

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

API 47-103-03068 County Wetzel District Center
Quad Littleton Pad Name North Henderson Field/Pool Name Marcellus
Farm name Howard Henderson Well Number 516126
Operator (as registered with the OOG) Statoil USA Onshore Properties, INC (A Subsidiary of EQT Corp.)
Address 625 Liberty Ave, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,393,627.70 Easting 536,216.24
Landing Point of Curve Northing 4,394,176.42 Easting 536,309.56
Bottom Hole Northing 4,395,728.13 Easting 534,717.99

Elevation (ft) 1342 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)
Production - 12.9 ppg synthetic based - Cyberdrill

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Date permit issued 2/27/2015 Date drilling commenced 5/6/2015 Date drilling ceased 5/22/2015
Date completion activities began 2/14/2018 Date completion activities ceased 4/30/2018
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

Freshwater depth(s) ft 622 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2077 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 822, 1102, 1222 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed
[Signature]

Reviewed by:
DHT

API 47-103 - 03068 Farm name Howard Henderson Well number 516126

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	26	20	94	NEW	H-40	N/A	Y
Surface	17 1/2	13 3/8	674	NEW	J-55	N/A	Y
Coal							
Intermediate 1	12 1/4	9 5/8	2871	NEW	J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2	5 1/2	15339	NEW	P-110EC	N/A	Y
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 A	115	15.6	1.3	150	0	72+
Surface	CLASS A	290	15.8	2.3	667	0	72+
Coal							
Intermediate 1	CLASS A	590	15.8	2.31	1363	0	72+
Intermediate 2							
Intermediate 3							
Production	CLASS H	2660	15	1.29	3431	830	72+
Tubing							

Drillers TD (ft) 15339 Loggers TD (ft) N/A

Deepest formation penetrated MARCELLUS Plug back to (ft) N/A

Plug back procedure _____

Kick off depth (ft) 6711

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 _____

SURFACE = 1 centralizer w/ stop collar 10 ft above float shoe. One Single Bow every joint to 100ft below surface.
 INTERMEDIATE = 1 centek centralizer w/ stop collar 10 ft above float shoe 1 centek centralizer w/ stop collar 10 ft above float collar. 1 centralizer every joint for the first 15 joints. One centralizer every 3 jts to 100ft below surface.
 PRODUCTION = 1 centek centralizer w/ stop collar 10ft above shoe. 1 centek centralizer 10ft above float collar. 1 centek centralizer every joint (floating) until KOP. 1 centek centralizer every 3 joints (floating) until 200ft inside intermediate shoe. 1 centek centralizer 50ft below mandrel hanger.

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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516126 47-103-03068-00-00 - Additional Stimulating Company Information

Stimulating Company FTS International

Address 1432 Route 519 City Eighty-Four, State PA Zip 15330

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516126-47-103-03068-00-00 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	10/28/2017	15,158	15,360	10	MARCELLUS
1	2/17/2018	14,985	15,116	31	MARCELLUS
2	2/17/2018	14,771	14,945	40	MARCELLUS
3	3/28/2018	14,556	14,730	40	MARCELLUS
4	3/29/2018	14,341	14,515	40	MARCELLUS
5	3/30/2018	14,126	14,300	40	MARCELLUS
6	3/30/2018	13,911	14,085	40	MARCELLUS
7	3/30/2018	13,696	13,870	40	MARCELLUS
8	3/31/2018	13,481	13,655	40	MARCELLUS
9	4/12/2018	13,269	13,450	24	MARCELLUS
10	4/22/2018	13,055	13,229	40	MARCELLUS
11	4/23/2018	12,840	13,014	40	MARCELLUS
12	4/23/2018	12,625	12,799	40	MARCELLUS
13	4/24/2018	12,410	12,584	40	MARCELLUS
14	4/24/2018	12,195	12,369	40	MARCELLUS
15	4/24/2018	11,980	12,154	40	MARCELLUS
16	4/25/2018	11,765	11,939	40	MARCELLUS
17	4/25/2018	11,550	11,724	40	MARCELLUS
18	4/25/2018	11,335	11,509	40	MARCELLUS
19	4/26/2018	11,120	11,294	40	MARCELLUS
20	4/26/2018	10,905	11,079	40	MARCELLUS
21	4/27/2018	10,690	10,864	40	MARCELLUS
22	4/27/2018	10,475	10,649	40	MARCELLUS
23	4/27/2018	10,260	10,434	40	MARCELLUS
24	4/28/2018	10,045	10,219	40	MARCELLUS
25	4/28/2018	9,830	10,004	40	MARCELLUS
26	4/28/2018	9,614	9,788	40	MARCELLUS
27	4/28/2018	9,398	9,572	40	MARCELLUS
28	4/29/2018	9,182	9,356	40	MARCELLUS
29	4/29/2018	8,841	9,144	40	MARCELLUS
30	4/30/2018	8,626	8,800	40	MARCELLUS
31	4/30/2018	8,411	8,585	40	MARCELLUS
32	4/30/2018	8,196	8,370	40	MARCELLUS
33	4/30/2018	7,981	8,155	40	MARCELLUS

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516126 47-103-03068-00-00 - Stimulated Stages

Stage Number	Stimulation 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)
Injection Test #1	2/16/2018	10	7,208	7,956	5,420	0	1,351	0
Injection Test #2	2/17/2018	30	7,989	8,646	6,386	0	4,414	0
1	2/17/2018	83	8,938	9,176	4,761	465,225	8,398	0
2	2/18/2018	72	9,070	9,400	4,642	466,246	9,587	0
3	3/27/2018	13	5,675	7,181	5,662	0	912	0
3	3/29/2018	78	8,927	9,450	4,288	501,560	10,381	0
4	3/29/2018	89	8,954	9,184	5,008	500,210	10,655	0
5	3/29/2018	55	8,582	9,323	5,809	0	1,558	0
5	3/30/2018	88	8,885	9,217	4,974	500,230	9,646	0
6	3/30/2018	92	9,076	9,571	4,418	502,650	9,117	0
7	3/31/2018	85	8,953	9,553	4,371	502,800	8,589	0
8	3/31/2018	94	8,910	9,033	4,718	500,320	8,774	0
9	4/12/2018	35	8,436	9,189	5,659	0	3,877	0
9	4/22/2018	87	8,561	9,570	4,604	497,650	8,279	0
10	4/23/2018	90	8,486	9,466	4,464	500,540	8,258	0
11	4/23/2018	78	8,614	9,139	4,465	502,140	8,693	0
12	4/24/2018	81	8,530	9,205	4,488	501,530	8,372	0
13	4/24/2018	93	8,638	9,467	4,733	498,980	8,189	0
14	4/24/2018	94	8,770	9,388	4,943	500,820	8,117	0
15	4/25/2018	90	7,921	8,522	5,195	499,280	8,203	0
16	4/25/2018	92	8,314	8,923	4,820	499,630	8,116	0
17	4/25/2018	90	7,868	8,488	4,637	498,960	8,221	0
18	4/26/2018	89	8,174	8,684	5,090	500,940	8,175	0
19	4/26/2018	90	8,548	9,463	4,909	501,400	8,093	0
20	4/27/2018	92	8,121	9,168	5,404	500,260	8,251	0
21	4/27/2018	89	8,543	9,429	5,017	501,640	8,032	0
22	4/27/2018	90	8,293	9,330	5,440	500,190	7,919	0
23	4/28/2018	86	7,977	8,586	5,745	498,340	9,157	0
24	4/28/2018	90	8,303	8,983	5,841	500,960	8,222	0
25	4/28/2018	92	8,399	9,347	5,463	500,930	7,945	0
26	4/28/2018	89	8,200	8,523	5,478	499,520	8,017	0
27	4/29/2018	90	8,271	8,538	5,391	498,740	8,442	0
28	4/29/2018	90	8,737	9,274	4,854	501,380	8,858	0
29	4/29/2018	88	8,005	8,509	4,780	500,280	8,350	0
30	4/30/2018	88	8,313	8,555	5,112	498,520	7,887	0
31	4/30/2018	88	8,208	9,175	5,223	501,230	7,766	0

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LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H2S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT NAME TVD	DEPTH IN FT MD	DEPTH IN FT MD	
FRESH WATER ZONE	1	622	1	622	FRESH WATER
SAND/SHALE	1	884.9	1	885	
WAYNESBURG COAL	881.9	884.9	882	885	
SAND/SHALE	884.9	1,099.80	885	1,100.00	
SEWICKLEY COAL	1,099.80	1,104.80	1,100.00	1,105.00	
SAND/SHALE	1,104.80	1,218.50	1,105.00	1,219.00	
PITTSBURGH COAL	1,218.50	1,224.50	1,219.00	1,225.00	
SAND/SHALE	1,224.50	2,387.70	1,225.00	2,408.00	BRINE
BIG LIME	2,387.70	2,425.80	2,408.00	2,447.00	
SAND/SHALE	2,425.80	2,456.10	2,447.00	2,478.00	
BIG INJUN	2,456.10	2,663.80	2,478.00	2,690.00	
SAND/SHALE	2,663.80	2,776.50	2,690.00	2,804.00	
WEIR	2,776.50	2,796.40	2,804.00	2,824.00	
SAND/SHALE	2,796.40	2,990.40	2,824.00	3,019.00	
GANTZ	2,990.40	3,020.40	3,019.00	3,049.00	
SAND/SHALE	3,020.40	3,134.10	3,049.00	3,163.00	
50F	3,134.10	3,151.10	3,163.00	3,180.00	
SAND/SHALE	3,151.10	3,171.10	3,180.00	3,200.00	
30F	3,171.10	3,183.10	3,200.00	3,212.00	
SAND/SHALE	3,183.10	3,231.00	3,212.00	3,260.00	
GORDON	3,231.00	3,261.00	3,260.00	3,290.00	
SAND/SHALE	3,261.00	3,300.00	3,290.00	3,329.00	
BAYARD	3,300.00	3,310.00	3,329.00	3,339.00	
SAND/SHALE	3,310.00	3,886.90	3,339.00	3,916.00	
WARREN	3,886.90	3,921.90	3,916.00	3,951.00	
SAND/SHALE	3,921.90	3,977.90	3,951.00	4,007.00	
SPEECHLEY	3,977.90	4,170.90	4,007.00	4,200.00	
SAND/SHALE	4,170.90	4,850.80	4,200.00	4,880.00	
RILEY	4,850.80	4,900.80	4,880.00	4,930.00	
SAND/SHALE	4,900.80	5,391.10	4,930.00	5,421.00	
BENSON	5,391.10	5,551.00	5,421.00	5,581.00	
SAND/SHALE	5,551.00	5,846.90	5,581.00	5,877.00	
ALEXANDER	5,846.90	5,864.90	5,877.00	5,895.00	
SAND/SHALE	5,864.90	6,169.60	5,895.00	6,200.00	
ELK	6,169.60	6,992.40	6,200.00	7,033.00	
SONYEA	6,992.40	7,130.30	7,033.00	7,206.00	
MIDDLESEX	7,130.30	7,155.40	7,206.00	7,244.00	
GENESSEE	7,155.40	7,199.30	7,244.00	7,317.00	
GENESE0	7,199.30	7,211.50	7,317.00	7,339.00	
TULLY	7,211.50	7,223.50	7,339.00	7,361.00	
HAMILTON	7,223.50	7,273.60	7,361.00	7,453.00	
MARCELLUS	7,273.60	7,273.60	7,453.00	7,453.00	

