

APPROVED

NAME:

DATE:

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514664

API: 47 - 017 - 06384

Submission: Initial Amended

Notes: Inj Test - 4.01
Reperf - stg 41 (41.1)

Correction to Production Cement Top
(MD)

RECEIVED
Office of Oil and Gas

DEC 21 2015

WV Department of
Environmental Protection

4/04/2016

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

API 47 - 017 - 06384 County Doddridge District West Union
Quad West Union 7.5' Pad Name WEU51 Field/Pool Name _____
Farm name Jane Hardin Trustee/Mary Well Number 514664
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 4,345,189 Easting 520,433
Landing Point of Curve Northing 4,345,221 Easting 520,835
Bottom Hole Northing 4,343,293 Easting 521,774

Elevation (ft) 1208 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)
SBM 12.5ppg - powdered hydrocarbon resin, calcium carbonate, ground almond hulls, barium sulfate, calcium chloride, lecithin liquid, organophilic clay, polyaminated fatty acid, calcium hydroxide, polyimide surfactant, modified fatty acid, dimer.trimer fatty acid, ground walnut hulls, refined base oil.

Date permit issued 1/31/2014 Date drilling commenced 5/29/2014 Date drilling ceased 9/28/2014
Date completion activities began 3/29/2015 Date completion activities ceased 4/11/2015
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 334 Open mine(s) (Y/N) depths N
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths N
Coal depth(s) ft 101,170,294,314,486,555 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

04/01/2016

API 47-017 - 06384 Farm name Jane Hardin Trustee/Mary Well number 514664

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	28"	26"	40'	New	82.6#/ft		Y
Surface	17-1/2"	13-3/8"	1171'	New	54.5#/ft	213.82', 545'	Y
Coal							
Intermediate 1	12-3/8"	9-5/8"	5299'	New	40#/ft	3177', 4543'	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	15,024'	New	20#/ft	N/A	N
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 ²)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	49	15.6	1.18	57.82	0	8
Surface	Class A	882	15.6	1.19	1049.58	0	8
Coal							
Intermediate 1	Class A	375/340/1165	14.2/15.6/15.6	1.26/1.18/1.18	2248.4	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	330/985	14.2/15.2	1.26/1.97	2356	4,829'	72
Tubing							

Drillers TD (ft) 15,024' Loggers TD (ft) N/A
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,744

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 Conductor-N/A

Surface-bow spring centralizers set at 1127', 670', 213'
 Intermediate-bow spring centralizers set at 5255', 4838', 4384', 3928', 3473', 3100', 2957', 2584', 2128', 1672', 1215', 758'
 Production- Composite bodied centralizers on every joint from Shoe track up to 5,000' MD.

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 _____

Drilling Contractor: Savanna Drilling
Address: 2204 Timberloch Place Suite 230

City: Woodlands State: TX Zip: 77380

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FESH WATER ZONE	0	0	334	334
SAND / SHALE	0	0	101	101
WASHINGTON COAL	101	101	104	104
SAND / SHALE	104	104	170	170
WAYNESBURG A COAL	170	170	172	172
SAND / SHALE	172	172	294	294
COAL	294	294	298	298
SAND / SHALE	298	298	314	314
UNIONTOWN COAL	314	314	317	317
SAND / SHALE	317	317	486	486
REDSTONE COAL	486	486	487	487
SAND / SHALE	487	487	555	555
PITTSBURGH COAL	555	555	558	558
SAND / SHALE	558	558	1,478	1,478
MAXTON	1,478	1,478	1,874	1,874
BIG LIME	1,874	1,874	1,943	1,943
KEENER	1,943	1,943	2,173	2,173
WEIR	2,173	2,173	2,369	2,369
BEREA	2,369	2,369	2,375	2,375
GANTZ	2,375	2,375	2,489	2,489
50F	2,489	2,489	2,579	2,579
30F	2,579	2,579	2,723	2,723
4TH	2,723	2,723	2,916	2,916
BAYARD	2,916	2,916	3,233	3,233
WARREN	3,233	3,233	3,294	3,294
SPEECHLEY	3,294	3,294	3,965	3,965
BALLTOWN A	3,965	3,965	4,241	4,241
BRADFORD	4,241	4,241	4,447	4,447
RILEY	4,447	4,447	4,884	4,884
BENSON	4,884	4,884	5,131	5,131
ALEXANDER	5,131	5,131	6,436	6,314
SONYEA	6,436	6,314	6,799	6,456
MIDDLESEX	6,799	6,456	6,950	6,511
GENESEE	6,950	6,511	7,176	6,593
GENESEO	7,176	6,593	7,258	6,621
TULLY	7,258	6,621	7,355	6,649
HAMILTON	7,355	6,649	7,445	6,674
MARCELLUS	7,445	6,674	15,024	6,756



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EQT Production - Marcellus

Doddridge County, WV Grid

Doddridge County 514664

Well #514664

Main Wellbore

Design: As Drilled Surveys

Standard Survey Report

29 September, 2014



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04/01/2016



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Phoenix Technology Services Survey Report



Where energy meets innovation.

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514664
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1224.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB @ 1224.0usft
Site:	Doddridge County 514664	North Reference:	Grid
Well:	Well #514664	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	As Drilled Surveys		

Project

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

Site

Site Position:		Northing:	277 756 70 usft	Latitude:	39 26
From:	Map	Easting:	1,642,259 10 usft	Longitude:	-80 76
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0 81 "

Well

Well Position	+N-S	0.0 usft	Northing:	277,756 70 usft	Latitude:	39° 15' 20 520 N
	+E-W	0.0 usft	Easting:	1 642 259 10 usft	Longitude:	80 45' 48 066 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	1,208 0 usft

Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	9/16/2014	-8 49	66 76	52,243

Design

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0 0	0 0	0 0	145 67

Survey Program

From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0 00	5 607 0	Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
0 00	15 024 0	514664 PHX MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declination

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)
0 0	0 00	0 00	0.0	-1,224 0	0 0	0.0	0.0	0.00	0 00	0 00
99 0	0 26	237 75	99.0	-1,125.0	-0.1	-0.2	0.0	0.26	0 26	0 00
199 0	0 26	217 38	199 0	-1 025 0	-0.4	-0.5	0 1	0 09	0 00	-20 37
299 0	0 27	217 79	299.0	-925 0	-0.8	-0.8	0 2	0 01	0 01	0 41
399 0	0 27	214 78	399 0	-825 0	-1.2	-1 1	0 4	0 01	0 00	-3 01
499 0	0 15	192 46	499 0	-725 0	-1.5	-1 2	0 5	0 14	-0 12	-22 32
599 0	0 13	158 29	599.0	-625 0	-1.7	-1 2	0 7	0 08	-0 02	-34 17
699 0	0 13	141 07	699 0	-525 0	-1.9	-1.1	1 0	0 04	0 00	17 22



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Phoenix Technology Services Survey Report



Where energy meets innovation.

