

**APPROVED**

NAME: *John A. [Signature]*

DATE: *2/10/2016*

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513136

API: 47 - 017 - 05951

Submission:  Initial  Amended

Notes: Correction to Production Cement Top (MD)

RECEIVED  
Office of Oil and Gas

DEC 21 2015

WV Department of  
Environmental Protection

04/01/2016  
AX 04/01/16

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

API 47 - 017 - 05951 County Doddridge District 8  
Quad Oxford Pad Name OXF149 Field/Pool Name \_\_\_\_\_  
Farm name Harper, Lucy E. Well Number 513136  
Operator (as registered with the OOG) EQT Production Company  
Address 625 Liberty Ave. EQT Plaza, 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 4,341,363 Easting 517,206  
Landing Point of Curve Northing 4,341,271 Easting 517,575  
Bottom Hole Northing 4,340,510 Easting 517,946

Elevation (ft) 1240 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)  
Water base Mud 11.5 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide.  
partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose.

Date permit issued 01/21/2014 Date drilling commenced 7/10/2014 Date drilling ceased 11/27/2014  
Date completion activities began 5/4/2015 Date completion activities ceased 5/8/2015  
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 287', 326', 393', 438' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft NA Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 642 Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by: \_\_\_\_\_

04/01/2016

API 47-017 - 05951 Farm name Harper, Lucy E. Well number 513136

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	24	20	40	New	MC-50, 81 #/ft	N/A	Yes
Surface	17-1/2	13-3/8	943	New	J-55, 54.5 #/ft	416	Yes
Coal							
Intermediate 1	12-3/8	9-5/8	3116	New	A-500, 40 #/ft	1,381	Yes
Intermediate 2							
Intermediate 3							
Production	8-1/2	5-1/2	10416	New	P-110, 20#/ft	N/A	No
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	38	15.6	1.18	18.4	Surface	8
Surface	Class A	752	15.6	1.20	902	Surface	8
Coal							
Intermediate 1	Class A / Class A	895 / 228 / 1123	15.6 / 15.6	1.18 / 1.18	1056/269/1257	Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A / Class H	570 / 430 / 1000	14.2 / 15.2	1.26 / 1.97	1565.3	3,808'	72
Tubing							

Drillers TD (ft) 10,425' Loggers TD (ft) N/A  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5,260'

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 \_\_\_\_\_

20" Conductor - N/A  
 13-3/8" Surface - Bowspring Centralizers - 153', 567', 941'  
 9-5/8" Intermediate - Bowspring Centralizers - 241', 705', 1,169', 1,634', 2,099', 2,521', 3,028', 3,071'  
 5-1/2" Production - Composite Body Centralizers - Every Joint from the shoe to 500' above KOP.

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 \_\_\_\_\_



API 47- 017 - 05951 Farm name Harper, Lucy E. Well number 513136

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6,643'	TVD	7,205' MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 927 psi Bottom Hole N/A psi DURATION OF TEST 57.0 hrs

OPEN FLOW Gas 10,379 mcfpd Oil N/A bpd NGL 8.7 bpd Water 713.1 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME 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 <sub>2</sub> S, ETC)
	0		0		

Please insert additional pages as applicable.

Drilling Contractor Alpha Hunter  
Address P.O Box 430 City Reno State OH Zip 45773

Logging Company Gyrodata Inc.  
Address 601 Mayer St. City Bridgeville State PA Zip 15017

Cementing Company Allied Services  
Address 333 Technology Drive, Suite 290 City Canonsburg State PA Zip 15317

Stimulating Company FTSI  
Address 301 E 18th Street City Cisco State TX Zip 76437

Please insert additional pages as applicable.

Completed by Brad Maddox Telephone 412-395-7053  
Signature *Brad Maddox* Title Director of Drilling Date 12/9/2015

Drilling Contractor: **Patterson UTI**

Address: **207 Carlton Drive**

City: **Eighty Four** State: **PA**

Zip: **15330**

Cementing Company **Nabors Well Services**

Address **2504 Smith Creek Road**

City **Waynesburg**

State **PA**

Zip **15370**

Logging Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

**513136 Final Formations API#41-017-05951**

<b>Formation Name</b>	<b>Final Top MD (ftGL) (ft)</b>	<b>Final Top TVD (ft)</b>	<b>Final Btm MD (ftGL) (ft)</b>	<b>Final Btm TVD (ft)</b>
FRESH WATER ZONE	1	1	438	438
SANDSTONE/SHALE	1	1	642	642
COAL	642	642	645	645
SANDSTONE/SHALE	645	645	1,518.00	1,518.00
MAXTON	1,518.00	1,518.00	1,863.00	1,863.00
BIG LIME	1,863.00	1,863.00	1,923.00	1,923.00
KEENER	1,923.00	1,923.00	2,153.00	2,153.00
WEIR	2,153.00	2,153.00	2,353.00	2,353.00
BEREA	2,353.00	2,353.00	2,365.00	2,365.00
GANTZ	2,365.00	2,365.00	2,448.00	2,447.90
50F	2,448.00	2,447.90	2,557.00	2,556.90
30F	2,557.00	2,556.90	2,596.00	2,595.90
GORDON	2,596.00	2,595.90	2,702.00	2,701.90
4TH	2,702.00	2,701.90	2,839.00	2,838.90
5TH	2,839.00	2,838.90	2,878.00	2,877.90
BAYARD	2,878.00	2,877.90	3,213.00	3,212.90
WARREN	3,213.00	3,212.90	3,283.00	3,282.90
SPEECHLEY	3,283.00	3,282.90	3,810.00	3,809.90
BALLTOWN A	3,810.00	3,809.90	3,965.00	3,964.90
BALLTOWN B	3,965.00	3,964.90	4,160.00	4,159.90
BRADFORD	4,160.00	4,159.90	4,405.00	4,404.80
RILEY	4,405.00	4,404.80	4,837.00	4,836.70
BENSON	4,837.00	4,836.70	5,099.00	5,098.60
ALEXANDER	5,099.00	5,098.60	5,792.00	5,738.20
RHINESTREET	5,792.00	5,738.20	6,056.00	5,938.10
RHINESTREET UPPER	6,056.00	5,938.10	6,470.00	6,241.00
SONYEA	6,470.00	6,241.00	6,784.00	6,458.70
MIDDLESEX	6,784.00	6,458.70	6,850.00	6,499.90
GENESSEE	6,850.00	6,499.90	6,970.00	6,564.00
GENESE0	6,970.00	6,564.00	7,070.00	6,607.00
TULLY	7,070.00	6,607.00	7,124.00	6,626.30
HAMILTON	7,124.00	6,626.30	7,182.00	6,642.70
MARCELLUS	7,182.00	6,642.70		

**PHOENIX**  
TECHNOLOGY SERVICES



## **EQT Production - Marcellus**

Doddridge County, WV Grid

Doddridge County 513136

Well #513136

Well #513136

Design: As Drilled Surveys

## **Standard Survey Report**

01 December, 2014



Where energy meets innovation.