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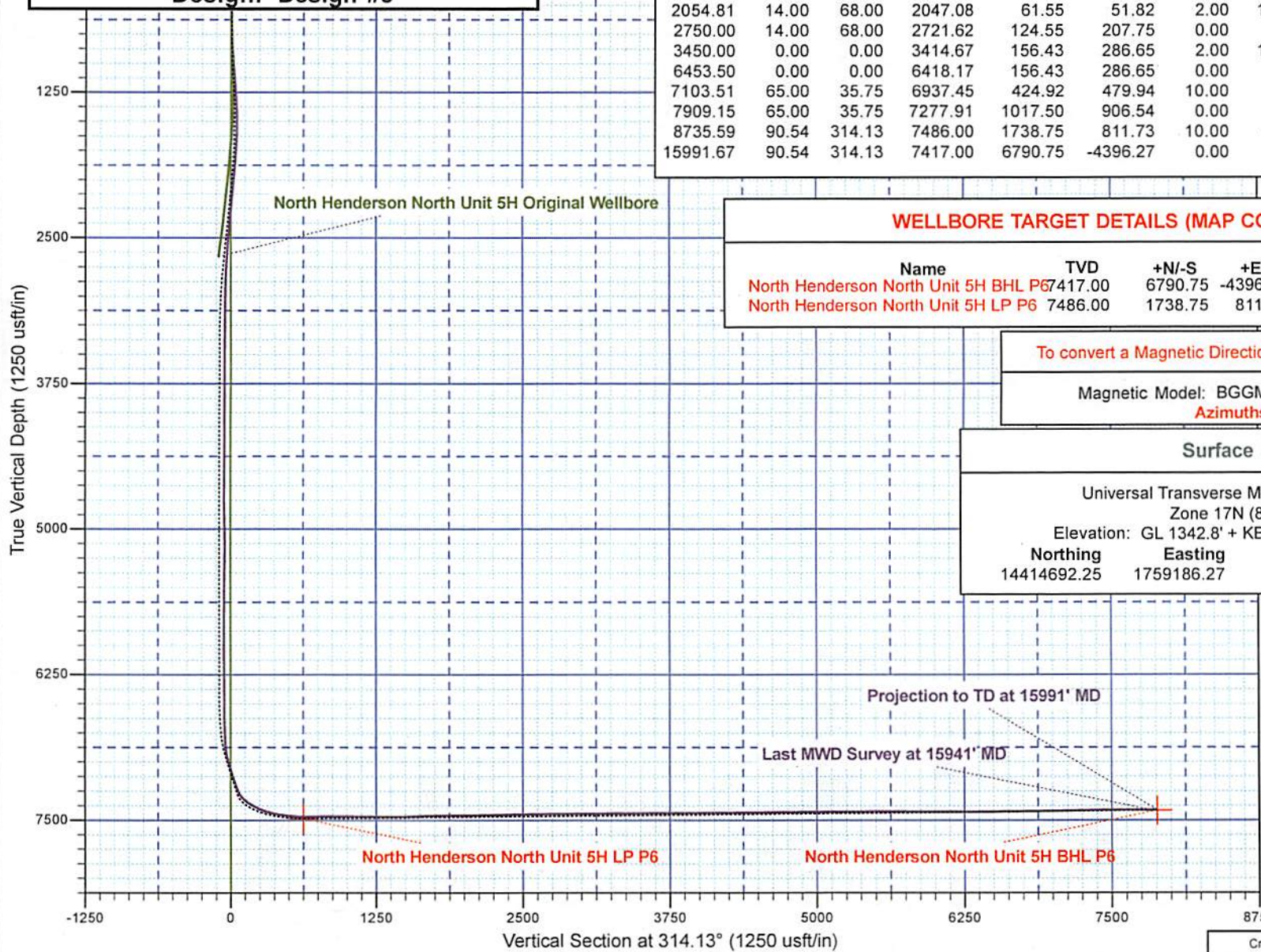
HALLIBURTON

Sperry Drilling Services

Wetzel County WV
 Site: North Henderson North Unit Pad
 Well: North Henderson North Unit 5H
 Wellbore: Sidetrack
 Design: Design #8

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1000.00	2.30	324.88	999.79	14.68	-8.39	0.00	0.00	16.24	Start ST
1100.00	3.53	280.00	1099.67	16.85	-12.58	2.50	-85.30	20.76	End Build
1200.00	3.53	280.00	1199.48	17.92	-18.64	0.00	0.00	25.86	Start Build/Turn
2054.81	14.00	68.00	2047.08	61.55	51.82	2.00	154.15	5.67	End Build/Turn
2750.00	14.00	68.00	2721.62	124.55	207.75	0.00	0.00	-62.39	Start Drop
3450.00	0.00	0.00	3414.67	156.43	286.65	2.00	180.00	-96.83	End Drop
6453.50	0.00	0.00	6418.17	156.43	286.65	0.00	0.00	-96.83	Start Build
7103.51	65.00	35.75	6937.45	424.92	479.94	10.00	35.75	-48.61	End Build
7909.15	65.00	35.75	7277.91	1017.50	906.54	0.00	0.00	57.79	Start Build/Turn
8735.59	90.54	314.13	7486.00	1738.75	811.73	10.00	-85.94	628.05	End Build/Turn
15991.67	90.54	314.13	7417.00	6790.75	-4396.27	0.00	0.00	7883.80	TD



WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
North Henderson North Unit 5H BHL P6	7417.00	6790.75	-4396.27	14421483.00	1754790.00
North Henderson North Unit 5H LP P6	7486.00	1738.75	811.73	14416431.00	1759998.00

To convert a Magnetic Direction to a Grid Direction, Subtract 8.99°

Magnetic Model: BGGM2015 Date: 22-Jun-15
 Azimuths to Grid North

Surface Location:

Universal Transverse Mercator (US Survey Feet)
 Zone 17N (84 W to 78 W)
 Elevation: GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)

Northing	Easting	Latitude	Longitude
14414692.25	1759186.27	39.693424	-80.577794

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Sperry Drilling Services

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	Start Build
1300.00	10.00	39.50	1297.46	33.58	27.68	2.00	39.50	3.59	End Build
2750.00	10.00	39.50	2725.44	227.87	187.84	0.00	0.00	24.35	Start Drop
3250.00	0.00	0.00	3222.90	261.45	215.53	2.00	180.00	27.94	End Drop
6765.00	0.00	0.00	6737.90	261.45	215.53	0.00	0.00	27.94	Start Build
7341.23	57.62	39.36	7221.78	467.25	384.30	10.00	39.36	50.56	Start Build/Turn
8204.26	90.79	314.23	7502.00	1192.68	287.14	10.00	-86.72	626.20	End Build/Turn
15451.32	90.79	314.23	7402.00	6247.68	-4904.86	0.00	0.00	7872.57	TD

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N-S	+E-W	Northing	Easting
North Henderson North Unit 4H BHL P4	7402.00	6247.68	-4904.86	14420947.00	1754280.00
North Henderson North Unit 4H LP P4	7502.00	1192.68	287.14	14415892.00	1759472.00