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514664
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1224.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB @ 1224.0usft
Site:	Doddridge County 514664	North Reference:	Grid
Well:	Well #514664	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
799.0	0.12	183.07	799.0	-425.0	-2.1	-1.1	1.1	0.09	-0.01	42.00
899.0	0.26	237.31	899.0	-325.0	-2.3	-1.2	1.2	0.21	0.14	54.24
999.0	0.18	229.90	999.0	-225.0	-2.6	-1.6	1.2	0.08	-0.08	-7.41
1,099.0	0.19	93.22	1,099.0	-125.0	-2.7	-1.5	1.4	0.34	0.01	-136.68
1,199.0	0.34	74.14	1,199.0	-25.0	-2.6	-1.1	1.5	0.17	0.15	-19.08
1,299.0	0.41	48.55	1,299.0	75.0	-2.3	-0.5	1.6	0.18	0.07	-25.59
1,399.0	0.45	51.33	1,399.0	175.0	-1.8	0.1	1.5	0.05	0.04	2.78
1,499.0	0.45	78.64	1,499.0	275.0	-1.5	0.8	1.6	0.21	0.00	27.31
1,599.0	0.46	96.47	1,599.0	375.0	-1.4	1.5	2.1	0.14	0.01	17.83
1,699.0	0.45	112.21	1,699.0	475.0	-1.6	2.3	2.7	0.12	-0.01	15.74
1,799.0	0.44	128.35	1,799.0	575.0	-2.0	3.0	3.3	0.13	-0.01	16.14
1,899.0	0.43	133.89	1,899.0	675.0	-2.5	3.5	4.1	0.04	-0.01	5.54
1,999.0	0.46	139.39	1,999.0	775.0	-3.1	4.1	4.8	0.05	0.03	5.50
2,099.0	0.39	142.46	2,099.0	875.0	-3.7	4.5	5.6	0.07	-0.07	3.07
2,199.0	0.31	151.53	2,199.0	975.0	-4.2	4.9	6.2	0.10	-0.08	9.07
2,299.0	0.34	156.17	2,299.0	1,075.0	-4.7	5.1	6.8	0.04	0.03	4.64
2,399.0	0.30	147.82	2,399.0	1,175.0	-5.2	5.4	7.3	0.06	-0.04	-8.35
2,499.0	0.33	163.15	2,499.0	1,275.0	-5.7	5.6	7.8	0.09	0.03	15.33
2,599.0	0.29	154.09	2,599.0	1,375.0	-6.2	5.8	8.4	0.06	-0.04	-9.06
2,699.0	0.34	175.72	2,699.0	1,475.0	-6.7	5.9	8.9	0.13	0.05	21.63
2,799.0	0.39	178.45	2,799.0	1,575.0	-7.3	6.0	9.4	0.05	0.05	2.73
2,899.0	0.38	179.02	2,899.0	1,675.0	-8.0	6.0	10.0	0.01	-0.01	0.57
2,999.0	0.36	182.82	2,999.0	1,775.0	-8.6	6.0	10.5	0.03	-0.02	3.80
3,099.0	0.46	179.15	3,099.0	1,874.9	-9.4	6.0	11.1	0.10	0.10	-3.67
3,199.0	0.39	180.52	3,199.0	1,974.9	-10.1	6.0	11.7	0.07	-0.07	1.37
3,299.0	0.39	178.69	3,299.0	2,074.9	-10.8	6.0	12.3	0.01	0.00	-1.83
3,399.0	0.44	174.92	3,399.0	2,174.9	-11.5	6.0	12.9	0.06	0.05	-3.77
3,499.0	0.43	179.51	3,499.0	2,274.9	-12.3	6.0	13.5	0.04	-0.01	4.59
3,599.0	0.44	174.20	3,599.0	2,374.9	-13.0	6.1	14.2	0.04	0.01	-5.31
3,699.0	0.48	179.00	3,699.0	2,474.9	-13.8	6.1	14.9	0.06	0.04	4.80
3,799.0	0.53	180.86	3,799.0	2,574.9	-14.7	6.1	15.6	0.05	0.05	1.86
3,899.0	0.62	181.32	3,899.0	2,674.9	-15.7	6.1	16.4	0.09	0.09	0.46
3,999.0	0.66	201.56	3,999.0	2,774.9	-16.8	5.9	17.2	0.23	0.04	20.24
4,099.0	0.73	212.58	4,099.0	2,874.9	-17.9	5.3	17.8	0.15	0.07	11.02
4,199.0	0.78	224.14	4,199.0	2,974.9	-18.9	4.5	18.1	0.16	0.05	11.56
4,299.0	0.85	236.67	4,299.0	3,074.9	-19.8	3.4	18.3	0.19	0.07	12.53
4,399.0	0.88	251.22	4,399.0	3,174.9	-20.4	2.1	18.0	0.22	0.03	14.55
4,499.0	0.94	255.25	4,499.0	3,274.9	-20.9	0.6	17.6	0.09	0.06	4.03
4,599.0	1.02	259.08	4,599.0	3,374.9	-21.3	-1.1	16.9	0.10	0.08	3.83
4,699.0	1.04	274.00	4,699.0	3,474.8	-21.4	-2.9	16.0	0.27	0.02	14.92
4,799.0	1.05	277.34	4,799.0	3,574.8	-21.2	-4.7	14.9	0.06	0.01	3.34
4,899.0	1.09	283.80	4,899.0	3,674.8	-20.8	-6.5	13.5	0.13	0.04	6.46



