WR-35 Rev (5-01)

DATE: 4/23/2010
API # : 47-021-5641

GS

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

Farm name: Zinn, Manley
Operator Well No.: Zinn #23

LOCATION:
Elevation: 1130'
Quadrangle: Auburn 7.5'
District: Troy
County: Gilmer
Latitude: 2500' Feet South of 39 Deg. 07 Min 64.3 Sec.
Longitude 6400' Feet West of 80 Deg. 85 Min. 60.5 Sec.
Company: Ramsey Associated Petroluem, Inc.

| | | Casing & Tubing | Used in drilling | Left in well | Cement fill Up. Cu. Ft. |
|---|---|---|---|---|---|
| Address: P.O. Box 90 | | 13 " | | 42' | |
| Glenville, WV 26351 | | 9" | | 126' | Surface |
| Agent: Leon Ramsey | | 7" | | 1011.50' | Surface |
| Inspector: David Gilbert | | 4" | | 4938' | 4000' |
| Date Permit Issued: | 10/27/08 | | | | |
| Date Well Work Commenced: | 10/29/08 | | | | |
| Date Well Work Completed: | 12/10/08 | | | | |
| Verbal Plugging: | | | | | |
| Date Permission granted on: | | | | | |
| Rotary X Cable | Rig | | | | |
| Total Depth (feet): | 5004' | | | | |
| Fresh Water Depth (ft.): | 80' | | | | |
| | | | | | |
| Salt Water Depth (ft.): | 1800' | | | | |
| | | | | | |
| Is coal being mined in area (N/Y)? | N | | | | |
| Coal Depths (ft.): | | | | | |

OPENFLOWDATA

Producing formation ELK Pay zone depth (ft) 4878' – 4660'
Gas: Initial open flow No test MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow No test MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests Hours
Static rock Pressure psig (surface pressure) after Hours

Second producing formation BENSON Pay zone depth (ft) 4507' – 4487'
Gas: Initial open flow No test MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow No test MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests Hours
Static rock Pressure psig (surface pressure) after Hours

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

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APR 23 2014
WV Department of
Environmental Protection

Signed: _____

By: LEON RAMSEY

Date: 4/23/2010

SUMMARY OF PROCEDURES AND ESTIMATED FORMATION TOPS FOR
RAMSEY ASSOCIATED PETROLEUM, INC.
ZINN #23

Lease Name: Zinn
API# 47-021-5641
Gilmer 7.5' Quadrangle
Elevation 1130'
TROY DISTRICT
GILMER COUNTY, WEST VIRGINIA

| ZONE | DEPTH | GAS CHECK | REMARKS |
|---|---|---|---|
| LITTLE LIME | 1869'-1915' | | |
| BIG LIME | 1920'-1990' | | |
| BIG INJUN | 1990'-2079' | | |
| SPEECHLEY | 3293'-3539' | | |
| BALLTOWN | 3539- 4077' | | |
| RILEY | 4360'-4440' | | |
| BENSON | 4488'-4509' | | |
| ALEXANDER | 4835'-4940' | | |
| **TOTAL DEPTH** | **5004'** | | |

**Perforations & Fracture Treatment**
**Well Name: ZINN 23**
**API #** 47- 021-05641
T.D. 4938' of 9.50 # 4 ½"

**1st Stage-** ELK (from 4878' to 4660')
60 QF 400 sks 20/40
500 gal. 15% HCL
with Clay and Iron Stabilizer
20 perforations w/ 6 perforation balls
1, 2, 3 ppg @25-30 BBl per min

---

**2nd Stage-** BENSON (from 4507' to 4487')
60 QF 400 sks 20/40
500 gal. 15% HCL
with Clay and Iron Stabilizer
10 perforations w/ 2 perforation balls
1, 2, 3 ppg @25-30 BBl per min

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WR-35 Rev (5-01)

DATE: 6/11/2010
API # : 47-021-5642

GS

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

Farm name: Zinn, Manley
LOCATION:
Elevation: 1247'
District: Troy
Latitude: 3490' Feet South of 39 Deg. 07 Min 36.8 Sec.
Longitude 7180' Feet West of 80 Deg. 85 Min. 86.7 Sec.
Company: Ramsey Associated Petroluem, Inc.

Operator Well No.: Zinn #24

Quadrangle: Auburn 7.5'
County: Gilmer

| | | Casing & Tubing | Used in drilling | Left in well | Cement fill Up. Cu. Ft. |
|---|---|---|---|---|---|
| Address: P.O. Box 90 | | 13 " | | 42' | |
| Glenville, WV 26351 | | 9" | | 126' | Surface |
| Agent: Leon Ramsey | | 7" | | 1013' | Surface |
| Inspector: David Gilbert | | 4" | | 5022' | 4000' |
| Date Permit Issued: | 10/27/08 | | | | |
| Date Well Work Commenced: | 11/10/08 | | | | |
| Date Well Work Completed: | 2/11/09 | | | | |
| Verbal Plugging: | | | | | |
| Date Permission granted on: | | | | | |
| Rotary X Cable | Rig | | | | |
| Total Depth (feet): | 5056' | | | | |
| Fresh Water Depth (ft.): | 100' | | | | |
| | | | | | |
| Salt Water Depth (ft.): | 917' | | | | |
| | | | | | |
| Is coal being mined in area (N/Y)? | N | | | | |
| Coal Depths (ft.): | | | | | |

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OPENFLOWDATA

Producing formation ALEXANDER ELK Pay zone depth (ft) 4993' – 4854'
Gas: Initial open flow No test MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow No test MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests Hours
Static rock Pressure psig (surface pressure) after Hours

Second producing formation ELK BENSON Pay zone depth (ft) 4789' – 4558'
Gas: Initial open flow No test MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow No test MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests Hours
Static rock Pressure psig (surface pressure) after Hours

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

Signed: _____

By: LEON RAMSEY Date: 6/11/2010

SUMMARY OF PROCEDURES AND ESTIMATED FORMATION TOPS FOR
RAMSEY ASSOCIATED PETROLEUM, INC.
ZINN #24

Lease Name: Zinn
API# 47-021-5642
Gilmer 7.5' Quadrangle
Elevation 1247'
TROY DISTRICT
GILMER COUNTY, WEST VIRGINIA

| ZONE | DEPTH | GAS CHECK | REMARKS |
|---|---|---|---|
| LITTLE LIME | 2078' – 2120' | | |
| BIG LIME | 2143' – 2205' | | |
| BIG INJUN | 2205' – 2268' | | |
| SPEECHLEY | 3231' – 3482' | | |
| BALLTOWN | 3482' – 3902' | | |
| RILEY | 4316' – 4503' | | |
| BENSON | 4611' – 4624' | | |
| ELK | 4788' – 4996' | | |

TOTAL DEPTH 5056'

**Perforations & Fracture Treatment**
**Well Name:** ZINN 24
**API #** 47-021-05642
T.D. 5022 of 9.50 # 4 ½"

**1st Stage-** ALEXANDER - ELK (from 4993' to 4854')
QF 400 sks 20/40
500 gal. 15% HCL
with Clay and Iron Stabilizer
18 perforations w/ _____ perforation balls
1, 2, 3 ppg @25-30 BBl per min

---

**2nd Stage-** ELK-BENSON (from 4789' to 4558')
QF 460 sks 20/40
500 gal. 15% HCL
with Clay and Iron Stabilizer
16 perforations w/ _____ perforation balls
1, 2, 3 ppg @25-30 BBl per min

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WR-35 Rev (5-01)

DATE: 6/11/2010
API # : 47-021-5643

GS

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

Farm name: Zinn, Manley
Operator Well No.: Zinn #25

LOCATION:
Elevation: 1229'
Quadrangle: Auburn 7.5'
District: Troy
County: Gilmer
Latitude: 4080' Feet South of 39 Deg. 07 Min 22 Sec.
Longitude 6100' Feet West of 80 Deg. 85 Min. 49 Sec.
Company: Ramsey Associated Petroleum, Inc.

| | | Casing & Tubing | Used in drilling | Left in well | Cement fill Up. Cu. Ft. |
|---|---|---|---|---|---|
| Address: | P.O. Box 90 | 13 " | | 35' | |
| | Glenville, WV 26351 | 9" | | 126' | Surface |
| Agent: | Leon Ramsey | 7" | | 992' | Surface |
| Inspector: | David Gilbert | 4 ½ " | | 4718' | 3000' |
| Date Permit Issued: | 10/27/08 | | | | |
| Date Well Work Commenced: | 10/30/08 | | | | |
| Date Well Work Completed: | 2/2/09 | | | | |
| Verbal Plugging: | | | | | |
| Date Permission granted on: | | | | | |
| Rotary X Cable | Rig | | | | |
| Total Depth (feet): | 4997' | | | | |
| Fresh Water Depth (ft.): | 95' | | | | |
| | | | | | |
| Salt Water Depth (ft.): | 1899' | | | | |
| | | | | | |
| Is coal being mined in area (N/Y)? | N | | | | |
| Coal Depths (ft.): | | | | | |

OPENFLOWDATA

Producing formation ELK BENSON Pay zone depth (ft) 4874' – 4593'
Gas: Initial open flow No test MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow No test MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests Hours
Static rock Pressure psig (surface pressure) after Hours

Second producing formation BALLTOWN SPEECHLY Pay zone depth (ft) 3812' – 2996'
Gas: Initial open flow No test MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow No test MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests Hours
Static rock Pressure psig (surface pressure) after Hours

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

Signed: _____

By: LEON RAMSEY Date: 6/11/2010

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SUMMARY OF PROCEDURES AND ESTIMATED FORMATION TOPS FOR
RAMSEY ASSOCIATED PETROLEUM, INC.
ZINN #25

Lease Name: Zinn
API# 47-021-05643
Gilmer 7.5' Quadrangle
Elevation 1229'
TROY DISTRICT
GILMER COUNTY, WEST VIRGINIA

| ZONE | DEPTH | GAS CHECK | REMARKS |
|---|---|---|---|
| LITTLE LIME | 2054' – 2101' | | |
| BIG LIME | 2122' – 2187' | | |
| BIG INJUN | 2187' – 2240' | | |
| SPEECHLEY | 2953' – 3261' | | |
| BALLTOWN | 3559' – 3884' | | |
| BENSON | 4590' – 4613' | | |
| ELK | 4759' – 4962' | | |
| **TOTAL DEPTH** | **4997'** | | |

**Perforations & Fracture Treatment**
**Well Name:_ZINN 25_**
**API # 47-21-05643**
T.D. _____4918'_____of 9.50 # 4 ½"

**1st Stage-** ___ELK-BENSON_____ (from ___4874_____' to ___4593_____' )
__60_QF ___400_____sks 20/40
500 gal. 15% HCL
with Clay and Iron Stabilizer
_____16_____ perforations w/ ___4_____perforation balls
1, 2, 3 ppg @25-30 BBl per min

