	13-2-14.8
H3	BRADCOVICH JOSEPH EARL EST	13-2-14.4
I3	MAGERS GARY E ET UX	13-2-2.2
J3	SHIVELY JOYCE	13-2-14.1
K3	SHIVELY JOYCE	13-2-14.5
L3	PYSH WAYNE ET UX	13-2-13.8
M3	PASCOLI KENT A	13-2-13
N3	BROWN BETHANN K	1-RB2Q-34.1
O3	SHREVES HOLLIE L	1-RB2Q-31.1
P3	SHREVES HOLLIE L	1-RB2Q-31

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
⚠ REVISED DHP 04-18-2022			
	OPERATOR'S WELL #: DAVID REINBEAU MSH 201H	**API #:** 47-051-02440	**DATE:** 03-09-2022
			DRAWN BY: N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 4

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS TEAM Review
04-18-2022

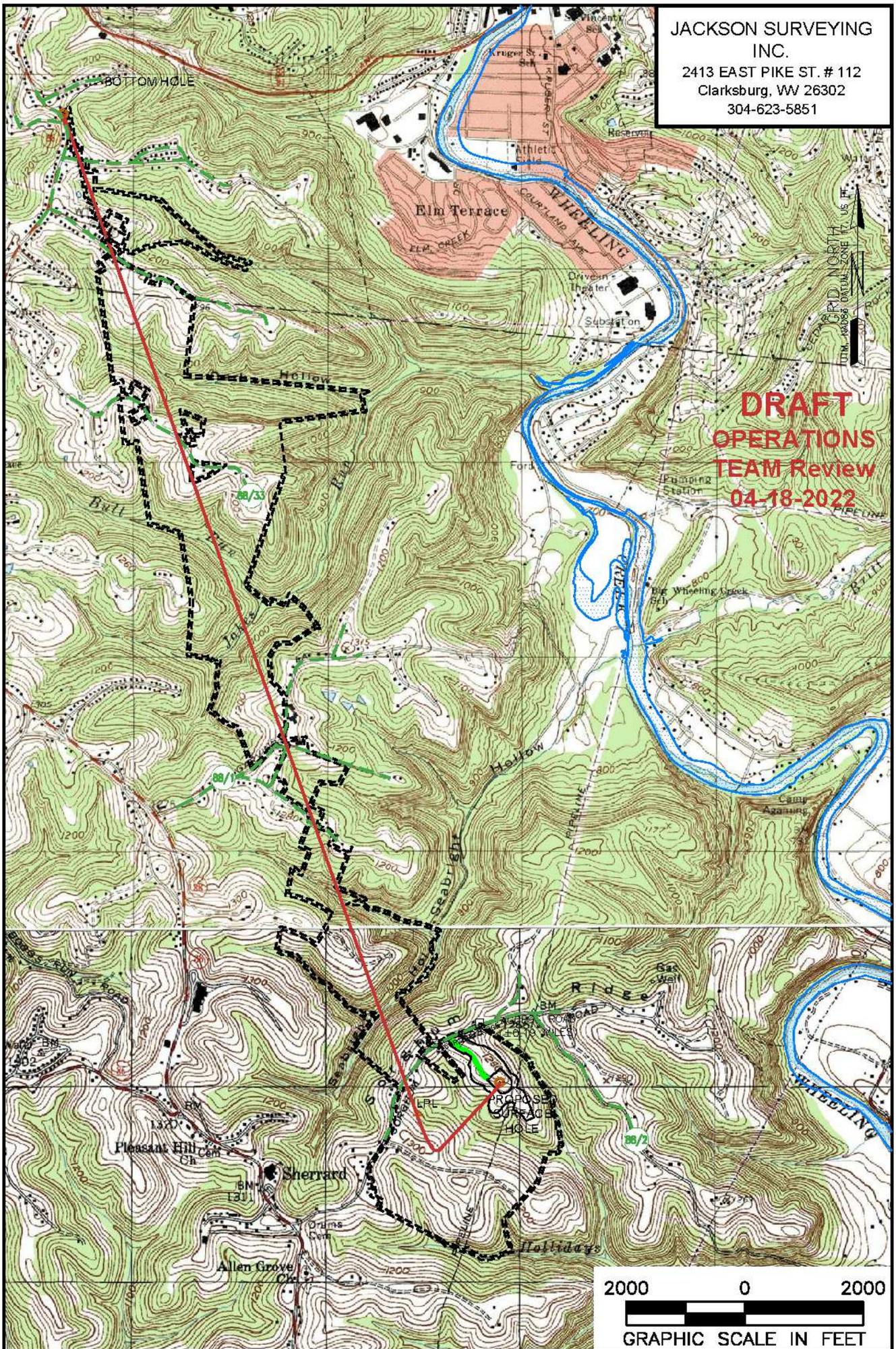
	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
Q3	BROWN BETHANN K	1-RB2Q-34
R3	LASH FRANKLIN W	1-RB2L-83
S3	WODESKY JANET L	1-RB2L-84
T3	HUNTLEY CHAD D & SUSAN L	1-RB2L-85
U3	ROTRIGA MARY RUTH ESTATE	1-RB2L-76
V3	JOSEPH KENNETH M & N E	1-RB2L-75
W3	VILLAGE OF BETHLEHEM	1-RB2L-66
X3	SCHNUPP JAMES P & M A	1-RB2L-88
Y3	PICKETT VALERIE & GARY B	1-RB2L-64
Z3	MARTIN KIMBERLEE GEORGETTE	1-RB2L-62
A4	WEST MAX L M D & M A	1-RB2L-61
B4	MARTIN DONALD L & L J	1-RB2L-60
C4	PICKETT VALERIE A	1-RB2L-59
D4	JUNKINS DONALD A	1-RB2L-58.1
E4	JUNKINS DONALD A	1-RB2L-58
F4	DONAHUE DEREK A & ABBEY M	1-RB2L-40.1
G4	DONAHUE DEREK A & ABBEY M	1-RB2L-40
H4	TROOP JASON P & COURTNEY	1-RB2L-35
I4	FRY FRANCIS H	1-RB2L-36
J4	DAMICO GREGORY B	1-RB2G-20
K4	SMITH SANDRA S	1-RB2G-21
L4	GARDNER RICHARD L SR & GARDNER CONNIE L	1-RB2G-23
M4	STENGER WILLIAM JR	1-RB2G-24
N4	CUNNINGHAM WAYNE D & G K	1-RB2G-73
O4	CONRAD JOSHUA D & TRISHA J	1-RB2-27.3
P4	CLEGG AUBREI L	1-RB2L-112
Q4	COMBS ANTHONY & QUINN AMBER	1-RB2L-43
R4	BLAZIER HOWARD T JR & S L	1-RB2L-44
S4	SCHMIDT THOMAS L & L E	1-RB2L-56
T4	SCHMIDT JOSEPH L (OCC) SCHMIDT THOMAS G (OCC)	1-RB2L-52
U4	KOMOROWSKI MICHAEL C & KOMOROWSKI REBECCA L	1-RB2L-51
V4	WILSON R & J (LIFE EST) MARSHALL S & SUTTON C	1-RB2L-54
W4	TOWNSEND CARL A	1-RB2L-50
X4	SNYDER CHRISTINE LEE	1-RB2L-50.1
Y4	GARVIN DALE C & E	1-RB2L-49.1
Z4	TROUTEN JENNA MICHELLE	1-RB2L-71
A5	BECK SANDRA M	1-RB2L-72
B5	YOHO PATRICK A	1-RB2L-73
C5	PAULEY SCOTT F & ECHEMANN CHRISTINA	1-RB2L-74
D5	BREIDING BERNARD D & APRIL	1-RB2L-80
E5	BREIDING BERNARD D & APRIL	1-RB2L-80.1
F5	NEIMAN CHARLES AND MARK	1-RB2L-81
G5	ANDREWS JEREMY	1-RB2-32.1
H5	GARVIN D CRAIG & EYDIE M	1-RB2M-54.2
I5	RICHTER ELWOOD F JR & C A	1-RB2M-56.1
J5	RICHTER ELWOOD F JR	1-RB2M-56
K5	ASBURY RYAN & ANNE	1-RB2-31.5
L5	POTTS JOHN W & ROSE A	1-RB2-31.2
M5	BRAUNLICH EARL FRITZ & JAMIE LYNN	13-2-102.4
N5	RAHBAR AHMAD CREDIT SHELTER TRUST	13-2-102
O5	PINTER EUGENE M & JOAN	1-RB2-33.2
P5	BRAUNLICH EARL FRITZ & JAMIE LYNN	13-2-104
Q5	WOLEN JOHN & MICHELLE	13-2-102.3
R5	RENFORTH GEORGE III	13-2-16.2
S5	PERONI CONSTRUCTION INC	10-W95-112
T5	LONG RICHARD E ET UX	13-2-35
U5	LAUTER FRANK ET AL	13-2-36
V5	POLLACK RICHARD J ET UX	13-2-38.1
W5	GARVIN CORRINE A EST	13-2-38
X5	BURKE RICHARD & FITZPATRICK DEBRA	13-2-31.2
Y5	MILLER GEORGE W ET AL	13-2-79
Z5	GARVIN JOHN A & KAREN L	13-2-78
A6	ROMINE WANDA KAY	13-2-77
B6	BOWSER MARY ANNE	13-2-76
C6	GARVIN JOHN ARTHUR & KAREN L	13-2-75
D6	GARVIN JOHN A & KAREN L	13-2-73
E6	MUSTACHIO EMILY A & GARVIN GRANT W	13-2-72
F6	GARVIN CORRINE A EST	13-2-98
G6	GARVIN CORRINE A EST	13-2-99
H6	GARVIN CORRINE A EST	13-2-100

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
I6	GARVIN CORRINE A EST	13-2-101.1
J6	GARVIN CORRINE A EST	13-2-101
K6	MCGUIRE PHILIP C	13-4-21.4
L6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.5
M6	WEST RICHARD D JR	13-4-22.24
N6	GAMES MARY VIRGINIA - TOD	13-4-22.2
O6	GAMES FRED & MARY V	13-4-22.17
P6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.3
Q6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.5
R6	ORLOFSKE SEAN A & JENNIFER L	13-4-22.6
S6	FISHER DEBRA ANN GAMES & GALEN E	13-4-22.3
T6	HOFFMASTER KEVIN & CRYSTAL	13-4-22.27
U6	BRINKMEIER BRUCE & TAMARA	13-4-22.14
V6	COULLING LOUISE S ET AL	13-3-3
W6	OHIO COUNTY COAL RESOURCES INC	13-3-3.1
X6	ALEXANDER LORRAINE	13-7-18
Y6	ALEXANDER LORRAINE	13-7-18.1
Z6	ALEXANDER LORRAINE	13-7-20
A7	BOWMAN MICHAEL ET UX	13-8-28
B7	SAMPSON EDITH VIRGINIA EST	13-7-19
C7	NARRISH KEVIN	13-8-30
D7	SOUTH CHRISTOPHER C	13-8-31
E7	KOSTELECSKY JOSEPH J JR & CAROLYN - TOD	13-8-31.1
F7	FUNK CHARLES D ET UX	13-8-32
G7	LOY EUGENE EST ET AL	13-8-1
H7	LIBERTY JOHN ET UX	13-8-10
I7	MCCOMBS JOHN A SR, THOMAS E & BETH	13-8-11

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
⚠ REVISED DHP 04-18-2022			
	OPERATOR'S WELL #: DAVID REINBEAU MSH 201H	**API #:** 47-051-02440	**DATE:** 03-09-2022
			DRAWN BY: N. MANO
	DISTRICT: UNION / **COUNTY:** MARSHALL	**STATE:** WV	**SCALE:** N/A
			DRAWING NO: WELL LOCATION PLAT 5

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 09:59AM

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL — LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- PROPOSED PATH

WELL OPERATOR:	WELL (FARM) NAME:	WELL #	SERIAL #
SWN PRODUCTION COMPANY, LLC	DAVID REINBEAU MSH	201H	
ADDRESS:	COUNTY – CODE	DISTRICT;	
1300 FORT PIERPONT ROAD, SUITE 200 MORGANTOWN, WV 26508	MARSHALL – 051	UNION	
SURFACE OWNER:	USGS 7 1/2 QUADRANGLE MAP NAME	API #:	
SHELLY A. & DAVID W. REINBEAU	MOUNDSVILLE, WV	47-051-02440	

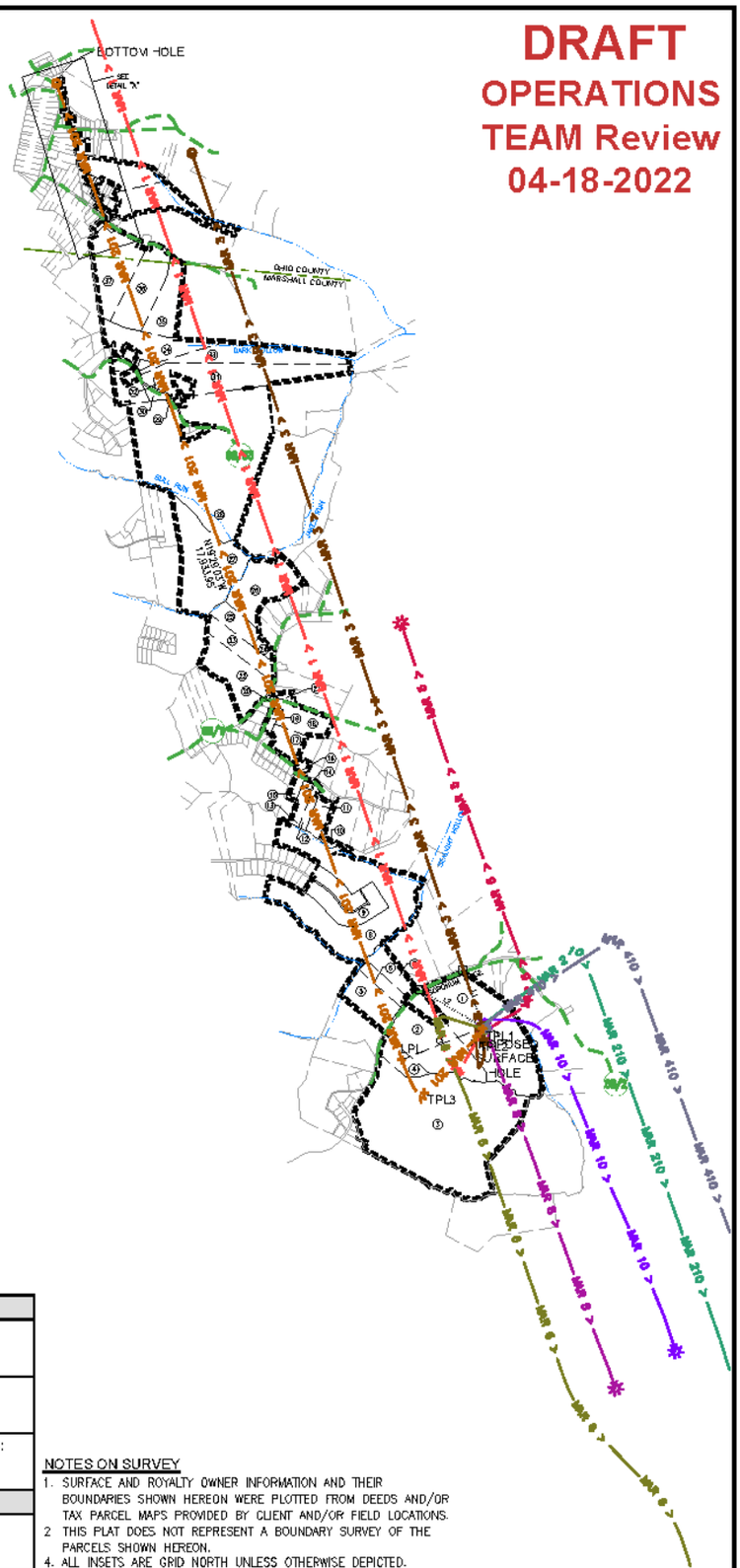
2:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:54AM

PROPERTY NUMBER 2501171299
PAD ID 3001156582

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
04-18-2022

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

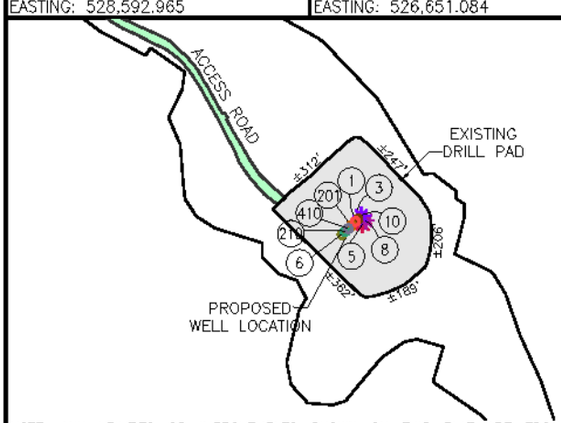


SURFACE HOLE LOCATION (SHL):
GEOGRAPHIC (NAD83): LATITUDE: 39.992806° LONGITUDE: -80.661481°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,294.030 EASTING: 1,735,229.340
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
TURNING POINT LOCATION-1 (TP1):
GEOGRAPHIC (NAD83): LATITUDE: 39.992765° LONGITUDE: -80.661481°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,278.780 EASTING: 1,735,229.340
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,009.026 EASTING: 528,898.961

TURNING POINT LOCATION-2 (TP2):	LANDING POINT LOCATION (LPL):
GEOGRAPHIC (NAD83): LATITUDE: 39.992358° LONGITUDE: -80.661852°	GEOGRAPHIC (NAD83): LATITUDE: 39.991289° LONGITUDE: -80.666462°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,524,130.170 EASTING: 1,735,125.950	UTM (NAD83, ZONE 17, FEET): NORTHING: 14,523,736.250 EASTING: 1,733,836.210
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,963.730 EASTING: 528,867.447	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
TURNING POINT LOCATION-3 (TP3):	**BOTTOM HOLE LOCATION (BHL):**
GEOGRAPHIC (NAD83): LATITUDE: 39.989714° LONGITUDE: -80.665080°	GEOGRAPHIC (NAD83): LATITUDE: 40.037778° LONGITUDE: -80.687607°
UTM (NAD83, ZONE 17, FEET): NORTHING: 14,523,164.200 EASTING: 1,734,225.420	UTM (NAD83, ZONE 17, FEET): NORTHING: 14,540,643.200 EASTING: 1,727,854.430
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,669.301 EASTING: 528,592.965	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,996.911 EASTING: 526,651.084

NOTES ON SURVEY
1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

3000 0 3000
GRAPHIC SCALE IN FEET



NOTE: ANY UTILITIES OR IMPROVEMENTS SHOWN ON THIS PLAT ARE FROM REASONABLE VISUAL OBSERVATIONS. NO UTILITY COMPANIES WERE CONTACTED FOR UTILITY LINE LOCATIONS.

COMPANY: SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #:	DAVID REINBEAU MSH 201H	API #: 47-051-02440
DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV

SWN PRODUCTION COMPANY, LLC
SURFACE HOLES
1. "DAVID REINBEAU MSH 1H"
3. "DAVID REINBEAU MSH 3H"
5. "DAVID REINBEAU MSH 5H"
6. "DAVID REINBEAU MSH 6H"
8. "DAVID REINBEAU MSH 8H"
10. "DAVID REINBEAU MSH 10H"
201. "DAVID REINBEAU MSH 201H"
210. "DAVID REINBEAU MSH 210H"
410. "DAVID REINBEAU MSH 410H"

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- ABANDONED WELL
- PLUGGED & ABANDONED WELL
- LPL LANDING POINT LOCATION
- DRILLING UNIT
- LEASE BOUNDARY
- HARDLINE BOUNDARY
- UPP 2 > UPPER POINT PLEASANT PATH
- MAR 2 > MARCELLUS PATH

REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 04-18-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 3000'
	DRAWING NO:
	INTERNAL WELL PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 4-18-22\REINBEAU 201H MSH WELL PLAT 4-18-22.DWG
MONDAY APRIL 18 2022 08:54AM

PROPERTY NUMBER 2501171299
PAD ID 3001156582

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 201H
Well Pad Name: David Reinbeau MSH

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	051-Marshal	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 201H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.06.16 16:07:20 -04'00'

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6306 ', Target Base TVD- 6357', Anticipated Thickness- 51', Associated Pressure- 4130

8) Proposed Total Vertical Depth: 6346'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 26514'

11) Proposed Horizontal Leg Length: 19497.80'

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio County Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	26514'	26514'	Tail 8776sx/ 100' inside Intermediate
Tubing							
Liners							

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.06.16 16:07:36 -04'00'

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company	Proposed Drilling Program

Well:	DAVID REINBEAU MSH 201	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9928 Latitude	-80.6615 Longitude	
BHL:	40.0418 Latitude	-80.6895 Longitude	
KB Elev:	1,277 ft MSL	KB: 26 ft AGL	**GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,639 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	26,514 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	8776	A	14.5-15.0

KOP at 5,739 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,346 '
TMD - 26,514 '

TD at 26,514 ' MD
6,103 ' TVD

6,346 ' Target Center

EOB at 7,007 ' MD

SHL Onondaga 6,357 ' TVD

Onondaga 6,114 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
10.5# Brine Mud

2,100 ' to 5,739 '
Air/Mist
↓
Air
TD at 5,739 '

5,739 ' to 7,007 '
12.5-13.5 ppg

7,007 ' to 26,514 '
12.5-13.9 ppg

Created by: C R Hall on 06/16/2022

Gayne Knitowski

Digitally signed by Gayne Knitowski
Date: 2022.06.16 16:07:55 -04'00'

Latitude: 40°00'00" — SURFACE HOLE 10,221'

Latitude: 40°05'00" — BOTTOM HOLE — 6,380'

Longitude: 80°40'00" — BOTTOM HOLE 15,119'

Longitude: 80°37'30" — SURFACE HOLE 2621'

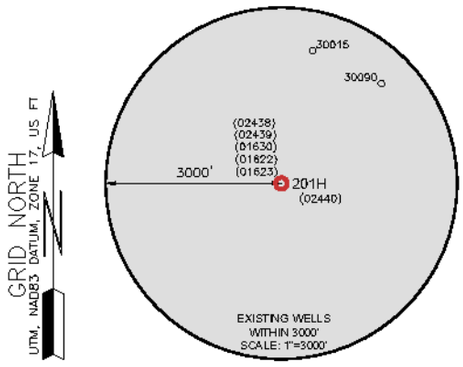
JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

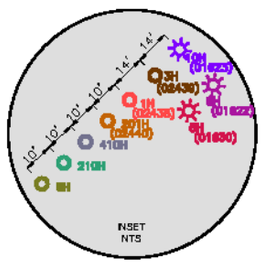
DRAFT
OPERATIONS TEAM Review
06-15-2022

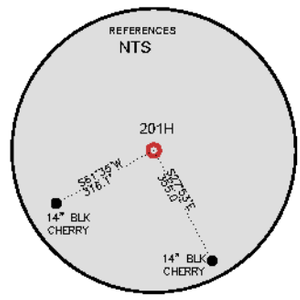
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,013.674 EASTING: 528,898.961
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,426,843.663 EASTING: 528,474.334
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,432,446.285 EASTING: 526,492.121

SHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 18°39'42" W	1050.82'	SHL TO LANDMARK	FENCE CORNER
L2	N 59°07'47" W	1275.06'	SHL TO LANDMARK	FENCE CORNER
LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 68°10'48" W	1500.64'	2287.58'	SHL TO LPL







BHL

WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

2000 0 2000
GRAPHIC SCALE IN FEET

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. 708 _____

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 201H

API WELL #: 47 (STATE) 051 (COUNTY) 02440 (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1250.8'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,346 TVD 26,514 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

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

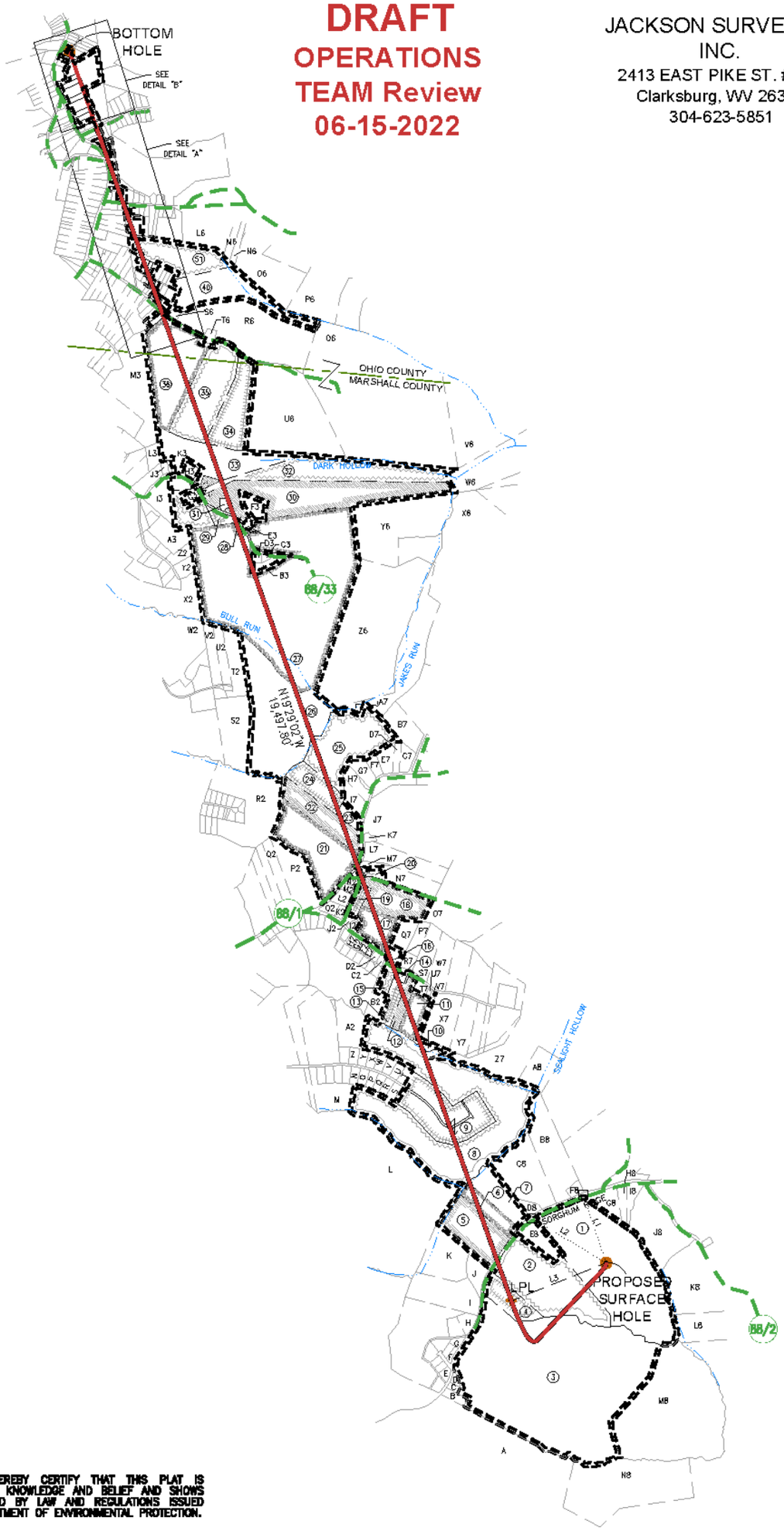
REVISIONS:	DATE: 03-09-2022
⚠ REVISED DHP 06-15-2022	
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

2:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:27PM

PROPERTY NUMBER 2501171299
PAD ID 3001156592

DRAFT
OPERATIONS TEAM Review 06-15-2022

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



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. 708

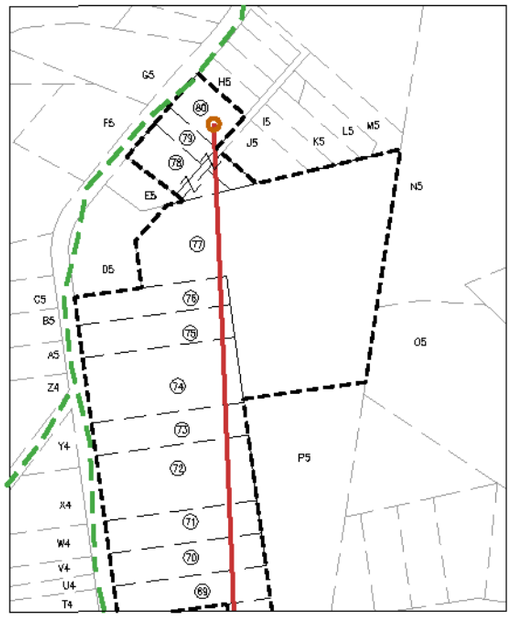
REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
⚠ REVISED DHP 06-15-2022			
	OPERATOR'S DAVID REINBEAU MSH	API #: 47-051-02440	DATE: 03-09-2022
	WELL #: 201H		DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 2

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:04PM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DRAFT
OPERATIONS
TEAM Review
06-15-2022

DETAIL "B"



DETAIL "A"

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. 708 _____

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™			
⚠ REVISED DHP 06-15-2022				
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 201H	**API #:** 47-051-02440	**DATE:** 03-09-2022
				DRAWN BY: N. MANO
	DISTRICT: UNION	**COUNTY:** MARSHALL	**STATE:** WV	**SCALE:** N/A
				DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\201H\FINAL\REINBEAU 201H MSH 06-15-22\REINBEAU 201H MSH WELL PLAT 06-15-22.DWG
WEDNESDAY JUNE 15 2022 02:04PM

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 3H
Well Pad Name: David Reinbeau MSH

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 | 051-MArsha | 07-Union | 486-Moundsville
Operator ID | County | District | Quadrangle

2) Operator's Well Number: David Reinbeau MSH 3H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.04.08 07:58:20 -04'00'

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6314 ', Target Base TVD- 6367', Anticipated Thickness- 53', Associated Pressure- 4139

8) Proposed Total Vertical Depth: 6349'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 22789'

11) Proposed Horizontal Leg Length: 15706.89

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio Count Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	22789'	22789'	Tail 7432sx/ 100' inside intermediate
Tubing							
Liners							

Gayne Knitowski Digitally signed by Gayne Knitowski Date: 2022.04.08 07:58:46 -04'00'

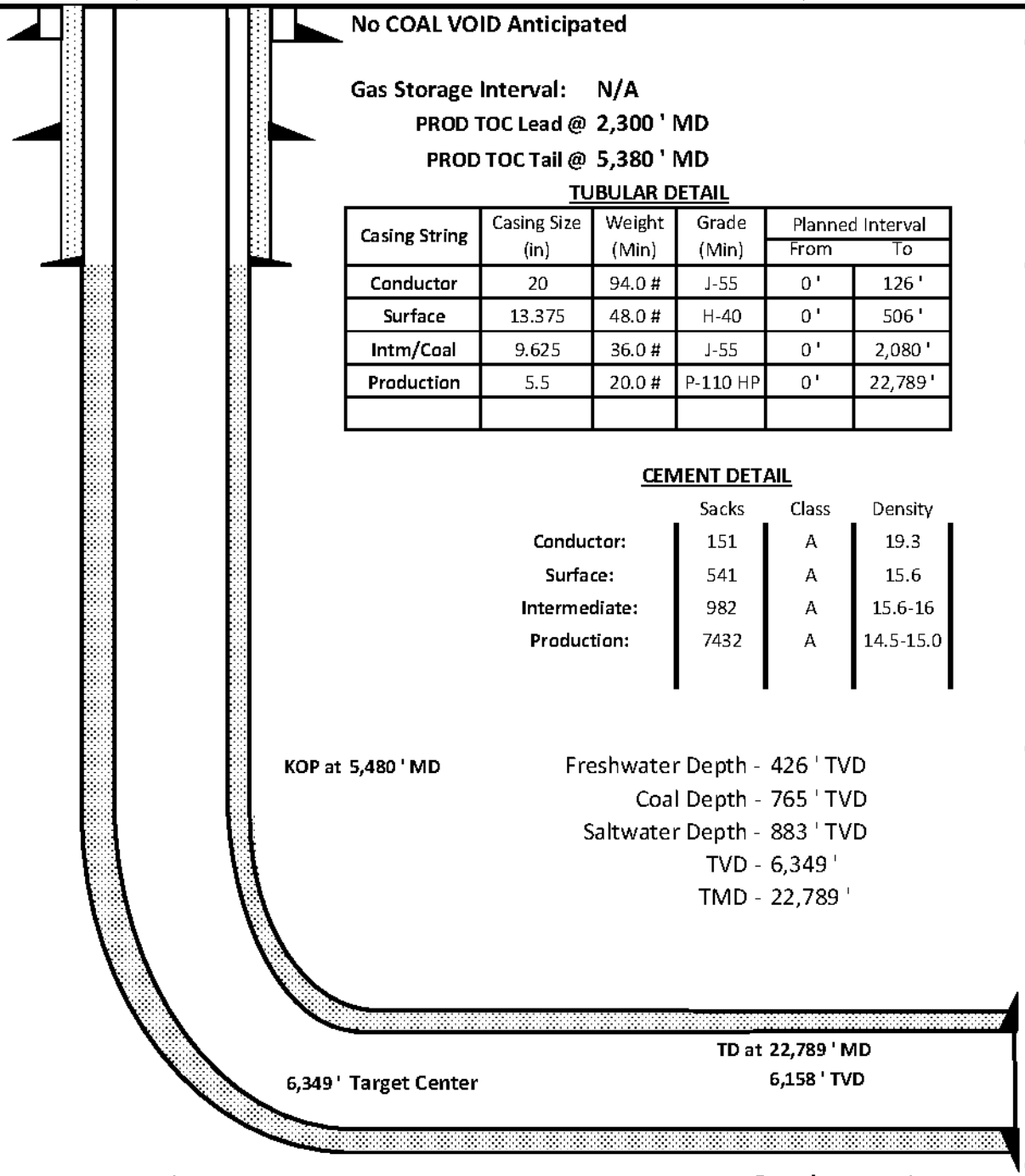
TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well:	DAVID REINBEAU MSH 3	**Re-entry Rig:**	TBD
Field:	NORTH VICTORY FIELD WET	**Prospect:**	Marcellus Shale
County:	MARSHALL	**State:**	WV
SHL:	39.9929 Latitude	-80.6614 Longitude	
BHL:	40.0344 Latitude	-80.6792 Longitude	
KB Elev:	1,277 ft MSL	KB: 26 ft AGL	**GL Elev:** 1,251 ft MSL



Gas Storage Interval: N/A

PROD TOC Lead @ 2,300 ' MD

PROD TOC Tail @ 5,380 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	22,789 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	7432	A	14.5-15.0

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
Air/Mist

2,100 ' to 5,480 '
Air/Mist
↓
Air/Mist
TD at 5,480 '

5,480 ' to 6,850 '
12.5-13.0 ppg
↓

6,850 ' to 22,789 '
12.5-13.8ppg

Created by: C R Hall on 04/07/2022

Latitude: 40°00'00" ——— SURFACE HOLE 10,203' ———

Latitude: 40°02'30" BOTTOM HOLE ——— 3,668' ———

BOTTOM HOLE 2,184'

SURFACE HOLE 2604'

Longitude: 80°40'00"

Longitude: 80°37'30"

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

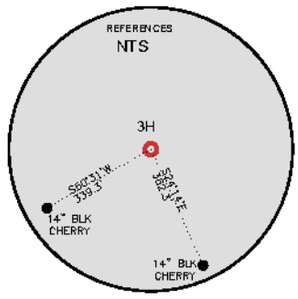
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,018.725 EASTING: 528,904.237
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,019.133 EASTING: 528,894.096
AZIMUTH POINT LOCATION-1 (AZL1):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,033.846 EASTING: 528,890.155
AZIMUTH POINT LOCATION-2 (AZL2):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,080.036 EASTING: 528,876.399
AZIMUTH POINT LOCATION-3 (AZL3):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,428,734.188 EASTING: 528,333.720
AZIMUTH POINT LOCATION-4 (AZL4):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,428,738.934 EASTING: 528,332.150
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,628.410 EASTING: 527,366.466

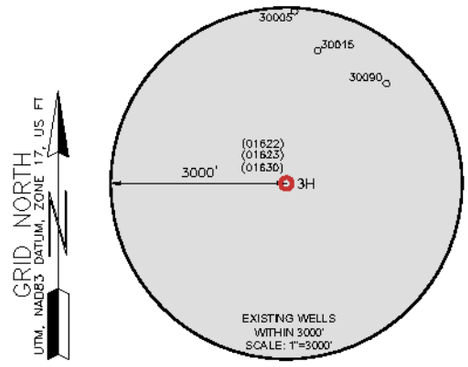
SHL

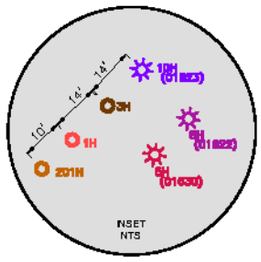
BHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 19°51'22" W	1040.88'	SHL TO LANDMARK	FENCE CORNER
L2	N 60°09'45" W	1281.63'	SHL TO LANDMARK	FENCE CORNER
L4	N 14°59'44" W	49.97'	LPL TO AZL1	
L6	N 18°18'09" W	16.40'	AZL3 TO AZL4	

LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	N 87°41'37" W	33.30'	1569.95'	SHL TO LPL
L5	N 16°35'02" W	158.12'	158.13'	AZL1 TO AZL2







WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

DAVID L JACKSON LICENSED NO. 708 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

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. 708 David L Jackson

2000 0 2000

GRAPHIC SCALE IN FEET

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 3H

API WELL #: 47 (STATE) 051 (COUNTY) (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1251.2'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,349 TVD 22,789 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

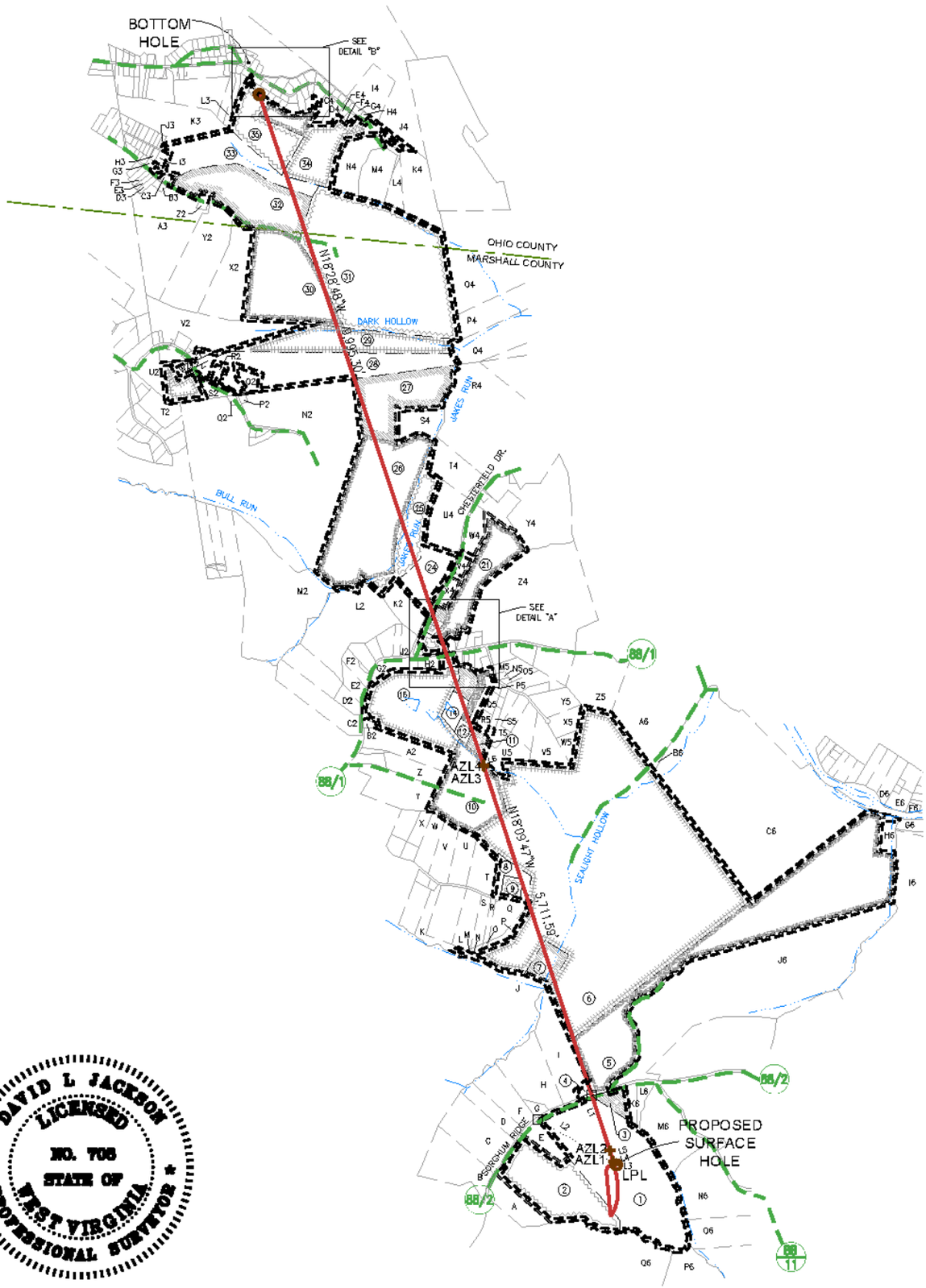
LEGEND:

- 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: 04-05-2022
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

PROPERTY NUMBER 2501166047
PAD ID 3001156592

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



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.

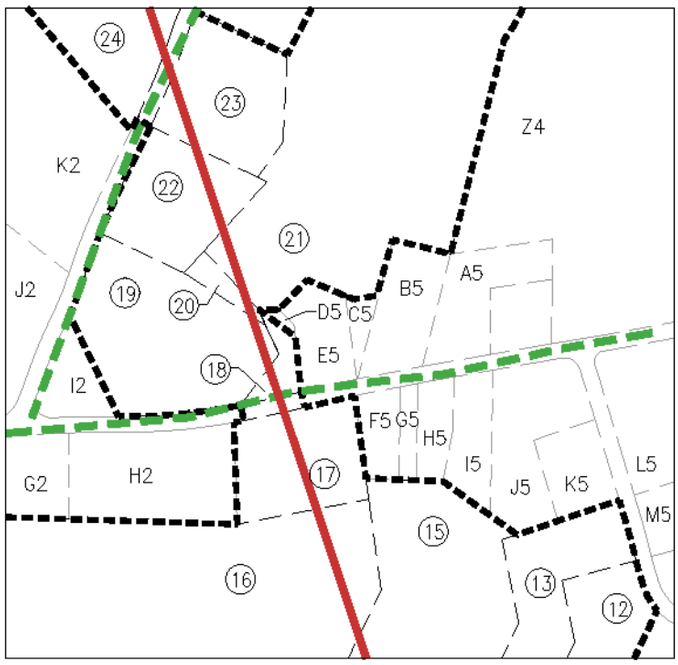
P.S. 708 David L Jackson

REVISIONS:	COMPANY: SWN Production Company, LLC / SWN Production Company™		DATE: 04-05-2022
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 3H	DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 2

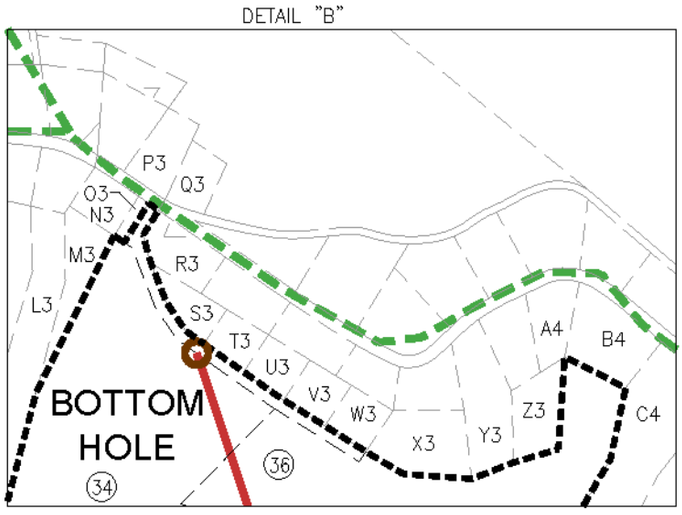
Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:50AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DETAIL "A"



DETAIL "B"



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P.S. 708 David L Jackson

DAVID L JACKSON
LICENSED
NO. 708
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

REVISIONS:	COMPANY: SWN Production Company, LLC / SWN Production Company™			DATE: 04-05-2022
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 3H		DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV	SCALE: N/A
				DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:50AM

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WELL BORE TRACTS		
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	REINBEAU SHELLY A & DAVID W (S/R)	13-8-29
TRACT	SURFACE OWNER (S)	TAX PARCEL
2	REINBEAU SHELLY A & DAVID W (S)	13-8-27
3	MARTISH KEVIN (S)	13-8-30
4	SAMPSON EDITH VIRGINIA EST (S)	13-7-19
5	BONACCI BRIAN T (S)	13-3-5.1
6	COLLINS LOUISE S ET AL (S)	13-3-3
7	OHIO COUNTY COAL RESOURCES INC (S)	13-3-3.1
8	GEHO STANLEY R & BETH B (S)	13-4-22.16
9	GEHO STANLEY R & BETH B (S)	13-4-22.7
10	MCGUIRE PHILIP C (S)	13-4-21.4
11	YOUNGER DONALD A & MOORE TERESA R (S)	13-2-94
12	DAY JOHN U EST & MERCER CHRISTINE (S)	13-2-95
13	CHAPPELEAR THOMAS C & PAULA A (S)	13-2-95.1
14	GARVIN CORRINE A EST (S)	13-2-97
15	GARVIN LEILA N & DONALD A (S)	13-2-96
16	GARVIN CORRINE A EST (S)	13-2-98
17	MERCER RICK (S)	13-2-81.1
18	RANSOM DONNA K & DAVID W -TRUSTS (S)	13-2-30.9
19	RANSOM DONNA K & DAVID W -TRUSTS (S)	13-2-30.2
20	RANSOM DONNA K & DAVID W -TRUSTS (S)	13-2-30.5
21	DOUGHERTY LOIS J (S)	13-2-30.8
22	DOUGHERTY KAREN E (S)	13-2-30.3
23	SCHLIEPER DAVID J & LYNDSEY B (S)	13-2-30.4
24	BURKE RICHARD & FITZPATRICK (S)	13-2-31.1
25	GARVIN CORRINE A EST (S)	13-2-38
26	POLLACK RICHARD J ET UX (S)	13-2-38.1
27	LAUTER FRANK ET AL (S)	13-2-36
28	SEIDLER E DALE JR (S)	13-2-14.9
29	SEIDLER PATRICIA L IRREVOCABLE (S)	13-2-14.7
30	WOLEN JOHN & MICHELLE (S)	13-2-102.3
31	BRAUNLICH EARL ER TZ & JAMIE (S)	13-2-102.4
32	RAHBAR AHMAD CREDIT SHELTER TRUST (S)	13-2-102
33	ANDREWS JANET M TRUSTEE (S)	1-RB2-32
34	POTTS JOHN W & ROSE A (S)	1-RB2-31.2
35	ASBURY RYAN & ANNE (S)	1-RB2-31.5
36	MORGAN LEE ANN (S)	1-RB2-31.12

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
	OPERATOR'S WELL #: DAVID REINBEAU MSH 3H		DATE: 04-05-2022
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			DRAWN BY: N. MANO
			SCALE: N/A
			DRAWING NO:
			WELL LOCATION PLAT 4

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
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2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

ADJOINING OWNERS TABLE		
TRACT	SURFACE OWNER	TAX PARCEL
A	REINBEAU RONALD W & FRIEDE A - LIFE	13-7-22.2
B	MCCOMBS JOHN A SR & MARILYN S	13-7-22.1
C	REINBEAU DAVID W & SHELLY A	13-7-22.3
D	REINBEAU DAVID W & SHELLY A	13-7-21.1
E	BOWMAN MICHAEL ET UX	13-8-28
F	BOWMAN MICHAEL J & CONSTANCE G	13-7-21
G	ALEXANDER LORRAINE	13-7-20
H	ALEXANDER LORRAINE	13-7-18.1
I	ALEXANDER LORRAINE	13-7-18
J	WARD CYNTHIA J & DALE P	13-4-23.6
K	WEST VALLIE JAMES ET AL	13-4-22
L	BRINKMEIER BRUCE & TAMARA	13-4-22.14
M	BRINKMEIER BRUCE & TAMARA	13-4-22.15
N	WALTON EARL RICHARD JR & BRANDICE C	13-4-22.21
O	WALTON EARL RICHARD JR & BRANDICE C	13-4-22.23
P	GAMES FRED & MARY V	13-4-22.19
Q	GAMES FRED & MARY V	13-4-22.18
R	GAMES MARY VIRGINIA - TOD	13-4-22.22
S	WALTON EARL RICHARD JR & BRANDICE C	13-4-22.20
T	WEST VALLIE JAMES ET AL	13-4-22
U	HILL CAROL LYNN & FORDYCE BRIAN W	13-4-22.8
V	MANNING JOHN B & KIMBERLY R	13-4-22.13
W	GAMES FRED & MARY V	13-4-22.17
X	GAMES MARY VIRGINIA - TOD	13-4-22.25
Y	MCGUIRE PHILIP C	13-4-21.9
Z	GARVIN CORRINE A EST	13-2-101
A2	GARVIN CORRINE A EST	13-2-100
B2	GARVIN CORRINE A EST	13-2-99
C2	GARVIN CORRINE A EST	13-2-70
D2	GARVIN CORRINE A EST	13-2-71
E2	MUSTACHIO EMILY A & GARVIN GRANT W	13-2-72
F2	GARVIN JOHN A & KAREN L	13-2-73
G2	GARVIN DOROTHY MAE EST	13-2-81
H2	GARVIN JOHN	13-2-81.2
I2	RANSOM DAVID W & DONNA K	13-2-80
J2	MILLER GEORGE W ET AL	13-2-79
K2	BURKE RICHARD & FITZPATRICK DEBRA	13-2-31.2
L2	GARVIN CORRINE A EST	13-2-68
M2	ST MYERS MICHAEL W	13-2-67
N2	ROGERSON GEORGE C EST	13-2-39
O2	SEIDLER E DALE JR ET UX	13-2-14.3
P2	COFFIELD RONALD J	13-2-39.3
Q2	COFFIELD RONALD J	13-2-39.5
R2	SEIDLER NETTIE	13-2-14
S2	SEIDLER TIMOTHY I ET UX	13-2-14.2
T2	BLATT JAMES E ET UX	13-2-12.7
U2	MAGERS GARY E ET UX	13-2-2.2
V2	SHIVELY JOYCE	13-2-14.6
W2	NUGENT LINDA S ET AL	13-2-14.8
X2	RAHBAR AHMAD CREDIT, SHELTER TRUST	13-2-102
Y2	BANE RYAN A & JULIE A	13-2-102.2
Z2	BRAUNLICH EARL FRITZ & JAMIE	13-2-104
A3	TURNER JASON & TIFFANY	13-2-102.1
B3	WEISNER RANDY P	1-RB2-33.3
C3	FEDERAL NATIONAL MORTGAGE ASSOCIATION	1-RB2-32.3
D3	PRASCIK LORI JEAN	1-RB2Q-33
E3	MULARCIK BRYAN & TIFFANY	1-RB2Q-32
F3	SHREVES HOLLIE L	1-RB2Q-31.1
G3	KNORR WILLIAM JOHN & KNORR ELIZABETH VIRGINIA	1-RB2L-81.1
H3	NEIMAN CHARLES AND MARK	1-RB2L-81
I3	ANDREWS JEREMY	1-RB2-32.1
J3	PAULEY SCOTT F & ECHEMANN CHRISTINA	1-RB2L-74
K3	SCHMIDT THOMAS	1-RB2-28
L3	RICHTER ELWOOD F JR	1-RB2M-56
M3	RICHTER ELWOOD F & CHRISTINE M	1-RB2-31.6
N3	MUSAP SASHA DAVID & MITEVSKI VERA	1-RB2M-30
O3	MUSAP SASHA DAVID & MITEVSKI VERA	1-RB2M-29
P3	MORGAN CARL WILLIAM	1-RB2M-39
Q3	MORGAN CARL WILLIAM	1-RB2M-31.9
R3	TRABERT TERRY W & B J	1-RB2M-31
S3	CONNER ERNEST & PHYLLIS	1-RB2M-38
T3	DICOCCO JACK M & M E	1-RB2M-47
U3	DICOCCO JACK M & M E	1-RB2M-48