To convert a Magnetic Direction to a Grid Direction, Subtract 8.96°

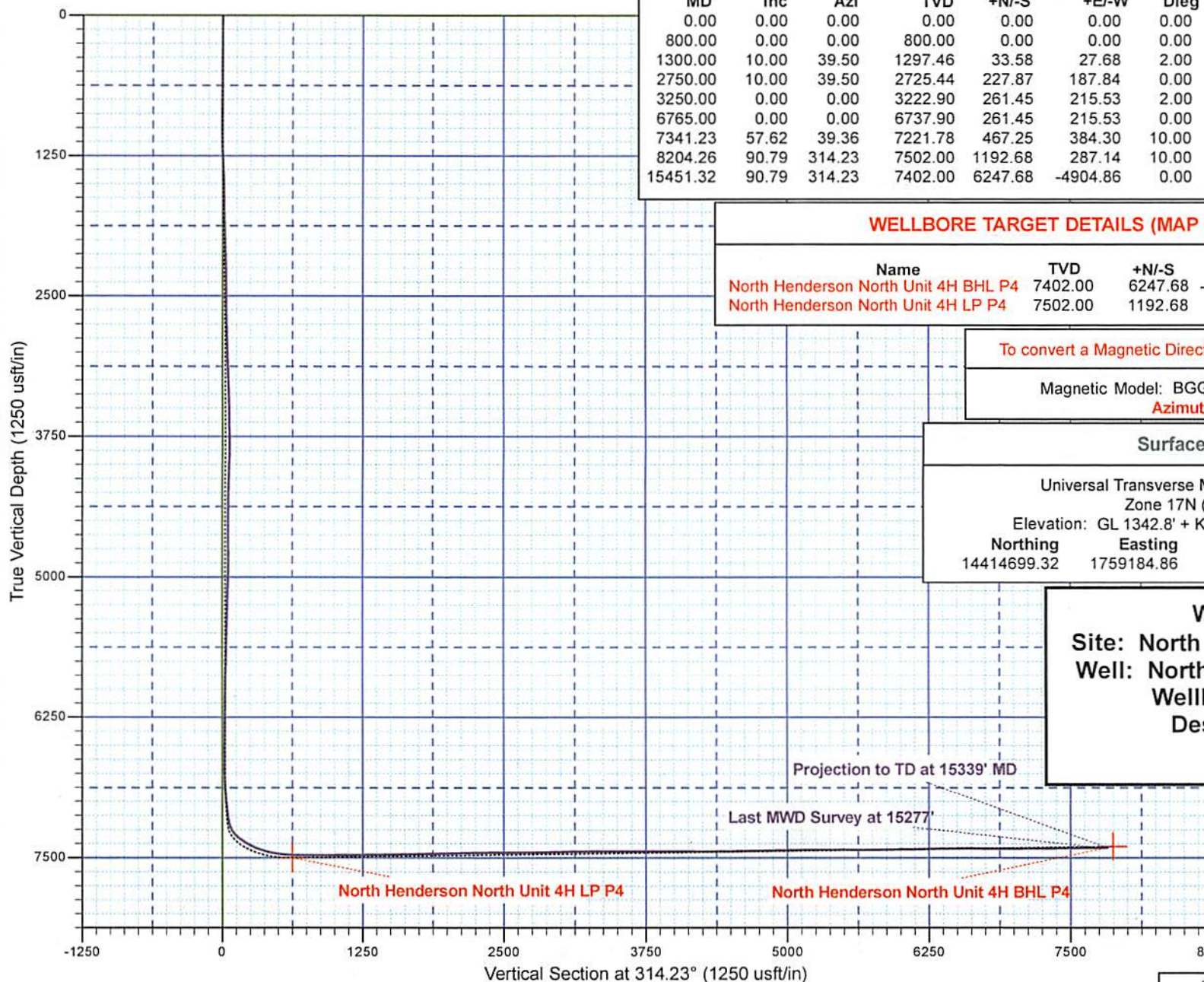
Magnetic Model: BGGM2014 Date: 17-Apr-15
Azimuths to Grid North

Surface Location:

Universal Transverse Mercator (US Survey Feet)
Zone 17N (84 W to 78 W)
Elevation: GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)

Northing	Easting	Latitude	Longitude
14414699.32	1759184.86	39.693444	-80.577799

Wetzel County WV
Site: North Henderson North Unit Pad
Well: North Henderson North Unit 4H
Wellbore: Wellbore #1
Design: Design #4
Orion Polaris



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Sperry Drilling Services

Wetzel County WV
Site: North Henderson North Unit Pad
Well: North Henderson North Unit 4H
Wellbore: Wellbore #1
Design: Design #4
Orion Polaris

Surface Location:

Universal Transverse Mercator (US Survey Feet)
Zone 17N (84 W to 78 W)
Elevation: GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)

Northing	Easting	Latitude	Longitude
14414699.32	1759184.86	39.693444	-80.577799

To convert a Magnetic Direction to a Grid Direction, Subtract 8.96°

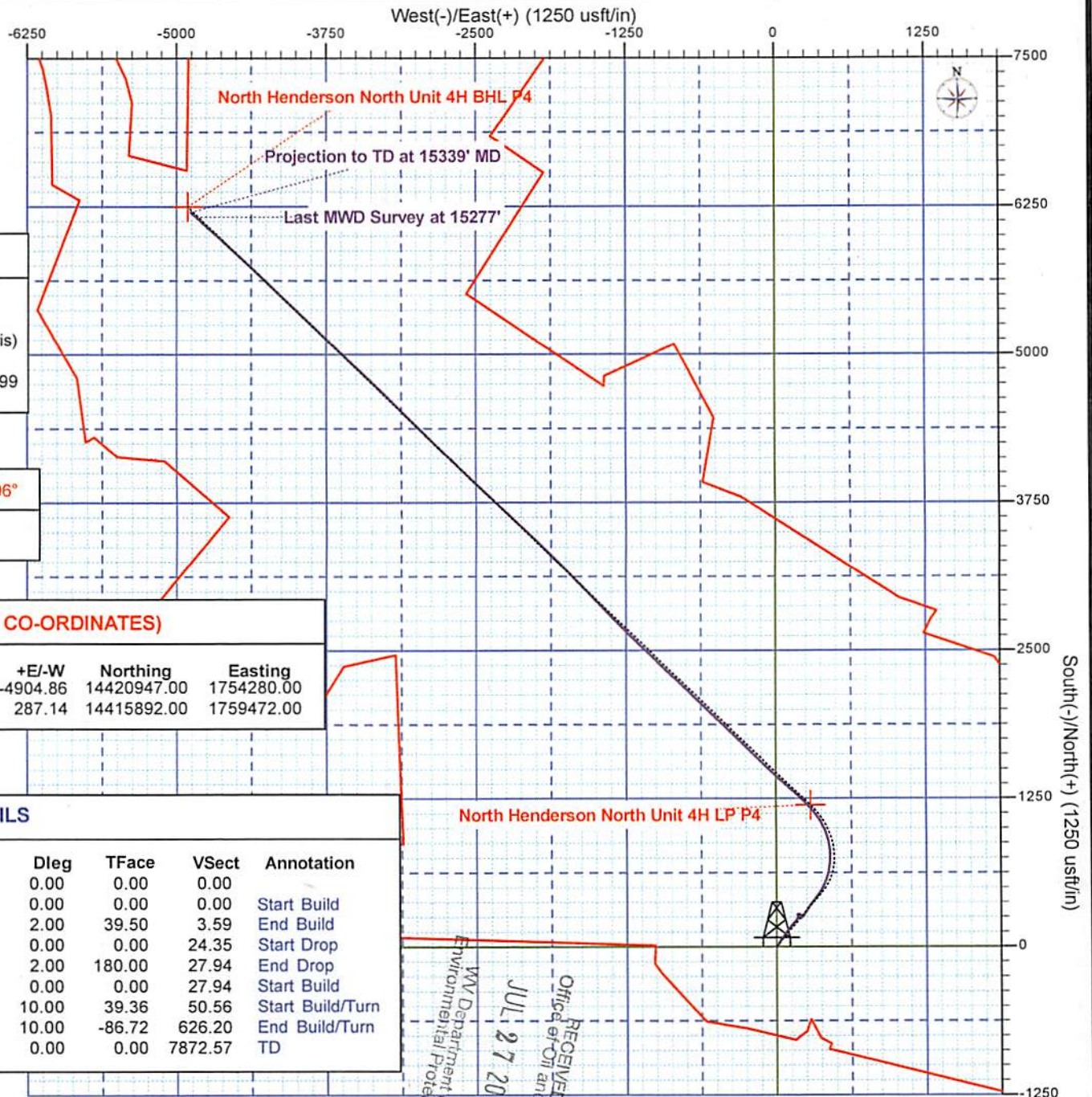
Magnetic Model: BGGM2014 Date: 17-Apr-15
Azimuths to Grid North

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
North Henderson North Unit 4H BHL P4	7402.00	6247.68	-4904.86	14420947.00	1754280.00
North Henderson North Unit 4H LP P4	7502.00	1192.68	287.14	14415892.00	1759472.00

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	Start Build
1300.00	10.00	39.50	1297.46	33.58	27.68	2.00	39.50	3.59	End Build
2750.00	10.00	39.50	2725.44	227.87	187.84	0.00	0.00	24.35	Start Drop
3250.00	0.00	0.00	3222.90	261.45	215.53	2.00	180.00	27.94	End Drop
6765.00	0.00	0.00	6737.90	261.45	215.53	0.00	0.00	27.94	Start Build
7341.23	57.62	39.36	7221.78	467.25	384.30	10.00	39.36	50.56	Start Build/Turn
8204.26	90.79	314.23	7502.00	1192.68	287.14	10.00	-86.72	626.20	End Build/Turn
15451.32	90.79	314.23	7402.00	6247.68	-4904.86	0.00	0.00	7872.57	TD



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Sperry Drilling

Statoil

Wetzel County WV (NAD 27 UTM 17N us ft)

North Henderson North Unit Pad

North Henderson North Unit 4H - Slot North Henderson 4H

Wellbore #1

Design: Surveys

Standard Survey Report

20 May, 2015

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Company:	Statoil	Local Co-ordinate Reference:	Well North Henderson North Unit 4H - Slot North Henderson 4H
Project:	Wetzel County WW (NAD 27 UTM 17N us ft)	TVD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Site:	North Henderson North Unit Pad	MD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Well:	North Henderson North Unit 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Project	Wetzel County WW (NAD 27 UTM 17N us ft)		
Map System:	Universal Transverse Mercator (US Survey Fee	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	North Henderson North Unit Pad				
Site Position:	Northing:	14,414,677.53 usft	Latitude:	39.693384	
From: Map	Easting:	1,759,189.60 usft	Longitude:	-80.577782	
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.27 °