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**2nd Stage-** _____BALLTOWN-SPEECHLY_____ (from __3812_' to ___2996__' )
__60_QF _350____sks 20/40
500 gal. 15% HCL
with Clay and Iron Stabilizer
_____14_____ perforations w/ ___4_____perforation balls
1, 2, 3 ppg @25-30 BBl per min

WR-35
Rev. 8/23/13



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

API 47 - 39 - 06331 County KANAWHA District BIG SANDY
Quad CLENDENIN Pad Name _____ Field/Pool Name _____
Farm name RAYMOND BAIL III & JANICE BAIL Well Number NANCY GREEN 1A
Operator (as registered with the OOG) RAVEN RIDGE ENERGY
Address 3230 PENNSYLVANIA AVE City CHARLESTON State WV Zip 35302

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing N/A Easting N/A
Landing Point of Curve Northing N/A Easting N/A
Bottom Hole Northing N/A Easting N/A

Elevation (ft) 1073' 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)
SOAP

Date permit issued 2/13/2012 Date drilling commenced 3/2/2012 Date drilling ceased 3/6/2012
Date completion activities began 4/2/2012 Date completion activities ceased 4/25/2012
Verbal plugging (Y/N) N Date permission granted N/A Granted by N

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

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Freshwater depth(s) ft 200 Open mine(s) (Y/N) depths N/A
Salt water depth(s) ft 1300-1800 Void(s) encountered (Y/N) depths N/A
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths N/A
Is coal being mined in area (Y/N) NO

Reviewed by:

WR-35
Rev. 8/23/13



API 47- 39 - 06331 Farm name RAYMOND BAIL III & JANICE BAIL Well number NANCY GREEN 1A

| 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 | 14 1/4 | 13 3/8 | 30' | NEW | J55-42LBS | | YES-CEMENTED BY RIG |
| Surface | 12 1/4 | 9 5/8 | 379' | NEW | LS-17LBS | | YES |
| Coal | | | | | | | |
| Intermediate 1 | 8 3/4 | 7 | 1524' | NEW | J55-23LBS | 400 | YES |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 6 1/4 | 4 1/2 | 2460' | NEW | J55-10.5LBS | | YES |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details

| 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 | CLASS I | 10 BY HAND | | | | GL | 8 |
| Surface | CLASS I | 140 | 15.6 | 1.18 | 165.2 | GL | 8 |
| Coal | | | | | | | |
| Intermediate 1 | CLASS I | 300 | 15.6 | 1.18 | 354 | GL | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | CLASS I | 150 | 14.2 | 1.29 | 193.5 | 750 | |
| Tubing | | | | | | | |

Drillers TD (ft) 2500' Loggers TD (ft) 2374'
Deepest formation penetrated WEIR Plug back to (ft) N/A
Plug back procedure

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

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- 39 - 06331 Farm name RAYMOND BAIL III & JANICE BAIL Well number NANCY GREEN 1A

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| 1 | 4/2/2013 | 2130' | 2200' | 20 | WEIR |
| | | | | | |
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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) |
|---|---|---|---|---|---|---|---|---|
| 1 | 4/3/2012 | 20 | 3200 | 3600 | 2000 | 15,366 | 202 | 417,000 |
| | | | | | | | | |
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Please insert additional pages as applicable.

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API 47- 39 - 06331 Farm name RAYMOND BAIL III & JANICE BAIL Well number NANCY GREEN 1A

| PRODUCING FORMATION(S) | DEPTHS | |
|---|---|---|
| WEIR | 2243' - 2289' TVD | MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

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

SHUT-IN PRESSURE Surface 50 psi Bottom Hole psi DURATION OF TEST 12 hrs

OPEN FLOW Gas 3 mcfpd Oil 1/2 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 | 0 | 1262' | 0 | | |
| SALT SAND | 1262' | 1491' | | | |
| SAND | 1491' | 1548' | | | |
| MAXTON | 1548' | 1692' | | | |
| PENCIL CAVE | 1692' | 1706' | | | |
| LITTLE LIME | 1706' | 1712' | | | |
| BIG LIME | 1712' | 1886' | | | |
| BIG INJUN | 1886' | 1915' | | | |
| SAND | 1915' | 2243' | | | |
| WEIR | 2243' | 2289' | | | |
| SAND | 2289' | 2500' | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Please insert additional pages as applicable.

Drilling Contractor R&R WELLSERVICE
Address AMBLER RIDGE City WALTON State WV Zip 25286

Logging Company SUPERIOR WELL SERVICE
Address 1650 HACKERS CREEK RD City JANE LEW State WV Zip 26378

Cementing Company BAKER HUGHES (BJ SERVICES)
Address 1681 EAST MAIN ST City BRIDGEPORT State WV Zip 26330

Stimulating Company BAKER HUGHES (BJ SERVICES)
Address 1681 EAST MAIN ST City BRIDGEPORT State WV Zip 26330

Please insert additional pages as applicable.

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WV Department of Environmental Protection

Completed by DANIELLE N. BOGGS Telephone 304-344-9291
Signature Danielle N. Boggs Title OPERATIONS MANAGER Date 12/12/2013

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

WR-35
Rev. 8/23/13



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

API 47 - 39 - 06347 County KANAWHA District BIG SANDY
Quad CLENDENIN - 299 Pad Name _____ Field/Pool Name _____
Farm name DANIEL & LAURA BODKINS Well Number OSBORNE 1A
Operator (as registered with the OOG) RAVEN RIDGE ENERGY, LLC
Address 3230 PENNSYLVANIA AVENUE City CHARLESTON State WV Zip 25302

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing N/A Easting N/A
Landing Point of Curve Northing N/A Easting N/A
Bottom Hole Northing N/A Easting N/A

Elevation (ft) 980' 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)
SOAP

Date permit issued 12/28/2012 Date drilling commenced 3/14/2013 Date drilling ceased 3/21/2013
Date completion activities began 8/30/2013 Date completion activities ceased 9/13/2013
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

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WV Department of
Environmental Protection

Freshwater depth(s) ft 200' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,200' - 1,700' Void(s) encountered (Y/N) depths N
Coal depth(s) ft NONE OF RECORD Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) NO

Reviewed by: _____

WR-35
Rev. 8/23/13



API 47- 39 - 06347 Farm name DANIEL & LAURA BODKINS Well number OSBORNE 1A

| 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 | 14 1/4" | 13 3/8" | 30' | NEW | J55 - 42 LBS | | YES - CEMENTED BY RIG |
| Surface | 12 1/4" | 9 5/8" | 380' | NEW | LS - 17 LBS | | YES |
| Coal | | | | | | | |
| Intermediate 1 | 8 3/4" | 7" | 1836' | NEW | J55 - 23LBS | 348' | YES |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 6 1/4" | 4 1/2" | 2160' | NEW | J55 - 10.5LBS | | YES |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details

| 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 | Class I | 10 - Cemented by Hand | | | | Ground Level | 8 |
| Surface | Class I | 120 | 15.6 | 1.18 | 141.6 | Ground Level | 8 |
| Coal | | | | | | | |
| Intermediate 1 | Class I | 330 | 15.6 | 1.18 | 389.4 | Ground Level | 8 |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | Class I | 150 | 14.2 | 1.29 | 193.5 | 500' | 8 |
| Tubing | | | | | | | |

Drillers TD (ft) 2274' Loggers TD (ft) 2156'
Deepest formation penetrated WEIR Plug back to (ft)
Plug back procedure

Kick off depth (ft) N/A

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

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Environmental Protection

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

WR-35
Rev. 8/23/13



API 47- 39 - 06347 Farm name DANIEL & LAURA BODKINS Well number OSBORNE 1A

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| 1 | 8/28/2013 | 1950' | 2100' | 20 | WEIR |
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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) |
|---|---|---|---|---|---|---|---|---|
| 1 | 8/30/13 | 30 | 2608 | 2880 | 1638 | 8,800lbs. | 494 | 0 |
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API 47- 39 - 06347 Farm name DANIEL & LAURA BODKINS Well number OSBORNE 1A

| PRODUCING FORMATION(S) | DEPTHS | |
|---|---|---|
| WEIR | 2141' - 2190' TVD | MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

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

SHUT-IN PRESSURE Surface 50 psi Bottom Hole psi DURATION OF TEST 12 hrs

OPEN FLOW Gas 2 mcfpd Oil 1/2 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 | 0 | 1269' | 0 | | |
| SALT SAND | 1269' | 1494' | | | |
| SAND | 1494' | 1557' | | | |
| MAXTON | 1557' | 1695' | | | |
| PENCIL CAVE | 1695' | 1713' | | | |
| LITTLE LIME | 1713' | 1719' | | | |
| BIG LIME | 1719' | 1879' | | | |
| BIG INJUN | 1879' | 1904' | | | |
| SAND | 1904' | 2141' | | | |
| WEIR | 2141' | 2190' | | | |
| SAND | 2190' | 2247' | | | |
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Please insert additional pages as applicable.

Drilling Contractor R & R Well Service
Address Ambler Ridge City Walton State WV Zip 25286

Logging Company Nabors Completion & Production
Address 82 Elkins Road City Buckhannon State WV Zip 26201

Cementing Company Universal Well Services
Address 5 Hall Run Road City Buckhannon State WV Zip 26201

Stimulating Company Producers Service Corporation
Address 109 Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

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Completed by Danielle N. Boggs Telephone 304-344-9291
Signature Danielle N. Boggs Title Operations Manager Date 12/9/2013

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

WR-35 API # 47 - 047-02030

Revised

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas
Well Operator's Report of Well Work

Farm Name : Plum Creek Timberlands Operator Well No. : 142

LOCATION: Elevation: 2031.31' Quadrangle: War

District: Big Creek County: McDowell

Latitude: 3040 Feet South of 37 Deg. 20 Min. 00 Sec.

Longitude: 4398 Feet West of 81 Deg. 42 Min. 30 Sec.