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Wellbore:	Main Wellbore		
Design:	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)
4,999.0	0.99	292.05	4,998.8	3,774.8	-20.3	-8.3	12.1	0.18	-0.10	8.25
5,099.0	1.03	291.17	5,098.8	3,874.8	-19.6	-9.9	10.6	0.04	0.04	-0.88
5,199.0	1.03	303.96	5,198.8	3,974.8	-18.8	-11.5	9.1	0.23	0.00	12.79
5,299.0	1.23	310.84	5,298.7	4,074.7	-17.6	-13.0	7.2	0.24	0.20	6.88
5,399.0	1.39	321.27	5,398.7	4,174.7	-16.0	-14.6	5.0	0.29	0.16	10.43
5,499.0	1.62	340.08	5,498.7	4,274.7	-13.7	-15.8	2.4	0.54	0.23	18.81
5,599.0	2.00	347.06	5,598.6	4,374.6	-10.7	-16.7	-0.6	0.44	0.38	6.98
Gyro Tie In=5607 MD										
5,607.0	2.01	346.60	5,606.6	4,382.6	-10.4	-16.8	-0.9	0.24	0.13	-5.75
5,742.0	3.60	19.00	5,741.5	4,517.5	-4.1	-16.0	-5.6	1.62	1.18	24.00
5,773.0	6.40	28.10	5,772.3	4,548.3	-1.6	-14.8	-7.0	9.36	9.03	29.35
5,805.0	9.30	30.60	5,804.0	4,580.0	2.2	-12.7	-8.9	9.12	9.06	7.81
5,836.0	11.80	35.40	5,834.5	4,610.5	6.9	-9.6	-11.1	8.54	8.06	15.48
5,868.0	13.40	40.50	5,865.7	4,641.7	12.4	-5.2	-13.2	6.09	5.00	15.94
5,899.0	15.10	43.10	5,895.8	4,671.8	18.1	-0.2	-15.0	5.86	5.48	8.39
5,931.0	17.90	44.80	5,926.5	4,702.5	24.6	6.2	-16.8	8.88	8.75	5.31
5,963.0	20.60	45.90	5,956.7	4,732.7	32.0	13.7	-18.7	8.51	8.44	3.44
5,994.0	22.70	46.70	5,985.5	4,761.5	39.9	21.9	-20.6	6.84	6.77	2.58
6,025.0	25.10	45.80	6,013.8	4,789.8	48.6	31.0	-22.7	7.83	7.74	-2.90
6,057.0	27.50	43.40	6,042.5	4,818.5	58.7	40.9	-25.4	8.20	7.50	-7.50
6,089.0	29.70	41.60	6,070.6	4,846.6	70.0	51.3	-28.9	7.38	6.88	-5.63
6,120.0	32.00	40.30	6,097.2	4,873.2	82.0	61.7	-32.9	7.72	7.42	-4.19
6,152.0	34.60	40.30	6,124.0	4,900.0	95.4	73.1	-37.6	8.13	8.13	0.00
6,183.0	37.50	40.30	6,149.0	4,925.0	109.3	84.9	-42.4	9.35	9.35	0.00
6,214.0	40.60	40.60	6,173.1	4,949.1	124.2	97.5	-47.5	10.02	10.00	0.97
6,246.0	43.70	40.50	6,196.8	4,972.8	140.5	111.5	-53.2	9.69	9.69	-0.31
6,277.0	46.70	40.60	6,218.7	4,994.7	157.2	125.8	-58.9	9.68	9.68	0.32
6,309.0	49.40	40.70	6,240.0	5,016.0	175.3	141.3	-65.1	8.44	8.44	0.31
6,341.0	52.00	40.80	6,260.3	5,036.3	194.0	157.5	-71.4	8.13	8.13	0.31
6,372.0	54.50	41.00	6,278.9	5,054.9	212.8	173.7	-77.8	8.08	8.06	0.65
6,404.0	57.00	41.70	6,296.9	5,072.9	232.6	191.2	-84.3	8.02	7.81	2.19
6,435.0	59.00	42.40	6,313.3	5,089.3	252.2	208.8	-90.5	6.73	6.45	2.26
6,467.0	61.10	43.00	6,329.3	5,105.3	272.5	227.6	-96.7	6.76	6.56	1.88
6,498.0	62.90	43.00	6,343.8	5,119.8	292.6	246.3	-102.7	5.81	5.81	0.00
6,530.0	64.60	43.10	6,358.0	5,134.0	313.5	265.9	-109.0	5.32	5.31	0.31
6,561.0	66.40	43.30	6,370.8	5,146.8	334.1	285.2	-115.1	5.84	5.81	0.65
6,593.0	67.90	43.30	6,383.3	5,159.3	355.5	305.4	-121.4	4.69	4.69	0.00
6,624.0	68.70	43.60	6,394.7	5,170.7	376.5	325.2	-127.5	2.73	2.58	0.97
6,656.0	69.40	43.50	6,406.2	5,182.2	398.1	345.8	-133.8	2.21	2.19	-0.31
6,687.0	70.00	43.60	6,416.9	5,192.9	419.2	365.8	-139.9	1.96	1.94	0.32
6,719.0	69.90	45.40	6,427.9	5,203.9	440.6	386.9	-145.7	5.29	-0.31	5.63
6,750.0	70.00	47.60	6,438.5	5,214.5	460.7	408.0	-150.4	6.67	0.32	7.10
6,782.0	69.50	51.30	6,449.6	5,225.6	480.2	430.8	-153.6	10.96	-1.56	11.56



Where energy meets innovation.

Phoenix Technology Services Survey Report



Where energy meets innovation.