Well	North Henderson North Unit 4H - Slot North Henderson 4H					
Well Position	+N/-S	0.00 usft	Northing:	14,414,699.32 usft	Latitude:	39.693444
	+E/-W	0.00 usft	Easting:	1,759,184.86 usft	Longitude:	-80.577799
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,342.80 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	4/17/2015	-8.69	67.08	52,326

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00		

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Survey Program	Date	5/20/2015				JUL 27 2018
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	WV Department of Environmental Protection	
88.00	642.00	MS Gyro (Wellbore #1)	NSG-CT_csg+cent	Continuous gyro in casing + centrollers		
708.00	15,339.00	Sperry MWD (Wellbore #1)	MWD+SC	Fixed:v2:standard dec & axial correction		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88.00	0.39	150.29	88.00	-0.26	0.15	-0.29	0.44	0.44	0.00	
181.00	0.24	142.19	181.00	-0.69	0.42	-0.78	0.17	-0.16	-8.71	
273.00	0.23	147.57	273.00	-1.00	0.64	-1.16	0.03	-0.01	5.85	
365.00	0.28	146.30	365.00	-1.34	0.87	-1.55	0.05	0.05	-1.38	
457.00	0.41	171.62	456.99	-1.85	1.04	-2.04	0.21	0.14	27.52	
549.00	0.47	184.75	548.99	-2.55	1.06	-2.54	0.13	0.07	14.27	

Company:	Statoil	Local Co-ordinate Reference:	Well North Henderson North Unit 4H - Slot North Henderson 4H
Project:	Wetzel County WV (NAD 27 UTM 17N us ft)	TVD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Site:	North Henderson North Unit Pad	MD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Well:	North Henderson North Unit 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
642.00	0.44	180.80	641.99	-3.29	1.02	-3.03	0.05	-0.03	-4.25	
708.00	0.28	166.31	707.99	-3.70	1.05	-3.34	0.28	-0.24	-21.95	
738.00	0.27	131.65	737.99	-3.82	1.12	-3.47	0.55	-0.03	-115.53	
769.00	0.48	115.33	768.99	-3.92	1.30	-3.67	0.75	0.68	-52.65	
861.00	0.79	67.65	860.98	-3.85	2.23	-4.28	0.64	0.34	-51.83	
892.00	0.99	60.56	891.98	-3.63	2.66	-4.44	0.74	0.65	-22.87	
923.00	1.38	57.89	922.97	-3.30	3.21	-4.61	1.27	1.26	-8.61	
954.00	1.76	50.92	953.96	-2.81	3.90	-4.75	1.37	1.23	-22.48	
984.00	2.18	45.66	983.94	-2.12	4.66	-4.82	1.52	1.40	-17.53	
1,015.00	2.81	39.71	1,014.91	-1.12	5.57	-4.77	2.19	2.03	-19.19	
1,046.00	3.54	35.35	1,045.86	0.25	6.61	-4.56	2.48	2.35	-14.06	
1,076.00	4.36	31.47	1,075.79	1.97	7.74	-4.17	2.87	2.73	-12.93	
1,107.00	5.21	29.92	1,106.68	4.20	9.06	-3.56	2.77	2.74	-5.00	
1,138.00	6.13	28.20	1,137.53	6.88	10.54	-2.76	3.02	2.97	-5.55	
1,169.00	6.97	27.26	1,168.33	10.01	12.18	-1.75	2.73	2.71	-3.03	
1,199.00	7.62	26.55	1,198.09	13.40	13.91	-0.61	2.19	2.17	-2.37	
1,230.00	8.12	26.15	1,228.79	17.21	15.79	0.69	1.62	1.61	-1.29	
1,322.00	9.58	28.15	1,319.70	29.79	22.27	4.83	1.62	1.59	2.17	
1,418.00	9.17	28.08	1,414.41	43.58	29.64	9.17	0.43	-0.43	-0.07	
1,512.00	8.39	31.91	1,507.31	56.01	36.79	12.71	1.04	-0.83	4.07	
1,608.00	8.53	39.88	1,602.27	67.42	45.05	14.75	1.23	0.15	8.30	
1,703.00	9.49	38.85	1,696.10	78.93	54.48	16.02	1.02	1.01	-1.08	
1,798.00	9.14	37.34	1,789.85	91.03	63.97	17.66	0.45	-0.37	-1.59	
1,894.00	10.66	35.56	1,884.41	104.31	73.76	19.91	1.61	1.58	-1.85	
1,990.00	10.15	32.22	1,978.84	118.69	83.44	23.01	0.82	-0.53	-3.48	RECEIVED
2,086.00	9.69	31.31	2,073.40	132.75	92.15	26.57	0.51	-0.48	-0.95	Office of Oil and Gas
2,181.00	10.23	34.34	2,166.97	146.55	101.06	29.81	0.79	0.57	3.19	JUL 27 2018
2,276.00	9.89	38.57	2,260.51	159.89	110.90	32.06	0.86	-0.36	4.45	WV Department of Environmental Protection
2,371.00	10.31	40.63	2,354.04	172.72	121.53	33.40	0.58	0.44	2.17	
2,467.00	11.03	41.82	2,448.38	186.09	133.24	34.33	0.78	0.75	1.24	
2,561.00	11.33	42.22	2,540.59	199.63	145.45	35.03	0.33	0.32	0.43	
2,656.00	10.01	41.53	2,633.95	212.72	157.19	35.75	1.40	-1.39	-0.73	
2,752.00	6.69	35.49	2,728.92	223.52	165.97	36.99	3.57	-3.46	-6.29	
2,817.00	5.42	29.23	2,793.56	229.28	169.67	38.36	2.20	-1.95	-9.63	
2,887.00	5.23	24.83	2,863.25	235.06	172.62	40.28	0.64	-0.27	-6.29	
2,949.00	4.84	21.16	2,925.02	240.07	174.75	42.24	0.82	-0.63	-5.92	
3,044.00	3.84	11.37	3,019.74	246.93	176.83	45.54	1.31	-1.05	-10.31	
3,139.00	3.07	2.29	3,114.57	252.59	177.56	48.96	0.99	-0.81	-9.56	
3,234.00	2.23	348.45	3,209.47	256.94	177.29	52.19	1.11	-0.88	-14.57	
3,329.00	1.95	341.55	3,304.41	260.28	176.41	55.15	0.40	-0.29	-7.26	
3,423.00	1.90	338.41	3,398.35	263.25	175.33	58.00	0.12	-0.05	-3.34	
3,518.00	1.80	350.00	3,493.30	266.18	174.49	60.64	0.41	-0.11	12.20	

Company:	Statoil	Local Co-ordinate Reference:	Well North Henderson North Unit 4H - Slot North Henderson 4H
Project:	Wetzel County WW (NAD 27 UTM 17N us ft)	TVD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Site:	North Henderson North Unit Pad	MD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Well:	North Henderson North Unit 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
3,614.00	2.40	41.33	3,589.25	269.18	175.55	61.97	1.98	0.62	53.47	
3,709.00	2.21	39.35	3,684.17	272.09	178.03	62.23	0.22	-0.20	-2.08	
3,804.00	1.55	29.74	3,779.12	274.62	179.83	62.70	0.77	-0.69	-10.12	
3,899.00	1.44	39.86	3,874.09	276.65	181.23	63.12	0.30	-0.12	10.65	
3,994.00	1.69	110.45	3,969.06	277.08	183.31	61.92	1.92	0.26	74.31	
4,089.00	1.55	108.23	4,064.02	276.19	185.84	59.49	0.16	-0.15	-2.34	
4,184.00	1.46	111.29	4,158.99	275.35	188.19	57.22	0.13	-0.09	3.22	
4,279.00	1.11	106.87	4,253.96	274.64	190.20	55.29	0.38	-0.37	-4.65	
4,375.00	0.75	100.52	4,349.95	274.25	191.70	53.94	0.39	-0.37	-6.61	
4,470.00	0.44	101.57	4,444.95	274.07	192.67	53.11	0.33	-0.33	1.11	
4,565.00	0.17	159.35	4,539.94	273.86	193.08	52.68	0.40	-0.28	60.82	
4,660.00	0.43	244.63	4,634.94	273.58	192.81	52.68	0.47	0.27	89.77	
4,755.00	0.77	251.92	4,729.94	273.23	191.88	53.10	0.37	0.36	7.67	
4,851.00	1.15	265.61	4,825.92	272.95	190.31	54.03	0.46	0.40	14.26	
4,945.00	0.84	251.43	4,919.91	272.66	188.71	54.97	0.42	-0.33	-15.09	
5,040.00	2.26	129.34	5,014.89	271.25	189.50	53.42	2.95	1.49	-128.52	
5,135.00	2.00	125.78	5,109.82	269.10	192.29	49.92	0.31	-0.27	-3.75	
5,231.00	1.85	130.88	5,205.77	267.10	194.82	46.71	0.24	-0.16	5.31	
5,326.00	1.52	142.19	5,300.73	265.10	196.76	43.93	0.49	-0.35	11.91	
5,421.00	1.59	147.23	5,395.69	263.00	198.24	41.40	0.16	0.07	5.31	
5,517.00	1.54	151.19	5,491.66	260.75	199.58	38.87	0.12	-0.05	4.12	
5,613.00	1.60	166.53	5,587.62	258.31	200.52	36.50	0.44	0.06	15.98	
5,708.00	1.91	174.26	5,682.58	255.45	200.99	34.17	0.41	0.33	8.14	
5,803.00	2.26	181.23	5,777.51	252.00	201.10	31.68	0.45	0.37	7.34	
5,898.00	2.78	194.82	5,872.42	247.90	200.47	29.27	0.83	0.55	14.31	
5,993.00	3.14	202.46	5,967.29	243.27	198.89	27.18	0.56	0.38	8.04	
6,089.00	1.41	218.13	6,063.22	239.91	197.16	26.08	1.90	-1.80	16.32	
6,182.00	0.52	213.25	6,156.20	238.66	196.22	25.87	0.96	-0.96	-5.25	
6,278.00	2.13	57.75	6,252.18	239.25	197.49	25.37	2.72	1.68	-161.98	
6,372.00	2.77	63.19	6,346.10	241.20	200.99	24.23	0.72	0.68	5.79	
6,468.00	3.49	57.73	6,441.95	243.81	205.54	22.79	0.81	0.75	-5.69	
6,562.00	4.52	49.53	6,535.72	247.74	210.77	21.78	1.25	1.10	-8.72	
6,664.00	5.25	53.24	6,637.35	253.14	217.57	20.68	0.78	0.72	3.64	
6,758.00	7.64	30.01	6,730.77	261.13	224.14	21.54	3.71	2.54	-24.71	
6,854.00	12.50	33.92	6,825.26	275.29	233.14	24.97	5.11	5.06	4.07	
6,949.00	17.97	32.67	6,916.89	296.17	246.79	29.75	5.77	5.76	-1.32	
7,044.00	27.73	32.77	7,004.33	327.16	266.72	37.10	10.27	10.27	0.11	
7,139.00	38.39	35.23	7,083.84	369.97	295.78	46.13	11.31	11.22	2.59	
7,235.00	48.93	37.24	7,153.19	423.28	334.99	55.22	11.07	10.98	2.09	
7,330.00	54.35	30.76	7,212.17	485.04	376.46	68.59	7.82	5.71	-6.82	
7,424.00	58.61	21.65	7,264.14	555.29	410.86	92.94	9.26	4.53	-9.69	