Company: Classic Oil and Gas Resources
300 Chippendale Circle
Lexington, KY 40517

Agent: ROBERT INGHRAM

Inspector: Barry Stollings
Permit Issued: 03-01-05
Well Work Commenced: 07-27-06
Well Work Completed: 08-01-06
Verbal Plugging
Permission granted on: 08-01-06
Rotary X Cable ____ Rig
Total Depth (feet) 2300'
Fresh water depths (ft) 800', 1100'

Salt water depths (ft) None

Is coal being mined in area (Y/N)? N
Coal Depths (ft): No Record

| Casing & Tubing | Used in Drilling | Left In Well | Cement Fill Up Cu. Ft. |
|---|---|---|---|
| Size 12 3/4" | 21' | 21' | n/a |
| 9 5/8" | 0' | 0' | n/a |
| 7" | 1646' | 1646' | 180 sks |
| 4 1/2" | 0' | 0' | n/a |
| | | | |

OPEN FLOW DATA
Producing formation N/A Pay zone depth (ft) ____

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

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

Received
MAR 24 2014
Office of Oil and Gas
WV Dept. of Environmental Protection

CLASSIC OIL & GAS RESOURCES, INC.
BY: William Kelly
Date: 03/21/14

**DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.**

Lost hole, P&A, skidded rig.

| FORMATION | TOP | BOTTOM | OIL, GAS, WATER |
|---|---|---|---|
| Pennsylvanian Sands, shales, coals | 0' | 1564' | |
| Salt Sand | — | — | |
| Ravencliff | 2233' | 2300' TD | |
| Upper Maxton | | | |
| Middle Maxton | | | |
| Lower Maxton | | | |
| Big Lime | | | |
| Injun | | | |
| Weir | | | |
| Berea | | | |
| Gordon | | | |
| Devonian Shale | | | |

Revised
047-02293

WR-35 API # 47 - 047-~~02030~~

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas
Well Operator's Report of Well Work

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Environmental Pro

Farm Name : Plum Creek Timberlands  Operator Well No. : 142

LOCATION: Elevation: 2031.31'  Quadrangle: War

District: Big Creek  County: McDowell

Latitude: 3040 Feet South of 37 Deg. 20 Min. 00 Sec.

Longitude: 4398 Feet West of 81 Deg. 42 Min. 30 Sec.

Company: Classic Oil and Gas Resources
416 West Brannon Road
Nicholasville, KY 40356-8845

Agent: ROBERT INGHRAM

Inspector: Barry Stollings

Permit Issued: ~~03-01-05~~ 8/8/06

Well Work Commenced: ~~07-27-06~~ 8/8/06

Well Work Completed: ~~11-27-06~~ 8/14/06

Verbal Plugging

Permission granted on: N/A

Rotary X Cable ____ Rig

Total Depth (feet) 6515'

Fresh water depths (ft) 800',1100'

Salt water depths (ft) None

Is coal being mined in area (Y/N)? N

Coal Depths (ft): No Record

| Casing & Tubing | Used in Drilling | Left In Well | Cement Fill Up Cu. Ft. |
|---|---|---|---|
| Size 12 3/4" | 21' | 21' | n/a |
| 9 5/8" | 0' | 0' | n/a |
| 7" | 1688' | 1688' | 330 sks |
| 4 1/2" | 6429' | 6429' | 115sks |
| | | | |

OPEN FLOW DATA

Producing formation Shale, Gordon, Berea  Pay zone depth (ft) See Back

Gas: Initial open flow Show MCF/d Oil: Initial open flow s0 Bbl/d

Final open flow 531 MCF/d Final open flow 0 Bbl/d

Time of open flow between initial and final tests n/a Hours

Static rock Pressure 800 psig (surface pressure) after 24 Hours

Second producing formation ____ Pay zone depth (ft) ____

Gas: Initial open flow ____ MCF/d Oil: Initial open flow ____ Bbl/d

Final open flow ____ MCF/d Final open flow ____ Bbl/d

Time of open flow between inital and final tests ____ Hours

Static rock Pressure ____ psig (surface pressure) after ____ Hours

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

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APR 21 2014
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Environmental Protection

CLASSIC OIL & GAS RESOURCES, INC.
BY: W. W. Kelly, Jr.
Date: 7-20-07

47-02293

**DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL**

10-12-06: Frac: Shale 6230'-40 (21 shots) - Variable Quality Foam frac - 25,934# 20/40 sar
739,400 Scg N2, BDP 1730#, ATP 2383#, AIR 20 BPM, ISIP 2132#. Shale 5641'-6077' (2
547,900 Scf N2, BDP 2602#, ATP 1397#, AIR 40,000 Scf /min, ISIP 2110#. Gordon 4986'
Quality Foam Frac - 24,682# 20/40 sand, 160 bbl total fluid, 593,100 Scf N2, BDP 2527#,
BPM, ISIP 1789#. Berea 4870'-78' (17 shots) - 70Q foam frac - 25,626# 20/40 sand, 146 bb
Scf N2, BDP 2450#, ATP 1996#, AIR 18 BPM, ISIP 2271#. Flow back on choke to pit. Kr
clean up to bottom. Final Openflow gauged 10/10 W 4"= 531Mcf. SI. Completed.

| FORMATION | TOP | BOTTOM | OIL, GAS |
|---|---|---|---|
| Pennsylvanian Sands, shales, coals | 0' | 1564' | |
| Salt Sand | --- | --- | |
| Ravencliff | 2233' | 2318' | |
| Upper Maxton | 2483' | 2516' | |
| Middle Maxton | 3050' | 3086' | |
| Lower Maxton | 3294' | 3364' | |
| Big Lime | 3654' | 4228' | |
| Injun | --- | --- | |
| Weir | --- | --- | |
| Berea | 4841' | 4899' | |
| Gordon | 4984' | 5000' | |
| Devonian Shale | 4899 | 6515 | Gas at TD - Sh |

JK

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 - 047 - 2657 W County McDowell District Big Creek
Quad Bradshaw Pad Name _____ Field/Pool Name Pond Creek
Farm name Pocahontas Mining Limited Well Number 560 WV-K35 PMC South
Operator (as registered with the OOG) GeoMet Operating Company
Address 5336 Stadium Trace Pkwy Suite 206 City Birmingham State Alabama Zip 35244

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4128581.00 Easting 432067.91
Landing Point of Curve Northing n/a Easting n/a
Bottom Hole Northing n/a Easting n/a

Elevation (ft) 2369 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)

_____

_____

Date permit issued Oct 19,2012 Date drilling commenced 11/10/2008 Date drilling ceased 11/14/2008
Date completion activities began 9/19/2013 Date completion activities ceased 9/24/2013
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 50-200' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,181' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 551' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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APR 28 2014
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Environmental Protection

Reviewed by:
_____

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 047 - 2657 W  Farm name Pocahontas Mining Limited  Well number 560 WV-K35 PMC South

| 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 | 15" | 13-3/8 | 18' | New | | | |
| Surface | 10-3/4" | 8-5/8 | 667' | New | | 88' | N |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 8" | 5-1/2 | 1962' | New | | | Y |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

Comment Details Casing and Cementing information pertains to entire well make up. Well was drilled in 2008

| 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 | Class A | 180 | 15.6 | 1.19 | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 50/50 Poz | 310 | 14.2 | 1.31 | | | |
| Tubing | | | | | | | |

Drillers TD (ft) 1995'  Loggers TD (ft) 1995.89
Deepest formation penetrated Coal 1944-46  Plug back to (ft) n/a
Plug back procedure n/a

Kick off depth (ft) n/a

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 n/a

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

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 047 - 2657 W  Farm name Pocahontas Mining Limited  Well number 560 WV-K35 PMC South

## PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| 1st | 2/21/2013 | 547' | 549' | 4 | Coal -- 551' |
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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) |
|---|---|---|---|---|---|---|---|---|
| | N/A | | | | | | | |
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Please insert additional pages as applicable.

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 047 - 2657 W  Farm name Pocahontas Mining Limited  Well number 560 WV-K35 PMC South

| PRODUCING FORMATION(S) | DEPTHS | |
|---|---|---|
| | TVD | MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

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

SHUT-IN PRESSURE Surface 89 psi  Bottom Hole ___ psi  DURATION OF TEST 24 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) |
|---|---|---|---|---|---|
| | 0 | | 0 | | |
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Please insert additional pages as applicable.

Drilling Contractor Largo Well Service
Address PO Box 1464  City Abingdon  State VA  Zip 24212

Logging Company Well Service of Virginia
Address PO Box 627  City Richlands  State VA  Zip 24641

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

Stimulating Company ___
Address ___  City ___  State ___  Zip ___

Please insert additional pages as applicable.

Completed by Jeff Cooper  Telephone 276-971-3268
Signature Jeff Cooper  Title Production Supervisor  Date 4-29-14

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

WR-35
Rev (9-11)

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

DATE: 4-14-2014
API #: ~~47-05-01327~~ 51-01327

Farm name: Ray Baker 10H  Operator Well No.: 831191

LOCATION: Elevation: 1,310'  Quadrangle: Glen Easton

District: Liberty  County: Marshall
Latitude: 14,100' Feet South of 39 Deg. 47 Min. 30 Sec.
Longitude 7,030' Feet West of 80 Deg. 37 Min. 30 Sec.

Company: Chesapeake Appalachia, L.L.C.

| Address: P.O. Box 18496 | Casing & Tubing | Used in drilling | Left in well | Cement fill up Cu. Ft. |
|---|---|---|---|---|
| Oklahoma City, OK 73154-0496 | 20" | 40' | 40' | Driven |
| Agent: Eric Gillespie | | | | |
| Inspector: Bill Hendershot | | | | |
| Date Permit Issued: 2-23-2010 | | | | |
| Date Well Work Commenced: 9/27/2010 | | | | |
| Date Well Work Completed: 9/27/2010 | | | | |
| Verbal Plugging: | | | | |
| Date Permission granted on: | | | | |
| Rotary ☑ Cable ☐ Rig ☐ | | | | |
| Total Vertical Depth (ft): 40 | | | | |
| Total Measured Depth (ft): | | | | |
| Fresh Water Depth (ft.): ~~395~~' | | | | |
| Salt Water Depth (ft.): N/A | | | | |
| Is coal being mined in area (N/Y)? N | | | | |
| Coal Depths (ft.): ~~375~~' | | | | |
| Void(s) encountered (N/Y) Depth(s) N | | | | |

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)
Producing formation Marcellus Pay zone depth (ft) N/A
Gas: Initial open flow N/A MCF/d Oil: Initial open flow ____ Bbl/d
Final open flow N/A MCF/d Final open flow N/A Bbl/d
Time of open flow between initial and final tests ____ Hours
Static rock Pressure ____ psig (surface pressure) after ____ Hours

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

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APR 16 2014
WV Department of Environmental Protection

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Mallene Williams
Signature

4-18-2014
Date

51-01327

Were core samples taken? Yes_____ No_____ Were cuttings caught during drilling? Yes_____ No_____

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list_____

**NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.**

Perforated Intervals, Fracturing, or Stimulating:

Plug Back Details Including Plug Type and Depth(s):

| Formations Encountered: Surface: | Top Depth / | Bottom Depth |
|---|---|---|
| Sand Shale | 0 | 40' |

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WR-35
Rev (5-01)

DATE:
API #: 47-5101379

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas

Well Operator's Report of Well Work

Farm name: HAZLETT, FREDERICK S. Operator Well No.: SHL-1C-HS

LOCATION: Elevation 1163.06' Quadrangle: MAJORSVILLE

District: SANDHILL County MARSHALL
Latitude: Feet South of 39 Deg. 58 Min. 23.91 Sec.
Longitude Feet West of 80 Deg. 34 Min. 29.47 Sec.