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514664
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1224.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB @ 1224.0usft
Site:	Doddridge County 514664	North Reference:	Grid
Well:	Well #514664	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
6,814.0	69.10	54.80	6,460.9	5,236.9	498.2	454.7	-155.0	10.31	-1.25	10.94
6,845.0	68.80	58.10	6,472.0	5,248.0	514.2	478.8	-154.6	9.98	-0.97	10.65
6,877.0	68.40	62.60	6,483.7	5,259.7	528.9	504.7	-152.2	13.15	-1.25	14.06
6,909.0	68.20	66.60	6,495.6	5,271.6	541.7	531.6	-147.6	11.63	-0.63	12.50
6,940.0	68.10	70.80	6,507.1	5,283.1	552.1	558.4	-141.1	12.58	-0.32	13.55
6,972.0	68.40	74.40	6,519.0	5,295.0	561.0	586.7	-132.4	10.49	0.94	11.25
7,003.0	68.40	77.60	6,530.4	5,306.4	568.0	614.7	-122.4	9.60	0.00	10.32
7,034.0	68.10	80.70	6,541.9	5,317.9	573.4	643.0	-110.9	9.34	-0.97	10.00
7,066.0	68.50	82.30	6,553.7	5,329.7	577.8	672.4	-98.0	4.81	1.25	5.00
7,097.0	69.10	84.60	6,564.9	5,340.9	581.1	701.1	-84.5	7.18	1.94	7.42
7,129.0	69.40	87.60	6,576.3	5,352.3	583.1	730.9	-69.4	8.82	0.94	9.38
7,161.0	69.40	91.00	6,587.5	5,363.5	583.5	760.9	-52.8	9.95	0.00	10.63
7,192.0	69.70	94.50	6,598.4	5,374.4	582.1	789.9	-35.3	10.62	0.97	11.29
7,224.0	70.20	98.30	6,609.3	5,385.3	578.7	819.8	-15.7	11.26	1.56	11.88
7,256.0	70.90	102.40	6,620.0	5,396.0	573.3	849.4	5.6	12.28	2.19	12.81
7,287.0	72.60	105.80	6,629.7	5,405.7	566.1	878.0	27.6	11.77	5.48	10.97
7,319.0	73.90	108.30	6,638.9	5,414.9	557.1	907.3	51.5	8.51	4.06	7.81
7,350.0	74.20	111.10	6,647.4	5,423.4	547.1	935.3	75.6	8.74	0.97	9.03
7,382.0	73.90	114.70	6,656.2	5,432.2	535.1	963.7	101.5	10.86	-0.94	11.25
7,414.0	74.00	118.30	6,665.1	5,441.1	521.4	991.2	128.3	10.82	0.31	11.25
7,445.0	74.20	121.80	6,673.6	5,449.6	506.5	1,017.0	155.2	10.88	0.65	11.29
7,477.0	74.20	124.00	6,682.3	5,458.3	489.8	1,042.8	183.6	6.62	0.00	6.88
7,509.0	74.70	126.40	6,690.9	5,466.9	472.0	1,068.0	212.5	7.39	1.56	7.50
7,540.0	76.10	130.00	6,698.7	5,474.7	453.4	1,091.6	241.1	12.11	4.52	11.61
7,571.0	77.60	133.60	6,705.7	5,481.7	433.3	1,114.1	270.4	12.30	4.84	11.61
7,603.0	78.80	137.60	6,712.3	5,488.3	410.9	1,136.0	301.2	12.80	3.75	12.50
7,635.0	80.80	141.00	6,718.0	5,494.0	387.1	1,156.5	332.5	12.18	6.25	10.63
7,666.0	83.50	143.50	6,722.2	5,498.2	362.8	1,175.3	363.2	11.82	8.71	8.06
7,697.0	87.40	147.10	6,724.7	5,500.7	337.4	1,192.9	394.1	17.09	12.58	11.61
7,761.0	92.00	151.80	6,725.0	5,501.0	282.3	1,225.4	457.9	10.27	7.19	7.34
7,823.0	92.60	151.80	6,722.5	5,498.5	227.7	1,254.7	519.5	0.97	0.97	0.00
7,886.0	91.80	153.80	6,720.1	5,496.1	171.7	1,283.5	582.0	3.42	-1.27	3.17
7,949.0	91.20	155.40	6,718.4	5,494.4	114.8	1,310.5	644.2	2.71	-0.95	2.54
8,012.0	90.40	154.70	6,717.6	5,493.6	57.7	1,337.1	706.3	1.69	-1.27	-1.11
8,076.0	90.10	154.60	6,717.3	5,493.3	-0.1	1,364.5	769.5	0.49	-0.47	-0.16
8,139.0	90.60	155.50	6,716.9	5,492.9	-57.2	1,391.0	831.7	1.63	0.79	1.43
8,202.0	90.90	156.80	6,716.1	5,492.1	-114.9	1,416.5	893.6	2.12	0.48	2.06
8,265.0	89.80	155.20	6,715.7	5,491.7	-172.4	1,442.1	955.6	3.08	-1.75	-2.54
8,328.0	89.90	155.10	6,715.8	5,491.8	-229.6	1,468.6	1,017.7	0.22	0.16	-0.16
8,392.0	90.20	155.00	6,715.8	5,491.8	-287.6	1,495.6	1,080.9	0.49	0.47	-0.16
8,455.0	90.30	154.70	6,715.5	5,491.5	-344.6	1,522.4	1,143.1	0.50	0.16	-0.48
8,518.0	90.50	154.20	6,715.1	5,491.1	-401.5	1,549.5	1,205.3	0.85	0.32	-0.79
8,581.0	91.10	154.00	6,714.2	5,490.2	-458.1	1,577.1	1,267.7	1.00	0.95	-0.32



Where energy meets innovation.

Phoenix Technology Services Survey Report



Where energy meets innovation.

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514684
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1224.0usft
Project:	Doddridge County, Wv Grd	MD Reference:	KB @ 1224.0usft
Site:	Doddridge County 514684	North Reference:	Grid
Well:	Well #514684	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
8,644.0	91 10	152 80	6,713.0	5,489.0	-514.5	1,605.3	1 330.1	1 90 0.00		-1 90
8,707.0	91 30	152 50	6,711.7	5,487.7	-570.4	1,634.2	1,392.6	0 57 0.32		-0 48
8,770.0	92 20	153.10	6,709.7	5,485.7	-626.4	1,663.0	1,455.1	1 72 1.43		0 95
8,833.0	90 40	154 70	6,708.3	5,484.3	-683.0	1,690.7	1,517.4	3.82 -2.86		2.54
8,895.0	90 80	156.10	6,707.7	5,483.7	-739.3	1,716.5	1,578.5	2 35 0.65		2 26
8,959.0	91 60	156 70	6,706.2	5,482.2	-798.0	1,742.1	1,641.4	1 82 1.56		0 94
9,022.0	91 00	155 40	6,704.7	5,480.7	-855.5	1,767.7	1 703.3	2 42 -1.27		-2 06
9,084.0	89 30	154 30	6,704.5	5,480.5	-911.6	1 794.0	1 764.5	3 27 -2.74		-1 77
9 148.0	90 40	154 80	6,704.7	5 480.7	-969.4	1 821.5	1 827.8	1 89 1.72		0 78
9,211.0	91 30	154 70	6,703.7	5 479.7	-1 026.4	1 848.4	1 890.0	1 44 1.43		-0 16
9,274.0	88 80	154 60	6,703.7	5,479.7	-1,083.3	1 875.4	1 952.2	3 97 -3.97		-0 16
9 337.0	88 30	154.30	6,705.3	5,481.3	-1,140.1	1,902.5	2 014.4	0 93 -0.79		-0 48
9,400.0	88 80	154.20	6,706.9	5,482.9	-1,196.9	1,929.9	2,076.7	0 81 0.79		-0 16
9,463.0	89 10	153 80	6,708.0	5,484.0	-1,253.5	1,957.5	2 139.0	0 79 0.48		-0 63
9 526.0	89 80	153 90	6,708.6	5,484.6	-1,310.0	1,985.3	2 201.4	1 12 1.11		0 16
9 589.0	90 40	155.30	6,708.5	5,484.5	-1,366.9	2,012.3	2 263.6	2 42 0.95		2 22
9 653.0	91 30	156 40	6,707.6	5,483.6	-1,425.3	2,038.5	2 326.6	2 22 1.41		1 72
9,716.0	91 50	156 20	6,706.0	5,482.0	-1,483.0	2 063.8	2 388.5	0 45 0.32		-0 32
9,779.0	90 50	155.70	6,704.9	5,480.9	-1,540.5	2,089.5	2,450.5	1 77 -1.59		-0 79
9 842.0	90 40	154 90	6,704.4	5,480.4	-1,597.8	2 115.8	2,512.6	1 28 -0.16		-1 27
9,905.0	90 90	154 10	6,703.7	5 479.7	-1 654.6	2 142.9	2 574.8	1 50 0.79		-1 27
9 968.0	91 40	154 00	6,702.5	5 478.5	-1,711.3	2 170.5	2,637.2	0 81 0.79		-0 16
10,031.0	90 30	155 70	6,701.5	5 477.5	-1,768.3	2 197.2	2,699.3	3 21 -1.75		2 70
10,094.0	89 90	155 40	6,701.4	5,477.4	-1 825.6	2,223.3	2,761.4	0 79 -0.63		-0 48
10,156.0	90 20	154 70	6,701.4	5 477.4	-1,881.8	2,249.5	2 822.6	1 23 0.48		-1 13
10,220.0	90 00	153 90	6,701.3	5,477.3	-1,939.5	2,277.2	2 885.9	1 29 -0.31		-1 25
10,282.0	89 10	154.20	6,701.7	5,477.7	-1,995.3	2,304.3	2,947.2	1.53 -1.45		0.48
10,345.0	88 90	154 10	6,702.8	5,478.8	-2,051.9	2,331.8	3,009.5	0.35 -0.32		-0 16
10,408.0	89 80	156.10	6,703.6	5,479.6	-2,109.1	2,358.3	3,071.6	3.48 1.43		3 17
10,471.0	90 20	157.40	6,703.6	5,479.6	-2,167.0	2,383.2	3,133.5	2.16 0.63		2.06
10,534.0	91 10	157.60	6,702.8	5,478.8	-2,225.2	2,407.3	3,195.1	1.46 1.43		0.32
10,597.0	89 90	157.00	6,702.3	5,478.3	-2,283.3	2,431.6	3,256.8	2.13 -1.90		-0.95
10,661.0	90 10	157.00	6,702.3	5,478.3	-2,342.2	2,456.6	3,319.6	0.31 0.31		0.00
10,724.0	90 20	156.60	6,702.1	5,478.1	-2,400.1	2,481.4	3,381.4	0.65 0.16		-0.63
10,787.0	89 00	156 70	6,702.6	5,478.6	-2,457.9	2,506.4	3,443.2	1.91 -1.90		0.16
10,851.0	87 70	155.20	6,704.4	5,480.4	-2,516.3	2,532.5	3,506.2	3.10 -2.03		-2.34
10,914.0	87 90	155.30	6,706.8	5,482.8	-2,573.5	2,558.8	3,568.3	0.35 0.32		0 16
10,977.0	89 30	157.30	6,708.4	5,484.4	-2,631.2	2,584.2	3,630.2	3.87 2.22		3 17
11,040.0	90 20	158.00	6,708.6	5,484.6	-2,689.4	2,608.1	3,691.8	1.81 1.43		1 11
11,104.0	89 90	156 00	6,708.6	5,484.6	-2,748.4	2,633.1	3 754.5	3 16 -0.47		-3 13
11,167.0	90 20	154 60	6 708.5	5 484.5	-2,805.6	2,659.4	3,816.6	2 27 0.48		-2 22
11,230.0	89 20	154 20	6,708.9	5,484.9	-2,862.4	2,686.7	3,878.9	1 71 -1.59		-0 63



