WR-35
Rev. 8/23/13

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DEC 11 2014

WV Department of
Environmental Protection



State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

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API 47- 043 - 03460 County LINCOLN District DUVAL
Quad GRIFFITHSVILLE 7.5' Pad Name J.A. FOWLER Field/Pool Name GRIFFITHSVILLE
Farm name MCCLURE, ANDY J. & REBECCA Well Number 113
Operator (as registered with the OOG) H.G. ENERGY LLC
Address 5260 DuPONT ROAD City PARKERSBURG State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,231,236 M Easting 416,427 M
Landing Point of Curve Northing ____ Easting ____
Bottom Hole Northing ____ Easting ____

Elevation (ft) 882' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal □ Horizontal 6A ■ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM □ Gas □ Oil ■ Secondary Recovery □ Solution Mining □ Storage □ Other ____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL ■Oil □ Other ____
Drilled with □ Cable ■ Rotary

Inj well
GLS

Drilling Media Surface hole ■ Air □ Mud ■Fresh Water Intermediate hole ■ Air □ Mud ■ Fresh Water □ Brine
Production hole ■ Air □ Mud □ Fresh Water ■ Brine
Mud Type(s) and Additive(s)
N/A

Date permit issued 6/17/2013 Date drilling commenced 11/7/14 Date drilling ceased 11/13/14
Date completion activities began 11/17/14 Date completion activities ceased 12/5/14
Verbal plugging (Y/N) N Date permission granted ____ Granted by ____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft N Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1180' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 458'- 463' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

WR-35
Rev. 8/23/13

API 47- 043 - 03460 Farm name MCCLURE, ANDY J. & REBECCA Well number 113

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---|---|---|---|---|---|---|---|
| Conductor | 12 1/4" | 11 5/8" | 30' | Used | LS | | Sand In |
| Surface | 8 3/4" | 7" | 515' | New | LS | 84' | Y |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 6 1/4" | 4 1/2" | 2509.7' | New | J-55 | | Y |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details Circulated Est. 50 sks to surface on 7" surface cement job. Circulated Est. 10 sks to surface on 4 1/2" cement job.

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield ( ft $^3$/sks) | Volume (ft $^3$) | Cement Top (MD) | WOC (hrs) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Surface | Reg Neat | 130 | 15.6 | 1.18 | 153.4 | Surface | 8 |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 50:50 Pozmix | 110/125 | 13.2/14.2 | 1.64/1.27 | 180/159 | 64' | 8 |
| Tubing | | | | | | | |

Drillers TD (ft) 2530' Loggers TD (ft) 2534'
Deepest formation penetrated Berea Plug back to (ft) N/A
Plug back procedure N/A

Kick off depth (ft)

Check all wireline logs run ■ caliper ■ density ■ deviated/directional ■ induction ■ neutron ■ resistivity ■ gamma ray ■ temperature □ sonic

Well cored □ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes □ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
6 Centralizers every 84 from bottom on 4 1/2", Centralizer placed mid string on 7"

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 043 - 03460 Farm name MCCLURE, ANDY J. & REBECCA Well number 113

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| 1 | 12/5/14 | 2359' | 2373' | 84 | Berea |

Please insert additional pages as applicable.

## STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No. | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|---|---|---|---|---|---|---|---|---|
| 1 | 12/5/14 | 3.3 | 1463 | 1890 | 651 | | 47 | 12 bbls HCL |

Please insert additional pages as applicable.

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API 47- 043 - 03460 Farm name MCCLURE, ANDY J. & REBECCA Well number 113

| PRODUCING FORMATION(S) | DEPTHS | |
|---|---|---|
| Berea | 2359'- 2373' TVD | MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY ☐ Estimated ☐ Orifice ☐ Pilot

| LITHOLOGY/ FORMATION NAME | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, $H_2S$, ETC) |
|---|---|---|---|---|---|
| Sand/Shale | 0 | 458 | 0 | | |
| Pittsburgh Coal | 458 | 463 | | | |
| Sand/Shale | 463 | 1638 | | | |
| Big Lime | 1638 | 1842 | | | |
| Big Injun | 1842 | 2084 | | | |
| Shale | 2084 | 2337 | | | |
| Coffee Shale | 2337 | 2357 | | | |
| Berea | 2357 | 2374 | | | |
| Shale | 2374 | 2530 | | | |
| TD | 2530 | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

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Please insert additional pages as applicable.

Drilling Contractor Decker Drilling
Address 11565 State Route 676 City Vincent State OH Zip 45784

Logging Company Weatherford International
Address 777 North River Avenue City Weston State WV Zip 26452

Cementing Company Universal Services
Address 5252 Rt 1428 City Allen State KY Zip 41601

Stimulating Company Producers Service Corp.
Address 109 South Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Roger Feldman Telephone 304-420-1107
Signature _____ Title Operations Manager Date 12/8/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

43-03460

Prepared for:

HG Energy

PRODUCERS SERVICE CORP.

Pre
Pro
Jas
109
Zan
740

INVOICE #: 17197

WELL NAME: J A Fowler #113

STATE & COUNTY: WV / Lincoln

TOWNSHIP/FIELD: Griffithsville

DATE of SERVICE: 12/5/2014

CUSTOMER PO#

| Description | Notes | Amount | Units | U |
|---|---|---|---|---|
| ACID PUMP CHARGE 1000-2000 PSI | | 1 | EA | $ |
| MILEAGE CHARGE PER UNIT ONE WAY | | 0 | MI | $ |
| IC ACID 15% | | 500 | GAL | $ |
| PRO HIB II | | 0.5 | GAL | $ |
| ACID DELIVERY | | 2 | HR | $ |
| PRO CLA FIRM LP | | 0.5 | GAL | $ |
| PRO PEN | | 1 | GAL | $ |
| PRO NE-1 | | 0.5 | GAL | $ |
| PRO SOL | | 5 | GAL | $ |
| DATA VAN | | 1 | STAGE | $ |

TOT

Customer Approval: _____

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Well Operator's Report of Well Work

API 47 - 043 - 03471 County LINCOLN District DUVAL
Quad GRIFFITHSVILLE 7.5' Pad Name J.A. FOWLER Field/Pool Name GRIFFITHSVILLE
Farm name MCCLURE, ANDY J. & REBECCA Well Number 214
Operator (as registered with the OOG) H.G. ENERGY LLC
Address 5260 DuPONT ROAD City PARKERSBURG State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,231,370 M Easting 416,557 M
Landing Point of Curve Northing ____ Easting ____
Bottom Hole Northing 4,231,250 M Easting 416,625 M

Elevation (ft) 895' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal □ Horizontal 6A ■ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM □ Gas □ Oil ■ Secondary Recovery □ Solution Mining □ Storage □ Other ____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL ~~■ Oil~~ □ Other ____
Drilled with □ Cable ■ Rotary

Injection Well GCS

Drilling Media Surface hole ■ Air □ Mud ■Fresh Water Intermediate hole ■ Air □ Mud ■ Fresh Water □ Brine
Production hole ■ Air □ Mud □ Fresh Water ■ Brine
Mud Type(s) and Additive(s)
N/A

Date permit issued 6/17/2013 Date drilling commenced 11/4/14 Date drilling ceased 11/7/14
Date completion activities began 11/17/14 Date completion activities ceased 12/5/14
Verbal plugging (Y/N) N Date permission granted ____ Granted by ____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1120' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 468'- 473' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

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API 47- 043 - 03471 Farm name MCCLURE, ANDY J. & REBECCA Well number 214

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---|---|---|---|---|---|---|---|
| Conductor | 12 1/4" | 11 5/8" | 30' | Used | LS | | Sand In |
| Surface | 8 3/4" | 7" | 590' | New | LS | 84' | Y |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 6 1/4" | 4 1/2" | 2583.1 | New | J-55 | | Y |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details Circulated est. 50 sks cement to surface on 7" cement job. Circulated est 7 sks cement to surface on 4 1/2" cement job.

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield ( $ft^3$/sks) | Volume ($ft^3$) | Cement Top (MD) | WOC (hrs) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Surface | Reg Neat | 135 | 15.6 | 1.18 | 159 | Surface | 8 |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 50:50 Pozmix | 110/125 | 13.2/14.2 | 1.64/1.27 | 180/159 | 150' | 8 |
| Tubing | | | | | | | |

Drillers TD (ft) 2631 Loggers TD (ft) 2633'
Deepest formation penetrated Berea Plug back to (ft) N/A
Plug back procedure N/A

Kick off depth (ft) 600'

Check all wireline logs run ■ caliper ■ density ■ deviated/directional ■ induction
■ neutron ■ resistivity ■ gamma ray ■ temperature □ sonic

Well cored □ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes □ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
6 Centralizers every 84 from bottom on 4 1/2", Centralizer placed mid string on 7"

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 043 - 03471 Farm name MCCLURE, ANDY J. & REBECCA Well number 214

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| 1 | 12/5/14 | 2430' | 2444' | 84 | Berea |

Please insert additional pages as applicable.

## STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No. | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|---|---|---|---|---|---|---|---|---|
| 1 | 12/5/14 | 3.1 | 916 | 1205 | 819 | | 49 | 12 bbls HCL |

Please insert additional pages as applicable.

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| PRODUCING FORMATION(S) | DEPTHS | |
|---|---|---|
| Berea | 2430'- 2444' TVD | MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY ☐ Estimated ☐ Orifice ☐ Pilot

| LITHOLOGY/ FORMATION NAME | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, $H_2S$, ETC) |
|---|---|---|---|---|---|
| Sand/Shale | 0 | 468 | 0 | 468 | |
| Pittsburgh Coal | 468 | 473 | 468 | 473 | |
| Sand/Shale | 473 | 1648 | 473 | 1680 | |
| Big Lime | 1648 | 1854 | 1680 | 1896 | |
| Big Injun | 1854 | 2095 | 1896 | 2149 | |
| Shale | 2095 | 2345 | 2149 | 2404 | |
| Coffee Shale | 2345 | 2368 | 2404 | 2428 | |
| Berea | 2368 | 2387 | 2428 | 2448 | |
| Shale | 2387 | 2570 | 2448 | 2631 | Drilled directional S 41° E a distance of 425' |
| TD | 2570' | | 2631 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Please insert additional pages as applicable.

Drilling Contractor Decker Drilling
Address 11565 State Route 676 City Vincent State OH Zip 45784

Logging Company Weatherford International
Address 777 North River Avenue City Weston State WV Zip 26452

Cementing Company Universal Services
Address 5252 Rt 1428 City Allen State KY Zip 41601

Stimulating Company Producers Service Corp.
Address 109 South Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Roger Heldman Telephone 304-420-1107
Signature _____ Title Operations Manager Date 12/8/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

43-03471

# HG Energy, LLC

**Lincoln County, West Virgina**
**JA Fowler #214**
**JA Fowler 214**

**Wellbore #1**

**Design: Wellbore #1**

# Survey Report - Geographic

**12 November, 2014**

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The APPALACHIAN DIRECTIONAL COMPANY

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# Survey Report - Geographic

| | | | |
|---|---|---|---|
| **Company:** | HG Energy, LLC | **Local Co-ordinate Reference:** | Well JA Fowler 214 |
| **Project:** | Lincoln County, West Virgina | **TVD Reference:** | Well @ 920.0usft (Decker #9) |
| **Site:** | JA Fowler #214 | **MD Reference:** | Well @ 920.0usft (Decker #9) |
| **Well:** | JA Fowler 214 | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM Compass |

**Project** Lincoln County, West Virgina

| | | | |
|---|---|---|---|
| Map System: | Universal Transverse Mercator | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

**Site** JA Fowler #214

| | | | | | |
|---|---|---|---|---|---|
| Site Position: | | Northing: | 13,882,378.33 usft | Latitude: | 38° 13' 34.800 N |
| From: | Lat/Long | Easting: | 1,366,605.80 usft | Longitude: | 81° 57' 12.600 W |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | -0.59 ° |

**Well** JA Fowler 214

| | | | | | | |
|---|---|---|---|---|---|---|
| Well Position | +N/-S | 0.0 usft | Northing: | 13,882,378.33 usft | Latitude: | 38° 13' 34.800 N |
| | +E/-W | 0.0 usft | Easting: | 1,366,605.80 usft | Longitude: | 81° 57' 12.600 W |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | 0.0 usft | Ground Level: | 912.0 usft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 10/28/2014 | -7.44 | 66.08 | 51,826 |

**Design** Wellbore #1

Audit Notes:

| | | | | | |
|---|---|---|---|---|---|
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 139.00 |

**Survey Program** Date 11/10/2014

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 600.0 | 2,631.0 | MWD (Wellbore #1) | MWD default | MWD - Standard |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 13,882,378.33 | 1,366,605.80 | 38° 13' 34.800 N | 81° 57' 12.600 W |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 13,882,378.33 | 1,366,605.80 | 38° 13' 34.800 N | 81° 57' 12.600 W |
| **FIRST SURVEY @ 600' MD / 600 TVD** | | | | | | | | | |
| 625.0 | 0.90 | 139.00 | 625.0 | -0.1 | 0.1 | 13,882,378.19 | 1,366,605.93 | 38° 13' 34.799 N | 81° 57' 12.598 W |
| 655.0 | 1.20 | 138.80 | 655.0 | -0.6 | 0.5 | 13,882,377.77 | 1,366,606.29 | 38° 13' 34.794 N | 81° 57' 12.594 W |
| 685.0 | 1.90 | 132.20 | 685.0 | -1.1 | 1.1 | 13,882,377.20 | 1,366,606.87 | 38° 13' 34.789 N | 81° 57' 12.586 W |
| 715.0 | 2.60 | 147.20 | 715.0 | -2.0 | 1.8 | 13,882,376.30 | 1,366,607.60 | 38° 13' 34.780 N | 81° 57' 12.577 W |
| 745.0 | 3.80 | 141.90 | 744.9 | -3.4 | 2.8 | 13,882,374.94 | 1,366,608.59 | 38° 13' 34.767 N | 81° 57' 12.565 W |
| 775.0 | 5.10 | 144.40 | 774.8 | -5.3 | 4.2 | 13,882,373.07 | 1,366,609.98 | 38° 13' 34.748 N | 81° 57' 12.547 W |
| 805.0 | 6.30 | 138.30 | 804.7 | -7.6 | 6.0 | 13,882,370.76 | 1,366,611.85 | 38° 13' 34.726 N | 81° 57' 12.523 W |
| 835.0 | 7.20 | 138.00 | 834.5 | -10.2 | 8.4 | 13,882,368.13 | 1,366,614.20 | 38° 13' 34.700 N | 81° 57' 12.493 W |
| 865.0 | 8.20 | 136.10 | 864.2 | -13.1 | 11.1 | 13,882,365.20 | 1,366,616.94 | 38° 13' 34.671 N | 81° 57' 12.459 W |

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# Survey Report - Geographic

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|---|---|---|---|
| **Company:** | HG Energy, LLC | **Local Co-ordinate Reference:** | Well JA Fowler 214 |
| **Project:** | Lincoln County, West Virgina | **TVD Reference:** | Well @ 920.0usft (Decker #9) |
| **Site:** | JA Fowler #214 | **MD Reference:** | Well @ 920.0usft (Decker #9) |
| **Well:** | JA Fowler 214 | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM Compass |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 895.0 | 8.80 | 131.20 | 893.9 | -16.2 | 14.4 | 13,882,362.14 | 1,366,620.15 | 38° 13' 34.641 N | 81° 57' 12.418 W |
| 925.0 | 9.70 | 126.80 | 923.5 | -19.2 | 18.1 | 13,882,359.12 | 1,366,623.90 | 38° 13' 34.612 N | 81° 57' 12.371 W |
| 955.0 | 10.17 | 127.70 | 953.0 | -22.4 | 22.2 | 13,882,355.98 | 1,366,628.02 | 38° 13' 34.581 N | 81° 57' 12.319 W |
| 985.0 | 11.40 | 129.70 | 982.5 | -25.9 | 26.6 | 13,882,352.47 | 1,366,632.40 | 38° 13' 34.547 N | 81° 57' 12.263 W |
| 1,015.0 | 12.70 | 131.30 | 1,011.8 | -29.9 | 31.4 | 13,882,348.40 | 1,366,637.16 | 38° 13' 34.507 N | 81° 57' 12.203 W |
| 1,045.0 | 13.80 | 130.90 | 1,041.0 | -34.5 | 36.5 | 13,882,343.88 | 1,366,642.34 | 38° 13' 34.463 N | 81° 57' 12.138 W |
| 1,075.0 | 14.70 | 136.60 | 1,070.1 | -39.6 | 41.9 | 13,882,338.77 | 1,366,647.66 | 38° 13' 34.413 N | 81° 57' 12.070 W |
| 1,105.0 | 16.40 | 140.50 | 1,099.0 | -45.6 | 47.2 | 13,882,332.74 | 1,366,652.97 | 38° 13' 34.354 N | 81° 57' 12.003 W |
| 1,135.0 | 18.00 | 144.80 | 1,127.7 | -52.7 | 52.5 | 13,882,325.68 | 1,366,658.33 | 38° 13' 34.285 N | 81° 57' 11.935 W |
| 1,165.0 | 18.10 | 143.30 | 1,156.2 | -60.2 | 58.0 | 13,882,318.16 | 1,366,663.79 | 38° 13' 34.211 N | 81° 57' 11.865 W |
| 1,195.0 | 17.70 | 143.60 | 1,184.7 | -67.6 | 63.5 | 13,882,310.75 | 1,366,669.28 | 38° 13' 34.138 N | 81° 57' 11.796 W |
| 1,225.0 | 17.50 | 143.50 | 1,213.3 | -74.9 | 68.9 | 13,882,303.45 | 1,366,674.67 | 38° 13' 34.067 N | 81° 57' 11.727 W |
| 1,255.0 | 17.30 | 142.90 | 1,242.0 | -82.1 | 74.2 | 13,882,296.27 | 1,366,680.05 | 38° 13' 33.996 N | 81° 57' 11.659 W |
| 1,285.0 | 17.20 | 142.70 | 1,270.6 | -89.2 | 79.6 | 13,882,289.18 | 1,366,685.42 | 38° 13' 33.927 N | 81° 57' 11.590 W |
| 1,315.0 | 17.20 | 142.90 | 1,299.3 | -96.2 | 85.0 | 13,882,282.12 | 1,366,690.79 | 38° 13' 33.857 N | 81° 57' 11.522 W |
| 1,345.0 | 17.40 | 143.30 | 1,327.9 | -103.4 | 90.3 | 13,882,274.98 | 1,366,696.14 | 38° 13' 33.787 N | 81° 57' 11.454 W |
| 1,375.0 | 17.60 | 142.20 | 1,356.5 | -110.5 | 95.8 | 13,882,267.80 | 1,366,701.61 | 38° 13' 33.717 N | 81° 57' 11.385 W |
| 1,405.0 | 17.80 | 142.80 | 1,385.1 | -117.8 | 101.4 | 13,882,260.57 | 1,366,707.16 | 38° 13' 33.646 N | 81° 57' 11.314 W |
| 1,435.0 | 18.00 | 142.00 | 1,413.7 | -125.1 | 107.0 | 13,882,253.26 | 1,366,712.78 | 38° 13' 33.574 N | 81° 57' 11.243 W |
| 1,465.0 | 17.80 | 142.00 | 1,442.2 | -132.3 | 112.7 | 13,882,246.00 | 1,366,718.46 | 38° 13' 33.503 N | 81° 57' 11.171 W |
| 1,495.0 | 17.60 | 142.20 | 1,470.8 | -139.5 | 118.3 | 13,882,238.80 | 1,366,724.06 | 38° 13' 33.432 N | 81° 57' 11.100 W |
| 1,525.0 | 17.40 | 141.00 | 1,499.4 | -146.6 | 123.9 | 13,882,231.73 | 1,366,729.67 | 38° 13' 33.363 N | 81° 57' 11.028 W |
| 1,555.0 | 17.30 | 142.90 | 1,528.0 | -153.6 | 129.4 | 13,882,224.68 | 1,366,735.18 | 38° 13' 33.294 N | 81° 57' 10.958 W |
| 1,585.0 | 17.30 | 142.70 | 1,556.7 | -160.8 | 134.8 | 13,882,217.58 | 1,366,740.57 | 38° 13' 33.224 N | 81° 57' 10.890 W |
| 1,615.0 | 17.20 | 141.70 | 1,585.3 | -167.8 | 140.2 | 13,882,210.55 | 1,366,746.03 | 38° 13' 33.155 N | 81° 57' 10.821 W |
| 1,645.0 | 17.20 | 141.30 | 1,614.0 | -174.7 | 145.7 | 13,882,203.61 | 1,366,751.55 | 38° 13' 33.087 N | 81° 57' 10.751 W |
| 1,675.0 | 16.70 | 137.60 | 1,642.7 | -181.4 | 151.4 | 13,882,196.96 | 1,366,757.23 | 38° 13' 33.022 N | 81° 57' 10.678 W |
| 1,705.0 | 16.20 | 136.50 | 1,671.5 | -187.6 | 157.2 | 13,882,190.74 | 1,366,763.02 | 38° 13' 32.961 N | 81° 57' 10.605 W |
| 1,735.0 | 16.10 | 133.90 | 1,700.3 | -193.5 | 163.1 | 13,882,184.82 | 1,366,768.89 | 38° 13' 32.903 N | 81° 57' 10.531 W |
| 1,765.0 | 17.10 | 133.90 | 1,729.0 | -199.5 | 169.3 | 13,882,178.88 | 1,366,775.07 | 38° 13' 32.845 N | 81° 57' 10.453 W |
| 1,795.0 | 18.00 | 136.10 | 1,757.6 | -205.9 | 175.7 | 13,882,172.48 | 1,366,781.46 | 38° 13' 32.782 N | 81° 57' 10.372 W |
| 1,825.0 | 18.50 | 134.00 | 1,786.1 | -212.5 | 182.3 | 13,882,165.84 | 1,366,788.10 | 38° 13' 32.717 N | 81° 57' 10.288 W |
| 1,855.0 | 18.80 | 133.10 | 1,814.5 | -219.1 | 189.3 | 13,882,159.23 | 1,366,795.05 | 38° 13' 32.653 N | 81° 57' 10.200 W |
| 1,885.0 | 18.90 | 134.70 | 1,842.9 | -225.8 | 196.2 | 13,882,152.51 | 1,366,802.04 | 38° 13' 32.587 N | 81° 57' 10.111 W |
| 1,915.0 | 18.80 | 139.90 | 1,871.3 | -232.9 | 202.8 | 13,882,145.39 | 1,366,808.60 | 38° 13' 32.517 N | 81° 57' 10.028 W |
| 1,945.0 | 17.90 | 146.10 | 1,899.8 | -240.5 | 208.5 | 13,882,137.86 | 1,366,814.29 | 38° 13' 32.443 N | 81° 57' 9.956 W |
| 1,975.0 | 17.60 | 147.70 | 1,928.4 | -248.1 | 213.5 | 13,882,130.20 | 1,366,819.28 | 38° 13' 32.368 N | 81° 57' 9.892 W |
| 2,005.0 | 18.00 | 146.00 | 1,956.9 | -255.8 | 218.5 | 13,882,122.53 | 1,366,824.30 | 38° 13' 32.293 N | 81° 57' 9.828 W |
| 2,035.0 | 17.40 | 145.70 | 1,985.5 | -263.4 | 223.6 | 13,882,114.98 | 1,366,829.42 | 38° 13' 32.219 N | 81° 57' 9.763 W |
| 2,065.0 | 16.70 | 144.30 | 2,014.2 | -270.6 | 228.7 | 13,882,107.77 | 1,366,834.46 | 38° 13' 32.148 N | 81° 57' 9.699 W |
| 2,095.0 | 16.00 | 143.70 | 2,043.0 | -277.4 | 233.6 | 13,882,100.94 | 1,366,839.43 | 38° 13' 32.081 N | 81° 57' 9.636 W |
| 2,125.0 | 15.20 | 140.50 | 2,071.9 | -283.8 | 238.6 | 13,882,094.57 | 1,366,844.38 | 38° 13' 32.018 N | 81° 57' 9.573 W |
| 2,155.0 | 14.50 | 140.10 | 2,100.9 | -289.7 | 243.5 | 13,882,088.66 | 1,366,849.29 | 38° 13' 31.960 N | 81° 57' 9.511 W |
| 2,185.0 | 13.80 | 139.80 | 2,130.0 | -295.3 | 248.2 | 13,882,083.04 | 1,366,854.01 | 38° 13' 31.905 N | 81° 57' 9.451 W |
| 2,215.0 | 13.10 | 138.70 | 2,159.1 | -300.6 | 252.8 | 13,882,077.76 | 1,366,858.56 | 38° 13' 31.854 N | 81° 57' 9.393 W |
| 2,245.0 | 12.50 | 136.00 | 2,188.4 | -305.5 | 257.3 | 13,882,072.87 | 1,366,863.06 | 38° 13' 31.806 N | 81° 57' 9.336 W |
| 2,275.0 | 11.90 | 136.40 | 2,217.7 | -310.0 | 261.6 | 13,882,068.29 | 1,366,867.45 | 38° 13' 31.761 N | 81° 57' 9.280 W |
| 2,305.0 | 11.00 | 135.10 | 2,247.1 | -314.3 | 265.8 | 13,882,064.02 | 1,366,871.60 | 38° 13' 31.719 N | 81° 57' 9.228 W |
| 2,335.0 | 10.40 | 133.60 | 2,276.6 | -318.2 | 269.8 | 13,882,060.13 | 1,366,875.58 | 38° 13' 31.681 N | 81° 57' 9.177 W |
| 2,365.0 | 9.50 | 132.80 | 2,306.1 | -321.8 | 273.6 | 13,882,056.58 | 1,366,879.36 | 38° 13' 31.646 N | 81° 57' 9.130 W |
| 2,395.0 | 9.30 | 127.30 | 2,335.7 | -324.9 | 277.3 | 13,882,053.43 | 1,366,883.10 | 38° 13' 31.616 N | 81° 57' 9.082 W |
| 2,425.0 | 9.80 | 127.70 | 2,365.3 | -327.9 | 281.3 | 13,882,050.40 | 1,366,887.05 | 38° 13' 31.586 N | 81° 57' 9.032 W |
| 2,455.0 | 10.00 | 127.20 | 2,394.9 | -331.1 | 285.3 | 13,882,047.26 | 1,366,891.15 | 38° 13' 31.555 N | 81° 57' 8.981 W |
| 2,485.0 | 9.50 | 125.70 | 2,424.5 | -334.1 | 289.4 | 13,882,044.24 | 1,366,895.23 | 38° 13' 31.526 N | 81° 57' 8.929 W |
| 2,515.0 | 8.70 | 126.20 | 2,454.1 | -336.9 | 293.3 | 13,882,041.46 | 1,366,899.07 | 38° 13' 31.499 N | 81° 57' 8.880 W |

43.03471

# Survey Report - Geographic

| | | | |
|---|---|---|---|
| **Company:** | HG Energy, LLC | **Local Co-ordinate Reference:** | Well JA Fowler 214 |
| **Project:** | Lincoln County, West Virgina | **TVD Reference:** | Well @ 920.0usft (Decker #9) |
| **Site:** | JA Fowler #214 | **MD Reference:** | Well @ 920.0usft (Decker #9) |
| **Well:** | JA Fowler 214 | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM Compass |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 2,545.0 | 7.90 | 122.50 | 2,483.8 | -339.3 | 296.8 | 13,882,039.01 | 1,366,902.64 | 38° 13' 31.475 N | 81° 57' 8.835 W |
| 2,575.0 | 7.30 | 119.30 | 2,513.5 | -341.4 | 300.2 | 13,882,036.97 | 1,366,906.04 | 38° 13' 31.455 N | 81° 57' 8.792 W |
| 2,631.0 | 7.30 | 119.30 | 2,569.0 | -344.8 | 306.4 | 13,882,033.49 | 1,366,912.25 | 38° 13' 31.421 N | 81° 57' 8.714 W |
| **TD @ 2631' MD / 2569' TVD** | | | | | | | | | |

**Design Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 600.0 | 600.0 | 0.0 | 0.0 | FIRST SURVEY @ 600' MD / 600 TVD |
| 2,631.0 | 2,569.0 | -344.8 | 306.4 | TD @ 2631' MD / 2569' TVD |

Checked By: _____ Approved By: _____ Date: _____

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# HG Energy, LLC

**Lincoln County, West Virgina**
**JA Fowler #214**
**JA Fowler 214**
**Wellbore #1**

**Design: Wellbore #1**

# HG Energy EOW Report

**12 November, 2014**

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# HG Energy EOW Report

| | | | |
|---|---|---|---|
| Company: | HG Energy, LLC | Local Co-ordinate Reference: | Well JA Fowler 214 |
| Project: | Lincoln County, West Virgina | TVD Reference: | Well @ 920.0usft (Decker #9) |
| Site: | JA Fowler #214 | MD Reference: | Well @ 920.0usft (Decker #9) |
| Well: | JA Fowler 214 | North Reference: | Grid |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM Compass |

43-03471

## Project: Lincoln County, West Virgina

| | | | |
|---|---|---|---|
| Map System: | Universal Transverse Mercator | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

## Site: JA Fowler #214

| | | | | | |
|---|---|---|---|---|---|
| Site Position: | | Northing: | 13,882,378.33 usft | Latitude: | 38° 13' 34.800 N |
| From: | Lat/Long | Easting: | 1,366,605.80 usft | Longitude: | 81° 57' 12.600 W |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | -0.59 ° |

## Well: JA Fowler 214

| | | | | | | |
|---|---|---|---|---|---|---|
| Well Position | +N/-S | 0.0 usft | Northing: | 13,882,378.33 usft | Latitude: | 38° 13' 34.800 N |
| | +E/-W | 0.0 usft | Easting: | 1,366,605.80 usft | Longitude: | 81° 57' 12.600 W |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | 0.0 usft | Ground Level: | 912.0 usft |

## Wellbore: Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 10/28/2014 | -7.44 | 66.08 | 51,826 |

## Design: Wellbore #1

Audit Notes:

| | | | | | |
|---|---|---|---|---|---|
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 139.00 |

## Survey Program: Date 11/10/2014

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 600.0 | 2,631.0 | MWD (Wellbore #1) | MWD default | MWD - Standard |

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# HG Energy EOW Report

| | | | |
|---|---|---|---|
| **Company:** | HG Energy, LLC | **Local Co-ordinate Reference:** | Well JA Fowler 214 |
| **Project:** | Lincoln County, West Virgina | **TVD Reference:** | Well @ 920.0usft (Decker #9) |
| **Site:** | JA Fowler #214 | **MD Reference:** | Well @ 920.0usft (Decker #9) |
| **Well:** | JA Fowler 214 | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM Compass |

43-03471

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Closure Distance (usft) | Closure Azimuth (°) |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.0 | 0.00 |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.0 | 0.00 |
| **FIRST SURVEY @ 600' MD / 600 TVD** | | | | | | | | | |
| 625.0 | 0.90 | 139.00 | 625.0 | -0.1 | 0.1 | 0.2 | 3.60 | 0.2 | 139.00 |
| 655.0 | 1.20 | 138.80 | 655.0 | -0.6 | 0.5 | 0.7 | 1.00 | 0.7 | 138.92 |
| 685.0 | 1.90 | 132.20 | 685.0 | -1.1 | 1.1 | 1.6 | 2.40 | 1.6 | 136.75 |
| 715.0 | 2.60 | 147.20 | 715.0 | -2.0 | 1.8 | 2.7 | 3.03 | 2.7 | 138.52 |
| 745.0 | 3.80 | 141.90 | 744.9 | -3.4 | 2.8 | 4.4 | 4.12 | 4.4 | 140.62 |
| 775.0 | 5.10 | 144.40 | 774.8 | -5.3 | 4.2 | 6.7 | 4.38 | 6.7 | 141.56 |
| 805.0 | 6.30 | 138.30 | 804.7 | -7.6 | 6.0 | 9.7 | 4.48 | 9.7 | 141.40 |
| 835.0 | 7.20 | 138.00 | 834.5 | -10.2 | 8.4 | 13.2 | 3.00 | 13.2 | 140.53 |
| 865.0 | 8.20 | 136.10 | 864.2 | -13.1 | 11.1 | 17.2 | 3.44 | 17.2 | 139.70 |
| 895.0 | 8.80 | 131.20 | 893.9 | -16.2 | 14.4 | 21.6 | 3.13 | 21.6 | 138.45 |
| 925.0 | 9.70 | 126.80 | 923.5 | -19.2 | 18.1 | 26.4 | 3.81 | 26.4 | 136.71 |
| 955.0 | 10.17 | 127.70 | 953.0 | -22.4 | 22.2 | 31.4 | 1.65 | 31.5 | 135.17 |
| 985.0 | 11.40 | 129.70 | 982.5 | -25.9 | 26.6 | 37.0 | 4.28 | 37.1 | 134.20 |
| 1,015.0 | 12.70 | 131.30 | 1,011.8 | -29.9 | 31.4 | 43.2 | 4.47 | 43.4 | 133.67 |
| 1,045.0 | 13.80 | 130.90 | 1,041.0 | -34.5 | 36.5 | 50.0 | 3.68 | 50.2 | 133.32 |
| 1,075.0 | 14.70 | 136.60 | 1,070.1 | -39.6 | 41.9 | 57.3 | 5.55 | 57.6 | 133.38 |
| 1,105.0 | 16.40 | 140.50 | 1,099.0 | -45.6 | 47.2 | 65.4 | 6.65 | 65.6 | 134.03 |
| 1,135.0 | 18.00 | 144.80 | 1,127.7 | -52.7 | 52.5 | 74.2 | 6.81 | 74.4 | 135.06 |
| 1,165.0 | 18.10 | 143.30 | 1,156.2 | -60.2 | 58.0 | 83.5 | 1.58 | 83.6 | 136.06 |
| 1,195.0 | 17.70 | 143.60 | 1,184.7 | -67.6 | 63.5 | 92.7 | 1.37 | 92.7 | 136.79 |
| 1,225.0 | 17.50 | 143.50 | 1,213.3 | -74.9 | 68.9 | 101.7 | 0.67 | 101.7 | 137.39 |
| 1,255.0 | 17.30 | 142.90 | 1,242.0 | -82.1 | 74.2 | 110.6 | 0.90 | 110.7 | 137.86 |
| 1,285.0 | 17.20 | 142.70 | 1,270.6 | -89.2 | 79.6 | 119.5 | 0.39 | 119.5 | 138.23 |
| 1,315.0 | 17.20 | 142.90 | 1,299.3 | -96.2 | 85.0 | 128.4 | 0.20 | 128.4 | 138.55 |

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| | | | |
|---|---|---|---|
| **Company:** | HG Energy, LLC | **Local Co-ordinate Reference:** | Well JA Fowler 214 |
| **Project:** | Lincoln County, West Virginia | **TVD Reference:** | Well @ 920.0usft (Decker #9) |
| **Site:** | JA Fowler #214 | **MD Reference:** | Well @ 920.0usft (Decker #9) |
| **Well:** | JA Fowler 214 | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM Compass |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Closure Distance (usft) | Closure Azimuth (°) |
|---|---|---|---|---|---|---|---|---|---|
| 1,345.0 | 17.40 | 143.30 | 1,327.9 | -103.4 | 90.3 | 137.3 | 0.78 | 137.3 | 138.84 |
| 1,375.0 | 17.60 | 142.20 | 1,356.5 | -110.5 | 95.8 | 146.3 | 1.29 | 146.3 | 139.08 |
| 1,405.0 | 17.80 | 142.80 | 1,385.1 | -117.8 | 101.4 | 155.4 | 0.90 | 155.4 | 139.28 |
| 1,435.0 | 18.00 | 142.00 | 1,413.7 | -125.1 | 107.0 | 164.6 | 1.06 | 164.6 | 139.46 |
| 1,465.0 | 17.80 | 142.00 | 1,442.2 | -132.3 | 112.7 | 173.8 | 0.67 | 173.8 | 139.59 |
| 1,495.0 | 17.60 | 142.20 | 1,470.8 | -139.5 | 118.3 | 182.9 | 0.70 | 182.9 | 139.72 |
| 1,525.0 | 17.40 | 141.00 | 1,499.4 | -146.6 | 123.9 | 191.9 | 1.38 | 191.9 | 139.81 |
| 1,555.0 | 17.30 | 142.90 | 1,528.0 | -153.6 | 129.4 | 200.8 | 1.92 | 200.9 | 139.90 |
| 1,585.0 | 17.30 | 142.70 | 1,556.7 | -160.8 | 134.8 | 209.7 | 0.20 | 209.8 | 140.02 |
| 1,615.0 | 17.20 | 141.70 | 1,585.3 | -167.8 | 140.2 | 218.6 | 1.04 | 218.7 | 140.11 |
| 1,645.0 | 17.20 | 141.30 | 1,614.0 | -174.7 | 145.7 | 227.5 | 0.39 | 227.5 | 140.17 |
| 1,675.0 | 16.70 | 137.60 | 1,642.7 | -181.4 | 151.4 | 236.2 | 3.96 | 236.3 | 140.14 |
| 1,705.0 | 16.20 | 136.50 | 1,671.5 | -187.6 | 157.2 | 244.7 | 1.96 | 244.8 | 140.03 |
| 1,735.0 | 16.10 | 133.90 | 1,700.3 | -193.5 | 163.1 | 253.0 | 2.43 | 253.1 | 139.88 |
| 1,765.0 | 17.10 | 133.90 | 1,729.0 | -199.5 | 169.3 | 261.6 | 3.33 | 261.6 | 139.68 |
| 1,795.0 | 18.00 | 136.10 | 1,757.6 | -205.9 | 175.7 | 270.6 | 3.73 | 270.6 | 139.52 |
| 1,825.0 | 18.50 | 134.00 | 1,786.1 | -212.5 | 182.3 | 280.0 | 2.75 | 280.0 | 139.37 |
| 1,855.0 | 18.80 | 133.10 | 1,814.5 | -219.1 | 189.3 | 289.5 | 1.39 | 289.5 | 139.18 |
| 1,885.0 | 18.90 | 134.70 | 1,842.9 | -225.8 | 196.2 | 299.2 | 1.76 | 299.2 | 139.01 |
| 1,915.0 | 18.80 | 139.90 | 1,871.3 | -232.9 | 202.8 | 308.9 | 5.61 | 308.9 | 138.96 |
| 1,945.0 | 17.90 | 146.10 | 1,899.8 | -240.5 | 208.5 | 318.3 | 7.16 | 318.3 | 139.07 |
| 1,975.0 | 17.60 | 147.70 | 1,928.4 | -248.1 | 213.5 | 327.3 | 1.91 | 327.3 | 139.29 |
| 2,005.0 | 18.00 | 146.00 | 1,956.9 | -255.8 | 218.5 | 336.4 | 2.19 | 336.4 | 139.50 |
| 2,035.0 | 17.40 | 145.70 | 1,985.5 | -263.4 | 223.6 | 345.5 | 2.02 | 345.5 | 139.66 |
| 2,065.0 | 16.70 | 144.30 | 2,014.2 | -270.6 | 228.7 | 354.2 | 2.70 | 354.2 | 139.80 |
| 2,095.0 | 16.00 | 143.70 | 2,043.0 | -277.4 | 233.6 | 362.6 | 2.40 | 362.7 | 139.90 |
| 2,125.0 | 15.20 | 140.50 | 2,071.9 | -283.8 | 238.6 | 370.7 | 3.92 | 370.7 | 139.94 |