04/01/2016





Phoenix  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 513136
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 23ft @ 1283 0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB@23ft @ 1283 0usft
<b>Site:</b>	Doddridge County 513136	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513136	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Well #513136		
<b>Design:</b>	As Drilled Surveys		

<b>Project</b>	Doddridge County, WV Grid		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	West Virginia North 4701		Using geodetic scale factor

<b>Site</b>	Doddridge County 513136				
<b>Site Position:</b>		<b>Northing:</b>	265 377 90 usft	<b>Latitude:</b>	39 22
<b>From:</b>	Map	<b>Easting:</b>	1 631 462 00 usft	<b>Longitude:</b>	-80 80
<b>Position Uncertainty:</b>	0 0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.83 "

<b>Well</b>	Well #513136					
<b>Well Position</b>	<b>+N-S</b>	0 0 usft	<b>Northing:</b>	265,377 90 usft	<b>Latitude:</b>	39° 13' 16.655 N
	<b>+E-W</b>	0 0 usft	<b>Easting:</b>	1,631,462 00 usft	<b>Longitude:</b>	80° 48' 3.035 W
<b>Position Uncertainty</b>		0 0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,240.0 usft

<b>Wellbore</b>	Well #513136				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010_14	11/17/2014	-8.46	66.72	52 209

<b>Design</b>	As Drilled Surveys				
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**Audit Notes:**

Version: 1 0      Phase: ACTUAL      Tie On Depth: 0 0

<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	0 0	0 0	0 0	140.04

<b>Survey Program</b>	<b>Date</b>	12/1/2014			
<b>From (')</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0 00	5 163 0	513136 Gyrodatta Gyro (Well #513136)	GYD_DP_MS	Gyrodatta gyro-compassing and drop	
0 00	5 799 0	513136 Pro D Surveys (Well #513136)	MWD	MWD - Standard	
0 00	10 425 0	513136 PHX MWD (Well #513136)	MWD+IGRF	MWD+IGRF v3 standard declination	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>Subsea Depth (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>
0 0	0.00	0.00	0 0	-1,263.0	0.0	0 0	0 0	0.00	0.00	0 00
110 0	0.45	288.28	110 0	-1,153.0	0.1	-0.4	-0.4	0.41	0.41	0 00
210 0	0.42	286.93	210 0	-1,053.0	0.4	-1.1	-1.0	0.03	-0.03	-1.35
310 0	0.17	273.49	310 0	-953 0	0.5	-1.6	-1.4	0.26	-0.25	-13.44
410 0	0.12	293.31	410 0	-853 0	0.5	-1.9	-1.6	0.07	-0.05	19.82
510 0	0.03	91.07	510 0	-753 0	0.6	-1.9	-1.7	0.15	-0.09	157.76
610 0	0.12	143.48	610 0	-653 0	0.5	-1.9	-1.6	0.10	0.09	52.41



Phoenix  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 513136
<b>Company:</b>	EQT Production - Merseilus	<b>TVD Reference:</b>	KB @ 23ft @ 1263.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB @ 23ft @ 1263.0usft
<b>Site:</b>	Doddridge County 513136	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513136	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Well #513136		
<b>Design:</b>	As Drilled Surveys		

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
710.0	0.32	165.88	710.0	-553.0	0.1	-1.7	-1.2	0.21	0.20	22.40
810.0	0.23	202.80	810.0	-453.0	-0.3	-1.7	-0.9	0.19	-0.09	36.92
910.0	0.19	234.83	910.0	-353.0	-0.6	-2.0	-0.8	0.12	-0.04	32.03
1010.0	0.17	21.35	1,010.0	-253.0	-0.6	-2.0	-0.9	0.34	-0.02	146.52
1,110.0	0.30	29.78	1,110.0	-153.0	-0.2	-1.8	-1.0	0.13	0.13	8.43
1,210.0	0.28	37.30	1,210.0	-53.0	0.2	-1.6	-1.2	0.04	-0.02	7.52
1,310.0	0.29	18.69	1,310.0	47.0	0.7	-1.3	-1.4	0.09	0.01	-18.61
1,410.0	0.31	12.74	1,410.0	147.0	1.2	-1.2	-1.7	0.04	0.02	-5.95
1,510.0	0.29	8.49	1,510.0	247.0	1.7	-1.1	-2.0	0.03	-0.02	-4.25
1,610.0	0.32	41.53	1,610.0	347.0	2.1	-0.9	-2.2	0.18	0.03	33.04
1,710.0	0.47	58.50	1,710.0	447.0	2.6	-0.3	-2.2	0.19	0.15	16.97
1,810.0	0.64	65.67	1,810.0	547.0	3.0	0.5	-2.0	0.18	0.17	7.17
1,910.0	0.70	66.88	1,910.0	647.0	3.5	1.6	-1.6	0.06	0.06	1.21
2,010.0	0.60	77.10	2,010.0	747.0	3.8	2.7	-1.2	0.15	-0.10	10.22
2,110.0	0.49	88.64	2,110.0	847.0	4.0	3.6	-0.7	0.15	-0.11	11.54
2,210.0	0.51	95.40	2,210.0	947.0	3.9	4.5	-0.1	0.06	0.02	6.76
2,310.0	0.46	102.76	2,310.0	1,047.0	3.8	5.3	0.5	0.08	-0.05	7.36
2,410.0	0.36	105.71	2,409.9	1,146.9	3.6	6.0	1.1	0.10	-0.10	2.95
2,510.0	0.37	99.25	2,509.9	1,246.9	3.5	6.6	1.6	0.04	0.01	-6.46
2,610.0	0.34	97.88	2,609.9	1,346.9	3.4	7.2	2.0	0.03	-0.03	-1.37
2,710.0	0.30	82.99	2,709.9	1,446.9	3.4	7.6	2.4	0.09	-0.04	-14.89
2,810.0	0.29	94.06	2,809.9	1,546.9	3.4	8.3	2.7	0.06	-0.01	11.07
2,910.0	0.34	83.78	2,909.9	1,646.9	3.4	8.8	3.1	0.08	0.05	-10.28
3,010.0	0.40	83.74	3,009.9	1,746.9	3.5	9.5	3.4	0.06	0.06	-0.04
3,110.0	0.41	99.49	3,109.9	1,846.9	3.5	10.2	3.9	0.11	0.01	15.75
3,210.0	0.52	110.33	3,209.9	1,946.9	3.2	11.0	4.6	0.14	0.11	10.84
3,310.0	0.58	109.58	3,309.9	2,046.9	2.9	11.9	5.4	0.06	0.06	-0.75
3,410.0	0.54	109.36	3,409.9	2,146.9	2.6	12.8	6.2	0.04	-0.04	-0.22
3,510.0	0.45	110.27	3,509.9	2,246.9	2.3	13.6	7.0	0.09	-0.09	0.91
3,610.0	0.44	108.89	3,609.9	2,346.9	2.0	14.3	7.6	0.01	-0.01	-1.38
3,710.0	0.44	103.16	3,709.9	2,446.9	1.8	15.1	8.3	0.04	0.00	-5.73
3,810.0	0.37	95.80	3,809.9	2,546.9	1.7	15.8	8.8	0.09	-0.07	-7.36
3,910.0	0.46	347.85	3,909.9	2,646.9	2.1	16.0	8.7	0.67	0.09	-107.95
4,010.0	0.44	283.87	4,009.9	2,746.9	2.6	15.5	8.0	0.48	-0.02	-63.98
4,110.0	0.65	275.20	4,109.9	2,846.9	2.7	14.6	7.3	0.23	0.21	-8.67
4,210.0	1.26	280.15	4,209.9	2,946.9	2.9	13.0	6.1	0.61	0.61	4.95
4,310.0	1.56	282.38	4,309.9	3,046.9	3.4	10.5	4.1	0.30	0.30	2.23
4,410.0	1.46	287.62	4,409.8	3,146.8	4.1	8.0	2.0	0.17	-0.10	5.24
4,510.0	1.55	289.84	4,509.8	3,246.8	4.9	5.5	-0.3	0.11	0.09	2.22
4,610.0	1.62	294.23	4,609.8	3,346.8	6.0	3.0	-2.7	0.14	0.07	4.39
4,710.0	1.61	305.60	4,709.7	3,446.7	7.4	0.5	-5.3	0.32	-0.01	11.37
4,810.0	1.53	307.31	4,809.7	3,546.7	9.0	-1.7	-8.0	0.09	-0.08	1.71
4,910.0	1.36	310.66	4,909.6	3,646.6	10.6	-3.6	-10.5	0.19	-0.17	3.35