| Company: CNX Gas Company LLC | Casing & Tubing | Used in drilling | Left in well | Cement fill up Cu. Ft. |
|---|---|---|---|---|
| **Address:** 200 Evergreene Drive | | | | |
| Waynesburg, PA 15370 | | | | |
| **Agent:** Tim Rinehart | | | | |
| **Inspector:** Bill Hendershot | | | | |
| **Date Permit Issued:** 01/24/2011 | | | | |
| **Date Well Work Commenced:** 01/26/2011 | 30" | 39' | 39' | Grouted In |
| **Date Well Work Completed:** 09-18-11 | 20" | 80' | 80' | 155 sks |
| **Verbal Plugging** N/A | 13 3/8" | 995' | 995' | 670 sks |
| **Date Permission granted on:** 01/26/2011 | | | | |
| **Rotary Cable Rig** X | 9 5/8" | 2915' | 2915' | 950 sks |
| **Total Depth (feet):** 11,635' | 5 ½" | 11,556' | 11,556' | 1,905 sks |
| **Fresh Water Depth (ft.):** 200' | | | | |
| | | | | |
| **Salt Water Depth (ft.):** | | | | |
| | | | | |
| **Is coal being mined in area (N/Y)?** Yes | | | | |
| **Coal Depths (ft.)** 652'-658' | | | | |

OPEN FLOW DATA

Producing formation Marcellus Pay zone depth (ft) 6,458' TVD
Gas: Initial open flow 2259 MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow 2284 MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests 24 Hours
Static rock Pressure 2450 psig (surface pressure) after 24 Hours

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

***Commingled with previous formations**

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

Signed:
By: DESIGNATED AGENT, GENERAL MANAGER WV GAS OPS.
Date: 3/21/14

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MAR 27 2014
WV Department of Environmental Protection

Laura Adkins - Noble Energy

51-01379

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Rev (5-01)
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WELL: 47-5101379

**Were core samples taken? Yes / No Were cuttings caught during drilling? Yes / No**

**Were Electrical Yes / No, Mechanical Yes / No, or Geophysical logs Yes / No recorded on this well?**

**NOTE: IN THE AREA BELOW PUT THE FOLLOWING:**

**1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR PHYSICAL CHANGE, ETC.**
**2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.**

**PERFORATED INTERVALS, FRACTURING, OR STIMULATING:**

**FORMATIONS ENCOUNTERED:**

| FORMATION | GAMMA RAY /FORMATION TOPS TOP | BASE |
|---|---|---|

***Depths Determined By Drillers Log***

| Driller's Log | |
|---|---|
| Depth | Formation |
| 0'-15' | Fill |
| 15'-150' | Shale |
| 150'-652' | Shale/Sand |
| 652'658' | Coal |
| 658'-762' | Shale/Sand |
| 762'-1013' | Red Rock |
| 1013'-1249' | Shale |
| 1249'-1377' | Shale/Sand |
| 1377'-1408' | Shale/Lime |
| 1408'-1502' | Shale/Sand |
| 1502'-1659' | Sand |
| 1659'-1721' | Sand/Lime |
| ~~1721'-1782'~~ | ~~Sand/Shale/Lime~~ |
| 1782'-1847' | Sand |
| 1847'-2003' | Shale/Sand |
| 2003'-2097' | Shale/Lime |
| 2097'-2253' | Sand/Shale/Lime |
| 2253'-2284' | Sand/Shale/Lime |
| 2284'-2378' | Sand/Lime/Silt |
| 2378'-2473' | Red Rock/Shale |
| 2473'-2505' | Red Rock/Shale |
| 2505'-2599' | Shale/Lime |
| 2599'-2694' | Sand/Shale/Lime |
| 2694'-2820' | Sand/Shale/Silt |
| 2820'-2946' | Shale/Lime |
| 2946'-3027' | Sand/Shale/Silt |
| 3027'-3500' | Sand/Silt |

51-01379

*Depth Determined From AIR-Quad/Gamma Logs*

CONSOL ENERGY

Geological Top Estimations

| | |
|---|---|
| Well (Pad) Name | SHL01 pad |
| Datum (GR) | 1163 |

| | TVD | S.L. | |
|---|---|---|---|
| Gas Sand Top | 1262 | -99 | |
| Gas Sand Base | 1326 | -163 | |
| 1st Salt Sand Top | 1358 | -195 | |
| 1st Salt Sand Base | 1366 | -203 | |
| 2nd Salt Sand Top | 1463 | -300 | The salt sands could possibly be a fluid thief zone |
| 2nd Salt Sand Base | 1518 | -355 | |
| 3rd Salt Sand Top | 1551 | -388 | |
| 3rd Salt Sand Base | 1592 | -429 | |
| Maxton Top | 1613 | -450 | |
| Maxton Base | 1693 | -530 | |
| Big Lime Top | 1697 | -534 | |
| Big Injun Top | 1730 | -567 | |
| Big Injun Base | 1916 | -753 | |
| Berea Top | 2212 | -1049 | |
| Berea Base | 2229 | -1066 | |
| Gantz Top | 2265 | -1102 | |
| Gantz Base | 2313 | -1150 | |
| Gordon Top | 2631 | -1468 | |
| Gordon Base | 2649 | -1486 | |
| Fifth Top | 2741 | -1578 | |
| Fifth Base | 2772 | -1609 | |
| Burkett Shale | 6302 | -5139 | |
| Tully Top | 6310 | -5147 | |
| Hamilton Top | 6343 | -5180 | |
| Marcellus | ~6449 | -5286 | |
| Onondaga | ~6508 | -5345 | |

TVD: ~6530

| Bottom Perf | # of Perfs | BD Press (psi) | ATP (psi) | Avg Rate (bpm) | ISIP (psi) | Frac Gradient | Sand (lbs) | Acid (gals) | Water (gals) |
|---|---|---|---|---|---|---|---|---|---|
| 11530 | 60 | 8,673 | 8,269 | 72.4 | 5,740 | 1.22 | 316,320 | 2,000 | 372,876 |
| 11,367 | 40 | 7,635 | 8,202 | 85.7 | 4,925 | 1.11 | 355,640 | 2,000 | 301,434 |
| 11,067 | 40 | 6,376 | 7,914 | 86.0 | 4,751 | 1.08 | 121,520 | 2,000 | 196,350 |
| 10,767 | 40 | 5,555 | 7,433 | 89.7 | 4,681 | 1.07 | 353,620 | 2,000 | 314,874 |
| 10,467 | 40 | 6,225 | 7,345 | 90.4 | 5,010 | 1.12 | 353,120 | 2,000 | 286,944 |
| 10,167 | 40 | 6,523 | 7,211 | 90.7 | 4,861 | 1.10 | 353,740 | 2,000 | 276,780 |
| 9,867 | 40 | 6,528 | 7,215 | 90.0 | 4,664 | 1.07 | 348,440 | 2,000 | 266,490 |
| 9,567 | 40 | 7,289 | 7,313 | 90.5 | 4,635 | 1.07 | 345,540 | 2,000 | 278,418 |
| 9,267 | 40 | 7,243 | 7,383 | 90.7 | 5,139 | 1.14 | 350,920 | 2,000 | 276,066 |
| 8,967 | 40 | 5,956 | 7,039 | 90.9 | 6,026 | 1.26 | 353,500 | 2,000 | 266,826 |
| 8,667 | 40 | 6,179 | 6,678 | 90.3 | 4,727 | 1.08 | 353,400 | 2,000 | 277,830 |
| 8,367 | 40 | 6,444 | 7,089 | 90.7 | 4,868 | 1.10 | 320,660 | 2,000 | 257,544 |
| 8,067 | 40 | 6,666 | 6,863 | 90.0 | 4,862 | 1.10 | 352,000 | 2,000 | 277,326 |
| 7,767 | 40 | 6,441 | 6,727 | 90.0 | 4,501 | 1.05 | 350,560 | 2,000 | 268,254 |
| 7,467 | 40 | 6,407 | 7,148 | 83.7 | 3,676 | 0.94 | 353,000 | 2,000 | 285,432 |
| 7,167 | 36 | 6,572 | 6,786 | 90.0 | 4,228 | 1.01 | 354,660 | 2,000 | 275,436 |

51.01376

51-01379

SHL 1C
47-051-01379

| Stage # | Plug Type | Plug Depth |
|---|---|---|
| 1 | Composite Frac Plug | 11390 |
| 2 | Composite Frac Plug | 11390 |
| 3 | Composite Frac Plug | 11090 |
| 4 | Composite Frac Plug | 10790 |
| 5 | Composite Frac Plug | 10490 |
| 6 | Composite Frac Plug | 10190 |
| 7 | Composite Frac Plug | 9890 |
| 8 | Composite Frac Plug | 9590 |
| 9 | Composite Frac Plug | 9290 |
| 10 | Composite Frac Plug | 8990 |
| 11 | Composite Frac Plug | 8690 |
| 12 | Composite Frac Plug | 8390 |
| 13 | Composite Frac Plug | 8090 |
| 14 | Composite Frac Plug | 7790 |
| 15 | Composite Frac Plug | 7490 |
| 16 | Composite Frac Plug | 7190 |