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Survey Report

Company:	Statoil	Local Co-ordinate Reference:	Well North Henderson North Unit 4H - Slot North Henderson 4H
Project:	Wetzel County WV (NAD 27 UTM 17N us ft)	TVD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Site:	North Henderson North Unit Pad	MD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Well:	North Henderson North Unit 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
7,519.00	64.77	11.74	7,309.26	635.28	434.63	131.70	11.23	6.48	-10.43	
7,614.00	66.68	4.28	7,348.36	720.95	446.64	182.85	7.43	2.01	-7.85	
7,709.00	67.79	355.79	7,385.17	808.45	446.67	243.87	8.32	1.17	-8.94	
7,805.00	72.19	346.56	7,418.08	897.43	432.75	315.91	10.13	4.58	-9.61	
7,900.00	75.20	337.56	7,444.80	984.04	404.65	396.46	9.63	3.17	-9.47	
7,995.00	81.95	327.35	7,463.65	1,066.40	361.59	484.76	12.70	7.11	-10.75	
8,091.00	86.57	321.58	7,473.26	1,144.06	306.10	578.70	7.67	4.81	-6.01	
8,186.00	88.66	314.77	7,477.22	1,214.74	242.84	673.33	7.49	2.20	-7.17	
8,282.00	90.40	313.64	7,478.01	1,281.67	174.03	769.32	2.16	1.81	-1.18	
8,376.00	90.17	312.64	7,477.54	1,345.94	105.44	863.30	1.09	-0.24	-1.06	
8,471.00	90.24	311.50	7,477.20	1,409.60	34.92	958.23	1.20	0.07	-1.20	
8,566.00	90.87	314.02	7,476.28	1,474.09	-34.82	1,053.19	2.73	0.66	2.65	
8,661.00	90.54	313.42	7,475.11	1,539.74	-103.48	1,148.17	0.72	-0.35	-0.63	
8,753.00	90.60	315.40	7,474.19	1,604.11	-169.19	1,240.16	2.15	0.07	2.15	
8,845.00	90.47	314.92	7,473.33	1,669.34	-234.06	1,332.15	0.54	-0.14	-0.52	
8,937.00	90.07	314.97	7,472.90	1,734.33	-299.17	1,424.14	0.44	-0.43	0.05	
9,029.00	89.90	314.60	7,472.92	1,799.14	-364.47	1,516.14	0.44	-0.18	-0.40	
9,122.00	91.58	312.97	7,471.72	1,863.49	-431.60	1,609.12	2.52	1.81	-1.75	
9,214.00	91.11	313.30	7,469.56	1,926.37	-498.72	1,701.08	0.62	-0.51	0.36	
9,306.00	91.58	315.24	7,467.40	1,990.57	-564.58	1,793.05	2.17	0.51	2.11	
9,398.00	91.61	314.39	7,464.84	2,055.39	-629.81	1,885.00	0.92	0.03	-0.92	
9,490.00	91.34	314.41	7,462.48	2,119.73	-695.52	1,976.97	0.29	-0.29	0.02	
9,583.00	91.17	314.47	7,460.44	2,184.83	-761.91	2,069.95	0.19	-0.18	0.06	
9,675.00	90.97	314.33	7,458.72	2,249.19	-827.63	2,161.93	0.27	-0.22	-0.15	
9,767.00	90.94	313.47	7,457.19	2,312.97	-893.91	2,253.92	0.94	-0.03	-0.93	
9,859.00	91.04	314.76	7,455.60	2,377.01	-959.95	2,345.90	1.41	0.11	1.40	
9,951.00	90.47	314.08	7,454.39	2,441.39	-1,025.65	2,437.89	0.96	-0.62	-0.74	
10,045.00	89.97	313.58	7,454.02	2,506.49	-1,093.46	2,531.89	0.75	-0.53	-0.53	
10,139.00	89.80	313.79	7,454.21	2,571.41	-1,161.44	2,625.89	0.29	-0.18	0.22	
10,234.00	90.54	315.76	7,453.93	2,638.32	-1,228.87	2,720.88	2.22	0.78	2.07	
10,330.00	90.84	315.88	7,452.77	2,707.16	-1,295.77	2,816.83	0.34	0.31	0.12	
10,424.00	91.14	316.26	7,451.15	2,774.85	-1,360.97	2,910.77	0.52	0.32	0.40	
10,519.00	91.17	316.05	7,449.24	2,843.35	-1,426.77	3,005.70	0.22	0.03	-0.22	
10,615.00	91.08	316.42	7,447.35	2,912.67	-1,493.16	3,101.62	0.40	-0.09	0.39	
10,710.00	90.67	316.08	7,445.90	2,981.28	-1,558.85	3,196.55	0.56	-0.43	-0.36	
10,806.00	90.87	316.51	7,444.61	3,050.67	-1,625.17	3,292.48	0.49	0.21	0.45	
10,901.00	90.60	316.77	7,443.39	3,119.74	-1,690.39	3,387.38	0.39	-0.28	0.27	
10,997.00	89.50	315.30	7,443.31	3,188.83	-1,757.03	3,483.33	1.91	-1.15	-1.53	
11,092.00	89.46	314.85	7,444.17	3,256.09	-1,824.12	3,578.32	0.48	-0.04	-0.47	
11,187.00	90.84	314.56	7,443.92	3,322.92	-1,891.63	3,673.31	1.48	1.45	-0.31	
11,283.00	90.57	315.34	7,442.74	3,390.74	-1,959.57	3,769.30	0.86	-0.28	0.81	
11,378.00	89.46	313.22	7,442.72	3,457.06	-2,027.58	3,864.29	2.52	-1.17	-2.23	

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WV Department of Environmental Protection