Phoenix  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	See Doddridge County 513136
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23ft @ 1263.0usft
<b>Project:</b>	Doddridge County WV Grid	<b>MD Reference:</b>	KB@23ft @ 1263.0usft
<b>Site:</b>	Doddridge County 513136	<b>North Reference:</b>	C=0
<b>Well:</b>	Well #513136	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Well #513136		
<b>Design:</b>	As Drilled Surveys		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,010.0	1.15	308.13	5,009.6	3,746.6	12.0	-5.3	-12.6	0.22	-0.21	-2.53
5,110.0	1.00	310.33	5,109.6	3,846.6	13.2	-6.8	-14.5	0.16	-0.15	2.20
Circ. To Res (61 MD)										
5,163.0	1.07	301.48	5,162.6	3,899.6	13.7	-7.6	-15.4	0.33	0.13	-16.70
5,196.0	1.10	293.48	5,195.6	3,932.6	14.0	-8.1	-16.0	0.47	0.09	-24.24
5,239.0	1.28	298.68	5,238.6	3,975.6	14.4	-8.9	-16.8	0.49	0.42	12.09
5,282.0	2.30	25.29	5,281.6	4,018.6	15.4	-9.0	-17.6	5.97	2.37	201.42
5,325.0	7.29	36.66	5,324.4	4,061.4	16.4	-7.0	-18.6	11.76	11.60	26.44
5,368.0	12.59	27.58	5,366.7	4,103.7	24.7	-3.2	-21.0	12.82	12.33	-21.12
5,411.0	17.19	21.06	5,408.3	4,145.3	34.8	1.3	-25.9	11.37	10.70	-15.16
5,454.0	19.40	17.27	5,449.1	4,186.1	47.6	5.7	-32.6	5.83	5.14	-8.81
5,497.0	21.70	17.18	5,489.4	4,226.4	62.0	10.2	-41.0	5.35	5.35	-0.21
5,540.0	25.10	19.25	5,528.8	4,265.8	78.2	15.5	-50.0	8.13	7.91	4.81
5,584.0	29.70	20.18	5,567.9	4,304.9	97.3	22.4	-60.2	10.50	10.45	2.11
5,627.0	33.89	22.29	5,604.4	4,341.4	118.4	30.6	-71.1	10.08	9.74	4.91
5,670.0	36.28	25.77	5,639.6	4,376.6	140.9	40.7	-81.9	7.25	5.56	8.09
5,713.0	36.72	32.67	5,674.2	4,411.2	163.2	53.2	-90.9	9.87	1.02	16.51
5,756.0	35.62	40.67	5,708.9	4,445.9	183.5	68.3	-96.8	11.00	-2.56	18.14
Final Pre-D Survey - 0793 MD										
5,799.0	35.40	47.67	5,743.9	4,480.9	201.4	85.7	-99.3	9.47	-0.51	16.28
First Phoenix (WV) Survey - 6824 MD / 5754 TVL										
5,824.0	36.00	50.70	5,764.2	4,501.2	210.9	96.7	-99.5	7.47	2.40	12.12
5,850.0	37.80	52.70	5,785.0	4,522.0	220.6	109.0	-99.1	8.32	6.92	7.69
5,882.0	39.70	54.70	5,810.0	4,547.0	232.4	125.1	-97.8	7.11	5.94	6.25
5,913.0	40.80	58.20	5,833.7	4,570.7	243.5	141.8	-95.5	8.11	3.55	11.29
5,944.0	41.50	61.60	5,857.0	4,594.0	253.7	159.5	-92.0	7.56	2.26	10.97
5,976.0	42.60	65.50	5,880.8	4,617.8	263.2	178.7	-87.0	8.86	3.44	12.19
6,007.0	44.00	67.70	5,903.3	4,640.3	271.7	198.2	-81.0	6.64	4.52	7.10
6,038.0	45.00	70.40	5,925.4	4,662.4	279.4	218.5	-73.9	6.90	3.23	8.71
6,070.0	45.80	73.80	5,947.9	4,684.9	286.4	240.1	-65.3	7.97	2.50	10.63
6,102.0	45.60	77.60	5,970.3	4,707.3	292.1	262.3	-55.4	8.52	-0.63	11.88
6,133.0	45.30	78.80	5,992.0	4,729.0	296.6	283.9	-45.0	2.92	-0.97	3.87
6,165.0	44.90	78.30	6,014.6	4,751.6	301.1	305.2	-34.2	1.67	-1.25	-1.56
6,227.0	42.20	81.20	6,059.5	4,796.5	308.7	348.2	-13.0	5.42	-4.35	4.68
6,322.0	41.80	80.40	6,130.1	4,867.1	318.9	410.9	19.5	0.70	-0.42	-0.84
6,416.0	41.10	79.40	6,200.6	4,937.6	329.8	472.2	50.5	1.02	-0.74	-1.06
6,479.0	42.20	79.70	6,247.7	4,984.7	337.4	513.4	71.1	1.77	1.75	0.48
6,511.0	42.50	80.20	6,271.3	5,008.3	341.2	534.6	81.9	1.41	0.94	1.56
6,542.0	42.90	83.80	6,294.1	5,031.1	344.1	555.4	93.0	7.98	1.29	11.61
6,574.0	43.90	88.70	6,317.4	5,054.4	345.5	577.3	106.0	10.97	3.13	15.31
6,606.0	45.00	92.40	6,340.2	5,077.2	345.3	599.7	120.5	8.80	3.44	11.56
6,637.0	46.10	96.60	6,361.9	5,098.9	343.6	621.8	136.0	10.30	3.55	13.55
6,669.0	47.40	100.70	6,383.9	5,120.9	340.0	644.8	153.5	10.18	4.06	12.81