ADJOINING OWNERS TABLE		
TRACT	SURFACE OWNER	TAX PARCEL
V3	TRABERT TIMOTHY LEE	1-RB2M-49
W3	TRABERT TIMOTHY LEE	1-RB2M-50
X3	BALLER ROSE MARY SPROWLS DAVID W	1-RB2M-51
Y3	BALLER ROSE MARY SPROWLS DAVID W	1-RB2M-31.8
Z3	GILLIGAN SHELLEY	1-RB2M-31.7
A4	GILLIGAN SHELLEY	1-RB2M-31.1
B4	KURKO BRIAN S & JACLYN E	1-RB2M-37
C4	HAHLE ELEANOR T (LE); GUY ROBERT D; GUY CHERYL H	1-RB2M-31.10
D4	HAHLE ELEANOR T (LE); GUY ROBERT D; GUY CHERYL H	1-RB2M-31.11
E4	SHOWALTER BRIAN & BETH	1-RB2M-52.1
F4	SHOWALTER BRIAN & BETH	1-RB2M-52
G4	GANTZER MICHAEL J & D M	1-RB2M-45
H4	WHEELING ANTENNA CO INC C/O COMCAST CORPORATION	1-RB2M-46
I4	WHEELING ANTENNA CO C/O COMCAST CORPORATION	1-RB2-26
J4	GALE JAMES ASSET MGMT LLC	1-RB2-24.1
K4	POTTS PATRICK J	1-RB2-31.9
L4	POTTS JOHN W & ROSE A	1-RB2-31.8
M4	POTTS JOHN W & R A	1-RB2-31.1
N4	POTTS JOHN W & ROSE A	1-RB2-31.13
O4	C J RYAN NC	10-W95-109
P4	RENFORTH GEORGE III	13-2-16.2
Q4	PERONI CONSTRUCTION INC	10-W95-112
R4	LONG RICHARD E ET UX	13-2-35
S4	LONG RICHARD E ET UX	13-2-37
T4	LONG RICHARD E ET UX	13-2-32
U4	WALKER MICHAEL A	13-2-31
V4	DOUGHERTY MICHAEL C	13-2-30.7
W4	INGRAM ROBERT HOWARD III ET UX	13-2-30.6
X4	DOUGHERTY MICHAEL C	13-2-30.10
Y4	LONG RICHARD E ET UX	13-2-34
Z4	WILLIS CHARLES ROBERT ET AL	13-2-29
A5	HANKET COURTNEY T	13-2-30.11
B5	DOUGHERTY LOIS J	13-2-30.1
C5	DOUGHERTY LOIS J	13-2-30.14
D5	HANKET COURTNEY T	13-2-30.11
E5	RANSOM DONNA K & DAVID W	13-2-30.12
F5	MERCER RICK	13-2-82.1
G5	MERCER RICK	13-2-82.2
H5	BILINSKY HARRY EST & PALMER JOSEPH J	13-2-82
I5	MERCER RICK W	13-2-83
J5	STOEHR JOHN ROBERT ET UX	13-2-83.1
K5	REDD JOHN N ET UX	13-2-84
L5	GARVIN JOHN ARTHUR	13-2-85
M5	DENNING MICHAEL J ET UX	13-2-86
N5	HENRY VICTORIA A	13-2-86.1
O5	HENRY VICTORIA A	13-2-86.2
P5	FLANAGAN JAMES A & BETY S	13-2-94.2
Q5	YOUNGER DONALD A & MOORE TERESA R	13-2-94.4
R5	YOUNGER DONALD A & MOORE TERESA R	13-2-94.6
S5	YOUNGER DONALD A & MOORE TERESA R	13-2-94.3
T5	BANE RYAN	13-2-93
U5	WIEDEBUSCH ROBERT & CINDY	13-2-93.1
V5	WIEDEBUSCH ROBERT & CINDY	13-2-91
W5	GAUGHAN MICHAEL WM	13-2-90.1
X5	GAUGHAN MICHAEL W ET UX	13-2-90
Y5	ABEL JAMES R & SHERI L	13-2-89
Z5	ISER RONALD J ET UX	13-2-88
A6	WHITE HORSE FARM LLC	13-3-2
B6	COULLING LOUISE S ET AL	13-3-5.3
C6	COULLING LOUISE S	13-3-5
D6	DAWSON THOMAS A ET AL	12-1B-21.1
E6	MCADAMS ROBERT E & JODY L	12-1B-27.1
F6	MATTUCCI MARK A	12-1B-28
G6	MAAS BRIAN J & AMY C - TRUST	13-3-8
H6	MAAS BRIAN J & AMY C - TRUST	13-3-10
I6	HART JOHN J & RENEE A	13-3-11
J6	BONACCI FRANK A	13-3-5.5
K6	SOUTH CHRISTOPHER C	13-8-31
L6	KOSTELECSKY JOSEPH J JR & CAROLYN - TOD	13-8-31.1
M6	FUNK CHARLES D ET UX	13-8-32
N6	LOY EUGENE EST ET AL	13-8-1
O6	LIBERTY JOHN ET UX	13-8-10
P6	MCCOMBS JOHN A SR, THOMAS E & BETH	13-8-11
Q6	MCCOMBS JOHN A SR, THOMAS E & BETH	13-8-26

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
	OPERATOR'S WELL #: DAVID REINBEAU MSH 3H		DATE: 04-05-2022
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			DRAWN BY: N. MANO
			SCALE: N/A
			DRAWING NO: WELL LOCATION PLAT 5

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
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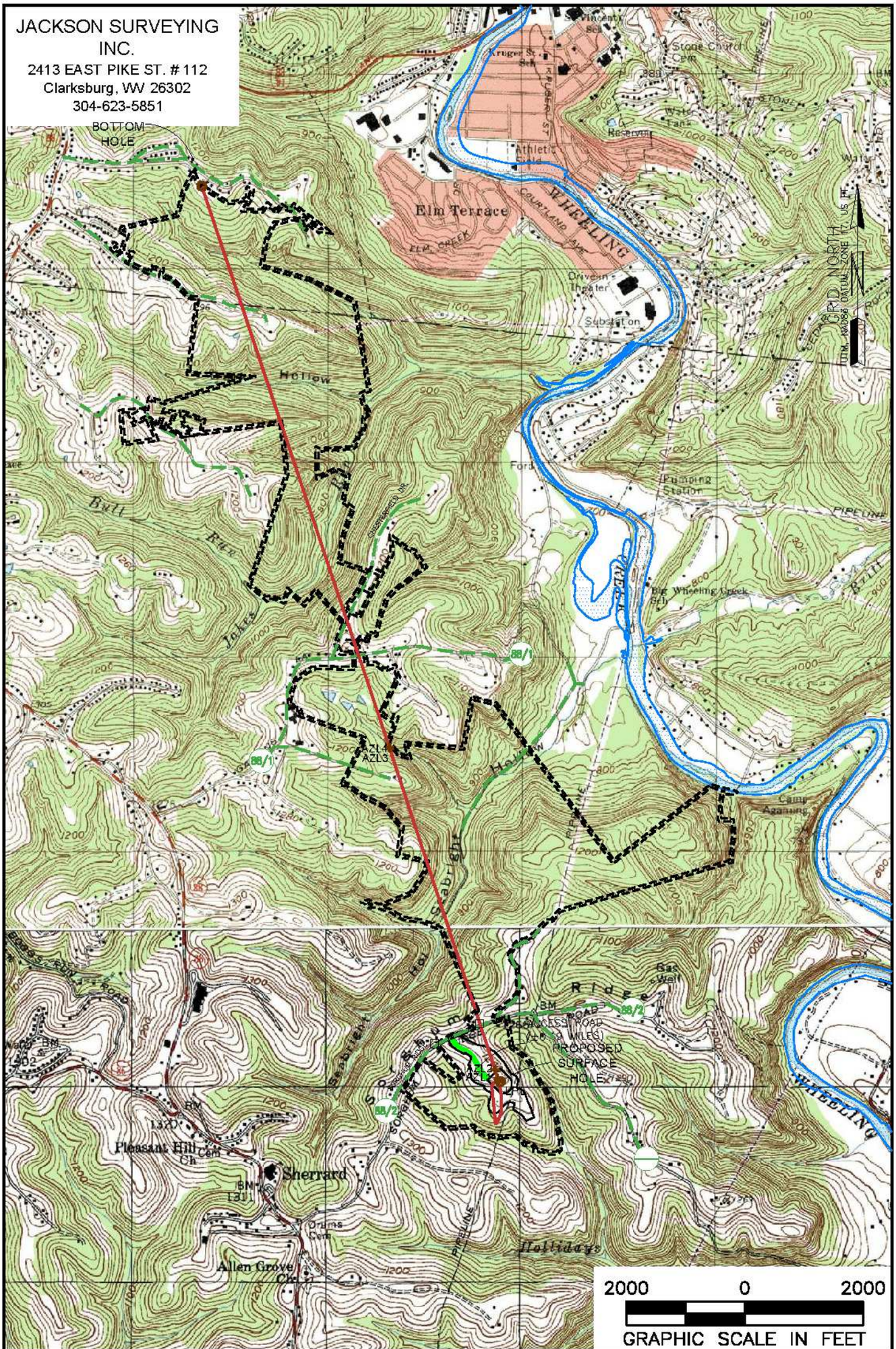

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL — LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- PROPOSED PATH

WELL OPERATOR:	WELL (FARM) NAME:	WELL #	SERIAL #
SWN PRODUCTION COMPANY, LLC	DAVID REINBEAU MSH	3H	
ADDRESS:	COUNTY – CODE	DISTRICT;	
1300 FORT PIERPONT ROAD, SUITE 200 MORGANTOWN, WV 26508	MARSHALL – 051	UNION	
SURFACE OWNER:	USGS 7 1/2 QUADRANGLE MAP NAME		
SHELLY A. & DAVID W. REINBEAU	MOUNDSVILLE, WV		

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TUESDAY APRIL 05 2022 07:52AM

PROPERTY NUMBER 2501166047
PAD ID 3001156582

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. David Reinbeau MSH 3H
Well Pad Name: David Reinbeau MSH

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	051-MArsha	07-Union	486-Moundsville
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: David Reinbeau MSH 3H Well Pad Name: David Reinbeau MSH

3) Farm Name/Surface Owner: Shelly A & David W. Reinbeau Public Road Access: Sorghum Ridge Road

4) Elevation, current ground: 1251' Elevation, proposed post-construction: 1251'

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 6314 ', Target Base TVD- 6367', Anticipated Thickness- 53', Associated Pressure- 4139

8) Proposed Total Vertical Depth: 6349'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 22789'

11) Proposed Horizontal Leg Length: 15706.89

12) Approximate Fresh Water Strata Depths: 426'

13) Method to Determine Fresh Water Depths: Deepest nearby water well

14) Approximate Saltwater Depths: 883' Salinity Profile

15) Approximate Coal Seam Depths: 765'

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

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

(a) If Yes, provide Mine Info: Name: Ohio Count Mine
Depth: 765'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	506'	506'	541 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J-55	36#	2080'	2080'	982 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	22789'	22789'	Tail 743sx/ 100' inside Intermediate
Tubing							
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company | Proposed Drilling Program

Well: DAVID REINBEAU MSH 3 **Re-entry Rig:** TBD
Field: NORTH VICTORY FIELD WET **Prospect:** Marcellus Shale
County: MARSHALL **State:** WV
SHL: 39.9929 Latitude -80.6614 Longitude
BHL: 40.0344 Latitude -80.6792 Longitude
KB Elev: 1,277 ft MSL **KB:** 26 ft AGL **GL Elev:** 1,251 ft MSL

No COAL VOID Anticipated

Gas Storage Interval: N/A
PROD TOC Lead @ 2,300 ' MD
PROD TOC Tail @ 5,380 ' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval From	Planned Interval To
Conductor	20	94.0 #	J-55	0 '	126 '
Surface	13.375	48.0 #	H-40	0 '	506 '
Intm/Coal	9.625	36.0 #	J-55	0 '	2,080 '
Production	5.5	20.0 #	P-110 HP	0 '	22,789 '

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	541	A	15.6
Intermediate:	982	A	15.6-16
Production:	7432	A	14.5-15.0

KOP at 5,480 ' MD

Freshwater Depth - 426 ' TVD
Coal Depth - 765 ' TVD
Saltwater Depth - 883 ' TVD
TVD - 6,349 '
TMD - 22,789 '

TD at 22,789 ' MD
6,158 ' TVD

6,349 ' Target Center

EOB at 6,850 ' MD

SHL Onondaga 6,367 ' TVD

Onondaga 6,176 ' TVD

126 ' to 526 '
Air/Mist

526 ' to 2,100 '
Air/Mist
↓
Air/Mist

2,100 ' to 5,480 '
Air/Mist
↓
Air/Mist
TD at 5,480 '

5,480 ' to 6,850 '
12.5-13.0 ppg
↓

6,850 ' to 22,789 '
12.5-13.8ppg

Created by: C R Hall on 04/07/2022

Latitude: 40°00'00" ← SURFACE HOLE 10,203' →

Latitude: 40°02'30" BOTTOM HOLE ← 3,668' →

BOTTOM HOLE 2,184'

SURFACE HOLE 2604'

Longitude: 80°40'00"

Longitude: 80°37'30"

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

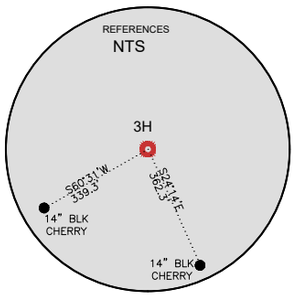
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,018.725 EASTING: 528,904.237
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,019.133 EASTING: 528,894.096
AZIMUTH POINT LOCATION-1 (AZL1):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,033.846 EASTING: 528,890.155
AZIMUTH POINT LOCATION-2 (AZL2):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,427,080.036 EASTING: 528,876.399
AZIMUTH POINT LOCATION-3 (AZL3):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,428,734.188 EASTING: 528,333.720
AZIMUTH POINT LOCATION-4 (AZL4):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,428,738.934 EASTING: 528,332.150
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,431,628.410 EASTING: 527,366.466

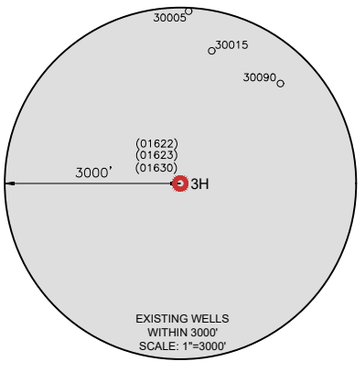
SHL

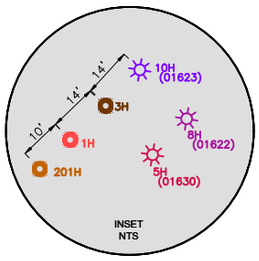
BHL

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 19°51'22" W	1040.88'	SHL TO LANDMARK	FENCE CORNER
L2	N 60°09'45" W	1281.63'	SHL TO LANDMARK	FENCE CORNER
L4	N 14°59'44" W	49.97'	LPL TO AZL1	
L6	N 18°18'09" W	16.40'	AZL3 TO AZL4	

LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	N 87°41'37" W	33.30'	1569.95'	SHL TO LPL
L5	N 16°35'02" W	158.12'	158.13'	AZL1 TO AZL2







WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. NO WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. NO PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

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. 708 David L Jackson

DAVID L JACKSON LICENSED NO. 708 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

2000 0 2000

GRAPHIC SCALE IN FEET

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)

OPERATOR'S WELL #: DAVID REINBEAU MSH 3H

API WELL #: 47 (STATE) 051 (COUNTY) (PERMIT)

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

WATERSHED: HOLLIDAYS RUN OF WHEELING CREEK (HUC-10) ELEVATION: 1251.2'

DISTRICT: UNION COUNTY: MARSHALL QUADRANGLE: MOUNDSVILLE, WV

SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

OIL & GAS ROYALTY OWNER: SHELLY A. & DAVID W. REINBEAU ACREAGE: ±50.88

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,349 TVD 22,789 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

LEGEND:

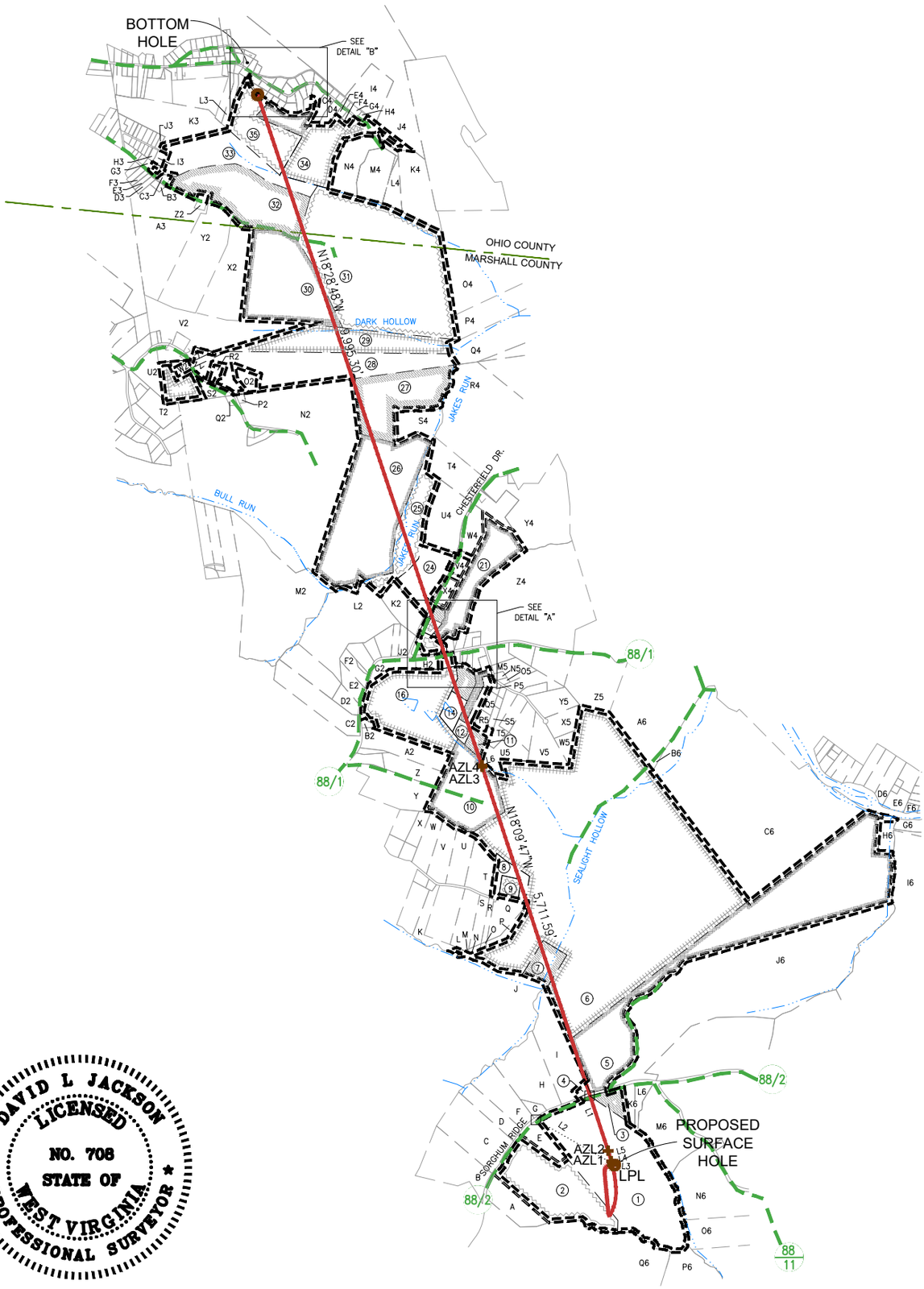
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- (W) EXISTING WATER WELL
- (S) EXISTING SPRING
- SURVEYED BOUNDARY
- DRILLING UNIT
- LEASE BOUNDARY
- PROPOSED PATH

REVISIONS:	DATE: 04-05-2022
	DRAWN BY: N. MANO
	SCALE: 1" = 2000'
	DRAWING NO:
	WELL LOCATION PLAT

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:50AM

PROPERTY NUMBER 2501166047
PAD ID 3001156592

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



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.

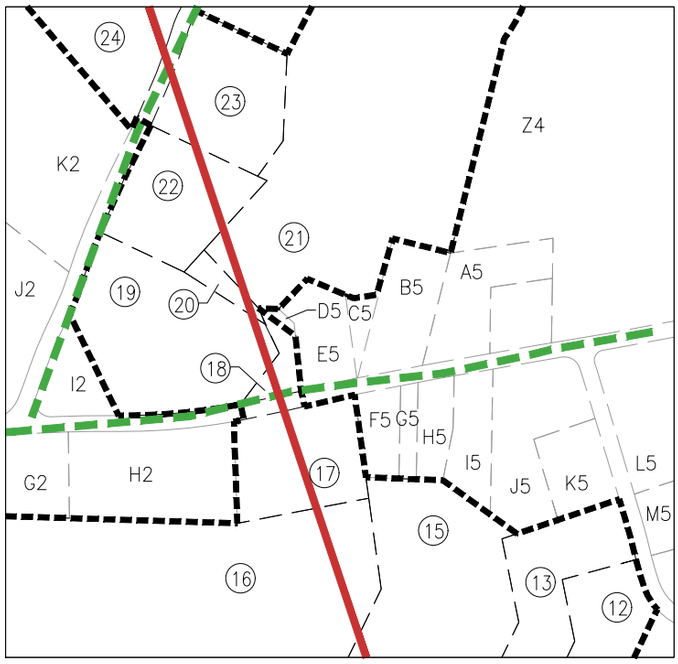
P.S. 708 David L Jackson

REVISIONS:	COMPANY: SWN Production Company, LLC / SWN Production Company™		DATE: 04-05-2022
	OPERATOR'S WELL #: DAVID REINBEAU MSH 3H		DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			SCALE: N/A
			DRAWING NO: WELL LOCATION PLAT 2

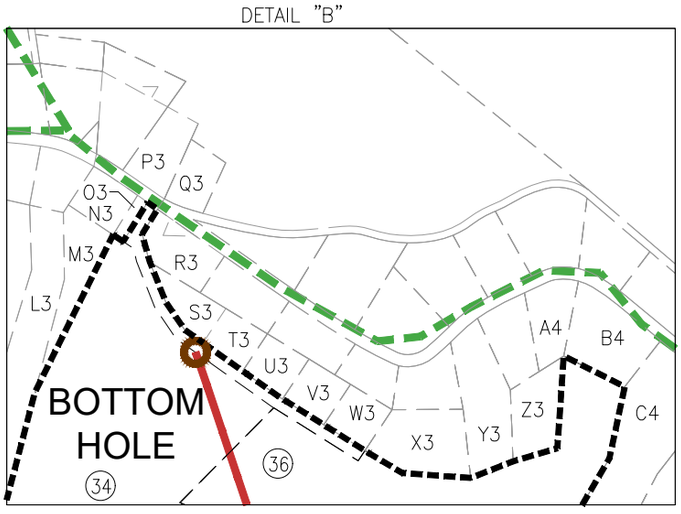
Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:50AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

DETAIL "A"



DETAIL "B"



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. 708 David L Jackson

DAVID L JACKSON LICENSED NO. 708 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

REVISIONS:	COMPANY: SWN Production Company, LLC — SWN Production Company™		
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 3H	DATE: 04-05-2022
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV
			DRAWN BY: N. MANO
			SCALE: N/A
			DRAWING NO: WELL LOCATION PLAT 3

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:50AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

	WELL BORE TRACTS	
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	REINBEAU SHELLY A & DAVID W (S/R)	13-8-29
TRACT	SURFACE OWNER (S)	TAX PARCEL
2	REINBEAU SHELLY A & DAVID W (S)	13-8-27
3	NARRISH KEVIN (S)	13-8-30
4	SAMPSON EDITH VIRGINIA EST (S)	13-7-19
5	BONACCI BRIAN F (S)	13-3-5.1
6	COULLING LOUISE S ET AL (S)	13-3-3
7	OHIO COUNTY COAL RESOURCES INC (S)	13-3-3.1
8	GEHO STANLEY R & BETH B (S)	13-4-22.16
9	GEHO STANLEY R & BETH B (S)	13-4-22.7
10	MCGUIRE PHILIP C (S)	13-4-21.4
11	YOUNGER DONALD A & MOORE TERESA R (S)	13-2-94
12	DAY JOHN U EST & MERCER CHRISTINE (S)	13-2-95
13	CHAPPELEAR THOMAS C & PAULA A (S)	13-2-95.1
14	GARVIN CORRINE A EST (S)	13-2-97
15	GARVIN LEILA N & DONALD A (S)	13-2-96
16	GARVIN CORRINE A EST (S)	13-2-98
17	MERCER RICK (S)	13-2-81.1
18	RANSOM DONNA K & DAVID W -TRUSTS (S)	13-2-30.9
19	RANSOM DONNA K & DAVID W -TRUSTS (S)	13-2-30.2
20	RANSOM DONNA K & DAVID W -TRUSTS (S)	13-2-30.5
21	DOUGHERTY LOIS J (S)	13-2-30.8
22	DOUGHERTY KAREN E (S)	13-2-30.3
23	SCHLIEPER DAVID J & LYNDSEY B (S)	13-2-30.4
24	BURKE RICHARD & FITZPATRICK (S)	13-2-31.1
25	GARVIN CORRINE A EST (S)	13-2-38
26	POLLACK RICHARD J ET UX (S)	13-2-38.1
27	LAUTER FRANK ET AL (S)	13-2-36
28	SEIDLER E DALE JR (S)	13-2-14.9
29	SEIDLER PATRICIA L IRREVOCABLE (S)	13-2-14.7
30	WOLEN JOHN & MICHELLE (S)	13-2-102.3
31	BRAUNLICH EARL FRITZ & JAMIE (S)	13-2-102.4
32	RAHBAR AHMAD CREDIT SHELTER TRUST (S)	13-2-102
33	ANDREWS JANET M TRUSTEE (S)	1-RB2-32
34	POTTS JOHN W & ROSE A (S)	1-RB2-31.2
35	ASBURY RYAN & ANNE (S)	1-RB2-31.5
36	MORGAN LEE ANN (S)	1-RB2-31.12

REVISIONS:	COMPANY: SWN Production Company, LLC / SWN Production Company™			DATE: 04-05-2022
	OPERATOR'S WELL #:	DAVID REINBEAU MSH 3H		DRAWN BY: N. MANO
	DISTRICT: UNION	COUNTY: MARSHALL	STATE: WV	SCALE: N/A
				DRAWING NO: WELL LOCATION PLAT 4