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| Site: | JA Fowler #214 | MD Reference: | Well @ 920.0usft (Decker #9) |
| Well: | JA Fowler 214 | North Reference: | Grid |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM Compass |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Closure Distance (usft) | Closure Azimuth (°) |
|---|---|---|---|---|---|---|---|---|---|
| 2,155.0 | 14.50 | 140.10 | 2,100.9 | -289.7 | 243.5 | 378.4 | 2.36 | 378.4 | 139.95 |
| 2,185.0 | 13.80 | 139.80 | 2,130.0 | -295.3 | 248.2 | 385.7 | 2.35 | 385.7 | 139.95 |
| 2,215.0 | 13.10 | 138.70 | 2,159.1 | -300.6 | 252.8 | 392.7 | 2.48 | 392.7 | 139.94 |
| 2,245.0 | 12.50 | 136.00 | 2,188.4 | -305.5 | 257.3 | 399.3 | 2.82 | 399.4 | 139.90 |
| 2,275.0 | 11.90 | 136.40 | 2,217.7 | -310.0 | 261.6 | 405.6 | 2.02 | 405.7 | 139.84 |
| 2,305.0 | 11.00 | 135.10 | 2,247.1 | -314.3 | 265.8 | 411.6 | 3.12 | 411.6 | 139.78 |
| 2,335.0 | 10.40 | 133.60 | 2,276.6 | -318.2 | 269.8 | 417.1 | 2.20 | 417.2 | 139.71 |
| 2,365.0 | 9.50 | 132.80 | 2,306.1 | -321.8 | 273.6 | 422.3 | 3.04 | 422.3 | 139.63 |
| 2,395.0 | 9.30 | 127.30 | 2,335.7 | -324.9 | 277.3 | 427.1 | 3.07 | 427.2 | 139.52 |
| 2,425.0 | 9.80 | 127.70 | 2,365.3 | -327.9 | 281.3 | 432.0 | 1.68 | 432.0 | 139.38 |
| 2,455.0 | 10.00 | 127.20 | 2,394.9 | -331.1 | 285.3 | 437.1 | 0.73 | 437.1 | 139.24 |
| 2,485.0 | 9.50 | 125.70 | 2,424.5 | -334.1 | 289.4 | 442.0 | 1.87 | 442.0 | 139.10 |
| 2,515.0 | 8.70 | 126.20 | 2,454.1 | -336.9 | 293.3 | 446.6 | 2.68 | 446.6 | 138.96 |
| 2,545.0 | 7.90 | 122.50 | 2,483.8 | -339.3 | 296.8 | 450.8 | 3.21 | 450.8 | 138.82 |
| 2,575.0 | 7.30 | 119.30 | 2,513.5 | -341.4 | 300.2 | 454.6 | 2.45 | 454.6 | 138.67 |
| 2,631.0 | 7.30 | 119.30 | 2,569.0 | -344.8 | 306.4 | 461.3 | 0.00 | 461.3 | 138.37 |

TD @ 2631' MD / 2569' TVD

**Design Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 600.0 | 600.0 | 0.0 | 0.0 | FIRST SURVEY @ 600' MD / 600 TVD |
| 2,631.0 | 2,569.0 | -344.8 | 306.4 | TD @ 2631' MD / 2569' TVD |

Checked By: _____ Approved By: _____ Date: _____

43-03471

JA Fowler 214
Lincoln County, West Virgina
Q141156 & AM-141140
Design #1

Company Name: HG Energy, LLC
JA Fowler 214
Lincoln County, West Virgina
Rig: Decker #9
Created By: Jerry Arsenault
Date: 11/10/2014

| PROJECT DETAILS: | Lincoln County, West Virgina |
|---|---|
| Geodetic System: | Universal Transverse Mercator |
| Datum: | NAD83 West Virginia - HARN |
| Ellipsoid: | GRS 1980 |
| Zone: | Zone 17N (84 W to 78 W) |
| System Datum: | Mean Sea Level |

DESIGN TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| PBHL - JA Fowler #214 - plan hits target center | 2404.0 | -326.5 | 283.8 | 13882051.79 | 1366889.64 | 38° 13' 31.600 N | 81° 57' 9.000 W |

# HG Energy

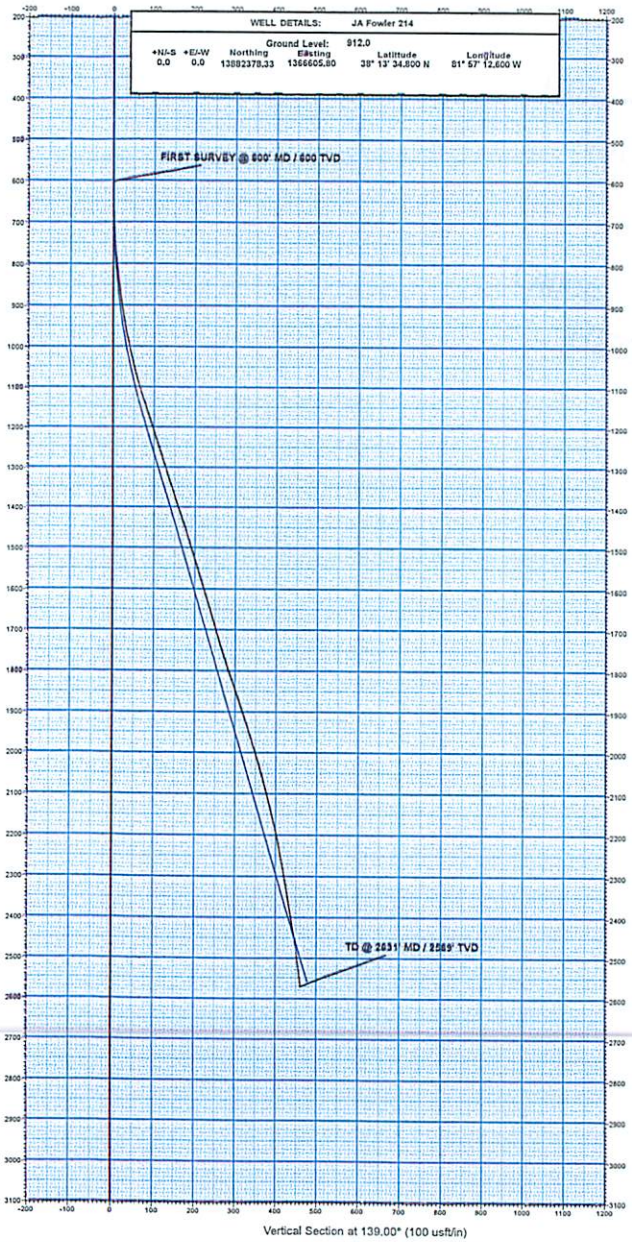
ADC
The APPALACHIAN DIRECTIONAL COMPANY

43-03471

WELL DETAILS: JA Fowler 214

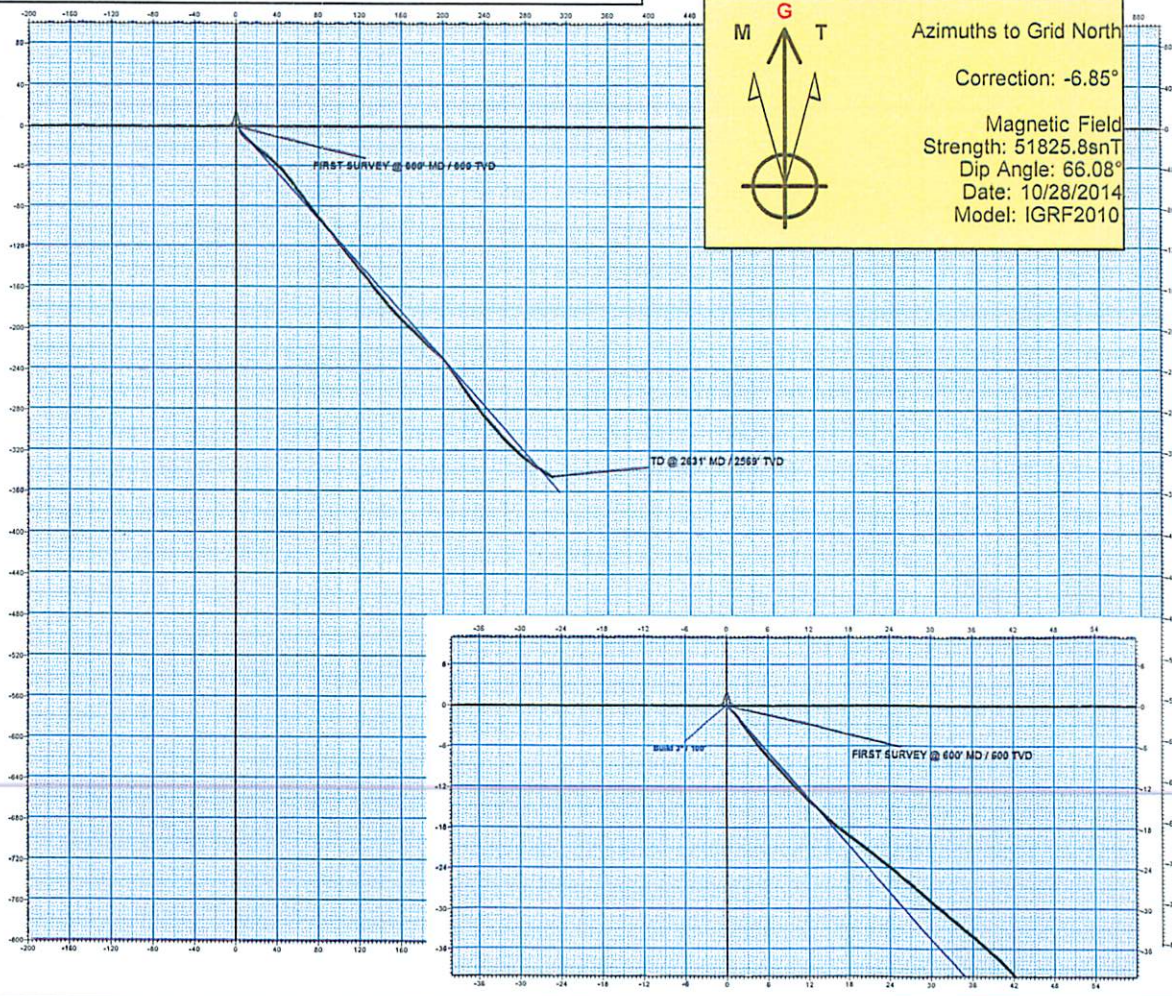
Ground Level: 912.0

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|
| 0.0 | 0.0 | 13882378.33 | 1366605.80 | 38° 13' 34.800 N | 81° 57' 12.600 W |




ANNOTATIONS

| MD | Inc | Azi | TVD | +N/-S | +E/-W | VSect | Departure | Annotation |
|---|---|---|---|---|---|---|---|---|
| 650.0 | 0.00 | 0.00 | 650.0 | 0.0 | 0.0 | 0.0 | 0.0 | Build 3° / 100' |
| 1193.0 | 16.29 | 139.00 | 1185.7 | -57.9 | 50.3 | 76.7 | 76.7 | EOB @ 16.29° Inc / 139° Azm |
| 2462.2 | 16.29 | 139.00 | 2404.0 | -326.5 | 283.8 | 432.7 | 432.7 | Hold @ 16.29° Inc / 139° Azm |
| 2622.2 | 16.29 | 139.00 | 2557.6 | -360.4 | 313.3 | 477.5 | 477.5 | TD @ 2622' MD / 2558' TVD |







Azimuths to Grid North

Correction: -6.85°

Magnetic Field
Strength: 51825.8snT
Dip Angle: 66.08°
Date: 10/28/2014
Model: IGRF2010

4303471

Prepared for:

HG Energy

PRODUCERS SERVICE CORP.

Pr
Pr
Jas
109
Zar
740

| | |
|---|---|
| INVOICE #: | 17198 |
| WELL NAME: | J A Fowler #214 |
| STATE & COUNTY: | WV / Lincoln |
| TOWNSHIP/FIELD: | Griffithsville |
| DATE of SERVICE: | 12/5/2014 |
| CUSTOMER PO# | |

| Description | Notes | Amount | Units | U |
|---|---|---|---|---|
| ACID PUMP CHARGE 1000-2000 PSI | | 1 | EA | $ |
| MILEAGE CHARGE PER UNIT ONE WAY | | 0 | MI | $ |
| IC ACID 15% | | 500 | GAL | $ |
| PRO HIB II | | 0.5 | GAL | $ |
| ACID DELIVERY | | 2 | HR | $ |
| PRO CLA FIRM LP | | 0.5 | GAL | $ |
| PRO PEN | | 1 | GAL | $ |
| PRO NE-1 | | 0.5 | GAL | $ |
| PRO SOL | | 5 | GAL | $ |
| DATA VAN | | 1 | STAGE | $ |

TO

Customer Approval: _____

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Environmental Protection

WR-35
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Page ___ of ___

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 051 - 01671 County Marshall District Sandhill
Quad Valley Grove Pad Name SHL25 (Pilot Hole) Field/Pool Name NA
Farm name David Rutherford Well Number SHL25 AHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4427948.45 Easting 538180.92
Landing Point of Curve Northing 4428122.61 Easting 538135.48
Bottom Hole Northing 4429789.44 Easting 536929.56

Elevation (ft) 1343.98 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air ■ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

Date permit issued 10/11/2013 Date drilling commenced 3/18/2014 Date drilling ceased 6/16/2014
Date completion activities began 8/5/2014 Date completion activities ceased 9/26/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 213 Open mine(s) (Y/N) depths N
Salt water depth(s) ft None noted for Offsets Void(s) encountered (Y/N) depths N
Coal depth(s) ft 810', 866' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y, Shoemaker Mine 866'

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WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01671 Farm name David Rutherford Well number SHL25 AHS

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---|---|---|---|---|---|---|---|
| Conductor | 36 | 30 | 40 | N | | | |
| Surface | 24 | 20 | 418.3 | N | J-55 94# | | Y |
| Coal | | | | | | | |
| Intermediate 1 | 17 1/2 | 13 3/8 | 1253.1 | N | J-55 54.5# | | Y |
| Intermediate 2 | 12 1/4 | 9 5/8 | 3264.0 | N | K-55 36# | | Y |
| Intermediate 3 | | | | | | | |
| Production | 8 3/4 | 5 1/2 | 13880.0 | N | P-110 20# | | Y |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details Surface Casing 4 centralizer and 2 baskets, Intermediate 1 11 Centralizers, Itermediate 2 62 Centralizers, Production 216 Centrek Cent.

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield ( $ft^3$/sks) | Volume ($ft^3$) | Cement Top (MD) | WOC (hrs) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Surface | Type I | 604 | 15.60 | 1.20 | 126.0 | 0 | 8 |
| Coal | | | | | | | |
| Intermediate 1 | Class A | 1175 | 16.20 | 1.09 | 228.0 | 0 | 8 |
| Intermediate 2 | Class Halcem | 1190 | 12.50 | 1.09 | 234.0 | 0 | 8 |
| Intermediate 3 | | | | | | | |
| Production | Class A | 2240 | 14.80 | 1.37 | 504.0 | 668 | 8 |
| Tubing | | | | | | | |

Drillers TD (ft) 13,890 Loggers TD (ft) 13,866

Deepest formation penetrated Marcellus Plug back to (ft) ___

Plug back procedure ___

Kick off depth (ft) 6003

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ☐ No ☐ Conventional ☐ Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING ___

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS ___

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS ___

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED ___

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WR-35
Rev. 8/23/13



API 47- 051 - 01671 Farm name David Rutherford Well number SHL25 AHS

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| | PLEASE SEE ATTACHED PERFORATION RECORD | | | | |

Please *insert additional* pages as applicable.

## STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No. | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|---|---|---|---|---|---|---|---|---|
| | PLEASE SEE ATTACHED STIMULATION STAGE ATTACHMENT | | | | | | | |

Please insert additional pages as applicable.

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Perforation Record

API: 47-051-01671 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25A-HS

| Stage No. | Stim Date | Top Perf | Bottom Perf | # of Perfs | Formation |
|---|---|---|---|---|---|
| **Toe Sleeve** | 8/4/2014 | 13748 | 13752 | | |
| Toe Prep Inj Test | 8/5/2014 | | | | Marcellus |
| 1.1 | 8/6/2014 | 13453 | 13725 | 50 | Marcellus |
| 1.2 | 8/6/2014 | | | | Marcellus |
| 2.1 | 8/8/2014 | 13157 | 13428 | 50 | Marcellus |
| 2.2 | 8/8/2014 | | | | Marcellus |
| 3.1 | 8/9/2014 | 12861 | 13132 | 50 | Marcellus |
| 3.2 | 8/9/2014 | | | | Marcellus |
| 4.1 | 8/10/2014 | 12565 | 12836 | 50 | Marcellus |
| 4.2 | 8/10/2014 | | | | Marcellus |
| 5.1 | 8/11/2014 | 12269 | 12540 | 50 | Marcellus |
| 5.2 | 8/11/2014 | | | | Marcellus |
| 6.1 | 8/12/2014 | 11973 | 12244 | 50 | Marcellus |
| 6.2 | 8/12/2014 | | | | Marcellus |
| 7 Inj Test | 8/26/2014 | 11677 | 11948 | | Marcellus |
| 7 | 8/27/2014 | | | 50 | Marcellus |
| 8 | 8/27/2014 | 11381 | 11652 | 50 | Marcellus |
| 9 | 8/28/2014 | 11085 | 11356 | 50 | Marcellus |
| 10 | 8/28/2014 | 10789 | 11060 | 50 | Marcellus |
| 11 | 8/29/2014 | 10493 | 10764 | 50 | Marcellus |
| 12 | 8/29/2014 | 10197 | 10468 | 50 | Marcellus |
| 13 | 8/30/2014 | 9901 | 10172 | 50 | Marcellus |
| 14 | 8/31/2014 | 9605 | 9876 | 50 | Marcellus |
| 15 | 9/1/2014 | 9309 | 9580 | 50 | Marcellus |
| 16 | 9/2/2014 | 9013 | 9284 | 50 | Marcellus |
| 17 | 9/2/2014 | 8717 | 8988 | 50 | Marcellus |
| 18 | 9/4/2014 | 8421 | 8692 | 50 | Marcellus |
| 19 | 9/4/2014 | 8155 | 8396 | 45 | Marcellus |
| 20 | 9/5/2014 | 7829 | 8100 | 50 | Marcellus |
| 21 | 9/6/2014 | 7533 | 7804 | 50 | Marcellus |
| 21B (Reperf) | 9/6/2014 | 7548 | 7610 | 48 | Marcellus |
| 22 | 9/7/2014 | 7237 | 7508 | 50 | Marcellus |
| 22B (Reperf) | 9/7/2014 | 7227 | 7242 | 36 | Marcellus |
| 23 | 9/7/2014 | 6896 | 7206 | 50 | Marcellus |

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STIMULATION INFORMATION PER STAGE

API: 47-051-01671 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25A-HS

| Stage No. | Stim Date | Avg Rate (bpm) | ATP (psi) | Max BD Pressure | ISIP (psi) | Proppant (lbs) | Water (BBLS) | Amount of $N^2$/ other (units) |
|---|---|---|---|---|---|---|---|---|
| Toe Prep Inj Test | 8/5/2014 | 9.9 | 8,780 | 8,739 | 5,837 | - | 381.05 | |
| 1.1 | 8/6/2014 | 85.2 | 7,553 | 5,341 | 3,766 | 303,283 | 8,375.75 | |
| 1.2 | 8/6/2014 | 82.8 | 7,673 | 7,206 | - | 298,356 | 9,063.84 | |
| 2.1 | 8/8/2014 | 87.5 | 7,558 | 5,732 | 3,941 | 304,431 | 7,992.81 | |
| 2.2 | 8/8/2014 | 79.4 | 7,500 | 7,383 | - | 295,569 | 8,069.40 | |
| 3.1 | 8/9/2014 | 87.9 | 7,853 | 5,785 | 5,162 | 301,075 | 7,220.06 | |
| 3.2 | 8/9/2014 | 83.2 | 8,436 | 6,307 | - | 300,325 | 7,782.94 | |
| 4.1 | 8/10/2014 | 83.8 | 7,835 | 5,621 | 4,213 | 299,580 | 7,207.68 | |
| 4.2 | 8/10/2014 | 85.3 | 7,875 | 5,482 | - | 302,557 | 7,479.78 | |
| 5.1 | 8/11/2014 | 76.8 | 8,035 | 5,736 | 4,363 | 301,809 | 7,756.37 | |
| 5.2 | 8/11/2014 | 76.5 | 8,074 | 6,307 | - | 299,353 | 7,835.53 | |
| 6.1 | 8/12/2014 | 80.7 | 7,946 | 5,496 | 4,161 | 300,164 | 7,425.23 | |
| 6.2 | 8/12/2014 | 81.8 | 8,217 | 6,219 | - | 301,092 | 7,671.90 | |
| 7 Inj Test | 8/26/2014 | 26.5 | 5,254 | - | 4,695 | - | 597.48 | |
| 7 | 8/27/2014 | 74.7 | 7,316 | 5,786 | 4,238 | 600,952 | 15,370.22 | |
| 8 | 8/27/2014 | 77.3 | 7,139 | 5,820 | 4,422 | 599,737 | 17,854.45 | |
| 9 | 8/28/2014 | 77.6 | 7,167 | 5,822 | 4,216 | 599,649 | 15,078.45 | |
| 10 | 8/28/2014 | 78.8 | 7,014 | 5,535 | 4,453 | 601,218 | 15,158.90 | |
| 11 | 8/29/2014 | 73.9 | 7,401 | 5,675 | 4,411 | 600,822 | 14,593.60 | |
| 12 | 8/29/2014 | 75.7 | 7,123 | 5,670 | 4,552 | 600,758 | 14,928.17 | |
| 13 | 8/30/2014 | 75.1 | 7,387 | 5,910 | 4,376 | 599,690 | 15,064.45 | |
| 14 | 8/31/2014 | 80.9 | 6,676 | 6,408 | 4,359 | 598,816 | 16,790.86 | |
| 15 | 9/1/2014 | 77.9 | 6,942 | 6,910 | 4,533 | 590,419 | 14,680.80 | |
| 16 | 9/2/2014 | 80.3 | 6,848 | 6,750 | 4,986 | 608,218 | 14,899.01 | |
| 17 | 9/2/2014 | 80.6 | 6,522 | 6,435 | 4,122 | 600,078 | 15,814.81 | |
| 18 | 9/4/2014 | 69.4 | 7,422 | 7,566 | 4,378 | 601,910 | 17,413.12 | |
| 19 | 9/4/2014 | 80.6 | 6,528 | 6,548 | 4,485 | 592,212 | 14,653.71 | |
| 20 | 9/5/2014 | 79.6 | 6,428 | 5,734 | 4,097 | 609,588 | 14,732.31 | |
| 21 | 9/6/2014 | 66.2 | 7,293 | 5,743 | 5,320 | 301,635 | 12,728.05 | |
| 21B (Reperf) | 9/6/2014 | 89.5 | 6,570 | 5,347 | 4,610 | 301,515 | 7,067.09 | |
| 22 | 9/7/2014 | 88.4 | 6,705 | 6,563 | 5,160 | 291,909 | 7,704.38 | |
| 22B (Reperf) | 9/7/2014 | 89.2 | 6,856 | 5,702 | 4,600 | 306,225 | 7,341.14 | |
| 23 | 9/7/2014 | 88.6 | 6,297 | 5,644 | 4,253 | 601,808 | 14,737.11 | |

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WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01671 Farm name David Rutherford Well number _____

| PRODUCING FORMATION(S) | DEPTHS | | | |
|---|---|---|---|---|
| Marcellus | 6,689 | TVD | 13,890 | MD |
| | | | | |
| | | | | |
| | | | | |

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown □ Open Flow OIL TEST □ Flow □ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

| OPEN FLOW | Gas | Oil | NGL | Water | GAS MEASURED BY |
|---|---|---|---|---|---|
| | 5084 mcfpd | 41 bpd | 407 bpd | 778 bpd | □ Estimated ■ Orifice □ Pilot |

| LITHOLOGY/ FORMATION NAME | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, $H_2S$, ETC) |
|---|---|---|---|---|---|
| | 0 | | 0 | | |
| | PLEASE SEE ATTACHED FORMATION SHEET | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
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Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling Company
Address 171 Locust Avenue Ext. City Mt. Morris State PA Zip 15379

Logging Company Baker Hughes
Address 400 Technology Drive City Canonsburg State PA Zip 15317

Cementing Company Schlumberger
Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy SRCS
Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Regina A. Logue Telephone 724-820-3559
Signature Regina A Logue Title Regulatory Analyst Date 12/10/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

**SHL25 AHS**

47-051-01671

| Formations | Top TVD | Base TVD | Top MD | Base MD | Fluid |
|---|---|---|---|---|---|
| Shale | 0 | 812 | 0 | 812 | |
| Pittsburgh Coal | 812 | 822 | 812 | 822 | |
| Shale and Sandstone | 822 | 1420 | 822 | 1420 | |
| Gas Sand | 1420 | 1473 | 1420 | 1473 | |
| Shale | 1473 | 1517 | 1473 | 1517 | |
| 1st Salt Sand | 1517 | 1595 | 1517 | 1595 | |
| 2nd Salt Sand | 1595 | 1606 | 1595 | 2944 | |
| 3rd Salt Sand | 1606 | 1665 | 1606 | 2977 | |
| Shale | 1665 | 1700 | 1665 | 3364 | |
| Maxton Sand | 1700 | 1838 | 1700 | 3388 | |
| Shale | 1838 | 1860 | 1838 | 4281 | |
| Big Lime | 1860 | 1946 | 1860 | 4295 | |
| Big Injun | 1946 | 2126 | 1946 | 5211 | |
| Price | 2126 | 2465 | 2126 | 5282 | |
| Murrysville | 2465 | 2488 | 2465 | 5326 | |
| Shale and Sandstone | 2488 | 2715 | 2488 | 5959 | |
| 50' Sand | 2715 | 2728 | 2715 | 3388 | |
| Shale | 2728 | 2814 | 2728 | 4281 | |
| Gordon Stray | 2814 | 2821 | 2814 | 4295 | |
| Shale | 2821 | 2836 | 2821 | 5211 | |
| Gordon | 2836 | 2854 | 2836 | 5282 | |
| Shale | 2854 | 2944 | 2854 | 5326 | |
| Fifth Sand | 2944 | 2977 | 2944 | 2977 | |
| Shale | 2977 | 3363 | 2977 | 3364 | |
| Speechley Sand | 3363 | 3387 | 3364 | 3388 | |
| Shale | 3387 | 4271 | 3388 | 4281 | |
| Warren Sand | 4271 | 4285 | 4281 | 4295 | |
| Shale | 4285 | 5192 | 4295 | 5211 | |
| Java Shale | 5192 | 5262 | 5211 | 5282 | |
| Pipe Creek Shale | 5262 | 5306 | 5282 | 5326 | |
| Angola Shale | 5306 | 5932 | 5326 | 5959 | |
| Rhinestreet | 5932 | 6346 | 5959 | 6404 | |
| Cashaqua | 6346 | 6438 | 6404 | 6533 | |
| Middlesex | 6438 | 6475 | 6533 | 6597 | |
| West River | 6475 | 6516 | 6597 | 6684 | |
| Burkett | 6516 | 6549 | 6684 | 6774 | Gas |
| Tully Limestone | 6549 | 6577 | 6774 | not encountered | |
| Hamilton | 6577 | 6691 | not encountered | not encountered | |
| Marcellus | 6691 | | not encountered | not encountered | |

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|---|---|
| Job Start Date: | 8/5/2014 |
| Job End Date: | 9/7/2014 |
| State: | West Virginia |
| County: | Marshall |
| API Number: | 47-051-01671-00-00 |
| Operator Name: | Noble Energy, Inc. |
| Well Name and Number: | SHL 25 A |
| Longitude: | -80.52906000 |
| Latitude: | 40.00078500 |
| Datum: | NAD27 |
| Federal/Tribal Well: | NO |
| True Vertical Depth: | 6,689 |
| Total Base Water Volume (gal): | 15,080,782 |
| Total Base Non Water Volume: | 0 |

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FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

INTERSTATE Oil & Gas COMPACT COMMISSION

51-01671

**Hydraulic Fracturing Fluid Composition:**

| Trade Name | Supplier | Purpose | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Maximum Ingredient Concentration in HF Fluid (% by mass)** | Comments |
|---|---|---|---|---|---|---|---|
| Fresh Water | Operator | Base Fluid | | | | | |
| | | | Fresh Water | 7732-18-5 | 100.00000 | 89.28061 | Density = 8.330 |
| Premium White 40/70 | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 7.10706 | |
| SAND - PREMIUM - 100 MESH, 100 LB, SK (101213353) | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 1.96531 | |
| Premium White 40/70 | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 0.74581 | |
| HYDROCHLORIC ACID 5-10% | Halliburton | Solvent | | | | | |
| | | | Hydrochloric acid | 7647-01-0 | 10.00000 | 0.07296 | |
| FR-66 | Halliburton | Friction Reducer | | | | | |
| | | | Hydrotreated light petroleum distillate | 64742-47-8 | 30.00000 | 0.02057 | |
| HYDROCHLORIC ACID 10-30% | Halliburton | Solvent | | | | | |
| | | | Hydrochloric acid | 7647-01-0 | 30.00000 | 0.00892 | |
| FE-1A ACIDIZING COMPOSITION | Halliburton | Additive | | | | | |
| | | | Acetic anhydride | 108-24-7 | 100.00000 | 0.00393 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Acetic acid | 64-19-7 | 60.00000 | 0.00236 | |
| BE-9 | Halliburton | Biocide | | | | | |
| | | | Tributyl tetradecyl phosphonium chloride | 81741-28-8 | 10.00000 | 0.00409 | |
| LP-65 | Halliburton | Scale Inhibitor | | | | | |
| | | | Ammonium chloride | 12125-02-9 | 10.00000 | 0.00246 | |
| Biovert NWB | Halliburton | Viscosifier | | | | | |
| | | | Polylactide resin | Confidential | 100.00000 | 0.00189 | Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226 |
| LoSurf-300D | Halliburton | Non-ionic Surfactant | | | | | |
| | | | Ethanol | 64-17-5 | 60.00000 | 0.00079 | |
| | | | Heavy aromatic petroleum naphtha | 64742-94-5 | 30.00000 | 0.00040 | |
| | | | Naphthalene | 91-20-3 | 5.00000 | 0.00007 | |
| | | | Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched | 127087-87-0 | 5.00000 | 0.00007 | |
| | | | 1,2,4 Trimethylbenzene | 95-63-6 | 1.00000 | 0.00001 | |
| HAI-OS ACID INHIBITOR | Halliburton | Corrosion Inhibitor | | | | | |
| | | | Methanol | 67-56-1 | 60.00000 | 0.00039 | |
| | | | Propargyl alcohol | 107-19-7 | 10.00000 | 0.00007 | |
| Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS. | | | | | | | |
| | | Other Ingredient(s) | | | | | |
| | | | Water | 7732-18-5 | | 0.85612 | |
| | | Other Ingredient(s) | | | | | |
| | | | Polyacrylamide copolymer | Confidential | | 0.02057 | |
| | | Other Ingredient(s) | | | | | |
| | | | Organic phosphonate | Confidential | | 0.01478 | |
| | | Other Ingredient(s) | | | | | |
| | | | Fatty acid tall oil amide | Confidential | | 0.00343 | |
| | | Other Ingredient(s) | | | | | |
| | | | Ammonium chloride | 12125-02-9 | | 0.00343 | |
| | | Other Ingredient(s) | | | | | |
| | | | Alcohols, C12-16, ethoxylated | 68551-12-2 | | 0.00343 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sodium chloride | 7647-14-5 | | 0.00343 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sorbitan monooleate polyoxyethylene derivative | 9005-65-6 | | 0.00069 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sorbitan, mono-9-octadecenoate, (Z) | 1338-43-8 | | 0.00069 | |
| | | Other Ingredient(s) | | | | | |
| | | | Oxyalkylated phenolic resin | Confidential | | 0.00040 | |

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DEC 15 2014

51-01271

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Other Ingredient(s) | | | | | |
| | | | Formaldehyde | 50-00-0 | | 0.00025 | |
| | | Other Ingredient(s) | | | | | |
| | | | Fatty acids, tall oil | Confidential | | 0.00020 | |
| | | Other Ingredient(s) | | | | | |
| | | | Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide | 68527-49-1 | | 0.00020 | |
| | | Other Ingredient(s) | | | | | |
| | | | Alcohols, C14-C15, ethoxylated | 68951-67-7 | | 0.00020 | |
| | | Other Ingredient(s) | | | | | |
| | | | Oxyalkylated phenolic resin | Confidential | | 0.00013 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00003 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00003 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00001 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00001 | |

51-01671

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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# Actual Wellpath Report

SHL 25A-HS (AWP) Proj: 13890'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot A |
| Area | Marshall County, WV | Well | SHL 25A-HS |
| Field | Marshall | Wellbore | SHL 25A-HS (AWB) |
| Facility | SHL-25 Pad | | |

51-01671

| REPORT SETUP INFORMATION | | | |
|---|---|---|---|
| Projection System | NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet | Software System | WellArchitect® 4.0.1 |
| North Reference | Grid | User | Kroschr |
| Scale | 0.999962 | Report Generated | 18/Jun/2014 at 13:25 |
| Convergence at slot | 0.67° West | Database/Source file | WA_Pennsylvania/SHL_25A-HS__AWB_.xml |

| WELLPATH LOCATION | Local coordinates | | Grid coordinates | | Geographic coordinates | |
|---|---|---|---|---|---|---|
| | North[ft] | East[ft] | Easting[US ft] | Northing[US ft] | Latitude | Longitude |
| Slot Location | 0.00 | 0.00 | 1705028.19 | 548357.37 | 40°00'02.826"N | 80°33'10.462"W |
| Facility Reference Pt | | | 1705028.19 | 548357.37 | 40°00'02.826"N | 80°33'10.462"W |
| Field Reference Pt | | | 609601.22 | 0.00 | 38°23'48.753"N | 84°21'09.765"W |

| WELLPATH DATUM | | | |
|---|---|---|---|
| Calculation method | Minimum curvature | Nomac 79 (RT) to Facility Vertical Datum | 26.00ft |
| Horizontal Reference Pt | Slot | Nomac 79 (RT) to Mean Sea Level | 1351.00ft |
| Vertical Reference Pt | Nomac 79 (RT) | Nomac 79 (RT) to Mud Line at Slot (Slot A) | 26.00ft |
| MD Reference Pt | Nomac 79 (RT) | Section Origin | N 0.00, E 0.00 ft |
| Field Vertical Reference | Mean Sea Level | Section Azimuth | 325.00° |

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# Actual Wellpath Report

SHL 25A-HS (AWP) Proj: 13890'



BAKER HUGHES

51-01671

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot A |
| Area | Marshall County, WV | Well | SHL 25A-HS |
| Field | Marshall | Wellbore | SHL 25A-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (150 stations) † = interpolated/extrapolated station