Phoenix  
Survey Report



<b>Database:</b>	EDM 5000 - Single User - Go	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 513135
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	K&S #23ft @ 1283.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	K&S #23ft @ 1293.0usft
<b>Site:</b>	Doddridge County 513135	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #S13135	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Well #S13135		
<b>Design:</b>	As Drilled Surveys		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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6 700 0	48 80	104 00	6,404.6	5,141.6	335.1	667.3	171.8	9 12 4 52		10 65
6,732 0	49 90	107.10	6,425.4	5,162.4	328.6	690.7	191.8	8 11 3 44		9 69
6 764 0	50 20	110.70	6,446.0	5,183.0	320.6	713.9	212.8	8 67 0 94		11 25
6 796 0	50 50	113 20	6,466.4	5,203.4	311.4	736.8	234.5	8 09 0 94		7 81
6 827 0	51 60	116 50	6,485.9	5,222.9	301.3	758.6	256.3	9 01 3 55		10 65
6 859 0	53 80	118 60	6 505 3	5 242 3	289 5	781 2	279 8	8 63 6 88		6 56
6 890 0	56 00	120 40	6 523 1	5 260 1	277 0	803 3	303 6	8 54 7 10		5 81
6,922 0	58 70	122 50	6 540 4	5,277 4	263 0	826 2	329 1	10 09 8 44		6 56
6 953 0	61 10	125 30	6 555 9	5 292 9	248 0	848 5	354 9	11 00 7 74		9 03
6 985 0	63 00	128 70	6 570 9	5,307 9	231 0	871 1	382 4	11 11 5 94		10 63
7 016 0	64 30	131 90	6 584 7	5,321 7	213 0	892 2	409 8	10 16 4 19		10 32
7,048 0	65 80	134.90	6,598.2	5,335.2	193.1	913.3	438.6	9 71 4 69		9 38
7,079 0	67 50	137 90	6 610 5	5,347 5	172 5	932 9	467 0	10 44 5 48		9 68
7,111.0	70.10	140 10	6 622 0	5,359 0	150 0	952 5	496 8	10 35 8 13		6 88
7 142 0	73 20	141 70	6 631 8	5,368 8	127 1	971 0	526 3	11 14 10 00		5 16
7,173 0	74 60	144 20	6 640 4	5 377 4	103 4	989 0	556 0	8 97 4 52		8 06
7,205 0	76 00	146 40	6,648 5	5 385 5	77 9	1,006 6	586 8	7 96 4 38		6 88
7,236 0	77 70	147 60	6,655 6	5,392 6	52 6	1,023 0	616 8	6 65 5 48		3 87
7,268 0	79 70	149 00	6 661 8	5,398 8	25 9	1,039 5	647 8	7 58 6 25		4 36
7,299 0	82 20	150 20	6,666 7	5,403 7	-0 5	1,055 0	678 0	8 92 8 06		3 87
7,330 0	85 30	151 40	6,670 1	5 407 1	-27 4	1 070 1	708 3	10 71 10 00		3 87
7,362 0	89 10	152 30	6,671 6	5 408 6	-55 6	1 085 1	739 6	12 20 11 88		2 81
7,394 0	89 70	153 80	6,672 0	5 409 0	-84 1	1,099 6	770 7	5 05 1 88		4 69
7,456 0	90 60	156 10	6,671 8	5 408 8	-140 3	1,125 9	830 6	3 98 1 45		3 71
7,551 0	91 00	155 60	6,670 5	5 407 5	-226 9	1 164 7	922 0	0 67 0 42		-0 53
7,645 0	89 60	155 90	6,670.0	5 407 0	-312.6	1,203.3	1,012.5	1 52 -1.49		0 32
7,740.0	89 40	155 50	6 670 8	5 407 8	-399 2	1,242.4	1,104.0	0 47 -0 21		-0 42
7,835.0	89 80	155 30	6,671 5	5 408 5	-485 6	1,282 0	1 195 6	0 47 0 42		-0 21
7,929.0	90 60	156 60	6,671.2	5 408 2	-571 4	1 320 3	1,286 0	1 62 0 85		1 38
8 024 0	91 80	157 10	6 669 2	5 406 2	-658 8	1,357 6	1 376 9	1 37 1 26		0 53
8 119 0	92 00	155 10	6 666 0	5 403 0	-745 6	1,396 1	1,468.1	2 11 0 21		-2 11
8 213 0	90 60	155 00	6,663 9	5,400 9	-830 8	1,435 7	1,558 9	1 49 -1 49		-0 11
8,308.0	90 70	152 90	6,662 8	5 399 8	-916 1	1,477.5	1,651.1	2 21 0 11		-2 21
8,403.0	91 30	153 30	6 661 1	5 398 1	-1,000 8	1,520.4	1,743.6	0 76 0 63		0 42
8,497 0	89 70	153 50	6,660 3	5 397 3	-1,084 9	1,562 5	1 835 1	1 72 -1 70		0 21
8,592 0	89 70	155 60	6,660 8	5 397 8	-1,170 6	1,603 3	1,927 0	2 21 0 00		2 21
8,687 0	90 20	154 40	6,660 9	5 397 9	-1,256 7	1,643 5	2,018 8	1 37 0 53		-1 26
8,782 0	90 00	154 10	6,660 7	5 397 7	-1,342 3	1,684 8	2 110 9	0 38 -0 21		-0 32
8,877 0	89 00	154 60	6,661 6	5 398 6	-1 427 9	1,725 9	2,203 0	1 18 -1 05		0 53
8,972 0	89 10	155 70	6,663 1	5 400 1	-1 514 1	1,765 6	2,294 7	1 16 0 11		1 16
9 066 0	89 30	154.80	6,664.5	5 401 5	-1,599.5	1,805 1	2,385 4	0 98 0 21		-0 96
9,160 0	90 30	156 70	6,664 6	5 401 8	-1,685 2	1 843 7	2,475 8	2 28 1 06		2 02



Phoenix  
Survey Report



<b>Database:</b>	EEM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 513136
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 23# @ 1263.6usft
<b>Project:</b>	Doddridge County YW Grid	<b>MD Reference:</b>	KB @ 23# @ 1263.6usft
<b>Site:</b>	Doddridge County 513136	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513136	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Well #513136		
<b>Design:</b>	As Drilled Surveys		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,255.0	90.90	155.40	6,663.8	5,400.8	-1,772.0	1,882.3	2,567.1	1.51	0.63	-1.37
9,350.0	90.00	154.50	6,663.0	5,400.0	-1,858.0	1,922.5	2,658.9	1.34	-0.95	-0.95
9,444.0	90.40	153.60	6,662.7	5,399.7	-1,942.6	1,963.7	2,750.1	1.05	0.43	-0.96
9,539.0	88.40	153.50	6,663.7	5,400.7	-2,027.6	2,006.0	2,842.5	2.11	-2.11	-0.11
9,633.0	89.80	155.90	6,665.2	5,402.2	-2,112.6	2,046.1	2,933.4	2.96	1.49	2.55
9,728.0	90.40	155.20	6,665.0	5,402.0	-2,199.1	2,085.5	3,025.0	0.97	0.63	-0.74
9,822.0	88.30	154.70	6,666.1	5,403.1	-2,284.2	2,125.3	3,115.6	2.30	-2.23	-0.53
9,917.0	88.70	155.40	6,668.6	5,405.6	-2,370.3	2,165.3	3,207.5	0.85	0.42	0.74
10,011.0	88.70	154.20	6,670.7	5,407.7	-2,455.3	2,205.3	3,298.4	1.28	0.00	-1.28
10,105.0	89.90	155.30	6,671.9	5,408.9	-2,540.4	2,245.4	3,389.3	1.73	1.28	1.17
10,200.0	90.10	153.40	6,671.9	5,408.9	-2,626.0	2,286.5	3,481.3	2.01	0.21	-2.00
10,295.0	89.40	149.50	6,672.3	5,409.3	-2,709.4	2,331.9	3,574.4	4.17	-0.74	-4.11
Final Survey=10370' MD/ 6673' TVD										
10,370.0	90.00	151.20	6,672.7	5,409.7	-2,774.6	2,369.0	3,648.2	2.40	0.80	2.27
Projection to TD=10425' MD/ 6673' TVD										
10,425.0	90.00	151.20	6,672.7	5,409.7	-2,822.8	2,395.5	3,702.2	0.00	0.00	0.00