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:51AM

JACKSON SURVEYING
INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
A	REINBEAU RONALD W & FRIEDE A - LIFE	13-7-22.2
B	MCCOMBS JOHN A SR & MARILYN S	13-7-22.1
C	REINBEAU DAVID W & SHELLY A	13-7-22.3
D	REINBEAU DAVID W & SHELLY A	13-7-21.1
E	BOWMAN MICHAEL ET UX	13-8-28
F	BOWMAN MICHAEL J & CONSTANCE G	13-7-21
G	ALEXANDER LORRAINE	13-7-20
H	ALEXANDER LORRAINE	13-7-18.1
I	ALEXANDER LORRAINE	13-7-18
J	WARD CYNTHIA J & DALE P	13-4-23.6
K	WEST VALLIE JAMES ET AL	13-4-22
L	BRINKMEIER BRUCE & TAMARA	13-4-22.14
M	BRINKMEIER BRUCE & TAMARA	13-4-22.15
N	WALTON EARL RICHARD JR & BRANDICE C	13-4-22.21
O	WALTON EARL RICHARD JR & BRANDICE C	13-4-22.23
P	GAMES FRED & MARY V	13-4-22.19
Q	GAMES FRED & MARY V	13-4-22.18
R	GAMES MARY VIRGINIA - TOD	13-4-22.22
S	WALTON EARL RICHARD JR & BRANDICE C	13-4-22.20
T	WEST VALLIE JAMES ET AL	13-4-22
U	HILL CAROL LYNN & FORDYCE BRIAN W	13-4-22.8
V	MANNING JOHN B & KIMBERLY R	13-4-22.13
W	GAMES FRED & MARY V	13-4-22.17
X	GAMES MARY VIRGINIA - TOD	13-4-22.25
Y	MCGUIRE PHILIP C	13-4-21.9
Z	GARVIN CORRINE A EST	13-2-101
A2	GARVIN CORRINE A EST	13-2-100
B2	GARVIN CORRINE A EST	13-2-99
C2	GARVIN CORRINE A EST	13-2-70
D2	GARVIN CORRINE A EST	13-2-71
E2	MUSTACHIO EMILY A & GARVIN GRANT W	13-2-72
F2	GARVIN JOHN A & KAREN L	13-2-73
G2	GARVIN DOROTHY MAE EST	13-2-81
H2	GARVIN JOHN	13-2-81.2
I2	RANSOM DAVID W & DONNA K	13-2-80
J2	MILLER GEORGE W ET AL	13-2-79
K2	BURKE RICHARD & FITZPATRICK DEBRA	13-2-31.2
L2	GARVIN CORRINE A EST	13-2-68
M2	ST MYERS MICHAEL W	13-2-67
N2	ROGERSON GEORGE C EST	13-2-39
O2	SEIDLER E DALE JR ET UX	13-2-14.3
P2	COFFIELD RONALD J	13-2-39.3
Q2	COFFIELD RONALD J	13-2-39.5
R2	SEIDLER NETTIE	13-2-14
S2	SEIDLER TIMOTHY I ET UX	13-2-14.2
T2	BLATT JAMES E ET UX	13-2-42.7
U2	MAGERS GARY E ET UX	13-2-2.2
V2	SHIVELY JOYCE	13-2-14.6
W2	NUGENT LINDA S ET AL	13-2-14.8
X2	RAHBAR AHMAD CREDIT, SHELTER TRUST	13-2-102
Y2	BANE RYAN A & JULIE A	13-2-102.2
Z2	BRAUNLICH EARL FRITZ & JAMIE	13-2-104
A3	TURNER JASON & TFFANY	13-2-102.1
B3	WEISNER RANDY P	1-RB2-33.3
C3	FEDERAL NATIONAL MORTGAGE ASSOCIATION	1-RB2-32.3
D3	PRASCIK LORI JEAN	1-RB2Q-33
E3	MULARCIK BRYAN & TIFFANY	1-RB2Q-32
F3	SHREVES HOLLIE L	1-RB2Q-31.1
G3	KNORR WILLIAM JOHN & KNORR ELIZABETH VIRGINIA	1-RB2L-81.1
H3	NEIMAN CHARLES AND MARK	1-RB2L-81
I3	ANDREWS JEREMY	1-RB2-32.1
J3	PAULEY SCOTT F & ECHEMANN CHRISTINA	1-RB2L-74
K3	SCHMIDT THOMAS	1-RB2-28
L3	RICHTER ELWOOD F JR	1-RB2M-56
M3	RICHTER ELWOOD F & CHRISTINE M	1-RB2-31.6
N3	MUSAP SASHA DAVID & MITEVSKI VERA	1-RB2M-30
O3	MUSAP SASHA DAVID & MITEVSKI VERA	1-RB2M-29
P3	MORGAN CARL WILLIAM	1-RB2M-39
Q3	MORGAN CARL WILLIAM	1-RB2M-31.9
R3	TRABERT TERRY W & B J	1-RB2M-31
S3	CONNER ERNEST & PHYLLIS	1-RB2M-38
T3	DICOCCO JACK M & M E	1-RB2M-47
U3	DICOCCO JACK M & M E	1-RB2M-48

	ADJOINING OWNERS TABLE	
TRACT	SURFACE OWNER	TAX PARCEL
V3	TRABERT TIMOTHY LEE	1-RB2M-49
W3	TRABERT TIMOTHY LEE	1-RB2M-50
X3	BALLER ROSE MARY SPROWLS DAVID W	1-RB2M-51
Y3	BALLER ROSE MARY SPROWLS DAVID W	1-RB2M-31.8
Z3	GILLIGAN SHELLEY	1-RB2M-31.7
A4	GILLIGAN SHELLEY	1-RB2M-31.1
B4	KURKO BRIAN S & JACLYN E	1-RB2M-37
C4	HAHLE ELEANOR T (LE); GUY ROBERT D; GUY CHERYL H	1-RB2M-31.10
D4	HAHLE ELEANOR T (LE); GUY ROBERT D; GUY CHERYL H	1-RB2M-31.11
E4	SHOWALTER BRIAN & BETH	1-RB2M-52.1
F4	SHOWALTER BRIAN & BETH	1-RB2M-52
G4	GANTZER MICHAEL J & D M	1-RB2M-45
H4	WHEELING ANTENNA CO INC C/O COMCAST CORPORATION	1-RB2M-46
I4	WHEELING ANTENNA CO C/O COMCAST CORPORATION	1-RB2-26
J4	GALE JAMES ASSET MGMT LLC	1-RB2-24.1
K4	POTTS PATRICK J	1-RB2-31.9
L4	POTTS JOHN W & ROSE A	1-RB2-31.8
M4	POTTS JOHN W & R A	1-RB2-31.1
N4	POTTS JOHN W & ROSE A	1-RB2-31.13
O4	C J RYAN NC	10-W95-109
P4	RENFORTH GEORGE III	13-2-16.2
Q4	PERONI CONSTRUCTION INC	10-W95-112
R4	LONG RICHARD E ET UX	13-2-35
S4	LONG RICHARD E ET UX	13-2-37
T4	LONG RICHARD E ET UX	13-2-32
U4	WALKER MICHAEL A	13-2-31
V4	DOUGHERTY MICHAEL C	13-2-30.7
W4	INGRAM ROBERT HOWARD III ET UX	13-2-30.6
X4	DOUGHERTY MICHAEL C	13-2-30.10
Y4	LONG RICHARD E ET UX	13-2-34
Z4	WILLIS CHARLES ROBERT ET AL	13-2-29
A5	HANKET COURTNEY T	13-2-30.11
B5	DOUGHERTY LOIS J	13-2-30.1
C5	DOUGHERTY LOIS J	13-2-30.14
D5	HANKET COURTNEY T	13-2-30.11
E5	RANSOM DONNA K & DAVID W	13-2-30.12
F5	MERCER RICK	13-2-82.1
G5	MERCER RICK	13-2-82.2
H5	BILINSKY HARRY EST & PALMER JOSEPH J	13-2-82
I5	MERCER RICK W	13-2-83
J5	STOEHR JOHN ROBERT ET UX	13-2-83.1
K5	REDD JOHN N ET UX	13-2-84
L5	GARVIN JOHN ARTHUR	13-2-85
M5	DENNING MICHAEL J ET UX	13-2-86
N5	HENRY VICTORIA A	13-2-86.1
O5	HENRY VICTORIA A	13-2-86.2
P5	FLANAGAN JAMES A & BETY S	13-2-94.2
Q5	YOUNGER DONALD A & MOORE TERESA R	13-2-94.4
R5	YOUNGER DONALD A & MOORE TERESA R	13-2-94.6
S5	YOUNGER DONALD A & MOORE TERESA R	13-2-94.3
T5	BANE RYAN	13-2-93
U5	WIEDEBUSCH ROBERT & CINDY	13-2-93.1
V5	WIEDEBUSCH ROBERT & CINDY	13-2-91
W5	GAUGHAN MICHAEL WM	13-2-90.1
X5	GAUGHAN MICHAEL W ET UX	13-2-90
Y5	ABEL JAMES R & SHERI L	13-2-89
Z5	ISER RONALD J ET UX	13-2-88
A6	WHITE HORSE FARM LLC	13-3-2
B6	COULLING LOUISE S ET AL	13-3-5.3
C6	COULLING LOUISE S	13-3-5
D6	DAWSON THOMAS A ET AL	12-1B-21.1
E6	MCADAMS ROBERT E & JODY L	12-1B-27.1
F6	MATTUCCI MARK A	12-1B-28
G6	MAAS BRIAN J & AMY C - TRUST	13-3-8
H6	MAAS BRIAN J & AMY C - TRUST	13-3-10
I6	HART JOHN J & RENEE A	13-3-11
J6	BONACCI FRANK A	13-3-5.5
K6	SOUTH CHRISTOPHER C	13-8-31
L6	KOSTELECSKY JOSEPH J JR & CAROLYN - TOD	13-8-31.1
M6	FUNK CHARLES D ET UX	13-8-32
N6	LOY EUGENE EST ET AL	13-8-1
O6	LIBERTY JOHN ET UX	13-8-10
P6	MCCOMBS JOHN A SR, THOMAS E & BETH	13-8-11
Q6	MCCOMBS JOHN A SR, THOMAS E & BETH	13-8-26

REVISIONS:

COMPANY:

SWN Production Company, LLC

SWN Production Company™

OPERATOR'S WELL #: DAVID REINBEAU MSH 3H

DISTRICT: UNION

COUNTY: MARSHALL

STATE: WV

DATE: 04-05-2022

DRAWN BY: N. MANO

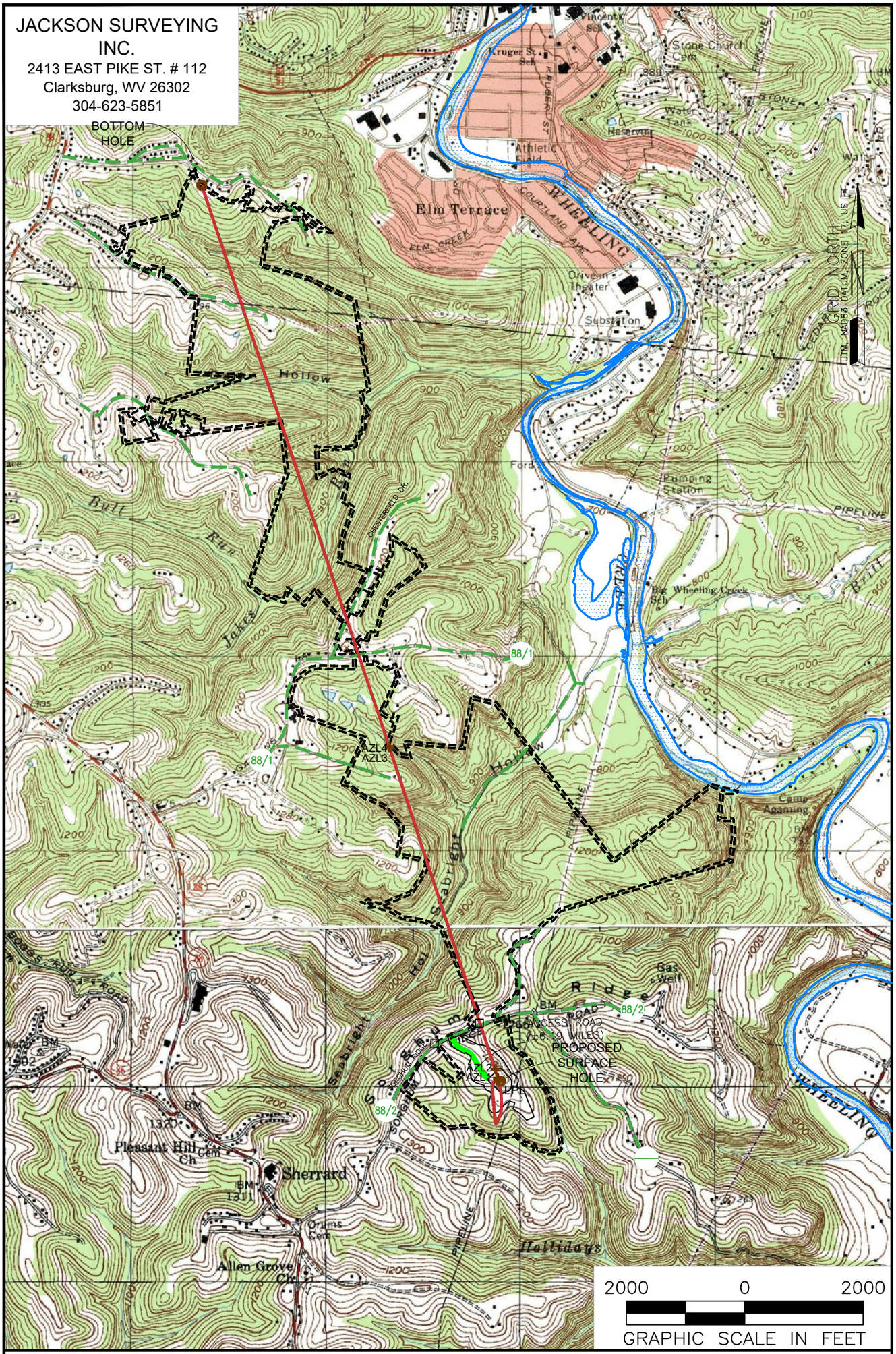
SCALE: N/A

DRAWING NO:

WELL LOCATION PLAT 5

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:51AM

JACKSON SURVEYING INC.
2413 EAST PIKE ST. # 112
Clarksburg, WV 26302
304-623-5851



NOTES ON SURVEY

1. 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.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL — LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- PROPOSED PATH

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC	WELL (FARM) NAME: DAVID REINBEAU MSH	WELL # 3H	SERIAL #
ADDRESS: 1300 FORT PIERPONT ROAD, SUITE 200 MORGANTOWN, WV 26508	COUNTY – CODE MARSHALL – 051	DISTRICT; UNION	
SURFACE OWNER: SHELLY A. & DAVID W. REINBEAU	USGS 7 1/2 QUADRANGLE MAP NAME MOUNDSVILLE, WV		

Z:\2022 BACKUPS\1-03-22 DJ\SWN\DAVID REINBEAU MSH\WELL PLATS\3H\FINAL\REINBEAU 3H MSH 4-5-22\REINBEAU 3H MSH WELL PLAT 4-5-22.DWG
TUESDAY APRIL 05 2022 07:52AM

PROPERTY NUMBER 2501166047
PAD ID 3001156592

Groundwater and Environmental Professionals Since 1891

November 30, 2021

Mr. Joshua Boyda
Senior Environmental Specialist
Southwestern Energy
1300 Fort Pierpont Drive
Suite 201
Morgantown, West Virginia 26508

Re: Summary of Investigative Findings
David Reinbeau Well Pad
Union District, Marshall County, West Virginia

Dear Mr. Boyda:

Moody and Associates, Inc. (Moody) was retained by SWN Production Company, LLC (SWN) to conduct soil and water quality screening and sampling at the David Reinbeau well pad, located at 843 Sorghum Ridge Road, Wheeling, West Virginia (*Figure 1*). The characterization efforts were conducted in response to a fire which occurred at an on-site compressor on October 22, 2021. The potential contaminants at the well pad consist of antifreeze (ethylene glycol), unused motor oil, and condensate. An SDS for the antifreeze being used on the site, which has been provided by SWN, is attached as *Appendix A*.

Soil Screening and Sampling

On October 26, 2021, Moody mobilized to the site to characterize the extent of potential ethylene glycol impacts at the site. Due to the low-volatility of ethylene glycol, a photoionization detector (PID) was not effective in detecting this constituent. Therefore, Moody relied on visual and olfactory observations, as well as characterization sampling results to verify the lateral and vertical extents of impacted material. Notably, no glycol odors were observed at any location during Moody's site visit. In total, 13 soil

characterization samples were collected within a 40-foot radius of the compressor station. In addition, two background reference samples (BG-01 and BG-02) were collected from an upgradient location that was not impacted by the release. The soil sampling locations are depicted on *Figure 2*.

All samples were properly preserved and submitted to Environmental Services Laboratories (ESL) in Indiana, Pennsylvania, for analysis of ethylene glycol. The laboratory results are summarized on *Table 1*, and the laboratory analytical reports are provided in *Appendix B*.

Moody returned to the site on October 28, 2021, to conduct additional site characterization activities to confirm that any potential contaminants were confined to the well pad. This evaluation included a visual inspection of three drain boxes, which are part of the well pad's stormwater management system. Surface runoff and rainwater from the well pad are diverted to these drain boxes, each of which discharges from an outfall pipe to a riprap apron located downgradient of the well pad. SWN reports that the pad drains were immediately closed following the incident, and have remained closed, to prevent off-site migration of contaminants. Moody confirmed that the pad drains were closed; no water was observed to be flowing from any outfall pipe, and no pooled water was observed at any outfall location.

A water quality sample was collected from each of the three drain boxes (AQ-01 through AQ-03), and a soil sample was collected from each of their respective outfall locations. The sampling locations are shown on *Figure 3*. The samples were properly preserved and submitted to ESL for analysis of ethylene glycol, and the motor oil- and condensate-related parameters listed on *Table 2.* The results are summarized on *Tables 3* and *4*, and the laboratory analytical reports are included in *Appendix B*.

On November 5, 2021, Moody conducted additional field screening of the well pad for volatile organic compounds (VOCs) and conductivity using a PID and soil conductivity probe, respectively. Soil conductivity measurements ranged from 0.02 to 0.49 millsiemens per centimeter (mS/cm). Measurements obtained with the PID ranged from 0.0 to 6.2 parts

per million (ppm).

Results and Conclusions

The laboratory analytical results were conservatively evaluated in the context of the West Virginia De Minimis standards based on residential use. Because there is currently no De Minimis standard for chloride in soil, concentrations were compared to the Soil Action Level established under the West Virginia Corrective Action Guidance Document (CAGD) for Leaking Aboveground Storage Tanks (ASTs) and Underground Storage Tanks (USTs). Ethylene glycol was not detected in any of the soil characterization samples collected on the well pad, nor was it detected in any of the samples collected from the pad drains or outfall locations. Therefore, ethylene glycol is not considered to be a contaminant of concern at the site.

All chloride concentrations measured in the water quality samples were well below the De Minimis standard of 250 mg/L. In addition, no VOCs or polycyclic aromatic hydrocarbons (PAHs) were detected in any of the water quality samples.

Chloride concentrations within the soil samples collected from the outfall locations were all below the Soil Action Level of 1,000 mg/kg. No VOCs were detected in any of these samples. Trace amounts of PAHs were detected in all three soil samples collected from the outfall locations; however, all concentrations were below their respective De Minimis standard and are therefore protective of human health.

Low conductivity and PID values obtained in the immediate vicinity of the compressor station suggest minimal, if any, VOC and/or brine impacts at the site. Because no VOCs or PAHs were detected in any of the water quality samples collected from the drain boxes, it is unlikely that the PAHs identified at the drain outfalls are associated with this incident. Based on the results of Moody's assessment, it appears that the contamination caused by the fire has been confined to a relatively small area of the well pad. If you have any questions or need additional information regarding the information provided in this report, please call our office at (724) 746-5200.

Sincerely,
MOODY AND ASSOCIATES, INC.

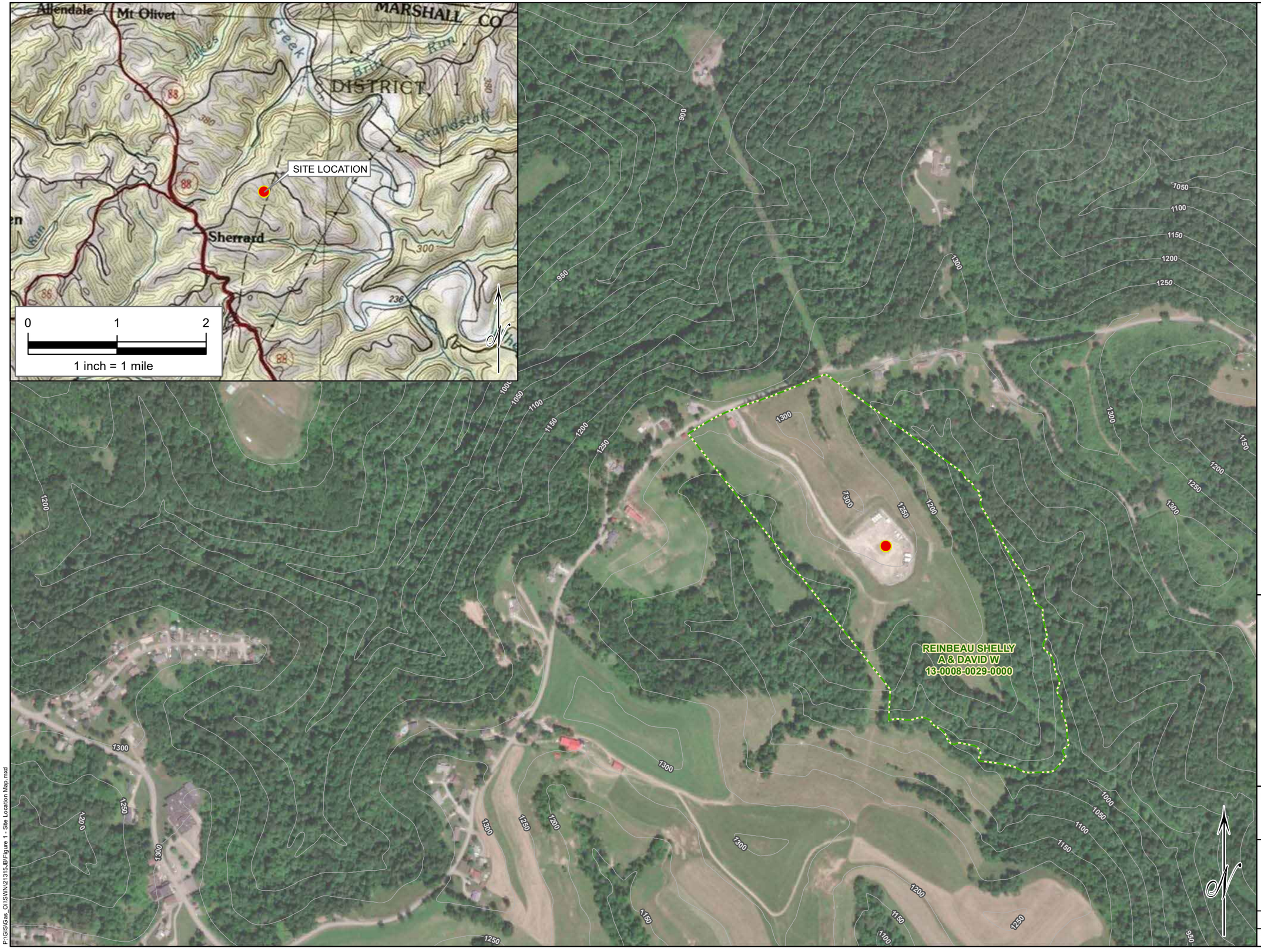
Jona M. Stoskey
Geoscientist II

Jessie Bobrzynski, P.G., LRS
Project Manager II

Attachments:

Figure 1: Site Location Map
Figure 2: Ethylene Glycol Soil Sampling Locations Map
Figure 3: Pad Drain Sampling Locations Map
Table 1: Summary of Soil Sampling Results – Ethylene Glycol
Table 2: List of Sampling Parameters
Table 3: Summary of Soil Sampling Results – Pad Drain Outfalls
Table 4: Summary of Water Quality Sampling Results – Pad Drains
Appendix A: SDS for Antifreeze
Appendix B: Laboratory Analytical Reports

FIGURES



LEGEND

- David Reinbeau Gas Well Pad
- Parcel Boundary

Scale:

0 500 1,000

1 inch = 500 feet

Map References:

- Reinbeau gas well location retrieved from WVGIS Technical Center. WV Gas Well Locations.
- Parcel boundary retrieved from WVGIS Technical Center. Marshall County Parcels Q3 2020.
- 7½- minute quadrangle: Moundsville, PA
- Base topography retrieved from WVGIS Technical Center. 10 ft. interval contours.
- Base inset topography retrieved from ESRI online database. USA Topo Maps.
- Base aerial imagery retrieved from ESRI online database. World Imagery with World Transportation overlay.

Notes:

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FIGURE 1:
SITE LOCATION MAP

David Reinbeau Well Pad

Union District,
Marshall County, WV

Project #: 21-315-JB

Prepared for : SWN Production Company

1720 Washington Rd.
Suite 100
Washington, PA 15301
Office: (724) 746-5200
Fax: (724) 746-5603
www.moody-s.com

Moody and Associates, Inc.

Drawn by:	MPS	Date:	11/18/21
Checked by:	JLB	Revision:	

P:\GIS\Gas_Oil\SWN\21315JB\Figure 1 - Site Location Map.mxd

LEGEND

- Soil Sampling Locations
- Background Soil Samping Locations

Scale:

0 40 80

1 inch = 40 feet

Map References:

- Soil sampling locations and background sampling locations collected and analyzed by Moody and Associates, Inc.
- 7½- minute quadrangle: Moundsville, PA
- Base aerial imagery referenced in by Moody and Associates, Inc via Google Earth. Date of imagery: 3/21/2021

Notes:

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FIGURE 2:
ETHYL GLYCOL SAMPLING LOCATIONS MAP

David Reinbeau Well Pad

Union District,
Marshall County, WV

Project #: 21-315-JB

Prepared for : SWN Production Company

1720 Washington Rd.
Suite 100
Washington, PA 15301
Office: (724) 746-5200
Fax: (724) 746-5603
www.moody-s.com

Moody and Associates, Inc.