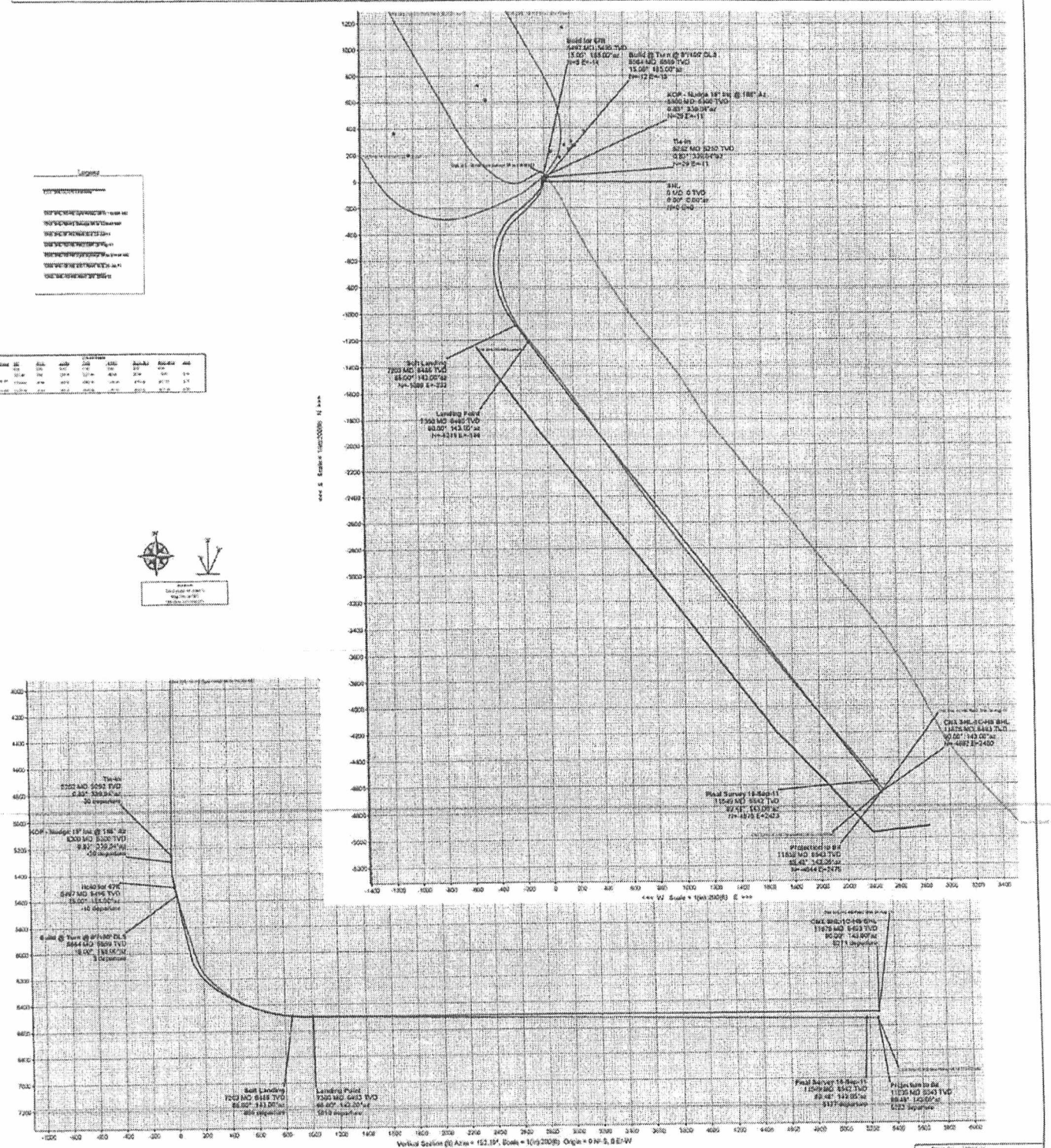
51-01379

CNX GAS

# CNX

PATHFINDER
A Schlumberger Company

| WELL | FIELD | DRILLING RIG |
|---|---|---|
| SHL-1C-HS | WV Marshall County (NAD 27) | Nabors M59 |



51-01379

**Schlumberger**

# CNX SHL-1C-HS Gyro+MWD 0ft to 11635ft MD Survey Report

(Def Survey)