Company:	Statoil	Local Co-ordinate Reference:	Well North Henderson North Unit 4H - Slot North Henderson 4H
Project:	Wetzel County VW (NAD 27 UTM 17N us ft)	TVD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Site:	North Henderson North Unit Pad	MD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Well:	North Henderson North Unit 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
11,473.00	89.46	313.45	7,443.61	3,522.25	-2,096.67	3,959.27	0.24	0.00	0.24	
11,569.00	89.66	313.54	7,444.35	3,588.32	-2,166.31	4,055.26	0.23	0.21	0.09	
11,664.00	89.60	313.83	7,444.96	3,653.94	-2,235.01	4,150.26	0.31	-0.06	0.31	
11,758.00	89.46	313.14	7,445.73	3,718.62	-2,303.21	4,244.24	0.75	-0.15	-0.73	
11,852.00	90.84	313.19	7,445.49	3,782.93	-2,371.77	4,338.23	1.47	1.47	0.05	
11,946.00	90.84	314.11	7,444.11	3,847.80	-2,439.78	4,432.21	0.98	0.00	0.98	
12,041.00	91.08	314.40	7,442.52	3,914.09	-2,507.81	4,527.20	0.40	0.25	0.31	
12,136.00	90.81	314.27	7,440.95	3,980.47	-2,575.75	4,622.18	0.32	-0.28	-0.14	
12,232.00	90.94	314.12	7,439.48	4,047.39	-2,644.57	4,718.17	0.21	0.14	-0.16	
12,327.00	91.14	313.58	7,437.76	4,113.19	-2,713.07	4,813.15	0.61	0.21	-0.57	
12,422.00	91.11	314.64	7,435.89	4,179.30	-2,781.27	4,908.13	1.12	-0.03	1.12	
12,518.00	91.01	314.54	7,434.12	4,246.68	-2,849.62	5,004.12	0.15	-0.10	-0.10	
12,613.00	90.64	314.91	7,432.75	4,313.53	-2,917.11	5,099.10	0.55	-0.39	0.39	
12,709.00	90.54	314.70	7,431.76	4,381.17	-2,985.22	5,195.09	0.24	-0.10	-0.22	
12,804.00	91.11	315.55	7,430.39	4,448.49	-3,052.24	5,290.07	1.08	0.60	0.89	
12,899.00	91.17	315.40	7,428.50	4,516.20	-3,118.85	5,385.03	0.17	0.06	-0.16	
12,995.00	88.59	314.01	7,428.70	4,583.73	-3,187.07	5,481.01	3.05	-2.69	-1.45	
13,089.00	88.66	314.96	7,430.96	4,649.58	-3,254.11	5,574.99	1.01	0.07	1.01	
13,185.00	90.70	313.95	7,431.50	4,716.80	-3,322.63	5,670.98	2.37	2.12	-1.05	
13,282.00	90.67	314.08	7,430.34	4,784.20	-3,392.38	5,767.97	0.14	-0.03	0.13	
13,378.00	90.87	313.66	7,429.05	4,850.72	-3,461.59	5,863.96	0.48	0.21	-0.44	
13,474.00	90.30	313.52	7,428.07	4,916.91	-3,531.11	5,959.95	0.61	-0.59	-0.15	
13,569.00	90.97	314.02	7,427.01	4,982.62	-3,599.71	6,054.94	0.88	0.71	0.53	
13,664.00	91.24	314.00	7,425.18	5,048.62	-3,668.02	6,149.92	0.28	0.28	-0.02	
13,759.00	91.28	314.40	7,423.09	5,114.83	-3,736.11	6,244.90	0.42	0.04	0.42	
13,854.00	91.08	314.82	7,421.14	5,181.53	-3,803.73	6,339.87	0.49	-0.21	-0.44	
13,949.00	91.57	314.73	7,418.94	5,248.42	-3,871.15	6,434.84	0.52	0.52	-0.99	
14,045.00	89.93	314.05	7,417.68	5,315.57	-3,939.74	6,530.83	1.85	-1.71	-0.71	
14,141.00	89.53	314.53	7,418.14	5,382.61	-4,008.46	6,626.83	0.65	-0.42	0.50	
14,235.00	89.30	313.95	7,419.10	5,448.18	-4,075.80	6,720.82	0.66	-0.24	-0.62	
14,329.00	88.96	313.90	7,420.52	5,513.39	-4,143.49	6,814.81	0.37	-0.36	-0.05	
14,422.00	90.40	313.65	7,421.04	5,577.72	-4,210.64	6,907.80	1.57	1.55	-0.27	
14,517.00	90.47	313.63	7,420.32	5,643.28	-4,279.39	7,002.80	0.08	0.07	-0.02	
14,612.00	90.74	313.71	7,419.32	5,708.88	-4,348.10	7,097.79	0.30	0.28	0.08	
14,707.00	90.60	312.71	7,418.21	5,773.92	-4,417.34	7,192.76	1.06	-0.15	-1.05	
14,802.00	90.23	312.61	7,417.52	5,838.29	-4,487.20	7,287.73	0.40	-0.39	-0.11	
14,898.00	90.24	312.23	7,417.12	5,903.05	-4,558.07	7,383.68	0.40	0.01	-0.40	
14,993.00	90.47	313.27	7,416.54	5,967.53	-4,627.83	7,478.64	1.12	0.24	1.09	
15,087.00	90.74	313.32	7,415.54	6,031.99	-4,696.24	7,572.62	0.29	0.29	0.05	
15,182.00	90.77	312.85	7,414.29	6,096.88	-4,765.61	7,667.60	0.50	0.03	-0.49	
15,277.00	90.74	312.71	7,413.04	6,161.39	-4,835.34	7,762.56	0.15	-0.03	-0.15	

Last MWD Survey at 15277'

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Survey Report

Company:	Statoil	Local Co-ordinate Reference:	Well North Henderson North Unit 4H - Slot North Henderson 4H
Project:	Wetzel County WV (NAD 27 UTM 17N us ft)	TVD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Site:	North Henderson North Unit Pad	MD Reference:	GL 1342.8' + KB 22' @ 1364.80usft (Orion Polaris)
Well:	North Henderson North Unit 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,339.00	90.64	312.43	7,412.29	6,203.33	-4,880.99	7,824.53	0.48	-0.16	-0.45
Projection to TD at 15339' MD									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
450.00		13 3/8"	13.375	17.500	
673.00	672.99	9 5/8"	9.625	12.250	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
15,277.00	7,413.04	6,161.39	-4,835.34	Last MWD Survey at 15277'	
15,339.00	7,412.29	6,203.33	-4,880.99	Projection to TD at 15339' MD	

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/16/2018
Job End Date:	4/30/2018
State:	West Virginia
County:	Wetzel
API Number:	47-103-03068-00-00
Operator Name:	EQT Production
Well Name and Number:	516126
Latitude:	39.69344400
Longitude:	-80.57779900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,274
Total Base Water Volume (gal):	12,280,716
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
Water	FTS International, U.S. Well Services	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	85.93905	None
WFRA-405	U.S. Well Services	Friction Reducer					

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			Water	7732-18-5	15.00000	0.00006	None
Other Chemical (s)	Listed Above	See Trade Name (s) List					
			Water	7732-18-5	15.00000	0.00006	
BioClear 5000	U.S. Well Services	Biocide					
				Listed Below			
AP One	U.S. Well Services	Gel Breaker					
				Listed Below			
CS-500-SI	FTS International	Scale Inhibitor					
				Listed Below			
SI 1200s	U.S. Well Services	Scale Inhibitor					
				Listed Below			
FRW-600	FTS International, U.S. Well Services	Friction Reducer					
				Listed Below			
Sand (Proppant)	FTS International, U.S. Well Services	Proppant					
				Listed Below			
DireCT	Newark Drilling Fluids	Lubricant					

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				Listed Below			
CI-150	FTS International, U.S. Well Services	Acid Corrosion Inhibitor					
				Listed Below			
AI-303	U.S. Well Services	Acid Corrosion Inhibitor					
				Listed Below			
MC MX 8-4543	Multi-Chem Group, LLC	Bacteria Treatment					
				Listed Below			
HVG-1	FTS International, U.S. Well Services	Gelling Agent					
				Listed Below			
Silver 7500 Pipe On Pipe	Silverback Chemical	Friction Reducer					
				Listed Below			
MC MX 5-3886	Multi-Chem Group, LLC	Bacteria Treatment					
				Listed Below			
LT Flush System I	U.S. Well Services	Flush Agent					
				Listed Below			

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APB-1	FTS International, U.S. Well Services	Gel Breaker					
				Listed Below			
Hydrochloric Acid (15%)	FTS International, U.S. Well Services	Acidizing					
				Listed Below			
LGC-15	U.S. Well Services	Water Gelling Agent					
				Listed Below			

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

			Silica Substrate	14808-60-7	100.00000	13.79234	None
			Hydrochloric Acid	7647-01-0	15.00000	0.02353	None
			2-Propenoic Acid, Polymer With 2-Propenamide	9003-06-9	30.00000	0.01728	None
			Hydrotreated Light Distillate (Petroleum)	64742-47-8	30.00000	0.01728	
			Hydrotreated Light Distillate (Petroleum)	64742-47-8	30.00000	0.01728	None
			2-Propenoic Acid, Polymer With 2-Propenamide	9003-06-9	30.00000	0.01728	
			Hydrotreated Light Distillate (Petroleum)	64742-47-8	100.00000	0.00484	None
			Hydrotreated Light Distillate (Petroleum)	64742-47-8	100.00000	0.00484	
			Calcium Nitrate.4H2O	13477-34-4	100.00000	0.00308	None
			Petroleum Distillates	64742-47-8	25.00000	0.00160	None
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	10.00000	0.00125	None
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	10.00000	0.00125	

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		Ammonia	7664-41-7	5.00000	0.00109	None
		Alkyl Phosphonic Acid	Proprietary	5.00000	0.00109	
		Alkyl Phosphonic Acid	Proprietary	5.00000	0.00109	None
		Ammonia	7664-41-7	5.00000	0.00109	
		Ammonium Acetate	631-61-8	10.00000	0.00064	None
		Petroleum Distillates	64742-47-8	60.00000	0.00047	
		Petroleum Distillates	64742-47-8	60.00000	0.00047	None
		Ethoxylated Alcohols	68002-97-1	3.60000	0.00023	None
		Ethoxylated Alcohols	68551-12-2	3.60000	0.00023	None
		Ethoxylated Alcohols	68439-50-9	3.60000	0.00023	None
		Proprietary	Proprietary	100.00000	0.00020	None
		Ethylene Glycol	107-21-1	10.00000	0.00020	None
		Lubricating Oils (Petroleum), C20-50, Hydrotreated Neutral Oil- Based	72623-87-1	45.00000	0.00019	
		Lubricating Oils (Petroleum), C20-50, Hydrotreated Neutral Oil- Based	72623-87-1	45.00000	0.00019	None
		Proprietary	Proprietary	40.00000	0.00017	None
		Proprietary	Proprietary	40.00000	0.00017	
		Ammonium Persulfate	7727-54-0	100.00000	0.00014	None
		Ammonium Persulfate	7727-54-0	100.00000	0.00014	
		Benzensulfonic Acid, Dodecyl-, Compound With 2-Aminoethanol (1:1)	26836-07-7	7.00000	0.00013	None
		2,2,4-Trimethylpentane- 1,3-Diol Monoisobutyrate	25265-77-4	7.00000	0.00013	None
		Benzensulfonic Acid, Dodecyl-, Compound With 2-Aminoethanol (1:1)	26836-07-7	7.00000	0.00013	
		2,2,4-Trimethylpentane- 1,3-Diol Monoisobutyrate	25265-77-4	7.00000	0.00013	
		Proprietary	Proprietary	15.00000	0.00006	None