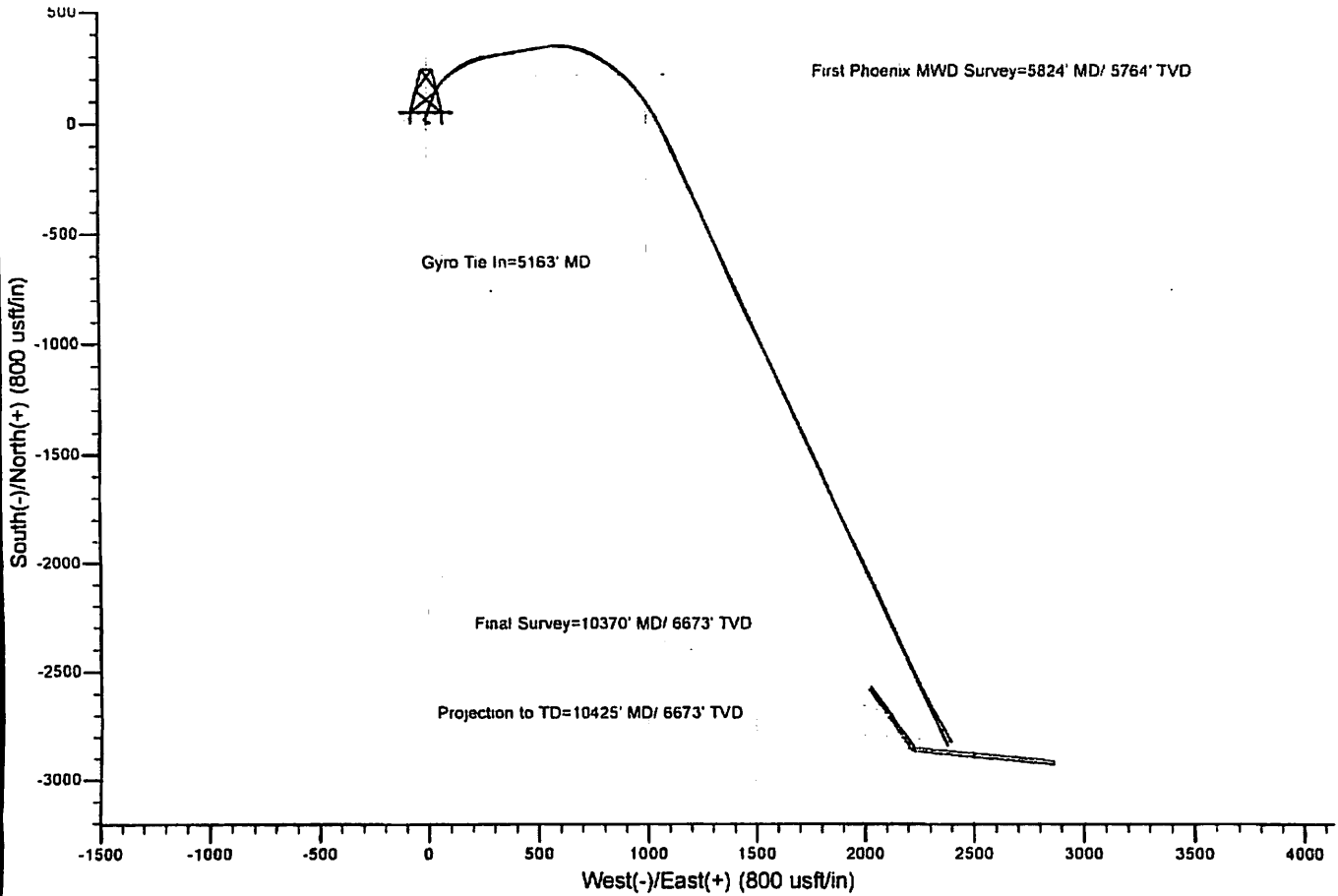
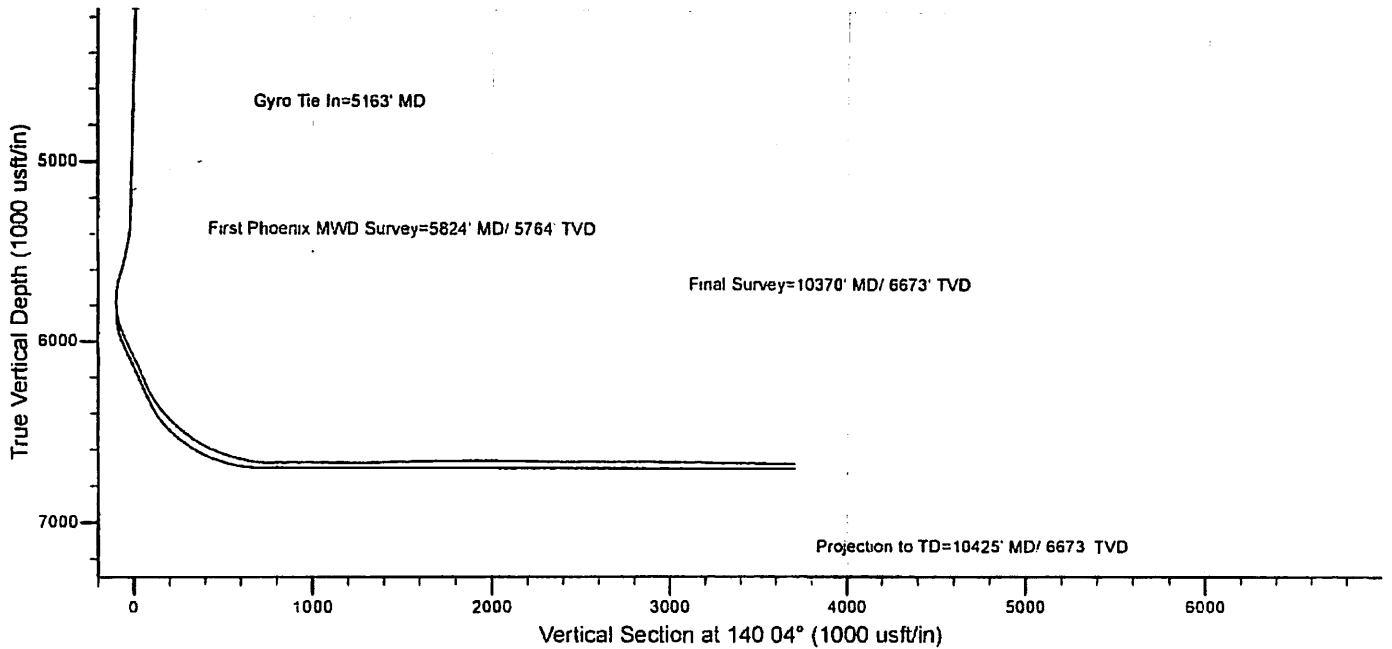
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,163.0	5,162.6	13.7	-7.6	Gyro Tie In=5163' MD
5,799.0	5,743.9	201.4	85.7	Final Pro D Survey=5799' MD
5,824.0	5,764.2	210.9	96.7	First Phoenix MWD Survey=5824' MD/ 5764' TVD
10,370.0	6,672.7	-2,774.6	2,369.0	Final Survey=10370' MD/ 6673' TVD
10,425.0	6,672.7	-2,822.8	2,395.5	Projection to TD=10425' MD/ 6673' TVD