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00† | 0.000 | 179.200 | 0.00 | 0.00 | 0.00 | 0.00 | 1705028.19 | 548357.37 | 40°00'02.826"N | 80°33'10.462"W | 0.00 | 0.000 | 0.00 |
| 26.00 | 0.000 | 179.200 | 26.00 | 0.00 | 0.00 | 0.00 | 1705028.19 | 548357.37 | 40°00'02.826"N | 80°33'10.462"W | 0.00 | 0.000 | 0.00 |
| 115.00 | 0.190 | 179.200 | 115.00 | -0.12 | -0.15 | 0.00 | 1705028.19 | 548357.22 | 40°00'02.825"N | 80°33'10.462"W | 0.15 | 179.200 | 0.21 |
| 215.00 | 0.220 | 188.040 | 215.00 | -0.40 | -0.50 | -0.02 | 1705028.17 | 548356.87 | 40°00'02.822"N | 80°33'10.463"W | 0.50 | 182.556 | 0.04 |
| 315.00 | 0.430 | 190.450 | 315.00 | -0.80 | -1.06 | -0.12 | 1705028.07 | 548356.31 | 40°00'02.816"N | 80°33'10.464"W | 1.07 | 186.304 | 0.21 |
| 415.00 | 0.430 | 196.860 | 414.99 | -1.30 | -1.79 | -0.29 | 1705027.90 | 548355.58 | 40°00'02.809"N | 80°33'10.466"W | 1.81 | 189.333 | 0.05 |
| 515.00 | 0.360 | 183.040 | 514.99 | -1.78 | -2.46 | -0.42 | 1705027.77 | 548354.91 | 40°00'02.802"N | 80°33'10.467"W | 2.50 | 189.670 | 0.12 |
| 615.00 | 0.230 | 170.150 | 614.99 | -2.21 | -2.97 | -0.40 | 1705027.79 | 548354.40 | 40°00'02.797"N | 80°33'10.467"W | 3.00 | 187.697 | 0.15 |
| 715.00 | 0.280 | 168.670 | 714.99 | -2.61 | -3.41 | -0.32 | 1705027.87 | 548353.96 | 40°00'02.793"N | 80°33'10.466"W | 3.43 | 185.353 | 0.05 |
| 771.00 | 0.410 | 170.470 | 770.99 | -2.92 | -3.74 | -0.26 | 1705027.93 | 548353.63 | 40°00'02.789"N | 80°33'10.465"W | 3.75 | 183.968 | 0.23 |
| 1281.00 | 0.440 | 249.940 | 1280.98 | -4.06 | -6.22 | -1.80 | 1705026.39 | 548351.15 | 40°00'02.765"N | 80°33'10.484"W | 6.47 | 196.126 | 0.11 |
| 1340.00 | 0.550 | 266.060 | 1339.98 | -3.86 | -6.31 | -2.29 | 1705025.90 | 548351.06 | 40°00'02.764"N | 80°33'10.491"W | 6.72 | 199.958 | 0.30 |
| 1468.00 | 0.750 | 240.830 | 1467.97 | -3.45 | -6.76 | -3.64 | 1705024.55 | 548350.61 | 40°00'02.759"N | 80°33'10.508"W | 7.68 | 208.269 | 0.27 |
| 1563.00 | 1.070 | 241.680 | 1562.96 | -3.29 | -7.49 | -4.96 | 1705023.23 | 548349.88 | 40°00'02.752"N | 80°33'10.525"W | 8.98 | 213.527 | 0.34 |
| 1658.00 | 1.210 | 248.890 | 1657.94 | -2.94 | -8.27 | -6.68 | 1705021.51 | 548349.10 | 40°00'02.744"N | 80°33'10.547"W | 10.63 | 218.921 | 0.21 |
| 1752.00 | 1.110 | 124.330 | 1751.93 | -3.56 | -9.14 | -6.85 | 1705021.34 | 548348.23 | 40°00'02.735"N | 80°33'10.549"W | 11.42 | 216.854 | 2.19 |
| 1847.00 | 1.590 | 112.950 | 1846.90 | -5.54 | -10.17 | -4.88 | 1705023.31 | 548347.20 | 40°00'02.725"N | 80°33'10.523"W | 11.28 | 205.616 | 0.58 |
| 1942.00 | 1.710 | 119.610 | 1941.86 | -7.93 | -11.39 | -2.43 | 1705025.76 | 548345.98 | 40°00'02.714"N | 80°33'10.492"W | 11.64 | 192.054 | 0.24 |
| 1987.00 | 1.640 | 123.790 | 1986.84 | -9.14 | -12.08 | -1.31 | 1705026.88 | 548345.29 | 40°00'02.707"N | 80°33'10.477"W | 12.15 | 186.203 | 0.31 |
| 2036.00 | 1.400 | 121.970 | 2035.83 | -10.34 | -12.78 | -0.22 | 1705027.97 | 548344.59 | 40°00'02.700"N | 80°33'10.463"W | 12.79 | 180.995 | 0.50 |
| 2131.00 | 0.980 | 127.030 | 2130.81 | -12.19 | -13.89 | 1.41 | 1705029.60 | 548343.48 | 40°00'02.689"N | 80°33'10.442"W | 13.96 | 174.199 | 0.46 |
| 2226.00 | 1.100 | 117.820 | 2225.79 | -13.77 | -14.80 | 2.87 | 1705031.06 | 548342.57 | 40°00'02.681"N | 80°33'10.423"W | 15.08 | 169.042 | 0.22 |
| 2320.00 | 1.010 | 130.800 | 2319.77 | -15.38 | -15.76 | 4.29 | 1705032.48 | 548341.61 | 40°00'02.671"N | 80°33'10.405"W | 16.34 | 164.773 | 0.27 |
| 2415.00 | 0.960 | 126.700 | 2414.76 | -16.94 | -16.79 | 5.56 | 1705033.75 | 548340.58 | 40°00'02.661"N | 80°33'10.388"W | 17.69 | 161.666 | 0.09 |
| 2509.00 | 0.380 | 127.660 | 2508.75 | -17.99 | -17.45 | 6.44 | 1705034.63 | 548339.92 | 40°00'02.655"N | 80°33'10.377"W | 18.60 | 159.738 | 0.62 |
| 2605.00 | 0.580 | 157.330 | 2604.75 | -18.77 | -18.09 | 6.88 | 1705035.07 | 548339.28 | 40°00'02.649"N | 80°33'10.371"W | 19.36 | 159.177 | 0.33 |
| 2699.00 | 0.250 | 175.570 | 2698.75 | -19.41 | -18.73 | 7.08 | 1705035.27 | 548338.64 | 40°00'02.642"N | 80°33'10.369"W | 20.03 | 159.299 | 0.37 |
| 2794.00 | 0.530 | 236.090 | 2793.75 | -19.58 | -19.19 | 6.73 | 1705034.92 | 548338.18 | 40°00'02.638"N | 80°33'10.373"W | 20.33 | 160.668 | 0.49 |
| 2889.00 | 0.810 | 253.060 | 2888.74 | -19.36 | -19.63 | 5.72 | 1705033.91 | 548337.74 | 40°00'02.633"N | 80°33'10.386"W | 20.45 | 163.742 | 0.36 |
| 2983.00 | 1.050 | 239.260 | 2982.73 | -19.09 | -20.26 | 4.35 | 1705032.54 | 548337.11 | 40°00'02.627"N | 80°33'10.403"W | 20.72 | 167.888 | 0.35 |
| 3078.00 | 1.360 | 252.350 | 3077.71 | -18.69 | -21.05 | 2.53 | 1705030.72 | 548336.32 | 40°00'02.619"N | 80°33'10.427"W | 21.20 | 173.157 | 0.43 |
| 3173.00 | 1.560 | 250.680 | 3172.67 | -18.00 | -21.82 | 0.23 | 1705028.42 | 548335.55 | 40°00'02.611"N | 80°33'10.456"W | 21.82 | 179.393 | 0.22 |
| 3233.00 | 1.530 | 247.390 | 3232.65 | -17.61 | -22.40 | -1.28 | 1705026.91 | 548334.98 | 40°00'02.605"N | 80°33'10.475"W | 22.43 | 183.269 | 0.16 |
| 3372.00 | 1.710 | 253.520 | 3371.60 | -16.56 | -23.70 | -4.98 | 1705023.21 | 548333.67 | 40°00'02.592"N | 80°33'10.523"W | 24.22 | 191.870 | 0.18 |
| 3467.00 | 0.850 | 77.820 | 3466.59 | -16.38 | -23.95 | -5.65 | 1705022.54 | 548333.42 | 40°00'02.589"N | 80°33'10.531"W | 24.61 | 193.276 | 2.69 |
| 3561.00 | 1.420 | 52.230 | 3560.57 | -16.59 | -23.09 | -4.05 | 1705024.14 | 548334.28 | 40°00'02.598"N | 80°33'10.511"W | 23.44 | 189.946 | 0.80 |
| 3656.00 | 0.280 | 229.610 | 3655.56 | -16.56 | -22.52 | -3.30 | 1705024.89 | 548334.85 | 40°00'02.604"N | 80°33'10.501"W | 22.76 | 188.325 | 1.79 |
| 3751.00 | 0.650 | 223.060 | 3750.56 | -16.69 | -23.06 | -3.84 | 1705024.35 | 548334.31 | 40°00'02.598"N | 80°33'10.508"W | 23.38 | 189.453 | 0.39 |
| 3846.00 | 0.830 | 210.710 | 3845.55 | -17.08 | -24.05 | -4.56 | 1705023.63 | 548333.32 | 40°00'02.588"N | 80°33'10.517"W | 24.48 | 190.735 | 0.25 |
| 3941.00 | 1.280 | 214.330 | 3940.53 | -17.74 | -25.52 | -5.51 | 1705022.68 | 548331.85 | 40°00'02.574"N | 80°33'10.529"W | 26.11 | 192.183 | 0.48 |
| 4036.00 | 0.700 | 233.970 | 4035.52 | -18.13 | -26.73 | -6.58 | 1705021.61 | 548330.64 | 40°00'02.562"N | 80°33'10.543"W | 27.53 | 193.821 | 0.70 |
| 4130.00 | 0.390 | 286.970 | 4129.51 | -17.89 | -26.98 | -7.35 | 1705020.84 | 548330.39 | 40°00'02.559"N | 80°33'10.553"W | 27.96 | 195.234 | 0.60 |
| 4225.00 | 0.810 | 266.320 | 4224.51 | -17.28 | -26.93 | -8.33 | 1705019.86 | 548330.44 | 40°00'02.559"N | 80°33'10.565"W | 28.19 | 197.183 | 0.49 |
| 4320.00 | 1.120 | 257.050 | 4319.50 | -16.58 | -27.18 | -9.90 | 1705018.29 | 548330.19 | 40°00'02.557"N | 80°33'10.585"W | 28.93 | 200.017 | 0.36 |
| 4415.00 | 0.670 | 185.410 | 4414.49 | -16.66 | -27.94 | -10.86 | 1705017.33 | 548329.43 | 40°00'02.549"N | 80°33'10.598"W | 29.98 | 201.238 | 1.17 |

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# Actual Wellpath Report

SHL 25A-HS (AWP) Proj: 13890'



BAKER HUGHES

51-01671

## REFERENCE WELLPATH IDENTIFICATION

| | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot A |
| Area | Marshall County, WV | Well | SHL 25A-HS |
| Field | Marshall | Wellbore | SHL 25A-HS (AWB) |
| Facility | SHL-25 Pad | | |

## WELLPATH DATA (150 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4509.00 | 0.980 | 230.120 | 4508.48 | -17.15 | -29.00 | -11.53 | 1705016.66 | 548328.37 | 40°00'02.539"N | 80°33'10.606"W | 31.21 | 201.676 | 0.73 |
| 4604.00 | 1.090 | 230.020 | 4603.46 | -17.29 | -30.10 | -12.84 | 1705015.35 | 548327.27 | 40°00'02.528"N | 80°33'10.623"W | 32.73 | 203.105 | 0.12 |
| 4699.00 | 1.320 | 246.880 | 4698.44 | -17.15 | -31.11 | -14.54 | 1705013.65 | 548326.26 | 40°00'02.517"N | 80°33'10.644"W | 34.35 | 205.050 | 0.44 |
| 4793.00 | 1.070 | 293.930 | 4792.42 | -16.17 | -31.18 | -16.34 | 1705011.85 | 548326.19 | 40°00'02.516"N | 80°33'10.668"W | 35.21 | 207.654 | 1.04 |
| 4888.00 | 1.120 | 279.630 | 4887.41 | -14.76 | -30.67 | -18.07 | 1705010.12 | 548326.70 | 40°00'02.521"N | 80°33'10.690"W | 35.59 | 210.502 | 0.29 |
| 4983.00 | 1.650 | 279.130 | 4982.38 | -13.16 | -30.30 | -20.33 | 1705007.86 | 548327.08 | 40°00'02.525"N | 80°33'10.719"W | 36.49 | 213.866 | 0.56 |
| 5078.00 | 1.300 | 308.760 | 5077.35 | -11.17 | -29.40 | -22.52 | 1705005.67 | 548327.97 | 40°00'02.533"N | 80°33'10.747"W | 37.04 | 217.451 | 0.87 |
| 5173.00 | 1.420 | 287.360 | 5172.32 | -9.20 | -28.38 | -24.49 | 1705003.70 | 548328.99 | 40°00'02.543"N | 80°33'10.773"W | 37.48 | 220.790 | 0.55 |
| 5267.00 | 0.960 | 17.100 | 5266.31 | -7.80 | -27.28 | -25.37 | 1705002.82 | 548330.09 | 40°00'02.554"N | 80°33'10.784"W | 37.25 | 222.921 | 1.82 |
| 5347.00 | 1.090 | 30.910 | 5346.29 | -7.07 | -25.98 | -24.78 | 1705003.41 | 548331.39 | 40°00'02.567"N | 80°33'10.777"W | 35.91 | 223.639 | 0.35 |
| 5424.00 | 2.560 | 94.630 | 5423.26 | -7.87 | -25.50 | -22.69 | 1705005.50 | 548331.88 | 40°00'02.572"N | 80°33'10.750"W | 34.13 | 221.666 | 2.98 |
| 5518.00 | 10.400 | 98.750 | 5516.59 | -15.09 | -26.96 | -12.19 | 1705016.00 | 548330.41 | 40°00'02.559"N | 80°33'10.615"W | 29.59 | 204.339 | 8.35 |
| 5613.00 | 10.490 | 104.980 | 5610.02 | -27.64 | -30.50 | 4.64 | 1705032.83 | 548326.87 | 40°00'02.526"N | 80°33'10.398"W | 30.85 | 171.357 | 1.19 |
| 5708.00 | 11.170 | 112.890 | 5703.33 | -42.06 | -36.31 | 21.47 | 1705049.66 | 548321.06 | 40°00'02.470"N | 80°33'10.181"W | 42.18 | 149.408 | 1.72 |
| 5803.00 | 11.150 | 115.220 | 5796.53 | -57.83 | -43.81 | 38.26 | 1705066.44 | 548313.57 | 40°00'02.398"N | 80°33'09.964"W | 58.16 | 138.869 | 0.48 |
| 5898.00 | 11.160 | 115.000 | 5889.74 | -73.76 | -51.60 | 54.90 | 1705083.09 | 548305.77 | 40°00'02.323"N | 80°33'09.749"W | 75.34 | 133.229 | 0.05 |
| 5992.00 | 11.110 | 113.090 | 5981.97 | -89.33 | -59.00 | 71.47 | 1705099.66 | 548298.37 | 40°00'02.252"N | 80°33'09.535"W | 92.68 | 129.540 | 0.40 |
| 6087.00 | 10.790 | 51.110 | 6075.54 | -96.52 | -57.00 | 86.86 | 1705115.05 | 548300.37 | 40°00'02.273"N | 80°33'09.338"W | 103.90 | 123.274 | 11.82 |
| 6182.00 | 12.300 | 5.030 | 6168.80 | -88.15 | -41.31 | 94.69 | 1705122.87 | 548316.07 | 40°00'02.429"N | 80°33'09.240"W | 103.31 | 113.568 | 9.57 |
| 6230.00 | 13.130 | 0.460 | 6215.63 | -79.79 | -30.76 | 95.18 | 1705123.37 | 548326.61 | 40°00'02.534"N | 80°33'09.235"W | 100.03 | 107.910 | 2.72 |
| 6277.00 | 17.390 | 359.690 | 6260.96 | -69.66 | -18.39 | 95.19 | 1705123.37 | 548338.98 | 40°00'02.656"N | 80°33'09.237"W | 96.95 | 100.937 | 9.07 |
| 6326.00 | 21.570 | 0.530 | 6307.14 | -56.31 | -2.06 | 95.23 | 1705123.42 | 548355.31 | 40°00'02.817"N | 80°33'09.238"W | 95.25 | 91.237 | 8.55 |
| 6372.00 | 26.010 | 0.270 | 6349.23 | -41.18 | 16.49 | 95.35 | 1705123.54 | 548373.86 | 40°00'03.001"N | 80°33'09.240"W | 96.77 | 80.186 | 9.65 |
| 6467.00 | 35.880 | 349.710 | 6430.66 | 1.25 | 64.87 | 90.46 | 1705118.65 | 548422.24 | 40°00'03.478"N | 80°33'09.310"W | 111.32 | 54.356 | 11.82 |
| 6561.00 | 44.580 | 345.470 | 6502.37 | 57.30 | 124.03 | 77.24 | 1705105.43 | 548481.40 | 40°00'04.061"N | 80°33'09.489"W | 146.12 | 31.912 | 9.70 |
| 6656.00 | 47.570 | 347.490 | 6568.27 | 120.95 | 190.55 | 61.28 | 1705089.46 | 548547.92 | 40°00'04.717"N | 80°33'09.704"W | 200.16 | 17.826 | 3.50 |
| 6751.00 | 55.840 | 336.620 | 6627.20 | 192.09 | 261.11 | 38.00 | 1705066.19 | 548618.47 | 40°00'05.411"N | 80°33'10.013"W | 263.86 | 8.280 | 12.49 |
| 6846.00 | 65.920 | 331.130 | 6673.40 | 273.97 | 335.40 | 1.35 | 1705029.54 | 548692.76 | 40°00'06.141"N | 80°33'10.496"W | 335.40 | 0.231 | 11.74 |
| 6941.00 | 75.540 | 329.690 | 6704.72 | 363.14 | 413.27 | -42.91 | 1704985.28 | 548770.62 | 40°00'06.905"N | 80°33'11.076"W | 415.49 | 354.073 | 10.23 |
| 7036.00 | 81.350 | 329.520 | 6723.74 | 455.88 | 493.52 | -89.98 | 1704938.21 | 548850.87 | 40°00'07.693"N | 80°33'11.693"W | 501.65 | 349.667 | 6.12 |
| 7131.00 | 88.580 | 327.260 | 6732.07 | 550.28 | 574.05 | -139.55 | 1704888.64 | 548931.39 | 40°00'08.483"N | 80°33'12.342"W | 590.77 | 346.336 | 7.97 |
| 7166.00 | 91.480 | 326.440 | 6732.05 | 585.25 | 603.35 | -158.69 | 1704869.51 | 548960.69 | 40°00'08.770"N | 80°33'12.592"W | 623.87 | 345.264 | 8.61 |
| 7198.00 | 91.940 | 324.340 | 6731.10 | 617.24 | 629.67 | -176.86 | 1704851.34 | 548987.02 | 40°00'09.028"N | 80°33'12.830"W | 654.04 | 344.311 | 6.72 |
| 7226.00 | 92.090 | 323.340 | 6730.11 | 645.21 | 652.26 | -193.37 | 1704834.83 | 549009.61 | 40°00'09.250"N | 80°33'13.045"W | 680.32 | 343.487 | 3.61 |
| 7320.00 | 91.140 | 322.250 | 6727.46 | 739.10 | 727.10 | -250.18 | 1704778.02 | 549084.44 | 40°00'09.983"N | 80°33'13.786"W | 768.94 | 341.013 | 1.54 |
| 7415.00 | 90.490 | 321.490 | 6726.11 | 833.95 | 801.82 | -308.83 | 1704719.37 | 549159.16 | 40°00'10.714"N | 80°33'14.551"W | 859.24 | 338.935 | 1.05 |
| 7510.00 | 90.580 | 319.770 | 6725.22 | 928.67 | 875.26 | -369.09 | 1704659.11 | 549232.59 | 40°00'11.433"N | 80°33'15.337"W | 949.89 | 337.135 | 1.81 |
| 7605.00 | 90.650 | 325.050 | 6724.20 | 1023.53 | 950.50 | -427.02 | 1704601.19 | 549307.83 | 40°00'12.170"N | 80°33'16.092"W | 1042.02 | 335.808 | 5.56 |
| 7700.00 | 90.580 | 325.810 | 6723.18 | 1118.52 | 1028.72 | -480.92 | 1704547.29 | 549386.05 | 40°00'12.936"N | 80°33'16.797"W | 1135.58 | 334.944 | 0.80 |
| 7794.00 | 90.490 | 326.820 | 6722.31 | 1212.49 | 1106.94 | -533.05 | 1704495.16 | 549464.26 | 40°00'13.703"N | 80°33'17.478"W | 1228.60 | 334.287 | 1.08 |
| 7889.00 | 90.620 | 327.860 | 6721.39 | 1307.41 | 1186.91 | -584.31 | 1704443.90 | 549544.23 | 40°00'14.488"N | 80°33'18.149"W | 1322.94 | 333.789 | 1.10 |
| 7984.00 | 90.740 | 327.780 | 6720.26 | 1402.29 | 1267.31 | -634.90 | 1704393.31 | 549624.63 | 40°00'15.276"N | 80°33'18.811"W | 1417.46 | 333.390 | 0.15 |
| 8079.00 | 90.650 | 331.420 | 6719.11 | 1496.96 | 1349.23 | -682.97 | 1704345.25 | 549706.55 | 40°00'16.080"N | 80°33'19.441"W | 1512.24 | 333.152 | 3.83 |
| 8174.00 | 90.740 | 330.570 | 6717.95 | 1591.43 | 1432.31 | -729.03 | 1704299.19 | 549789.62 | 40°00'16.896"N | 80°33'20.046"W | 1607.17 | 333.024 | 0.90 |
| 8268.00 | 90.620 | 320.970 | 6716.84 | 1685.31 | 1509.93 | -781.84 | 1704246.38 | 549867.24 | 40°00'17.657"N | 80°33'20.736"W | 1700.34 | 332.625 | 10.21 |

Received
Office of Oil & Gas
DEC 15 2014

noble energy

# Actual Wellpath Report

SHL 25A-HS (AWP) Proj: 13890'



BAKER HUGHES

51-01671

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot A |
| Area | Marshall County, WV | Well | SHL 25A-HS |
| Field | Marshall | Wellbore | SHL 25A-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (150 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8363.00 | 90.740 | 319.480 | 6715.71 | 1779.97 | 1582.94 | -842.61 | 1704185.61 | 549940.24 | 40°00'18.371"N | 80°33'21.528"W | 1793.23 | 331.973 | 1.57 |
| 8458.00 | 90.920 | 322.440 | 6714.33 | 1874.71 | 1656.71 | -902.43 | 1704125.79 | 550014.01 | 40°00'19.093"N | 80°33'22.308"W | 1886.55 | 331.422 | 3.12 |
| 8552.00 | 90.950 | 325.610 | 6712.80 | 1968.67 | 1732.76 | -957.64 | 1704070.59 | 550090.06 | 40°00'19.838"N | 80°33'23.028"W | 1979.78 | 331.072 | 3.37 |
| 8647.00 | 91.050 | 322.900 | 6711.14 | 2063.64 | 1809.84 | -1013.12 | 1704015.11 | 550167.14 | 40°00'20.593"N | 80°33'23.753"W | 2074.11 | 330.761 | 2.85 |
| 8742.00 | 90.950 | 325.350 | 6709.48 | 2158.61 | 1886.80 | -1068.78 | 1703959.45 | 550244.10 | 40°00'21.348"N | 80°33'24.480"W | 2168.48 | 330.471 | 2.58 |
| 8836.00 | 90.860 | 327.030 | 6708.00 | 2252.57 | 1964.90 | -1121.08 | 1703907.16 | 550322.19 | 40°00'22.113"N | 80°33'25.164"W | 2262.22 | 330.293 | 1.79 |
| 8931.00 | 91.140 | 327.660 | 6706.34 | 2347.48 | 2044.87 | -1172.33 | 1703855.91 | 550402.16 | 40°00'22.897"N | 80°33'25.834"W | 2357.08 | 330.174 | 0.73 |
| 9027.00 | 90.060 | 324.580 | 6705.33 | 2443.44 | 2124.55 | -1225.84 | 1703802.40 | 550481.84 | 40°00'23.679"N | 80°33'26.534"W | 2452.83 | 330.016 | 3.40 |
| 9121.00 | 89.910 | 324.320 | 6705.36 | 2537.44 | 2201.03 | -1280.49 | 1703747.75 | 550558.31 | 40°00'24.428"N | 80°33'27.248"W | 2546.41 | 329.811 | 0.32 |
| 9216.00 | 89.910 | 323.790 | 6705.51 | 2632.42 | 2277.94 | -1336.25 | 1703691.99 | 550635.22 | 40°00'25.182"N | 80°33'27.976"W | 2640.94 | 329.604 | 0.56 |
| 9312.00 | 89.880 | 322.930 | 6705.68 | 2728.38 | 2354.97 | -1393.54 | 1703634.70 | 550712.25 | 40°00'25.936"N | 80°33'28.724"W | 2736.39 | 329.385 | 0.90 |
| 9406.00 | 90.830 | 322.390 | 6705.10 | 2822.30 | 2429.70 | -1450.56 | 1703577.69 | 550786.98 | 40°00'26.668"N | 80°33'29.468"W | 2829.76 | 329.162 | 1.16 |
| 9501.00 | 89.510 | 320.640 | 6704.82 | 2917.12 | 2504.06 | -1509.67 | 1703518.58 | 550861.33 | 40°00'27.396"N | 80°33'30.239"W | 2923.94 | 328.915 | 2.31 |
| 9596.00 | 88.920 | 323.080 | 6706.12 | 3011.96 | 2578.77 | -1568.33 | 1703459.92 | 550936.03 | 40°00'28.127"N | 80°33'31.004"W | 3018.23 | 328.693 | 2.64 |
| 9690.00 | 88.950 | 326.330 | 6707.87 | 3105.93 | 2655.46 | -1622.63 | 1703405.63 | 551012.73 | 40°00'28.879"N | 80°33'31.713"W | 3111.98 | 328.573 | 3.46 |
| 9785.00 | 88.980 | 326.590 | 6709.58 | 3200.88 | 2734.63 | -1675.11 | 1703353.15 | 551091.89 | 40°00'29.655"N | 80°33'32.399"W | 3206.90 | 328.510 | 0.28 |
| 9880.00 | 88.920 | 323.740 | 6711.32 | 3295.86 | 2812.59 | -1729.36 | 1703298.90 | 551169.85 | 40°00'30.419"N | 80°33'33.108"W | 3301.72 | 328.414 | 3.00 |
| 9974.00 | 88.920 | 324.180 | 6713.10 | 3389.83 | 2888.58 | -1784.66 | 1703243.61 | 551245.84 | 40°00'31.164"N | 80°33'33.830"W | 3395.42 | 328.291 | 0.47 |
| 10069.00 | 89.780 | 327.420 | 6714.17 | 3484.80 | 2967.14 | -1838.04 | 1703190.22 | 551324.39 | 40°00'31.934"N | 80°33'34.528"W | 3490.32 | 328.223 | 3.53 |
| 10163.00 | 89.880 | 325.900 | 6714.45 | 3578.75 | 3045.67 | -1889.70 | 1703138.56 | 551402.92 | 40°00'32.704"N | 80°33'35.204"W | 3584.28 | 328.182 | 1.62 |
| 10258.00 | 89.880 | 327.590 | 6714.65 | 3673.71 | 3125.11 | -1941.80 | 1703086.47 | 551482.35 | 40°00'33.483"N | 80°33'35.885"W | 3679.25 | 328.145 | 1.78 |
| 10352.00 | 90.060 | 328.830 | 6714.70 | 3767.56 | 3205.00 | -1991.32 | 1703036.95 | 551562.25 | 40°00'34.266"N | 80°33'36.534"W | 3773.25 | 328.147 | 1.33 |
| 10447.00 | 90.460 | 327.420 | 6714.27 | 3862.41 | 3285.67 | -2041.48 | 1702986.79 | 551642.91 | 40°00'35.058"N | 80°33'37.191"W | 3868.24 | 328.146 | 1.54 |
| 10541.00 | 90.370 | 327.740 | 6713.59 | 3956.31 | 3365.02 | -2091.87 | 1702936.40 | 551722.26 | 40°00'35.836"N | 80°33'37.850"W | 3962.23 | 328.133 | 0.35 |
| 10636.00 | 90.430 | 326.980 | 6712.93 | 4051.23 | 3445.02 | -2143.11 | 1702885.16 | 551802.25 | 40°00'36.620"N | 80°33'38.521"W | 4057.22 | 328.115 | 0.80 |
| 10731.00 | 90.310 | 324.690 | 6712.31 | 4146.21 | 3523.61 | -2196.46 | 1702831.82 | 551880.84 | 40°00'37.391"N | 80°33'39.218"W | 4152.14 | 328.063 | 2.41 |
| 10825.00 | 90.250 | 323.310 | 6711.85 | 4240.19 | 3599.66 | -2251.71 | 1702776.57 | 551956.89 | 40°00'38.136"N | 80°33'39.940"W | 4245.91 | 327.973 | 1.47 |
| 10921.00 | 90.150 | 323.160 | 6711.52 | 4336.15 | 3676.56 | -2309.17 | 1702719.12 | 552033.79 | 40°00'38.889"N | 80°33'40.690"W | 4341.59 | 327.868 | 0.19 |
| 11015.00 | 90.280 | 323.580 | 6711.17 | 4430.11 | 3752.00 | -2365.25 | 1702663.04 | 552109.22 | 40°00'39.628"N | 80°33'41.422"W | 4435.30 | 327.773 | 0.47 |
| 11110.00 | 90.370 | 321.830 | 6710.63 | 4525.03 | 3827.57 | -2422.81 | 1702605.48 | 552184.79 | 40°00'40.368"N | 80°33'42.173"W | 4529.93 | 327.667 | 1.84 |
| 11205.00 | 90.460 | 322.720 | 6709.94 | 4619.92 | 3902.71 | -2480.93 | 1702547.35 | 552259.92 | 40°00'41.104"N | 80°33'42.931"W | 4624.52 | 327.556 | 0.94 |
| 11299.00 | 90.220 | 326.910 | 6709.38 | 4713.89 | 3979.52 | -2535.09 | 1702493.21 | 552336.73 | 40°00'41.856"N | 80°33'43.639"W | 4718.39 | 327.501 | 4.46 |
| 11394.00 | 90.370 | 325.910 | 6708.89 | 4808.86 | 4058.65 | -2587.64 | 1702440.65 | 552415.86 | 40°00'42.632"N | 80°33'44.326"W | 4813.37 | 327.480 | 1.06 |
| 11489.00 | 90.400 | 324.550 | 6708.25 | 4903.86 | 4136.68 | -2641.82 | 1702386.48 | 552493.89 | 40°00'43.397"N | 80°33'45.034"W | 4908.29 | 327.436 | 1.43 |
| 11583.00 | 89.970 | 323.740 | 6707.95 | 4997.85 | 4212.87 | -2696.88 | 1702331.42 | 552570.07 | 40°00'44.143"N | 80°33'45.754"W | 5002.14 | 327.375 | 0.98 |
| 11678.00 | 89.850 | 323.900 | 6708.10 | 5092.82 | 4289.55 | -2752.96 | 1702275.34 | 552646.75 | 40°00'44.895"N | 80°33'46.486"W | 5096.96 | 327.308 | 0.21 |
| 11773.00 | 90.250 | 324.430 | 6708.02 | 5187.81 | 4366.57 | -2808.57 | 1702219.73 | 552723.76 | 40°00'45.649"N | 80°33'47.212"W | 5191.82 | 327.251 | 0.70 |
| 11867.00 | 90.220 | 323.860 | 6707.63 | 5281.80 | 4442.75 | -2863.63 | 1702164.67 | 552799.95 | 40°00'46.396"N | 80°33'47.932"W | 5285.68 | 327.196 | 0.61 |
| 11962.00 | 90.280 | 323.690 | 6707.22 | 5376.78 | 4519.39 | -2919.77 | 1702108.53 | 552876.58 | 40°00'47.146"N | 80°33'48.665"W | 5380.52 | 327.135 | 0.19 |
| 12057.00 | 90.150 | 323.540 | 6706.86 | 5471.75 | 4595.87 | -2976.13 | 1702052.18 | 552953.06 | 40°00'47.895"N | 80°33'49.400"W | 5475.34 | 327.074 | 0.21 |
| 12151.00 | 90.400 | 323.460 | 6706.41 | 5565.72 | 4671.43 | -3032.04 | 1701996.27 | 553028.61 | 40°00'48.636"N | 80°33'50.130"W | 5569.16 | 327.014 | 0.28 |
| 12246.00 | 90.460 | 328.030 | 6705.69 | 5660.68 | 4749.93 | -3085.50 | 1701942.82 | 553107.11 | 40°00'49.405"N | 80°33'50.829"W | 5664.11 | 326.993 | 4.81 |
| 12341.00 | 90.520 | 329.630 | 6704.88 | 5755.46 | 4831.21 | -3134.66 | 1701893.65 | 553188.39 | 40°00'50.202"N | 80°33'51.474"W | 5759.05 | 327.023 | 1.69 |
| 12435.00 | 90.680 | 329.110 | 6703.90 | 5849.18 | 4912.09 | -3182.55 | 1701845.76 | 553269.26 | 40°00'50.996"N | 80°33'52.101"W | 5852.97 | 327.061 | 0.58 |
| 12530.00 | 90.650 | 329.450 | 6702.79 | 5943.91 | 4993.75 | -3231.08 | 1701797.24 | 553350.92 | 40°00'51.797"N | 80°33'52.737"W | 5947.89 | 327.096 | 0.36 |

51-01671

## REFERENCE WELLPATH IDENTIFICATION

| | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot A |
| Area | Marshall County, WV | Well | SHL 25A-HS |
| Field | Marshall | Wellbore | SHL 25A-HS (AWB) |
| Facility | SHL-25 Pad | | |

## WELLPATH DATA (150 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12625.00 | 90.580 | 328.700 | 6701.78 | 6038.67 | 5075.24 | -3279.90 | 1701748.42 | 553432.41 | 40°00'52.597"N | 80°33'53.377"W | 6042.83 | 327.127 | 0.79 |
| 12720.00 | 90.620 | 327.370 | 6700.78 | 6133.53 | 5155.83 | -3330.19 | 1701698.13 | 553512.99 | 40°00'53.387"N | 80°33'54.036"W | 6137.81 | 327.141 | 1.40 |
| 12815.00 | 90.550 | 324.510 | 6699.81 | 6228.50 | 5234.52 | -3383.39 | 1701644.94 | 553591.68 | 40°00'54.159"N | 80°33'54.731"W | 6232.78 | 327.123 | 3.01 |
| 12910.00 | 91.020 | 322.460 | 6698.51 | 6323.45 | 5310.86 | -3439.91 | 1701588.42 | 553668.02 | 40°00'54.907"N | 80°33'55.469"W | 6327.57 | 327.068 | 2.21 |
| 13004.00 | 90.490 | 322.040 | 6697.27 | 6417.33 | 5385.18 | -3497.45 | 1701530.88 | 553742.33 | 40°00'55.634"N | 80°33'56.220"W | 6421.24 | 326.998 | 0.72 |
| 13099.00 | 90.550 | 321.450 | 6696.41 | 6512.18 | 5459.78 | -3556.27 | 1701472.07 | 553816.93 | 40°00'56.364"N | 80°33'56.987"W | 6515.84 | 326.921 | 0.62 |
| 13194.00 | 90.620 | 322.170 | 6695.44 | 6607.02 | 5534.44 | -3615.00 | 1701413.34 | 553891.59 | 40°00'57.095"N | 80°33'57.754"W | 6610.46 | 326.848 | 0.76 |
| 13289.00 | 90.520 | 323.260 | 6694.49 | 6701.94 | 5610.02 | -3672.54 | 1701355.79 | 553967.16 | 40°00'57.835"N | 80°33'58.505"W | 6705.21 | 326.790 | 1.15 |
| 13383.00 | 90.520 | 324.390 | 6693.64 | 6795.92 | 5685.89 | -3728.02 | 1701300.31 | 554043.04 | 40°00'58.579"N | 80°33'59.229"W | 6799.08 | 326.749 | 1.20 |
| 13478.00 | 90.490 | 326.320 | 6692.80 | 6890.91 | 5764.04 | -3782.03 | 1701246.31 | 554121.18 | 40°00'59.345"N | 80°33'59.935"W | 6894.05 | 326.729 | 2.03 |
| 13573.00 | 90.460 | 327.500 | 6692.01 | 6985.85 | 5843.63 | -3833.89 | 1701194.45 | 554200.77 | 40°01'00.125"N | 80°34'00.614"W | 6989.04 | 326.732 | 1.24 |
| 13668.00 | 90.400 | 328.620 | 6691.30 | 7080.71 | 5924.24 | -3884.15 | 1701144.20 | 554281.38 | 40°01'00.916"N | 80°34'01.272"W | 7084.01 | 326.750 | 1.18 |
| 13762.00 | 90.620 | 326.930 | 6690.46 | 7174.59 | 6003.76 | -3934.27 | 1701094.08 | 554360.89 | 40°01'01.696"N | 80°34'01.928"W | 7177.99 | 326.763 | 1.81 |
| 13866.00 | 90.490 | 325.880 | 6689.46 | 7278.55 | 6090.38 | -3991.81 | 1701036.54 | 554447.51 | 40°01'02.545"N | 80°34'02.681"W | 7281.98 | 326.758 | 1.02 |
| 13890.00 | 90.490 | 325.880 | 6689.25 | 7302.55 | 6110.25 | -4005.27 | 1701023.08 | 554467.37 | 40°01'02.740"N | 80°34'02.857"W | 7305.98 | 326.755 | 0.00 |

## TARGETS

| Name | MD [ft] | TVD [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|---|
| SHL 25A-HS BHL:Rev-1 | | 6661.00 | 6096.06 | -4008.16 | **1701020.19** | **554453.19** | 40°01'02.599"N | 80°34'02.892"W | point |
| SHL 25A-HS BHL:Rev-2 | | 6680.91 | 6096.06 | -4008.16 | **1701020.19** | **554453.19** | 40°01'02.599"N | 80°34'02.892"W | point |
| SHL 25A-HS LP:Rev-1 | | 6726.00 | 570.88 | -139.39 | **1704888.81** | **548928.23** | 40°00'08.452"N | 80°33'12.339"W | point |
| SHL 25A-HS LP:Rev-2 | | 6728.00 | 570.88 | -139.39 | **1704888.81** | **548928.23** | 40°00'08.452"N | 80°33'12.339"W | point |

## WELLPATH COMPOSITION - Ref Wellbore: SHL 25A-HS (AWB) Ref Wellpath: SHL 25A-HS (AWP) Proj: 13890'

| Start MD [ft] | End MD [ft] | Positional Uncertainty Model | Log Name/Comment | Wellbore |
|---|---|---|---|---|
| 26.00 | 771.00 | Generic gyro - northseeking (Standard) | 01_VES Gyro Surveys 17 1/2" (100'-756') | SHL 25A-HS (AWB) |
| 771.00 | 3233.00 | NaviTrak (Standard) | 02_BHI MWD Surveys 12 1/4" (771')(1281'-3233') Proj: 3285' | SHL 25A-HS (AWB) |
| 3233.00 | 5347.00 | NaviTrak (MagCorr) | 03_BHI LCP 8 3/4" (3233')(3372'-5347') | SHL 25A-HS (AWB) |
| 5347.00 | 13866.00 | NaviTrak (MagCorr) | 04_BHI AT Curve <8-3/4"> (5347')(5424'-13866') | SHL 25A-HS (AWB) |
| 13866.00 | 13890.00 | Blind Drilling (std) | Projection to bit | SHL 25A-HS (AWB) |

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Office of Oil & Gas
DEC 15 2014

51-01671

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | **NOBLE ENERGY** | Slot | **Slot A** |
| Area | **Marshall County, WV** | Well | **SHL 25A-HS** |
| Field | **Marshall** | Wellbore | **SHL 25A-HS (AWB)** |
| Facility | **SHL-25 Pad** | | |

**COMMENTS**

**Wellpath general comments**
API: 47-051-01671-0000
Rig: Nomac 79
BHI Job #: 6323806A
Duration: 06/11/2014-06/17/2014
VES Gyro Surveys (100'-756')
BHI MWD Surveys (771')(1281'-3233')
BHI LCP (3233')(3372'-5347')
BHI AT Curve (5347')(5424'-13866')
TD Projected to MD: 13890'

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Office of Oil & Gas
DEC 15 2014

# NOBLE ENERGY

Location: Marshall County, WV
Field: Marshall
Facility: SHL-25 Pad

Slot: Slot A
Well: SHL 25A-HS
Wellbore: SHL 25A-HS (PWB)

## Location Information

| Facility Name | | | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|
| SHL-25 Pad | | | 1705028.190 | 548357.370 | 40°00'02.826"N | 80°33'10.462"W |
| Slot | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
| Slot A | 0.00 | 0.00 | 1705028.190 | 548357.370 | 40°00'02.826"N | 80°33'10.462"W |

| | |
|---|---|
| Nomac 79 (RT) to Mud line (At Slot: Slot A) | 26ft |
| Mean Sea Level to Mud line (At Slot: Slot A) | -1325ft |
| Nomac 79 (RT) to Mean Sea Level | 1351ft |

Plot reference wellpath is SHL 25A-HS (PWP) Rev-D.0

| | |
|---|---|
| True vertical depths are referenced to Nomac 79 (RT) | Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet |
| Measured depths are referenced to Nomac 79 (RT) | North Reference: Grid north |
| Nomac 79 (RT) to Mean Sea Level: 1351 feet | Scale: True distance |
| Mean Sea Level to Mud line (At Slot: Slot A): -1325 feet | Depths are in feet |
| Coordinates are in feet referenced to Slot | Created by: kroschr on 18/Jun/2014 |

## Well Profile Data

| Design Comment | MD (ft) | Inc (°) | Az (°) | TVD (ft) | Local N (ft) | Local E (ft) | DLS (°/100ft) | VS (ft) |
|---|---|---|---|---|---|---|---|---|
| Tie On | 3233.00 | 1.530 | 247.390 | 3232.65 | -22.40 | -1.28 | 0.00 | -17.61 |
| Projection | 3285.00 | 1.530 | 247.390 | 3284.63 | -22.93 | -2.56 | 0.00 | -17.31 |
| End of Drop | 3361.50 | 0.000 | 108.741 | 3361.13 | -23.32 | -3.50 | 2.00 | -17.09 |
| KOP | 5400.00 | 0.000 | 108.741 | 5399.63 | -23.32 | -3.50 | 0.00 | -17.09 |
| End of Build (J) | 5665.52 | 10.621 | 108.741 | 5663.62 | -31.21 | 19.73 | 4.00 | -36.88 |
| End of Tangent (J) | 6011.72 | 10.621 | 108.741 | 6003.90 | -51.71 | 80.16 | 0.00 | -88.33 |
| End of 3D Arc | 6380.13 | 28.000 | 358.000 | 6357.51 | 25.99 | 110.13 | 9.00 | -41.88 |
| LP | 7126.77 | 90.400 | 325.000 | 6728.00 | 570.88 | -139.39 | 9.00 | 547.59 |
| BHL | 13871.93 | 90.400 | 325.000 | 6680.91 | 6096.06 | -4008.16 | 0.00 | 7292.59 |