| | | | |
|---|---|---|---|
| Report Date: | September 16, 2011 - 09:59 AM | Survey / DLS Computation: | Minimum Curvature / Lubinski |
| Client: | CNX | Vertical Section Azimuth: | 152.185 ° (Grid North) |
| Field: | WV Marshall County (NAD 27) | Vertical Section Origin: | 0.000 ft, 0.000 ft |
| Structure / Slot: | CNX SHL-1C-HS / CNX SHL-1C-HS | TVD Reference Datum: | KB |
| Well: | SHL-1C-HS | TVD Reference Elevation: | 1165.337 ft above Unknown |
| Borehole: | Original Borehole | Seabed / Ground Elevation: | 1162.337 ft above Unknown |
| UWI / API#: | Unknown / Unknown | Magnetic Declination: | -8.730 ° |
| Survey Name: | CNX SHL-1C-HS Gyro+MWD 0ft to 11635ft MD | Total Field Strength: | 52937.757 nT |
| Survey Date: | July 25, 2011 | Magnetic Dip Angle: | 67.601 ° |
| Tort / AHD / DDI / ERD Ratio: | 194.730 ° / 5793.668 ft / 6.377 / 0.581 | Declination Date: | July 25, 2011 |
| Coordinate Reference System: | NAD27 West Virginia State Plane, Northern Zone, US Feet | Magnetic Declination Model: | BGGM 2011 |
| Location Lat / Long: | N 39° 58' 23.63017", W 80° 34' 30.20660" | North Reference: | Grid North |
| Location Grid N/E Y/X: | N 538398.359 ftUS, E 1698702.721 ftUS | Grid Convergence Used: | -0.668 ° |
| CRS Grid Convergence Angle: | -0.66864257 ° | Total Corr Mag North->Grid North: | -8.044 ° |
| Grid Scale Factor: | 0.99995907 | Local Coord Referenced To: | Well Head |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | TVDSS (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (NAD ° ' " ") | Longitude (EAW ° ' " ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL | 0.00 | 0.00 | 0.00 | 0.00 | -1165.34 | 0.00 | 0.00 | 0.00 | N/A | 538398.36 | 1698702.72 | N 39 58 23.64 | W 80 34 30.21 |
| | 100.00 | 0.24 | 337.58 | 100.00 | -1077.34 | -0.23 | 0.21 | -0.09 | 0.22 | 538398.57 | 1698702.63 | N 39 58 23.64 | W 80 34 30.21 |
| | 200.00 | 0.11 | 176.58 | 200.00 | -977.34 | -0.35 | 0.51 | -0.16 | 0.35 | 538398.67 | 1698702.96 | N 39 58 23.64 | W 80 34 30.21 |
| | 300.00 | 0.21 | 42.26 | 300.00 | -877.34 | -0.32 | 0.35 | -0.03 | 0.30 | 538398.71 | 1698702.89 | N 39 58 23.64 | W 80 34 30.21 |
| | 400.00 | 0.20 | 86.83 | 400.00 | -777.34 | -0.31 | 0.49 | 0.27 | 0.18 | 538398.85 | 1698702.99 | N 39 58 23.64 | W 80 34 30.20 |
| | 500.00 | 0.09 | 38.46 | 500.00 | -677.34 | -0.29 | 0.58 | 0.49 | 0.16 | 538398.91 | 1698703.21 | N 39 58 23.64 | W 80 34 30.20 |
| | 600.00 | 0.18 | 107.23 | 600.00 | -577.34 | -0.19 | 0.57 | 0.69 | 0.17 | 538398.93 | 1698703.40 | N 39 58 23.64 | W 80 34 30.20 |
| | 700.00 | 0.14 | 293.87 | 700.00 | -477.34 | -0.17 | 0.57 | 0.72 | 0.32 | 538398.93 | 1698703.44 | N 39 58 23.64 | W 80 34 30.20 |
| | 800.00 | 0.17 | 328.97 | 800.00 | -377.34 | -0.41 | 0.75 | 0.53 | 0.10 | 538398.11 | 1698703.25 | N 39 58 23.65 | W 80 34 30.20 |
| | 900.00 | 0.21 | 319.55 | 900.00 | -277.34 | -0.74 | 1.02 | 0.34 | 0.05 | 538398.38 | 1698703.06 | N 39 58 23.65 | W 80 34 30.20 |
| | 1000.00 | 0.11 | 264.31 | 1000.00 | -177.34 | -0.96 | 1.15 | 0.12 | 0.17 | 538398.51 | 1698702.84 | N 39 58 23.65 | W 80 34 30.21 |
| | 1100.00 | 0.09 | 266.65 | 1100.00 | -77.34 | -1.02 | 1.13 | -0.06 | 0.02 | 538398.49 | 1698702.67 | N 39 58 23.65 | W 80 34 30.21 |
| | 1200.00 | 0.18 | 4.79 | 1200.00 | 22.66 | -1.19 | 1.28 | -0.12 | 0.21 | 538398.64 | 1698702.61 | N 39 58 23.65 | W 80 34 30.21 |
| | 1300.00 | 0.15 | 34.01 | 1300.00 | 122.66 | -1.38 | 1.45 | -0.03 | 0.09 | 538398.81 | 1698702.69 | N 39 58 23.65 | W 80 34 30.21 |
| | 1400.00 | 0.22 | 348.24 | 1400.00 | 222.66 | -1.63 | 1.65 | 0.00 | 0.16 | 538397.20 | 1698702.73 | N 39 58 23.65 | W 80 34 30.21 |
| | 1500.00 | 0.38 | 334.66 | 1500.99 | 322.66 | -2.13 | 2.32 | -0.17 | 0.15 | 538397.88 | 1698702.65 | N 39 58 23.66 | W 80 34 30.21 |
| | 1600.00 | 0.43 | 295.22 | 1600.99 | 422.66 | -2.74 | 2.76 | -0.64 | 0.27 | 538398.12 | 1698702.08 | N 39 58 23.67 | W 80 34 30.22 |
| | 1700.00 | 0.38 | 328.83 | 1700.99 | 522.65 | -3.37 | 3.21 | -1.15 | 0.24 | 538398.56 | 1698701.57 | N 39 58 23.67 | W 80 34 30.22 |
| | 1800.00 | 0.52 | 332.25 | 1800.99 | 622.65 | -4.16 | 3.60 | -1.54 | 0.14 | 538399.25 | 1698701.18 | N 39 58 23.68 | W 80 34 30.23 |
| | 1900.00 | 0.28 | 357.76 | 1900.98 | 722.65 | -4.83 | 4.54 | -1.75 | 0.29 | 538399.90 | 1698700.96 | N 39 58 23.68 | W 80 34 30.23 |
| | 2000.00 | 0.27 | 18.49 | 2000.98 | 822.65 | -5.22 | 5.00 | -1.69 | 0.10 | 538400.36 | 1698701.03 | N 39 58 23.69 | W 80 34 30.23 |
| | 2100.00 | 0.20 | 68.92 | 2100.98 | 922.65 | -5.36 | 5.29 | -1.45 | 0.21 | 538400.65 | 1698701.27 | N 39 58 23.69 | W 80 34 30.23 |
| | 2200.00 | 0.34 | 318.96 | 2200.98 | 1022.64 | -5.63 | 5.58 | -1.49 | 0.45 | 538400.94 | 1698701.23 | N 39 58 23.69 | W 80 34 30.23 |
| | 2300.00 | 0.39 | 329.87 | 2300.98 | 1122.64 | -6.25 | 6.09 | -1.88 | 0.08 | 538401.45 | 1698700.86 | N 39 58 23.70 | W 80 34 30.23 |
| | 2400.00 | 0.27 | 313.49 | 2400.98 | 1222.64 | -6.82 | 6.55 | -2.20 | 0.15 | 538401.90 | 1698700.52 | N 39 58 23.70 | W 80 34 30.24 |
| | 2500.00 | 0.14 | 329.21 | 2500.98 | 1322.64 | -7.16 | 6.81 | -2.44 | 0.14 | 538402.17 | 1698700.28 | N 39 58 23.71 | W 80 34 30.24 |
| | 2600.00 | 0.31 | 338.62 | 2600.98 | 1422.64 | -7.55 | 7.17 | -2.60 | 0.17 | 538402.53 | 1698700.12 | N 39 58 23.71 | W 80 34 30.24 |
| | 2700.00 | 0.22 | 344.21 | 2700.98 | 1522.64 | -8.01 | 7.61 | -2.75 | 0.09 | 538402.97 | 1698699.97 | N 39 58 23.71 | W 80 34 30.24 |
| | 2800.00 | 0.39 | 301.93 | 2800.97 | 1622.64 | -8.49 | 7.97 | -3.09 | 0.27 | 538403.33 | 1698699.63 | N 39 58 23.72 | W 80 34 30.25 |
| | 2900.00 | 0.65 | 9.36 | 2900.97 | 1722.63 | -9.24 | 8.71 | -3.28 | 0.62 | 538404.07 | 1698699.44 | N 39 58 23.72 | W 80 34 30.25 |
| | 3000.00 | 0.44 | 312.33 | 3000.97 | 1822.63 | -10.05 | 9.53 | -3.48 | 0.55 | 538404.89 | 1698699.24 | N 39 58 23.73 | W 80 34 30.25 |
| | 3100.00 | 0.35 | 308.19 | 3100.96 | 1922.63 | -10.69 | 9.97 | -4.01 | 0.10 | 538405.33 | 1698698.71 | N 39 58 23.74 | W 80 34 30.26 |
| | 3200.00 | 0.49 | 322.97 | 3200.96 | 2022.62 | -11.39 | 10.49 | -4.51 | 0.18 | 538405.85 | 1698698.21 | N 39 58 23.74 | W 80 34 30.27 |
| | 3300.00 | 0.53 | 319.44 | 3300.96 | 2122.62 | -12.26 | 11.18 | -5.07 | 0.05 | 538406.54 | 1698697.65 | N 39 58 23.75 | W 80 34 30.27 |
| | 3400.00 | 0.58 | 305.51 | 3400.95 | 2222.62 | -13.18 | 11.83 | -5.78 | 0.14 | 538407.19 | 1698696.94 | N 39 58 23.76 | W 80 34 30.28 |
| | 3500.00 | 0.44 | 308.05 | 3500.95 | 2322.61 | -13.96 | 12.39 | -6.49 | 0.14 | 538407.72 | 1698696.23 | N 39 58 23.76 | W 80 34 30.29 |
| | 3600.00 | 0.56 | 347.06 | 3600.95 | 2422.61 | -14.79 | 13.08 | -6.90 | 0.35 | 538408.44 | 1698695.82 | N 39 58 23.77 | W 80 34 30.30 |
| | 3700.00 | 0.43 | 327.03 | 3700.94 | 2522.60 | -15.64 | 13.87 | -7.21 | 0.21 | 538409.23 | 1698695.51 | N 39 58 23.78 | W 80 34 30.30 |
| | 3800.00 | 0.45 | 329.39 | 3800.94 | 2622.60 | -16.40 | 14.53 | -7.62 | 0.03 | 538409.88 | 1698695.10 | N 39 58 23.78 | W 80 34 30.31 |
| | 3900.00 | 0.47 | 359.51 | 3900.94 | 2722.60 | -17.16 | 15.27 | -7.82 | 0.24 | 538410.63 | 1698694.90 | N 39 58 23.79 | W 80 34 30.31 |
| | 4000.00 | 0.52 | 358.70 | 4000.93 | 2822.60 | -17.93 | 16.14 | -7.84 | 0.05 | 538411.50 | 1698694.89 | N 39 58 23.80 | W 80 34 30.31 |
| | 4100.00 | 0.36 | 11.51 | 4100.93 | 2922.59 | -18.59 | 16.92 | -7.76 | 0.17 | 538412.27 | 1698694.94 | N 39 58 23.81 | W 80 34 30.31 |
| | 4200.00 | 0.54 | 357.49 | 4200.93 | 3022.59 | -19.27 | 17.71 | -7.73 | 0.19 | 538413.07 | 1698694.99 | N 39 58 23.81 | W 80 34 30.31 |
| | 4300.00 | 0.62 | 2.58 | 4300.92 | 3122.58 | -20.17 | 18.72 | -7.73 | 0.10 | 538414.08 | 1698694.99 | N 39 58 23.82 | W 80 34 30.31 |
| | 4400.00 | 0.72 | 12.14 | 4400.91 | 3222.58 | -21.12 | 19.88 | -7.57 | 0.15 | 538415.24 | 1698695.15 | N 39 58 23.83 | W 80 34 30.31 |
| | 4500.00 | 0.81 | 359.18 | 4500.91 | 3322.57 | -22.09 | 21.02 | -7.51 | 0.24 | 538416.38 | 1698695.22 | N 39 58 23.85 | W 80 34 30.31 |
| | 4600.00 | 0.59 | 344.51 | 4600.90 | 3422.56 | -23.09 | 22.05 | -7.71 | 0.09 | 538417.40 | 1698695.01 | N 39 58 23.86 | W 80 34 30.31 |
| | 4700.00 | 0.68 | 330.96 | 4700.90 | 3522.56 | -24.10 | 22.96 | -8.09 | 0.14 | 538418.34 | 1698694.63 | N 39 58 23.87 | W 80 34 30.31 |
| | 4800.00 | 0.57 | 344.29 | 4800.89 | 3622.55 | -25.10 | 23.91 | -8.47 | 0.13 | 538419.28 | 1698694.25 | N 39 58 23.87 | W 80 34 30.32 |
| | 4900.00 | 0.70 | 325.01 | 4900.89 | 3722.55 | -26.19 | 24.88 | -8.94 | 0.25 | 538420.24 | 1698693.77 | N 39 58 23.88 | W 80 34 30.33 |
| | 5000.00 | 0.83 | 325.08 | 5000.88 | 3822.54 | -27.51 | 25.98 | -9.72 | 0.13 | 538421.34 | 1698693.00 | N 39 58 23.89 | W 80 34 30.34 |
| | 5100.00 | 0.69 | 333.86 | 5100.87 | 3922.53 | -28.82 | 27.10 | -10.40 | 0.19 | 538422.46 | 1698692.33 | N 39 58 23.91 | W 80 34 30.34 |
| | 5200.00 | 0.74 | 347.61 | 5200.86 | 4022.52 | -30.04 | 28.27 | -10.79 | 0.18 | 538423.63 | 1698691.93 | N 39 58 23.92 | W 80 34 30.35 |
| Final Gyro | 5252.00 | 0.83 | 339.04 | 5251.86 | 4075.52 | -30.63 | 28.84 | -10.97 | 0.34 | 538424.20 | 1698691.75 | N 39 58 23.92 | W 80 34 30.35 |
| | 5294.00 | 0.68 | 337.69 | 5293.85 | 4108.52 | -31.18 | 29.36 | -11.17 | 0.36 | 538424.72 | 1698691.56 | N 39 58 23.93 | W 80 34 30.35 |
| | 5344.00 | 2.76 | 171.92 | 5343.84 | 4158.50 | -30.34 | 28.44 | -11.11 | 6.65 | 538423.80 | 1698691.61 | N 39 58 23.92 | W 80 34 30.35 |
| | 5391.00 | 8.86 | 165.45 | 5390.60 | 4205.26 | -25.05 | 24.01 | -10.10 | 11.97 | 538419.37 | 1698692.62 | N 39 58 23.88 | W 80 34 30.34 |
| | 5435.00 | 11.07 | 167.61 | 5433.96 | 4248.63 | -18.76 | 16.79 | -8.39 | 5.21 | 538412.15 | 1698694.33 | N 39 58 23.80 | W 80 34 30.32 |
| | 5487.00 | 14.12 | 170.33 | 5484.71 | 4299.37 | -8.16 | 5.58 | -6.91 | 5.90 | 538400.94 | 1698695.81 | N 39 58 23.69 | W 80 34 30.30 |
| | 5531.00 | 15.05 | 179.01 | 5527.29 | 4341.95 | 1.84 | -5.49 | -6.47 | 2.61 | 538393.67 | 1698696.25 | N 39 58 23.56 | W 80 34 30.29 |
| | 5579.00 | 18.71 | 188.20 | 5573.47 | 4388.13 | 12.98 | -18.55 | -7.94 | 8.27 | 538378.61 | 1698695.38 | N 39 58 23.45 | W 80 34 30.30 |
| | 5627.00 | 19.20 | 194.05 | 5619.13 | 4433.79 | 24.45 | -33.04 | -10.24 | 5.40 | 538362.32 | 1698692.48 | N 39 58 23.31 | W 80 34 30.33 |
| | 5676.00 | 22.21 | 197.35 | 5664.96 | 4479.62 | 36.98 | -49.71 | -14.96 | 6.59 | 538345.66 | 1698687.76 | N 39 58 23.15 | W 80 34 30.39 |
| | 5727.00 | 25.27 | 203.66 | 5711.65 | 4526.31 | 50.58 | -68.68 | -22.21 | 7.70 | 538326.48 | 1698680.51 | N 39 58 22.96 | W 80 34 30.48 |
| | 5772.00 | 29.29 | 209.13 | 5751.92 | 4566.48 | 62.37 | -87.00 | -31.28 | 8.66 | 538308.36 | 1698671.46 | N 39 58 22.78 | W 80 34 30.59 |
| | 5820.00 | 32.72 | 218.29 | 5793.19 | 4607.65 | 73.85 | -107.15 | -44.83 | 13.29 | 538288.21 | 1698657.89 | N 39 58 22.57 | W 80 34 30.77 |
| | 5865.00 | 37.24 | 221.04 | 5830.65 | 4644.72 | 83.72 | -126.99 | -61.30 | 10.87 | 538268.37 | 1698641.42 | N 39 58 22.38 | W 80 34 30.97 |
| | 5912.00 | 42.08 | 224.16 | 5866.23 | 4680.89 | 93.73 | -149.03 | -81.63 | 11.13 | 538246.35 | 1698621.10 | N 39 58 22.16 | W 80 34 31.23 |
| | 5960.00 | 44.37 | 222.75 | 5901.20 | 4715.87 | 104.29 | -172.90 | -104.23 | 5.18 | 538222.47 | 1698598.50 | N 39 58 21.92 | W 80 34 31.52 |
| | 6008.00 | 48.55 | 224.40 | 5933.47 | 4748.13 | 114.74 | -196.64 | -126.83 | 8.38 | 538198.72 | 1698575.90 | N 39 58 21.68 | W 80 34 31.81 |
| | 6055.00 | 49.41 | 227.87 | 5966.27 | 4780.93 | 124.78 | -221.84 | -153.08 | 7.68 | 538173.53 | 1698549.65 | N 39 58 21.43 | W 80 34 32.14 |
| | 6102.00 | 50.16 | 228.63 | 5998.62 | 4811.28 | 133.42 | -245.74 | -179.68 | 2.02 | 538149.63 | 1698522.87 | N 39 58 21.19 | W 80 34 32.48 |
| | 6150.00 | 50.37 | 228.01 | 6027.30 | 4841.96 | 142.27 | -270.28 | -207.43 | 1.09 | 538125.09 | 1698495.30 | N 39 58 20.94 | W 80 34 32.83 |
| | 6195.00 | 50.55 | 226.78 | 6055.95 | 4870.81 | 151.13 | -293.78 | -232.97 | 2.16 | 538101.59 | 1698469.77 | N 39 58 20.71 | W 80 34 33.15 |
| | 6245.00 | 51.40 | 219.93 | 6087.45 | 4902.12 | 163.87 | -322.01 | -259.89 | 10.74 | 538073.38 | 1698443.14 | N 39 58 20.43 | W 80 34 33.49 |