Drawn by:	MPS	Date:	11/15/21
Checked by:	JLB	Revision:	

P:\GIS\Gas_Oil\SWN\21315JB\Figure 2 - Ethylene Glycol Sampling Locations Map.mxd

LEGEND

- Water Quality Sampling Locations
- Soil Screening and Sampling Locations

Scale:

0 50 100

1 inch = 50 feet

Map References:

- Water quality sampling locations and soil screening and sampling locations collected and analyzed by Moody and Associates, Inc.
- 7½- minute quadrangle: Moundsville, PA
- Base aerial imagery referenced in by Moody and Associates, Inc via Google Earth. Date of imagery: 3/21/2021

Notes:

This drawing is property of SWN Production Company and contains information that is proprietary and confidential in nature. It may not be copied or otherwise reproduced in whole or in part without prior written consent.

FIGURE 3:
PAD DRAIN SAMPLING LOCATIONS MAP

David Reinbeau Well Pad

Union District,
Marshall County, WV

Project #: 21-315-JB

Prepared for : SWN Production Company

1720 Washington Rd.
Suite 100
Washington, PA 15301
Office: (724) 746-5200
Fax: (724) 746-5603
www.moody-s.com

Moody and Associates, Inc.

Drawn by:	MPS	Date:	11/15/21
Checked by:	JLB	Revision:	

P:\GIS\Gas_Oil\SWN\21315JB\Figure 3 - Pad Drain Sampling Locations Map.mxd

TABLES

Table 1
Summary of Soil Sampling Results - Ethylene Glycol
David Reinbeau Well Pad
SWN Production Company, LLC
Union District, Marshall County, West Virginia

PARAMETERS		SAMPLE ID															WV DEP De Minimis [1]
		SO-01	SO-02	SO-03	SO-04	SO-05	SO-06	SO-07	SO-08	SO-09	SO-10	SO-11	SO-12	SO-13	BG-01	BG-02	
		10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021	
General Chemistry	**Units**																
% Solids	%	88.4	88.0	90.8	91.8	88.9	90.6	90.6	90.2	92.2	90.3	91.7	90.0	89.6	92.4	86.4	NA
Glycols	**Units**																
Ethylene Glycol	mg/kg	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	130,000

Notes:
(1): Values reflect the De Minimis standards for Direct Contact with soil based on Residential Use
NA: Not Applicable
mg/kg: milligrams per kilogram

Table 2
List of Sampling Parameters
David Reinbeau Well Pad
SWN Production Company, LLC
Union District, Marshall County, West Virginia

PARAMETERS
General Chemistry
Chloride
Volatile Organics
Benzene
Toluene
Ethyl Benzene
m,p-Xylenes
o-Xylenes
Total Xylenes
PAHs
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenz(a,h)anthracene
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Naphthalene
Phenanthrene
Pyrene
Glycols
Ethylene Glycol

Table 3
Summary of Soil Sampling Results - Pad Drain Outfalls
David Reinbeau Well Pad
SWN Production Company, LLC
Union District, Marshall County, West Virginia

PARAMETERS		SAMPLE ID			WV DEP De Minimis [1]
		SO-01	SO-02	SO-03	
		10/26/2021	10/26/2021	10/26/2021	
General Chemistry	**Units**				
% Moisture	%	70.1	81.8	76.5	NA
Chloride	mg/kg	370	15.2 J	941	1000 [2]
Volatile Organics	**Units**				
Benzene	mg/kg	< 0.0727	< 0.0624	< 0.0666	1.2
Toluene	mg/kg	< 0.0542	< 0.0465	< 0.0497	820
Ethyl Benzene	mg/kg	< 0.0513	< 0.0440	< 0.0473	6.2
m,p-Xylenes	mg/kg	< 0.117	< 0.100	< 0.107	NA
o-Xylenes	mg/kg	< 0.030	< 0.0257	< 0.0274	NA
Total Xylenes	mg/kg	< 0.117	< 0.100	< 0.107	260
PAHs	**Units**				
Acenaphthene	mg/kg	< 0.00087	< 0.00072	< 0.00078	4,100
Acenaphthylene	mg/kg	< 0.00069	< 0.00057	0.0028 J	4,200
Anthracene	mg/kg	0.0031 J	0.0013 J	0.0027 J	23,000
Benzo(a)anthracene	mg/kg	0.0132	0.0058 J	0.0124	0.21
Benzo(a)pyrene	mg/kg	0.0099	0.0051 J	0.0139	0.016
Benzo(b)fluoranthene	mg/kg	0.0213	0.0113	0.0346	0.16
Benzo(g,h,i)perylene	mg/kg	0.0063 J	0.0035 J	0.0087	1,800
Benzo(k)fluoranthene	mg/kg	0.0206	0.0109	0.0335	1.6
Chrysene	mg/kg	0.0136	0.0068 J	0.0171	16
Dibenz(a,h)anthracene	mg/kg	< 0.0021	< 0.0018	< 0.0019	0.016
Fluoranthene	mg/kg	0.0354	0.0117	0.0288	2,400
Fluorene	mg/kg	< 0.00089	< 0.00074	< 0.00080	2,900
Indeno(1,2,3-cd)pyrene	mg/kg	0.0055 J	0.0029 J	0.0072 J	0.16
Naphthalene	mg/kg	0.0055 J	0.0039 J	0.0142	4.1
Phenanthrene	mg/kg	0.0248	0.0093	0.0130	23,000
Pyrene	mg/kg	0.0280	0.0100	0.0197	2,300
Glycols	**Units**				
Ethylene Glycol	mg/kg	< 100	< 100	< 100	130,000

Notes:

(1): Values reflect the De Minimis standards for Direct Contact with soil based on Res

(2): Currently, there is no De Minimis standard for chloride in soil. Value reflects Tier 1 Soil Action Level obtained from Table 5 of the West Virginia CAGD for Leaking ASTs and USTs

J: Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte

NA: Not applicable

mg/kg: milligrams per kilogram

Table 4
Summary of Water Quality Sampling Results - Pad Drains
David Reinbeau Well Pad
SWN Production Company, LLC
Union District, Marshall County, West Virginia

PARAMETERS		SAMPLE ID				WV DEP De Minimis [1]
		AQ-01	AQ-02	AQ-03	Trip Blank	
		10/26/2021	10/26/2021	10/26/2021	10/26/2021	
General Chemistry	**Units**					
Chloride	mg/L	8.01	40.9	5.97	---	250 [2]
Volatile Organics	**Units**					
Benzene	µg/L	< 0.510	< 0.510	< 0.510	< 0.510	5
Toluene	µg/L	< 0.380	< 0.380	< 0.380	0.960 J	1,000
Ethyl Benzene	µg/L	< 0.360	< 0.360	< 0.360	< 0.360	700
m,p-Xylenes	µg/L	< 0.820	< 0.820	< 0.820	< 0.820	NA
o-Xylenes	µg/L	< 0.210	< 0.210	< 0.210	< 0.210	NA
Total Xylenes	µg/L	< 0.820	< 0.820	< 0.820	< 0.820	10,000
PAHs	**Units**					
Acenaphthene	µg/L	< 0.023	< 0.023	< 0.023	---	240
Acenaphthylene	µg/L	< 0.021	< 0.021	< 0.021	---	320
Anthracene	µg/L	< 0.022	< 0.022	< 0.022	---	1,800
Benzo(a)anthracene	µg/L	< 0.081	< 0.081	< 0.081	---	0.012
Benzo(a)pyrene	µg/L	< 0.026	< 0.026	< 0.026	---	0.2
Benzo(b)fluoranthene	µg/L	< 0.042	< 0.042	< 0.042	---	0.034
Benzo(g,h,i)perylene	µg/L	< 0.031	< 0.031	< 0.031	---	600
Benzo(k)fluoranthene	µg/L	< 0.042	< 0.042	< 0.042	---	0.34
Chrysene	µg/L	< 0.033	< 0.033	< 0.033	---	3.4
Dibenz(a,h)anthracene	µg/L	< 0.031	< 0.031	< 0.031	---	0.0034
Fluoranthene	µg/L	< 0.020	< 0.020	< 0.020	---	800
Fluorene	µg/L	< 0.022	< 0.022	< 0.022	---	150
Indeno(1,2,3-cd)pyrene	µg/L	< 0.033	< 0.033	< 0.033	---	0.034
Naphthalene	µg/L	< 0.042	< 0.042	< 0.042	---	0.17
Phenanthrene	µg/L	< 0.027	< 0.027	< 0.027	---	6,000
Pyrene	µg/L	< 0.021	< 0.021	< 0.021	---	79
Glycols	**Units**					
Ethylene Glycol	µg/L	< 0.638	< 0.638	< 0.638	---	40,000

Notes:

(1): Values reflect the De Minimis standards for Direct Contact with soil based on Residential Use

(2): Currently there are no De Minimis or EPA Regional Screening Levels for chloride in soil or groundwater. Value reflects WV Surface Water Standards for Drinking Water

J: Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte

NA: Not applicable

mg/L: milligrams per liter

µg/L: micrograms per liter

APPENDIX A

SDS for Antifreeze

Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Delo ELC Antifreeze/Coolant - Premixed 50/50

Product Use: Heavy Duty Coolant
Product Number(s): 227811
Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency & Information Center: Located in the USA. International collect calls accepted.
(800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: 1 (800) 582-3835, LUBETEK@chevron.com

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Reproductive toxicant (developmental): Category 2. Target organ toxicant (repeated exposure): Category 2.

Signal Word: Warning

Health Hazards: Suspected of damaging the unborn child. May cause damage to organs (Kidney) through prolonged or repeated exposure.

PRECAUTIONARY STATEMENTS:
Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapours/spray. Use personal protective equipment as required.
Response: IF exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell.

Storage: Store locked up.
Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Ethylene Glycol	107-21-1	34 - < 80 %weight
Sodium 2-ethylhexanoate	19766-89-3	0.1 - < 3 %weight

SECTION 4 FIRST AID MEASURES

Description of first aid measures
Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed
IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: May be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:
Reproduction and Birth Defects: Contains material that may cause harm to the unborn child if swallowed based on animal data.
Target Organs: Contains material that may cause damage to the following organ(s) following repeated inhalation at concentrations above the recommended exposure limit:Kidney See Section 11 for additional information. Risk depends on duration and level of exposure.

Indication of any immediate medical attention and special treatment needed Not Applicable

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Dry Chemical, CO2, Aqueous Film Forming Foam (AFFF) or alcohol resistant foam.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Sodium.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Do not taste or swallow antifreeze or solution. Keep out of the reach of children and animals.
Precautionary Measures: Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: Do not store in open or unlabeled containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels

below the recommended exposure limits. Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Natural rubber, Neoprene, Nitrile Rubber, Polyvinyl Chloride (PVC or Vinyl).
Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors, Dusts and Mists.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	Form	TWA	STEL	Ceiling	Notation
Ethylene Glycol	ACGIH	--	.01 ppm	--	--	Skin

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Red
Physical State: Liquid
Odor: Faint or Mild
Odor Threshold: No data available
pH: 8 - 8.6; 67%volume @ 20°C (solution in water)
Vapor Pressure: No data available
Vapor Density (Air = 1): 2.10
Initial Boiling Point: 109°C (228.2°F)
Solubility: Soluble in water.
Freezing Point: -37°C (-34.6°F) (Max)
Melting Point: Not Applicable
Specific Gravity: 1.06 - 1.09
Density: 1.071 kg/l @ 15°C (59°F) (Min)
Viscosity: No data available
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): Not Applicable

Flashpoint: Not Applicable
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: Ketones (Elevated temperatures), Aldehydes (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material.

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains ethylene glycol (EG). The toxicity of EG via inhalation or skin contact is expected to be slight at room temperature. The estimated oral lethal dose is about 100 cc (3.3 oz.) for an adult human. Ethylene glycol is oxidized to oxalic acid which results in the deposition of calcium oxalate crystals mainly in the brain and kidneys. Early signs and symptoms of EG poisoning may resemble those of alcohol intoxication. Later, the victim may experience nausea, vomiting, weakness, abdominal and muscle pain, difficulty in breathing and decreased urine output. When EG was heated above the boiling point of water, vapors formed which reportedly caused unconsciousness, increased lymphocyte count, and a rapid, jerky movement of the eyes in persons chronically exposed. When EG was administered orally to pregnant rats and mice, there was an increase in fetal deaths and birth defects. Some of these effects occurred at doses that had no toxic effects on the mothers. We are not aware of any reports that EG causes reproductive toxicity in human beings.

2-Ethylhexanoic acid (2-EXA) caused an increase in liver size and enzyme levels when repeatedly administered to rats via the diet. When administered to pregnant rats by gavage or in drinking water, 2-EXA caused teratogenicity (birth defects) and delayed postnatal development of the pups. Additionally, 2-EXA impaired female fertility in rats. Birth defects were seen in the offspring of mice who were administered sodium 2-ethylhexanoate via intraperitoneal injection during pregnancy.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from products of a similar structure and composition.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.
The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PROPRIETARY ANTIFREEZE PREPARATION IN NON-BULK PACKAGING; NOT REGULATED FOR TRANSPORT UNDER 49 CFR
Additional Information: Bulk shipments containing a reportable quantity (RQ, 5000 pounds or more) of ethylene glycol in a single packaging are transported as hazardous material. The shipping description is: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ETHYLENE GLYCOL CONTAINS BITTERANT), 9, III, RQ (ETHYLENE GLYCOL)

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER ICAO TI OR IATA DGR

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	05=MA RTK
01-2A=IARC Group 2A	06=NJ RTK
01-2B=IARC Group 2B	07=PA RTK
02=NTP Carcinogen	08-1=TSCA 5(e)
03=EPCRA 313	08-2=TSCA 12(b)
04=CA Proposition 65	

The following components of this material are found on the regulatory lists indicated.
Ethylene Glycol 07

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: Refer to components listed in Section 3.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1* Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: SECTION 02 - Hazard Statements information was added.
SECTION 02 - Hazard Statements information was deleted.
SECTION 02 - Health Classification information was added.
SECTION 02 - Health Classification information was deleted.
SECTION 02 - Health Hazard information was deleted.
SECTION 02 - Pictogram information was added.
SECTION 02 - Pictogram information was deleted.
SECTION 02 - Precautionary Statements information was added.
SECTION 02 - Precautionary Statements information was deleted.
SECTION 02 - Signal Word information was added.
SECTION 02 - Signal Word information was deleted.
SECTION 08 - Occupational Exposure Limit Table information was modified.
SECTION 09 - Physical/Chemical Properties information was modified.
SECTION 15 - Chemical Inventories information was modified.
SECTION 15 - Regulatory Information information was modified.

Revision Date: May 10, 2021

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road, San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

APPENDIX B

Laboratory Analytical Reports

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia Street
Indiana, PA 15701
P: (724) 463-8378
F: (724) 465-4209
PADEP: 32-00382

1276 Bentleyville Road
Van Voorhis, PA 15366
P: (724) 258-8378
F: (724) 258-8376
PADEP: 63-04247

435 Broad Street
Montoursville, PA 17754
P: (570) 321-9002
F: (570) 321-1957
PADEP: 41-04880

950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

05 November 2021

Moody & Associates, Inc. (Washington Office)
Attn: Jessie Bobrzynski
1720 Washington Road
Washington, PA 15301

Work Order: 1102291
Project: David Reinbeau Pad Sampling

Report of Analysis

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received	Sample Notes
SO-01	1102291-01	Solid	10/26/2021 10:00	10/27/21 17:00	
SO-02	1102291-02	Solid	10/26/2021 10:10	10/27/21 17:00	
SO-03	1102291-03	Solid	10/26/2021 10:15	10/27/21 17:00	
SO-04	1102291-04	Solid	10/26/2021 10:20	10/27/21 17:00	
SO-05	1102291-05	Solid	10/26/2021 10:25	10/27/21 17:00	
SO-06	1102291-06	Solid	10/26/2021 10:35	10/27/21 17:00	
SO-07	1102291-07	Solid	10/26/2021 10:40	10/27/21 17:00	
SO-08	1102291-08	Solid	10/26/2021 10:45	10/27/21 17:00	
SO-09	1102291-09	Solid	10/26/2021 10:50	10/27/21 17:00	
SO-10	1102291-10	Solid	10/26/2021 11:05	10/27/21 17:00	
SO-11	1102291-11	Solid	10/26/2021 11:10	10/27/21 17:00	
SO-12	1102291-12	Solid	10/26/2021 11:15	10/27/21 17:00	
SO-13	1102291-13	Solid	10/26/2021 11:20	10/27/21 17:00	
BG-01	1102291-14	Solid	10/26/2021 11:40	10/27/21 17:00	
BG-02	1102291-15	Solid	10/26/2021 11:45	10/27/21 17:00	

Report Narrative

The results contained in this report are only representative of the samples received. Environmental Service Laboratories, Inc. is not responsible for use or interpretation of the data included herein.

Ethylene Glycol subcontracted to Geochemical Testing, WV DEP Lab ID 141; please see attached subcontract laboratory Report of Analysis for results.

Definitions

RL Reporting Limit

Certifications

Analyses performed by Environmental Service Laboratories, Inc., Indiana PA unless otherwise specified.

Environmental Service Laboratories, Inc., Indiana, PA/TNI Certification #32-00382

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia Street
Indiana, PA 15701
P: (724) 463-8378
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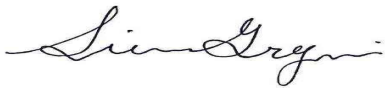
950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/05/2021 09:36

Approved By



Sierra Grguric
Oil & Gas Field Supervisor/Project Manager

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia St.
Indiana, PA 15701
P: 724-463-TEST
F: 724-465-4209

1276 Bentleyville I
Van Voorhis, PA 1
P: 724-258-TEST
F: 724-258-8376

1102291

SAMPLE REQUEST & CHAIN OF CUSTODY

Chain of Custody

(Updated July 2016)

Sample Identification	1102291 ESL#	Sample Date	Sample Time (24-Hour)	Sample Type	Matrix	List Number of Bottles	Container Type (List Size)	Preservative (List Type)	Add/Subtract Parameters/ Comments
SO-01	01	10/26/2021	1000	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-02	02	10/26/2021	1010	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-03	03	10/26/2021	1015	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-04	04	10/26/2021	1020	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-05	05	10/26/2021	1025	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-06	06	10/26/2021	1035	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-07	07	10/26/2021	1040	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-08	08	10/26/2021	1045	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-09	09	10/26/2021	1050	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-10	10	10/26/2021	1105	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-11	11	10/26/2021	1110	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol

Sample Type:	**Matrix:**	**Container Type:**	
G = Grab	**AQ** = Water	**P** = Plastic	**Other**: list
C = Composite	**SO** = Soil	**G** = Glass	
D = Discharge	**SL** = Sludge	**AG** = Amber glass	
O = Other	**O** = Other (list)	**VV** = VOA Vial	

THE UNDERSIGNED PURCHASER HEREBY AGREES TO PAY SERVICE CHARGES ON ACCOUNTS OVER 31 DAYS OLD

1. THESE SERVICE CHARGES WILL ACCRUE AT THE RATE OF 1 1/2% PER MONTH (18% PER ANNUM OR THE MAXIMUM ALLOWED BY LAW.)
2. THE UNDERSIGNED PURCHASER AGREES TO PAY, IN THE EVENT HIS ACCOUNT BECOMES DELINQUENT AND IS TURNED OVER TO ANY ATTORNEY FOR COLLECTION, REASONABLE ATTORNEY'S FEES PLUS ALL COURT AND ATTENDANT COLLECTION COSTS.

Moody & Associates, Inc.
1720 Washington Road
Washington, PA 15301
(724) 746-5200

Sampled By: (Signature) Jona M Stoskey	Date/Time 10/27/21 0940	Received By: (Signature) Amanda Shay	Date/Time 10-27-21 9:40
Relinquished By: (Signature) Amanda Shay 10-27-21	Date/Time 1700	Received By: (Signature)	Date/Time 10-27-21 1500
Relinquished By: (Signature) 1027	Date/Time	Received By: (Signature) D	Date/Time 10/27/21 17:00 1073SV

Sampler: Jona Stoskey and Brittany Dengler

Project #:	21-315-JB
Project Name:	David Reinbeau Pad Sampling
Project Manager:	Jessie Bobrzynski
Invoice to:	Bill Directly to SWN c/o Joshua Boyda

LAB USE ONLY

Correct Preservations Y / N / NA **Correct Containers** Y / N / NA **Receipt Temperature** _____

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia St.
Indiana, PA 15701
P: 724-463-TEST
F: 724-465-4209

1276 Bentleyville Rd.
Van Voorhis, PA 15366
P: 724-258-TEST
F: 724-258-8376

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Wil
P:
F: !

1102291

SAMPLE REQUEST & CHAIN OF CUSTODY

Chain of Custody

(Updated July 2016)

Sample Identification	1102291 ESL#	Sample Date	Sample Time (24-Hour)	Sample Type	Matrix	List Number of Bottles	Container Type (List Size)	Preservative (List Type)	Add/Subtract Parameters/ Comments
SO-12	12	10/26/2021	1115	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
SO-13	13	10/26/2021	1120	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
BG-01	14	10/26/2021	1140	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol
BG-02	15	10/26/2021	1145	G	SO	1	1 - 4oz glass jar	None	Ethylene Glycol

Sample Type:	Matrix:	Container Type:	
G = Grab	AQ = Water	P = Plastic	Other: list
C = Composite	SO = Soil	G = Glass	
D = Discharge	SL = Sludge	AG = Amber glass	
O = Other	O = Other (list)	VV = VOA Vial	

THE UNDERSIGNED PURCHASER HEREBY AGREES TO PAY SERVICE CHARGES ON ACCOUNTS OVER 31 DAYS OLD
1. THESE SERVICE CHARGES WILL ACCRUE AT THE RATE OF 1 1/2% PER MONTH (18% PER ANNUM OR THE MAXIMUM ALLOWED BY LAW.)
2. THE UNDERSIGNED PURCHASER AGREES TO PAY, IN THE EVENT HIS ACCOUNT BECOMES DELINQUENT AND IS TURNED OVER TO ANY ATTORNEY FOR COLLECTION, REASONABLE ATTORNEY'S FEES PLUS ALL COURT AND ATTENDANT COLLECTION COSTS.

		Moody & Associates, Inc. **1720 Washington Road** **Washington, PA 15301** **(724) 746-5200**
Sampled By: (Signature) Jona M Stoskey — Date/Time 10/27/21 0940	Received By: (Signature) Amanda Shay — Date/Time 10-27-21 9:40	**Sampler:** Jona Stoskey and Brittany Dengler
Relinquished By: (Signature) Amanda Shay 10-27-21 — Date/Time 1700	Received By: (Signature) — Date/Time	**Project #:** 21-315-JB
		Project Name: David Reinbeau Pad Sampling
Relinquished By: (Signature) — Date/Time	Received By: (Signature) D — Date/Time 10/27/21 1700	**Project Manager:** Jessie Bobrzynski
LAB USE ONLY		**Invoice to:** Bill Directly to SWN c/o Joshua Boyda
Correct Preservations Y / N / NA	**Correct Containers** Y / N / NA	**Receipt Temperature** _____

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE RECEIPT AND REVIEW FORM

Client: Moody	Work Orde 1102291

PART A: GENERAL INFORMATION- SATELLITE LABORATORY

Received by/Lab ID:	**Date/Time Received:** / / _____
Method of Delivery: Client Drop-Off ESL Courier Other: _____	**Received on Ice?** YES NO
Sample Receipt Temperature: _____ °C	**IR Gun ID:**
Containers Removed by Satellite Lab for Analysis of: FECAL TC/EC TC MPN EC MPN TC/EC MPN (N/A)	

PART B: GENERAL INFORMATION- INDIANA LABORATORY

Received by/Lab ID: ES IW352	**Samples Received on Ice?** (YES) NO
Date/Time Received: 10/27/21 1700	**Date Sampled:** 10/26/21
Method of Delivery: FedEx UPS Client Drop off ESL courier Other: _____	
Sample Receipt Temperature: 4.1 °C	**IR Gun ID:** 4
Sample State of Collection: (PA) NY OH WV Other: _____	**PWSID Compliance Drinking Water Samples:** YES (NO)

PART C: Receipt Details

Completed (if different from above): _____ / / _____
Signature Date Time

Sample Receipt Criteria		Comments/Qualifiers (Required for Non-Conforming Items)
Chain of custody documents included with samples?	YES NO	Comments:
COC form is properly signed in relinquished/received sections?	YES NO	Comments:
Sample containers intact and sealed?	YES NO	Circle Applicable: Damaged Container Leaking Container Custody Seal Broken Other: _____
Number of containers received matches number indicated on COC?	YES NO	Sample IDs and Containers Affected:
Sample IDs on COC match IDs on bottles?	YES NO	Sample IDs and Containers Affected:
Date and time on COC match date and time on bottles?	YES NO	Sample IDs and Containers Affected:
Samples received within holding time?	YES NO	Sample IDs and Containers Affected:
Samples received at appropriate pH for analysis requested?	YES NO	Sample IDs and Containers Affected and Observed pH:
Samples requiring thermal preservation within 0 ≤ 6°C? Microbiology within 0 ≤ 10°C?	YES NO	For non-WV samples outside of thermal preservation range sampled same day and received on ice are considered acceptable as long as the cooling process has begun.
Adequate sample volume received?	YES NO	Analyses Affected:
VOA vials free of headspace (defined as < 6 mm bubble)?	YES (NO)	Sample IDs and Containers Affected:

Other Comments:	Deficiency Log Created: YES (NO)

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Wednesday, November 3, 2021

Sierra Grguric
ENVIRONMENTAL SERVICE LAB
1803 PHILADELPHIA STREET
INDIANA, PA 15701

Order No.: G2110H96

Dear Sierra Grguric:

Geochemical Testing received 15 sample(s) on 10/29/2021 for the analyses presented in the following report.

There were no problems with sample receipt protocols and analyses met the TNI/NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Geochemical Testing

Date: *03-Nov-21*

CLIENT: ENVIRONMENTAL SERVICE LAB
Project:
Lab Order: G2110H96

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

H - Method Hold Time exceeded and is not compliant with 40CFR136 Table II.

U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.

B - Analyte detected in the associated Method Blank

Q1 - See case narrative ND - Not Detected

MCL - Contaminant Limit J - Indicates an estimated value.

Q - Qualifier QL -Quantitation Limit DF - Dilution Factor

S - Surrogate Recovery outside accepted recovery limits

T - Sample received above required temperature and is not compliant with 40CFR136 Table II.

T1 - Sample received above required temperature

MDA - Minimum Detectable Activity.

** - Value exceeds Action Limit

TICs - Tentatively Identified Compounds.

