

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

API 47 - 017 - 6391 County Doddridge District 8
Quad Oxford Pad Name OXF149 Field/Pool Name _____
Farm name Harper, Lucy E. Well Number 512482
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 4,341,360 Easting 517,203
Landing Point of Curve Northing 4,341,578 Easting 517,416
Bottom Hole Northing 4,342,348 Easting 517,041

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 11/23/2014
Date completion activities began 4/20/2015 Date completion activities ceased 4/26/2015
Verbal plugging (Y/N) N Date permission granted N/A Granted by Office of Oil & Gas

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 N/A 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: _____

10/23/2015

API 47-017 - 6391 Farm name Harper, Lucy E. Well number 512482

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	927	New	J-55, 54.5 #/ft	N/A	Yes
Coal							
Intermediate 1	12-3/8	9-5/8	3139	New	A-500, 40 #/ft	1359	Yes
Intermediate 2							
Intermediate 3							
Production	8-1/2	5-1/2	10,465	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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	A	38	15.6	1.18	18.4	Surface	8
Surface	A	782	15.6	1.20	983	Surface	8
Coal							
Intermediate 1	A/A	872 / 193 / 1065	15.6 / 15.6	1.18 / 1.18	1029/228/1257	Surface	8
Intermediate 2							
Intermediate 3							
Production	A/H	500 / 455 / 955	14.2 / 15.2	1.97 / 1.26	985 / 573 / 1558	4,465'	72
Tubing							

Drillers TD (ft) 10,468' Loggers TD (ft) _____
 Deepest formation penetrated Onondaga Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 5,023'

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 - 75', 532', 925'
 9-5/8" Intermediate - Bowspring Centralizers - 220', 842', 1,062', 1,484', 1,906', 2,328', 2,749', 3,137'
 5-1/2" Production - Composite Body Centralizers - Every Joint from the shoe to 1500' 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 All Non-Radioactive, Chemical Tracers

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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 _____

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Formation Name	Final Top TVD (ftGL) (ft)	Final Btm TVD (ftGL) (ft)
FRESH WATER ZONE	1	438
SANDSTONE/SHALE	1	642
COAL	642	645
SANDSTONE/SHALE	645	1,518.00
MAXTON	1,518.00	1,863.00
BIG LIME	1,863.00	1,923.00
KEENER	1,923.00	2,153.00
WEIR	2,153.00	2,353.00
BEREA	2,353.00	2,365.00
GANTZ	2,365.00	2,448.00
50F	2,448.00	2,557.00
30F	2,557.00	2,596.00
GORDON	2,596.00	2,702.00
4TH	2,702.00	2,839.00
5TH	2,839.00	2,878.00
BAYARD	2,878.00	3,213.00
WARREN	3,213.00	3,283.00
SPEECHLEY	3,283.00	3,810.00
BALLTOWN A	3,810.00	3,965.00
BALLTOWN B	3,965.00	4,160.00
BRADFORD	4,160.00	4,405.00
RILEY	4,405.00	4,836.60
BENSON	4,836.60	5,098.10
ALEXANDER	5,098.10	5,683.80
RHINESTREET	5,683.80	5,883.30
RHINESTREET UPPER	5,883.30	6,277.20
SONYEA	6,277.20	6,431.30
MIDDLESEX	6,431.30	6,489.80
GENESSEE	6,489.80	6,568.80
GENESE0	6,568.80	6,602.90
TULLY	6,602.90	6,626.80
HAMILTON	6,626.80	6,642.90
MARCELLUS	6,642.90	

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512482- 47-017-06391-0000 - Stimulated Stages

Stage Number	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
Initiation Sleeve	4/20/2015	8.7	808	9013	5680	0	666	0
1	4/21/2015	95.8	8637	9101	4817	196,673	6820	0
2	4/21/2015	92.8	8339	9249	6655	188,122	7985	0
2.01	4/22/2015	7.6	6492	7531	6421	0	2417	0
3	4/22/2015	100	7687	7874	5572	198,850	5486	0
4	4/22/2015	100.8	8255	8676	5945	200,414	6414	0
5	4/22/2015	99.4	7991	8554	5179	201,160	5513	0
6	4/23/2015	99.8	8324	8737	5398	202,591	5595	0
7	4/23/2015	99.1	8261	8839	5738	183,636	5306	0
8	4/23/2015	97	8580	9146	5468	201,192	6032	0
9	4/23/2015	100	7815	8574	4835	200,751	5510	0
10	4/23/2015	96.9	7748	9184	5103	200,783	6105	0
11	4/24/2015	99.2	7857	8823	5423	188,833	5370	0
12	4/24/2015	100.3	7860	8878	5351	199,214	5594	0
13	4/24/2015	93.1	7168	8951	4579	111,343	6701	0
13.01	4/24/2015	0	5346	5682	0	0	1689	0
13.1	4/25/2015	100	7357	7940	5165	86,289	1238	0
14	4/25/2015	100.3	7091	7384	5291	200,616	5343	0
15	4/25/2015	94.4	7811	8360	5269	201,123	5303	0
16	4/25/2015	99.2	7682	8741	5659	199,764	5228	0
17	4/25/2015	97.30	7715	8723	6187	199,463	5,314	0
18	4/26/2015	91.40	8113	9228	5577	198,838	5,975	0
19	4/26/2015	94.80	7927	8929	5181	200,499	6,529	0
20	4/26/2015	90.70	7767	8910	4946	170,028	6,055	0
21	4/26/2015	97.80	7905	8517	5573	198,664	5,138	0
22	4/26/2015	99.50	7548	9019	4009	193,514	5,274	0