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			Proprietary	Proprietary	15.00000	0.00006	
			Petroleum Distillate	64742-47-8	55.00000	0.00004	None
			Guar Gum	9000-30-0	50.00000	0.00004	None
			Ammonium Persulfate	7727-54-0	95.00000	0.00003	
			Ammonium Persulfate	7727-54-0	95.00000	0.00003	None
			Proprietary	Proprietary	5.00000	0.00002	None
			Proprietary	Proprietary	5.00000	0.00002	
			Organic Amine Resin Salt	Proprietary	30.00000	0.00001	None
			Isopropanol	67-63-0	30.00000	0.00001	None
			Ethylene Glycol	107-21-1	30.00000	0.00001	None
			Dimethylformamide	68-12-2	10.00000	0.00000	None
			Aromatic Aldehyde	Proprietary	10.00000	0.00000	None
			Quaternary Ammonium Compound	Proprietary	10.00000	0.00000	None
			Proprietary	Proprietary	1.00000	0.00000	
			Proprietary	Proprietary	1.00000	0.00000	None
			Ethylene Glycol	107-21-1	40.00000	0.00000	
			Ethylene Glycol	107-21-1	40.00000	0.00000	None
			Surfactant	68439-51-0	2.00000	0.00000	None
			Surfactant	68439-51-0	2.00000	0.00000	
			Clay	14808-60-7	2.00000	0.00000	
			Clay	14808-60-7	2.00000	0.00000	None
			Butyl Cellosolve	111-76-2	20.00000	0.00000	None
			Formic Acid	64-18-6	20.00000	0.00000	None
			Cinnamaldehyde	104-55-2	20.00000	0.00000	None
			Cinnamaldehyde	104-55-2	20.00000	0.00000	
			Formic Acid	64-18-6	20.00000	0.00000	
			Butyl Cellosolve	111-76-2	20.00000	0.00000	
			Polyether	Proprietary	10.00000	0.00000	
			Polyether	Proprietary	10.00000	0.00000	None
			Acetophenone, Thiourea, Formaldehyde Polymer	68527-49-1	5.00000	0.00000	

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			Acetophenone, Thiourea, Formaldehyde Polymer	68527-49-1	5.00000	0.00000	None
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* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%
 *** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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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Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 516126

API: 47 - 103 - 03068

Submission: Initial Amended

Notes: Please Note that stimulation operations for this well were performed by (2) separate vendors:

(1) FTS International
(2/14/2018-2/18/2018)

(2) U.S. Well Services
(4/22/2018-4/30/2018)

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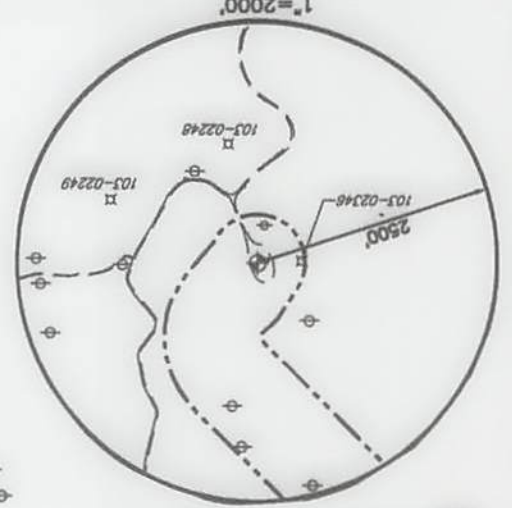
WELL OPERATOR: EOT PRODUCTION COMPANY
 ADDRESS: 115 PROFESSIONAL PL. P.O. BOX 280
 CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330
 DESIGNATED AGENT: REX C. RAY
 TARGET FORMATION: MARCELLUS
 ESTIMATED DEPTH: 7,478'
 CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY) AS-DRILLED
 DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORMATE NEW FORMATION
 SURFACE OWNER: HOWARD HENDERSON
 OIL & GAS ROYALTY OWNER: MAXINE HENDERSON
 ACREAGE: 125.4
 DISTRICT: CENTER COUNTY: WETZEL QUADRANGLE: LITTLETON
 WATERSHED: LOWER WEST VIRGINIA FORK FISH CREEK
 ELEVATION: 1342.80 (AS-DRILLED) SHALLOW STORAGE LIQUID INJECTION GAS DEEP PRODUCTION WASTE DISPOSAL OIL

UNITED STATES TOPOGRAPHIC MAPS
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25034
 W/DEP
 DATE: JULY 5, 2017
 SCALE: 1"=2000'
 NORTH HENDERSON NORTH UNIT
 OPERATOR'S WELL #: 4H AS-DRILLED
 API WELL #: 47 STATE 103 COUNTY 03068
 ELEVATION: (NAVD 88, US FT)
 SOURCE OF SURVEY GRADE GPS
 MIN. DEGREE OF ACCURACY: 1/200

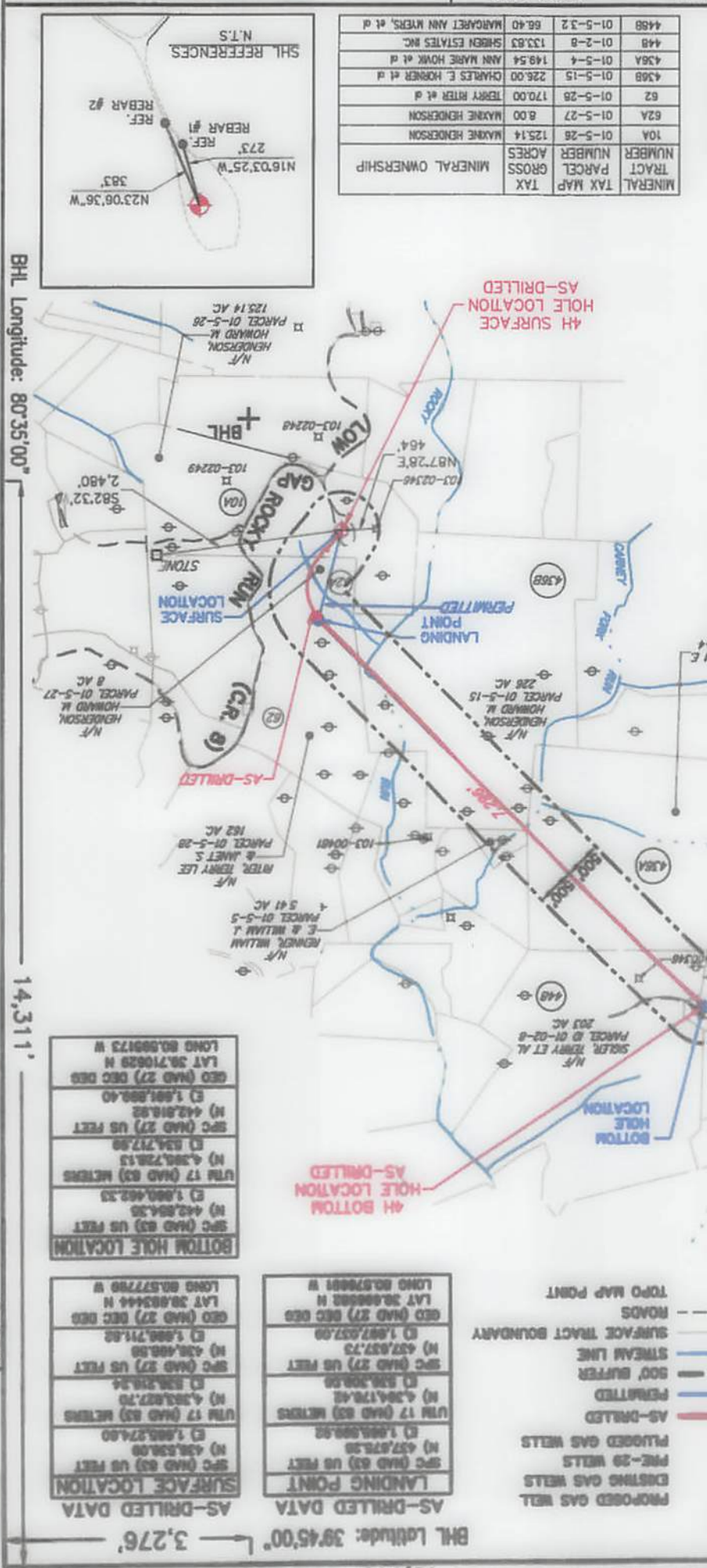


I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
 P.S. 2241

MINERAL TAX MAP	TRACT NUMBER	GROSS ACRES	MINERAL OWNERSHIP
448B	01-5-26	125.14	MAXINE HENDERSON
62A	01-5-27	8.00	MAXINE HENDERSON
62	01-5-26	170.00	TERRY HINTER & P
436B	01-5-15	226.00	CHARLES E. HONOR & P
436A	01-5-4	149.54	ANN MARE HOKK & P
448	01-2-8	133.83	SHREN ESTATES INC
448B	01-5-32	66.40	MARGARET ANN WERS, et al



- GENERAL NOTES:
1. THE BOUNDARY LINES SHOWN HEREON ARE BASED ON RECORD DEED, PLATS, AND TAX MAPS BEST FIT TO FOUND FIELD EVIDENCE AND AERIAL PHOTOS. THIS PLAT DOES NOT REPRESENT AN ACTUAL BOUNDARY SURVEY OF THE INDIVIDUAL PARCELS.
 2. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' OF PROPOSED WELL.
 3. THERE ARE NO EXISTING OCCUPIED DWELLINGS, BUILDINGS OR RAILROADS WITHIN 625' OF PROPOSED WELL.
 4. THE PROPOSED WELL IS GREATER THAN 100' FROM PERENNIAL STREAM, WETLAND, POND, RESERVOIR OR LAKE. THERE ARE NO NATIVE TROUT STREAMS WITHIN 300' OF PROPOSED WELL.