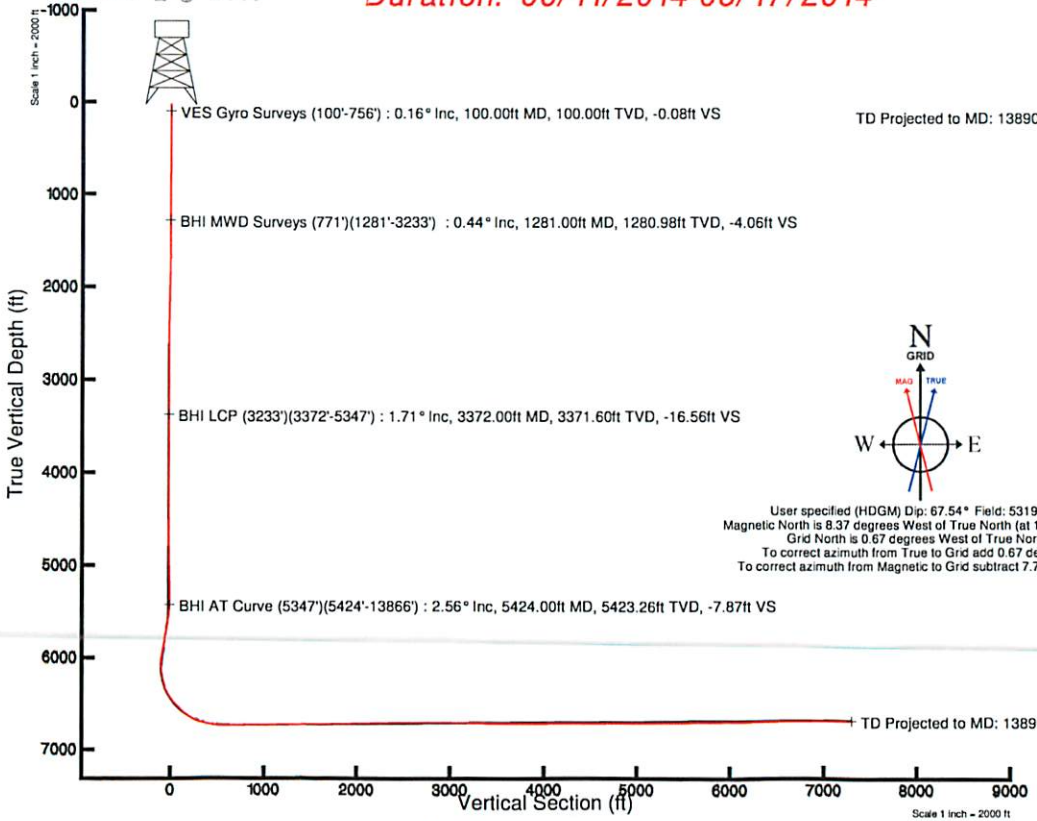
## Targets

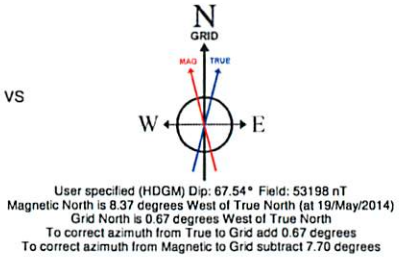
| Name | MD (ft) | TVD (ft) | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|
| SHL 25A-HS BHL:Rev-1 | | 6661.00 | 6096.06 | -4008.16 | 1701020.19 | 554453.19 | 40°01'02.599"N | 80°34'02.892"W |
| SHL 25A-HS BHL:Rev-2 | 13871.93 | 6680.91 | 6096.06 | -4008.16 | 1701020.19 | 554453.19 | 40°01'02.599"N | 80°34'02.892"W |
| SHL 25A-HS LP:Rev-1 | | 6726.00 | 570.88 | -139.39 | 1704888.81 | 548928.23 | 40°00'08.452"N | 80°33'12.339"W |
| SHL 25A-HS LP:Rev-2 | 7126.77 | 6728.00 | 570.88 | -139.39 | 1704888.81 | 548928.23 | 40°00'08.452"N | 80°33'12.339"W |

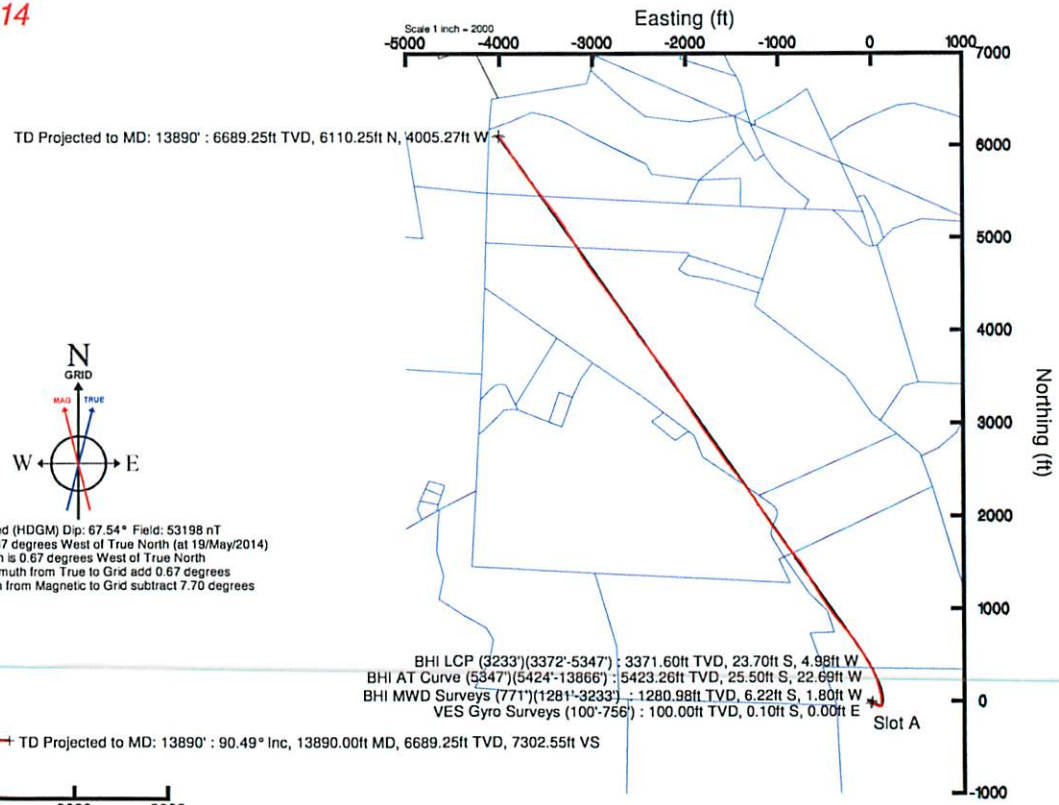
51-01671

Received
Office of Oil & Gas
DEC 15 2014

API: 47-051-01671-0000
Rig: Nomac 79
BHI Job #: 6323806A
Duration: 06/11/2014-06/17/2014



Well is located on topo map 14,885' feet south of Latitude: 40°02'30"

# AS DRILLED PLAT

Well is located on topo map 3,123' feet west of Longitude: 80°32'30"

| PERMITTED APPROX. LANDING POINT |
|---|
| UTM 17-NAD83 |
| N:4428121.65 |
| E:538135.55 |
| NAD27, WV NORTH |
| N:548928.23 |
| E:1704888.81 |

| AS DRILLED APPROX. LANDING POINT |
|---|
| UTM 17-NAD83 |
| N:4428122.61 |
| E:538135.48 |
| NAD27, WV NORTH |
| N:548931.39 |
| E:1704888.64 |

| PARCEL | LESSOR |
|---|---|
| 1 | DAVID RUTHERFORD ET UX. |
| 2 | STEPHEN YOURKOVICK ET AL. |
| 3 | JOHN R. GRAY ET UX. |
| 4 | DELBERT L. NELSON ET UX. |
| 5 | CNX GAS COMPANY LLC ET AL. |
| 6 | DON N. BRYANT ET UX. |
| 7 | JAMES A. GRAY ET UX. |

NOTES:

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

| AS DRILLED BOTTOM HOLE LOCATION (BHL) |
|---|
| UTM 17-NAD83 |
| N:4429789.44 |
| E:536929.56 |
| NAD27, WV NORTH |
| N:554467.37 |
| E:1701023.08 |

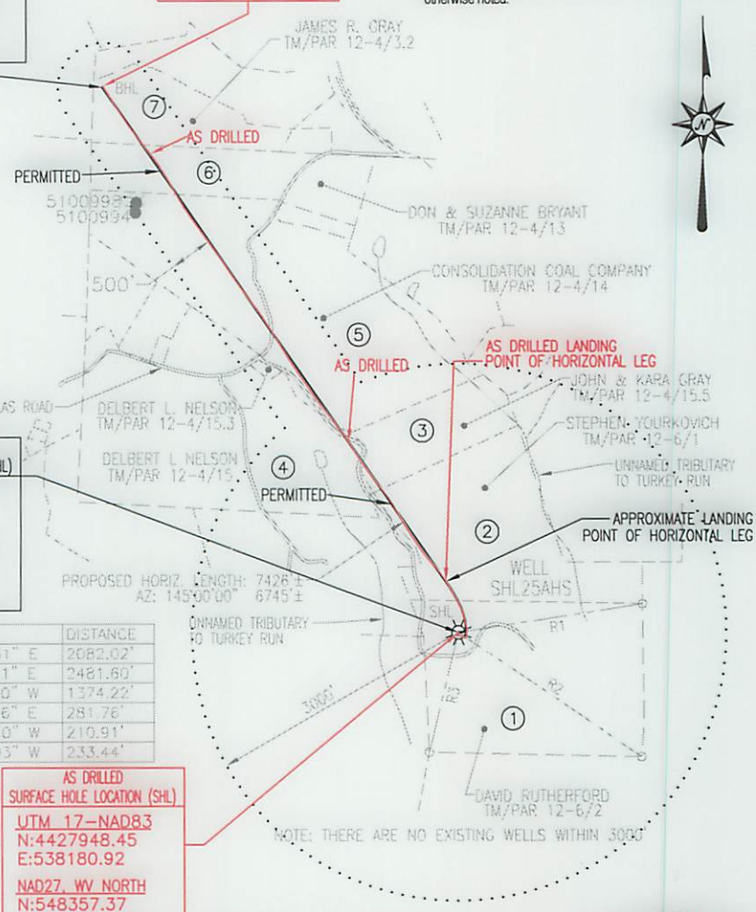
| PERMITTED BOTTOM HOLE LOCATION (BHL) |
|---|
| UTM 17-NAD83 |
| N:4429785.11 |
| E:536928.76 |
| NAD27, WV NORTH |
| N:554453.19 |
| E:1701020.19 |

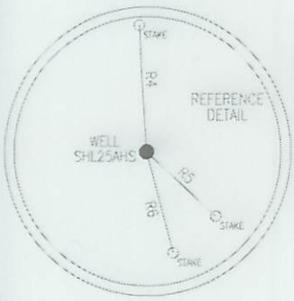
## LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED.
- (0) LEASE NUMBER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED

EXISTING WELLS

- EXISTING WELLS
- PLUGGED WELLS

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| UTM 17-NAD83 |
| N:4427948.41 |
| E:538181.04 |
| NAD27, WV NORTH |
| N:548357.23 |
| E:1705028.51 |

| LINE | BEARING | DISTANCE |
|---|---|---|
| R1 | N 81°05'31" E | 2082.02' |
| R2 | S 56°00'11" E | 2481.60' |
| R3 | S 13°46'20" W | 1374.22' |
| R4 | S 03°38'46" E | 281.76' |
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| R6 | N 14°27'03" W | 233.44' |

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| N:4427948.45 |
| E:538180.92 |
| NAD27, WV NORTH |
| N:548357.37 |
| E:1705028.19 |

**Blue Mountain Inc.**
10125 MASON DIXON HIGHWAY
BURTON, WV 26562
PHONE: (304) 662-6486

FILE #: SHL25AHS-AS DRILLED

DRAWING #: SHL25AHS-AS DRILLED

SCALE: 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/2500

PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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

Signed: George D. Six

R.P.E.: _____ L.L.S.: P.S. No. 2000

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

PLACE SEAL HERE

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

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

DATE: DECEMBER 8, 2014

OPERATOR'S WELL #: SHL25AHS-AS DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01671 (PERMIT)

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

WATERSHED: WHEELING CREEK ELEVATION: 1343.98'

COUNTY/DISTRICT: MARSHALL / SAND HILL QUADRANGLE: VALLEY GROVE, WV 7.5'

SURFACE OWNER: DAVID RUTHERFORD ACREAGE: 95.912±

OIL & GAS ROYALTY OWNER: DAVID RUTHERFORD ET UX. ACREAGE: 520.779±

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐

PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐

CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,823'± TMD: 13,925'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN

Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590

City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

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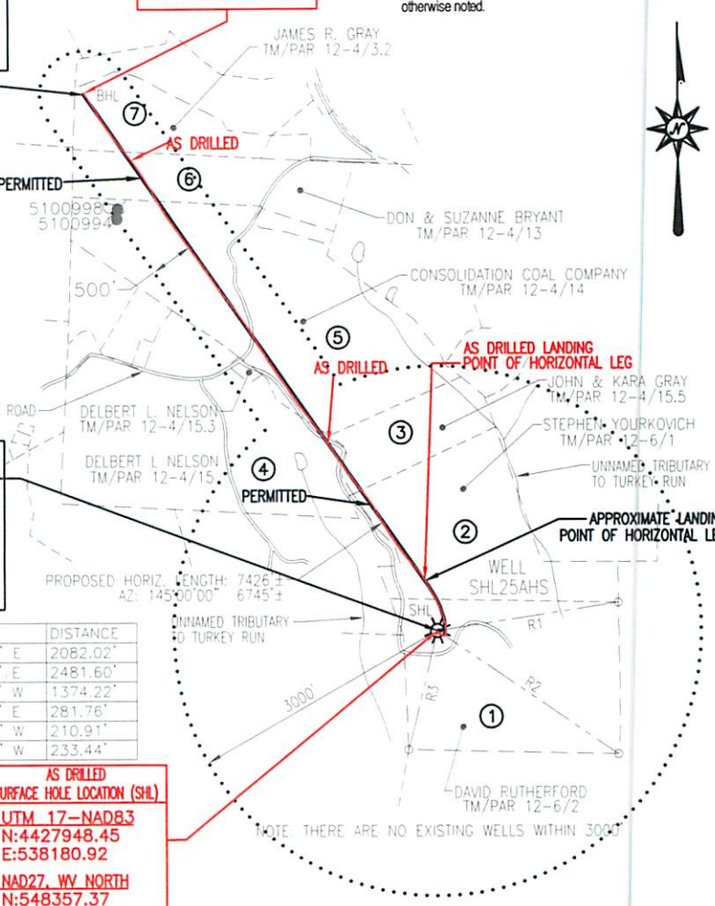


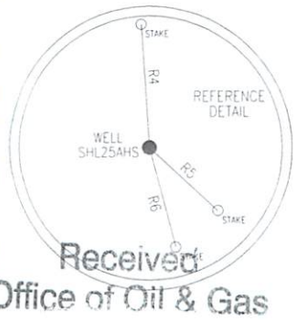


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API WELL #: 47 (STATE) 51 (COUNTY) 01671 (PERMIT)

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☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK ELEVATION: 1343.98'

COUNTY/DISTRICT: MARSHALL / SAND HILL QUADRANGLE: VALLEY GROVE, WV 7.5'

SURFACE OWNER: DAVID RUTHERFORD ACREAGE: 95.912±

OIL & GAS ROYALTY OWNER: DAVID RUTHERFORD ET UX. ACREAGE: 520.779±

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐

PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐

CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,823'± TMD: 13,925'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN

Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590

City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

WR-35
Rev. 8/23/13

Page ___ of ___

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 051 - 01682 County Marshall District Sandhill
Quad Valley Grove Pad Name SHL25 Field/Pool Name NA
Farm name David Rutherford Well Number SHL25 CHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

| | | | | |
|---|---|---|---|---|
| Top hole | Northing | 4427951.08 | Easting | 538172.17 |
| Landing Point of Curve | Northing | 4428285.75 | Easting | 538294.16 |
| Bottom Hole | Northing | 4430293.94 | Easting | 536837.05 |

Elevation (ft) 1344.44 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air ■ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

Date permit issued 11/18/2013 Date drilling commenced 3/18/2014 Date drilling ceased 5/30/2014
Date completion activities began 8/6/2014 Date completion activities ceased 10/4/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 213 Open mine(s) (Y/N) depths N
Salt water depth(s) ft None noted for Offsets Void(s) encountered (Y/N) depths N
Coal depth(s) ft 810', 866' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y, Shoemaker Mine 866'

Reviewed by:

Received
Office of Oil & Gas
DEC 15 2014

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01682 Farm name David Rutherford Well number SHL25 CHS

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---|---|---|---|---|---|---|---|
| Conductor | 36 | 30 | 40 | N | | | |
| Surface | 24 | 20 | 418.3 | N | J-55 94# | | Y |
| Coal | | | | | | | |
| Intermediate 1 | 17 1/2 | 13 3/8 | 1253.85 | N | J-55 54.5# | | Y |
| Intermediate 2 | 12 1/4 | 9 5/8 | 3232.70 | N | K-55 36# | | Y |
| Intermediate 3 | | | | | | | |
| Production | 8 3/4 | 5 1/2 | 15464.5 | N | P-110 20# | | Y |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details Surface Casing 4 centralizer and 2 baskets, Intermediate 1 11 Centralizers, Itermediate 2 42 Centralizers, Production 251 Centralizers

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield ( $ft^3$/sks) | Volume ($ft^3$) | Cement Top (MD) | WOC (hrs) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Surface | Type I | 604 | 15.60 | 1.20 | 104.0 | 0 | 8 |
| Coal | | | | | | | |
| Intermediate 1 | Type I | 1027 | 15.60 | 1.20 | 220.0 | 0 | 8 |
| Intermediate 2 | Class A | 1160 | 16.20 | 1.09 | 225.0 | 0 | 8 |
| Intermediate 3 | | | | | | | |
| Production | Class A | 2681 | 14.80 | 1.26 | 597.0 | 3000 | 8 |
| Tubing | | | | | | | |

Drillers TD (ft) 15,474 Loggers TD (ft) 15,449

Deepest formation penetrated Marcellus Plug back to (ft) Not a Pilot Hole

Plug back procedure Not a Pilot Hole

Kick off depth (ft) 6114

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐sonic

Well cored ☐ Yes ☐ No ☐ Conventional ☐ Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
4 Centralizers on Surface (1 every 3rd joint) and 2 baskets 11 Centralizers on Intermediate 1 (1 every 3rd joint) 42 Centralizers on Intermediate 2 (1 every 3rd Joint)
251 Centralizers on Production (1 every 3rd to Curve, then 1 every joint to TD)

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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DEC 15 2014

WR-35
Rev. 8/23/13



API 47- 051 - 01682 Farm name David Rutherford Well number SHL25 CHS

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| | | | | | |
| | PLEASE SEE ATTACHED | | | | |
| | PERFORATION RECORD | | | | |
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Please insert additional pages as applicable.

## STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No. | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | PLEASE SEE ATTACHED | | | | | | | |
| | STIMULATION STAGE | | | | | | | |
| | ATTACHMENT | | | | | | | |
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Please insert additional pages as applicable.

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DEC 15 2014

Perforation Record

API: 47-051-01682 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25C-HS

| Stage No. | Stim Date | Top Perf | Bottom Perf | # of Perfs | Formation |
|---|---|---|---|---|---|
| Toe Sleeve | 8/4/2014 | 15331 | 15334 | | |
| Toe Sub Inj Test | 8/6/2014 | 15215 | 15,307 | - | Marcellus |
| 1.1 | 8/6/2014 | 15096 | 15,307 | 50 | Marcellus |
| 1.2 | 8/7/2014 | | | | Marcellus |
| 1.3 | 8/7/2014 | | | | Marcellus |
| 2.1 Over Pressure | 8/8/2014 | - | - | - | Marcellus |
| 2.1 | 8/16/2014 | 14739 | 15,010 | 50 | Marcellus |
| 2.2 | 8/16/2014 | | | | Marcellus |
| 2.3 | 8/17/2014 | | | | Marcellus |
| 3.1 | 8/17/2014 | 14443 | 14,714 | 50 | Marcellus |
| 3.2 | 8/17/2014 | | | | Marcellus |
| 3.3 | 8/17/2014 | | | | Marcellus |
| 4.1 | 8/18/2014 | 14147 | 14,418 | 50 | Marcellus |
| 4.2 | 8/18/2014 | | | | Marcellus |
| 4.3 | 8/18/2014 | | | | Marcellus |
| 5.1 | 8/18/2014 | 13851 | 14,122 | 50 | Marcellus |
| 5.2 | 8/18/2014 | | | | Marcellus |
| 5.3 | 8/18/2014 | | | | Marcellus |
| 6.1 | 8/19/2014 | 13555 | 13,826 | 50 | Marcellus |
| 6.2 | 8/19/2014 | | | | Marcellus |
| 6.3 | 8/19/2014 | | | | Marcellus |
| 7 (Diff PTR Format) | 8/19/2014 | 13259 | 13,530 | 50 | Marcellus |
| 8 | 8/20/2014 | 12963 | 13,234 | 50 | Marcellus |
| 9 | 8/21/2014 | 12667 | 12,938 | 50 | Marcellus |
| 10 | 8/21/2014 | 12371 | 12,642 | 50 | Marcellus |
| 11 | 8/22/2014 | 12075 | 12,346 | 50 | Marcellus |
| 12 | 8/22/2014 | 11780 | 12,049 | 50 | Marcellus |
| 13 | 8/22/2014 | 11483 | 11,753 | 50 | Marcellus |
| 14 | 8/23/2014 | 11187 | 11,458 | 50 | Marcellus |
| 15 | 8/23/2014 | 10891 | 11,161 | 50 | Marcellus |
| 16 | 8/23/2014 | 10595 | 10,866 | 50 | Marcellus |
| 17 | 8/24/2014 | 10299 | 10,570 | 50 | Marcellus |
| 18 | 8/24/2014 | 10003 | 10,274 | 50 | Marcellus |
| 19 | 8/25/2014 | 9707 | 9,977 | 50 | Marcellus |
| 20 | 8/25/2014 | 9411 | 9,680 | 50 | Marcellus |
| 21 | 8/27/2014 | 9115 | 9,386 | 50 | Marcellus |
| 22 | 8/27/2014 | 8819 | 9,090 | 50 | Marcellus |
| 23 | 8/28/2014 | 8523 | 8,794 | 50 | Marcellus |
| 24 | 8/29/2014 | 8227 | 8,498 | 50 | Marcellus |
| 24B (Reperf) | 8/29/2014 | 8216 | 8,247 | 36 | Marcellus |
| 25 | 8/29/2014 | 7931 | 8,202 | 50 | Marcellus |

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Perforation Record

API: 47-051-01682 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25C-HS

| Stage No. | Stim Date | Top Perf | Bottom Perf | # of Perfs | Formation |
|---|---|---|---|---|---|
| 26 | 8/30/2014 | 7635 | 7,903 | 50 | Marcellus |
| 27 | 8/30/2014 | 7339 | 7,610 | 50 | Marcellus |
| 27B (Reperf) | 8/31/2014 | 7380 | 7,412 | 48 | Marcellus |
| 28 | 8/31/2014 | 7043 | 7,314 | 50 | Marcellus |

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DEC 15 2014

STIMULATION INFORMATION PER STAGE

API: 47-051-01682 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25C-HS

| Stage No. | Stim Date | Avg Rate (bpm) | ATP (psi) | Max BD Pressure | ISIP (psi) | Proppant (lbs) | Water (BBLS) | Amount of $N^2$/ other (units) |
|---|---|---|---|---|---|---|---|---|
| Toe Sub Inj Test | 8/6/2014 | 16.8 | 8,005 | 9,138 | 5,794 | - | - | |
| 1.1 | 8/6/2014 | 86.7 | 7,541 | 5,733 | 3,979 | 199,757 | 6,462.14 | |
| 1.2 | 8/7/2014 | 87.7 | 7,480 | 5,603 | - | 201,772 | 6,698.90 | |
| 1.3 | 8/7/2014 | 87.8 | 7,626 | 5,361 | - | 198,514 | 6,601.57 | |
| 2.1 Over Pressure | 8/8/2014 | 14.9 | 5,421 | - | - | - | 125.50 | |
| 2.1 | 8/16/2014 | 78.6 | 7,861 | 5,850 | 4,340 | 196,332 | 6,911.33 | |
| 2.2 | 8/16/2014 | 83.2 | 7,987 | 5,382 | - | 199,975 | 7,463.61 | |
| 2.3 | 8/17/2014 | 80.2 | 8,256 | 5,210 | - | 206,648 | 7,076.07 | |
| 3.1 | 8/17/2014 | 78.4 | 8,203 | 5,774 | 4,372 | 200,021 | 7,029.07 | |
| 3.2 | 8/17/2014 | 77.1 | 8,033 | 5,695 | - | 186,457 | 5,881.80 | |
| 3.3 | 8/17/2014 | 76.1 | 7,937 | 6,202 | - | 217,712 | 6,904.71 | |
| 4.1 | 8/18/2014 | 78.4 | 8,002 | 5,731 | 4,049 | 201,024 | 8,837.54 | |
| 4.2 | 8/18/2014 | 75.6 | 8,007 | 5,634 | - | 200,653 | 7,004.78 | |
| 4.3 | 8/18/2014 | 77.6 | 8,138 | 5,396 | - | 199,192 | 8,970.92 | |
| 5.1 | 8/18/2014 | 78.6 | 7,847 | 6,021 | 4,463 | 198,310 | 6,639.06 | |
| 5.2 | 8/18/2014 | 79.3 | 7,786 | 5,689 | - | 198,662 | 6,913.71 | |
| 5.3 | 8/18/2014 | 75.4 | 7,689 | 5,641 | - | 202,337 | 6,801.19 | |
| 6.1 | 8/19/2014 | 80.5 | 7,495 | 5,898 | 4,654 | 197,789 | 6,086.00 | |
| 6.2 | 8/19/2014 | 78.1 | 7,447 | 5,695 | - | 202,224 | 6,608.45 | |
| 6.3 | 8/19/2014 | 75.7 | 7,519 | 5,575 | - | 199,870 | 6,582.74 | |
| 7 (Diff PTR Format) | 8/19/2014 | 76.3 | 7,395 | 5,698 | 4,538 | 596,500 | 18,744.18 | |
| 8 | 8/20/2014 | 72.5 | 7,608 | 5,444 | 4,169 | 600,254 | 20,033.63 | |
| 9 | 8/21/2014 | 68.9 | 7,189 | 5,821 | 4,241 | 601,817 | 19,422.80 | |
| 10 | 8/21/2014 | 68.4 | 7,428 | 6,250 | 4,426 | 600,002 | 20,383.71 | |
| 11 | 8/22/2014 | 70 | 7,359 | 5,668 | 4,583 | 604,548 | 19,314.31 | |
| 12 | 8/22/2014 | 71.6 | 6,961 | 5,560 | 4,306 | 603,920 | 18,631.25 | |
| 13 | 8/22/2014 | 73.4 | 6,693 | 5,209 | 4,522 | 603,047 | 18,669.60 | |
| 14 | 8/23/2014 | 73 | 6,879 | 5,758 | 4,584 | 599,724 | 19,320.01 | |
| 15 | 8/23/2014 | 73.6 | 6,602 | 5,586 | 4,430 | 602,172 | 18,107.61 | |
| 16 | 8/23/2014 | 73.7 | 6,956 | 5,585 | 4,277 | 599,894 | 18,684.39 | |
| 17 | 8/24/2014 | 72.7 | 6,388 | 5,746 | 4,748 | 605,572 | 18,428.67 | |
| 18 | 8/24/2014 | 73.1 | 6,737 | 5,279 | 4,570 | 601,509 | 18,218.05 | |
| 19 | 8/25/2014 | 75.9 | 6,738 | 5,676 | 4,322 | 601,505 | 18,776.20 | |
| 20 | 8/25/2014 | 65.6 | 7,217 | 5,515 | 5,510 | 544,809 | 18,346.90 | |
| 21 | 8/27/2014 | 76.4 | 6,596 | 5,666 | 4,336 | 643,705 | 18,496.26 | |
| 22 | 8/27/2014 | 73.4 | 6,826 | 5,463 | 4,307 | 600,850 | 17,669.00 | |
| 23 | 8/28/2014 | 74.8 | 6,605 | 5,864 | 4,290 | 606,158 | 17,466.02 | |
| 24 | 8/29/2014 | 61.8 | 7,626 | 5,884 | 5,291 | 212,006 | 12,803.90 | |
| 24B (Reperf) | 8/29/2014 | 45.9 | 7,459 | 6,506 | 5,850 | 200,654 | 8,255.48 | |
| 25 | 8/29/2014 | 76.5 | 6,406 | 5,139 | 4,605 | 601,477 | 17,683.52 | |
| 26 | 8/30/2014 | 70.2 | 7,205 | 5,960 | 5,673 | 600,000 | 24,184.72 | |

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STIMULATION INFORMATION PER STAGE

API: 47-051-01682 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25C-HS

| Stage No. | Stim Date | Avg Rate (bpm) | ATP (psi) | Max BD Pressure | ISIP (psi) | Proppant (lbs) | Water (BBLS) | Amount of $N^2$/ other (units) |
|---|---|---|---|---|---|---|---|---|
| 27 | 8/30/2014 | 63.8 | 7,522 | 5,661 | 6,219 | 405,516 | 18,045.55 | |
| 27B (Reperf) | 8/31/2014 | 87.8 | 6,878 | 5,799 | 4,347 | 198,203 | 5,674.17 | |
| 28 | 8/31/2014 | 89 | 6,855 | 6,320 | 3,973 | 601,334 | 17,133.75 | |

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DEC 15 2014

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01682 Farm name David Rutherford Well number SHL25 CHS

| PRODUCING FORMATION(S) | DEPTHS | | | |
|---|---|---|---|---|
| Marcellus | 6,681 | TVD | 15,474 | MD |
| | | | | |
| | | | | |
| | | | | |

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

| OPEN FLOW | Gas | Oil | NGL | Water | GAS MEASURED BY |
|---|---|---|---|---|---|
| | 6375 mcfpd | 51 bpd | 310 bpd | 654 bpd | ☐ Estimated ■ Orifice ☐ Pilot |

| LITHOLOGY/ FORMATION NAME | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, $H_2S$, ETC) |
|---|---|---|---|---|---|
| | 0 | | 0 | | |
| | PLEASE SEE ATTACHED FORMATION SHEET | | | | |
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Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling Company
Address 171 Locust Avenue Ext. City Mt. Morris State PA Zip 15349

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company Schlumberger
Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy SRCS
Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Regina A. Logue Telephone 724-820-3559
Signature Regina A. Logue Title Regulatory Analyst Date 12/10/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

**SHL25 CHS**

47-051-01682

| Formations | Top TVD | Base TVD | Top MD | Base MD | Fluid |
|---|---|---|---|---|---|
| Shale | 0 | 812 | 0 | 812 | |
| Pittsburgh Coal | 812 | 822 | 812 | 822 | |
| Shale and Sandstone | 822 | 1420 | 822 | 1420 | |
| Gas Sand | 1420 | 1473 | 1420 | 1473 | |
| Shale | 1473 | 1517 | 1473 | 1517 | |
| 1st Salt Sand | 1517 | 1595 | 1517 | 1595 | |
| 2nd Salt Sand | 1595 | 1606 | 1595 | 2944 | |
| 3rd Salt Sand | 1606 | 1665 | 1606 | 2977 | |
| Shale | 1665 | 1700 | 1665 | 3364 | |
| Maxton Sand | 1700 | 1838 | 1700 | 3388 | |
| Shale | 1838 | 1860 | 1838 | 4281 | |
| Big Lime | 1860 | 1946 | 1860 | 4295 | |
| Big Injun | 1946 | 2126 | 1946 | 5211 | |
| Price | 2126 | 2465 | 2126 | 5282 | |
| Murrysville | 2465 | 2488 | 2465 | 5326 | |
| Shale and Sandstone | 2488 | 2715 | 2488 | 5959 | |
| 50' Sand | 2715 | 2728 | 2715 | 3388 | |
| Shale | 2728 | 2814 | 2728 | 4281 | |
| Gordon Stray | 2814 | 2821 | 2814 | 4295 | |
| Shale | 2821 | 2836 | 2821 | 5211 | |
| Gordon | 2836 | 2854 | 2836 | 5282 | |
| Shale | 2854 | 2944 | 2854 | 5326 | |
| Fifth Sand | 2944 | 2977 | 2944 | 2977 | |
| Shale | 2977 | 3363 | 2977 | 3364 | |
| Speechley Sand | 3363 | 3387 | 3364 | 3388 | |
| Shale | 3387 | 4271 | 3388 | 4281 | |
| Warren Sand | 4271 | 4285 | 4281 | 4295 | |
| Shale | 4285 | 5192 | 4295 | 5211 | |
| Java Shale | 5192 | 5262 | 5211 | 5282 | |
| Pipe Creek Shale | 5262 | 5306 | 5282 | 5326 | |
| Angola Shale | 5306 | 5932 | 5326 | 5959 | |
| Rhinestreet | 5932 | 6346 | 5959 | 6404 | |
| Cashaqua | 6346 | 6438 | 6404 | 6533 | |
| Middlesex | 6438 | 6475 | 6533 | 6597 | |
| West River | 6475 | 6516 | 6597 | 6684 | |
| Burkett | 6516 | 6549 | 6684 | 6774 | Gas |
| Tully Limestone | 6549 | 6577 | 6774 | not encountered | |
| Hamilton | 6577 | 6691 | not encountered | not encountered | |
| Marcellus | 6691 | | not encountered | not encountered | |

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|---|---|
| Job Start Date: | 8/6/2014 |
| Job End Date: | 8/31/2014 |
| State: | West Virginia |
| County: | Marshall |
| API Number: | 47-051-01682-00-00 |
| Operator Name: | Noble Energy, Inc. |
| Well Name and Number: | SHL 25 C |
| Longitude: | -80.55300900 |
| Latitude: | 40.00080900 |
| Datum: | NAD27 |
| Federal/Tribal Well: | NO |
| True Vertical Depth: | 6,681 |
| Total Base Water Volume (gal): | 22,671,300 |
| Total Base Non Water Volume: | 0 |

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FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Interstate Oil & Gas Compact Commission

51-01682

## Hydraulic Fracturing Fluid Composition:

| Trade Name | Supplier | Purpose | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Maximum Ingredient Concentration in HF Fluid (% by mass)** | Comments |
|---|---|---|---|---|---|---|---|
| Fresh Water | Operator | Base Fluid | | | | | |
| | | | Fresh Water | 7732-18-5 | 100.00000 | 91.01489 | Density = 8.340 |
| SAND - PREMIUM WHITE | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 6.40738 | |
| SSA-2 | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 1.60379 | |
| HYDROCHLORIC ACID 5-10% | Halliburton | Solvent | | | | | |
| | | | Hydrochloric acid | 7647-01-0 | 10.00000 | 0.07920 | |
| FR-66 | Halliburton | Friction Reducer | | | | | |
| | | | Hydrotreated light petroleum distillate | 64742-47-8 | 30.00000 | 0.02050 | |
| HYDROCHLORIC ACID 10-30% | Halliburton | Solvent | | | | | |
| | | | Hydrochloric acid | 7647-01-0 | 30.00000 | 0.01163 | |
| FE-1A ACIDIZING COMPOSITION | Halliburton | Additive | | | | | |
| | | | Acetic anhydride | 108-24-7 | 100.00000 | 0.00446 | |
| | | | Acetic acid | 64-19-7 | 60.00000 | 0.00268 | |
| BE-9 | Halliburton | Biocide | | | | | |

Office of Oil & Gas
DEC 15 2014

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|---|---|---|---|---|---|---|---|
| | | | Tributyl tetradecyl phosphonium chloride | 81741-28-8 | 10.00000 | 0.00409 | |
| LP-65 | Halliburton | Scale Inhibitor | | | | | |
| | | | Ammonium chloride | 12125-02-9 | 10.00000 | 0.00250 | |
| Biovert NWB | Halliburton | Viscosifier | | | | | |
| | | | Polylactide resin | Confidential | 100.00000 | 0.00212 | Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226 |
| LoSurf-300D | Halliburton | Non-ionic Surfactant | | | | | |
| | | | Ethanol | 64-17-5 | 60.00000 | 0.00090 | |
| | | | Heavy aromatic petroleum naphtha | 64742-94-5 | 30.00000 | 0.00045 | |
| | | | Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched | 127087-87-0 | 5.00000 | 0.00007 | |
| | | | Naphthalene | 91-20-3 | 5.00000 | 0.00007 | |
| | | | 1,2,4 Trimethylbenzene | 95-63-6 | 1.00000 | 0.00001 | |
| HAI-OS ACID INHIBITOR | Halliburton | Corrosion Inhibitor | | | | | |
| | | | Methanol | 67-56-1 | 60.00000 | 0.00044 | |
| | | | Propargyl alcohol | 107-19-7 | 10.00000 | 0.00007 | |
| LGC-36 UC | Halliburton | Liquid Gel Concentrate | | | | | |
| | | | Naphtha, hydrotreated heavy | 64742-48-9 | 60.00000 | 0.00010 | |
| | | | Guar gum | 9000-30-0 | 60.00000 | 0.00010 | |
| SP BREAKER | Halliburton | Breaker | | | | | |
| | | | Sodium persulfate | 7775-27-1 | 100.00000 | 0.00000 | |
| Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS. | | | | | | | |
| | | Other Ingredient(s) | | | | | |
| | | | Water | 7732-18-5 | | 0.92761 | |
| | | Other Ingredient(s) | | | | | |
| | | | Polyacrylamide copolymer | Confidential | | 0.02050 | |
| | | Other Ingredient(s) | | | | | |
| | | | Organic phosphonate | Confidential | | 0.01500 | |
| | | Other Ingredient(s) | | | | | |
| | | | Alcohols, C12-16, ethoxylated | 68551-12-2 | | 0.00342 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sodium chloride | 7647-14-5 | | 0.00342 | |
| | | Other Ingredient(s) | | | | | |
| | | | Fatty acid tall oil amide | Confidential | | 0.00342 | |
| | | Other Ingredient(s) | | | | | |
| | | | Ammonium chloride | 12125-02-9 | | 0.00342 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sorbitan, mono-9-octadecenoate, (Z) | 1338-43-8 | | 0.00068 | |
| | | Other Ingredient(s) | | | | | |

51-01682

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Sorbitan monooleate polyoxyethylene derivative | 9005-65-6 | | 0.00068 | |
| | | Other Ingredient(s) | | | | | |
| | | | Oxyalkylated phenolic resin | Confidential | | 0.00045 | |
| | | Other Ingredient(s) | | | | | |
| | | | Formaldehyde | 50-00-0 | | 0.00025 | |
| | | Other Ingredient(s) | | | | | |
| | | | Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide | 68527-49-1 | | 0.00022 | |
| | | Other Ingredient(s) | | | | | |
| | | | Fatty acids, tall oil | Confidential | | 0.00022 | |
| | | Other Ingredient(s) | | | | | |
| | | | Alcohols, C14-C15, ethoxylated | 68951-67-7 | | 0.00022 | |
| | | Other Ingredient(s) | | | | | |
| | | | Oxyalkylated phenolic resin | Confidential | | 0.00015 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00004 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00004 | |
| | | Other Ingredient(s) | | | | | |
| | | | Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl,salts with bentonite | 68953-58-2 | | 0.00001 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00001 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00001 | |
| | | Other Ingredient(s) | | | | | |
| | | | Fatty alcohol polyglycol ether surfactant | 9043-30-5 | | 0.00000 | |
| | | Other Ingredient(s) | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | | 0.00000 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sodium sulfate | 7757-82-6 | | 0.00000 | |

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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51-01682

# Actual Wellpath Report

SHL 25C-HS (AWP) Proj: 15474'



51-01682

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

| REPORT SETUP INFORMATION | | | |
|---|---|---|---|
| Projection System | NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet | Software System | WellArchitect® 4.0.1 |
| North Reference | Grid | User | Kroschr |
| Scale | 0.999962 | Report Generated | 04/Jun/2014 at 16:55 |
| Convergence at slot | 0.67° West | Database/Source file | WA_Pennsylvania/SHL_25C-HS__AWB_.xml |

| WELLPATH LOCATION | Local coordinates | | Grid coordinates | | Geographic coordinates | |
|---|---|---|---|---|---|---|
| | North[ft] | East[ft] | Easting[US ft] | Northing[US ft] | Latitude | Longitude |
| Slot Location | 9.13 | -28.59 | 1704999.60 | 548366.50 | 40°00'02.913"N | 80°33'10.831"W |
| Facility Reference Pt | | | 1705028.19 | 548357.37 | 40°00'02.826"N | 80°33'10.462"W |
| Field Reference Pt | | | 609601.22 | 0.00 | 38°23'48.753"N | 84°21'09.765"W |

| WELLPATH DATUM | | | |
|---|---|---|---|
| Calculation method | Minimum curvature | Nomac 79 (RT) to Facility Vertical Datum | 26.00ft |
| Horizontal Reference Pt | Slot | Nomac 79 (RT) to Mean Sea Level | 1351.00ft |
| Vertical Reference Pt | Nomac 79 (RT) | Nomac 79 (RT) to Mud Line at Slot (Slot C) | 26.00ft |
| MD Reference Pt | Nomac 79 (RT) | Section Origin | N 0.00, E 0.00 ft |
| Field Vertical Reference | Mean Sea Level | Section Azimuth | 325.00° |