E - Value above quantitation range

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-01
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-001	**Collection Date:**	10/26/2021 10:00:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 5:36 PM
Surr: 1,2-butanediol	107	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 5:36 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	88.4	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-02
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-002	**Collection Date:**	10/26/2021 10:10:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 5:50 PM
Surr: 1,2-butanediol	87.8	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 5:50 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	88.0	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-03
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-003	**Collection Date:**	10/26/2021 10:15:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 6:03 PM
Surr: 1,2-butanediol	94.2	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 6:03 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	90.8	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-04
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-004	**Collection Date:**	10/26/2021 10:20:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 6:17 PM
Surr: 1,2-butanediol	95.9	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 6:17 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	91.8	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-05
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-005	**Collection Date:**	10/26/2021 10:25:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 6:30 PM
Surr: 1,2-butanediol	99.2	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 6:30 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	88.9	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-06
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-006	**Collection Date:**	10/26/2021 10:35:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 6:44 PM
Surr: 1,2-butanediol	90.2	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 6:44 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	90.6	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-07
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-007	**Collection Date:**	10/26/2021 10:40:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 6:58 PM
Surr: 1,2-butanediol	83.1	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 6:58 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	90.6	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-08
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-008	**Collection Date:**	10/26/2021 10:45:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 7:11 PM
Surr: 1,2-butanediol	88.5	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 7:11 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	90.2	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-09
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-009	**Collection Date:**	10/26/2021 10:50:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 7:24 PM
Surr: 1,2-butanediol	84.4	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 7:24 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	92.2	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-10
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-010	**Collection Date:**	10/26/2021 11:05:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 7:38 PM
Surr: 1,2-butanediol	88.0	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 7:38 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	90.3	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-11
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-011	**Collection Date:**	10/26/2021 11:10:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 7:52 PM
Surr: 1,2-butanediol	99.5	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 7:52 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	91.7	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-12
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-012	**Collection Date:**	10/26/2021 11:15:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 8:05 PM
Surr: 1,2-butanediol	88.0	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 8:05 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	90.0	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-13
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-013	**Collection Date:**	10/26/2021 11:20:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 8:19 PM
Surr: 1,2-butanediol	91.9	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 8:19 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	89.6	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-14
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-014	**Collection Date:**	10/26/2021 11:40:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 8:32 PM
Surr: 1,2-butanediol	114	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 8:32 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	92.4	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

Laboratory Results

Geochemical Testing

Date: *03-Nov-21*

CLIENT:	ENVIRONMENTAL SERVICE LAB	**Client Sample ID:**	1102291-15
Lab Order:	G2110H96		
Project:		**Sampled By:**	Environmental Service Labs
Lab ID:	G2110H96-015	**Collection Date:**	10/26/2021 11:45:00 AM
Matrix:	SOLID	**Received Date:**	10/29/2021 3:41:47 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
GCFID GLYCOL ANALYSIS SOLIDS		Analyst: **AJR**				**EPA 8015 C**	**EPA 8015 C**
Ethylene Glycol	< 100	100		mg/Kg	1	11/01/21 2:21 PM	11/02/21 8:46 PM
Surr: 1,2-butanediol	111	50-130		%REC	1	11/01/21 2:21 PM	11/02/21 8:46 PM
TOTAL SOLID ANALYSIS		Analyst: **JIM**				**SM 2540 G**	**SM 2540 G**
Percent Total Solids	86.4	0.20		%	1	11/01/21 9:09 AM	11/01/21 12:00 AM

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05 November 2021

Moody & Associates, Inc. (Washington Office)
Attn: Jessie Bobrzynski
1720 Washington Road
Washington, PA 15301

Work Order: 1102446
Project: Water 21-315-JB

Report of Analysis

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received	Sample Notes
AQ-01	1102446-01	Water	10/28/2021 11:00	10/29/21 16:00	
AQ-02	1102446-02	Water	10/28/2021 12:45	10/29/21 16:00	
AQ-03	1102446-03	Water	10/28/2021 13:10	10/29/21 16:00	
Trip Blank	1102446-04	Water	10/28/2021 09:00	10/29/21 16:00	

Report Narrative

The results contained in this report are only representative of the samples received. Environmental Service Laboratories, Inc. is not responsible for use or interpretation of the data included herein.

PAHS subcontracted to Pace Analytical Services, LLC., WV-DEP ID 143; please see attached subcontract laboratory Report of Analysis for results.

Definitions

J The reported result is an estimated value less than the Reporting Limit (RL) but greater than the Method Detection Limit (MDL).

RL Reporting Limit

MDL Method Detection Limit

Certifications

Analyses performed by Environmental Service Laboratories, Inc., Indiana PA unless otherwise specified.

Environmental Service Laboratories, Inc., Indiana, PA/TNI Certification #32-00382

Approved By

Sierra Grguric
Oil & Gas Field Supervisor/Project Manager

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Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/05/2021 13:02

Lab Sample ID#: 1102446-01
Sample Type: Water
Sample Source: Grab
Sampler: Client
Client Sample ID: AQ-01

Sample Date: 10/28/2021 11:00
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: EPA300.0 2.1**					**Prep Method: No Prep - WetChem**		
Chloride	8.01	mg/L		0.303	2.00	TLL	10/30/21 20:02	10/30/21 20:02
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: Purge and Trap**		
Benzene	<0.510	ug/L		0.510	1.00	MJK	11/01/21 11:47	11/01/21 11:47
Toluene	<0.380	ug/L		0.380	1.00	MJK	11/01/21 11:47	11/01/21 11:47
Ethyl Benzene	<0.360	ug/L		0.360	1.00	MJK	11/01/21 11:47	11/01/21 11:47
m,p-Xylenes	<0.820	ug/L		0.820	2.00	MJK	11/01/21 11:47	11/01/21 11:47
o-Xylene	<0.210	ug/L		0.210	1.00	MJK	11/01/21 11:47	11/01/21 11:47
Total Xylenes	<0.820	ug/L		0.820	1.00	MJK	11/01/21 11:47	11/01/21 11:47
Surrogate: 1,2-Dichloroethane-d4	*97 %*		*80-120*			*MJK*	*11/01/21 11:47*	*11/01/21 11:47*
Surrogate: Toluene-d8	*102 %*		*88-110*			*MJK*	*11/01/21 11:47*	*11/01/21 11:47*
Surrogate: 4-Bromofluorobenzene	*100 %*		*86-115*			*MJK*	*11/01/21 11:47*	*11/01/21 11:47*
Organics	**Analytical Method: EPA8015C**					**Prep Method: No prep - Organics**		
Ethylene glycol	<0.638	mg/L		0.638	5.00	APC	11/01/21 17:16	11/01/21 17:16
Surrogate: 1,4-Butanediol	*91 %*		*80-120*			*APC*	*11/01/21 17:16*	*11/01/21 17:16*

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Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/05/2021 13:02

Lab Sample ID#: 1102446-02
Sample Type: Water
Sample Source: Grab
Sampler: Client
Client Sample ID: AQ-02

Sample Date: 10/28/2021 12:45
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: EPA300.0 2.1**					**Prep Method: No Prep - WetChem**		
Chloride	40.9	mg/L		0.303	2.00	TLL	10/30/21 20:21	10/30/21 20:21
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: Purge and Trap**		
Benzene	<0.510	ug/L		0.510	1.00	MJK	11/01/21 12:13	11/01/21 12:13
Toluene	<0.380	ug/L		0.380	1.00	MJK	11/01/21 12:13	11/01/21 12:13
Ethyl Benzene	<0.360	ug/L		0.360	1.00	MJK	11/01/21 12:13	11/01/21 12:13
m,p-Xylenes	<0.820	ug/L		0.820	2.00	MJK	11/01/21 12:13	11/01/21 12:13
o-Xylene	<0.210	ug/L		0.210	1.00	MJK	11/01/21 12:13	11/01/21 12:13
Total Xylenes	<0.820	ug/L		0.820	1.00	MJK	11/01/21 12:13	11/01/21 12:13
Surrogate: 1,2-Dichloroethane-d4	*99 %*		*80-120*			*MJK*	*11/01/21 12:13*	*11/01/21 12:13*
Surrogate: Toluene-d8	*101 %*		*88-110*			*MJK*	*11/01/21 12:13*	*11/01/21 12:13*
Surrogate: 4-Bromofluorobenzene	*98 %*		*86-115*			*MJK*	*11/01/21 12:13*	*11/01/21 12:13*
Organics	**Analytical Method: EPA8015C**					**Prep Method: No prep - Organics**		
Ethylene glycol	<0.638	mg/L		0.638	5.00	APC	11/01/21 17:31	11/01/21 17:31
Surrogate: 1,4-Butanediol	*86 %*		*80-120*			*APC*	*11/01/21 17:31*	*11/01/21 17:31*

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Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/05/2021 13:02

Lab Sample ID#: 1102446-03
Sample Type: Water
Sample Source: Grab
Sampler: Client
Client Sample ID: AQ-03

Sample Date: 10/28/2021 13:10
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: EPA300.0 2.1**					**Prep Method: No Prep - WetChem**		
Chloride	5.97	mg/L		0.303	2.00	TLL	10/30/21 20:39	10/30/21 20:39
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: Purge and Trap**		
Benzene	<0.510	ug/L		0.510	1.00	MJK	11/01/21 12:38	11/01/21 12:38
Toluene	<0.380	ug/L		0.380	1.00	MJK	11/01/21 12:38	11/01/21 12:38
Ethyl Benzene	<0.360	ug/L		0.360	1.00	MJK	11/01/21 12:38	11/01/21 12:38
m,p-Xylenes	<0.820	ug/L		0.820	2.00	MJK	11/01/21 12:38	11/01/21 12:38
o-Xylene	<0.210	ug/L		0.210	1.00	MJK	11/01/21 12:38	11/01/21 12:38
Total Xylenes	<0.820	ug/L		0.820	1.00	MJK	11/01/21 12:38	11/01/21 12:38
Surrogate: 1,2-Dichloroethane-d4	*99 %*		*80-120*			*MJK*	*11/01/21 12:38*	*11/01/21 12:38*
Surrogate: Toluene-d8	*102 %*		*88-110*			*MJK*	*11/01/21 12:38*	*11/01/21 12:38*
Surrogate: 4-Bromofluorobenzene	*100 %*		*86-115*			*MJK*	*11/01/21 12:38*	*11/01/21 12:38*
Organics	**Analytical Method: EPA8015C**					**Prep Method: No prep - Organics**		
Ethylene glycol	<0.638	mg/L		0.638	5.00	APC	11/01/21 17:47	11/01/21 17:47
Surrogate: 1,4-Butanediol	*89 %*		*80-120*			*APC*	*11/01/21 17:47*	*11/01/21 17:47*

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Indiana, PA 15701
P: (724) 463-8378
F: (724) 465-4209
PADEP: 32-00382

1276 Bentleyville Road
Van Voorhis, PA 15366
P: (724) 258-8378
F: (724) 258-8376
PADEP: 63-04247

435 Broad Street
Montoursville, PA 17754
P: (570) 321-9002
F: (570) 321-1957
PADEP: 41-04880

950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/05/2021 13:02

Lab Sample ID#: 1102446-04
Sample Type: Water
Sample Source: Trip Blank
Sampler: Client
Client Sample ID: Trip Blank

Sample Date: 10/28/2021 09:00
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: Purge and Trap**		
Benzene	<0.510	ug/L		0.510	1.00	MJK	11/01/21 13:03	11/01/21 13:03
Toluene	0.960	ug/L	J	0.380	1.00	MJK	11/01/21 13:03	11/01/21 13:03
Ethyl Benzene	<0.360	ug/L		0.360	1.00	MJK	11/01/21 13:03	11/01/21 13:03
m,p-Xylenes	<0.820	ug/L		0.820	2.00	MJK	11/01/21 13:03	11/01/21 13:03
o-Xylene	<0.210	ug/L		0.210	1.00	MJK	11/01/21 13:03	11/01/21 13:03
Total Xylenes	<0.820	ug/L		0.820	1.00	MJK	11/01/21 13:03	11/01/21 13:03
Surrogate: 1,2-Dichloroethane-d4	*100 %*		*80-120*			*MJK*	*11/01/21 13:03*	*11/01/21 13:03*
Surrogate: Toluene-d8	*104 %*		*88-110*			*MJK*	*11/01/21 13:03*	*11/01/21 13:03*
Surrogate: 4-Bromofluorobenzene	*99 %*		*86-115*			*MJK*	*11/01/21 13:03*	*11/01/21 13:03*

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE REQUEST & CHAIN OF CUSTODY

PAGE 1 OF 1

HEADQUARTERS
1803 Philadelphia St.
Indiana, PA 15701
(724) 463-TEST
FAX: (724) 465-4209

SOUTHERN DIVISION
1276 Bentleyville Road
Van Voorhis, PA 15366
(724) 258-TEST
FAX: (724) 258-8376

NO
435
Moi
(57(
FAX

EST DIVISION
Street
, PA 16150
TEST
FAX: (724) 465-4209

1102446

Requested TAT:
Rush 3 days
Standard

FOR INTERNAL LABORATORY USE ONLY

Sample Identification	ESL# 1102446	Sample Type: Composite Date on/off	Composite Time on/off	Grab Date	Grab Time	Matrix	# of Containers	Container Type / Preservative	Analysis Requested
AQ-01	01			10/28/21	11:00	W	3	VOA Vial 40mL HCl	BTEX
						W	1	Poly 500mL None	Chloride
						W	1	Amber Glass Liter None	PAHS
						W	3	VOA Vial 40mL None	Ethylene Glycol
AQ-02	02			10/28/21	12:45	W	3	VOA Vial 40mL HCl	BTEX
						W	1	Poly 500mL None	Chloride
						W	1	Amber Glass Liter None	PAHS
						W	3	VOA Vial 40mL None	Ethylene Glycol

THE UNDERSIGNED PURCHASER HEREBY AGREES TO PAY SERVICE CHARGES ON ACCOUNTS OVER 31 DAYS OLD.
1. THESE SERVICE CHARGES WILL ACCRUE AT THE RATE OF 1 1/2% PER MONTH (18% PER ANNUM OR THE MAXIMUM ALLOWED BY LAW.)
2. THE UNDERSIGNED PURCHASER AGREES TO PAY, IN THE EVENT HIS ACCOUNT BECOMES DELINQUENT AND IS TURNED OVER TO ANY ATTORNEY FOR COLLECTION, REASONABLE ATTORNEY'S FEES PLUS ALL COURT AND ATTENDANT COLLECTION COSTS.

Project Notes: 21-315-JB
Direct Bill to SWN (Josh Boyda)

	Sampled By: (Signature)	Date/ Time	Relinquished By: (Signature)	Date/ Time	Received By: (Signature)	Date/ Time
1	Jessie Bobrzynski	10/28/21 ~~0955~~ 1340				
2	Jessie Bobrzynski	10/29/21 0955	Amanda Shay	10-29-21 9:55		
3			Amanda Shay	10-29-21 10:30	Amanda Shay (04247)	10-29-21 10:30
4						
5						

	Relinquished By: (Signature)	Date/ Time	Received By: (Signature)	Date/ Time
3				
4				
5				

3				
4				
5				

| | Relinquished By: (Signature) | Date/ Time | Received By: (Signature) | Date/ Time

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE REQUEST & CHAIN OF CUSTODY

PAGE 1 OF 1

HEADQUARTERS
1803 Philadelphia St.
Indiana, PA 15701
(724) 463-TEST
FAX: (724) 465-4209

SOUTHERN DIVISION [X]
1276 Bentleyville Road
Van Voorhis, PA 15366
(724) 258-TEST
FAX: (724) 258-8376

NORT [ ]
435 Br
Monto
(570)
FAX: (

T DIVISION [ ]
eet
A 16150
ST
65-4209

1102446

Requested TAT:
Rush 3 days [X]
Standard [ ]

FOR INTERNAL LABORATORY USE ONLY

Sample Identification	ESL#	Sample Type: Composite Date on/off	Composite Time on/off	Grab Date	Grab Time	Matrix	# of Containers	Container Type / Preservative	Analysis Requested
AQ-03	03			10/28/21	13:10	W	3	VOA Vial 40mL HCl	BTEX
						W	1	Poly 500mL None	Chloride
						W	4	Amber Glass 8 oz None	PAHS
						W	3	VOA Vial 40mL None	Ethylene Glycol
Trip Blank	04			10/28/21	09:00	W	2	VOA Vial 40mL HCl	BTEX

THE UNDERSIGNED PURCHASER HEREBY AGREES TO PAY SERVICE CHARGES ON ACCOUNTS OVER 31 DAYS OLD.
1. THESE SERVICE CHARGES WILL ACCRUE AT THE RATE OF 1 1/2% PER MONTH (18% PER ANNUM OR THE MAXIMUM ALLOWED BY LAW.)
2. THE UNDERSIGNED PURCHASER AGREES TO PAY, IN THE EVENT HIS ACCOUNT BECOMES DELINQUENT AND IS TURNED OVER TO ANY ATTORNEY FOR COLLECTION, REASONABLE ATTORNEY'S FEES PLUS ALL COURT AND ATTENDANT COLLECTION COSTS.

Project Notes: 21-315-JB
Direct Bill to SWN (Josh Boyda)

	Sampled By: (Signature)	Date/ Time	Received By: (Signature)	Date/ Time
	Jessie Bobrzynski	10/28/21 ~~0955~~ 1340 JB		
	Jessie Bobrzynski	10/29/21 0955	Amanda Athy	10-29-21 9:55
	Relinquished By: (Signature)	Date/ Time	Received By: (Signature)	Date/ Time
	Amanda Athy	10-29-21 10:30	Amanda Athy (04247)	10-29-21 10:30
	Relinquished By: (Signature)	Date/ Time	Received By: (Signature)	Date/ Time
		10-29-21 1330		10-29-21 1330
	Relinquished By: (Signature)	Date/ Time	Received By: (Signature)	Date/ Time
		10-29-21 1520		10/29/21 1600 (10882)

Correct Preservations Y / N / NA **Correct Containers** Y / N / NA **Receipt Temperature** _____

Company/Name:	**Moody & Associates (Washington, PA)**
Address:	1720 Washington Road, Suite 100
	Washington, PA 15301
Contact Person:	Jessie Bobrzynski
Phone Number:	724-554-5339
Email Address:	Jbobrzynski@moody-s.com
State of Collection:	WV

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE RECEIPT AND REVIEW FORM

1102446

Client: Moody - AQ-03	WO (if here)

PART A: GENERAL INFORMATION- SATELLITE LABORATORY

Received by/Lab ID: 04247	**Date/Time Received:** 10/29/21 10:30
Method of Delivery: Client Drop-Off (ESL Courier) Other: _____	**Received on Ice?** (YES) NO
Sample Receipt Temperature: 6.5 °C	**IR Gun ID:** #7
Containers Removed by Satellite Lab for Analysis of: FECAL TC/EC TC MPN EC MPN TC/EC MPN (N/A)	

PART B: GENERAL INFORMATION- INDIANA LABORATORY

Received by/Lab ID: SPM (00582)	**Samples Received on Ice?** (YES) NO
Date/Time Received: 10/29/21 1600	**Date Sampled:** 10/28/21
Method of Delivery: FedEx UPS Client Drop off (ESL courier) Other: _____	
Sample Receipt Temperature: 2.9 °C	**IR Gun ID:** 3
Sample State of Collection: (PA) NY OH (WV) Other: _____ SPM 10/29/21	**PWSID Compliance Drinking Water Samples:** YES (NO)

PART C: Receipt Details

Completed (if different from above): _____ (Signature) / / (Date) _____ (Time)

Sample Receipt Criteria		Comments/Qualifiers (Required for Non-Conforming Items)
Chain of custody documents included with samples?	YES NO	Comments:
COC form is properly signed in relinquished/received sections?	YES NO	Comments:
Sample containers intact and sealed?	YES NO	Circle Applicable: Damaged Container Leaking Container Custody Seal Broken Other: _____
Number of containers received matches number indicated on COC?	YES NO	Sample IDs and Containers Affected:
Sample IDs on COC match IDs on bottles?	YES NO	Sample IDs and Containers Affected:
Date and time on COC match date and time on bottles?	YES NO	Sample IDs and Containers Affected:
Samples received within holding time?	YES NO	Sample IDs and Containers Affected:
Samples received at appropriate pH for analysis requested?	YES NO	Sample IDs and Containers Affected and Observed pH:
Samples requiring thermal preservation within 0 ≤ 6°C? Microbiology within 0 ≤ 10°C?	YES NO	For non-WV samples outside of thermal preservation range sampled same day and received on ice are considered acceptable as long as the cooling process has begun.
Adequate sample volume received?	YES NO	Analyses Affected:
VOA vials free of headspace (defined as < 6 mm bubble)?	YES NO	Sample IDs and Containers Affected:
Other Comments:		**Deficiency Log Created:** YES (NO)

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

November 04, 2021

Mr Richard Rodriguez
Environmental Service Laboratories, Inc.
1803 Philadelphia Street
Indiana, PA 15701

RE: Project: 1102446
Pace Project No.: 30447944

Dear Mr Rodriguez:

Enclosed are the analytical results for sample(s) received by the laboratory on October 30, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:
- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Megan A Rager

Megan A. Rager
megan.rager@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Rebecca Erwin, Environmental Service Laboratories, Inc.

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Greensburg, PA 15601
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CERTIFICATIONS

Project: 1102446
Pace Project No.: 30447944

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1102446
Pace Project No.: 30447944

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30447944001	**1102446-01**	Water	10/28/21 11:00	10/30/21 08:00
30447944002	**1102446-02**	Water	10/28/21 12:45	10/30/21 08:00
30447944003	**1102446-03**	Water	10/28/21 13:10	10/30/21 08:00

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Greensburg, PA 15601
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SAMPLE ANALYTE COUNT

Project: 1102446
Pace Project No.: 30447944

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30447944001	**1102446-01**	EPA 8270E By SIM	CF1	18	PASI-PA
30447944002	**1102446-02**	EPA 8270E By SIM	CF1	18	PASI-PA
30447944003	**1102446-03**	EPA 8270E By SIM	CF1	18	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1102446
Pace Project No.: 30447944

Method: **EPA 8270E By SIM**
Description: 8270E PAH SIM Reduced Volume
Client: Environmental Service Laboratories, Inc.
Date: November 04, 2021

General Information:
3 samples were analyzed for EPA 8270E By SIM by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 470517

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2271670)
  - 2-Fluorobiphenyl (S)
  - Terphenyl-d14 (S)
- MSD (Lab ID: 2271671)
  - 2-Fluorobiphenyl (S)
  - Terphenyl-d14 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

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(724)850-5600

PROJECT NARRATIVE

Project: 1102446
Pace Project No.: 30447944

Method: **EPA 8270E By SIM**
Description: 8270E PAH SIM Reduced Volume
Client: Environmental Service Laboratories, Inc.
Date: November 04, 2021

QC Batch: 470517

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 7394721001

ML: Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.

- MS (Lab ID: 2271670)
  - Benzo(a)anthracene
  - Benzo(a)pyrene
  - Benzo(b)fluoranthene
  - Benzo(k)fluoranthene
  - Chrysene
  - Fluoranthene
- MSD (Lab ID: 2271671)
  - Acenaphthylene
  - Benzo(a)anthracene
  - Benzo(a)pyrene
  - Benzo(b)fluoranthene
  - Benzo(k)fluoranthene
  - Chrysene
  - Dibenz(a,h)anthracene
  - Fluoranthene
  - Pyrene

Additional Comments:

Analyte Comments:

QC Batch: 470517

1c: Sample was extracted using the reduced volume extraction method. Entire bottle not used.

- 1102446-01 (Lab ID: 30447944001)
  - Acenaphthene
  - Acenaphthylene
  - Anthracene
  - Benzo(k)fluoranthene
  - Benzo(g,h,i)perylene
  - Benzo(a)anthracene
  - Benzo(b)fluoranthene
  - Benzo(a)pyrene
  - Chrysene
  - Dibenz(a,h)anthracene
  - Fluorene
  - Fluoranthene
  - Indeno(1,2,3-cd)pyrene
  - Naphthalene
  - Phenanthrene
  - Pyrene
- 1102446-02 (Lab ID: 30447944002)
  - Acenaphthene

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Greensburg, PA 15601
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PROJECT NARRATIVE

Project: 1102446
Pace Project No.: 30447944

Method: **EPA 8270E By SIM**
Description: 8270E PAH SIM Reduced Volume
Client: Environmental Service Laboratories, Inc.
Date: November 04, 2021

Analyte Comments:

QC Batch: 470517

1c: Sample was extracted using the reduced volume extraction method. Entire bottle not used.

- 1102446-02 (Lab ID: 30447944002)
  - Acenaphthylene
  - Anthracene
  - Benzo(k)fluoranthene
  - Benzo(g,h,i)perylene
  - Benzo(a)anthracene
  - Benzo(b)fluoranthene
  - Benzo(a)pyrene
  - Chrysene
  - Dibenz(a,h)anthracene
  - Fluorene
  - Fluoranthene
  - Indeno(1,2,3-cd)pyrene
  - Naphthalene
  - Phenanthrene
  - Pyrene
- 1102446-03 (Lab ID: 30447944003)
  - Acenaphthene
  - Acenaphthylene
  - Anthracene
  - Benzo(k)fluoranthene
  - Benzo(g,h,i)perylene
  - Benzo(a)anthracene
  - Benzo(b)fluoranthene
  - Benzo(a)pyrene
  - Chrysene
  - Dibenz(a,h)anthracene
  - Fluorene
  - Fluoranthene
  - Indeno(1,2,3-cd)pyrene
  - Naphthalene
  - Phenanthrene
  - Pyrene

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- MS (Lab ID: 2271670)
  - Acenaphthene
  - Acenaphthylene
  - Anthracene
  - Benzo(k)fluoranthene
  - Benzo(g,h,i)perylene
  - Benzo(a)anthracene
  - Benzo(b)fluoranthene

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1102446
Pace Project No.: 30447944

Method: **EPA 8270E By SIM**
Description: 8270E PAH SIM Reduced Volume
Client: Environmental Service Laboratories, Inc.
Date: November 04, 2021

Analyte Comments:

QC Batch: 470517

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- MS (Lab ID: 2271670)
  - Benzo(a)pyrene
  - Chrysene
  - Dibenz(a,h)anthracene
  - Fluorene
  - Fluoranthene
  - Indeno(1,2,3-cd)pyrene
  - Naphthalene
  - Phenanthrene
  - Pyrene
- MSD (Lab ID: 2271671)
  - Acenaphthene
  - Acenaphthylene
  - Anthracene
  - Benzo(k)fluoranthene
  - Benzo(g,h,i)perylene
  - Benzo(a)anthracene
  - Benzo(b)fluoranthene
  - Benzo(a)pyrene
  - Chrysene
  - Dibenz(a,h)anthracene
  - Fluorene
  - Fluoranthene
  - Indeno(1,2,3-cd)pyrene
  - Naphthalene
  - Phenanthrene
  - Pyrene

This data package has been reviewed for quality and completeness and is approved for release.