Where energy meets innovation.

Phoenix Technology Services Survey Report



Where energy meets innovation.

Database:	EDM 5000 1- Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514854
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1224.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB @ 1224.0usft
Site:	Doddridge County 514854	North Reference:	Grid
Well:	Well #514664	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)	
11,294.0	88.70	153.40	6,710.0	5,486.0	-2,919.8	2,714.9	3,942.3	1.47	-0.78	-1.25	
11,357.0	88.40	152.50	6,711.6	5,487.6	-2,975.9	2,743.6	4,004.7	1.51	-0.48	-1.43	
11,419.0	88.40	151.80	6,713.4	5,489.4	-3,030.7	2,772.5	4,066.3	1.13	0.00	-1.13	
11,482.0	88.00	154.10	6,715.3	5,491.3	-3,086.8	2,801.1	4,128.8	3.70	-0.63	3.65	
11,545.0	87.40	153.40	6,717.9	5,493.9	-3,143.2	2,829.0	4,191.1	1.46	-0.95	-1.11	
11,608.0	87.90	153.80	6,720.4	5,496.4	-3,199.6	2,857.0	4,253.4	1.02	0.79	0.63	
11,671.0	88.80	154.30	6,722.3	5,498.3	-3,256.2	2,884.5	4,315.7	1.63	1.43	0.79	
11,734.0	89.60	154.50	6,723.1	5,499.1	-3,313.1	2,911.7	4,378.0	1.31	1.27	0.32	
11,797.0	90.50	154.90	6,723.1	5,499.1	-3,370.0	2,938.7	4,440.2	1.56	1.43	0.63	
11,859.0	88.70	154.80	6,723.5	5,499.5	-3,426.1	2,965.0	4,501.4	2.91	-2.90	-0.16	
11,922.0	87.60	153.60	6,725.4	5,501.4	-3,482.8	2,992.4	4,563.7	2.38	-1.43	-1.90	
11,985.0	88.30	154.40	6,727.6	5,503.6	-3,539.4	3,020.0	4,626.0	1.50	0.79	1.27	
12,048.0	88.70	156.60	6,729.2	5,505.2	-3,596.7	3,046.1	4,688.0	3.55	0.63	3.49	
12,111.0	89.80	157.20	6,730.1	5,506.1	-3,654.7	3,070.8	4,749.8	1.99	1.75	0.95	
12,174.0	89.80	157.10	6,730.3	5,506.3	-3,712.7	3,095.3	4,811.6	0.16	0.00	-0.16	
12,237.0	90.10	157.00	6,730.3	5,506.3	-3,770.7	3,119.9	4,873.3	0.50	0.48	-0.16	
12,300.0	88.90	156.10	6,730.9	5,506.9	-3,828.5	3,144.9	4,935.2	2.38	-1.90	-1.43	
12,363.0	88.00	155.80	6,732.6	5,508.6	-3,886.0	3,170.6	4,997.2	1.51	-1.43	-0.48	
12,426.0	88.90	156.40	6,734.3	5,510.3	-3,943.6	3,196.1	5,059.1	1.72	1.43	0.95	
12,489.0	89.90	157.00	6,735.0	5,511.0	-4,001.5	3,221.0	5,120.9	1.85	1.59	0.95	
12,552.0	89.90	156.80	6,735.1	5,511.1	-4,059.4	3,245.8	5,182.7	0.32	0.00	-0.32	
12,615.0	89.30	155.60	6,735.5	5,511.5	-4,117.1	3,271.2	5,244.7	2.13	-0.95	-1.90	
12,678.0	87.00	154.60	6,737.5	5,513.5	-4,174.2	3,297.7	5,306.8	3.98	-3.65	-1.59	
12,741.0	86.70	154.40	6,741.0	5,517.0	-4,230.9	3,324.8	5,368.9	0.57	-0.48	-0.32	
12,804.0	86.90	154.40	6,744.5	5,520.5	-4,287.7	3,352.0	5,431.1	0.32	0.32	0.00	
12,867.0	87.00	154.10	6,747.9	5,523.9	-4,344.3	3,379.3	5,493.3	0.50	0.16	-0.48	
12,930.0	87.60	153.90	6,750.8	5,526.8	-4,400.9	3,406.9	5,555.6	1.00	0.95	-0.32	
12,993.0	89.00	154.60	6,752.7	5,528.7	-4,457.6	3,434.2	5,617.8	2.48	2.22	1.11	
13,056.0	90.20	155.80	6,753.1	5,529.1	-4,514.8	3,460.7	5,680.0	2.69	1.90	1.90	
13,119.0	91.30	156.70	6,752.3	5,528.3	-4,572.5	3,486.0	5,741.9	2.26	1.75	1.43	
13,182.0	91.60	156.10	6,750.7	5,526.7	-4,630.2	3,511.2	5,803.8	1.06	0.48	-0.95	
13,245.0	92.00	156.20	6,748.7	5,524.7	-4,687.8	3,536.7	5,865.7	0.65	0.63	0.16	
13,309.0	91.00	156.30	6,747.1	5,523.1	-4,746.3	3,562.5	5,928.6	1.57	-1.56	0.16	
13,372.0	89.40	157.30	6,746.9	5,522.9	-4,804.2	3,587.3	5,990.4	2.99	-2.54	1.59	
13,435.0	88.70	157.30	6,747.9	5,523.9	-4,862.3	3,611.6	6,052.1	1.11	-1.11	0.00	
13,499.0	89.80	158.00	6,748.7	5,524.7	-4,921.5	3,635.9	6,114.7	2.04	1.72	1.09	
13,562.0	91.20	159.00	6,748.2	5,524.2	-4,980.1	3,659.0	6,176.1	2.73	2.22	1.59	
13,625.0	89.60	158.10	6,747.7	5,523.7	-5,038.8	3,682.0	6,237.5	2.91	-2.54	-1.43	
13,688.0	88.60	156.50	6,748.7	5,524.7	-5,096.9	3,706.4	6,299.2	2.99	-1.59	-2.54	
13,751.0	89.70	156.80	6,749.7	5,525.7	-5,154.7	3,731.3	6,361.1	1.81	1.75	0.48	
13,814.0	90.20	156.90	6,749.7	5,525.7	-5,212.6	3,756.1	6,422.9	0.81	0.79	0.16	
13,877.0	89.80	154.90	6,749.7	5,525.7	-5,270.1	3,781.8	6,484.9	3.24	-0.63	-3.17	
13,940.0	90.50	154.50	6,749.6	5,525.6	-5,327.1	3,808.7	6,547.1	1.28	1.11	-0.63	



