

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

API 47-017-6458 County DODDRIDGE District WEST UNION
Quad OXFORD 7.5' Pad Name OXFORD 157 Field/Pool Name _____
Farm name JUSTIN L. HENDERSON ET AL Well Number 513144
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 4,343,012 Easting 520,179
Landing Point of Curve Northing 4,343,048 Easting 520,023
Bottom Hole Northing 4,344,139 Easting 519,492

Elevation (ft) 968 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 w/o Flowback
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 12.5 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 04/18/2014 Date drilling commenced 08/18/2014 Date drilling ceased 12/10/2014
Date completion activities began 4/13/2015 Date completion activities ceased 4/18/2015
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 144 Open mine(s) (Y/N) depths N
Salt water depth(s) ft - Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 351 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
SK-7/24/15
07/24/2015

API 47-017 - 6458 Farm name JUSTIN L. HENDERSON ET AL Well number 513144

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"	63'	NEW	A-500 40LB/FT	None	Y
Surface	17.5"	13.375"	943'	NEW	J-55 54.5LB/FT	None	Y
Coal							
Intermediate 1	12.375"	9.625"	5,064'	NEW	P-110 40LB/FT	1418', 2937', 3689'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	10,725'	NEW	P-110 20LB/FT	None.	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 ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	62	15.6	1.18	73.16	0	8
Surface	CLASS A	790	15.6	1.19	940.1	0	8
Coal							
Intermediate 1	CLASS A / CLASS A	375 / 340	14.2 / 15.6	1.28 / 1.18	881.2	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS A / CLASS H	305 / 530	14.2 / 15.2	1.26 / 1.97	1392	4,486	72
Tubing							

Drillers TD (ft) 10,738' Loggers TD (ft) 6486'

Deepest formation penetrated Marcellus Plug back to (ft) 5019'

Plug back procedure Pumped isolation plug # 1 with 2 bbls H2O, 42 3 bbls of 14.2 ppg cmt, 2 bbls H2O. Trip out of hole to @ 5250'. Pump isolation plug # 2 with 2 bbls H2O, 40 5 bbls (sks 210 end 1 28 yield) of 14.2 ppg cmt, 2 bbls H2O. Trip out of hole to @ 4850', pump kickoff plug with 2 bbls H2O, 32.2 bbls cmt (sks 165 and 1.12 yield) @ 16.0 ppg, Plugcem, 2 bbls H2O, Trip out of hole @ 4500' pump 20 bbls H2O.

Kick off depth (ft) 5,147'

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- NONE
SURFACE- 111', 484', 899'
INTERMEDIATE- 85', 584', 1,085', 1,585', 2,085', 2,585', 3,104', 3,606', 4,104', 4,603', 5,062'
PRODUCTION- Composite body centralizers every Jt from 4,545 to bottom'

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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API 47- 017 - 6458 Farm name JUSTIN L. HENDERSON ET AL Well number 513144

Drilling Contractor Patterson UTI
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company GYRODATA
Address 601 MAYER ST City BRIDGEVILLE State PA Zip 15017

Logging Company WEATHERFORD
Address P.O. BOX 200698 City DALLAS State TX Zip 75320

Cementing Company NABORS CEMENTING SERVICES
Address 2504 SMITH CREEK ROAD City WAYNESBURG State PA Zip 15370

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Formation	Top (ft TVD)	Bottom (ft TVD)
FRESH WATER ZONE	1	154
SAND/SHALE	1	347
PITTSBURGH COAL SEAM	347	351
SAND/SHALE	351	1,599.00
BIG LIME	1,599.00	1,884.00
WEIR	1,884.00	2,089.00
BEREA	2,089.00	2,093.00
GANTZ	2,093.00	2,204.00
50F	2,204.00	2,294.00
30F	2,294.00	2,349.00
GORDON	2,349.00	2,438.00
4TH	2,438.00	2,660.00
BAYARD	2,660.00	2,933.00
WARREN	2,933.00	3,010.00
SPEECHLEY	3,010.00	3,499.00
BALLTOWN A	3,499.00	4,146.00
RILEY	4,146.00	4,596.00
BENSON	4,596.00	4,849.00
ALEXANDER	4,849.00	6,006.10
SONYEA	6,006.10	6,140.10
MIDDLESEX	6,140.10	6,196.60
GENESEE	6,196.60	6,268.70
GENESEO	6,268.70	6,309.90
TULLY	6,309.90	6,337.30
HAMILTON	6,337.30	6,360.50
MARCELLUS	6,360.50	