Checked By \_\_\_\_\_ Approved By \_\_\_\_\_ Date \_\_\_\_\_



# EQT Production - Marcellus

Project: Doddridge County, WV Grid  
 Site: Doddridge County 513136  
 Well: Well #513136  
 Wellbore: Well #513136  
 Design: As Drilled Surveys



**513136- 47-017-05951-0000 - Perforations**

<b>Stage Number</b>	<b>Perforation Date</b>	<b>Top Perf Depth (ftKB)</b>	<b>Bottom Perf Depth (ftKB)</b>	<b>Number of Shots</b>	<b>Formation</b>
<b>Initiation Sleeve</b>	1/17/2015	10,414.00	10,416.00	10	MARCELLUS
<b>1</b>	5/4/2015	10,269.00	10,390.00	32	MARCELLUS
<b>2</b>	5/4/2015	10,119.00	10,241.00	40	MARCELLUS
<b>3</b>	5/4/2015	9,969.00	10,087.00	40	MARCELLUS
<b>4</b>	5/4/2015	9,819.00	9,941.00	40	MARCELLUS
<b>5</b>	5/5/2015	9,669.00	9,791.00	40	MARCELLUS
<b>6</b>	5/5/2015	9,518.50	9,639.00	40	MARCELLUS
<b>7</b>	5/5/2015	9,369.00	9,489.00	40	MARCELLUS
<b>8</b>	5/5/2015	9,219.00	9,339.00	40	MARCELLUS
<b>9</b>	5/5/2015	9,069.00	9,189.00	40	MARCELLUS
<b>9.1</b>	5/5/2015	9,085.00	9,145.00	24	MARCELLUS
<b>10</b>	5/6/2015	8,919.00	9,039.00	40	MARCELLUS
<b>11</b>	5/6/2015	8,769.00	8,889.00	40	MARCELLUS
<b>12</b>	5/6/2015	8,619.00	8,739.00	40	MARCELLUS
<b>13</b>	5/7/2015	8,469.00	8,589.00	40	MARCELLUS
<b>14</b>	5/7/2015	8,319.00	8,439.00	40	MARCELLUS
<b>15</b>	5/7/2015	8,169.00	8,286.00	40	MARCELLUS
<b>16</b>	5/7/2015	8,019.00	8,139.00	40	MARCELLUS
<b>17</b>	5/7/2015	7,869.00	7,989.00	40	MARCELLUS
<b>18</b>	5/7/2015	7,724.00	7,839.00	40	MARCELLUS
<b>19</b>	5/8/2015	7,569.00	7,689.00	40	MARCELLUS
<b>20</b>	5/8/2015	7,419.00	7,539.00	40	MARCELLUS
<b>21</b>	5/8/2015	7,269.00	7,389.00	40	MARCELLUS
<b>22</b>	5/8/2015	7,119.00	7,239.00	40	MARCELLUS

**513136- 47-017-05951-0000 - Stimulated Stages**

<b>Stage Number</b>	<b>Stimulation Date</b>	<b>Ave Pump Rate (BPM)</b>	<b>Ave Treatment Pressure (PSI)</b>	<b>Max Breakdown Pressure (PSI)</b>	<b>ISIP (PSI)</b>	<b>Amount of Proppant (lbs)</b>	<b>Amount of Water (bbls)</b>	<b>Amount of Nitrogen/other (units)</b>
Initiation:Sleeve	5/4/2015	15.9	6624	8,640.00	3,883	0	447	0
1	5/4/2015	100	7865	8,308.00	4,622	200,650	6051	0
2	5/4/2015	100.7	7767	8,413.00	4,983	199,829	4973	0
3	5/4/2015	98.4	7872	8,970.00	5,634	200,018	5283	0
4	5/5/2015	98.8	7654	8,243.00	5,277	202,695	5213	0
5	5/5/2015	99.8	8143	8,628.00	4,849	200,126	5380	0
6	5/5/2015	99.7	8301	9,146.00	4,880	200,710	4835	0
7	5/5/2015	100.5	7777	8,322.00	5,198	199,953	4959	0
8	5/5/2015	100.5	7867	8,819.00	5,233	201,140	4942	0
9	5/5/2015	92.4	8686	9,836.00	6,884	202,475	5239	0
9:1	5/6/2015	10.9	4827	6,516.00	5,514	0	2762	0
10	5/6/2015	99.1	8403	9,273.00	5,421	201,875	4912	0
11	5/6/2015	99.1	7916	8,420.00	5,027	202,736	5007	0
12	5/6/2015	96.6	8017	8,426.00	5,634	202,695	4653	0
13	5/7/2015	99.1	7771	8,197.00	5,285	204,038	4763	0
14	5/7/2015	100	8077	8,981.00	5,473	201,518	4848	0
15	5/7/2015	100.1	7951	8,310.00	3,949	201,266	4820	0
16	5/7/2015	99.8	7833	8,664.00	5,101	204,111	4877	0
17	5/7/2015	99.50	7811	9,070.00	5,378	200,742	4,771	0
18	5/7/2015	100.20	7499	7,963.00	5,211	202,800	4,730	0
19	5/8/2015	100.10	7566	8,210.00	5,432	200,532	4,816	0
20	5/8/2015	100.10	7853	8,948.00	5,121	203,974	4,856	0
21	5/8/2015	100.80	7547	7,917.00	7,585	203,544	4,850	0
22	5/8/2015	100.30	7539	8,743.00	3,397	201,934	4,968	0



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/4/2015
Job End Date:	5/8/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-05951-00-00
Operator Name:	EQT Production
Well Name and Number:	513136
Longitude:	-80.80084300
Latitude:	39.22129300
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,643
Total Base Water Volume (gal):	4,744,110
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	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	89.47720	None
Sand (Proppant)	FTS International	Proppant					
			Crystalline Silica	14808-60-7	100.00000	10.03348	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution					
			Calcium nitrate	10124-37-5	60.00000	0.05618	None
Hydrochloric Acid (15%)	FTS International	Acidizing					
			Hydrochloric Acid	7647-01-0	15.00000	0.04389	None
FRW-900	FTS International	Friction reducer					
			Hydrotreated light distillate	64742-47-8	30.00000	0.02200	None
			Alkyl Alcohol	Proprietary	10.00000	0.00733	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00357	None
CS-500-SI	FTS International	Scale inhibitor					
			Ethylene glycol	107-21-1	10.00000	0.00252	None
HVG-1	FTS International	Gelling agent					
			Petroleum distillate	64742-47-8	55.00000	0.00096	None
			Guar gum	9000-30-0	50.00000	0.00087	None
			Surfactant	68439-51-0	2.00000	0.00003	None