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| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (189 stations) † = interpolated/extrapolated station

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00† | 0.000 | 308.550 | 0.00 | 0.00 | 0.00 | 0.00 | 1704999.60 | 548366.50 | 40°00'02.913"N | 80°33'10.831"W | 0.00 | 0.000 | 0.00 |
| 26.00 | 0.000 | 308.550 | 26.00 | 0.00 | 0.00 | 0.00 | 1704999.60 | 548366.50 | 40°00'02.913"N | 80°33'10.831"W | 0.00 | 0.000 | 0.00 |
| 115.00 | 0.630 | 308.550 | 115.00 | 0.47 | 0.30 | -0.38 | 1704999.22 | 548366.80 | 40°00'02.916"N | 80°33'10.836"W | 0.49 | 308.550 | 0.71 |
| 215.00 | 0.530 | 298.600 | 214.99 | 1.41 | 0.87 | -1.22 | 1704998.38 | 548367.37 | 40°00'02.922"N | 80°33'10.847"W | 1.50 | 305.489 | 0.14 |
| 315.00 | 0.480 | 294.110 | 314.99 | 2.18 | 1.26 | -2.01 | 1704997.59 | 548367.76 | 40°00'02.926"N | 80°33'10.857"W | 2.37 | 302.149 | 0.06 |
| 415.00 | 0.650 | 318.840 | 414.98 | 3.11 | 1.86 | -2.76 | 1704996.84 | 548368.36 | 40°00'02.931"N | 80°33'10.867"W | 3.33 | 303.944 | 0.29 |
| 515.00 | 0.680 | 302.960 | 514.98 | 4.22 | 2.61 | -3.63 | 1704995.97 | 548369.11 | 40°00'02.939"N | 80°33'10.878"W | 4.47 | 305.681 | 0.19 |
| 615.00 | 0.320 | 145.960 | 614.98 | 4.49 | 2.70 | -3.98 | 1704995.62 | 548369.20 | 40°00'02.940"N | 80°33'10.883"W | 4.81 | 304.192 | 0.98 |
| 715.00 | 0.750 | 139.270 | 714.97 | 3.56 | 1.97 | -3.39 | 1704996.21 | 548368.47 | 40°00'02.933"N | 80°33'10.875"W | 3.92 | 300.191 | 0.43 |
| 815.00 | 0.420 | 142.560 | 814.97 | 2.54 | 1.19 | -2.74 | 1704996.86 | 548367.69 | 40°00'02.925"N | 80°33'10.866"W | 2.99 | 293.398 | 0.33 |
| 915.00 | 0.580 | 215.800 | 914.96 | 2.01 | 0.49 | -2.82 | 1704996.78 | 548366.99 | 40°00'02.918"N | 80°33'10.867"W | 2.86 | 279.775 | 0.61 |
| 1015.00 | 0.510 | 225.280 | 1014.96 | 1.77 | -0.24 | -3.43 | 1704996.17 | 548366.26 | 40°00'02.911"N | 80°33'10.875"W | 3.44 | 266.018 | 0.11 |
| 1115.00 | 0.560 | 245.030 | 1114.95 | 1.78 | -0.76 | -4.19 | 1704995.41 | 548365.74 | 40°00'02.905"N | 80°33'10.885"W | 4.26 | 259.738 | 0.19 |
| 1215.00 | 0.510 | 242.230 | 1214.95 | 1.92 | -1.17 | -5.02 | 1704994.58 | 548365.33 | 40°00'02.901"N | 80°33'10.895"W | 5.16 | 256.872 | 0.06 |
| 1315.00 | 0.430 | 243.410 | 1314.95 | 2.03 | -1.55 | -5.75 | 1704993.85 | 548364.95 | 40°00'02.897"N | 80°33'10.905"W | 5.96 | 254.949 | 0.08 |
| 1415.00 | 0.350 | 237.690 | 1414.94 | 2.10 | -1.88 | -6.35 | 1704993.25 | 548364.62 | 40°00'02.894"N | 80°33'10.912"W | 6.62 | 253.515 | 0.09 |
| 1515.00 | 0.740 | 224.600 | 1514.94 | 2.00 | -2.50 | -7.06 | 1704992.54 | 548364.00 | 40°00'02.888"N | 80°33'10.921"W | 7.49 | 250.487 | 0.41 |
| 1615.00 | 0.850 | 215.580 | 1614.93 | 1.64 | -3.56 | -7.94 | 1704991.66 | 548362.94 | 40°00'02.877"N | 80°33'10.933"W | 8.71 | 245.834 | 0.17 |
| 1715.00 | 0.620 | 201.490 | 1714.92 | 1.09 | -4.67 | -8.57 | 1704991.03 | 548361.83 | 40°00'02.866"N | 80°33'10.941"W | 9.76 | 241.417 | 0.29 |
| 1815.00 | 0.640 | 196.610 | 1814.92 | 0.45 | -5.71 | -8.93 | 1704990.67 | 548360.79 | 40°00'02.856"N | 80°33'10.945"W | 10.60 | 237.409 | 0.06 |
| 1915.00 | 0.310 | 161.600 | 1914.91 | -0.16 | -6.50 | -9.01 | 1704990.59 | 548360.00 | 40°00'02.848"N | 80°33'10.946"W | 11.11 | 234.172 | 0.43 |
| 2015.00 | 0.210 | 151.520 | 2014.91 | -0.60 | -6.92 | -8.83 | 1704990.77 | 548359.58 | 40°00'02.844"N | 80°33'10.944"W | 11.22 | 231.925 | 0.11 |
| 2115.00 | 0.430 | 180.510 | 2114.91 | -1.09 | -7.46 | -8.75 | 1704990.85 | 548359.04 | 40°00'02.839"N | 80°33'10.942"W | 11.49 | 229.562 | 0.27 |
| 2215.00 | 0.170 | 188.170 | 2214.91 | -1.50 | -7.98 | -8.77 | 1704990.83 | 548358.52 | 40°00'02.834"N | 80°33'10.943"W | 11.86 | 227.718 | 0.26 |
| 2315.00 | 0.420 | 229.720 | 2314.91 | -1.64 | -8.36 | -9.07 | 1704990.53 | 548358.14 | 40°00'02.830"N | 80°33'10.946"W | 12.34 | 227.339 | 0.31 |
| 2415.00 | 0.070 | 234.250 | 2414.91 | -1.68 | -8.63 | -9.40 | 1704990.20 | 548357.87 | 40°00'02.827"N | 80°33'10.951"W | 12.77 | 227.440 | 0.35 |
| 2515.00 | 0.330 | 273.010 | 2514.91 | -1.50 | -8.65 | -9.74 | 1704989.86 | 548357.85 | 40°00'02.827"N | 80°33'10.955"W | 13.03 | 228.377 | 0.28 |
| 2615.00 | 0.220 | 261.720 | 2614.90 | -1.24 | -8.67 | -10.22 | 1704989.38 | 548357.83 | 40°00'02.827"N | 80°33'10.961"W | 13.40 | 229.693 | 0.12 |
| 2715.00 | 0.510 | 241.600 | 2714.90 | -1.10 | -8.91 | -10.80 | 1704988.80 | 548357.59 | 40°00'02.824"N | 80°33'10.968"W | 14.00 | 230.486 | 0.31 |
| 2815.00 | 0.530 | 238.410 | 2814.90 | -1.02 | -9.36 | -11.58 | 1704988.02 | 548357.14 | 40°00'02.820"N | 80°33'10.979"W | 14.89 | 231.061 | 0.04 |
| 2915.00 | 0.580 | 236.590 | 2914.89 | -0.98 | -9.88 | -12.40 | 1704987.20 | 548356.62 | 40°00'02.814"N | 80°33'10.989"W | 15.86 | 231.451 | 0.05 |
| 3015.00 | 0.670 | 256.780 | 3014.89 | -0.75 | -10.29 | -13.39 | 1704986.21 | 548356.21 | 40°00'02.810"N | 80°33'11.002"W | 16.89 | 232.453 | 0.24 |
| 3115.00 | 0.660 | 245.000 | 3114.88 | -0.43 | -10.67 | -14.48 | 1704985.12 | 548355.83 | 40°00'02.806"N | 80°33'11.016"W | 17.99 | 233.619 | 0.14 |
| 3215.00 | 0.610 | 244.890 | 3214.87 | -0.24 | -11.14 | -15.49 | 1704984.11 | 548355.36 | 40°00'02.802"N | 80°33'11.028"W | 19.08 | 234.273 | 0.05 |
| 3305.00 | 0.680 | 242.840 | 3304.87 | -0.09 | -11.59 | -16.40 | 1704983.20 | 548354.91 | 40°00'02.797"N | 80°33'11.040"W | 20.08 | 234.752 | 0.08 |
| 3373.00 | 0.700 | 226.030 | 3372.86 | -0.10 | -12.06 | -17.05 | 1704982.55 | 548354.44 | 40°00'02.792"N | 80°33'11.048"W | 20.89 | 234.735 | 0.30 |
| 3467.00 | 0.830 | 262.250 | 3466.86 | 0.13 | -12.55 | -18.14 | 1704981.46 | 548353.95 | 40°00'02.787"N | 80°33'11.062"W | 22.06 | 235.326 | 0.52 |
| 3562.00 | 0.780 | 267.940 | 3561.85 | 0.79 | -12.67 | -19.47 | 1704980.13 | 548353.83 | 40°00'02.786"N | 80°33'11.079"W | 23.23 | 236.954 | 0.10 |
| 3657.00 | 1.060 | 266.460 | 3656.83 | 1.60 | -12.74 | -20.99 | 1704978.61 | 548353.76 | 40°00'02.785"N | 80°33'11.099"W | 24.56 | 238.741 | 0.30 |
| 3751.00 | 1.150 | 245.110 | 3750.82 | 2.22 | -13.19 | -22.72 | 1704976.88 | 548353.31 | 40°00'02.780"N | 80°33'11.121"W | 26.27 | 239.851 | 0.45 |
| 3846.00 | 0.700 | 247.720 | 3845.80 | 2.52 | -13.82 | -24.12 | 1704975.48 | 548352.68 | 40°00'02.774"N | 80°33'11.139"W | 27.80 | 240.195 | 0.48 |
| 3893.00 | 0.580 | 0.510 | 3892.80 | 2.77 | -13.69 | -24.38 | 1704975.22 | 548352.81 | 40°00'02.775"N | 80°33'11.142"W | 27.96 | 240.693 | 2.27 |
| 3941.00 | 3.080 | 60.950 | 3940.78 | 2.84 | -12.82 | -23.25 | 1704976.35 | 548353.68 | 40°00'02.784"N | 80°33'11.128"W | 26.55 | 241.135 | 5.91 |
| 3987.00 | 3.650 | 62.430 | 3986.70 | 2.52 | -11.54 | -20.87 | 1704978.73 | 548354.96 | 40°00'02.797"N | 80°33'11.098"W | 23.85 | 241.066 | 1.25 |
| 4035.00 | 4.100 | 53.250 | 4034.59 | 2.38 | -9.81 | -18.15 | 1704981.46 | 548356.69 | 40°00'02.814"N | 80°33'11.063"W | 20.63 | 241.613 | 1.59 |

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| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (189 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4086.00 | 4.270 | 53.500 | 4085.45 | 2.48 | -7.59 | -15.16 | 1704984.44 | 548358.91 | 40°00'02.837"N | 80°33'11.025"W | 16.95 | 243.415 | 0.34 |
| 4130.00 | 4.160 | 43.820 | 4129.33 | 2.83 | -5.46 | -12.74 | 1704986.86 | 548361.04 | 40°00'02.858"N | 80°33'10.994"W | 13.86 | 246.796 | 1.63 |
| 4177.00 | 4.460 | 46.970 | 4176.20 | 3.42 | -2.98 | -10.22 | 1704989.38 | 548363.52 | 40°00'02.883"N | 80°33'10.962"W | 10.65 | 253.730 | 0.81 |
| 4225.00 | 5.390 | 53.840 | 4224.02 | 3.73 | -0.38 | -7.04 | 1704992.56 | 548366.12 | 40°00'02.909"N | 80°33'10.921"W | 7.05 | 266.916 | 2.29 |
| 4272.00 | 6.770 | 46.160 | 4270.76 | 4.20 | 2.84 | -3.26 | 1704996.34 | 548369.34 | 40°00'02.941"N | 80°33'10.873"W | 4.32 | 311.127 | 3.40 |
| 4319.00 | 7.860 | 44.090 | 4317.38 | 5.23 | 7.07 | 0.98 | 1705000.58 | 548373.57 | 40°00'02.983"N | 80°33'10.820"W | 7.14 | 7.885 | 2.39 |
| 4368.00 | 9.650 | 45.000 | 4365.80 | 6.58 | 12.38 | 6.21 | 1705005.81 | 548378.88 | 40°00'03.036"N | 80°33'10.753"W | 13.85 | 26.656 | 3.66 |
| 4414.00 | 10.410 | 50.280 | 4411.10 | 7.59 | 17.76 | 12.14 | 1705011.74 | 548384.26 | 40°00'03.090"N | 80°33'10.678"W | 21.51 | 34.346 | 2.59 |
| 4460.00 | 11.880 | 54.890 | 4456.23 | 7.94 | 23.14 | 19.21 | 1705018.81 | 548389.64 | 40°00'03.144"N | 80°33'10.588"W | 30.08 | 39.693 | 3.73 |
| 4509.00 | 13.000 | 63.300 | 4504.09 | 7.15 | 28.52 | 28.26 | 1705027.86 | 548395.02 | 40°00'03.199"N | 80°33'10.472"W | 40.15 | 44.737 | 4.34 |
| 4554.00 | 14.820 | 63.860 | 4547.76 | 5.54 | 33.33 | 37.95 | 1705037.55 | 548399.83 | 40°00'03.247"N | 80°33'10.349"W | 50.51 | 48.707 | 4.06 |
| 4604.00 | 17.380 | 62.410 | 4595.80 | 3.59 | 39.61 | 50.31 | 1705049.91 | 548406.11 | 40°00'03.311"N | 80°33'10.191"W | 64.03 | 51.788 | 5.18 |
| 4654.00 | 19.250 | 60.080 | 4643.26 | 1.89 | 47.18 | 64.07 | 1705063.67 | 548413.68 | 40°00'03.387"N | 80°33'10.015"W | 79.57 | 53.635 | 4.02 |
| 4698.00 | 18.560 | 57.410 | 4684.89 | 0.96 | 54.57 | 76.26 | 1705075.86 | 548421.07 | 40°00'03.461"N | 80°33'09.859"W | 93.77 | 54.415 | 2.51 |
| 4735.00 | 17.910 | 54.560 | 4720.03 | 0.75 | 61.04 | 85.86 | 1705085.45 | 548427.54 | 40°00'03.527"N | 80°33'09.737"W | 105.34 | 54.590 | 2.98 |
| 4793.00 | 18.780 | 56.430 | 4775.09 | 0.59 | 71.37 | 100.90 | 1705100.50 | 548437.87 | 40°00'03.630"N | 80°33'09.545"W | 123.59 | 54.727 | 1.81 |
| 4825.00 | 19.820 | 57.210 | 4805.29 | 0.25 | 77.16 | 109.75 | 1705109.35 | 548443.66 | 40°00'03.689"N | 80°33'09.432"W | 134.16 | 54.892 | 3.35 |
| 4855.00 | 20.180 | 58.270 | 4833.48 | -0.24 | 82.63 | 118.43 | 1705118.03 | 548449.13 | 40°00'03.744"N | 80°33'09.322"W | 144.41 | 55.095 | 1.70 |
| 4888.00 | 21.250 | 59.930 | 4864.34 | -1.08 | 88.62 | 128.45 | 1705128.04 | 548455.12 | 40°00'03.804"N | 80°33'09.194"W | 156.06 | 55.396 | 3.70 |
| 4922.00 | 22.800 | 60.340 | 4895.86 | -2.22 | 94.97 | 139.51 | 1705139.10 | 548461.47 | 40°00'03.868"N | 80°33'09.053"W | 168.76 | 55.754 | 4.58 |
| 4952.00 | 23.320 | 60.300 | 4923.47 | -3.31 | 100.79 | 149.71 | 1705149.31 | 548467.29 | 40°00'03.927"N | 80°33'08.923"W | 180.48 | 56.051 | 1.73 |
| 4982.00 | 23.150 | 58.860 | 4951.03 | -4.26 | 106.78 | 159.92 | 1705159.51 | 548473.28 | 40°00'03.987"N | 80°33'08.792"W | 192.29 | 56.268 | 1.98 |
| 5030.00 | 19.590 | 56.190 | 4995.73 | -5.06 | 116.14 | 174.69 | 1705174.28 | 548482.64 | 40°00'04.081"N | 80°33'08.604"W | 209.77 | 56.382 | 7.69 |
| 5077.00 | 15.750 | 55.610 | 5040.50 | -5.29 | 124.13 | 186.50 | 1705186.09 | 548490.63 | 40°00'04.162"N | 80°33'08.453"W | 224.04 | 56.353 | 8.18 |
| 5123.00 | 16.390 | 57.150 | 5084.70 | -5.60 | 131.18 | 197.11 | 1705196.70 | 548497.67 | 40°00'04.233"N | 80°33'08.318"W | 236.77 | 56.355 | 1.67 |
| 5171.00 | 18.580 | 58.830 | 5130.48 | -6.36 | 138.81 | 209.34 | 1705208.93 | 548505.31 | 40°00'04.309"N | 80°33'08.162"W | 251.18 | 56.452 | 4.68 |
| 5234.00 | 20.670 | 58.930 | 5189.82 | -7.80 | 149.75 | 227.45 | 1705227.05 | 548516.24 | 40°00'04.420"N | 80°33'07.931"W | 272.32 | 56.641 | 3.32 |
| 5282.00 | 21.400 | 57.900 | 5234.62 | -8.82 | 158.77 | 242.13 | 1705241.72 | 548525.27 | 40°00'04.510"N | 80°33'07.744"W | 289.54 | 56.746 | 1.70 |
| 5329.00 | 21.620 | 57.740 | 5278.35 | -9.67 | 167.95 | 256.71 | 1705256.30 | 548534.44 | 40°00'04.603"N | 80°33'07.558"W | 306.77 | 56.806 | 0.48 |
| 5376.00 | 21.700 | 58.190 | 5322.03 | -10.57 | 177.15 | 271.42 | 1705271.01 | 548543.64 | 40°00'04.695"N | 80°33'07.370"W | 324.12 | 56.868 | 0.39 |
| 5424.00 | 21.850 | 59.870 | 5366.60 | -11.82 | 186.31 | 286.69 | 1705286.28 | 548552.81 | 40°00'04.788"N | 80°33'07.176"W | 341.91 | 56.981 | 1.34 |
| 5518.00 | 21.830 | 60.590 | 5453.86 | -15.01 | 203.68 | 317.04 | 1705316.63 | 548570.17 | 40°00'04.963"N | 80°33'06.788"W | 376.83 | 57.282 | 0.29 |
| 5613.00 | 21.730 | 61.060 | 5542.08 | -18.58 | 220.86 | 347.82 | 1705347.40 | 548587.35 | 40°00'05.136"N | 80°33'06.395"W | 412.01 | 57.585 | 0.21 |
| 5708.00 | 21.460 | 61.810 | 5630.41 | -22.50 | 237.58 | 378.52 | 1705378.11 | 548604.07 | 40°00'05.305"N | 80°33'06.003"W | 446.91 | 57.886 | 0.41 |
| 5803.00 | 22.430 | 63.760 | 5718.52 | -27.32 | 253.80 | 410.10 | 1705409.68 | 548620.29 | 40°00'05.469"N | 80°33'05.600"W | 482.28 | 58.248 | 1.28 |
| 5898.00 | 22.540 | 62.580 | 5806.30 | -32.48 | 270.20 | 442.52 | 1705442.10 | 548636.69 | 40°00'05.635"N | 80°33'05.186"W | 518.49 | 58.592 | 0.49 |
| 5993.00 | 20.500 | 56.630 | 5894.69 | -35.36 | 287.74 | 472.58 | 1705472.16 | 548654.23 | 40°00'05.811"N | 80°33'04.802"W | 553.29 | 58.664 | 3.14 |
| 6087.00 | 21.240 | 53.320 | 5982.52 | -35.33 | 306.96 | 499.98 | 1705499.56 | 548673.45 | 40°00'06.005"N | 80°33'04.453"W | 586.69 | 58.452 | 1.48 |
| 6136.00 | 19.490 | 50.290 | 6028.46 | -34.40 | 317.49 | 513.39 | 1705512.97 | 548683.98 | 40°00'06.110"N | 80°33'04.282"W | 603.63 | 58.267 | 4.17 |
| 6182.00 | 19.730 | 46.440 | 6071.79 | -32.61 | 327.74 | 524.92 | 1705524.50 | 548694.23 | 40°00'06.213"N | 80°33'04.136"W | 618.84 | 58.021 | 2.86 |
| 6230.00 | 22.560 | 40.950 | 6116.56 | -29.17 | 340.28 | 536.83 | 1705536.41 | 548706.77 | 40°00'06.338"N | 80°33'03.985"W | 635.59 | 57.630 | 7.19 |
| 6277.00 | 24.220 | 30.980 | 6159.71 | -23.05 | 355.37 | 547.71 | 1705547.28 | 548721.85 | 40°00'06.488"N | 80°33'03.847"W | 652.89 | 57.023 | 9.12 |
| 6327.00 | 24.790 | 22.790 | 6205.22 | -13.29 | 373.83 | 557.05 | 1705556.63 | 548740.31 | 40°00'06.672"N | 80°33'03.730"W | 670.86 | 56.135 | 6.88 |
| 6372.00 | 24.980 | 20.550 | 6246.05 | -2.88 | 391.42 | 564.04 | 1705563.62 | 548757.91 | 40°00'06.847"N | 80°33'03.643"W | 686.55 | 55.241 | 2.14 |
| 6418.00 | 27.660 | 21.230 | 6287.27 | 8.55 | 410.48 | 571.32 | 1705570.89 | 548776.96 | 40°00'07.036"N | 80°33'03.552"W | 703.49 | 54.304 | 5.86 |

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# Actual Wellpath Report

SHL 25C-HS (AWP) Proj: 15474'



51-01682

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (189 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6466.00 | 28.510 | 21.380 | 6329.62 | 21.08 | 431.53 | 579.53 | 1705579.10 | 548798.01 | 40°00'07.245"N | 80°33'03.450"W | 722.54 | 53.328 | 1.78 |
| 6512.00 | 31.090 | 17.980 | 6369.54 | 34.32 | 453.05 | 587.20 | 1705586.77 | 548819.53 | 40°00'07.458"N | 80°33'03.355"W | 741.66 | 52.348 | 6.70 |
| 6561.00 | 35.690 | 9.460 | 6410.46 | 52.16 | 479.21 | 593.46 | 1705593.03 | 548845.69 | 40°00'07.718"N | 80°33'03.278"W | 762.78 | 51.079 | 13.39 |
| 6656.00 | 44.720 | 1.650 | 6482.99 | 98.88 | 540.12 | 598.99 | 1705598.57 | 548906.60 | 40°00'08.320"N | 80°33'03.216"W | 806.55 | 47.958 | 10.87 |
| 6750.00 | 50.600 | 358.850 | 6546.28 | 155.63 | 609.56 | 599.21 | 1705598.79 | 548976.04 | 40°00'09.006"N | 80°33'03.224"W | 854.76 | 44.510 | 6.63 |
| 6845.00 | 56.650 | 353.280 | 6602.62 | 221.15 | 685.77 | 593.83 | 1705593.40 | 549052.24 | 40°00'09.759"N | 80°33'03.304"W | 907.15 | 40.890 | 7.92 |
| 6940.00 | 62.270 | 343.170 | 6650.97 | 296.24 | 765.64 | 576.96 | 1705576.54 | 549132.11 | 40°00'10.546"N | 80°33'03.533"W | 958.69 | 37.001 | 10.90 |
| 7035.00 | 68.440 | 335.890 | 6690.61 | 379.74 | 846.37 | 546.68 | 1705546.26 | 549212.84 | 40°00'11.340"N | 80°33'03.934"W | 1007.58 | 32.859 | 9.52 |
| 7130.00 | 74.960 | 335.260 | 6720.42 | 468.36 | 928.45 | 509.40 | 1705508.98 | 549294.91 | 40°00'12.147"N | 80°33'04.426"W | 1059.01 | 28.752 | 6.89 |
| 7224.00 | 82.440 | 330.870 | 6738.84 | 559.55 | 1010.53 | 467.64 | 1705467.22 | 549376.99 | 40°00'12.953"N | 80°33'04.974"W | 1113.49 | 24.833 | 9.18 |
| 7319.00 | 89.110 | 326.890 | 6745.84 | 654.00 | 1091.56 | 418.70 | 1705418.29 | 549458.02 | 40°00'13.748"N | 80°33'05.616"W | 1169.11 | 20.986 | 8.17 |
| 7353.00 | 90.220 | 325.020 | 6746.03 | 687.99 | 1119.73 | 399.67 | 1705399.25 | 549486.19 | 40°00'14.025"N | 80°33'05.864"W | 1188.92 | 19.643 | 6.40 |
| 7413.00 | 90.400 | 323.880 | 6745.71 | 747.99 | 1168.55 | 364.79 | 1705364.37 | 549535.00 | 40°00'14.503"N | 80°33'06.320"W | 1224.16 | 17.337 | 1.92 |
| 7508.00 | 90.340 | 323.000 | 6745.10 | 842.95 | 1244.85 | 308.20 | 1705307.79 | 549611.30 | 40°00'15.250"N | 80°33'07.058"W | 1282.44 | 13.906 | 0.93 |
| 7603.00 | 90.310 | 323.310 | 6744.56 | 937.90 | 1320.88 | 251.23 | 1705250.82 | 549687.32 | 40°00'15.995"N | 80°33'07.802"W | 1344.56 | 10.769 | 0.33 |
| 7698.00 | 90.280 | 322.780 | 6744.07 | 1032.84 | 1396.79 | 194.12 | 1705193.71 | 549763.23 | 40°00'16.739"N | 80°33'08.547"W | 1410.22 | 7.912 | 0.56 |
| 7792.00 | 90.370 | 323.230 | 6743.54 | 1126.78 | 1471.87 | 137.56 | 1705137.15 | 549838.31 | 40°00'17.474"N | 80°33'09.285"W | 1478.28 | 5.339 | 0.49 |
| 7887.00 | 90.310 | 325.400 | 6742.97 | 1221.77 | 1549.02 | 82.15 | 1705081.74 | 549915.46 | 40°00'18.230"N | 80°33'10.009"W | 1551.20 | 3.036 | 2.29 |
| 7982.00 | 90.250 | 327.420 | 6742.51 | 1316.73 | 1628.15 | 29.59 | 1705029.19 | 549994.59 | 40°00'19.006"N | 80°33'10.696"W | 1628.42 | 1.041 | 2.13 |
| 8077.00 | 90.250 | 326.710 | 6742.09 | 1411.67 | 1707.88 | -22.06 | 1704977.54 | 550074.32 | 40°00'19.788"N | 80°33'11.372"W | 1708.03 | 359.260 | 0.75 |
| 8171.00 | 90.370 | 326.830 | 6741.58 | 1505.62 | 1786.51 | -73.57 | 1704926.03 | 550152.94 | 40°00'20.559"N | 80°33'12.045"W | 1788.03 | 357.642 | 0.18 |
| 8266.00 | 90.310 | 326.090 | 6741.02 | 1600.59 | 1865.69 | -126.06 | 1704873.55 | 550232.12 | 40°00'21.335"N | 80°33'12.732"W | 1869.95 | 356.135 | 0.78 |
| 8361.00 | 90.120 | 325.830 | 6740.66 | 1695.58 | 1944.41 | -179.24 | 1704820.37 | 550310.84 | 40°00'22.107"N | 80°33'13.427"W | 1952.66 | 354.733 | 0.34 |
| 8456.00 | 90.310 | 326.460 | 6740.31 | 1790.56 | 2023.31 | -232.16 | 1704767.45 | 550389.73 | 40°00'22.880"N | 80°33'14.119"W | 2036.58 | 353.454 | 0.69 |
| 8551.00 | 90.120 | 326.590 | 6739.95 | 1885.52 | 2102.55 | -284.56 | 1704715.05 | 550468.96 | 40°00'23.657"N | 80°33'14.804"W | 2121.72 | 352.292 | 0.24 |
| 8646.00 | 90.430 | 327.260 | 6739.49 | 1980.47 | 2182.15 | -336.40 | 1704663.21 | 550548.56 | 40°00'24.438"N | 80°33'15.482"W | 2207.93 | 351.236 | 0.78 |
| 8741.00 | 90.370 | 327.900 | 6738.83 | 2075.37 | 2262.34 | -387.33 | 1704612.28 | 550628.75 | 40°00'25.225"N | 80°33'16.149"W | 2295.26 | 350.285 | 0.68 |
| 8835.00 | 90.310 | 327.150 | 6738.27 | 2169.27 | 2341.64 | -437.80 | 1704561.82 | 550708.05 | 40°00'26.002"N | 80°33'16.809"W | 2382.22 | 349.410 | 0.80 |
| 8930.00 | 90.280 | 326.780 | 6737.78 | 2264.22 | 2421.28 | -489.59 | 1704510.03 | 550787.69 | 40°00'26.783"N | 80°33'17.487"W | 2470.28 | 348.569 | 0.39 |
| 9025.00 | 90.340 | 325.890 | 6737.27 | 2359.19 | 2500.35 | -542.25 | 1704457.37 | 550866.75 | 40°00'27.558"N | 80°33'18.176"W | 2558.47 | 347.764 | 0.94 |
| 9120.00 | 90.180 | 326.150 | 6736.84 | 2454.17 | 2579.12 | -595.35 | 1704404.28 | 550945.52 | 40°00'28.331"N | 80°33'18.870"W | 2646.95 | 347.002 | 0.32 |
| 9215.00 | 90.120 | 326.390 | 6736.59 | 2549.15 | 2658.13 | -648.10 | 1704351.53 | 551024.53 | 40°00'29.105"N | 80°33'19.559"W | 2736.00 | 346.298 | 0.26 |
| 9310.00 | 89.780 | 324.050 | 6736.67 | 2644.14 | 2736.15 | -702.28 | 1704297.34 | 551102.55 | 40°00'29.870"N | 80°33'20.268"W | 2824.84 | 345.605 | 2.49 |
| 9404.00 | 90.090 | 323.440 | 6736.78 | 2738.12 | 2811.96 | -757.87 | 1704241.76 | 551178.34 | 40°00'30.613"N | 80°33'20.993"W | 2912.30 | 344.916 | 0.73 |
| 9499.00 | 90.490 | 323.760 | 6736.30 | 2833.09 | 2888.42 | -814.25 | 1704185.39 | 551254.80 | 40°00'31.362"N | 80°33'21.729"W | 3000.99 | 344.257 | 0.54 |
| 9594.00 | 90.710 | 323.850 | 6735.30 | 2928.06 | 2965.08 | -870.35 | 1704129.29 | 551331.46 | 40°00'32.113"N | 80°33'22.462"W | 3090.18 | 343.641 | 0.25 |
| 9690.00 | 90.830 | 324.420 | 6734.01 | 3024.04 | 3042.87 | -926.58 | 1704073.05 | 551409.25 | 40°00'32.875"N | 80°33'23.196"W | 3180.82 | 343.064 | 0.61 |
| 9784.00 | 90.220 | 322.610 | 6733.15 | 3118.00 | 3118.44 | -982.47 | 1704017.17 | 551484.82 | 40°00'33.615"N | 80°33'23.926"W | 3269.55 | 342.513 | 2.03 |
| 9879.00 | 91.540 | 324.280 | 6731.69 | 3212.95 | 3194.74 | -1039.04 | 1703960.60 | 551561.11 | 40°00'34.363"N | 80°33'24.664"W | 3359.46 | 341.984 | 2.24 |
| 9973.00 | 89.690 | 324.590 | 6730.69 | 3306.94 | 3271.20 | -1093.71 | 1703905.93 | 551637.57 | 40°00'35.112"N | 80°33'25.378"W | 3449.19 | 341.513 | 2.00 |
| 10068.00 | 89.540 | 324.480 | 6731.32 | 3401.93 | 3348.57 | -1148.83 | 1703850.82 | 551714.94 | 40°00'35.870"N | 80°33'26.098"W | 3540.16 | 341.064 | 0.20 |
| 10163.00 | 90.400 | 324.620 | 6731.37 | 3496.93 | 3425.96 | -1203.93 | 1703795.72 | 551792.32 | 40°00'36.628"N | 80°33'26.818"W | 3631.34 | 340.638 | 0.92 |
| 10258.00 | 90.430 | 327.280 | 6730.69 | 3591.90 | 3504.66 | -1257.11 | 1703742.54 | 551871.02 | 40°00'37.400"N | 80°33'27.513"W | 3723.30 | 340.267 | 2.80 |
| 10353.00 | 89.690 | 332.650 | 6730.59 | 3686.51 | 3586.87 | -1304.65 | 1703695.01 | 551953.23 | 40°00'38.207"N | 80°33'28.137"W | 3816.78 | 340.012 | 5.71 |
| 10447.00 | 90.280 | 331.080 | 6730.61 | 3779.83 | 3669.76 | -1348.97 | 1703650.68 | 552036.12 | 40°00'39.021"N | 80°33'28.719"W | 3909.85 | 339.817 | 1.78 |

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# Actual Wellpath Report

SHL 25C-HS (AWP) Proj: 15474'



BAKER HUGHES

51-01682

## REFERENCE WELLPATH IDENTIFICATION

| | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

## WELLPATH DATA (189 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10542.00 | 88.400 | 321.980 | 6731.71 | 3874.69 | 3748.92 | -1401.30 | 1703598.35 | 552115.27 | 40°00'39.797"N | 80°33'29.403"W | 4002.26 | 339.505 | 9.78 |
| 10637.00 | 89.540 | 318.690 | 6733.41 | 3969.34 | 3822.03 | -1461.92 | 1703537.74 | 552188.37 | 40°00'40.512"N | 80°33'30.193"W | 4092.08 | 339.068 | 3.66 |
| 10731.00 | 91.110 | 324.540 | 6732.88 | 4063.14 | 3895.67 | -1520.26 | 1703479.40 | 552262.02 | 40°00'41.233"N | 80°33'30.954"W | 4181.80 | 338.682 | 6.44 |
| 10826.00 | 90.620 | 322.230 | 6731.45 | 4158.08 | 3971.91 | -1576.91 | 1703422.75 | 552338.25 | 40°00'41.980"N | 80°33'31.694"W | 4273.49 | 338.346 | 2.49 |
| 10921.00 | 90.460 | 319.630 | 6730.55 | 4252.83 | 4045.66 | -1636.78 | 1703362.88 | 552412.00 | 40°00'42.702"N | 80°33'32.474"W | 4364.22 | 337.973 | 2.74 |
| 11015.00 | 91.020 | 318.570 | 6729.34 | 4346.32 | 4116.70 | -1698.32 | 1703301.35 | 552483.04 | 40°00'43.397"N | 80°33'33.276"W | 4453.26 | 337.582 | 1.28 |
| 11111.00 | 91.350 | 316.300 | 6727.35 | 4441.46 | 4187.39 | -1763.24 | 1703236.43 | 552553.72 | 40°00'44.087"N | 80°33'34.121"W | 4543.48 | 337.165 | 2.39 |
| 11205.00 | 90.740 | 321.750 | 6725.64 | 4534.90 | 4258.32 | -1824.84 | 1703174.83 | 552624.65 | 40°00'44.781"N | 80°33'34.923"W | 4632.85 | 336.803 | 5.83 |
| 11301.00 | 90.150 | 324.270 | 6724.89 | 4630.83 | 4334.99 | -1882.60 | 1703117.08 | 552701.31 | 40°00'45.532"N | 80°33'35.677"W | 4726.13 | 336.526 | 2.70 |
| 11396.00 | 90.060 | 322.910 | 6724.72 | 4725.80 | 4411.44 | -1938.98 | 1703060.69 | 552777.76 | 40°00'46.281"N | 80°33'36.413"W | 4818.76 | 336.273 | 1.43 |
| 11491.00 | 91.230 | 331.620 | 6723.64 | 4820.62 | 4491.27 | -1990.30 | 1703009.38 | 552857.59 | 40°00'47.064"N | 80°33'37.085"W | 4912.51 | 336.100 | 9.25 |
| 11585.00 | 90.000 | 328.090 | 6722.64 | 4914.26 | 4572.54 | -2037.50 | 1702962.18 | 552938.85 | 40°00'47.861"N | 80°33'37.704"W | 5005.95 | 335.983 | 3.98 |
| 11680.00 | 92.370 | 326.470 | 6720.67 | 5009.16 | 4652.44 | -2088.83 | 1702910.85 | 553018.75 | 40°00'48.645"N | 80°33'38.375"W | 5099.84 | 335.821 | 3.02 |
| 11775.00 | 92.000 | 331.820 | 6717.05 | 5103.81 | 4733.90 | -2137.50 | 1702862.18 | 553100.21 | 40°00'49.444"N | 80°33'39.013"W | 5194.11 | 335.699 | 5.64 |
| 11869.00 | 91.290 | 331.690 | 6714.35 | 5197.11 | 4816.68 | -2181.97 | 1702817.72 | 553182.98 | 40°00'50.257"N | 80°33'39.597"W | 5287.85 | 335.629 | 0.77 |
| 11964.00 | 90.920 | 327.340 | 6712.51 | 5291.78 | 4898.51 | -2230.14 | 1702769.55 | 553264.81 | 40°00'51.060"N | 80°33'40.229"W | 5382.28 | 335.522 | 4.59 |
| 12059.00 | 90.980 | 324.940 | 6710.94 | 5386.74 | 4977.38 | -2283.06 | 1702716.63 | 553343.68 | 40°00'51.833"N | 80°33'40.921"W | 5476.01 | 335.360 | 2.53 |
| 12153.00 | 90.620 | 321.650 | 6709.63 | 5480.68 | 5052.72 | -2339.23 | 1702660.46 | 553419.02 | 40°00'52.571"N | 80°33'41.654"W | 5567.95 | 335.158 | 3.52 |
| 12248.00 | 90.280 | 320.530 | 6708.88 | 5575.45 | 5126.64 | -2398.90 | 1702600.80 | 553492.94 | 40°00'53.295"N | 80°33'42.432"W | 5660.14 | 334.924 | 1.23 |
| 12342.00 | 90.460 | 322.960 | 6708.27 | 5669.29 | 5200.45 | -2457.09 | 1702542.61 | 553566.74 | 40°00'54.017"N | 80°33'43.191"W | 5751.69 | 334.710 | 2.59 |
| 12437.00 | 90.430 | 325.280 | 6707.54 | 5764.27 | 5277.42 | -2512.77 | 1702486.93 | 553643.71 | 40°00'54.771"N | 80°33'43.918"W | 5845.09 | 334.539 | 2.44 |
| 12532.00 | 90.430 | 322.300 | 6706.82 | 5859.24 | 5354.06 | -2568.88 | 1702430.82 | 553720.34 | 40°00'55.522"N | 80°33'44.651"W | 5938.44 | 334.368 | 3.14 |
| 12626.00 | 90.370 | 320.710 | 6706.17 | 5953.06 | 5427.62 | -2627.39 | 1702372.32 | 553793.91 | 40°00'56.242"N | 80°33'45.414"W | 6030.11 | 334.169 | 1.69 |
| 12720.00 | 90.340 | 323.050 | 6705.58 | 6046.91 | 5501.57 | -2685.41 | 1702314.30 | 553867.85 | 40°00'56.966"N | 80°33'46.171"W | 6121.98 | 333.982 | 2.49 |
| 12815.00 | 90.400 | 327.110 | 6704.97 | 6141.89 | 5579.45 | -2739.78 | 1702259.93 | 553945.72 | 40°00'57.729"N | 80°33'46.882"W | 6215.83 | 333.847 | 4.27 |
| 12910.00 | 90.490 | 328.070 | 6704.23 | 6236.78 | 5659.64 | -2790.69 | 1702209.02 | 554025.92 | 40°00'58.516"N | 80°33'47.548"W | 6310.27 | 333.753 | 1.01 |
| 13005.00 | 90.520 | 325.760 | 6703.39 | 6331.72 | 5739.23 | -2842.54 | 1702157.17 | 554105.50 | 40°00'59.296"N | 80°33'48.227"W | 6404.60 | 333.652 | 2.43 |
| 13100.00 | 90.370 | 325.530 | 6702.66 | 6426.71 | 5817.66 | -2896.15 | 1702103.56 | 554183.93 | 40°01'00.065"N | 80°33'48.927"W | 6498.68 | 333.535 | 0.29 |
| 13195.00 | 90.460 | 327.390 | 6701.97 | 6521.67 | 5896.84 | -2948.64 | 1702051.08 | 554263.10 | 40°01'00.841"N | 80°33'49.614"W | 6592.96 | 333.433 | 1.96 |
| 13289.00 | 90.740 | 328.620 | 6700.98 | 6615.54 | 5976.55 | -2998.44 | 1702001.28 | 554342.81 | 40°01'01.623"N | 80°33'50.266"W | 6686.54 | 333.357 | 1.34 |
| 13384.00 | 90.740 | 327.010 | 6699.76 | 6710.41 | 6056.94 | -3049.04 | 1701950.68 | 554423.20 | 40°01'02.412"N | 80°33'50.929"W | 6781.09 | 333.280 | 1.69 |
| 13478.00 | 90.620 | 322.670 | 6698.64 | 6804.38 | 6133.77 | -3103.15 | 1701896.57 | 554500.02 | 40°01'03.165"N | 80°33'51.636"W | 6874.06 | 333.165 | 4.62 |
| 13573.00 | 90.710 | 320.110 | 6697.54 | 6899.18 | 6207.99 | -3162.42 | 1701837.30 | 554574.24 | 40°01'03.891"N | 80°33'52.409"W | 6967.07 | 333.005 | 2.70 |
| 13668.00 | 90.710 | 320.100 | 6696.36 | 6993.83 | 6280.87 | -3223.35 | 1701776.38 | 554647.12 | 40°01'04.604"N | 80°33'53.203"W | 7059.70 | 332.833 | 0.01 |
| 13762.00 | 90.430 | 322.760 | 6695.43 | 7087.63 | 6354.35 | -3281.95 | 1701717.78 | 554720.60 | 40°01'05.323"N | 80°33'53.967"W | 7151.85 | 332.684 | 2.85 |
| 13858.00 | 90.310 | 326.160 | 6694.81 | 7183.61 | 6432.46 | -3337.74 | 1701661.99 | 554798.70 | 40°01'06.089"N | 80°33'54.696"W | 7246.86 | 332.576 | 3.54 |
| 13951.00 | 90.400 | 326.010 | 6694.23 | 7276.59 | 6509.63 | -3389.63 | 1701610.10 | 554875.87 | 40°01'06.845"N | 80°33'55.375"W | 7339.27 | 332.494 | 0.19 |
| 14046.00 | 90.150 | 328.340 | 6693.77 | 7371.52 | 6589.46 | -3441.12 | 1701558.61 | 554955.70 | 40°01'07.628"N | 80°33'56.049"W | 7433.86 | 332.426 | 2.47 |
| 14141.00 | 90.150 | 333.320 | 6693.52 | 7465.99 | 6672.38 | -3487.41 | 1701512.33 | 555038.62 | 40°01'08.442"N | 80°33'56.656"W | 7528.80 | 332.406 | 5.24 |
| 14236.00 | 90.250 | 332.190 | 6693.19 | 7560.12 | 6756.84 | -3530.90 | 1701468.84 | 555123.07 | 40°01'09.272"N | 80°33'57.228"W | 7623.79 | 332.410 | 1.19 |
| 14331.00 | 90.340 | 325.620 | 6692.70 | 7654.85 | 6838.15 | -3579.94 | 1701419.81 | 555204.37 | 40°01'10.069"N | 80°33'57.871"W | 7718.56 | 332.367 | 6.92 |
| 14425.00 | 90.430 | 320.690 | 6692.07 | 7748.77 | 6913.35 | -3636.29 | 1701363.46 | 555279.57 | 40°01'10.806"N | 80°33'58.606"W | 7811.33 | 332.256 | 5.25 |
| 14520.00 | 90.370 | 324.100 | 6691.41 | 7843.66 | 6988.60 | -3694.25 | 1701305.50 | 555354.82 | 40°01'11.543"N | 80°33'59.363"W | 7904.93 | 332.139 | 3.59 |
| 14615.00 | 90.460 | 323.550 | 6690.72 | 7938.63 | 7065.28 | -3750.32 | 1701249.43 | 555431.50 | 40°01'12.294"N | 80°34'00.095"W | 7998.94 | 332.040 | 0.59 |
| 14709.00 | 90.770 | 323.810 | 6689.71 | 8032.60 | 7141.01 | -3805.99 | 1701193.76 | 555507.23 | 40°01'13.036"N | 80°34'00.822"W | 8091.95 | 331.943 | 0.43 |