Where energy meets innovation.

Phoenix Technology Services Survey Report



Where energy meets innovation.

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514854
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1224.0usft
Project:	Doddridge County WV Grid	MD Reference:	KB @ 1224.0usft
Site:	Doddridge County 514854	North Reference:	Grid
Well:	Well #514664	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
14,003.0	89.80	153.70	6,749.4	5,525.4	-5,383.8	3,836.3	6,609.4	1.69	-1.11	-1.27
14,067.0	89.40	154.30	6,749.8	5,525.8	-5,441.3	3,864.3	6,672.7	1.13	-0.63	0.84
14,130.0	90.10	154.70	6,750.1	5,526.1	-5,498.1	3,891.4	6,735.0	1.28	1.11	0.63
14,193.0	87.50	153.20	6,751.4	5,527.4	-5,554.7	3,919.1	6,797.3	4.76	-4.13	-2.38
14,255.0	88.60	153.70	6,753.5	5,529.5	-5,610.2	3,946.8	6,858.7	1.95	1.77	0.81
14,319.0	88.90	153.60	6,754.9	5,530.9	-5,667.5	3,975.2	6,922.1	0.49	0.47	-0.16
14,382.0	89.70	153.50	6,755.7	5,531.7	-5,723.9	4,003.2	6,984.5	1.28	1.27	-0.16
14,445.0	89.70	153.60	6,756.0	5,532.0	-5,780.3	4,031.3	7,046.9	0.16	0.00	0.16
14,508.0	90.10	152.90	6,756.1	5,532.1	-5,836.6	4,059.7	7,109.3	1.28	0.63	-1.11
14,571.0	90.40	152.20	6,755.9	5,531.9	-5,892.5	4,088.7	7,171.9	1.21	0.48	-1.11
14,634.0	90.40	151.40	6,755.4	5,531.4	-5,948.0	4,118.5	7,234.5	1.27	0.00	-1.27
14,697.0	90.60	150.80	6,754.9	5,530.9	-6,003.1	4,148.9	7,297.2	1.00	0.32	-0.95
14,760.0	90.90	149.60	6,754.1	5,530.1	-6,057.8	4,180.2	7,360.0	1.96	0.48	-1.90
14,823.0	90.60	148.40	6,753.2	5,529.2	-6,111.8	4,212.7	7,422.9	1.96	-0.48	-1.90
14,886.0	90.50	148.30	6,752.6	5,528.6	-6,165.4	4,245.7	7,485.8	0.22	-0.16	-0.16
Last Survey=14949' MD/ 6752' TVD										
14,949.0	90.40	147.50	6,752.1	5,528.1	-6,218.8	4,279.2	7,548.8	1.28	-0.16	-1.27
Projection to TD=15024' MD/ 6752' TVD										
15,024.0	90.40	147.50	6,751.6	5,527.6	-6,282.0	4,319.5	7,623.7	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,607.0	5,606.6	-10.4	-16.8	Gyro Tie In=5607' MD
14,949.0	6,752.1	-6,218.8	4,279.2	Last Survey=14949' MD/ 6752' TVD
15,024.0	6,751.6	-6,282.0	4,319.5	Projection to TD=15024' MD/ 6752' TVD