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Greensburg, PA 15601
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ANALYTICAL RESULTS

Project: 1102446
Pace Project No.: 30447944

Sample: 1102446-01 **Lab ID: 30447944001** Collected: 10/28/21 11:00 Received: 10/30/21 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E PAH SIM Reduced Volume	Analytical Method: EPA 8270E By SIM Preparation Method: EPA 3510C Pace Analytical Services - Greensburg								
Acenaphthene	**0.10 U**	ug/L	0.10	0.023	1	11/01/21 13:05	11/01/21 19:01	83-32-9	1c
Acenaphthylene	**0.10 U**	ug/L	0.10	0.021	1	11/01/21 13:05	11/01/21 19:01	208-96-8	1c
Anthracene	**0.10 U**	ug/L	0.10	0.022	1	11/01/21 13:05	11/01/21 19:01	120-12-7	1c
Benzo(a)anthracene	**0.10 U**	ug/L	0.10	0.081	1	11/01/21 13:05	11/01/21 19:01	56-55-3	1c
Benzo(a)pyrene	**0.10 U**	ug/L	0.10	0.026	1	11/01/21 13:05	11/01/21 19:01	50-32-8	1c
Benzo(b)fluoranthene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:01	205-99-2	1c
Benzo(g,h,i)perylene	**0.10 U**	ug/L	0.10	0.031	1	11/01/21 13:05	11/01/21 19:01	191-24-2	1c
Benzo(k)fluoranthene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:01	207-08-9	1c
Chrysene	**0.10 U**	ug/L	0.10	0.033	1	11/01/21 13:05	11/01/21 19:01	218-01-9	1c
Dibenz(a,h)anthracene	**0.10 U**	ug/L	0.10	0.031	1	11/01/21 13:05	11/01/21 19:01	53-70-3	1c
Fluoranthene	**0.10 U**	ug/L	0.10	0.020	1	11/01/21 13:05	11/01/21 19:01	206-44-0	1c
Fluorene	**0.10 U**	ug/L	0.10	0.022	1	11/01/21 13:05	11/01/21 19:01	86-73-7	1c
Indeno(1,2,3-cd)pyrene	**0.10 U**	ug/L	0.10	0.033	1	11/01/21 13:05	11/01/21 19:01	193-39-5	1c
Naphthalene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:01	91-20-3	1c
Phenanthrene	**0.10 U**	ug/L	0.10	0.027	1	11/01/21 13:05	11/01/21 19:01	85-01-8	1c
Pyrene	**0.10 U**	ug/L	0.10	0.021	1	11/01/21 13:05	11/01/21 19:01	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	70	%.	19-92		1	11/01/21 13:05	11/01/21 19:01	321-60-8	
Terphenyl-d14 (S)	82	%.	55-109		1	11/01/21 13:05	11/01/21 19:01	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: 1102446
Pace Project No.: 30447944

Sample: 1102446-02 **Lab ID: 30447944002** Collected: 10/28/21 12:45 Received: 10/30/21 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E PAH SIM Reduced Volume	Analytical Method: EPA 8270E By SIM Preparation Method: EPA 3510C Pace Analytical Services - Greensburg								
Acenaphthene	**0.10 U**	ug/L	0.10	0.023	1	11/01/21 13:05	11/01/21 19:18	83-32-9	1c
Acenaphthylene	**0.10 U**	ug/L	0.10	0.021	1	11/01/21 13:05	11/01/21 19:18	208-96-8	1c
Anthracene	**0.10 U**	ug/L	0.10	0.022	1	11/01/21 13:05	11/01/21 19:18	120-12-7	1c
Benzo(a)anthracene	**0.10 U**	ug/L	0.10	0.081	1	11/01/21 13:05	11/01/21 19:18	56-55-3	1c
Benzo(a)pyrene	**0.10 U**	ug/L	0.10	0.026	1	11/01/21 13:05	11/01/21 19:18	50-32-8	1c
Benzo(b)fluoranthene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:18	205-99-2	1c
Benzo(g,h,i)perylene	**0.10 U**	ug/L	0.10	0.031	1	11/01/21 13:05	11/01/21 19:18	191-24-2	1c
Benzo(k)fluoranthene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:18	207-08-9	1c
Chrysene	**0.10 U**	ug/L	0.10	0.033	1	11/01/21 13:05	11/01/21 19:18	218-01-9	1c
Dibenz(a,h)anthracene	**0.10 U**	ug/L	0.10	0.031	1	11/01/21 13:05	11/01/21 19:18	53-70-3	1c
Fluoranthene	**0.10 U**	ug/L	0.10	0.020	1	11/01/21 13:05	11/01/21 19:18	206-44-0	1c
Fluorene	**0.10 U**	ug/L	0.10	0.022	1	11/01/21 13:05	11/01/21 19:18	86-73-7	1c
Indeno(1,2,3-cd)pyrene	**0.10 U**	ug/L	0.10	0.033	1	11/01/21 13:05	11/01/21 19:18	193-39-5	1c
Naphthalene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:18	91-20-3	1c
Phenanthrene	**0.10 U**	ug/L	0.10	0.027	1	11/01/21 13:05	11/01/21 19:18	85-01-8	1c
Pyrene	**0.10 U**	ug/L	0.10	0.021	1	11/01/21 13:05	11/01/21 19:18	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	71	%.	19-92		1	11/01/21 13:05	11/01/21 19:18	321-60-8	
Terphenyl-d14 (S)	80	%.	55-109		1	11/01/21 13:05	11/01/21 19:18	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: 1102446
Pace Project No.: 30447944

Sample: 1102446-03 **Lab ID: 30447944003** Collected: 10/28/21 13:10 Received: 10/30/21 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E PAH SIM Reduced Volume	Analytical Method: EPA 8270E By SIM Preparation Method: EPA 3510C Pace Analytical Services - Greensburg								
Acenaphthene	**0.10 U**	ug/L	0.10	0.023	1	11/01/21 13:05	11/01/21 19:34	83-32-9	1c
Acenaphthylene	**0.10 U**	ug/L	0.10	0.021	1	11/01/21 13:05	11/01/21 19:34	208-96-8	1c
Anthracene	**0.10 U**	ug/L	0.10	0.022	1	11/01/21 13:05	11/01/21 19:34	120-12-7	1c
Benzo(a)anthracene	**0.10 U**	ug/L	0.10	0.081	1	11/01/21 13:05	11/01/21 19:34	56-55-3	1c
Benzo(a)pyrene	**0.10 U**	ug/L	0.10	0.026	1	11/01/21 13:05	11/01/21 19:34	50-32-8	1c
Benzo(b)fluoranthene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:34	205-99-2	1c
Benzo(g,h,i)perylene	**0.10 U**	ug/L	0.10	0.031	1	11/01/21 13:05	11/01/21 19:34	191-24-2	1c
Benzo(k)fluoranthene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:34	207-08-9	1c
Chrysene	**0.10 U**	ug/L	0.10	0.033	1	11/01/21 13:05	11/01/21 19:34	218-01-9	1c
Dibenz(a,h)anthracene	**0.10 U**	ug/L	0.10	0.031	1	11/01/21 13:05	11/01/21 19:34	53-70-3	1c
Fluoranthene	**0.10 U**	ug/L	0.10	0.020	1	11/01/21 13:05	11/01/21 19:34	206-44-0	1c
Fluorene	**0.10 U**	ug/L	0.10	0.022	1	11/01/21 13:05	11/01/21 19:34	86-73-7	1c
Indeno(1,2,3-cd)pyrene	**0.10 U**	ug/L	0.10	0.033	1	11/01/21 13:05	11/01/21 19:34	193-39-5	1c
Naphthalene	**0.10 U**	ug/L	0.10	0.042	1	11/01/21 13:05	11/01/21 19:34	91-20-3	1c
Phenanthrene	**0.10 U**	ug/L	0.10	0.027	1	11/01/21 13:05	11/01/21 19:34	85-01-8	1c
Pyrene	**0.10 U**	ug/L	0.10	0.021	1	11/01/21 13:05	11/01/21 19:34	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	63	%.	19-92		1	11/01/21 13:05	11/01/21 19:34	321-60-8	
Terphenyl-d14 (S)	74	%.	55-109		1	11/01/21 13:05	11/01/21 19:34	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: 1102446
Pace Project No.: 30447944

QC Batch: 470517
QC Batch Method: EPA 3510C
Analysis Method: EPA 8270E By SIM
Analysis Description: 8270E PAH by SIM RV MSSV
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30447944001, 30447944002, 30447944003

METHOD BLANK: 2271668 Matrix: Water
Associated Lab Samples: 30447944001, 30447944002, 30447944003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	0.10 U	0.10	0.023	11/01/21 16:32	
Acenaphthylene	ug/L	0.10 U	0.10	0.021	11/01/21 16:32	
Anthracene	ug/L	0.10 U	0.10	0.022	11/01/21 16:32	
Benzo(a)anthracene	ug/L	0.10 U	0.10	0.081	11/01/21 16:32	
Benzo(a)pyrene	ug/L	0.10 U	0.10	0.026	11/01/21 16:32	
Benzo(b)fluoranthene	ug/L	0.10 U	0.10	0.042	11/01/21 16:32	
Benzo(g,h,i)perylene	ug/L	0.10 U	0.10	0.031	11/01/21 16:32	
Benzo(k)fluoranthene	ug/L	0.10 U	0.10	0.042	11/01/21 16:32	
Chrysene	ug/L	0.10 U	0.10	0.033	11/01/21 16:32	
Dibenz(a,h)anthracene	ug/L	0.10 U	0.10	0.031	11/01/21 16:32	
Fluoranthene	ug/L	0.10 U	0.10	0.020	11/01/21 16:32	
Fluorene	ug/L	0.10 U	0.10	0.022	11/01/21 16:32	
Indeno(1,2,3-cd)pyrene	ug/L	0.10 U	0.10	0.033	11/01/21 16:32	
Naphthalene	ug/L	0.10 U	0.10	0.042	11/01/21 16:32	
Phenanthrene	ug/L	0.10 U	0.10	0.027	11/01/21 16:32	
Pyrene	ug/L	0.10 U	0.10	0.021	11/01/21 16:32	
2-Fluorobiphenyl (S)	%.	71	19-92		11/01/21 16:32	
Terphenyl-d14 (S)	%.	80	55-109		11/01/21 16:32	

LABORATORY CONTROL SAMPLE: 2271669

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.8	89	29-110	
Acenaphthylene	ug/L	2	1.7	86	28-121	
Anthracene	ug/L	2	1.9	94	40-115	
Benzo(a)anthracene	ug/L	2	2.3	114	63-119	
Benzo(a)pyrene	ug/L	2	2.0	100	56-121	
Benzo(b)fluoranthene	ug/L	2	2.4	118	61-126	
Benzo(g,h,i)perylene	ug/L	2	2.0	98	53-123	
Benzo(k)fluoranthene	ug/L	2	2.1	104	57-121	
Chrysene	ug/L	2	2.0	99	62-109	
Dibenz(a,h)anthracene	ug/L	2	2.1	106	55-125	
Fluoranthene	ug/L	2	2.0	101	55-121	
Fluorene	ug/L	2	1.9	93	30-119	
Indeno(1,2,3-cd)pyrene	ug/L	2	2.1	106	56-124	
Naphthalene	ug/L	2	1.7	87	26-104	
Phenanthrene	ug/L	2	1.8	92	38-112	
Pyrene	ug/L	2	2.0	102	56-119	
2-Fluorobiphenyl (S)	%.			69	19-92	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: 1102446
Pace Project No.: 30447944

LABORATORY CONTROL SAMPLE: 2271669

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Terphenyl-d14 (S)	%.			82	55-109	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271670 2271671

Parameter	Units	7394721001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/L	2.7	1.9	2	3.2	3.0	26	14	10-125	6	20	D3,IR
Acenaphthylene	ug/L	ND	1.9	2	0.42J	0.38J	22	20	21-116		20	D3,IR, ML
Anthracene	ug/L	ND	1.9	2	0.81J	0.67J	42	34	26-114		20	D3
Benzo(a)anthracene	ug/L	ND	1.9	2	0.97 U	0.98 U	31	26	39-123		20	D3,ML
Benzo(a)pyrene	ug/L	ND	1.9	2	0.30J	0.98 U	16	12	24-126		20	D3,ML
Benzo(b)fluoranthene	ug/L	ND	1.9	2	0.97 U	0.98 U	17	15	24-135		20	D3,ML
Benzo(g,h,i)perylene	ug/L	ND	1.9	2	0.31J	0.98 U	16	13	10-132		20	D3
Benzo(k)fluoranthene	ug/L	ND	1.9	2	0.97 U	0.98 U	18	13	25-123		20	D3,ML
Chrysene	ug/L	ND	1.9	2	0.46J	0.40J	24	20	38-113		20	D3,ML
Dibenz(a,h)anthracene	ug/L	ND	1.9	2	0.97 U	0.98 U	16	12	13-122		20	D3,ML
Fluoranthene	ug/L	ND	1.9	2	0.52J	0.43J	27	22	32-123		20	D3,ML
Fluorene	ug/L	ND	1.9	2	0.50J	0.45J	26	23	10-134		20	D3,IR
Indeno(1,2,3-cd)pyrene	ug/L	ND	1.9	2	0.97 U	0.98 U	14	11	10-132		20	D3
Naphthalene	ug/L	ND	1.9	2	1.0	0.93J	53	47	17-98		20	D3
Phenanthrene	ug/L	ND	1.9	2	0.93J	0.78J	44	36	26-116		20	D3
Pyrene	ug/L	ND	1.9	2	0.59J	0.49J	31	25	31-125		20	D3,ML
2-Fluorobiphenyl (S)	%.						15	15	19-92		20	IR,S4
Terphenyl-d14 (S)	%.						19	16	55-109		20	S4

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1102446
Pace Project No.: 30447944

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1c	Sample was extracted using the reduced volume extraction method. Entire bottle not used.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
IR	The internal standard recovery associated with this result exceeds the upper control limit. The reported result should be considered an estimated value.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1102446
Pace Project No.: 30447944

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30447944001	**1102446-01**	EPA 3510C	470517	EPA 8270E By SIM	470674
30447944002	**1102446-02**	EPA 3510C	470517	EPA 8270E By SIM	470674
30447944003	**1102446-03**	EPA 3510C	470517	EPA 8270E By SIM	470674

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SUBCONTRACT ORDER

Environmental Service Laboratories, Inc.

1102446

Please report all results to **reports@envlabs.com**. Contact ESL with any questions.

SENDING LABORATORY:

Environmental Service Laboratories, Inc.
1803 Philadelphia Street
Indiana, PA 15701
Phone: 724-463-8378
Fax: 724-465-4209
Project Manager: Sierra Grguric

RECEIVING LABORATORY:

Pace Analytical Services, LLC.
1638 Roseytown Road - Suites 2, 3, 4
Greensburg, PA 15601
Phone :(724) 850-5600
Fax: (724) 850-5601

State of Origin: WV

Analysis	Due	Expires	Comments
Sample ID: 1102446-01			
Matrix: Water **Sampled: 10/28/2021 11:00** **Sample Type: Grab** **Sampled By: Client**			
PAH SIMS	11/10/2021 23:00	11/27/2021 11:00	WV
Containers Supplied:			
Amber Glass, 1000mL (E)			
Sample ID: 1102446-02			
Matrix: Water **Sampled: 10/28/2021 12:45** **Sample Type: Grab** **Sampled By: Client**			
PAH SIMS	11/10/2021 23:00	11/27/2021 12:45	WV
Containers Supplied:			
Amber Glass, 1000mL (E)			
Sample ID: 1102446-03			
Matrix: Water **Sampled: 10/28/2021 13:10** **Sample Type: Grab** **Sampled By: Client**			
PAH SIMS	11/10/2021 23:00	11/27/2021 13:10	WV
Containers Supplied:			
Amber Glass, 1000mL (E)			

WO# : 30447944

30447944

Released By	Date	Received By	Date
	10/30/21	Timothy	10/30/21 0700
Timothy	10/30/21 0800		10/30/21 0800
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: ESL Project # #30447944#

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other _____

Label BA
LIMS Login 0317

Tracking #: -

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 4.9 °C Correction Factor: 0.3 °C Final Temp: 4.6 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D3501	Date and Initials of person examining contents: 10-30-21
Chain of Custody Present:	-			1.	
Chain of Custody Filled Out:	-			2.	
Chain of Custody Relinquished:	-			3.	
Sampler Name & Signature on COC:		-		4.	
Sample Labels match COC: -Includes date/time/ID Matrix: WT	-			5.	
Samples Arrived within Hold Time:	-			6.	
Short Hold Time Analysis (<72hr remaining):		-		7.	
Rush Turn Around Time Requested:		-		8.	
Sufficient Volume:	-			9.	
Correct Containers Used: -Pace Containers Used:	-	-		10.	
Containers Intact:	-			11.	
Orthophosphate field filtered			-	12.	
Hex Cr Aqueous sample field filtered			-	13.	
Organic Samples checked for dechlorination:	-		pH<3C	14.	
Filtered volume received for Dissolved tests			-	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	-			16.	
All containers meet method preservation requirements.	-			Initial when completed: JR	Date/time of preservation:
				Lot # of added preservative:	
Headspace in VOA Vials (>6mm):			-	17.	
Trip Blank Present:			-	18.	
Trip Blank Custody Seals Present			-		
Rad Samples Screened < 0.5 mrem/hr	-			Initial when completed: JR	Date: 10-30 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia Street
Indiana, PA 15701
P: (724) 463-8378
F: (724) 465-4209
PADEP: 32-00382

1276 Bentleyville Road
Van Voorhis, PA 15366
P: (724) 258-8378
F: (724) 258-8376
PADEP: 63-04247

435 Broad Street
Montoursville, PA 17754
P: (570) 321-9002
F: (570) 321-1957
PADEP: 41-04880

950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

04 November 2021

Moody & Associates, Inc. (Washington Office)
Attn: Jessie Bobrzynski
1720 Washington Road
Washington, PA 15301

Work Order: 1102447
Project: Solid 21-315-JB

Report of Analysis

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received	Sample Notes
SO-01	1102447-01	Solid	10/28/2021 11:40	10/29/21 16:00	
SO-02	1102447-02	Solid	10/28/2021 12:15	10/29/21 16:00	
SO-03	1102447-03	Solid	10/28/2021 13:40	10/29/21 16:00	

Report Narrative

The results contained in this report are only representative of the samples received. Environmental Service Laboratories, Inc. is not responsible for use or interpretation of the data included herein.

Chloride and PAHS subcontracted to Pace Analytical Services, LLC., WV-DEP ID 143; please see attached subcontract laboratory Report of Analysis for results.

Definitions

RL Reporting Limit

Certifications

Analyses performed by Environmental Service Laboratories, Inc., Indiana PA unless otherwise specified.

Environmental Service Laboratories, Inc., Indiana, PA/TNI Certification #32-00382

Approved By

Sierra Grguric
Oil & Gas Field Supervisor/Project Manager

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia Street
Indiana, PA 15701
P: (724) 463-8378
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1276 Bentleyville Road
Van Voorhis, PA 15366
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PADEP: 63-04247

435 Broad Street
Montoursville, PA 17754
P: (570) 321-9002
F: (570) 321-1957
PADEP: 41-04880

950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/04/2021 08:37

Lab Sample ID#: 1102447-01
Sample Type: Solid
Sample Source: Grab
Sampler: Client
Client Sample ID: SO-01

Sample Date: 10/28/2021 11:40
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: SM2540G**					**Prep Method: Metals No Prep**		
% Solids	70.1	%				BJL	11/01/21 12:40	11/01/21 12:40
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: MeOH Extraction**		
Benzene	<72.7	ug/kg dry		72.7	143	MJK	11/02/21 11:33	11/02/21 11:33
Toluene	<54.2	ug/kg dry		54.2	143	MJK	11/02/21 11:33	11/02/21 11:33
Ethyl Benzene	<51.3	ug/kg dry		51.3	143	MJK	11/02/21 11:33	11/02/21 11:33
m,p-Xylenes	<117	ug/kg dry		117	285	MJK	11/02/21 11:33	11/02/21 11:33
o-Xylene	<30.0	ug/kg dry		30.0	143	MJK	11/02/21 11:33	11/02/21 11:33
Total Xylenes	<117	ug/kg dry		117	143	MJK	11/02/21 11:33	11/02/21 11:33
Surrogate: 1,2-Dichloroethane-d4	*100 %*		*80-120*			*MJK*	*11/02/21 11:33*	*11/02/21 11:33*
Surrogate: Toluene-d8	*103 %*		*88-110*			*MJK*	*11/02/21 11:33*	*11/02/21 11:33*
Surrogate: 4-Bromofluorobenzene	*102 %*		*86-115*			*MJK*	*11/02/21 11:33*	*11/02/21 11:33*

Lab Sample ID#: 1102447-02
Sample Type: Solid
Sample Source: Grab
Sampler: Client
Client Sample ID: SO-02

Sample Date: 10/28/2021 12:15
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: SM2540G**					**Prep Method: Metals No Prep**		
% Solids	81.8	%				BJL	11/01/21 12:40	11/01/21 12:40
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: MeOH Extraction**		
Benzene	<62.4	ug/kg dry		62.4	122	MJK	11/02/21 11:59	11/02/21 11:59
Toluene	<46.5	ug/kg dry		46.5	122	MJK	11/02/21 11:59	11/02/21 11:59
Ethyl Benzene	<44.0	ug/kg dry		44.0	122	MJK	11/02/21 11:59	11/02/21 11:59
m,p-Xylenes	<100	ug/kg dry		100	245	MJK	11/02/21 11:59	11/02/21 11:59
o-Xylene	<25.7	ug/kg dry		25.7	122	MJK	11/02/21 11:59	11/02/21 11:59
Total Xylenes	<100	ug/kg dry		100	122	MJK	11/02/21 11:59	11/02/21 11:59
Surrogate: 1,2-Dichloroethane-d4	*102 %*		*80-120*			*MJK*	*11/02/21 11:59*	*11/02/21 11:59*
Surrogate: Toluene-d8	*102 %*		*88-110*			*MJK*	*11/02/21 11:59*	*11/02/21 11:59*
Surrogate: 4-Bromofluorobenzene	*100 %*		*86-115*			*MJK*	*11/02/21 11:59*	*11/02/21 11:59*

ENVIRONMENTAL SERVICE LABORATORIES, INC.

1803 Philadelphia Street
Indiana, PA 15701
P: (724) 463-8378
F: (724) 465-4209
PADEP: 32-00382

1276 Bentleyville Road
Van Voorhis, PA 15366
P: (724) 258-8378
F: (724) 258-8376
PADEP: 63-04247

435 Broad Street
Montoursville, PA 17754
P: (570) 321-9002
F: (570) 321-1957
PADEP: 41-04880

950 West Main Street
Sharpsville, PA 16150
P: (724) 463-8378 x 500
F: (724) 465-4209
PADEP: 43-04934

Moody & Associates, Inc. (Washington Office)
1720 Washington Road
Washington, PA 15301

Reported: 11/04/2021 08:37

Lab Sample ID#: 1102447-03
Sample Type: Solid
Sample Source: Grab
Sampler: Client
Client Sample ID: SO-03

Sample Date: 10/28/2021 13:40
Receipt Date: 10/29/2021 16:00

Analyte	Sample Result	Units	Data Qualifier	MDL	RL	Analyst/ Certification	Prep Date/Time	Analysis Date/Time
General Chemistry	**Analytical Method: SM2540G**					**Prep Method: Metals No Prep**		
% Solids	76.5	%				BJL	11/01/21 12:40	11/01/21 12:40
Volatile Organics	**Analytical Method: EPA8260D**					**Prep Method: MeOH Extraction**		
Benzene	<66.6	ug/kg dry		66.6	131	MJK	11/02/21 12:24	11/02/21 12:24
Toluene	<49.7	ug/kg dry		49.7	131	MJK	11/02/21 12:24	11/02/21 12:24
Ethyl Benzene	<47.0	ug/kg dry		47.0	131	MJK	11/02/21 12:24	11/02/21 12:24
m,p-Xylenes	<107	ug/kg dry		107	261	MJK	11/02/21 12:24	11/02/21 12:24
o-Xylene	<27.4	ug/kg dry		27.4	131	MJK	11/02/21 12:24	11/02/21 12:24
Total Xylenes	<107	ug/kg dry		107	131	MJK	11/02/21 12:24	11/02/21 12:24
Surrogate: 1,2-Dichloroethane-d4	*101 %*		*80-120*			*MJK*	*11/02/21 12:24*	*11/02/21 12:24*
Surrogate: Toluene-d8	*102 %*		*88-110*			*MJK*	*11/02/21 12:24*	*11/02/21 12:24*
Surrogate: 4-Bromofluorobenzene	*98 %*		*86-115*			*MJK*	*11/02/21 12:24*	*11/02/21 12:24*

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE REQUEST & CHAIN OF CUSTODY

PAGE 1 OF 1

HEADQUARTERS
1803 Philadelphia St.
Indiana, PA 15701
(724) 463-TEST
FAX: (724) 465-4209

SOUTHERN DIVISION
1276 Bentleyville Road
Van Voorhis, PA 15366
(724) 258-TEST
FAX: (724) 258-8376

NORT T DIVISION
435 Br eet
Monto PA 16150
(570) . ST
FAX: (570) 321-1957 465-4209

1102447

Requested TAT:
Rush _____ days
Standard

FOR INTERNAL LABORATORY USE ONLY

Sample Identification	ESL# 1102447	Sample Type: Composite Date on/off	Composite Time on/off	Grab Date	Grab Time	Matrix	# of Containers	Container Type / Preservative	Analysis Requested
SO-01	01			10/28/21	1140	S	3	TerraCore Kit 2 MeOH VOAs, None	BTEX
						S	1	Glass Jar, 8 oz None	PAHS, Chloride
SO-02	02			10/28/21	1215	S	3	TerraCore Kit 2 MeOH VOAs, None	BTEX
						S	1	Glass Jar, 8 oz None	PAHS, Chloride
SO-03	03			10/28/21	1340	S	3	TerraCore Kit 2 MeOH VOAs, None	BTEX
						S	1	Glass Jar, 8 oz None	PAHS, Chloride

THE UNDERSIGNED PURCHASER HEREBY AGREES TO PAY SERVICE CHARGES ON ACCOUNTS OVER 31 DAYS OLD.
1. THESE SERVICE CHARGES WILL ACCRUE AT THE RATE OF 1 1/2% PER MONTH (18% PER ANNUM OR THE MAXIMUM ALLOWED BY LAW.)
2. THE UNDERSIGNED PURCHASER AGREES TO PAY, IN THE EVENT HIS ACCOUNT BECOMES DELINQUENT AND IS TURNED OVER TO ANY ATTORNEY FOR COLLECTION, REASONABLE ATTORNEY'S FEES PLUS ALL COURT AND ATTENDANT COLLECTION COSTS.