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513144 - 47-017-06358-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	3/27/2015	10,723.00	10,725.00	10	MARCELLUS
1	4/13/2015	10,458.00	10,640.00	32	MARCELLUS
2	4/14/2015	10,234.00	10,416.00	40	MARCELLUS
3	4/14/2015	10,009.00	10,191.00	40	MARCELLUS
4	4/15/2015	9,784.00	9,966.00	40	MARCELLUS
5	4/15/2015	9,561.00	9,741.00	40	MARCELLUS
6	4/16/2015	9,336.00	9,516.00	40	MARCELLUS
7	4/16/2015	9,109.00	9,291.00	40	MARCELLUS
8	4/16/2015	8,884.00	9,066.00	40	MARCELLUS
9	4/16/2015	8,661.00	8,841.00	40	MARCELLUS
10	4/16/2015	8,436.00	8,616.00	40	MARCELLUS
11	4/17/2015	8,209.00	8,387.00	40	MARCELLUS
12	4/17/2015	7,984.00	8,166.00	40	MARCELLUS
13	4/17/2015	7,759.00	7,941.00	40	MARCELLUS
14	4/17/2015	7,532.00	7,718.00	40	MARCELLUS
15	4/17/2015	7,309.00	7,491.00	40	MARCELLUS
16	4/18/2015	7,084.00	7,266.00	40	MARCELLUS
17	4/18/2015	6,859.00	7,041.00	40	MARCELLUS

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/13/2015
Job End Date:	4/18/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06458-00-00
Operator Name:	EQT Production
Well Name and Number:	513144
Longitude:	-80.76635300
Latitude:	39.23609200
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,361
Total Base Water Volume (gal):	7,164,234
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	Xeane Group	Carrier/Base Fluid	Water	7732-18-5	100.00000	90.08098	None
Sand (Proppant)	Xeane Group	Proppant	Silica Substrate	14808-60-7	100.00000	9.56560	None
MC MX 437-5	Mulli-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.06122	None
FFR 760	Xeane Group	Friction reducer	Hydrotreated Light Distillate	84742-47-8	30.00000	0.01610	None
			Alkyl Alcohol	Proprietary	10.00000	0.00537	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00268	None
Hydrochloric Acid (15%)	Xeane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02246	None
EC6330A	Xeane Group	Scale Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00121	None
FFR 730	Xeane Group	Friction reducer	Oxyalkylated alcohol A	Proprietary	5.00000	0.00117	None
AI 600	Xeane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00015	None

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513144

API: 47 - 017 - 6458

Submission: Initial Amended

Notes: waiting on Flowback

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NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. AS DRILLED INFORMATION PROVIDED BY EOT.

**EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE
2,164 ACRES±
WELL NO. WV 513144**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 270,827.7	E. 1,641,308.6
NAD'27 GEO.	LAT-(N) 39.236092	LONG-(W) 80.766353
NAD'83 UTM (M)	N. 4,343,011.9	E. 520,179.4

LANDING POINT

NAD'27 S.P.C.(FT)	N. 270,755.7	E. 1,640,796.0
NAD'27 GEO.	LAT-(N) 39.236424	LONG-(W) 80.768169
NAD'83 UTM (M)	N. 4,343,048.3	E. 520,022.6

BOTTOM HOLE

NAD'27 S.P.C.(FT)	N. 274,362.8	E. 1,639,114.0
NAD'27 GEO.	LAT-(N) 39.246261	LONG-(W) 80.774287
NAD'83 UTM (M)	N. 4,344,138.6	E. 519,491.9

LEGEND

AS DRILLED ——— (red line)

PROPOSED - - - - - (green dashed line)

**AS DRILLED COORDINATES
FOR WELL NO. WV 513144
(47-017-06458)**

(S.P.C. NORTHZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 270,827.7	E. 1,641,308.6
NAD'27 GEO.	LAT-(N) 39.236092	LONG-(W) 80.766353
NAD'83 UTM (M)	N. 4,343,011.9	E. 520,179.4

BOTTOM HOLE

NAD'27 S.P.C.(FT)	N. 274,361.6	E. 1,639,112.9
NAD'27 GEO.	LAT-(N) 39.246257	LONG-(W) 80.774291
NAD'83 UTM (M)	N. 4,344,138.3	E. 519,491.5



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.

P.S. 677 *Gregory A. Smith*



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

DATE APRIL 16, 20 13

REVISED 03/06/14 & 12/18/14

OPERATORS WELL NO. WV 513144

API WELL NO. 47-017-06458

STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200 FILE NO. 7889ASDRILLED513144

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1000'

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 970'(GROUND) 968'(PROPOSED) WATERSHED BLUESTONE CREEK

DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE OXFORD 7.5'

SURFACE OWNER JUSTIN L. HENDERSON (LIFE) ACREAGE 1,602.90±

ROYALTY OWNER LEEMAN MAXWELL HRS ACREAGE (2,164±) (1,090±) LEASE NO. 706764 / 706763

PROPOSED WORK: 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 6399'

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

COUNTY NAME PERMIT

07/24/2015