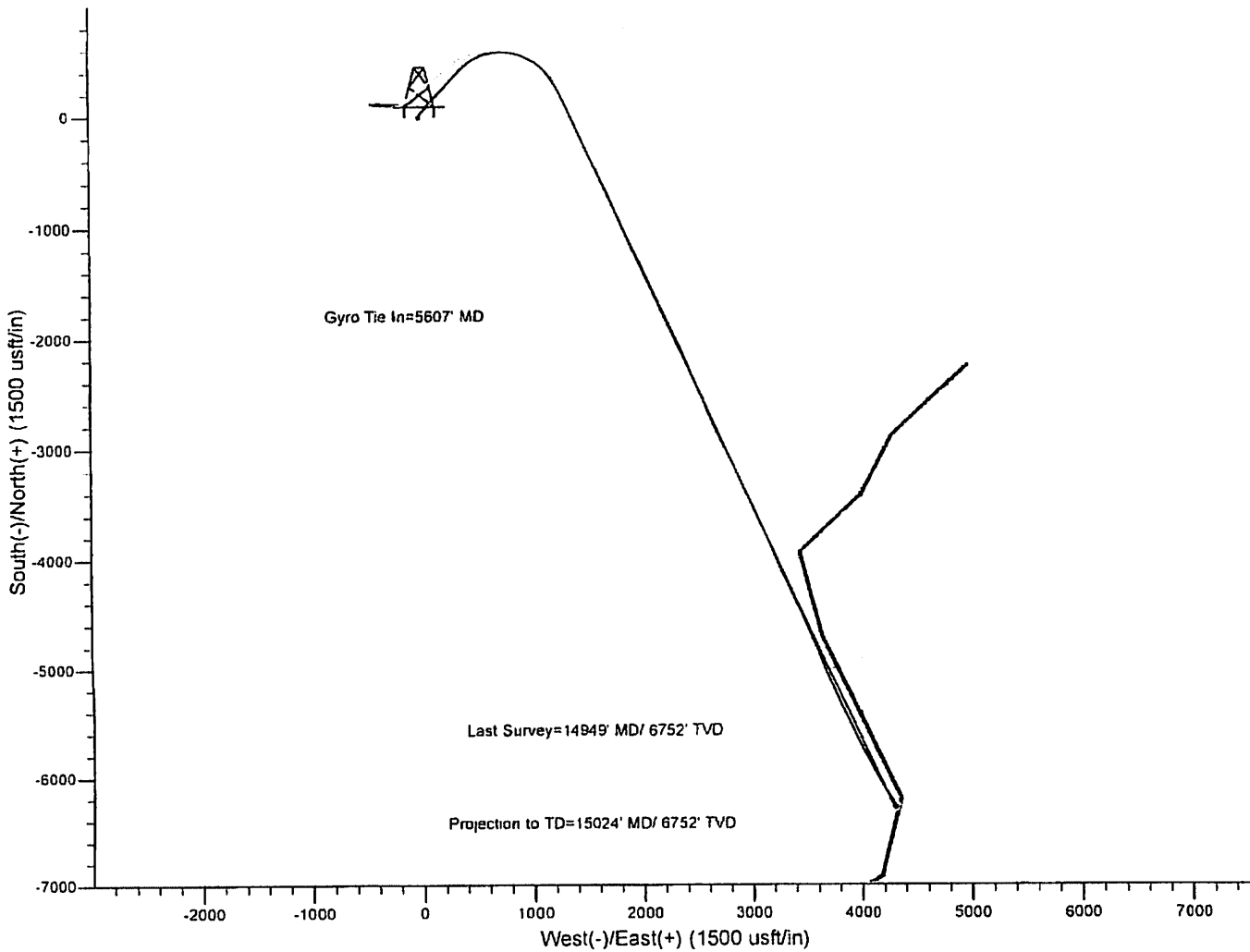
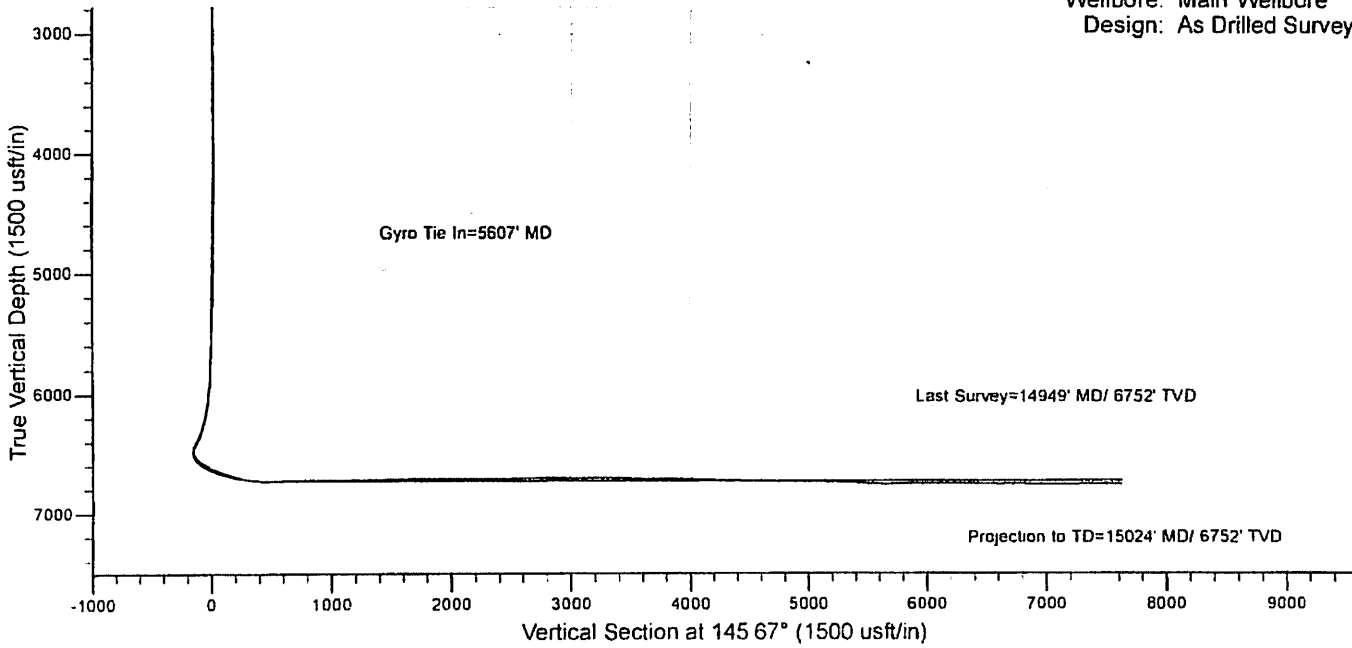
Checked By: _____ Approved By: _____ Date: _____

04/01/2016



EQT Production - Marcellus

Project: Doddridge County, WV Grid
Site: Doddridge County 514664
Well: Well #514664
Wellbore: Main Wellbore
Design: As Drilled Surveys