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512482- 47-017-06391-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	4/15/2015			10	MARCELLUS
1	4/20/2015	10,319.00	10,411.00	32	MARCELLUS
2	4/21/2015	10,169.00	10,290.00	40	MARCELLUS
3	4/22/2015	10,019.00	10,141.00	40	MARCELLUS
4	4/22/2015	9,869.00	9,991.00	40	MARCELLUS
5	4/22/2015	9,719.00	9,841.00	40	MARCELLUS
6	4/23/2015	9,579.00	9,681.00	40	MARCELLUS
7	4/23/2015	9,429.00	9,526.00	40	MARCELLUS
8	4/23/2015	9,279.00	9,377.00	40	MARCELLUS
9	4/23/2015	9,129.00	9,231.00	40	MARCELLUS
10	4/23/2015	8,979.00	9,081.00	40	MARCELLUS
11	4/24/2015	8,829.00	8,931.00	40	MARCELLUS
12	4/24/2015	8,669.00	8,791.00	40	MARCELLUS
13	4/24/2015	8,519.00	8,641.00	40	MARCELLUS
14	4/25/2015	8,367.00	8,487.00	40	MARCELLUS
15	4/25/2015	8,219.00	8,341.00	40	MARCELLUS
16	4/25/2015	8,069.00	8,191.00	40	MARCELLUS
17	4/25/2015	7,919.00	8,041.00	40	MARCELLUS
18	4/25/2015	7,779.00	7,881.00	40	MARCELLUS
19	4/26/2015	7,633.00	7,731.00	40	MARCELLUS
20	4/26/2015	7,479.00	7,581.00	40	MARCELLUS
21	4/26/2015	7,331.00	7,431.00	40	MARCELLUS
22	4/26/2015	7,139.00	7,233.00	40	MARCELLUS

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/20/2015
Job End Date:	4/26/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06391-00-00
Operator Name:	EQT Production
Well Name and Number:	512482
Longitude:	-80.80088400
Latitude:	39.22126700
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,642
Total Base Water Volume (gal):	5,653,200
Total Base Non Water Volume:	0



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	FTS International	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	91.19679	None
Sand (Proppant)	FTS International	Proppant					
			Crystalline Silica	14808-60-7	100.00000	8.35564	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution					
			Calcium nitrate	10124-37-5	60.00000	0.05473	None
FRW-900	FTS International	Friction reducer					
			Hydrotreated light distillate	64742-47-8	30.00000	0.02497	None
			Alkyl Alcohol	Proprietary	10.00000	0.00832	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00416	None
Hydrochloric Acid (15%)	FTS International	Acidizing					
			Hydrochloric Acid	7647-01-0	15.00000	0.03690	None
CS-500-SI	FTS International	Scale inhibitor					
			Ethylene glycol	107-21-1	10.00000	0.00242	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00082	None
HVG-1	FTS International	Gelling agent					
			Petroleum distillate	64742-47-8	55.00000	0.00035	None