			Clay	14808-60-7	2.00000	0.00003	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00097	None
CI-150	FTS International	Acid Corrosion Inhibitor					
			Isopropanol	67-63-0	30.00000	0.00016	None
			Organic amine resin salt	Proprietary	30.00000	0.00016	None
			Ethylene glycol	107-21-1	30.00000	0.00016	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00005	None
			Dimethylformamide	68-12-2	10.00000	0.00005	None
			Aromatic aldehyde	Proprietary	10.00000	0.00005	None
NE-100	FTS International	Non-emulsifier					
			2-Butoxyethanol	111-76-2	10.00000	0.00004	None
			2-Propanol	67-63-0	10.00000	0.00004	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00002	None
APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00002	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

Welcome Michelle N., Operator - OpNo. E1210363 [ Log Out ]



Submission to FracFocus using Excel Spreadsheets has been turned off.

[FIND A WELL BY STATE](#)

[ABOUT PROJECT PARTNERS](#)

(Note: Clicking the FracFocus, FIND A WELL links will open a new window.)

**Prepare Disclosure for FracFocus Submission**

[Disclosure Lists](#) | [Dashboard](#)

**i** Disclosure has been submitted.

Note: This window expires with 10 minutes of inactivity. After that you will be taken back to the dashboard.

[Preview Disclosure PDF](#) [Validate Disclosure](#) [Submit To FracFocus](#)

**Hydraulic Fracturing Data**

[Edit](#)

Job Start Date: 5/4/2015    Job End Date: 5/8/2015    API Number: 47-017-05951-00-00    State & County: West Virginia --- Doddridge

Well Name: 513136

Longitude: -80.800843    Latitude: 39.221293    Datum: NAD83    Federal/Tribal Well?

True Vertical Depth (ft): 6642.7    Total Water Vol (gal): 4744110    Total Non Water Vol: 0    Total Mass (lbs): 44245458



**MSDS Chemical Ingredients**

[New Additive](#)    [Select Additive](#)    [Add Additive](#)

	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
<a href="#">Edit</a>	Water	FTS International	Carrier/Base Fluid	Water	7732-18-5	100%	89.4772014203%	None	39589597.95
<a href="#">Edit</a>	Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100%	10.0334840196%	None	4439361
<a href="#">Edit</a>	MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60%	.0561810459%	None	24857.561
<a href="#">Edit</a>	Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15%	.0438935474%	None	19420.901
<a href="#">Edit</a>	FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30%	.0219992819%	None	9733.683
				Alkyl Alcohol	Proprietary	10%	.007333094%	None	3244.561
				Oxyalkylated alcohol A	Proprietary	5%	.003666547%	None	1622.281
<a href="#">Edit</a>	CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10%	.0025201941%	None	1115.071
<a href="#">Edit</a>	HVG-1	FTS International	Gelling agent	Petroleum distillate	64742-47-8	55%	.0009590191%	None	424.322
				Guar gum	9000-30-0	50%	.0008718355%	None	385.748

			Surfactant	68439-51-0	2%	.0000348734%	None	15.43
			Clay	14808-60-7	2%	.0000348734%	None	15.43
<input type="button" value="Edit"/>	FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55%	.0009731269%	None	430.564
<input type="button" value="Edit"/>	CI-150	FTS International	Acid Corrosion Inhibitor					
			Isopropanol	67-63-0	30%	.0001624471%	None	71.875
			Organic amine resin salt	Proprietary	30%	.0001624471%	None	71.875
			Ethylene glycol	107-21-1	30%	.0001624471%	None	71.875
			Quaternary ammonium compound	Proprietary	10%	.000054149%	None	23.958
			Dimethylformamide	68-12-2	10%	.000054149%	None	23.958
			Aromatic aldehyde	Proprietary	10%	.000054149%	None	23.958
<input type="button" value="Edit"/>	NE-100	FTS International	Non-emulsifier					
			2-Butoxyethanol	111-76-2	10%	.000044813%	None	19.828
			2-Propanol	67-63-0	10%	.000044813%	None	19.828
			Dodecylbenzenesulfonic acid	27176-87-0	5%	.0000224065%	None	9.914
<input type="button" value="Edit"/>	APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95%	.000019324%	None	8.55

**Non-MSDS Chemical Ingredients**

Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
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**\*\*CELLS WITH BLUE BACKGROUND ARE THE ONLY CELLS TO BE EDITED\*\***

Fracture Start Date/Time:	5/4/15 3:12
Fracture End Date/Time:	5/8/15 15:29
State:	West Virginia
County:	Doddridge
API Number:	47-017-05951-00-00
Operator Number:	E1210363
Well Name:	513136
Federal Well:	No
Longitude:	-80.800843
Latitude:	39.221293
Long/Lat Projection:	NAD83
True Vertical Depth (TVD):	6,643'
Total Clean Fluid Volume* (gal):	4,744,110



Additive	Specific Gravity	Additive Quantity	Mass (lb)
Water	1.00	4,744,110	39,589,598
Sand (Proppant)	2.65	4,439,361	4,439,361
Hydrochloric Acid (15%)	1.07	14,500	129,473
FRW-900	1.09	3,567	32,446
NE-100	0.99	24	198
HVG-1	1.08	86	771
MC MX 437-5	1.33	3,726	41,429
CS-500-SI	1.15	1,167	11,151
CI-150	0.99	29	240
FE-100L	1.77	53	783
APB-1	1.98	9	9