51-01682

## REFERENCE WELLPATH IDENTIFICATION

| | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

## WELLPATH DATA (189 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14804.00 | 90.710 | 324.480 | 6688.48 | 8127.58 | 7218.00 | -3861.63 | 1701138.12 | 555584.22 | 40°01'13.790"N | 80°34'01.549"W | 8186.07 | 331.853 | 0.71 |
| 14899.00 | 90.620 | 323.600 | 6687.38 | 8222.56 | 7294.89 | -3917.41 | 1701082.34 | 555661.10 | 40°01'14.543"N | 80°34'02.278"W | 8280.19 | 331.764 | 0.93 |
| 14994.00 | 90.710 | 326.330 | 6686.28 | 8317.55 | 7372.67 | -3971.94 | 1701027.82 | 555738.87 | 40°01'15.305"N | 80°34'02.990"W | 8374.52 | 331.687 | 2.88 |
| 15089.00 | 90.650 | 326.420 | 6685.15 | 8412.51 | 7451.77 | -4024.54 | 1700975.22 | 555817.97 | 40°01'16.081"N | 80°34'03.679"W | 8469.11 | 331.627 | 0.11 |
| 15183.00 | 90.740 | 324.630 | 6684.01 | 8506.50 | 7529.25 | -4077.75 | 1700922.02 | 555895.45 | 40°01'16.840"N | 80°34'04.374"W | 8562.57 | 331.561 | 1.91 |
| 15278.00 | 90.680 | 320.470 | 6682.83 | 8601.38 | 7604.64 | -4135.50 | 1700864.27 | 555970.84 | 40°01'17.578"N | 80°34'05.128"W | 8656.38 | 331.462 | 4.38 |
| 15373.00 | 90.400 | 324.240 | 6681.94 | 8696.26 | 7679.85 | -4193.51 | 1700806.26 | 556046.04 | 40°01'18.315"N | 80°34'05.885"W | 8750.18 | 331.364 | 3.98 |
| 15449.00 | 90.460 | 324.200 | 6681.37 | 8772.25 | 7741.50 | -4237.94 | 1700761.83 | 556107.70 | 40°01'18.919"N | 80°34'06.465"W | 8825.59 | 331.302 | 0.09 |
| 15474.00 | 90.460 | 324.200 | 6681.17 | 8797.25 | 7761.78 | -4252.56 | 1700747.21 | 556127.97 | 40°01'19.117"N | 80°34'06.657"W | 8850.40 | 331.282 | 0.00 |

## TARGETS

| Name | MD [ft] | TVD [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|---|
| SHL 25C-HS BHL:Plat | | 6653.00 | 7767.02 | -4240.30 | **1700759.47** | **556133.21** | 40°01'19.171"N | 80°34'06.500"W | point |
| SHL 25C-HS BHL:Rev-1 | | 6702.33 | 7767.02 | -4240.30 | **1700759.47** | **556133.21** | 40°01'19.171"N | 80°34'06.500"W | point |
| SHL 25C-HS LP:Plat | | 6745.00 | 1090.92 | 434.36 | **1705433.94** | **549457.38** | 40°00'13.744"N | 80°33'05.414"W | point |

## WELLPATH COMPOSITION - Ref Wellbore: SHL 25C-HS (AWB) Ref Wellpath: SHL 25C-HS (AWP) Proj: 15474'

| Start MD [ft] | End MD [ft] | Positional Uncertainty Model | Log Name/Comment | Wellbore |
|---|---|---|---|---|
| 26.00 | 3305.00 | Generic gyro - northseeking (Standard) | 01_12 1/4" VES Gyro Surveys (100'-3290') | SHL 25C-HS (AWB) |
| 3305.00 | 5171.00 | NaviTrak (MagCorr) | 02_BHI MWD Surveys 8 3/4"(3305')(3373'-5171') | SHL 25C-HS (AWB) |
| 5171.00 | 15449.00 | NaviTrak (MagCorr) | 03_BHI AT Curve <8-3/4"> (5171')(5234'-15449') | SHL 25C-HS (AWB) |
| 15449.00 | 15474.00 | Blind Drilling (std) | Projection to bit | SHL 25C-HS (AWB) |

Received
Office of Oil & Gas
DEC 15 2014

51-01682

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot C |
| Area | Marshall County, WV | Well | SHL 25C-HS |
| Field | Marshall | Wellbore | SHL 25C-HS (AWB) |
| Facility | SHL-25 Pad | | |

**COMMENTS**

**Wellpath general comments**
API:47-051-01682-0000
Rig: Nomac 79
BHI Job #: 6389945
Duration: 05/21/2014-05/30/2014
VES Gyro <12 1/4">(100'-3290')
BHI MWD Surveys <8 3/4">(3305')(3373'-5171')
BHI AT Curve <8 3/4">(5171')(5234-15449')
TD Projected to MD: 15474'

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Office of Oil & Gas
DEC 15 2014

# NOBLE ENERGY

Location: Marshall County, WV
Field: Marshall
Facility: SHL-25 Pad

Slot: Slot C
Well: SHL 25C-HS
Wellbore: SHL 25C-HS (PWB)

## Location Information

| Facility Name | | | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|
| SHL-25 Pad | | | 1705028.190 | 548357.370 | 40°00'02.826"N | 80°33'10.462"W |
| Slot | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
| Slot C | 9.13 | -28.59 | 1704999.600 | 548366.500 | 40°00'02.913"N | 80°33'10.831"W |

| | |
|---|---|
| Nomac 79 (RT) to Mud line (At Slot: Slot C) | 26ft |
| Mean Sea Level to Mud line (At Slot: Slot C) | -1325ft |
| Nomac 79 (RT) to Mean Sea Level | 1351ft |

Plot reference wellpath is SHL 25C-HS (PWP) Rev-D.0

| | |
|---|---|
| True vertical depths are referenced to Nomac 79 (RT) | Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet |
| Measured depths are referenced to Nomac 79 (RT) | North Reference: Grid north |
| Nomac 79 (RT) to Mean Sea Level: 1351 feet | Scale: True distance |
| Mean Sea Level to Mud line (At Slot: Slot C): -1325 feet | Depths are in feet |
| Coordinates are in feet referenced to Slot | Created by: kroschr on 04/Jun/2014 |

## Well Profile Data

| Design Comment | MD (ft) | Inc (°) | Az (°) | TVD (ft) | Local N (ft) | Local E (ft) | DLS (°/100ft) | VS (ft) |
|---|---|---|---|---|---|---|---|---|
| Tie On | 4414.00 | 10.410 | 50.280 | 4411.10 | 17.76 | 12.14 | 0.00 | 7.59 |
| Projection | 4466.00 | 11.740 | 51.540 | 4462.13 | 24.06 | 19.89 | 2.60 | 8.29 |
| End of 3D Arc (J) | 4784.49 | 20.967 | 60.726 | 4767.46 | 72.18 | 95.15 | 3.00 | 4.56 |
| End of Tangent (J) | 6147.50 | 20.967 | 60.726 | 6040.21 | 310.68 | 520.58 | 0.00 | -44.10 |
| End of 3D Arc | 6768.37 | 50.000 | 358.000 | 6554.54 | 617.52 | 613.69 | 7.00 | 153.84 |
| LP | 7327.00 | 90.300 | 325.000 | 6745.00 | 1090.92 | 434.36 | 9.00 | 644.50 |
| BHL | 15477.12 | 90.300 | 325.000 | 6702.33 | 7767.02 | -4240.30 | 0.00 | 8794.51 |

## Targets

| Name | MD (ft) | TVD (ft) | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|
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51-01682

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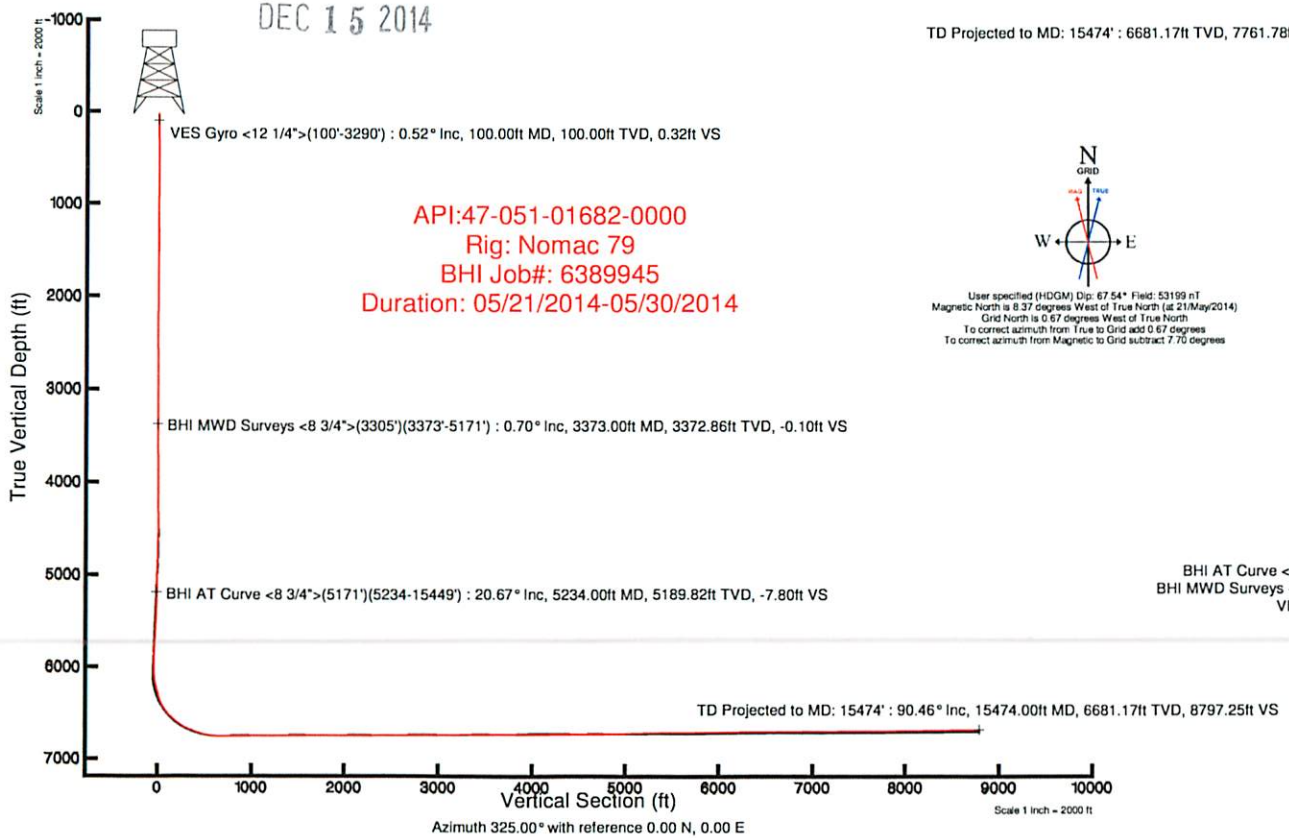
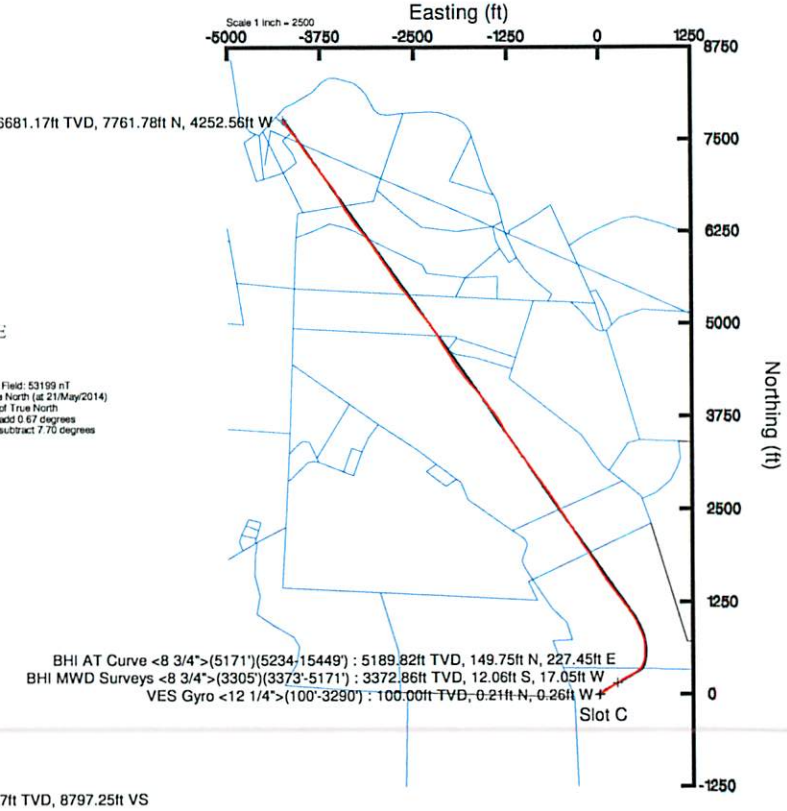
Office of Oil & Gas
DEC 15 2014




API:47-051-01682-0000
Rig: Nomac 79
BHI Job#: 6389945
Duration: 05/21/2014-05/30/2014



Well is located on topo map 14,876' feet south of Latitude: 40° 02' 30"

# AS DRILLED PLAT

Well is located on topo map 3,152' feet west of Longitude: 80° 32' 30"

| PERMITTED APPROX. LANDING POINT |
|---|
| UTM 17-NAD83 |
| N:4428285.64 |
| E:538298.93 |
| NAD27, WV NORTH |
| N:549457.38 |
| E:1705433.94 |

| AS DRILLED APPROX. LANDING POINT |
|---|
| UTM 17-NAD83 |
| N:4428285.75 |
| E:538294.16 |
| NAD27, WV NORTH |
| N:549458.02 |
| E:1705418.29 |

| PERMITTED BOTTOM HOLE LOCATION (BHL) |
|---|
| UTM 17-NAD83 |
| N:4430295.60 |
| E:536840.76 |
| NAD27, WV NORTH |
| N:556133.21 |
| E:1700759.47 |

NOTES:

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

| PARCEL | LESSOR |
|---|---|
| 1 | DAVID RUTHERFORD ET UX. |
| 2 | STEPHEN YOURKOVICH ET AL. |
| 3 | JOHN R. GRAY ET UX. |
| 4 | CNX GAS COMPANY LLC ET AL. |
| 5 | ROGER L. WHITE ET UX. |
| 6 | DON N. BRYANT ET UX. |
| 7 | JAMES A. GRAY ET UX. |
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## LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED.
- ⓪ - LEASE NUMBER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
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- AS DRILLED

EXISTING WELLS

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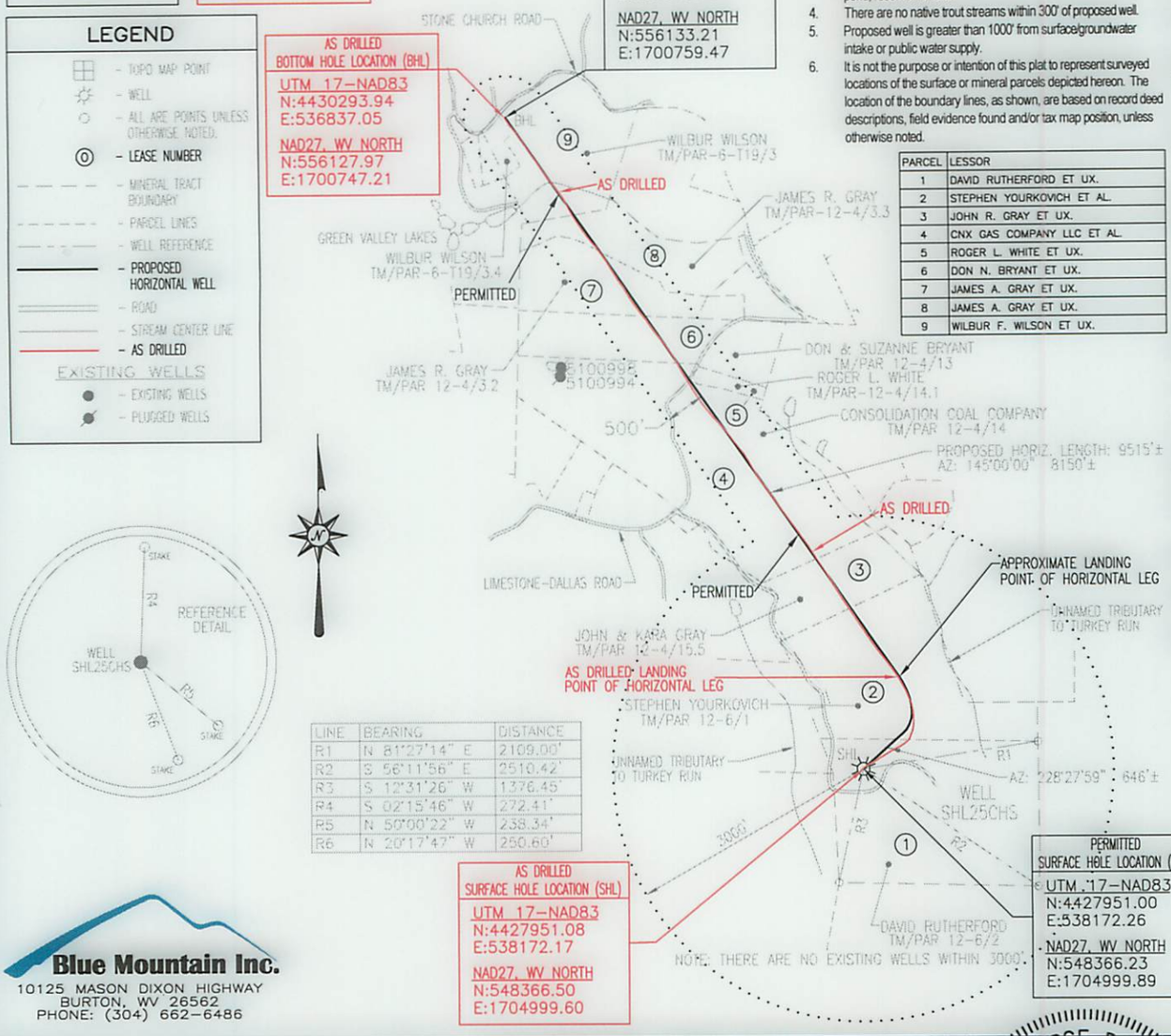
| N:4430293.94 |
| E:536837.05 |
| NAD27, WV NORTH |
| N:556127.97 |
| E:1700747.21 |




| LINE | BEARING | DISTANCE |
|---|---|---|
| R1 | N 81°27'14" E | 2109.00' |
| R2 | S 56°11'56" E | 2510.42' |
| R3 | S 12°31'26" W | 1376.45' |
| R4 | S 02°15'46" W | 272.41' |
| R5 | N 50°00'22" W | 238.34' |
| R6 | N 20°17'47" W | 250.60' |

| AS DRILLED SURFACE HOLE LOCATION (SHL) |
|---|
| UTM 17-NAD83 |
| N:4427951.08 |
| E:538172.17 |
| NAD27, WV NORTH |
| N:548366.50 |
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**Blue Mountain Inc.**
10125 MASON DIXON HIGHWAY
BURTON, WV 26562
PHONE: (304) 662-6486


FILE #: SHL25CHS-AS DRILLED

DRAWING #: SHL25CHS-AS DRILLED

SCALE: 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/2500

PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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

Signed: [signature]

R.P.E.: _____ L.L.S.: P.S. No. 2000

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

PLACE SEAL HERE

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

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

DATE: DECEMBER 8, 2014

OPERATOR'S WELL #: SHL25CHS-AS DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01682 (PERMIT)

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

WATERSHED: WHEELING CREEK ELEVATION: 1344.44'

COUNTY/DISTRICT: MARSHALL / SAND HILL QUADRANGLE: VALLEY GROVE, WV 7.5'

SURFACE OWNER: DAVID RUTHERFORD ACREAGE: 95.912±

OIL & GAS ROYALTY OWNER: DAVID RUTHERFORD ET UX. ACREAGE: 485.576±

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐

PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐

CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,823'± TMD: 15,630'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN

Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590

City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

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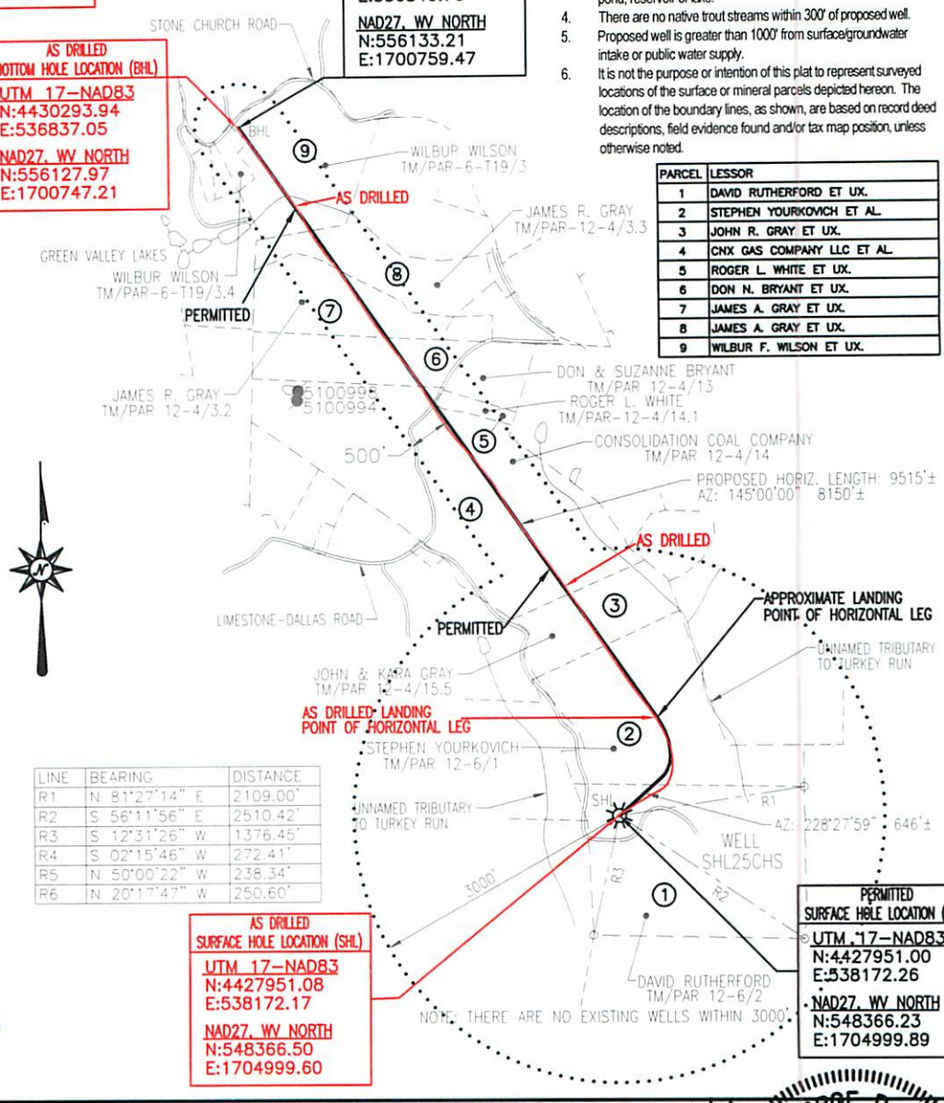


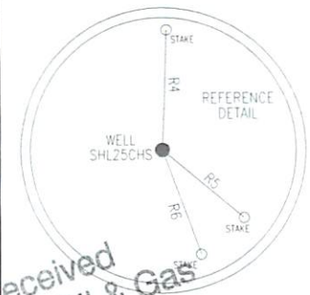


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PHONE: (304) 662-6486

FILE #: SHL25CHS-AS DRILLED

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Signed: George W. Six

R.P.E.: _____ L.L.S.: P.S. No. 2000

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

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PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐

CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,823'± TMD: 15,630'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN

Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590

City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

WR-35
Rev. 8/23/13

Page ___ of ___

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 051 - 01684 County Marshall District Sandhill
Quad Valley Grove Pad Name SHL25 Field/Pool Name NA
Farm name David Rutherford Well Number SHL25 BHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

| | | | | |
|---|---|---|---|---|
| Top hole | Northing | 4427949.71 | Easting | 538176.66 |
| Landing Point of Curve | Northing | 4428418.86 | Easting | 538486.73 |
| Bottom Hole | Northing | 4430433.09 | Easting | 537020.83 |

Elevation (ft) 1344.21 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air ■ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

Date permit issued 11/18/2013 Date drilling commenced 3/11/2014 Date drilling ceased 6/8/2014
Date completion activities began 8/6/2014 Date completion activities ceased 10/6/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 213 Open mine(s) (Y/N) depths N
Salt water depth(s) ft None noted for Offsets Void(s) encountered (Y/N) depths N
Coal depth(s) ft 810', 866' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y, Shoemaker Mine 866'

Received
Office of Oil & Gas
DEC 15 2014

Reviewed by: _____

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01684 Farm name David Rutherford Well number SHL25 BHS

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---|---|---|---|---|---|---|---|
| Conductor | 36 | 30 | 40 | N | | | |
| Surface | 24 | 20 | 418.3 | N | J-55 94# | | Y |
| Coal | | | | | | | |
| Intermediate 1 | 17 1/2 | 13 3/8 | 1252.9 | N | J-55 54.5# | | Y |
| Intermediate 2 | 12 1/4 | 9 5/8 | 3264.5 | N | K-55 36# | | Y |
| Intermediate 3 | | | | | | | |
| Production | 8 3/4 | 5 1/2 | 15799.7 | N | P-110 20# | | Y |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details Surface Casing 4 centralizer and 2 baskets, Intermediate 1 11 Centralizers, Itermediate 2 42 Centralizers, Production 260 Centralizers

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield ( $ft^3$/sks) | Volume ($ft^3$) | Cement Top (MD) | WOC (hrs) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Surface | Type I | 604 | 15.60 | 1.21 | 134.0 | 0 | 8 |
| Coal | | | | | | | |
| Intermediate 1 | Class A | 1042 | 15.60 | 1.20 | 223.0 | 0 | 8 |
| Intermediate 2 | Class A | 1058 | 15.60 | 1.21 | 226.1 | 0 | 8 |
| Intermediate 3 | | | | | | | |
| Production | Class A | 663 | 14.20 | 1.54 | 242.0 | 0 | 8 |
| Tubing | | | | | | | |

Drillers TD (ft) 15,805 Loggers TD (ft) 15,780

Deepest formation penetrated Marcellus Plug back to (ft) Not a Pilot Hole

Plug back procedure Not a Pilot Hole

Kick off depth (ft) 6381

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ☐ No ☐ Conventional ☐ Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
4 Centralizers on Surface (1 every 3rd joint) and 2 baskets 11 Centralizers on Intermediate 1 (1 every 3rd joint) 42 Centralizers on Intermediate 2 (1 every 3rd Joint)
260 Centralizers on Production (1 every 3rd to Curve, then 1 every joint to TD)

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

Received
Office of Oil & Gas
DEC 15 2014

WR-35
Rev. 8/23/13



API 47- 051 - 01684 Farm name David Rutherford Well number SHL25 BHS

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| | | | | | |
| | PLEASE SEE ATTACHED | | | | |
| | PERFORATION RECORD | | | | |
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Please insert additional pages as applicable.

## STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No. | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | PLEASE SEE ATTACHED | | | | | | | |
| | STIMULATION STAGE | | | | | | | |
| | ATTACHMENT | | | | | | | |
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Please insert additional pages as applicable.

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DEC 15 2014

Perforation Record

API: 47-051-01684 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25B-HS

| Stage No. | Stim Date | Top Perf | Bottom Perf | # of Perfs | Formation |
|---|---|---|---|---|---|
| Toe Sleeve | 8/4/2014 | 15671 | 15674 | | |
| Toe Prep Inj Test | 8/6/2014 | | - | - | Marcellus |
| 1.1 | 8/6/2014 | 15373 | 15,647 | 50 | Marcellus |
| 1.2 | 8/6/2014 | | | | Marcellus |
| 2.1 | 8/8/2014 | 15076 | 15,348 | 50 | Marcellus |
| 2.2 | 8/8/2014 | | | | Marcellus |
| 3.1 | 8/9/2014 | 14775 | 15,049 | 50 | Marcellus |
| 3.2 | 8/9/2014 | | | | Marcellus |
| 4.1 | 8/10/2014 | 14476 | 14,750 | 50 | Marcellus |
| 4.2 | 8/10/2014 | | | | Marcellus |
| 5.1 | 8/11/2014 | 14177 | 14,451 | 50 | Marcellus |
| 5.2 | 8/11/2014 | | | | Marcellus |
| 6.1 | 8/12/2014 | 13878 | 14,152 | 50 | Marcellus |
| 6.2 | 8/12/2014 | | | | Marcellus |
| 7.1 | 8/13/2014 | 13579 | 13,853 | 50 | Marcellus |
| 7.2 | 8/13/2014 | | | | Marcellus |
| 8.1 | 8/13/2014 | 13280 | 13,554 | 50 | Marcellus |
| 8.2 | 8/13/2014 | | | | Marcellus |
| 9.1 | 8/14/2014 | 12981 | 13,255 | 50 | Marcellus |
| 9.2 | 8/14/2014 | | | | Marcellus |
| 10 | 9/1/2014 | 12682 | 12,956 | 50 | Marcellus |
| 11 | 9/2/2014 | 12383 | 12,657 | 50 | Marcellus |
| 12 | 9/3/2014 | 12084 | 12,358 | 50 | Marcellus |
| 13 | 9/4/2014 | 11785 | 12,059 | 50 | Marcellus |
| 14 | 9/4/2014 | 11486 | 11,760 | 50 | Marcellus |
| 15 | 9/5/2014 | 11187 | 11,461 | 50 | Marcellus |
| 16 | 9/5/2014 | 10888 | 11,162 | 50 | Marcellus |
| 17.1(Acidize Formation) | 9/6/2014 | 10589 | 10,863 | 50 | Marcellus |
| 17 | 9/6/2014 | 10589 | 10,863 | 50 | Marcellus |
| 18 | 9/7/2014 | 10290 | 10,564 | 50 | Marcellus |
| 19 | 9/8/2014 | 9991 | 10,265 | 50 | Marcellus |
| 19B (Reperf) | 9/8/2014 | 9980 | 10,001 | 36 | Marcellus |
| 20 | 9/8/2014 | 9692 | 9,962 | 50 | Marcellus |
| 21 | 9/9/2014 | 9393 | 9,667 | 50 | Marcellus |
| 22 | 9/9/2014 | 9094 | 9,368 | 50 | Marcellus |
| 23 | 9/10/2014 | 8795 | 9,069 | 50 | Marcellus |
| 24 | 9/10/2014 | 8496 | 8,769 | 50 | Marcellus |
| 25 | 9/10/2014 | 8197 | 8,471 | 50 | Marcellus |
| 26 | 9/11/2014 | 7898 | 8,172 | 50 | Marcellus |
| 27 | 9/11/2014 | 7599 | 7,873 | 50 | Marcellus |

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DEC 15 2014

Perforation Record

API: 47-051-01684 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25B-HS

| Stage No. | Stim Date | Top Perf | Bottom Perf | # of Perfs | Formation |
|---|---|---|---|---|---|
| 28 | 9/11/2014 | 7320 | 7,574 | 50 | Marcellus |
| | | | | | Marcellus |
| | | | | | Marcellus |
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DEC 15 2014