Project Notes: 21-315-JB
Direct Bill to SWN (Josh Beyda)

	Sampled By: (Signature)	Date/ Time
	Jessie Bobrzynski	10/28/21 ~~0955~~ 1340 JB
	Jessie Bobrzynski	10/29/21 0955
Relinquished By: (Signature)	Amanda Athy	10-29-21 10:30
Relinquished By: (Signature)	[illegible]	10-29-21 1330
Relinquished By: (Signature)	[illegible]	10-29-21 1520

	Received By: (Signature)	Date/ Time
	Amanda Athy	10-29-21 9:55
	Amanda Athy (04247)	10-29-21 10:30
	[illegible]	10-29-21 1330
	SPM	10/29/21 1600 (00887)

Correct Preservations Y / N / NA **Correct Containers** Y / N / NA **Receipt Temperature** _____

Company/Name:	**Moody & Associates (Washington, PA)**
Address:	1720 Washington Road, Suite 100
	Washington, PA 15301
Contact Person:	Jessie Bobrzynski
Phone Number:	724-554-5339
Email Address:	Jbobrzynski@moody-s.com
State of Collection:	WV

ENVIRONMENTAL SERVICE LABORATORIES, INC.

SAMPLE RECEIPT AND REVIEW FORM

Client: Moody - SO-01 →SO-03	Worl 1102447 re)

PART A: GENERAL INFORMATION- SATELLITE LABORATORY

Received by/Lab ID: 04247	**Date/Time Received:** 10/29/21 10:30	
Method of Delivery: Client Drop-Off (ESL Courier) Other: _____	**Received on Ice?** (YES) NO	
Sample Receipt Temperature: 8.0 °C	**IR Gun ID:** #7	
Containers Removed by Satellite Lab for Analysis of: FECAL TC/EC TC MPN EC MPN TC/EC MPN (N/A)		

PART B: GENERAL INFORMATION- INDIANA LABORATORY

Received by/Lab ID: SPM (00582)	**Samples Received on Ice?** (YES) NO
Date/Time Received: 10/29/21 1600	**Date Sampled:** 10/28/21
Method of Delivery: FedEx UPS Client Drop off (ESL courier) Other: _____	
Sample Receipt Temperature: 3.0 °C	**IR Gun ID:** 4
Sample State of Collection: (PA) NY OH WV Other: ____	**PWSID Compliance Drinking Water Samples:** YES (NO)

PART C: Receipt Details

Completed (if different from above): _____ (Signature) / / _____ (Date) (Time)

Sample Receipt Criteria			Comments/Qualifiers (Required for Non-Conforming Items)
Chain of custody documents included with samples?	YES	NO	Comments:
COC form is properly signed in relinquished/received sections?	YES	NO	Comments:
Sample containers intact and sealed?	YES	NO	Circle Applicable: Damaged Container Leaking Container Custody Seal Broken Other: _____
Number of containers received matches number indicated on COC?	YES	NO	Sample IDs and Containers Affected:
Sample IDs on COC match IDs on bottles?	YES	NO	Sample IDs and Containers Affected:
Date and time on COC match date and time on bottles?	YES	NO	Sample IDs and Containers Affected:
Samples received within holding time?	YES	NO	Sample IDs and Containers Affected:
Samples received at appropriate pH for analysis requested?	YES	NO	Sample IDs and Containers Affected and Observed pH:
Samples requiring thermal preservation within 0 ≤ 6°C? Microbiology within 0 ≤ 10°C?	YES	NO	For non-WV samples outside of thermal preservation range sampled same day and received on ice are considered acceptable as long as the cooling process has begun.
Adequate sample volume received?	YES	NO	Analyses Affected:
VOA vials free of headspace (defined as < 6 mm bubble)?	YES	(NO)	Sample IDs and Containers Affected:

Other Comments:	Deficiency Log Created: YES (NO)

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

November 03, 2021

Mr Richard Rodriguez
Environmental Service Laboratories, Inc.
1803 Philadelphia Street
Indiana, PA 15701

RE: Project: 1102447
Pace Project No.: 30447945

Dear Mr Rodriguez:

Enclosed are the analytical results for sample(s) received by the laboratory on October 30, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Megan A Rager

Megan A. Rager
megan.rager@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Rebecca Erwin, Environmental Service Laboratories, Inc.

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Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1102447
Pace Project No.: 30447945

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
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SAMPLE SUMMARY

Project: 1102447
Pace Project No.: 30447945

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30447945001	**1102447-01**	Solid	10/28/21 11:40	10/30/21 08:00
30447945002	**1102447-02**	Solid	10/28/21 12:15	10/30/21 08:00
30447945003	**1102447-03**	Solid	10/28/21 13:40	10/30/21 08:00

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SAMPLE ANALYTE COUNT

Project: 1102447
Pace Project No.: 30447945

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30447945001	**1102447-01**	EPA 8270E by SIM	CF1	18	PASI-PA
		ASTM D2974-87	OMZ	1	PASI-PA
		EPA 9251	SAC	1	PASI-PA
30447945002	**1102447-02**	EPA 8270E by SIM	CF1	18	PASI-PA
		ASTM D2974-87	OMZ	1	PASI-PA
		EPA 9251	SAC	1	PASI-PA
30447945003	**1102447-03**	EPA 8270E by SIM	CF1	18	PASI-PA
		ASTM D2974-87	OMZ	1	PASI-PA
		EPA 9251	SAC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
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PROJECT NARRATIVE

Project: 1102447
Pace Project No.: 30447945

Method: **EPA 8270E by SIM**
Description: 8270E MSSV PAH by SIM
Client: Environmental Service Laboratories, Inc.
Date: November 03, 2021

General Information:
3 samples were analyzed for EPA 8270E by SIM by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1102447
Pace Project No.: 30447945

Method: **EPA 9251**
Description: 9251 Chloride
Client: Environmental Service Laboratories, Inc.
Date: November 03, 2021

General Information:
3 samples were analyzed for EPA 9251 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with SOP-GBUR-0126 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 470797

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 7393882002

MH: Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.

- MS (Lab ID: 2272793)
  - Chloride

R1: RPD value was outside control limits.

- MSD (Lab ID: 2272794)
  - Chloride

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: 1102447
Pace Project No.: 30447945

Sample: 1102447-01 **Lab ID: 30447945001** Collected: 10/28/21 11:40 Received: 10/30/21 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E MSSV PAH by SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3546 Pace Analytical Services - Greensburg								
Acenaphthene	**9.6 U**	ug/kg	9.6	0.87	1	10/31/21 12:00	11/02/21 10:39	83-32-9	
Acenaphthylene	**9.6 U**	ug/kg	9.6	0.69	1	10/31/21 12:00	11/02/21 10:39	208-96-8	
Anthracene	**3.1J**	ug/kg	9.6	0.87	1	10/31/21 12:00	11/02/21 10:39	120-12-7	
Benzo(a)anthracene	**13.2**	ug/kg	9.6	1.1	1	10/31/21 12:00	11/02/21 10:39	56-55-3	
Benzo(a)pyrene	**9.9**	ug/kg	9.6	0.60	1	10/31/21 12:00	11/02/21 10:39	50-32-8	
Benzo(b)fluoranthene	**21.3**	ug/kg	9.6	1.1	1	10/31/21 12:00	11/02/21 10:39	205-99-2	lp
Benzo(g,h,i)perylene	**6.3J**	ug/kg	9.6	1.4	1	10/31/21 12:00	11/02/21 10:39	191-24-2	
Benzo(k)fluoranthene	**20.6**	ug/kg	9.6	1.6	1	10/31/21 12:00	11/02/21 10:39	207-08-9	lp
Chrysene	**13.6**	ug/kg	9.6	0.49	1	10/31/21 12:00	11/02/21 10:39	218-01-9	
Dibenz(a,h)anthracene	**9.6 U**	ug/kg	9.6	2.1	1	10/31/21 12:00	11/02/21 10:39	53-70-3	
Fluoranthene	**35.4**	ug/kg	9.6	0.73	1	10/31/21 12:00	11/02/21 10:39	206-44-0	
Fluorene	**9.6 U**	ug/kg	9.6	0.89	1	10/31/21 12:00	11/02/21 10:39	86-73-7	
Indeno(1,2,3-cd)pyrene	**5.5J**	ug/kg	9.6	1.8	1	10/31/21 12:00	11/02/21 10:39	193-39-5	
Naphthalene	**5.5J**	ug/kg	9.6	1.9	1	10/31/21 12:00	11/02/21 10:39	91-20-3	
Phenanthrene	**24.8**	ug/kg	9.6	0.84	1	10/31/21 12:00	11/02/21 10:39	85-01-8	
Pyrene	**28.0**	ug/kg	9.6	1.1	1	10/31/21 12:00	11/02/21 10:39	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	56	%.	37-88		1	10/31/21 12:00	11/02/21 10:39	321-60-8	
Terphenyl-d14 (S)	57	%.	10-128		1	10/31/21 12:00	11/02/21 10:39	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Greensburg								
Percent Moisture	**30.8**	%	0.10	0.10	1		11/01/21 15:34		
9251 Chloride	Analytical Method: EPA 9251 Preparation Method: SOP-GBUR-0126 Pace Analytical Services - Greensburg								
Chloride	**370**	mg/kg	86.5	23.9	2	11/02/21 21:20	11/03/21 16:48	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: 1102447
Pace Project No.: 30447945

Sample: 1102447-02 **Lab ID: 30447945002** Collected: 10/28/21 12:15 Received: 10/30/21 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E MSSV PAH by SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3546 Pace Analytical Services - Greensburg								
Acenaphthene	**8.0 U**	ug/kg	8.0	0.72	1	10/31/21 12:00	11/02/21 11:38	83-32-9	
Acenaphthylene	**8.0 U**	ug/kg	8.0	0.57	1	10/31/21 12:00	11/02/21 11:38	208-96-8	
Anthracene	**1.3J**	ug/kg	8.0	0.73	1	10/31/21 12:00	11/02/21 11:38	120-12-7	
Benzo(a)anthracene	**5.8J**	ug/kg	8.0	0.94	1	10/31/21 12:00	11/02/21 11:38	56-55-3	
Benzo(a)pyrene	**5.1J**	ug/kg	8.0	0.50	1	10/31/21 12:00	11/02/21 11:38	50-32-8	
Benzo(b)fluoranthene	**11.3**	ug/kg	8.0	0.96	1	10/31/21 12:00	11/02/21 11:38	205-99-2	lp
Benzo(g,h,i)perylene	**3.5J**	ug/kg	8.0	1.2	1	10/31/21 12:00	11/02/21 11:38	191-24-2	
Benzo(k)fluoranthene	**10.9**	ug/kg	8.0	1.3	1	10/31/21 12:00	11/02/21 11:38	207-08-9	lp
Chrysene	**6.8J**	ug/kg	8.0	0.41	1	10/31/21 12:00	11/02/21 11:38	218-01-9	
Dibenz(a,h)anthracene	**8.0 U**	ug/kg	8.0	1.8	1	10/31/21 12:00	11/02/21 11:38	53-70-3	
Fluoranthene	**11.7**	ug/kg	8.0	0.61	1	10/31/21 12:00	11/02/21 11:38	206-44-0	
Fluorene	**8.0 U**	ug/kg	8.0	0.74	1	10/31/21 12:00	11/02/21 11:38	86-73-7	
Indeno(1,2,3-cd)pyrene	**2.9J**	ug/kg	8.0	1.5	1	10/31/21 12:00	11/02/21 11:38	193-39-5	
Naphthalene	**3.9J**	ug/kg	8.0	1.6	1	10/31/21 12:00	11/02/21 11:38	91-20-3	
Phenanthrene	**9.3**	ug/kg	8.0	0.71	1	10/31/21 12:00	11/02/21 11:38	85-01-8	
Pyrene	**10**	ug/kg	8.0	0.90	1	10/31/21 12:00	11/02/21 11:38	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	69	%.	37-88		1	10/31/21 12:00	11/02/21 11:38	321-60-8	
Terphenyl-d14 (S)	83	%.	10-128		1	10/31/21 12:00	11/02/21 11:38	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Greensburg								
Percent Moisture	**16.7**	%	0.10	0.10	1		11/01/21 15:34		
9251 Chloride	Analytical Method: EPA 9251 Preparation Method: SOP-GBUR-0126 Pace Analytical Services - Greensburg								
Chloride	**15.2J**	mg/kg	36.3	10.0	1	11/02/21 21:20	11/03/21 16:48	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: 1102447
Pace Project No.: 30447945

Sample: 1102447-03 **Lab ID: 30447945003** Collected: 10/28/21 13:40 Received: 10/30/21 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E MSSV PAH by SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3546 Pace Analytical Services - Greensburg								
Acenaphthene	**8.6 U**	ug/kg	8.6	0.78	1	10/31/21 12:00	11/02/21 11:57	83-32-9	
Acenaphthylene	**2.8J**	ug/kg	8.6	0.62	1	10/31/21 12:00	11/02/21 11:57	208-96-8	
Anthracene	**2.7J**	ug/kg	8.6	0.78	1	10/31/21 12:00	11/02/21 11:57	120-12-7	
Benzo(a)anthracene	**12.4**	ug/kg	8.6	1.0	1	10/31/21 12:00	11/02/21 11:57	56-55-3	
Benzo(a)pyrene	**13.9**	ug/kg	8.6	0.54	1	10/31/21 12:00	11/02/21 11:57	50-32-8	
Benzo(b)fluoranthene	**34.6**	ug/kg	8.6	1.0	1	10/31/21 12:00	11/02/21 11:57	205-99-2	lp
Benzo(g,h,i)perylene	**8.7**	ug/kg	8.6	1.3	1	10/31/21 12:00	11/02/21 11:57	191-24-2	
Benzo(k)fluoranthene	**33.5**	ug/kg	8.6	1.4	1	10/31/21 12:00	11/02/21 11:57	207-08-9	lp
Chrysene	**17.1**	ug/kg	8.6	0.44	1	10/31/21 12:00	11/02/21 11:57	218-01-9	
Dibenz(a,h)anthracene	**8.6 U**	ug/kg	8.6	1.9	1	10/31/21 12:00	11/02/21 11:57	53-70-3	
Fluoranthene	**28.8**	ug/kg	8.6	0.65	1	10/31/21 12:00	11/02/21 11:57	206-44-0	
Fluorene	**8.6 U**	ug/kg	8.6	0.80	1	10/31/21 12:00	11/02/21 11:57	86-73-7	
Indeno(1,2,3-cd)pyrene	**7.2J**	ug/kg	8.6	1.6	1	10/31/21 12:00	11/02/21 11:57	193-39-5	
Naphthalene	**14.2**	ug/kg	8.6	1.7	1	10/31/21 12:00	11/02/21 11:57	91-20-3	
Phenanthrene	**13.0**	ug/kg	8.6	0.76	1	10/31/21 12:00	11/02/21 11:57	85-01-8	
Pyrene	**19.7**	ug/kg	8.6	0.97	1	10/31/21 12:00	11/02/21 11:57	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	64	%.	37-88		1	10/31/21 12:00	11/02/21 11:57	321-60-8	
Terphenyl-d14 (S)	72	%.	10-128		1	10/31/21 12:00	11/02/21 11:57	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Greensburg								
Percent Moisture	**23.3**	%	0.10	0.10	1		11/01/21 15:34		
9251 Chloride	Analytical Method: EPA 9251 Preparation Method: SOP-GBUR-0126 Pace Analytical Services - Greensburg								
Chloride	**941**	mg/kg	395	109	10	11/02/21 21:20	11/03/21 16:49	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: 1102447
Pace Project No.: 30447945

QC Batch: 470525
QC Batch Method: EPA 3546
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E/3546 MSSV PAH by SIM
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30447945001, 30447945002, 30447945003

METHOD BLANK: 2271686 Matrix: Solid
Associated Lab Samples: 30447945001, 30447945002, 30447945003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/kg	6.6 U	6.6	0.60	11/02/21 10:00	
Acenaphthylene	ug/kg	6.6 U	6.6	0.48	11/02/21 10:00	
Anthracene	ug/kg	6.6 U	6.6	0.60	11/02/21 10:00	
Benzo(a)anthracene	ug/kg	6.6 U	6.6	0.78	11/02/21 10:00	
Benzo(a)pyrene	ug/kg	6.6 U	6.6	0.42	11/02/21 10:00	
Benzo(b)fluoranthene	ug/kg	6.6 U	6.6	0.80	11/02/21 10:00	
Benzo(g,h,i)perylene	ug/kg	6.6 U	6.6	1.0	11/02/21 10:00	
Benzo(k)fluoranthene	ug/kg	6.6 U	6.6	1.1	11/02/21 10:00	
Chrysene	ug/kg	6.6 U	6.6	0.34	11/02/21 10:00	
Dibenz(a,h)anthracene	ug/kg	6.6 U	6.6	1.5	11/02/21 10:00	
Fluoranthene	ug/kg	6.6 U	6.6	0.50	11/02/21 10:00	
Fluorene	ug/kg	6.6 U	6.6	0.62	11/02/21 10:00	
Indeno(1,2,3-cd)pyrene	ug/kg	6.6 U	6.6	1.3	11/02/21 10:00	
Naphthalene	ug/kg	6.6 U	6.6	1.3	11/02/21 10:00	
Phenanthrene	ug/kg	6.6 U	6.6	0.59	11/02/21 10:00	
Pyrene	ug/kg	6.6 U	6.6	0.75	11/02/21 10:00	
2-Fluorobiphenyl (S)	%.	66	37-88		11/02/21 10:00	
Terphenyl-d14 (S)	%.	77	10-128		11/02/21 10:00	

LABORATORY CONTROL SAMPLE: 2271687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	133	88.0	66	47-104	
Acenaphthylene	ug/kg	133	90.9	68	49-115	
Anthracene	ug/kg	133	93.7	71	52-115	
Benzo(a)anthracene	ug/kg	133	102	76	54-130	
Benzo(a)pyrene	ug/kg	133	93.7	70	59-126	
Benzo(b)fluoranthene	ug/kg	133	107	81	55-133	
Benzo(g,h,i)perylene	ug/kg	133	106	80	54-127	
Benzo(k)fluoranthene	ug/kg	133	108	82	56-120	
Chrysene	ug/kg	133	101	76	56-115	
Dibenz(a,h)anthracene	ug/kg	133	104	78	55-129	
Fluoranthene	ug/kg	133	102	76	56-125	
Fluorene	ug/kg	133	92.7	70	50-114	
Indeno(1,2,3-cd)pyrene	ug/kg	133	106	80	55-129	
Naphthalene	ug/kg	133	78.3	59	45-102	
Phenanthrene	ug/kg	133	92.5	70	50-110	
Pyrene	ug/kg	133	103	78	56-122	
2-Fluorobiphenyl (S)	%.			56	37-88	

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALITY CONTROL DATA

Project: 1102447
Pace Project No.: 30447945

LABORATORY CONTROL SAMPLE: 2271687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Terphenyl-d14 (S)	%.			68	10-128	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271688 2271689

Parameter	Units	30447945001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/kg	9.6 U	191	192	135	130	71	68	24-109	3	20	
Acenaphthylene	ug/kg	9.6 U	191	192	141	133	74	69	26-119	6	20	
Anthracene	ug/kg	3.1J	191	192	148	136	76	69	32-115	8	20	
Benzo(a)anthracene	ug/kg	13.2	191	192	158	142	76	67	30-133	11	20	
Benzo(a)pyrene	ug/kg	9.9	191	192	143	128	70	62	11-151	11	20	
Benzo(b)fluoranthene	ug/kg	21.3	191	192	172	152	79	68	25-140	12	20	
Benzo(g,h,i)perylene	ug/kg	6.3J	191	192	135	123	68	61	10-126	9	20	
Benzo(k)fluoranthene	ug/kg	20.6	191	192	161	145	74	65	25-127	10	20	
Chrysene	ug/kg	13.6	191	192	157	141	75	66	10-142	11	20	
Dibenz(a,h)anthracene	ug/kg	9.6 U	191	192	140	128	73	67	13-127	9	20	
Fluoranthene	ug/kg	35.4	191	192	174	158	72	64	20-139	10	20	
Fluorene	ug/kg	9.6 U	191	192	144	136	76	71	28-114	6	20	
Indeno(1,2,3-cd)pyrene	ug/kg	5.5J	191	192	143	130	72	65	15-123	10	20	
Naphthalene	ug/kg	5.5J	191	192	124	122	62	61	15-104	2	20	
Phenanthrene	ug/kg	24.8	191	192	160	143	71	62	10-135	11	20	
Pyrene	ug/kg	28.0	191	192	170	155	75	66	13-139	10	20	
2-Fluorobiphenyl (S)	%.						58	57	37-88			
Terphenyl-d14 (S)	%.						66	60	10-128			

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: 1102447
Pace Project No.: 30447945

QC Batch: 470616
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30447945001, 30447945002, 30447945003

SAMPLE DUPLICATE: 2272007

Parameter	Units	30447831001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.5	9.4	10	20	

SAMPLE DUPLICATE: 2272121

Parameter	Units	30447831002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.7	11.2	13	20	

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: 1102447
Pace Project No.: 30447945

QC Batch: 470797
QC Batch Method: SOP-GBUR-0126
Analysis Method: EPA 9251
Analysis Description: 9251 Chloride
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30447945001, 30447945002, 30447945003

METHOD BLANK: 2272791 Matrix: Solid
Associated Lab Samples: 30447945001, 30447945002, 30447945003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/kg	30.0 U	30.0	8.3	11/03/21 16:39	

LABORATORY CONTROL SAMPLE: 2272792

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/kg	398	359	90	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2272793 2272794

Parameter	Units	7393882002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/kg	ND	531	532	630	475	117	88	85-115	28	20	MH,R1

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1102447
Pace Project No.: 30447945

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

lp	Benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check standard but did not meet the resolution criteria specified in the test method. Sample results included are reported as individual isomers, but the lab and the client must recognize them as an isomeric pair.
MH	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.
R1	RPD value was outside control limits.

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1102447
Pace Project No.: 30447945

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30447945001	**1102447-01**	EPA 3546	470525	EPA 8270E by SIM	470559
30447945002	**1102447-02**	EPA 3546	470525	EPA 8270E by SIM	470559
30447945003	**1102447-03**	EPA 3546	470525	EPA 8270E by SIM	470559
30447945001	**1102447-01**	ASTM D2974-87	470616		
30447945002	**1102447-02**	ASTM D2974-87	470616		
30447945003	**1102447-03**	ASTM D2974-87	470616		
30447945001	**1102447-01**	SOP-GBUR-0126	470797	EPA 9251	471071
30447945002	**1102447-02**	SOP-GBUR-0126	470797	EPA 9251	471071
30447945003	**1102447-03**	SOP-GBUR-0126	470797	EPA 9251	471071

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SUBCONTRACT ORDER

Environmental Service Laboratories, Inc.

1102447

Please report all results to **reports@envlabs.com**. Contact ESL with any questions.

SENDING LABORATORY:

Environmental Service Laboratories, Inc.
1803 Philadelphia Street
Indiana, PA 15701
Phone: 724-463-8378
Fax: 724-465-4209
Project Manager: Sierra Grguric

RECEIVING LABORATORY:

Pace Analytical Services, LLC.
1638 Roseytown Road - Suites 2, 3, 4
Greensburg, PA 15601
Phone :(724) 850-5600
Fax: (724) 850-5601

State of Origin: WV

Analysis	Due	Expires		Comments
Sample ID: 1102447-01				
Matrix: Solid **Sampled: 10/28/2021 11:40**	**Sample Type: Grab**		**Sampled By: Client**	
Chloride IC	11/10/2021 23:00	11/25/2021 11:40	WV	C01
PAH SIMS	11/10/2021 23:00	11/27/2021 11:40	WV	
Containers Supplied:				
Glass Jar, 8 oz. (A)				
Sample ID: 1102447-02				
Matrix: Solid **Sampled: 10/28/2021 12:15**	**Sample Type: Grab**		**Sampled By: Client**	
Chloride IC	11/10/2021 23:00	11/25/2021 12:15	WV	
PAH SIMS	11/10/2021 23:00	11/27/2021 12:15	WV	
Containers Supplied:				
Glass Jar, 8 oz. (A)				
Sample ID: 1102447-03				
Matrix: Solid **Sampled: 10/28/2021 13:40**	**Sample Type: Grab**		**Sampled By: Client**	
Chloride IC	11/10/2021 23:00	11/25/2021 13:40	WV	
PAH SIMS	11/10/2021 23:00	11/27/2021 13:40	WV	
Containers Supplied:				
Glass Jar, 8 oz. (A)				

Released By	Date	Received By	Date
	10/30/21		10/30/21 0700
	10/30/21 0800		10/30/21 1030

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: ESL

Project # #30447945#

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other _____

Label BA

LIMS Login BM

Tracking #: -

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 5.4 °C Correction Factor: 0.3 °C Final Temp: ~~5~~ 5.1 °C

nc 10-30

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D3501	Date and Initials of person examining contents: JH 10-30-21
Chain of Custody Present:	-			1.	
Chain of Custody Filled Out:	-			2.	
Chain of Custody Relinquished:	-			3.	
Sampler Name & Signature on COC:		-		4.	
Sample Labels match COC: -Includes date/time/ID Matrix: SL	-			5.	
Samples Arrived within Hold Time:	-			6.	
Short Hold Time Analysis (<72hr remaining):		-		7.	
Rush Turn Around Time Requested:		-		8.	
Sufficient Volume:	-			9.	
Correct Containers Used:	-			10.	
-Pace Containers Used:		-			
Containers Intact:	-			11.	
Orthophosphate field filtered			-	12.	
Hex Cr Aqueous sample field filtered			-	13.	
Organic Samples checked for dechlorination:			-	14.	
Filtered volume received for Dissolved tests			-	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix		-		16.	
All containers meet method preservation requirements.	-			Initial when completed: JH	Date/time of preservation:
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			-	17.	
Trip Blank Present:			-	18.	
Trip Blank Custody Seals Present			-		
Rad Samples Screened < 0.5 mrem/hr	-			Initial when completed: JH	Date: 10-30 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.