NORTH HENDERSON NORTH 4H
 NORTH HENDERSON
 EOT PRODUCTION COMPANY

- LEGEND
- PROPOSED GAS WELL
 - EXISTING GAS WELLS
 - PRE-29 WELLS
 - PLUGGED GAS WELLS
 - AS-DRILLED
 - PERMITTED
 - 300' BUFFER
 - STREAM LINE
 - SURFACE TRACT BOUNDARY
 - ROADS
 - TOPO MAP POINT

BOTTOM HOLE LOCATION

SFC (GRID 63) US FEET	(N) 442,854.35
UTM 17 (GRID 63) METERS	(E) 1,089,462.33
SFC (GRID 27) US FEET	(N) 438,278.13
SFC (GRID 27) US FEET	(E) 524,272.88
(N) 442,854.35	
(E) 1,089,462.33	
LONG 80.599173 W	
LAT 39.710629 N	
GRID (GRID 27) DEC DEG	(E) 1,089,462.33
LONG 80.599173 W	

SURFACE LOCATION

SFC (GRID 63) US FEET	(N) 438,278.13
UTM 17 (GRID 63) METERS	(E) 524,272.88
SFC (GRID 27) US FEET	(N) 438,278.13
SFC (GRID 27) US FEET	(E) 524,272.88
(N) 438,278.13	
(E) 524,272.88	
LONG 80.577789 W	
LAT 39.693444 N	
GRID (GRID 27) DEC DEG	(E) 1,089,462.33
LONG 80.577789 W	

AS-DRILLED DATA

SFC (GRID 63) US FEET	(N) 437,875.28
UTM 17 (GRID 63) METERS	(E) 1,089,999.98
SFC (GRID 27) US FEET	(N) 437,875.28
SFC (GRID 27) US FEET	(E) 527,957.09
(N) 437,875.28	
(E) 1,089,999.98	
LONG 80.578881 W	
LAT 39.688888 N	
GRID (GRID 27) DEC DEG	(E) 1,089,999.98
LONG 80.578881 W	

BHL Longitude: 80°35'00"
 SHL Longitude: 80°32'30"
 14,311'
 5,394'
 3,276'
 10,113'

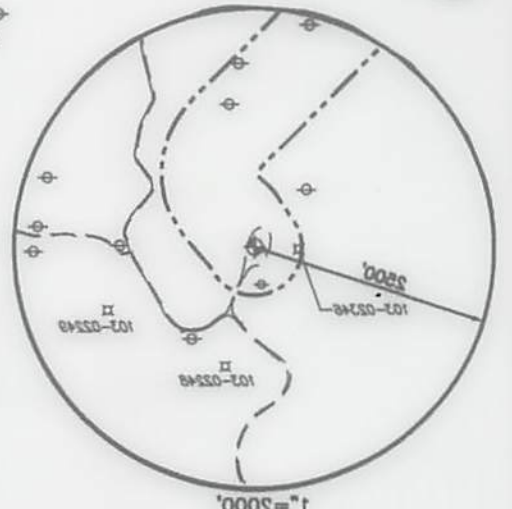
CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330
 ADDRESS: 115 PROFESSIONAL PL. P.O. BOX 280
 DESIGNATED AGENT: REX C. RAY

WELL OPERATOR: EOT PRODUCTION COMPANY
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 TARGET FORMATION: MARCELLUS
 CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY) AS-DRILLED
 DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION
 OIL & GAS ROYALTY OWNER: MAXINE HENDERSON
 SURFACE OWNER: HOWARD HENDERSON
 DISTRICT: CENTER COUNTY: WETZEL QUADRANGLE: LITTLETON
 WATERSHED: LOWER WEST VIRGINIA FORK FISH CREEK
 WELLS: OIL WASTE DISPOSAL PRODUCTION DEEP GAS LIQUID INJECTION STORAGE SHALLOW

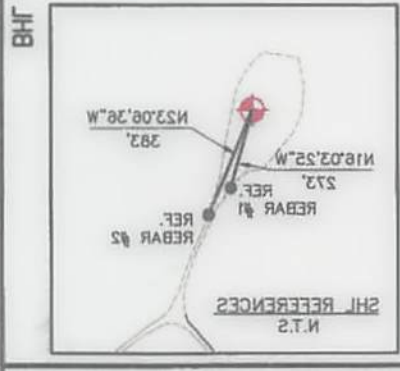
CHARLESTON, WV 25034
 OFFICE OF OIL & GAS
 601 57TH STREET
 WDEP
 UNITED STATES TOPOGRAPHIC MAPS
 SCALE: 1"=2000'
 DATE: JULY 5, 2017
 OPERATOR'S WELL #: 47 103 03068
 STATE COUNTY PERMIT
 ELEVATION: (NAD 88 US FT) SOURCE OF SURVEY GRADE GPS
 ACCURACY: 1/200
 MIN. DEGREE OF
 SCALE: 1"=5000'
 DATE: JULY 5, 2017
 NORTH HENDERSON NORTH UNIT



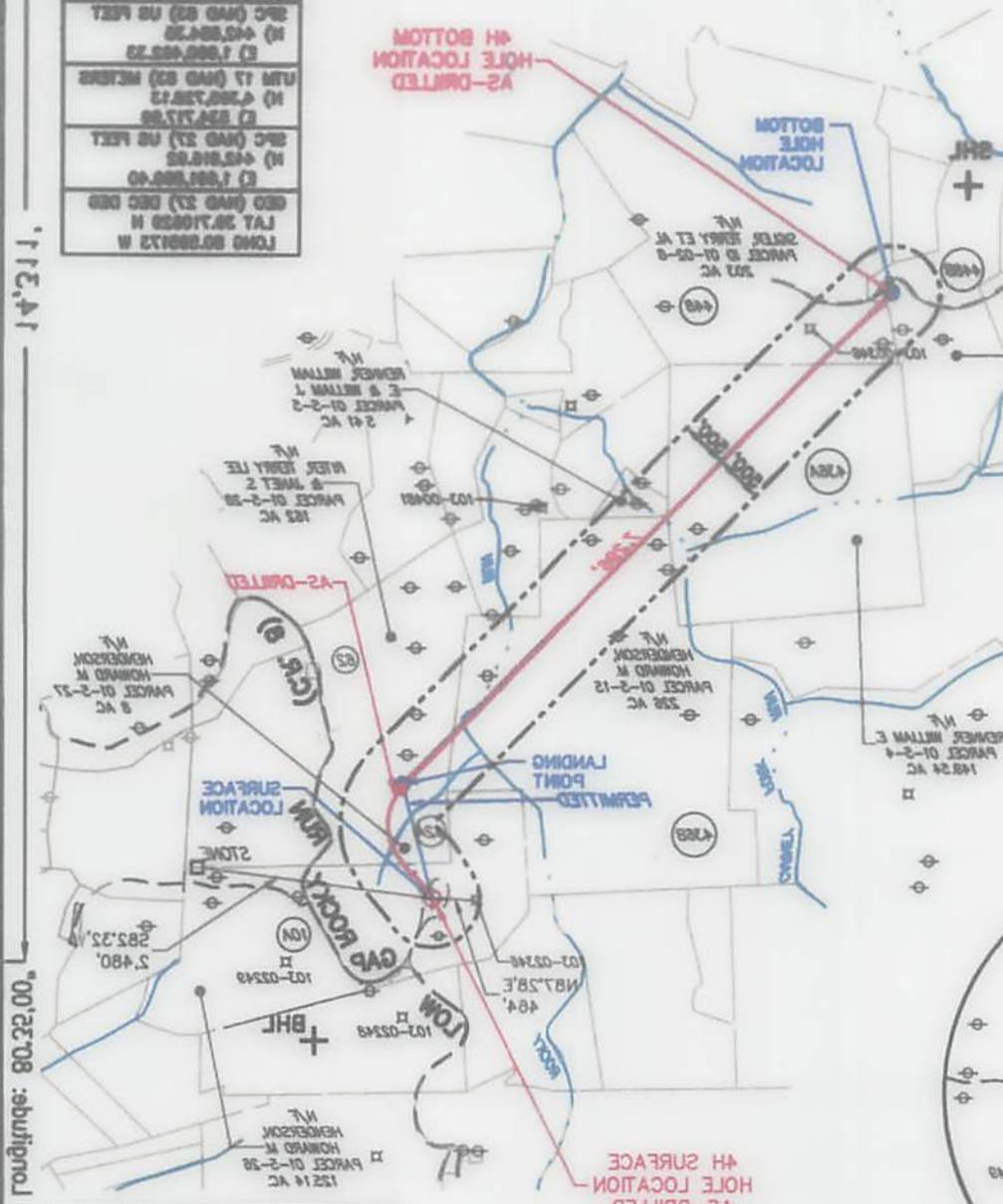
P. 2. 2241
 I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



- GENERAL NOTES**
1. THE BOUNDARY LINES SHOWN HEREON ARE BASED ON RECORD DEED, PLATS AND TAX MAPS BEST FIT TO FOUND FIELD EVIDENCE AND AERIAL PHOTOS. THIS PLAT DOES NOT REPRESENT AN ACTUAL BOUNDARY SURVEY OF THE INDIVIDUAL PARCELS.
 2. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 200' OF PROPOSED WELL.
 3. THERE ARE NO EXISTING OCCUPIED DWELLINGS, BUILDINGS OR RAILROADS WITHIN 825' OF PROPOSED WELL.
 4. THE PROPOSED WELL IS GREATER THAN 100' FROM PERENNIAL STREAM, WETLAND, POND, RESERVOIR OR LAKE. THERE ARE NO NATIVE TROUT STREAMS WITHIN 200' OF PROPOSED WELL.



MINERAL TRACT NUMBER	TAX MAP NUMBER	TAX PARCEL GROSS ACRES	MINERAL OWNERSHIP
448B 01-2-23	06-40	12.14	MARGARET ANN WELER, et al
428A 01-2-4	149-24	1.92-4	SHIBEN ESTATES INC
428B 01-2-12	328-00	328.00	CHARLES E. HOPPER, et al
82 01-2-28	170-00	170.00	TERRY RITZ, et al
82A 01-2-27	8.00	8.00	MAXINE HENDERSON
10A 01-2-28	12.14	12.14	MAXINE HENDERSON



AS-DRILLED DATA

LONG 88.2739 W	DEC 880	(E) 1.981,978.9	SFC (NAD 83) US FEET
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