STIMULATION INFORMATION PER STAGE

API: 47-051-01684 Farm name: David & Joy Rutherford ET AL Well Name: SHL-25B-HS

| Stage No. | Stim Date | Avg Rate (bpm) | ATP (psi) | Max BD Pressure | ISIP (psi) | Proppant (lbs) | Water (BBLS) | Amount of $N^2$/ other (units) |
|---|---|---|---|---|---|---|---|---|
| Toe Prep Inj Test | 8/6/2014 | 23 | 6,821 | 6,392 | 5,089 | - | 161.90 | |
| 1.1 | 8/6/2014 | 88.3 | 7,458 | 5,295 | 3,667 | 297,831 | 7,923.60 | |
| 1.2 | 8/6/2014 | 88.2 | 7,539 | 5,958 | - | 303,087 | 8,293.52 | |
| 2.1 | 8/8/2014 | 87.6 | 7,723 | 5,804 | 4,048 | 302,720 | 8,214.93 | |
| 2.2 | 8/8/2014 | 84.8 | 7,783 | 6,095 | - | 300,201 | 8,241.90 | |
| 3.1 | 8/9/2014 | 81.5 | 7,883 | 6,205 | 4,117 | 302,102 | 8,118.27 | |
| 3.2 | 8/9/2014 | 87.5 | 7,614 | 5,873 | - | 298,883 | 7,907.99 | |
| 4.1 | 8/10/2014 | 89.1 | 7,899 | 6,450 | 4,224 | 299,013 | 7,666.87 | |
| 4.2 | 8/10/2014 | 88.9 | 8,090 | 5,384 | - | 304,105 | 7,704.80 | |
| 5.1 | 8/11/2014 | 84.2 | 8,150 | 5,694 | 3,852 | 299,046 | 7,727.55 | |
| 5.2 | 8/11/2014 | 75.8 | 8,239 | 6,100 | - | 301,846 | 7,776.29 | |
| 6.1 | 8/12/2014 | 84.4 | 8,097 | 6,424 | 3,832 | 299,415 | 7,300.54 | |
| 6.2 | 8/12/2014 | 86.2 | 8,458 | 5,767 | - | 299,657 | 7,515.61 | |
| 7.1 | 8/13/2014 | 89.8 | 8,039 | 6,373 | 3,869 | 302,336 | 7,635.58 | |
| 7.2 | 8/13/2014 | 88.6 | 8,387 | 6,363 | - | 300,330 | 7,438.82 | |
| 8.1 | 8/13/2014 | 84.7 | 7,835 | 7,085 | 5,377 | 303,156 | 7,629.21 | |
| 8.2 | 8/13/2014 | 84.3 | 7,590 | 5,547 | - | 298,327 | 8,314.71 | |
| 9.1 | 8/14/2014 | 83 | 7,392 | 6,886 | 3,922 | 298,575 | 9,982.40 | |
| 9.2 | 8/14/2014 | 83.3 | 7,791 | 5,740 | - | 299,594 | 8,408.35 | |
| 10 | 9/1/2014 | 78 | 7,223 | 6,835 | 4,230 | 601,947 | 15,228.40 | |
| 11 | 9/2/2014 | 73.5 | 7,208 | 6,487 | 3,651 | 596,739 | 15,813.10 | |
| 12 | 9/3/2014 | 76.2 | 6,999 | 6,317 | 4,081 | 597,342 | 14,874.69 | |
| 13 | 9/4/2014 | 77.5 | 6,790 | 6,447 | 4,258 | 604,899 | 15,063.86 | |
| 14 | 9/4/2014 | 76.6 | 7,133 | 6,323 | 4,249 | 601,682 | 14,998.60 | |
| 15 | 9/5/2014 | 77.7 | 6,974 | 6,464 | 4,288 | 599,356 | 16,829.50 | |
| 16 | 9/5/2014 | 78.5 | 7,040 | 6,581 | 4,254 | 600,846 | 17,323.26 | |
| 17.1(Acidize Formation) | 9/6/2014 | 26.4 | 6,446 | 6,362 | - | - | 467.95 | |
| 17 | 9/6/2014 | 78.4 | 7,236 | 6,362 | 4,461 | 601,603 | 15,465.74 | |
| 18 | 9/7/2014 | 80.8 | 7,059 | 6,479 | 4,534 | 600,040 | 19,619.79 | |
| 19 | 9/8/2014 | 56.6 | 7,395 | 5,713 | 7,125 | 301,847 | 10,844.36 | |
| 19B (Reperf) | 9/8/2014 | 77.7 | 7,447 | 6,253 | 4,205 | 301,560 | 8,021.14 | |
| 20 | 9/8/2014 | 84.4 | 7,159 | 5,728 | 4,703 | 601,375 | 15,464.26 | |
| 21 | 9/9/2014 | 87.1 | 7,195 | 6,029 | 4,643 | 598,666 | 15,482.25 | |
| 22 | 9/9/2014 | 78.1 | 6,614 | 6,629 | 4,277 | 601,529 | 14,712.74 | |
| 23 | 9/10/2014 | 88.3 | 6,979 | 6,288 | 4,327 | 594,925 | 14,417.76 | |
| 24 | 9/10/2014 | 87.5 | 6,541 | 6,985 | 4,326 | 596,799 | 14,580.16 | |
| 25 | 9/10/2014 | 88.8 | 6,853 | 7,167 | 4,398 | 600,721 | 14,574.59 | |
| 26 | 9/11/2014 | 89.7 | 6,774 | 7,075 | 4,161 | 600,246 | 14,492.93 | |
| 27 | 9/11/2014 | 88.8 | 6,728 | 6,853 | 4,160 | 602,409 | 14,439.70 | |
| 28 | 9/11/2014 | 89.7 | 6,325 | 6,454 | 3,717 | 599,370 | 14,352.43 | |

Received
Office of Oil & Gas
1 5 2014

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01684 Farm name David Rutherford Well number SHL25 BHS

| PRODUCING FORMATION(S) | DEPTHS | | | |
|---|---|---|---|---|
| Marcellus | 6,745 | TVD | 15,805 | MD |
| | | | | |
| | | | | |
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Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

| OPEN FLOW | Gas | Oil | NGL | Water | GAS MEASURED BY |
|---|---|---|---|---|---|
| | 5691 mcfpd | 46 bpd | 455 bpd | 729 bpd | ☐ Estimated ■ Orifice ☐ Pilot |

| LITHOLOGY/ FORMATION NAME | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, $H_2S$, ETC) |
|---|---|---|---|---|---|
| | 0 | | 0 | | |
| | PLEASE SEE ATTACHED FORMATION SHEET | | | | |
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Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling Company
Address 171 Locust Avenue Ext. City Mt. Morris State PA Zip 15349

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company Schlumberger
Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy SRCS
Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Regina A. Logue Telephone 724-820-3559
Signature Regina A. Logue Title Regulatory Analyst Date 12/10/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

**SHL25 BHS**

47-051-01684

| Formations | Top TVD | Base TVD | Top MD | Base MD | Fluid |
|---|---|---|---|---|---|
| Shale | 0 | 812 | 0 | 812 | |
| Pittsburgh Coal | 812 | 822 | 812 | 822 | |
| Shale and Sandstone | 822 | 1420 | 822 | 1420 | |
| Gas Sand | 1420 | 1473 | 1420 | 1473 | |
| Shale | 1473 | 1517 | 1473 | 1517 | |
| 1st Salt Sand | 1517 | 1595 | 1517 | 1595 | |
| 2nd Salt Sand | 1595 | 1606 | 1595 | 2944 | |
| 3rd Salt Sand | 1606 | 1665 | 1606 | 2977 | |
| Shale | 1665 | 1700 | 1665 | 3364 | |
| Maxton Sand | 1700 | 1838 | 1700 | 3388 | |
| Shale | 1838 | 1860 | 1838 | 4281 | |
| Big Lime | 1860 | 1946 | 1860 | 4295 | |
| Big Injun | 1946 | 2126 | 1946 | 5211 | |
| Price | 2126 | 2465 | 2126 | 5282 | |
| Murrysville | 2465 | 2488 | 2465 | 5326 | |
| Shale and Sandstone | 2488 | 2715 | 2488 | 5959 | |
| 50' Sand | 2715 | 2728 | 2715 | 3388 | |
| Shale | 2728 | 2814 | 2728 | 4281 | |
| Gordon Stray | 2814 | 2821 | 2814 | 4295 | |
| Shale | 2821 | 2836 | 2821 | 5211 | |
| Gordon | 2836 | 2854 | 2836 | 5282 | |
| Shale | 2854 | 2944 | 2854 | 5326 | |
| Fifth Sand | 2944 | 2977 | 2944 | 2977 | |
| Shale | 2977 | 3363 | 2977 | 3364 | |
| Speechley Sand | 3363 | 3387 | 3364 | 3388 | |
| Shale | 3387 | 4271 | 3388 | 4281 | |
| Warren Sand | 4271 | 4285 | 4281 | 4295 | |
| Shale | 4285 | 5192 | 4295 | 5211 | |
| Java Shale | 5192 | 5262 | 5211 | 5282 | |
| Pipe Creek Shale | 5262 | 5306 | 5282 | 5326 | |
| Angola Shale | 5306 | 5932 | 5326 | 5959 | |
| Rhinestreet | 5932 | 6346 | 5959 | 6404 | |
| Cashaqua | 6346 | 6438 | 6404 | 6533 | |
| Middlesex | 6438 | 6475 | 6533 | 6597 | |
| West River | 6475 | 6516 | 6597 | 6684 | |
| Burkett | 6516 | 6549 | 6684 | 6774 | Gas |
| Tully Limestone | 6549 | 6577 | 6774 | not encountered | |
| Hamilton | 6577 | 6691 | not encountered | not encountered | |
| Marcellus | 6691 | | not encountered | not encountered | |

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

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DEC 15 2014

51-01684

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|---|---|
| Job Start Date: | 8/6/2014 |
| Job End Date: | 9/11/2014 |
| State: | West Virginia |
| County: | Marshall |
| API Number: | 47-051-01684-00-00 |
| Operator Name: | Noble Energy, Inc. |
| Well Name and Number: | SHL 25 B |
| Longitude: | -80.55295600 |
| Latitude: | 40.00079700 |
| Datum: | NAD27 |
| Federal/Tribal Well: | NO |
| True Vertical Depth: | 67,456,699 |
| Total Base Water Volume (gal): | 18,348,365 |
| Total Base Non Water Volume: | 0 |

## Hydraulic Fracturing Fluid Composition:

| Trade Name | Supplier | Purpose | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Maximum Ingredient Concentration in HF Fluid (% by mass)** | Comments |
|---|---|---|---|---|---|---|---|
| Fresh Water | Operator | Base Fluid | | | | | |
| | | | Fresh Water | 7732-18-5 | 100.00000 | 89.39591 | Density = 8.330 |
| SAND - PREMIUM WHITE | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 7.85702 | |
| SSA-2 | Halliburton | Proppant | | | | | |
| | | | Crystalline silica, quartz | 14808-60-7 | 100.00000 | 1.96814 | |
| HYDROCHLORIC ACID 5-10% | Halliburton | Solvent | | | | | |
| | | | Hydrochloric acid | 7647-01-0 | 10.00000 | 0.06292 | |
| FR-66 | Halliburton | Friction Reducer | | | | | |
| | | | Hydrotreated light petroleum distillate | 64742-47-8 | 30.00000 | 0.02074 | |
| FE-1A ACIDIZING COMPOSITION | Halliburton | Additive | | | | | |
| | | | Acetic anhydride | 108-24-7 | 100.00000 | 0.00334 | |
| | | | Acetic acid | 64-19-7 | 60.00000 | 0.00200 | |
| BE-9 | Halliburton | Biocide | | | | | |
| | | | Tributyl tetradecyl phosphonium chloride | 81741-28-8 | 10.00000 | 0.00411 | |
| LP-65 | Halliburton | Scale Inhibitor | | | | | |
| | | | Ammonium chloride | 12125-02-9 | 10.00000 | 0.00247 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HYDROCHLORIC ACID 10-30% | Halliburton | Solvent | | | | | |
| | | | Hydrochloric acid | 7647-01-0 | 30.00000 | 0.00235 | |
| Biovert NWB | Halliburton | Viscosifier | | | | | |
| | | | Polylactide resin | Confidential | 100.00000 | 0.00203 | Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226 |
| LoSurf-300D | Halliburton | Non-ionic Surfactant | | | | | |
| | | | Ethanol | 64-17-5 | 60.00000 | 0.00067 | |
| | | | Heavy aromatic petroleum naphtha | 64742-94-5 | 30.00000 | 0.00034 | |
| | | | Naphthalene | 91-20-3 | 5.00000 | 0.00006 | |
| | | | Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched | 127087-87-0 | 5.00000 | 0.00006 | |
| | | | 1,2,4 Trimethylbenzene | 95-63-6 | 1.00000 | 0.00001 | |
| HAI-OS ACID INHIBITOR | Halliburton | Corrosion Inhibitor | | | | | |
| | | | Methanol | 67-56-1 | 60.00000 | 0.00033 | |
| | | | Propargyl alcohol | 107-19-7 | 10.00000 | 0.00006 | |
| Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS. | | | | | | | |
| | | Other Ingredient(s) | | | | | |
| | | | Water | 7732-18-5 | | 0.73435 | |
| | | Other Ingredient(s) | | | | | |
| | | | Polyacrylamide copolymer | Confidential | | 0.02074 | |
| | | Other Ingredient(s) | | | | | |
| | | | Organic phosphonate | Confidential | | 0.01481 | |
| | | Other Ingredient(s) | | | | | |
| | | | Alcohols, C12-16, ethoxylated | 68551-12-2 | | 0.00346 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sodium chloride | 7647-14-5 | | 0.00346 | |
| | | Other Ingredient(s) | | | | | |
| | | | Fatty acid tall oil amide | Confidential | | 0.00346 | |
| | | Other Ingredient(s) | | | | | |
| | | | Ammonium chloride | 12125-02-9 | | 0.00346 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sorbitan monooleate polyoxyethylene derivative | 9005-65-6 | | 0.00069 | |
| | | Other Ingredient(s) | | | | | |
| | | | Sorbitan, mono-9-octadecenoate, (Z) | 1338-43-8 | | 0.00069 | |
| | | Other Ingredient(s) | | | | | |
| | | | Oxyalkylated phenolic resin | Confidential | | 0.00034 | |
| | | Other Ingredient(s) | | | | | |
| | | | Formaldehyde | 50-00-0 | | 0.00025 | |
| | | Other Ingredient(s) | | | | | |

Received
Office of Oil & Gas
DEC 15 2014

51-01684

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|---|---|---|---|---|---|---|---|
| | | | Fatty acids, tall oil | Confidential | | 0.00017 | |
| | | Other Ingredient(s) | | | | | |
| | | | Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide | 68527-49-1 | | 0.00017 | |
| | | Other Ingredient(s) | | | | | |
| | | | Alcohols, C14-C15, ethoxylated | 68951-67-7 | | 0.00017 | |
| | | Other Ingredient(s) | | | | | |
| | | | Oxyalkylated phenolic resin | Confidential | | 0.00011 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00003 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00003 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00001 | |
| | | Other Ingredient(s) | | | | | |
| | | | Olefins | Confidential | | 0.00001 | |

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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DEC 15 2014

51-01684

# Actual Wellpath Report

SHL 25B-HS (AWP) Proj: 15805'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

51-01684

| REPORT SETUP INFORMATION | | | |
|---|---|---|---|
| Projection System | NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet | Software System | WellArchitect® 4.0.1 |
| North Reference | Grid | User | Kroschr |
| Scale | 0.999962 | Report Generated | 11/Jun/2014 at 14:48 |
| Convergence at slot | 0.67° West | Database/Source file | WA_Pennsylvania/SHL_25B-HS__AWB_.xml |

| WELLPATH LOCATION | Local coordinates | | Grid coordinates | | Geographic coordinates | |
|---|---|---|---|---|---|---|
| | North[ft] | East[ft] | Easting[US ft] | Northing[US ft] | Latitude | Longitude |
| Slot Location | 4.38 | -13.92 | 1705014.27 | 548361.75 | 40°00'02.868"N | 80°33'10.642"W |
| Facility Reference Pt | | | 1705028.19 | 548357.37 | 40°00'02.826"N | 80°33'10.462"W |
| Field Reference Pt | | | 609601.22 | 0.00 | 38°23'48.753"N | 84°21'09.765"W |

| WELLPATH DATUM | | | |
|---|---|---|---|
| Calculation method | Minimum curvature | Nomac 79 (RT) to Facility Vertical Datum | 26.00ft |
| Horizontal Reference Pt | Slot | Nomac 79 (RT) to Mean Sea Level | 1351.00ft |
| Vertical Reference Pt | Nomac 79 (RT) | Nomac 79 (RT) to Mud Line at Slot (Slot B) | 26.00ft |
| MD Reference Pt | Nomac 79 (RT) | Section Origin | N 0.00, E 0.00 ft |
| Field Vertical Reference | Mean Sea Level | Section Azimuth | 325.00° |

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# Actual Wellpath Report

SHL 25B-HS (AWP) Proj: 15805'



51-01684

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

**WELLPATH DATA (172 stations)** † = interpolated/extrapolated station

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00† | 0.000 | 56.680 | 0.00 | 0.00 | 0.00 | 0.00 | 1705014.27 | 548361.75 | 40°00'02.868"N | 80°33'10.642"W | 0.00 | 0.000 | 0.00 |
| 26.00 | 0.000 | 56.680 | 26.00 | 0.00 | 0.00 | 0.00 | 1705014.27 | 548361.75 | 40°00'02.868"N | 80°33'10.642"W | 0.00 | 0.000 | 0.00 |
| 115.00 | 0.550 | 56.680 | 115.00 | -0.01 | 0.23 | 0.36 | 1705014.63 | 548361.98 | 40°00'02.871"N | 80°33'10.637"W | 0.43 | 56.680 | 0.62 |
| 215.00 | 0.600 | 53.670 | 214.99 | -0.01 | 0.81 | 1.18 | 1705015.45 | 548362.56 | 40°00'02.876"N | 80°33'10.627"W | 1.43 | 55.579 | 0.06 |
| 315.00 | 0.410 | 44.220 | 314.99 | 0.06 | 1.38 | 1.85 | 1705016.12 | 548363.13 | 40°00'02.882"N | 80°33'10.618"W | 2.31 | 53.394 | 0.21 |
| 415.00 | 0.470 | 67.870 | 414.99 | 0.04 | 1.79 | 2.48 | 1705016.75 | 548363.54 | 40°00'02.886"N | 80°33'10.610"W | 3.06 | 54.247 | 0.19 |
| 515.00 | 0.470 | 71.700 | 514.98 | -0.17 | 2.07 | 3.25 | 1705017.52 | 548363.82 | 40°00'02.889"N | 80°33'10.600"W | 3.85 | 57.514 | 0.03 |
| 615.00 | 0.470 | 273.700 | 614.98 | -0.03 | 2.22 | 3.23 | 1705017.50 | 548363.97 | 40°00'02.891"N | 80°33'10.601"W | 3.92 | 55.445 | 0.92 |
| 715.00 | 0.600 | 279.770 | 714.98 | 0.59 | 2.34 | 2.30 | 1705016.57 | 548364.09 | 40°00'02.892"N | 80°33'10.613"W | 3.28 | 44.567 | 0.14 |
| 815.00 | 0.850 | 282.120 | 814.97 | 1.51 | 2.58 | 1.06 | 1705015.33 | 548364.33 | 40°00'02.894"N | 80°33'10.629"W | 2.79 | 22.369 | 0.25 |
| 915.00 | 1.060 | 280.760 | 914.96 | 2.71 | 2.91 | -0.57 | 1705013.70 | 548364.66 | 40°00'02.897"N | 80°33'10.650"W | 2.97 | 348.922 | 0.21 |
| 1015.00 | 1.040 | 276.990 | 1014.94 | 3.98 | 3.20 | -2.38 | 1705011.89 | 548364.95 | 40°00'02.899"N | 80°33'10.673"W | 3.98 | 323.328 | 0.07 |
| 1115.00 | 1.110 | 270.640 | 1114.92 | 5.15 | 3.32 | -4.25 | 1705010.02 | 548365.07 | 40°00'02.900"N | 80°33'10.697"W | 5.39 | 307.979 | 0.14 |
| 1215.00 | 1.030 | 270.340 | 1214.90 | 6.24 | 3.33 | -6.12 | 1705008.15 | 548365.08 | 40°00'02.900"N | 80°33'10.721"W | 6.97 | 298.590 | 0.08 |
| 1315.00 | 1.020 | 265.100 | 1314.89 | 7.21 | 3.26 | -7.90 | 1705006.37 | 548365.01 | 40°00'02.899"N | 80°33'10.744"W | 8.55 | 292.436 | 0.09 |
| 1415.00 | 0.970 | 257.400 | 1414.87 | 7.97 | 3.00 | -9.61 | 1705004.66 | 548364.75 | 40°00'02.897"N | 80°33'10.766"W | 10.07 | 287.340 | 0.14 |
| 1515.00 | 0.970 | 235.110 | 1514.86 | 8.30 | 2.33 | -11.14 | 1705003.14 | 548364.08 | 40°00'02.890"N | 80°33'10.785"W | 11.38 | 281.834 | 0.37 |
| 1615.00 | 0.920 | 227.380 | 1614.85 | 8.19 | 1.31 | -12.42 | 1705001.85 | 548363.06 | 40°00'02.880"N | 80°33'10.802"W | 12.49 | 276.000 | 0.14 |
| 1715.00 | 0.860 | 219.920 | 1714.83 | 7.89 | 0.19 | -13.49 | 1705000.78 | 548361.94 | 40°00'02.868"N | 80°33'10.815"W | 13.49 | 270.791 | 0.13 |
| 1815.00 | 0.450 | 212.650 | 1814.83 | 7.55 | -0.72 | -14.19 | 1705000.08 | 548361.03 | 40°00'02.859"N | 80°33'10.824"W | 14.20 | 267.095 | 0.42 |
| 1915.00 | 0.450 | 205.890 | 1914.82 | 7.21 | -1.40 | -14.57 | 1704999.70 | 548360.35 | 40°00'02.853"N | 80°33'10.829"W | 14.64 | 264.496 | 0.05 |
| 2015.00 | 0.470 | 198.740 | 2014.82 | 6.77 | -2.15 | -14.87 | 1704999.40 | 548359.60 | 40°00'02.845"N | 80°33'10.833"W | 15.03 | 261.791 | 0.06 |
| 2115.00 | 0.410 | 195.660 | 2114.82 | 6.30 | -2.88 | -15.10 | 1704999.17 | 548358.87 | 40°00'02.838"N | 80°33'10.835"W | 15.37 | 259.208 | 0.06 |
| 2215.00 | 0.310 | 201.550 | 2214.82 | 5.93 | -3.47 | -15.30 | 1704998.97 | 548358.28 | 40°00'02.832"N | 80°33'10.838"W | 15.69 | 257.203 | 0.11 |
| 2315.00 | 0.350 | 215.760 | 2314.81 | 5.68 | -3.97 | -15.57 | 1704998.70 | 548357.78 | 40°00'02.827"N | 80°33'10.841"W | 16.07 | 255.686 | 0.09 |
| 2415.00 | 0.370 | 228.450 | 2414.81 | 5.54 | -4.44 | -15.99 | 1704998.28 | 548357.31 | 40°00'02.822"N | 80°33'10.847"W | 16.60 | 254.499 | 0.08 |
| 2515.00 | 0.360 | 226.620 | 2514.81 | 5.46 | -4.87 | -16.46 | 1704997.81 | 548356.88 | 40°00'02.818"N | 80°33'10.853"W | 17.17 | 253.536 | 0.02 |
| 2615.00 | 0.400 | 229.490 | 2614.81 | 5.38 | -5.31 | -16.96 | 1704997.31 | 548356.44 | 40°00'02.814"N | 80°33'10.859"W | 17.77 | 252.619 | 0.04 |
| 2715.00 | 0.480 | 236.890 | 2714.80 | 5.36 | -5.76 | -17.57 | 1704996.70 | 548355.99 | 40°00'02.809"N | 80°33'10.867"W | 18.50 | 251.842 | 0.10 |
| 2815.00 | 0.380 | 243.310 | 2814.80 | 5.42 | -6.14 | -18.22 | 1704996.05 | 548355.61 | 40°00'02.805"N | 80°33'10.875"W | 19.23 | 251.373 | 0.11 |
| 2915.00 | 0.340 | 242.650 | 2914.80 | 5.51 | -6.43 | -18.78 | 1704995.49 | 548355.32 | 40°00'02.802"N | 80°33'10.882"W | 19.85 | 251.109 | 0.04 |
| 3015.00 | 0.410 | 247.690 | 3014.80 | 5.63 | -6.70 | -19.38 | 1704994.89 | 548355.05 | 40°00'02.800"N | 80°33'10.890"W | 20.50 | 250.928 | 0.08 |
| 3115.00 | 0.390 | 252.190 | 3114.80 | 5.81 | -6.94 | -20.03 | 1704994.24 | 548354.81 | 40°00'02.797"N | 80°33'10.898"W | 21.20 | 250.893 | 0.04 |
| 3215.00 | 0.490 | 249.140 | 3214.79 | 6.01 | -7.20 | -20.76 | 1704993.52 | 548354.55 | 40°00'02.795"N | 80°33'10.907"W | 21.97 | 250.879 | 0.10 |
| 3282.00 | 0.590 | 248.820 | 3281.79 | 6.16 | -7.42 | -21.34 | 1704992.93 | 548354.33 | 40°00'02.792"N | 80°33'10.915"W | 22.60 | 250.826 | 0.15 |
| 3376.00 | 0.350 | 249.850 | 3375.79 | 6.35 | -7.70 | -22.07 | 1704992.21 | 548354.05 | 40°00'02.790"N | 80°33'10.924"W | 23.37 | 250.772 | 0.26 |
| 3471.00 | 3.720 | 54.300 | 3470.72 | 6.46 | -6.00 | -19.83 | 1704994.44 | 548355.75 | 40°00'02.807"N | 80°33'10.896"W | 20.72 | 253.177 | 4.27 |
| 3565.00 | 7.560 | 57.230 | 3564.25 | 6.26 | -0.87 | -12.16 | 1705002.12 | 548360.88 | 40°00'02.858"N | 80°33'10.798"W | 12.19 | 265.913 | 4.10 |
| 3660.00 | 8.570 | 54.500 | 3658.31 | 6.08 | 6.62 | -1.14 | 1705013.13 | 548368.37 | 40°00'02.933"N | 80°33'10.657"W | 6.72 | 350.255 | 1.14 |
| 3755.00 | 15.350 | 52.660 | 3751.20 | 6.66 | 18.38 | 14.64 | 1705028.91 | 548380.12 | 40°00'03.051"N | 80°33'10.457"W | 23.49 | 38.545 | 7.15 |
| 3849.00 | 12.990 | 51.790 | 3842.33 | 7.75 | 32.46 | 32.84 | 1705047.10 | 548394.21 | 40°00'03.193"N | 80°33'10.225"W | 46.17 | 45.331 | 2.52 |
| 3944.00 | 16.670 | 60.450 | 3934.16 | 7.06 | 45.79 | 53.09 | 1705067.36 | 548407.54 | 40°00'03.327"N | 80°33'09.967"W | 70.11 | 49.222 | 4.51 |
| 4039.00 | 20.330 | 54.780 | 4024.24 | 5.83 | 62.03 | 78.43 | 1705092.70 | 548423.78 | 40°00'03.490"N | 80°33'09.643"W | 100.00 | 51.660 | 4.29 |
| 4133.00 | 22.380 | 50.860 | 4111.79 | 7.18 | 82.75 | 105.66 | 1705119.92 | 548444.50 | 40°00'03.698"N | 80°33'09.297"W | 134.21 | 51.932 | 2.66 |
| 4228.00 | 24.380 | 51.600 | 4198.98 | 9.65 | 106.35 | 135.05 | 1705149.32 | 548468.09 | 40°00'03.935"N | 80°33'08.923"W | 171.90 | 51.782 | 2.13 |

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noble energy

# Actual Wellpath Report

SHL 25B-HS (AWP) Proj: 15805'



BAKER HUGHES

51-01684

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (172 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4275.00 | 25.220 | 55.070 | 4241.65 | 10.21 | 118.11 | 150.87 | 1705165.13 | 548479.85 | 40°00'04.053"N | 80°33'08.721"W | 191.60 | 51.944 | 3.57 |
| 4323.00 | 21.990 | 54.420 | 4285.63 | 10.29 | 129.19 | 166.56 | 1705180.83 | 548490.94 | 40°00'04.164"N | 80°33'08.521"W | 210.80 | 52.201 | 6.75 |
| 4418.00 | 25.640 | 56.710 | 4372.53 | 9.86 | 150.83 | 198.22 | 1705212.48 | 548512.58 | 40°00'04.382"N | 80°33'08.118"W | 249.08 | 52.732 | 3.96 |
| 4513.00 | 30.860 | 57.520 | 4456.18 | 8.17 | 175.21 | 235.98 | 1705250.24 | 548536.96 | 40°00'04.627"N | 80°33'07.636"W | 293.92 | 53.407 | 5.51 |
| 4607.00 | 22.950 | 54.210 | 4539.95 | 7.36 | 198.92 | 271.24 | 1705285.50 | 548560.66 | 40°00'04.865"N | 80°33'07.187"W | 336.37 | 53.745 | 8.56 |
| 4702.00 | 21.760 | 51.840 | 4627.81 | 8.59 | 220.63 | 300.12 | 1705314.37 | 548582.37 | 40°00'05.083"N | 80°33'06.819"W | 372.49 | 53.679 | 1.57 |
| 4796.00 | 26.810 | 54.460 | 4713.47 | 9.75 | 243.73 | 331.09 | 1705345.34 | 548605.47 | 40°00'05.315"N | 80°33'06.425"W | 411.13 | 53.641 | 5.49 |
| 4891.00 | 29.090 | 55.800 | 4797.38 | 9.63 | 269.17 | 367.63 | 1705381.88 | 548630.91 | 40°00'05.571"N | 80°33'05.959"W | 455.63 | 53.789 | 2.49 |
| 4986.00 | 26.310 | 51.060 | 4881.49 | 10.76 | 295.39 | 403.11 | 1705417.37 | 548657.13 | 40°00'05.834"N | 80°33'05.507"W | 499.76 | 53.767 | 3.73 |
| 5080.00 | 26.300 | 52.470 | 4965.76 | 13.11 | 321.17 | 435.83 | 1705450.08 | 548682.91 | 40°00'06.092"N | 80°33'05.090"W | 541.39 | 53.613 | 0.66 |
| 5175.00 | 25.080 | 53.240 | 5051.37 | 14.65 | 346.04 | 468.65 | 1705482.90 | 548707.78 | 40°00'06.342"N | 80°33'04.672"W | 582.56 | 53.559 | 1.33 |
| 5178.00 | 25.070 | 53.440 | 5054.09 | 14.69 | 346.80 | 469.67 | 1705483.92 | 548708.54 | 40°00'06.350"N | 80°33'04.659"W | 583.83 | 53.558 | 2.84 |
| 5235.00 | 23.450 | 52.490 | 5106.05 | 15.52 | 360.90 | 488.37 | 1705502.62 | 548722.64 | 40°00'06.491"N | 80°33'04.421"W | 607.25 | 53.536 | 2.92 |
| 5330.00 | 26.350 | 53.230 | 5192.21 | 17.00 | 385.04 | 520.26 | 1705534.51 | 548746.77 | 40°00'06.733"N | 80°33'04.015"W | 647.24 | 53.495 | 3.07 |
| 5425.00 | 26.290 | 53.950 | 5277.36 | 18.03 | 410.04 | 554.16 | 1705568.41 | 548771.77 | 40°00'06.984"N | 80°33'03.583"W | 689.36 | 53.501 | 0.34 |
| 5519.00 | 26.200 | 56.420 | 5361.68 | 17.90 | 433.77 | 588.28 | 1705602.52 | 548795.50 | 40°00'07.223"N | 80°33'03.149"W | 730.91 | 53.597 | 1.17 |
| 5614.00 | 26.160 | 58.880 | 5446.93 | 15.96 | 456.19 | 623.68 | 1705637.92 | 548817.92 | 40°00'07.448"N | 80°33'02.697"W | 772.71 | 53.816 | 1.14 |
| 5709.00 | 26.020 | 60.190 | 5532.25 | 12.66 | 477.37 | 659.69 | 1705673.93 | 548839.10 | 40°00'07.662"N | 80°33'02.238"W | 814.29 | 54.109 | 0.62 |
| 5804.00 | 24.440 | 56.430 | 5618.19 | 10.28 | 498.60 | 694.15 | 1705708.39 | 548860.33 | 40°00'07.876"N | 80°33'01.798"W | 854.66 | 54.311 | 2.37 |
| 5899.00 | 25.990 | 51.080 | 5704.15 | 11.22 | 522.55 | 726.72 | 1705740.96 | 548884.28 | 40°00'08.116"N | 80°33'01.383"W | 895.09 | 54.282 | 2.90 |
| 5994.00 | 29.350 | 48.470 | 5788.28 | 15.29 | 551.07 | 760.36 | 1705774.60 | 548912.80 | 40°00'08.402"N | 80°33'00.955"W | 939.05 | 54.067 | 3.76 |
| 6088.00 | 28.330 | 55.400 | 5870.64 | 17.75 | 579.02 | 795.97 | 1705810.21 | 548940.75 | 40°00'08.682"N | 80°33'00.502"W | 984.29 | 53.966 | 3.72 |
| 6183.00 | 25.890 | 59.660 | 5955.20 | 15.91 | 602.30 | 832.44 | 1705846.67 | 548964.03 | 40°00'08.916"N | 80°33'00.037"W | 1027.48 | 54.113 | 3.28 |
| 6278.00 | 24.910 | 58.860 | 6041.02 | 12.88 | 623.13 | 867.46 | 1705881.70 | 548984.85 | 40°00'09.126"N | 80°32'59.590"W | 1068.07 | 54.309 | 1.09 |
| 6322.00 | 24.970 | 60.590 | 6080.92 | 11.35 | 632.48 | 883.48 | 1705897.72 | 548994.20 | 40°00'09.220"N | 80°32'59.385"W | 1086.54 | 54.401 | 1.66 |
| 6373.00 | 26.320 | 61.800 | 6126.89 | 8.96 | 643.11 | 902.82 | 1705917.06 | 549004.83 | 40°00'09.328"N | 80°32'59.138"W | 1108.46 | 54.537 | 2.84 |
| 6468.00 | 32.670 | 54.560 | 6209.56 | 6.66 | 667.96 | 942.33 | 1705956.56 | 549029.68 | 40°00'09.578"N | 80°32'58.635"W | 1155.06 | 54.669 | 7.65 |
| 6562.00 | 39.330 | 45.730 | 6285.62 | 11.67 | 703.53 | 984.40 | 1705998.63 | 549065.25 | 40°00'09.934"N | 80°32'58.099"W | 1209.96 | 54.448 | 8.97 |
| 6657.00 | 46.950 | 38.030 | 6354.94 | 26.68 | 751.99 | 1027.44 | 1706041.67 | 549113.71 | 40°00'10.418"N | 80°32'57.554"W | 1273.23 | 53.799 | 9.74 |
| 6751.00 | 51.950 | 38.530 | 6416.03 | 47.21 | 808.03 | 1071.68 | 1706085.91 | 549169.75 | 40°00'10.977"N | 80°32'56.994"W | 1342.17 | 52.984 | 5.33 |
| 6846.00 | 57.710 | 28.510 | 6470.82 | 75.80 | 872.74 | 1114.26 | 1706128.48 | 549234.46 | 40°00'11.621"N | 80°32'56.456"W | 1415.36 | 51.930 | 10.53 |
| 6941.00 | 57.910 | 20.320 | 6521.49 | 116.66 | 945.86 | 1147.44 | 1706161.66 | 549307.57 | 40°00'12.348"N | 80°32'56.041"W | 1487.03 | 50.501 | 7.30 |
| 7036.00 | 57.870 | 11.710 | 6572.06 | 167.20 | 1023.09 | 1169.61 | 1706183.83 | 549384.80 | 40°00'13.113"N | 80°32'55.768"W | 1553.93 | 48.823 | 7.67 |
| 7131.00 | 60.280 | 2.670 | 6620.95 | 227.54 | 1103.82 | 1179.71 | 1706193.93 | 549465.52 | 40°00'13.912"N | 80°32'55.650"W | 1615.59 | 46.904 | 8.54 |
| 7225.00 | 64.890 | 353.680 | 6664.29 | 297.34 | 1187.07 | 1176.92 | 1706191.14 | 549548.77 | 40°00'14.735"N | 80°32'55.698"W | 1671.61 | 44.754 | 9.80 |
| 7320.00 | 70.400 | 345.100 | 6700.47 | 377.28 | 1273.27 | 1160.64 | 1706174.86 | 549634.96 | 40°00'15.585"N | 80°32'55.920"W | 1722.87 | 42.351 | 10.16 |
| 7415.00 | 74.590 | 337.990 | 6729.07 | 464.06 | 1359.10 | 1131.93 | 1706146.15 | 549720.80 | 40°00'16.429"N | 80°32'56.302"W | 1768.73 | 39.789 | 8.39 |
| 7509.00 | 80.450 | 331.540 | 6749.39 | 554.43 | 1442.01 | 1092.79 | 1706107.01 | 549803.71 | 40°00'17.244"N | 80°32'56.818"W | 1809.30 | 37.156 | 9.15 |
| 7604.00 | 90.430 | 325.350 | 6756.94 | 648.80 | 1522.55 | 1043.28 | 1706057.51 | 549884.24 | 40°00'18.034"N | 80°32'57.466"W | 1845.70 | 34.420 | 12.35 |
| 7699.00 | 90.430 | 319.840 | 6756.23 | 743.67 | 1597.98 | 985.60 | 1705999.83 | 549959.67 | 40°00'18.773"N | 80°32'58.218"W | 1877.49 | 31.665 | 5.80 |
| 7793.00 | 90.400 | 321.790 | 6755.55 | 837.42 | 1670.84 | 926.21 | 1705940.45 | 550032.52 | 40°00'19.486"N | 80°32'58.992"W | 1910.38 | 29.001 | 2.07 |
| 7888.00 | 90.340 | 330.160 | 6754.93 | 932.32 | 1749.50 | 873.10 | 1705887.34 | 550111.18 | 40°00'20.257"N | 80°32'59.686"W | 1955.27 | 26.522 | 8.81 |
| 7983.00 | 90.550 | 330.240 | 6754.20 | 1026.92 | 1831.94 | 825.89 | 1705840.13 | 550193.61 | 40°00'21.067"N | 80°33'00.305"W | 2009.50 | 24.267 | 0.24 |
| 8078.00 | 91.540 | 325.600 | 6752.46 | 1121.76 | 1912.39 | 775.46 | 1705789.70 | 550274.07 | 40°00'21.856"N | 80°33'00.966"W | 2063.64 | 22.072 | 4.99 |
| 8172.00 | 91.290 | 322.710 | 6750.14 | 1215.71 | 1988.56 | 720.44 | 1705734.68 | 550350.23 | 40°00'22.602"N | 80°33'01.684"W | 2115.04 | 19.915 | 3.09 |

Received
Office of Oil & Gas
DEC 15 2014

noble energy

# Actual Wellpath Report

SHL 25B-HS (AWP) Proj: 15805'