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| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | TVDSS (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6287.00 | 51.54 | 216.04 | 6113.82 | 4928.28 | 177.14 | -347.90 | -279.60 | 7.25 | 536947.48 | 1699422.93 | N 39 58 20.17 | W 80 34 33.75 |
| | 6339.00 | 51.69 | 209.61 | 6145.93 | 4960.39 | 197.14 | -362.14 | -301.64 | 9.85 | 536913.24 | 1699400.89 | N 39 58 19.83 | W 80 34 34.02 |
| | 6386.00 | 52.42 | 203.90 | 6174.85 | 4989.51 | 218.64 | -415.23 | -318.48 | 9.54 | 537960.15 | 1699384.25 | N 39 58 19.50 | W 80 34 34.20 |
| | 6433.00 | 52.23 | 198.20 | 6203.59 | 5018.25 | 243.09 | -449.92 | -331.83 | 9.61 | 537945.46 | 1699370.90 | N 39 58 19.15 | W 80 34 34.40 |
| | 6480.00 | 53.56 | 193.36 | 6231.65 | 5046.61 | 270.24 | -495.58 | -342.01 | 8.89 | 537909.60 | 1699360.73 | N 39 58 18.80 | W 80 34 34.52 |
| | 6527.00 | 54.85 | 189.45 | 6259.61 | 5074.18 | 299.73 | -623.29 | -349.53 | 7.13 | 537872.06 | 1699353.21 | N 39 58 18.43 | W 80 34 34.62 |
| | 6574.00 | 56.13 | 185.14 | 6286.21 | 5100.88 | 331.18 | -561.80 | -354.76 | 9.60 | 537833.78 | 1699347.97 | N 39 58 18.05 | W 80 34 34.68 |
| | 6621.00 | 57.64 | 183.10 | 6311.88 | 5126.56 | 364.40 | -600.83 | -357.92 | 6.30 | 537794.56 | 1699344.81 | N 39 58 17.66 | W 80 34 34.71 |
| | 6668.00 | 58.45 | 180.54 | 6336.77 | 5151.43 | 399.06 | -640.69 | -359.19 | 4.93 | 537754.70 | 1699343.55 | N 39 58 17.27 | W 80 34 34.72 |
| | 6714.00 | 60.48 | 178.08 | 6360.15 | 5174.81 | 434.52 | -680.27 | -358.00 | 9.44 | 537715.12 | 1699344.73 | N 39 58 16.87 | W 80 34 34.70 |
| | 6763.00 | 64.08 | 172.51 | 6382.94 | 5197.61 | 474.80 | -725.41 | -353.67 | 9.77 | 537671.96 | 1699349.07 | N 39 58 16.45 | W 80 34 34.64 |
| | 6809.00 | 67.14 | 169.54 | 6401.94 | 5216.60 | 514.45 | -764.76 | -347.12 | 8.88 | 537630.61 | 1699355.61 | N 39 58 16.04 | W 80 34 34.55 |
| | 6857.00 | 70.42 | 167.13 | 6419.31 | 5233.99 | 557.42 | -808.69 | -338.07 | 6.26 | 537588.80 | 1699364.67 | N 39 58 15.61 | W 80 34 34.42 |
| | 6904.00 | 71.95 | 163.20 | 6434.48 | 5249.14 | 600.76 | -851.58 | -326.67 | 8.66 | 537543.81 | 1699376.06 | N 39 58 15.19 | W 80 34 34.27 |
| | 6951.00 | 71.90 | 160.87 | 6449.04 | 5263.70 | 644.79 | -894.09 | -312.89 | 4.71 | 537501.31 | 1699389.84 | N 39 58 14.77 | W 80 34 34.09 |
| | 6998.00 | 73.70 | 157.79 | 6462.92 | 5277.58 | 689.34 | -936.09 | -297.03 | 7.39 | 537459.31 | 1699405.71 | N 39 58 14.35 | W 80 34 33.88 |
| | 7042.00 | 77.20 | 155.05 | 6473.94 | 5288.60 | 731.81 | -975.11 | -279.97 | 10.11 | 537420.29 | 1699422.76 | N 39 58 13.97 | W 80 34 33.65 |
| | 7093.00 | 82.87 | 151.57 | 6482.72 | 5297.38 | 782.01 | -1019.57 | -257.41 | 12.84 | 537376.44 | 1699445.32 | N 39 58 13.53 | W 80 34 33.36 |
| | 7139.00 | 84.22 | 150.42 | 6487.89 | 5302.56 | 827.70 | -1059.94 | -235.25 | 3.84 | 537335.46 | 1699467.49 | N 39 58 13.14 | W 80 34 33.07 |
| | 7187.00 | 88.39 | 145.84 | 6491.62 | 5306.49 | 875.41 | -1100.85 | -209.99 | 10.69 | 537294.85 | 1699492.74 | N 39 58 12.74 | W 80 34 32.73 |
| | 7233.00 | 87.04 | 141.71 | 6494.46 | 5309.12 | 920.83 | -1137.59 | -182.86 | 9.07 | 537257.82 | 1699519.87 | N 39 58 12.36 | W 80 34 32.38 |
| | 7283.00 | 89.67 | 141.98 | 6495.92 | 5310.58 | 969.82 | -1176.65 | -151.66 | 5.31 | 537218.76 | 1699551.05 | N 39 58 11.99 | W 80 34 31.97 |
| | 7332.00 | 91.34 | 140.98 | 6495.51 | 5310.17 | 1017.99 | -1214.74 | -120.98 | 3.52 | 537180.67 | 1699581.86 | N 39 58 11.62 | W 80 34 31.57 |
| | 7427.00 | 88.90 | 141.54 | 6495.31 | 5309.97 | 1111.23 | -1289.73 | -61.29 | 2.60 | 537106.69 | 1699641.43 | N 39 58 10.90 | W 80 34 30.80 |
| | 7521.00 | 88.94 | 141.69 | 6497.08 | 5311.74 | 1203.69 | -1362.38 | -2.80 | 0.37 | 537033.12 | 1699699.92 | N 39 58 10.18 | W 80 34 30.03 |
| | 7615.00 | 89.45 | 142.85 | 6498.40 | 5313.06 | 1299.17 | -1436.63 | 54.71 | 1.35 | 536958.79 | 1699757.43 | N 39 50 9.45 | W 80 34 29.29 |
| | 7711.00 | 89.38 | 143.35 | 6499.30 | 5314.04 | 1390.96 | -1510.49 | 112.35 | 0.53 | 536882.03 | 1699816.07 | N 39 58 8.70 | W 80 34 28.63 |
| | 7806.00 | 89.28 | 144.21 | 6500.49 | 5315.16 | 1484.93 | -1580.03 | 168.48 | 0.91 | 536805.39 | 1699871.19 | N 39 58 7.95 | W 80 34 27.80 |
| | 7901.00 | 89.42 | 144.69 | 6501.57 | 5316.23 | 1579.06 | -1657.32 | 223.71 | 0.53 | 536728.11 | 1699926.42 | N 39 58 7.19 | W 80 34 27.06 |
| | 7995.00 | 89.31 | 145.16 | 6502.61 | 5317.27 | 1672.30 | -1744.24 | 277.73 | 0.50 | 536651.19 | 1699980.44 | N 39 58 6.44 | W 80 34 26.37 |
| | 8090.00 | 89.38 | 145.38 | 6503.79 | 5318.38 | 1766.60 | -1822.30 | 331.67 | 0.23 | 536573.14 | 1700034.58 | N 39 58 5.67 | W 80 34 25.68 |
| | 8184.00 | 89.42 | 145.86 | 6504.88 | 5319.34 | 1859.96 | -1899.86 | 384.06 | 0.53 | 536495.58 | 1700087.05 | N 39 58 4.91 | W 80 34 24.97 |
| | 8279.00 | 89.31 | 146.72 | 6505.72 | 5320.39 | 1953.45 | -1978.05 | 437.13 | 0.92 | 536417.39 | 1700139.83 | N 39 58 4.14 | W 80 34 24.29 |
| | 8374.00 | 89.31 | 146.85 | 6506.88 | 5321.54 | 2049.04 | -2058.36 | 489.71 | 0.14 | 536337.09 | 1700192.41 | N 39 58 3.35 | W 80 34 23.60 |
| | 8468.00 | 89.31 | 145.95 | 6508.01 | 5322.67 | 2142.56 | -2136.65 | 541.72 | 0.96 | 536258.80 | 1700244.42 | N 39 58 2.59 | W 80 34 22.92 |
| | 8563.00 | 89.31 | 145.86 | 6509.15 | 5323.82 | 2236.98 | -2215.22 | 595.11 | 0.31 | 536180.23 | 1700297.81 | N 39 58 1.82 | W 80 34 22.22 |
| | 8657.00 | 89.35 | 145.20 | 6510.25 | 5324.92 | 2330.30 | -2292.62 | 648.44 | 0.49 | 536102.84 | 1700351.14 | N 39 58 1.06 | W 80 34 21.53 |
| | 8751.00 | 89.35 | 145.25 | 6511.32 | 5325.99 | 2423.60 | -2368.62 | 702.05 | 0.05 | 536026.84 | 1700404.74 | N 39 58 0.30 | W 80 34 20.83 |
| | 8846.00 | 89.52 | 144.57 | 6512.29 | 5326.96 | 2517.83 | -2447.85 | 756.68 | 0.74 | 535947.91 | 1700459.35 | N 39 57 59.54 | W 80 34 20.11 |
| | 8939.00 | 89.82 | 144.47 | 6512.98 | 5327.62 | 2610.00 | -2523.28 | 810.64 | 0.15 | 535872.18 | 1700513.33 | N 39 57 58.80 | W 80 34 19.41 |
| | 9033.00 | 89.38 | 144.25 | 6513.78 | 5328.44 | 2703.12 | -2599.67 | 865.41 | 0.35 | 535795.80 | 1700568.09 | N 39 57 58.05 | W 80 34 18.69 |
| | 9130.00 | 89.45 | 143.71 | 6514.77 | 5329.43 | 2799.12 | -2678.12 | 922.45 | 0.56 | 535717.35 | 1700625.13 | N 39 57 57.28 | W 80 34 17.95 |
| | 9224.00 | 89.28 | 143.01 | 6515.81 | 5330.47 | 2892.00 | -2753.54 | 978.54 | 0.77 | 535641.93 | 1700681.22 | N 39 57 56.54 | W 80 34 17.22 |
| | 9315.00 | 88.55 | 142.22 | 6518.74 | 5331.40 | 2981.73 | -2825.55 | 1033.79 | 0.92 | 535569.93 | 1700736.47 | N 39 57 55.84 | W 80 34 16.50 |
| | 9410.00 | 89.24 | 142.19 | 6517.78 | 5332.45 | 3079.23 | -2904.07 | 1094.46 | 0.31 | 535491.41 | 1700797.13 | N 39 57 55.07 | W 80 34 15.71 |
| | 9507.00 | 89.42 | 141.80 | 6518.67 | 5333.53 | 3170.75 | -2977.35 | 1151.72 | 0.46 | 535418.14 | 1700854.39 | N 39 57 54.35 | W 80 34 14.96 |
| | 9602.00 | 89.38 | 141.93 | 6519.37 | 5334.53 | 3264.21 | -3052.07 | 1210.38 | 0.14 | 535343.42 | 1700913.05 | N 39 57 53.62 | W 80 34 14.19 |
| | 9697.00 | 89.31 | 142.44 | 6520.06 | 5335.61 | 3357.76 | -3127.11 | 1268.82 | 0.54 | 535268.38 | 1700971.20 | N 39 57 52.85 | W 80 34 13.43 |
| | 9792.00 | 89.28 | 142.32 | 6522.12 | 5338.79 | 3451.37 | -3202.05 | 1326.61 | 0.13 | 535193.14 | 1701029.27 | N 39 57 52.15 | W 80 34 12.66 |
| | 9887.00 | 88.24 | 142.04 | 6523.55 | 5338.01 | 3544.91 | -3277.39 | 1384.06 | 0.30 | 535118.11 | 1701087.52 | N 39 57 51.42 | W 80 34 11.92 |
| | 9982.00 | 89.21 | 141.94 | 6524.63 | 5339.30 | 3638.41 | -3352.23 | 1443.38 | 0.11 | 535043.27 | 1701146.01 | N 39 57 50.68 | W 80 34 11.18 |
| | 10076.00 | 89.45 | 141.77 | 6525.73 | 5340.39 | 3730.88 | -3426.15 | 1501.41 | 0.31 | 534969.35 | 1701204.09 | N 39 57 49.96 | W 80 34 10.40 |
| | 10171.00 | 89.35 | 141.62 | 6526.73 | 5341.39 | 3824.28 | -3500.70 | 1560.29 | 0.19 | 534894.81 | 1701262.94 | N 39 57 49.23 | W 80 34 9.63 |
| | 10265.00 | 89.52 | 141.03 | 6527.65 | 5342.32 | 3916.69 | -3574.09 | 1618.64 | 0.18 | 534821.12 | 1701321.29 | N 39 57 48.51 | W 80 34 8.87 |
| | 10361.00 | 89.45 | 141.67 | 6528.52 | 5343.18 | 4011.06 | -3649.67 | 1679.20 | 0.08 | 534745.64 | 1701380.85 | N 39 57 47.77 | W 80 34 8.10 |
| | 10455.00 | 89.31 | 141.92 | 6529.53 | 5344.20 | 4103.52 | -3723.59 | 1736.34 | 0.30 | 534671.99 | 1701438.98 | N 39 57 47.05 | W 80 34 7.34 |
| | 10550.00 | 89.48 | 141.81 | 6530.54 | 5345.20 | 4196.98 | -3798.25 | 1795.00 | 0.21 | 534597.27 | 1701497.64 | N 39 57 46.32 | W 80 34 6.57 |
| | 10644.00 | 89.45 | 141.36 | 6531.41 | 5346.08 | 4289.37 | -3871.90 | 1853.40 | 0.48 | 534523.62 | 1701556.04 | N 39 57 45.60 | W 80 34 5.81 |
| | 10738.00 | 89.42 | 140.68 | 6532.34 | 5347.00 | 4381.58 | -3944.97 | 1912.53 | 0.72 | 534450.56 | 1701615.17 | N 39 57 44.88 | W 80 34 5.04 |
| | 10830.00 | 89.18 | 140.78 | 6533.46 | 5348.13 | 4471.74 | -4016.16 | 1970.77 | 0.27 | 534379.33 | 1701673.41 | N 39 57 44.18 | W 80 34 4.28 |
| | 10926.00 | 89.21 | 140.39 | 6534.81 | 5349.48 | 4565.77 | -4090.33 | 2031.73 | 0.39 | 534305.21 | 1701734.37 | N 39 57 43.46 | W 80 34 3.49 |
| | 11021.00 | 89.31 | 140.41 | 6536.04 | 5350.70 | 4658.76 | -4163.52 | 2092.28 | 0.11 | 534232.02 | 1701794.91 | N 39 57 42.74 | W 80 34 2.70 |
| | 11116.00 | 89.45 | 140.05 | 6537.07 | 5351.73 | 4751.69 | -4236.59 | 2153.05 | 0.41 | 534159.01 | 1701855.68 | N 39 57 42.03 | W 80 34 1.91 |
| | 11210.00 | 89.42 | 140.29 | 6538.00 | 5352.66 | 4843.63 | -4308.72 | 2213.26 | 0.26 | 534088.83 | 1701916.88 | N 39 57 41.32 | W 80 34 1.12 |
| | 11305.00 | 89.31 | 141.19 | 6539.05 | 5353.71 | 4936.73 | -4382.27 | 2273.37 | 0.95 | 534013.28 | 1701975.99 | N 39 57 40.60 | W 80 34 0.34 |
| | 11399.00 | 89.24 | 141.81 | 6540.24 | 5354.90 | 5029.89 | -4455.83 | 2331.68 | 0.66 | 533939.72 | 1702034.50 | N 39 57 39.84 | W 80 33 59.50 |
| | 11494.00 | 89.38 | 142.81 | 6541.46 | 5356.13 | 5122.68 | -4531.00 | 2389.99 | 1.06 | 533864.59 | 1702092.58 | N 39 57 39.15 | W 80 33 58.82 |
| Final Survey 16-Sep-11 | 11549.00 | 89.48 | 143.05 | 6542.00 | 5356.72 | 5176.96 | -4574.88 | 2423.11 | 0.57 | 533820.68 | 1702125.73 | N 39 57 38.72 | W 80 33 58.39 |
| Projection to Bit | 11635.00 | 89.48 | 143.05 | 6542.84 | 5357.50 | 5261.86 | -4643.80 | 2474.80 | 0.00 | 533751.86 | 1702177.42 | N 39 57 38.04 | W 80 33 57.71 |