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			Guar gum	9000-30-0	50.00000	0.00032	None
			Clay	14808-60-7	2.00000	0.00001	None
			Surfactant	68439-51-0	2.00000	0.00001	None
CI-150	FTS International	Acid Corrosion Inhibitor					
			Organic amine resin salt	Proprietary	30.00000	0.00014	None
			Ethylene glycol	107-21-1	30.00000	0.00014	None
			Isopropanol	67-63-0	30.00000	0.00014	None
			Dimethylformamide	68-12-2	10.00000	0.00005	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00005	None
			Aromatic aldehyde	Proprietary	10.00000	0.00005	None
NE-100	FTS International	Non-emulsifier					
			2-Propanol	67-63-0	10.00000	0.00004	None
			2-Butoxyethanol	111-76-2	10.00000	0.00004	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00002	None
Windshield Washer fluid	Spectrum Tracer Services	Diagnostics					
			Methanol	67-56-1	40.00000	0.00001	None
			Inert Ingredients	Proprietary	60.00000	0.00001	None
Frac Fluid Identifier (FFI)	Spectrum Tracer Services	Diagnostics					
			Water	7732-18-5	94.00000	0.00002	None
			Sodium Salts	Proprietary	6.00000	0.00000	None
APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00001	None
Oil/Water Soluble Tracer (OST)/(WST)	Spectrum Tracer Services	Diagnostics					
			Charcoal	7440-44-0	90.00000	0.00000	None
			Inert Ingredients	Proprietary	10.00000	0.00000	None
Kelzan L	Spectrum Tracer Services	Diagnostics					
			Xanthan Gum	11138-66-2	50.00000	0.00000	None
			Diporpylene glycol monomethyl ether	34590-94-8	50.00000	0.00000	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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LEWIS MAXWELL LEASE

2654 ACRES±

WELL NO. WV 512482

LATITUDE 39° 15' 00"

LONGITUDE 80° 47' 30"

BOTTOM HOLE
WELL NO. WV 512482
STATE PLANE COORDINATES
(NORTH ZONE) NAD 27

N. 268,620.4
E. 1,630,973.0

LAT=(N) 39.230175
LONG=(W) 80.802735

UTM (NAD83)(METERS)
N. 4,342,347.8
E. 517,041.0

HAESSLY LAND &
TIMBER, LLC
266.38 ACRES±

ZOE K. WALTERS
261 ACRES±

BOTTOM HOLE
WELL NO. WV 512482

LANDING POINT
WELL NO. WV 512482
STATE PLANE COORDINATES
(NORTH ZONE) NAD 27

N. 266,073.6
E. 1,632,160.6

LAT=(N) 39.223231
LONG=(W) 80.798413

UTM (NAD83)(METERS)
N. 4,341,578.0
E. 517,415.7

HAESSLY LAND &
TIMBER, LLC
485 ACRES±

WILLIAM RANDALL
HAMBLET, ET AL
442.60 ACRES±
TM 23-3.1

LUCY E. HARPER
442.60 ACRES±
TM 23-03

HAESSLY LAND &
TIMBER, LLC
615 ACRES±

I.L. MORRIS
6,603.75 ACRES±

WELL NO. WV 512482
STATE PLANE COORDINATES
(NORTH ZONE) NAD 27

N. 265,368.5
E. 1,631,450.3

LAT=(N) 39.221267
LONG=(W) 80.800884

UTM (NAD83)(METERS)
N. 4,341,359.6
E. 517,202.9

NORTH

FENCE POST
FOUND

NOTES ON SURVEY

1. TIES TO WELLS, REFERENCES 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).
5. PLAT DATED 03/11/10 REVISED 12/26/12 TO EXTEND HORIZONTAL LEG AND CHANGE BOTTOM HOLE COORDINATES, REVISED 06/06/13 TO SHOW NEW TOP HOLE COORDINATES, REVISED 08/12/13 TO CONFORM TO WV CODE R. 35-8 ETC.
6. AS DRILLED INFORMATION PROVIDED BY EQT.



LEGEND

AS DRILLED ———

PROPOSED - - - - -

AS DRILLED INFORMATION

BOTTOM HOLE WELL NO. WV 512482 STATE PLANE COORDINATES (NORTH ZONE) NAD 27	WELL NO. WV 512482 STATE PLANE COORDINATES (NORTH ZONE) NAD 27
N. 268,618.5 E. 1,630,935.5	N. 265,368.5 E. 1,631,450.3
LAT=(N) 39.230168 LONG=(W) 80.802867	LAT=(N) 39.221267 LONG=(W) 80.800884
UTM (NAD83)(METERS) N. 4,342,347.0 E. 517,029.5	UTM (NAD83)(METERS) N. 4,341,359.6 E. 517,202.9

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 AUGUST 29 20 13

REVISED DATE DECEMBER 04 20 14

OPERATORS WELL NO. WV 512482

API WELL NO. 47-017-06391

STATE WEST VIRGINIA COUNTY DODDRIDGE PERMIT 10/23/2015

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 6980ASDRILLED512482

PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1,000'

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± LEASE NO. 080616

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 _____

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY

ADDRESS 115 PROFESSIONAL PLACE BRIDGEPORT, WV 26330 P.O. BOX 280 ADDRESS 115 PROFESSIONAL PLACE BRIDGEPORT, WV 26330 P.O. BOX 280

COUNTY NAME
PERMIT