BAKER HUGHES

51-01684

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (172 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8267.00 | 89.570 | 322.630 | 6749.43 | 1310.62 | 2064.09 | 662.83 | 1705677.08 | 550425.76 | 40°00'23.342"N | 80°33'02.436"W | 2167.91 | 17.803 | 1.81 |
| 8362.00 | 89.450 | 321.100 | 6750.24 | 1405.47 | 2138.81 | 604.17 | 1705618.42 | 550500.48 | 40°00'24.073"N | 80°33'03.201"W | 2222.51 | 15.774 | 1.62 |
| 8457.00 | 89.720 | 321.880 | 6750.93 | 1500.29 | 2213.15 | 545.02 | 1705559.27 | 550574.81 | 40°00'24.801"N | 80°33'03.972"W | 2279.27 | 13.835 | 0.87 |
| 8552.00 | 90.400 | 323.870 | 6750.83 | 1595.22 | 2288.89 | 487.69 | 1705501.94 | 550650.55 | 40°00'25.543"N | 80°33'04.720"W | 2340.27 | 12.028 | 2.21 |
| 8647.00 | 90.830 | 325.800 | 6749.81 | 1690.21 | 2366.54 | 432.98 | 1705447.23 | 550728.20 | 40°00'26.304"N | 80°33'05.435"W | 2405.83 | 10.368 | 2.08 |
| 8742.00 | 89.600 | 328.920 | 6749.45 | 1785.12 | 2446.53 | 381.75 | 1705396.00 | 550808.18 | 40°00'27.088"N | 80°33'06.105"W | 2476.13 | 8.869 | 3.53 |
| 8836.00 | 89.480 | 329.990 | 6750.21 | 1878.83 | 2527.48 | 333.98 | 1705348.24 | 550889.13 | 40°00'27.883"N | 80°33'06.731"W | 2549.45 | 7.527 | 1.15 |
| 8931.00 | 88.890 | 326.510 | 6751.56 | 1973.65 | 2608.24 | 284.00 | 1705298.26 | 550969.89 | 40°00'28.675"N | 80°33'07.385"W | 2623.66 | 6.214 | 3.72 |
| 9026.00 | 89.970 | 322.560 | 6752.50 | 2068.62 | 2685.60 | 228.90 | 1705243.16 | 551047.24 | 40°00'29.433"N | 80°33'08.105"W | 2695.33 | 4.872 | 4.31 |
| 9121.00 | 89.570 | 320.760 | 6752.89 | 2163.46 | 2760.11 | 169.97 | 1705184.23 | 551121.75 | 40°00'30.163"N | 80°33'08.873"W | 2765.33 | 3.524 | 1.94 |
| 9216.00 | 90.310 | 320.870 | 6752.99 | 2258.20 | 2833.74 | 109.95 | 1705124.21 | 551195.38 | 40°00'30.883"N | 80°33'09.656"W | 2835.87 | 2.222 | 0.79 |
| 9311.00 | 90.180 | 319.340 | 6752.58 | 2352.85 | 2906.62 | 49.02 | 1705063.29 | 551268.26 | 40°00'31.597"N | 80°33'10.450"W | 2907.04 | 0.966 | 1.62 |
| 9405.00 | 90.150 | 318.420 | 6752.31 | 2446.31 | 2977.44 | -12.80 | 1705001.47 | 551339.07 | 40°00'32.289"N | 80°33'11.255"W | 2977.46 | 359.754 | 0.98 |
| 9500.00 | 90.090 | 319.030 | 6752.11 | 2540.74 | 3048.83 | -75.47 | 1704938.80 | 551410.46 | 40°00'32.987"N | 80°33'12.071"W | 3049.77 | 358.582 | 0.65 |
| 9596.00 | 89.630 | 322.930 | 6752.34 | 2636.49 | 3123.40 | -135.90 | 1704878.38 | 551485.03 | 40°00'33.717"N | 80°33'12.859"W | 3126.36 | 357.509 | 4.09 |
| 9691.00 | 90.250 | 331.760 | 6752.44 | 2731.32 | 3203.31 | -187.11 | 1704827.17 | 551564.93 | 40°00'34.501"N | 80°33'13.529"W | 3208.77 | 356.657 | 9.32 |
| 9785.00 | 90.550 | 340.420 | 6751.79 | 2823.47 | 3289.16 | -225.17 | 1704789.11 | 551650.78 | 40°00'35.345"N | 80°33'14.031"W | 3296.85 | 356.084 | 9.22 |
| 9880.00 | 91.050 | 337.100 | 6750.46 | 2915.72 | 3377.68 | -259.57 | 1704754.71 | 551739.30 | 40°00'36.216"N | 80°33'14.486"W | 3387.64 | 355.605 | 3.53 |
| 9975.00 | 90.490 | 330.550 | 6749.18 | 3009.54 | 3462.89 | -301.45 | 1704712.83 | 551824.50 | 40°00'37.053"N | 80°33'15.037"W | 3475.98 | 355.025 | 6.92 |
| 10070.00 | 91.170 | 329.250 | 6747.81 | 3104.18 | 3545.06 | -349.09 | 1704665.19 | 551906.67 | 40°00'37.859"N | 80°33'15.662"W | 3562.21 | 354.376 | 1.54 |
| 10164.00 | 90.280 | 327.390 | 6746.62 | 3198.01 | 3625.05 | -398.45 | 1704615.83 | 551986.65 | 40°00'38.644"N | 80°33'16.308"W | 3646.88 | 353.727 | 2.19 |
| 10259.00 | 90.400 | 328.240 | 6746.05 | 3292.89 | 3705.45 | -449.05 | 1704565.24 | 552067.05 | 40°00'39.433"N | 80°33'16.971"W | 3732.56 | 353.090 | 0.90 |
| 10354.00 | 91.660 | 323.190 | 6744.34 | 3387.83 | 3783.90 | -502.54 | 1704511.75 | 552145.50 | 40°00'40.202"N | 80°33'17.670"W | 3817.13 | 352.435 | 5.48 |
| 10448.00 | 91.260 | 320.730 | 6741.95 | 3481.66 | 3857.90 | -560.44 | 1704453.85 | 552219.50 | 40°00'40.926"N | 80°33'18.425"W | 3898.40 | 351.734 | 2.65 |
| 10543.00 | 89.720 | 317.900 | 6741.14 | 3576.18 | 3929.93 | -622.36 | 1704391.94 | 552291.52 | 40°00'41.631"N | 80°33'19.231"W | 3978.90 | 351.001 | 3.39 |
| 10638.00 | 89.690 | 317.360 | 6741.62 | 3670.39 | 4000.11 | -686.38 | 1704327.92 | 552361.71 | 40°00'42.317"N | 80°33'20.065"W | 4058.58 | 350.263 | 0.57 |
| 10732.00 | 90.340 | 320.170 | 6741.60 | 3763.83 | 4070.80 | -748.33 | 1704265.97 | 552432.38 | 40°00'43.008"N | 80°33'20.872"W | 4139.01 | 349.584 | 3.07 |
| 10827.00 | 90.490 | 322.710 | 6740.91 | 3858.63 | 4145.07 | -807.54 | 1704206.76 | 552506.66 | 40°00'43.735"N | 80°33'21.644"W | 4223.00 | 348.976 | 2.68 |
| 10922.00 | 90.460 | 326.510 | 6740.12 | 3953.61 | 4222.50 | -862.55 | 1704151.75 | 552584.09 | 40°00'44.494"N | 80°33'22.362"W | 4309.70 | 348.455 | 4.00 |
| 11016.00 | 90.520 | 329.710 | 6739.32 | 4047.46 | 4302.30 | -912.20 | 1704102.10 | 552663.88 | 40°00'45.277"N | 80°33'23.012"W | 4397.95 | 348.029 | 3.40 |
| 11112.00 | 90.490 | 329.500 | 6738.47 | 4143.14 | 4385.11 | -960.77 | 1704053.54 | 552746.68 | 40°00'46.089"N | 80°33'23.649"W | 4489.12 | 347.642 | 0.22 |
| 11206.00 | 90.580 | 329.010 | 6737.60 | 4236.88 | 4465.89 | -1008.82 | 1704005.49 | 552827.46 | 40°00'46.882"N | 80°33'24.279"W | 4578.42 | 347.271 | 0.53 |
| 11302.00 | 90.490 | 327.090 | 6736.70 | 4332.74 | 4547.34 | -1059.62 | 1703954.69 | 552908.91 | 40°00'47.681"N | 80°33'24.944"W | 4669.16 | 346.883 | 2.00 |
| 11397.00 | 90.620 | 323.350 | 6735.78 | 4427.71 | 4625.35 | -1113.80 | 1703900.52 | 552986.92 | 40°00'48.446"N | 80°33'25.652"W | 4757.56 | 346.461 | 3.94 |
| 11492.00 | 90.580 | 318.660 | 6734.78 | 4522.45 | 4699.16 | -1173.56 | 1703840.76 | 553060.72 | 40°00'49.168"N | 80°33'26.431"W | 4843.48 | 345.978 | 4.94 |
| 11586.00 | 90.310 | 314.400 | 6734.05 | 4615.40 | 4767.36 | -1238.21 | 1703776.11 | 553128.92 | 40°00'49.835"N | 80°33'27.272"W | 4925.53 | 345.440 | 4.54 |
| 11681.00 | 89.720 | 314.600 | 6734.03 | 4708.81 | 4833.95 | -1305.97 | 1703708.35 | 553195.50 | 40°00'50.485"N | 80°33'28.153"W | 5007.25 | 344.882 | 0.66 |
| 11776.00 | 89.820 | 321.740 | 6734.41 | 4803.07 | 4904.69 | -1369.29 | 1703645.04 | 553266.24 | 40°00'51.176"N | 80°33'28.977"W | 5092.24 | 344.401 | 7.52 |
| 11871.00 | 90.340 | 327.140 | 6734.28 | 4898.03 | 4981.94 | -1424.51 | 1703589.81 | 553343.49 | 40°00'51.933"N | 80°33'29.699"W | 5181.60 | 344.043 | 5.71 |
| 11965.00 | 90.460 | 330.290 | 6733.62 | 4991.82 | 5062.26 | -1473.32 | 1703541.01 | 553423.81 | 40°00'52.721"N | 80°33'30.338"W | 5272.30 | 343.773 | 3.35 |
| 12060.00 | 90.400 | 330.750 | 6732.91 | 5086.38 | 5144.96 | -1520.07 | 1703494.26 | 553506.50 | 40°00'53.533"N | 80°33'30.952"W | 5364.81 | 343.540 | 0.49 |
| 12154.00 | 90.400 | 326.830 | 6732.25 | 5180.15 | 5225.34 | -1568.77 | 1703445.57 | 553586.88 | 40°00'54.322"N | 80°33'31.590"W | 5455.75 | 343.289 | 4.17 |
| 12249.00 | 90.430 | 324.790 | 6731.56 | 5275.14 | 5303.91 | -1622.15 | 1703392.19 | 553665.45 | 40°00'55.092"N | 80°33'32.287"W | 5546.43 | 342.994 | 2.15 |
| 12343.00 | 90.340 | 325.200 | 6730.93 | 5369.13 | 5380.91 | -1676.07 | 1703338.27 | 553742.44 | 40°00'55.846"N | 80°33'32.992"W | 5635.90 | 342.699 | 0.45 |
| 12438.00 | 90.340 | 326.130 | 6730.37 | 5464.12 | 5459.35 | -1729.65 | 1703284.69 | 553820.88 | 40°00'56.615"N | 80°33'33.693"W | 5726.80 | 342.421 | 0.98 |

51-01684

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

WELLPATH DATA (172 stations)

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12533.00 | 90.620 | 326.580 | 6729.57 | 5559.09 | 5538.43 | -1782.28 | 1703232.06 | 553899.96 | 40°00'57.391"N | 80°33'34.381"W | 5818.14 | 342.162 | 0.56 |
| 12627.00 | 90.620 | 328.220 | 6728.55 | 5653.00 | 5617.62 | -1832.92 | 1703181.42 | 553979.14 | 40°00'58.167"N | 80°33'35.044"W | 5909.08 | 341.929 | 1.74 |
| 12721.00 | 90.520 | 328.030 | 6727.62 | 5746.86 | 5697.44 | -1882.56 | 1703131.79 | 554058.96 | 40°00'58.950"N | 80°33'35.694"W | 6000.40 | 341.715 | 0.23 |
| 12816.00 | 90.800 | 327.720 | 6726.53 | 5841.73 | 5777.89 | -1933.07 | 1703081.28 | 554139.41 | 40°00'59.739"N | 80°33'36.355"W | 6092.68 | 341.502 | 0.44 |
| 12911.00 | 90.890 | 322.360 | 6725.12 | 5936.69 | 5855.71 | -1987.48 | 1703026.87 | 554217.22 | 40°01'00.502"N | 80°33'37.066"W | 6183.80 | 341.252 | 5.64 |
| 13006.00 | 91.110 | 321.790 | 6723.47 | 6031.55 | 5930.63 | -2045.86 | 1702968.49 | 554292.15 | 40°01'01.236"N | 80°33'37.828"W | 6273.59 | 340.967 | 0.64 |
| 13101.00 | 91.050 | 321.050 | 6721.67 | 6126.35 | 6004.89 | -2105.09 | 1702909.26 | 554366.40 | 40°01'01.962"N | 80°33'38.600"W | 6363.18 | 340.681 | 0.78 |
| 13196.00 | 91.080 | 322.770 | 6719.91 | 6221.19 | 6079.64 | -2163.69 | 1702850.67 | 554441.15 | 40°01'02.694"N | 80°33'39.365"W | 6453.18 | 340.410 | 1.81 |
| 13290.00 | 90.280 | 323.700 | 6718.79 | 6315.14 | 6154.93 | -2219.94 | 1702794.41 | 554516.44 | 40°01'03.432"N | 80°33'40.099"W | 6543.04 | 340.167 | 1.30 |
| 13385.00 | 89.970 | 323.100 | 6718.59 | 6410.10 | 6231.20 | -2276.59 | 1702737.78 | 554592.70 | 40°01'04.179"N | 80°33'40.839"W | 6634.06 | 339.930 | 0.71 |
| 13479.00 | 89.850 | 324.970 | 6718.73 | 6504.08 | 6307.28 | -2331.79 | 1702682.58 | 554668.78 | 40°01'04.924"N | 80°33'41.560"W | 6724.51 | 339.711 | 1.99 |
| 13574.00 | 89.940 | 325.900 | 6718.91 | 6599.08 | 6385.51 | -2385.68 | 1702628.68 | 554747.00 | 40°01'05.691"N | 80°33'42.264"W | 6816.61 | 339.514 | 0.98 |
| 13669.00 | 89.970 | 326.610 | 6718.98 | 6694.05 | 6464.50 | -2438.46 | 1702575.91 | 554826.00 | 40°01'06.465"N | 80°33'42.954"W | 6909.12 | 339.333 | 0.75 |
| 13763.00 | 90.060 | 329.990 | 6718.96 | 6787.88 | 6544.47 | -2487.84 | 1702526.53 | 554905.96 | 40°01'07.250"N | 80°33'43.601"W | 7001.39 | 339.186 | 3.60 |
| 13859.00 | 90.030 | 324.630 | 6718.88 | 6883.77 | 6625.23 | -2539.67 | 1702474.70 | 554986.72 | 40°01'08.042"N | 80°33'44.280"W | 7095.33 | 339.026 | 5.58 |
| 13952.00 | 90.120 | 323.350 | 6718.76 | 6976.75 | 6700.46 | -2594.35 | 1702420.02 | 555061.94 | 40°01'08.779"N | 80°33'44.994"W | 7185.18 | 338.834 | 1.38 |
| 14047.00 | 89.970 | 323.780 | 6718.69 | 7071.72 | 6776.89 | -2650.77 | 1702363.60 | 555138.37 | 40°01'09.527"N | 80°33'45.730"W | 7276.87 | 338.637 | 0.48 |
| 14142.00 | 89.940 | 323.580 | 6718.76 | 7166.70 | 6853.43 | -2707.04 | 1702307.34 | 555214.91 | 40°01'10.277"N | 80°33'46.465"W | 7368.69 | 338.446 | 0.21 |
| 14237.00 | 89.820 | 323.870 | 6718.96 | 7261.67 | 6930.02 | -2763.25 | 1702251.13 | 555291.49 | 40°01'11.028"N | 80°33'47.199"W | 7460.61 | 338.261 | 0.33 |
| 14331.00 | 90.650 | 328.990 | 6718.57 | 7355.61 | 7008.32 | -2815.21 | 1702199.18 | 555369.79 | 40°01'11.795"N | 80°33'47.879"W | 7552.61 | 338.115 | 5.52 |
| 14426.00 | 90.400 | 334.370 | 6717.70 | 7449.93 | 7091.91 | -2860.26 | 1702154.13 | 555453.38 | 40°01'12.616"N | 80°33'48.471"W | 7646.98 | 338.035 | 5.67 |
| 14521.00 | 90.890 | 331.330 | 6716.63 | 7544.02 | 7176.43 | -2903.60 | 1702110.79 | 555537.89 | 40°01'13.446"N | 80°33'49.041"W | 7741.58 | 337.972 | 3.24 |
| 14616.00 | 90.890 | 324.960 | 6715.16 | 7638.82 | 7257.07 | -2953.70 | 1702060.68 | 555618.53 | 40°01'14.237"N | 80°33'49.697"W | 7835.14 | 337.853 | 6.70 |
| 14710.00 | 91.350 | 325.810 | 6713.32 | 7732.80 | 7334.41 | -3007.09 | 1702007.30 | 555695.87 | 40°01'14.995"N | 80°33'50.395"W | 7926.93 | 337.706 | 1.03 |
| 14805.00 | 91.320 | 325.360 | 6711.10 | 7827.77 | 7412.76 | -3060.77 | 1701953.62 | 555774.22 | 40°01'15.763"N | 80°33'51.097"W | 8019.81 | 337.564 | 0.47 |
| 14900.00 | 91.140 | 321.910 | 6709.07 | 7922.70 | 7489.23 | -3117.08 | 1701897.32 | 555850.68 | 40°01'16.512"N | 80°33'51.832"W | 8112.01 | 337.403 | 3.64 |
| 14995.00 | 91.230 | 319.980 | 6707.10 | 8017.44 | 7562.99 | -3176.92 | 1701837.48 | 555924.43 | 40°01'17.234"N | 80°33'52.612"W | 8203.14 | 337.215 | 2.03 |
| 15090.00 | 91.050 | 319.470 | 6705.21 | 8112.02 | 7635.45 | -3238.32 | 1701776.08 | 555996.90 | 40°01'17.943"N | 80°33'53.412"W | 8293.78 | 337.017 | 0.57 |
| 15184.00 | 90.920 | 318.470 | 6703.59 | 8205.48 | 7706.35 | -3300.01 | 1701714.39 | 556067.79 | 40°01'18.636"N | 80°33'54.216"W | 8383.19 | 336.818 | 1.07 |
| 15279.00 | 90.800 | 319.890 | 6702.17 | 8299.98 | 7778.23 | -3362.11 | 1701652.30 | 556139.67 | 40°01'19.339"N | 80°33'55.025"W | 8473.76 | 336.624 | 1.50 |
| 15374.00 | 90.620 | 321.720 | 6700.99 | 8394.71 | 7851.85 | -3422.13 | 1701592.27 | 556213.29 | 40°01'20.060"N | 80°33'55.808"W | 8565.19 | 336.451 | 1.94 |
| 15469.00 | 90.340 | 324.940 | 6700.19 | 8489.66 | 7928.04 | -3478.86 | 1701535.55 | 556289.47 | 40°01'20.806"N | 80°33'56.549"W | 8657.73 | 336.308 | 3.40 |
| 15563.00 | 90.340 | 326.750 | 6699.64 | 8583.64 | 8005.82 | -3531.63 | 1701482.78 | 556367.25 | 40°01'21.568"N | 80°33'57.239"W | 8750.17 | 336.196 | 1.93 |
| 15658.00 | 90.340 | 328.930 | 6699.07 | 8678.52 | 8086.23 | -3582.19 | 1701432.22 | 556447.66 | 40°01'22.357"N | 80°33'57.901"W | 8844.17 | 336.107 | 2.29 |
| 15753.00 | 90.430 | 329.940 | 6698.43 | 8773.23 | 8168.03 | -3630.50 | 1701383.91 | 556529.46 | 40°01'23.160"N | 80°33'58.534"W | 8938.53 | 336.036 | 1.07 |
| 15780.00 | 90.370 | 330.020 | 6698.25 | 8800.13 | 8191.41 | -3644.01 | 1701370.41 | 556552.83 | 40°01'23.389"N | 80°33'58.711"W | 8965.38 | 336.018 | 0.37 |
| 15805.00 | 90.370 | 330.020 | 6698.08 | 8825.03 | 8213.06 | -3656.50 | 1701357.91 | 556574.49 | 40°01'23.602"N | 80°33'58.875"W | 8990.24 | 336.001 | 0.00 |

Received
Office of Oil & Gas
DEC 15 2014

51.01684

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

**TARGETS**

| Name | MD [ft] | TVD [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|---|
| SHL 25B-HS BHL:Plat | | 6665.00 | 8217.96 | -3650.82 | 1701363.60 | 556579.38 | 40°01'23.651"N | 80°33'58.803"W | point |
| SHL 25B-HS BHL:Rev-1 | | 6693.91 | 8217.96 | -3650.82 | 1701363.60 | 556579.38 | 40°01'23.651"N | 80°33'58.803"W | point |
| SHL 25B-HS BHL:Rev-2 | | 6704.13 | 7152.24 | -2904.59 | 1702109.80 | 555513.70 | 40°01'13.207"N | 80°33'49.050"W | point |
| SHL 25B-HS LP:Rev-1 | | 6758.00 | 1533.68 | 1029.57 | 1706043.80 | 549895.37 | 40°00'18.143"N | 80°32'57.644"W | point |
| SHL 25B-HS LP:Plat | | 6763.00 | 1533.68 | 1029.57 | 1706043.80 | 549895.37 | 40°00'18.143"N | 80°32'57.644"W | point |

**WELLPATH COMPOSITION** - Ref Wellbore: SHL 25B-HS (AWB) Ref Wellpath: SHL 25B-HS (AWP) Proj: 15805'

| Start MD [ft] | End MD [ft] | Positional Uncertainty Model | Log Name/Comment | Wellbore |
|---|---|---|---|---|
| 26.00 | 3282.00 | Generic gyro - northseeking (Standard) | VES Gyro Surveys 12 1/4" (115'-3282') | SHL 25B-HS (AWB) |
| 3282.00 | 5175.00 | NaviTrak (MagCorr) | 02_BHI LCP <8-3/4"> (3282')(3376'-5175') | SHL 25B-HS (AWB) |
| 5175.00 | 15780.00 | NaviTrak (MagCorr) | 03_BHI AT Curve <8-3/4"> (5175')(5178'-15780') | SHL 25B-HS (AWB) |
| 15780.00 | 15805.00 | Blind Drilling (std) | Projection to bit | SHL 25B-HS (AWB) |

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51-01684

| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | NOBLE ENERGY | Slot | Slot B |
| Area | Marshall County, WV | Well | SHL 25B-HS |
| Field | Marshall | Wellbore | SHL 25B-HS (AWB) |
| Facility | SHL-25 Pad | | |

**COMMENTS**

**Wellpath general comments**
API: 47-051-01684-0000
Rig: Nomac 79
BHI Job #: 6414239
VES Gyro Surveys (115'-3282')
BHI LCP (3282')(3376'-5175')
BHI AT Curve (5175')(5178'-15780')
TD projected to MD: 15805'

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Office of Oil & Gas
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# NOBLE ENERGY

Location: Marshall County, WV
Field: Marshall
Facility: SHL-25 Pad

Slot: Slot B
Well: SHL 25B-HS
Wellbore: SHL 25B-HS (PWB)

## Location Information

| Facility Name | | | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|
| SHL-25 Pad | | | 1705028.190 | 548357.370 | 40°00'02.826"N | 80°33'10.462"W |
| Slot | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
| Slot B | 4.38 | -13.92 | 1705014.270 | 548361.750 | 40°00'02.868"N | 80°33'10.642"W |

| | |
|---|---|
| Nomac 79 (RT) to Mud line (At Slot: Slot B) | 26ft |
| Mean Sea Level to Mud line (At Slot: Slot B) | -1325ft |
| Nomac 79 (RT) to Mean Sea Level | 1351ft |

Plot reference wellpath is SHL 25B-HS (PWP) Rev-B.0

| | |
|---|---|
| True vertical depths are referenced to Nomac 79 (RT) | Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet |
| Measured depths are referenced to Nomac 79 (RT) | North Reference: Grid north |
| Nomac 79 (RT) to Mean Sea Level: 1351 feet | Scale: True distance |
| Mean Sea Level to Mud line (At Slot: Slot B): -1325 feet | Depths are in feet |
| Coordinates are in feet referenced to Slot | Created by: kroschr on 11/Jun/2014 |

## Well Profile Data

| Design Comment | MD (ft) | Inc (°) | Az (°) | TVD (ft) | Local N (ft) | Local E (ft) | DLS (°/100ft) | VS (ft) |
|---|---|---|---|---|---|---|---|---|
| Tie On | 3282.00 | 0.590 | 248.820 | 3281.79 | -7.42 | -21.34 | 0.00 | 6.16 |
| KOP | 3432.00 | 0.590 | 248.820 | 3431.78 | -7.98 | -22.78 | 0.00 | 6.53 |
| End of 3D Arc (J) | 4089.60 | 25.730 | 55.285 | 4067.97 | 73.52 | 93.44 | 4.00 | 6.63 |
| End of Tangent (J) | 6384.72 | 25.730 | 55.285 | 6135.54 | 640.95 | 912.46 | 0.00 | 1.67 |
| End of 3D Arc | 6754.16 | 50.000 | 40.000 | 6425.62 | 797.69 | 1072.05 | 7.00 | 38.53 |
| LP | 7630.38 | 90.450 | 325.000 | 6758.00 | 1533.68 | 1029.57 | 9.00 | 665.78 |
| Revised BHL | 14489.59 | 90.450 | 325.000 | 6704.13 | 7152.24 | -2904.59 | 0.00 | 7524.78 |

## Targets

| Name | MD (ft) | TVD (ft) | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|
| SHL 25B-HS BHL:Plat | | 6665.00 | 8217.96 | -3650.82 | 1701363.60 | 556579.38 | 40°01'23.651"N | 80°33'58.803"W |
| SHL 25B-HS BHL:Rev-1 | | 6693.91 | 8217.96 | -3650.82 | 1701363.60 | 556579.38 | 40°01'23.651"N | 80°33'58.803"W |
| SHL 25B-HS BHL:Rev-2 | 14489.59 | 6704.13 | 7152.24 | -2904.59 | 1702109.80 | 555513.70 | 40°01'13.207"N | 80°33'49.050"W |
| SHL 25B-HS LP:Rev-1 | 7630.38 | 6758.00 | 1533.68 | 1029.57 | 1706043.80 | 549895.37 | 40°00'18.143"N | 80°32'57.644"W |
| SHL 25B-HS LP:Plat | | 6763.00 | 1533.68 | 1029.57 | 1706043.80 | 549895.37 | 40°00'18.143"N | 80°32'57.644"W |

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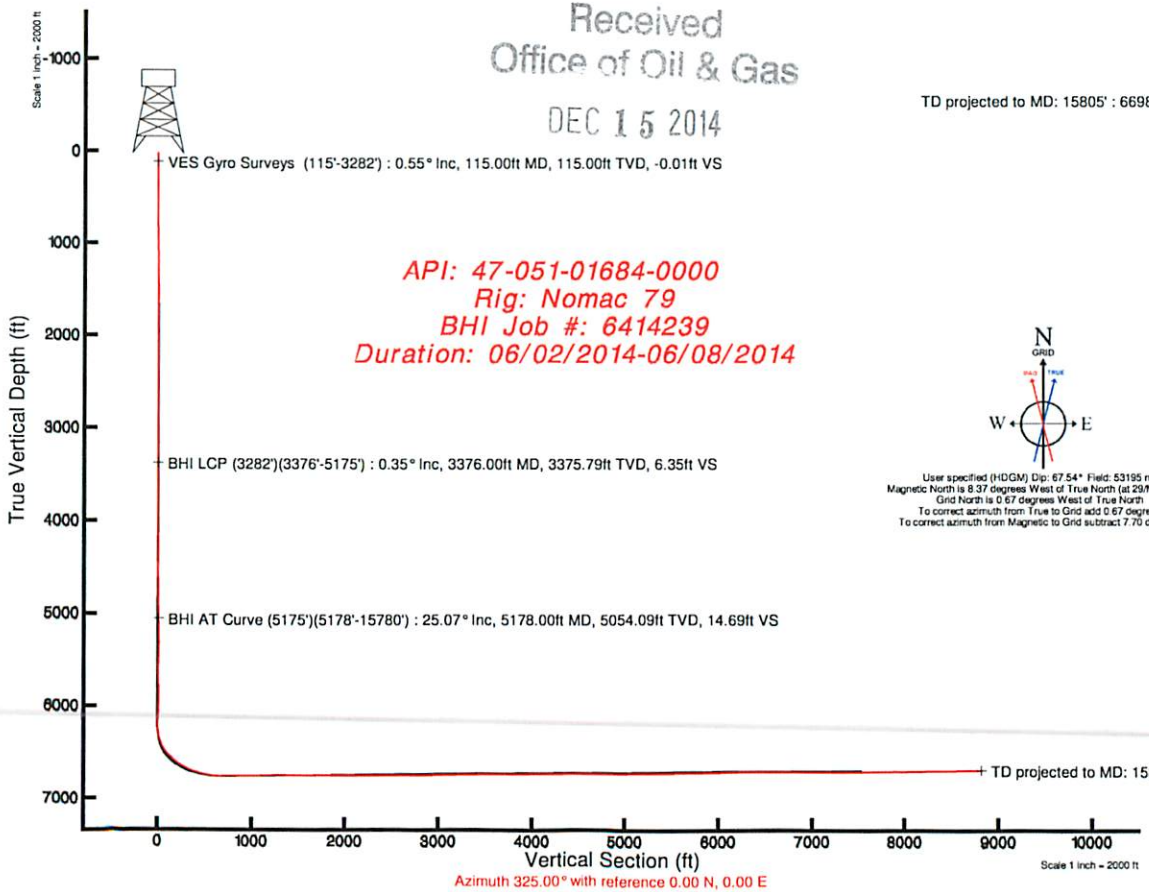
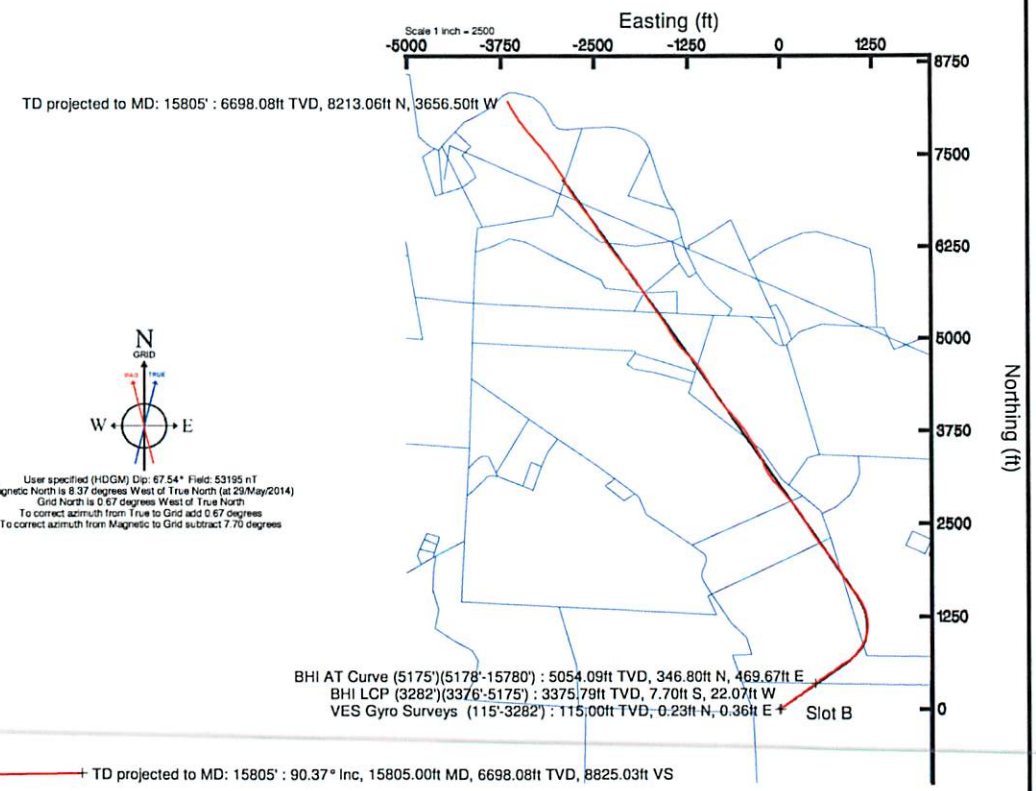
DEC 15 2014

API: 47-051-01684-0000
Rig: Nomac 79
BHI Job #: 6414239
Duration: 06/02/2014-06/08/2014










51-01684

Well is located on topo map 14,881' feet south of Latitude: 40° 02' 30"

# AS DRILLED PLAT

Well is located on topo map 3,138' feet west of Longitude: 80° 32' 30"

| PERMITTED APPROX. LANDING POINT | AS DRILLED APPROX. LANDING POINT | PERMITTED BOTTOM HOLE LOCATION (BHL) |
|---|---|---|
| UTM 17-NAD83 | UTM 17-NAD83 | UTM 17-NAD83 |
| N:4428422.19 | N:4428418.86 | N:4430434.61 |
| E:538482.50 | E:538486.73 | E:537022.54 |
| NAD27, WV NORTH | NAD27, WV NORTH | NAD27, WV NORTH |
| N:549895.37 | N:549884.24 | N:556579.38 |
| E:1706043.80 | E:1706057.51 | E:1701363.60 |

NOTES:

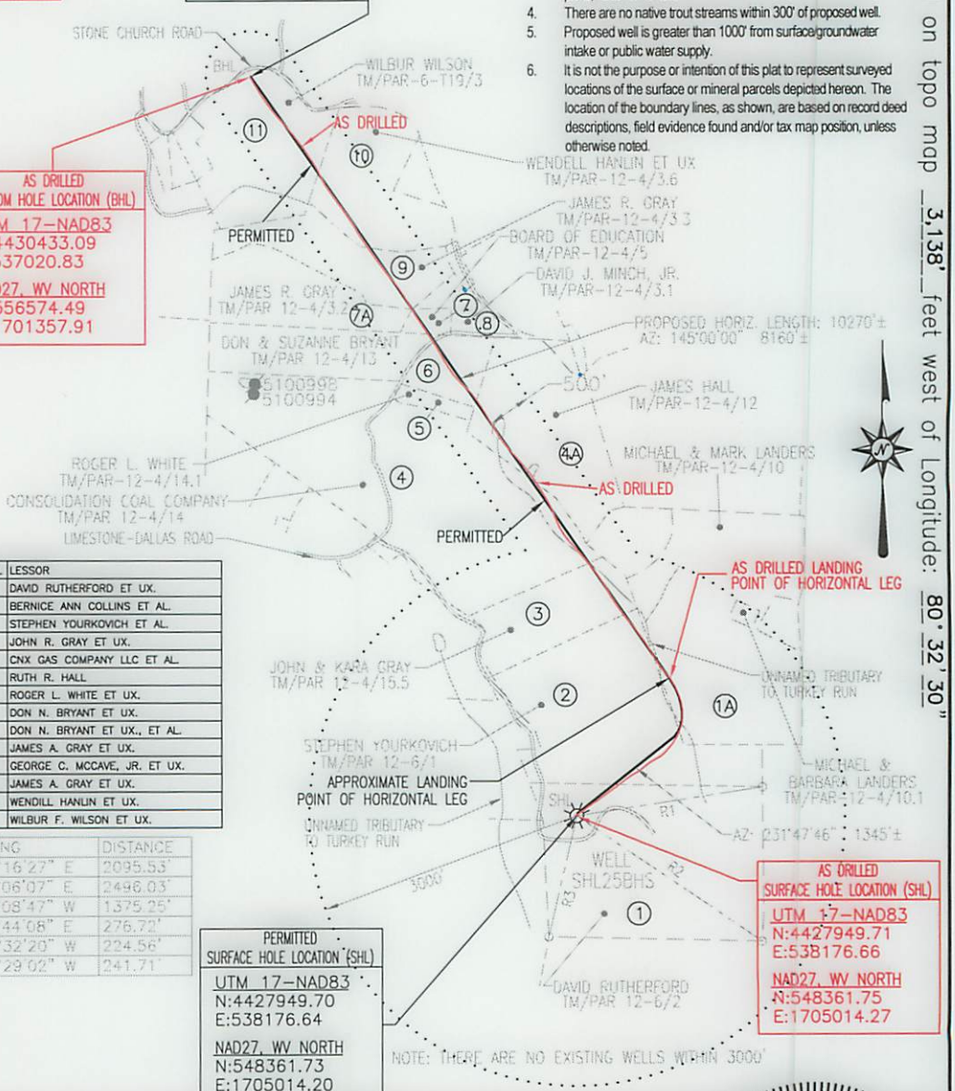
1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.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

LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- LEASE NUMBER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED

EXISTING WELLS

- EXISTING WELLS
- PLUGGED WELLS




AS DRILLED BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
N:4430433.09
E:537020.83
NAD27, WV NORTH
N:556574.49
E:1701357.91

AS DRILLED SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
N:4427949.71
E:538176.66
NAD27, WV NORTH
N:548361.75
E:1705014.27

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| PARCEL | LESSOR |
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| 1 | DAVID RUTHERFORD ET UX. |
| 1A | BERNICE ANN COLLINS ET AL. |
| 2 | STEPHEN YOURKOVICH ET AL. |
| 3 | JOHN R. GRAY ET UX. |
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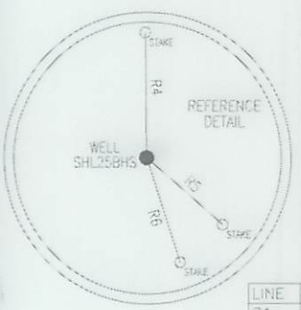


| LINE | BEARING | DISTANCE |
|---|---|---|
| R1 | N 81°16'27" E | 2095.53' |
| R2 | S 56°06'07" E | 2496.03' |
| R3 | S 13°08'47" W | 1375.25' |
| R4 | S 00°44'08" E | 276.72' |
| R5 | N 48°32'20" W | 224.56' |
| R6 | N 17°29'02" W | 241.71' |


Blue Mountain Inc.
10125 MASON DIXON HIGHWAY
BURTON, WV 26562
PHONE: (304) 662-6486


FILE #: SHL25BHS-AS DRILLED

DRAWING #: SHL25BHS-AS DRILLED

SCALE: 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/2500

PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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

Signed: [signature]

R.P.E.: _____ L.L.S.: P.S. No. 2000

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

PLACE SEAL HERE

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

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

DATE: DECEMBER 8, 2014

OPERATOR'S WELL #: SHL25BHS-AS DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01684 (PERMIT)

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

WATERSHED: WHEELING CREEK ELEVATION: 1344.21'

COUNTY/DISTRICT: MARSHALL / SAND HILL QUADRANGLE: VALLEY GROVE, WV 7.5'

SURFACE OWNER: DAVID RUTHERFORD ACREAGE: 95.912±

OIL & GAS ROYALTY OWNER: DAVID RUTHERFORD ET UX. ACREAGE: 671.677±

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐

PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐

CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,823'± TMD: 15,901'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN

Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590

City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

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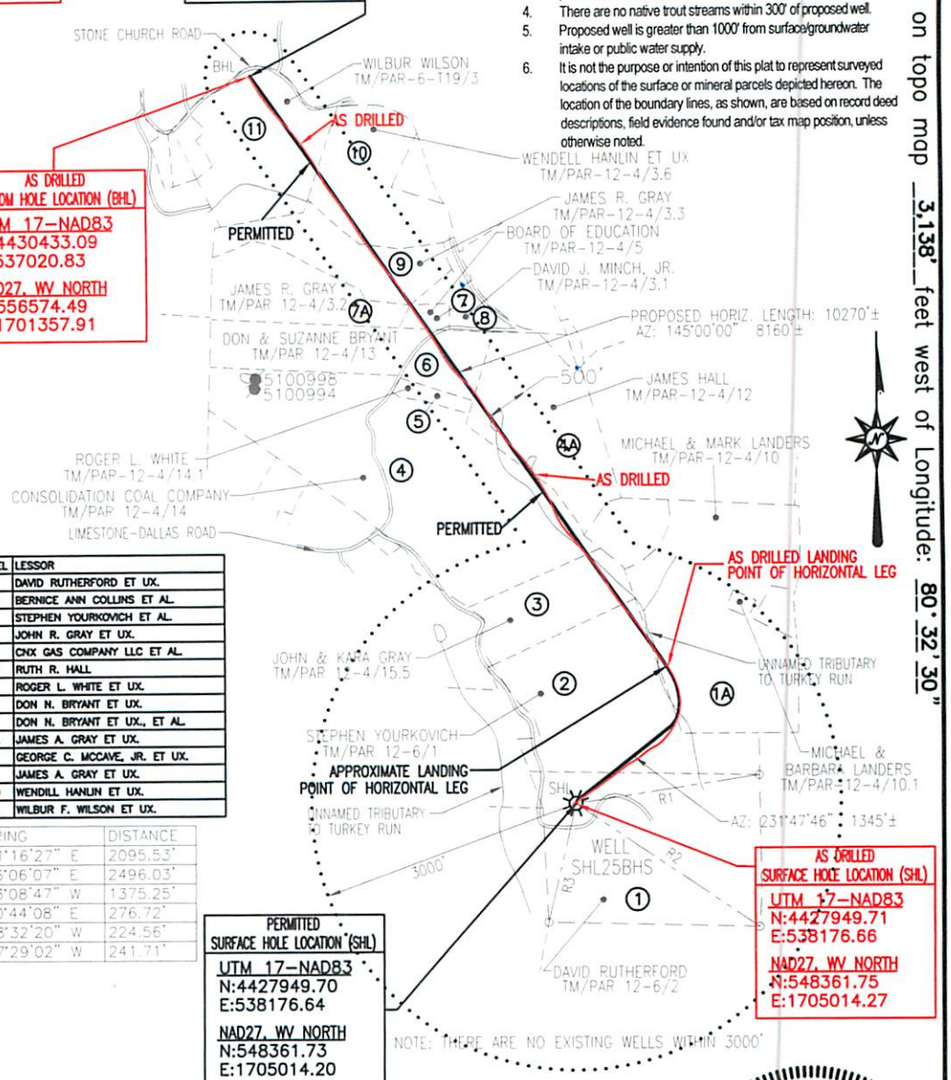


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City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301