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

| Description | MD From (ft) | MD To (ft) | EOU Freq (ft) | Survey Tool Type | Borehole / Survey |
|---|---|---|---|---|---|
| | 0.000 | 23.000 | Act Stns | SLB_NSG+MSHOT-Depth Only | Original Borehole / CNX SHL-1C-HS Gyro+MWD 0ft to 11635ft MD |
| | 23.000 | 5252.000 | Act Stns | SLB_NSG+MSHOT | Original Borehole / CNX SHL-1C-HS Gyro+MWD 0ft to 11635ft MD |
| | 5252.000 | 11549.000 | Act Stns | SLB_MWD-STD | Original Borehole / CNX SHL-1C-HS Gyro+MWD 0ft to 11635ft MD |
| | 11549.000 | 11635.000 | Act Stns | SLB_BLIND+TREND | Original Borehole / CNX SHL-1C-HS Gyro+MWD 0ft to 11635ft MD |

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|---|---|
| Fracture Date | 5/12/2012 |
| State: | West Virginia |
| County: | Marshall |
| API Number: | 47-051-01379 |
| Operator Name: | Noble Energy |
| Well Name and Number: | SHL C |
| Longitude: | -80.575057 |
| Latitude: | 39.973233 |
| Long/Lat Projection: | NAD27 |
| Production Type: | Gas |
| True Vertical Depth (TVD): | 6,543 |
| Total Water Volume* (gal): | 4,442,834 |

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 |
|---|---|---|---|---|---|---|---|
| Water | Noble | | | | 100.00% | 86.56700% | |
| WAI-251 LC | WFT | Acid Inhibitor | Pyridine, alkyl derives., quaternized wi | 68909-18-2 | 13.00000% | 0.00018% | |
| | | | Ethoxylated Nonylphenol | 68412-54-4 | 10.00000% | 0.00014% | |
| | | | Cinnamaldehyde | 104-55-2 | 10.00000% | 0.00014% | |
| | | | Ethylene Glycol | 107-21-1 | 60.00000% | 0.00081% | |
| | | | 2-Butoxyethanol | 111-76-2 | 5.00000% | 0.00007% | |
| | | | Methanol | 67-56-1 | 5.00000% | 0.00007% | |
| | | | Triethyl Phosphate | 78-40-0 | 5.00000% | 0.00007% | |
| | | | N,N-Dimethylformamide | 68-12-2 | 30.00000% | 0.00041% | |
| WIC-641L | WFT | Iron Control Agent | Citric Acid | 77-92-9 | 70.00000% | 0.00572% | |
| WFR-61L | WFT | Friction Reducer | Sodium Chloride | 7647-14-5 | 10.00000% | 0.00976% | |
| | | | Ammonium Chloride | 12125-02-9 | 7.00000% | 0.00683% | |
| | | | Petroleum Distillates | 64742-47-8 | 40.00000% | 0.03904% | |
| | | | Alcohols, C12-16, Ethoxylated | 68551-12-2 | 7.00000% | 0.00683% | |
| WSI-671L | WFT | Scale Inhibitor | Ammonium Chloride | 12125-02-9 | 40.00000% | 0.00968% | |
| WGA-15L | WFT | Slurried Gelling Agent | Petroleum Distillates | 64742-47-8 | 70.00000% | 0.03077% | |
| 15% HCL | WFT | Acid | Hydrogen Chloride | 7647-01-0 | 60.00000% | 0.46408% | |
| WBK-133 | WFT | Breaker | Ammonium Persulfate | 7727-54-0 | 100.00% | 0.00091% | |
| 100 Mesh | WFT | Proppant | Crystalline Silica in the form of Quartz | 14808-60-7 | 100.00% | 3.25678% | |
| 40/70 Mesh White S | WFT | Proppant | Crystalline Silica in the form of Quartz | 14808-60-7 | 100.00% | 9.22617% | |
| BioTreat XG | Phoenix Cher | Bacteria Control | Quaternary Amine | Trade Secret | 40.00000% | 0.01312% | |

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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 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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**For some of the constituents listed above, the data submitted by Weatherford is provided in good faith reliance on the representations of Weatherford's vendors/suppliers.

*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%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.