**Ingredients Section:**

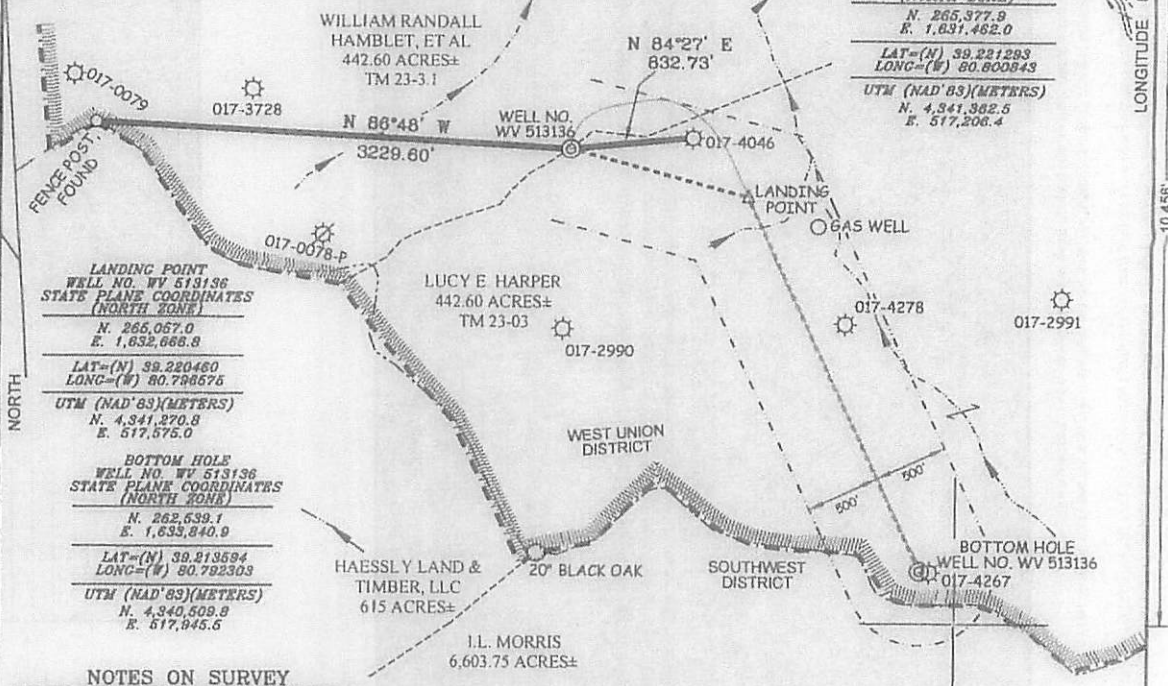
Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass) <sup>(1)</sup>	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass) <sup>(2)</sup>
Water	FTS International	Carrier/Base Fluid	Water	7732-18-5	100.00%	39,589,598	89.47720%
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00%	4,439,361	10.03348%
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00%	19,421	0.04389%
HVG-1	FTS International	Gelling agent	Guar gum	9001-30-0	50.00%	386	0.00087%
			Petroleum distillate	64742-47-8	55.00%	424	0.00096%
			Glycol	14808-60-7	2.00%	15	0.00003%
			Surfactant	68439-51-0	2.00%	15	0.00003%
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00%	24,858	0.05618%
CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10.00%	1,115	0.00252%
CI-150	FTS International	Acid Corrosion Inhibitor	Isopropanol	67-63-0	30.00%	72	0.00016%
			Dimethylformamide	68-12-2	10.00%	24	0.00005%
			Organic amine resin salt	Proprietary	30.00%	72	0.00016%
			Quaternary ammonium compound	Proprietary	10.00%	24	0.00005%
			Aromatic aldehyde	Proprietary	10.00%	24	0.00005%
			Ethylene glycol	107-21-1	30.00%	72	0.00016%
FE-100L	FTS International	Iron control	Citric acid	77-92-9	55.00%	431	0.00097%
APB-1	FTS International	Breaker	Ammonium persulfate	7727-54-0	95.00%	9	0.00002%
NE-100	FTS International	Non-emulsifier	2-Butoxyethanol	111-76-2	10.00%	20	0.00004%
			2-Propanol	67-63-0	10.00%	20	0.00004%
			Dodecylbenzenesulfonic acid	27176-87-0	5.00%	10	0.00002%
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00%	9,734	0.02200%
			Alkyl Alcohol	Proprietary	10.00%	3,245	0.00733%
			Oxalkylated alcohol A	Proprietary	5.00%	1,622	0.00367%

Total Slurry Mass (Lbs)  
44,245,458

<sup>(1)</sup>Total Water Volume sources may include fresh water, produced water, and/or recycled water  
<sup>(2)</sup> 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.

# LEWIS MAXWELL LEASE 2654 ACRES± WELL NO. WV 513136



**LANDING POINT**  
WELL NO. WV 513136  
STATE PLANE COORDINATES  
(NORTH ZONE)  
N. 265,067.0  
E. 1,632,668.8  
LAT=(N) 39.220460  
LONG=(W) 80.798675  
UTM (NAD'83)(METERS)  
N. 4,341,270.8  
E. 517,575.0

**BOTTOM HOLE**  
WELL NO. WV 513136  
STATE PLANE COORDINATES  
(NORTH ZONE)  
N. 262,539.1  
E. 1,633,840.9  
LAT=(N) 39.213639  
LONG=(W) 80.792303  
UTM (NAD'83)(METERS)  
N. 4,340,509.8  
E. 517,945.5

**WELL NO. WV 513136**  
STATE PLANE COORDINATES  
(NORTH ZONE)  
N. 265,377.9  
E. 1,631,462.0  
LAT=(N) 39.221293  
LONG=(W) 80.800843  
UTM (NAD'83)(METERS)  
N. 4,341,362.5  
E. 517,206.4

### NOTES ON SURVEY

1. TIES TO WELLS AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 28 PAGE 177.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF DODDRIDGE COUNTY IN JULY, 2013.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE TIE TO CORS NETWORK).
5. PLAT DATED 03/08/09 REVISED 03/11/10 TO EXTEND HORIZONTAL LEG AND CHANGE BOTTOM HOLE COORDINATES, REVISED 06/07/13 TO CHANGE TOP HOLE COORDINATES, REVISED 08/12/13 TO ADD 500' OFFSET ETC.
6. AS DRILLED INFORMATION PROVIDED BY EQT.

### LEGEND

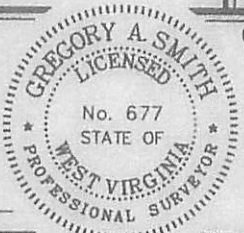
AS DRILLED ———  
PROPOSED - - - - -

### AS DRILLED INFORMATION

BOTTOM HOLE WELL NO. WV 513136 STATE PLANE COORDINATES (NORTH ZONE)		WELL NO. WV 513136 STATE PLANE COORDINATES (NORTH ZONE)	
N. 262,566.2	E. 1,633,857.4	N. 265,377.9	E. 1,631,462.0
LAT=(N) 39.213639	LONG=(W) 80.792246	LAT=(N) 39.221293	LONG=(W) 80.800843
UTM (NAD'83)(METERS) N. 4,340,514.7 E. 517,950.5		UTM (NAD'83)(METERS) N. 4,341,362.5 E. 517,206.4	



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



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
DATE AUGUST 29, 20 13  
REVISED DATE DECEMBER 05, 20 14  
OPERATORS WELL NO WV 513136  
API WELL NO. 47 - 017 - 05951  
STATE COUNTY PERMIT

P.S. 677 *Gregory A. Smith*

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 698DASDRILLED513136  
PROVEN SOURCE OF ELEVATION SCALE 1" = 1,000'  
DGPS (SURVEY GRADE TIE TO CORS NETWORK)

STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ IF "GAS" PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW

LOCATION: ELEVATION 1,240(GROUND) 1,242.5(PROPOSED) WATERSHED LEFT FORK  
DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE OXFORD 7.5'

SURFACE OWNER LUCY E. HARPER ACREAGE 442.6±  
ROYALTY OWNER LEWIS MAXWELL HEIRS LEASE ACREAGE 2,654±  
PROPOSED WORK: LEASE NO. 080616  
DRILL  CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE  PLUG OFF OLD \_\_\_  
FORMATION \_\_\_ PERFORATE NEW FORMATION \_\_\_ PLUG AND ABANDON \_\_\_ CLEAN OUT AND REPLUG \_\_\_ OTHER \_\_\_  
PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS ESTIMATED DEPTH \_\_\_

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY  
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

04/01/2016