514664 - 47-017-06383-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	2/3/2015	15,022.00	15,024.00	10	MARCELLUS
1	2/5/2015	14,878.00	14,995.00	42	MARCELLUS
2	3/29/2015	14,698.00	14,820.00	42	MARCELLUS
3	3/29/2015	14,520.00	14,640.00	42	MARCELLUS
4	3/30/2015	14,342.00	14,460.00	42	MARCELLUS
5	3/30/2015	14,158.00	14,280.00	42	MARCELLUS
6	3/31/2015	13,978.00	14,100.00	42	MARCELLUS
7	3/31/2015	13,798.00	13,920.00	42	MARCELLUS
8	3/31/2015	13,618.00	13,740.00	42	MARCELLUS
9	3/31/2015	13,438.00	13,560.00	42	MARCELLUS
10	4/1/2015	13,258.00	13,382.00	42	MARCELLUS
11	4/1/2015	13,078.00	13,200.00	42	MARCELLUS
12	4/1/2015	12,898.00	13,020.00	42	MARCELLUS
13	4/1/2015	12,722.00	12,840.00	42	MARCELLUS
14	4/2/2015	12,538.00	12,660.00	42	MARCELLUS
15	4/2/2015	12,358.00	12,480.00	42	MARCELLUS
16	4/2/2015	12,178.00	12,300.00	42	MARCELLUS
17	4/2/2015	11,998.00	12,120.00	42	MARCELLUS
18	4/2/2015	11,818.00	11,940.00	42	MARCELLUS
19	4/3/2015	11,638.00	11,760.00	42	MARCELLUS
20	4/3/2015	11,458.00	11,580.00	42	MARCELLUS
21	4/3/2015	11,278.00	11,400.00	42	MARCELLUS
22	4/3/2015	11,102.00	11,220.00	42	MARCELLUS
23	4/3/2015	10,918.00	11,040.00	42	MARCELLUS
24	4/3/2015	10,738.00	10,860.00	42	MARCELLUS
25	4/4/2015	10,558.00	10,680.00	42	MARCELLUS
26	4/4/2015	10,378.00	10,500.00	42	MARCELLUS
27	4/4/2015	10,198.00	10,320.00	42	MARCELLUS
28	4/4/2015	10,018.00	10,141.00	42	MARCELLUS
29	4/5/2015	9,838.00	9,962.00	42	MARCELLUS
30	4/5/2015	9,658.00	9,780.00	42	MARCELLUS
31	4/5/2015	9,482.00	9,600.00	42	MARCELLUS
32	4/5/2015	9,298.00	9,420.00	42	MARCELLUS
33	4/5/2015	9,118.00	9,240.00	42	MARCELLUS
34	4/6/2015	8,938.00	9,060.00	42	MARCELLUS
35	4/6/2015	8,758.00	8,880.00	42	MARCELLUS
36	4/6/2015	8,578.00	8,700.00	42	MARCELLUS
37	4/6/2015	8,398.00	8,521.00	42	MARCELLUS
38	4/7/2015	8,218.00	8,338.00	42	MARCELLUS
39	4/7/2015	8,040.00	8,160.00	42	MARCELLUS
40	4/7/2015	7,858.00	7,980.00	42	MARCELLUS
41	4/10/2015	7,678.00	7,800.00	42	MARCELLUS
41.1	4/11/2015	7,628.00	7,717.00	28	MARCELLUS

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/29/2015
Job End Date:	4/11/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06384-00-00
Operator Name:	EQT Production
Well Name and Number:	514664
Longitude:	-80.76335200
Latitude:	39.25570000
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,756
Total Base Water Volume (gal):	12,917,940
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	89.56995	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	10.06104	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05705	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02504	None
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.01537	None
			Alkyl Alcohol	Proprietary	10.00000	0.00512	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00256	None
FRW-600	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.00654	None
			Ammonium acetate	631-61-8	6.00000	0.00131	None
HVG-1	FTS International	Gelling agent	Petroleum distillate	64742-47-8	55.00000	0.00166	None
			Guar gum	9000-30-0	50.00000	0.00151	None

			Surfactant	68439-51-0	2.00000	0.00006	None
			Clay	14808-60-7	2.00000	0.00006	None
B-10	FTS International	High pH buffer					
			Potassium carbonate	584-08-7	48.00000	0.00194	None
			Potassium hydroxide	1310-58-3	20.00000	0.00081	None
CS-500-SI	FTS International	Scale inhibitor					
			Ethylene glycol	107-21-1	10.00000	0.00252	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00058	None
CI-150	FTS International	Acid Corrosion inhibitor					
			Isopropanol	67-63-0	30.00000	0.00009	None
			Ethylene glycol	107-21-1	30.00000	0.00009	None
			Organic amine resin salt	Proprietary	30.00000	0.00009	None
			Aromatic aldehyde	Proprietary	10.00000	0.00003	None
			Dimethylformamide	68-12-2	10.00000	0.00003	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00003	None
NE-100	FTS International	Non-emulsifier					
			2-Propanol	67-63-0	10.00000	0.00003	None
			2-Butoxyethanol	111-76-2	10.00000	0.00003	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00001	None
APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00006	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)

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Hydraulic Fracturing Data

[Edit](#)

Job Start Date 3/29/2015	Job End Date 4/11/2015	API Number 47-017-06384-00-00	State & County West Virginia --- Doddridge
Well Name 514664			
Longitude -80.763352	Latitude 39.2557	Datum NAD83	Federal/Tribal Well?
True Vertical Depth (ft) 6756	Total Water Vol (gal) 12917940	Total Non Water Vol 0	Total Mass (lbs) 120353092



MSDS Chemical Ingredients

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

	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
Edit	Water	FTS International	Carrier/Base Fluid	Water	7732-18-5	100%	89.5699539823%	None	107800209.3
Edit	Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100%	10.0610352245%	None	12108767
Edit	MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60%	.0570478982%	None	68658.909
Edit	Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15%	.0250395571%	None	30135.881
Edit	FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30%	.015372572%	None	18501.366
				Alkyl Alcohol	Proprietary	10%	.0051241907%	None	6167.122
				Oxyalkylated alcohol A	Proprietary	5%	.0025620953%	None	3083.561
Edit	FRW-600	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30%	.0065398435%	None	7870.904
				Ammonium acetate	631-61-8	6%	.0013079687%	None	1574.181
Edit	HVG-1	FTS International	Gelling agent						

			Petroleum distillate	64742-47-8	55%	.0016562337%	None	1993.328
			Guar gum	9000-30-0	50%	.001505667%	None	1812.117
			Surfactant	68439-51-0	2%	.0000602267%	None	72.485
			Clay	14808-60-7	2%	.0000602267%	None	72.485
Edit	B-10	FTS International	High pH buffer					
			Potassium carbonate	584-08-7	48%	.0019405244%	None	2335.481
			Potassium hydroxide	1310-58-3	20%	.0008085518%	None	973.117
Edit	CS-500-SI	FTS International	Scale inhibitor					
			Ethylene glycol	107-21-1	10%	.0025190956%	None	3031.809
Edit	FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55%	.0005805017%	None	698.652
Edit	CI-150	FTS International	Acid Corrosion Inhibitor					
			Isopropanol	67-63-0	30%	.0000906104%	None	109.052
			Ethylene glycol	107-21-1	30%	.0000906104%	None	109.052
			Organic amine resin salt	Proprietary	30%	.0000906104%	None	109.052
			Aromatic aldehyde	Proprietary	10%	.0000302035%	None	36.351
			Dimethylformamide	68-12-2	10%	.0000302035%	None	36.351
			Quaternary ammonium compound	Proprietary	10%	.0000302035%	None	36.351
Edit	NE-100	FTS International	Non-emulsifier					
			2-Propanol	67-63-0	10%	.000029517%	None	35.525
			2-Butoxyethanol	111-76-2	10%	.000029517%	None	35.525
			Dodecylbenzenesulfonic acid	27176-87-0	5%	.0000147585%	None	17.762
Edit	APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95%	.0000584115%	None	70.3

Non-MSDS Chemical Ingredients

New Ingredients									
Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass	

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