

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

API 47-950-2220 County TYLER District MCELROY  
Quad SHIRLEY Pad Name SHR60 Field/Pool Name N/A  
Farm name WELLS, VIVIAN J. Well Number 514463  
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 4,360,593.72 Easting 516,269.03  
Landing Point of Curve Northing 4,360,398.23 Easting 516,011.70  
Bottom Hole Northing 4,359,515.40 Easting 516,126.91

Elevation (ft) 1011 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)  
WBM 12.4 & SBM 12.7 ppg, barium sulfate, sodium & calcium chloride, xanthan gum, polyacrylic acid, sodium hydroxide, chrome lignosulfonate, calcium hydroxide, sodium acid pyrophosphate, bentonite, Methyl ester of sulfonated tannin, treated silica, organic clay, quaternary ammonium bentonite, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, glutaraldehyde, ground walnut shells, calcium carbonate, fibrous cellulose, glauconite, emulsifiers (blend of fatty acids, tall oil, diethylates, fatty amine, diethanolamine), wetting agent (blend of mineral oil and phospholipids).

Date permit issued 03/24/2015 Date drilling commenced 07/01/2015 Date drilling ceased 04/04/2016  
Date completion activities began 10/19/2016 Date completion activities ceased 10/22/2016  
Verbal plugging (Y/N) N Date permission granted N/A Granted by JAN 19 2017

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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug  
Freshwater depth(s) ft 83, 133, 570, 906 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1198, 1865 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 19, 420, 686, 875, 1315 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

**APPROVED**  
NAME: [Signature] Review by:  
DATE: 1/25/17 02/03/2017

API 47-950 - 2220

Farm name WELLS, VIVIAN J.

Well number 514463

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	26"	20"	55'	NEW	A-500 94LB/FT	NONE	Y
Surface	17.5"	13.375"	1002'	NEW	J-55 54.5LB/FT	414'	Y
Coal							
Intermediate 1	12.375"	9.625"	5067'	NEW	P-110 40LB/FT	19'0, 2871, 4795	Y
Intermediate 2							
Intermediate 3							
Production	8.75" & 8.5"	5.5"	10255'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set <u>Davis Lynch casing packer and diverter tool placed at 2734' Two stage cement job performed.</u>							

Comment Details N/A

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	83	15.6	1.18	98	0	8 +
Surface	CLASS A	928	15.6	1.20	1114	0	8
Coal							
Intermediate 1	CLASS A/A/A & CLASS A	309/323/105 & 1151	14.2/15.6/15.6 & 15.6	1.49/1.18/1.17 & 1.17	2311	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS A / CLASS H	740 / 340	15.2 / 15.6	1.12 / 1.85	1458	4054'	72 +
Tubing							

Drillers TD (ft) 10261' MD Loggers TD (ft) N/A

Deepest formation penetrated MARCELLUS Plug back to (ft) 4280'

Plug back procedure Trip in hole open ended, tagged bottom at 5178', blew hole dry (dusting), and tripped out to 4309'. Rigged up Baker Hughes Cementers, pumped 99.8 bbl Class A cement, pumped 2 bbls fresh water to flush drill pipe, trip up 300', dropped nerf ball, pumped 2 bbls water, and blew drill string out with air. TOOH to surface.

Kick off depth (ft) 5372' MD

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- RAN AT LEAST EVERY 500' FEET  
INTERMEDIATE- RAN AT LEAST EVERY 500' FEET  
PRODUCTION- COMPOSITE BODY CENTRALIZERS RAN EVERY JOINT FROM SHOE TO KOP

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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- 950 - 2220 Farm name WELLS, VIVIAN J. Well number 514463

Drilling Contractor Savanna Drilling - Rig 803  
Address 125 Industry Road City Waynesburg State PA Zip 15370

Logging Company Vaughn Energy Services  
Address P.O. Box 261021 City Corpus Christi State TX Zip 78246-1021

Logging Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Cementing Company HALLIBURTON ENERGY SERVICE  
Address 121 CHAMPION WAY City CANONSBURG State PA Zip 15317

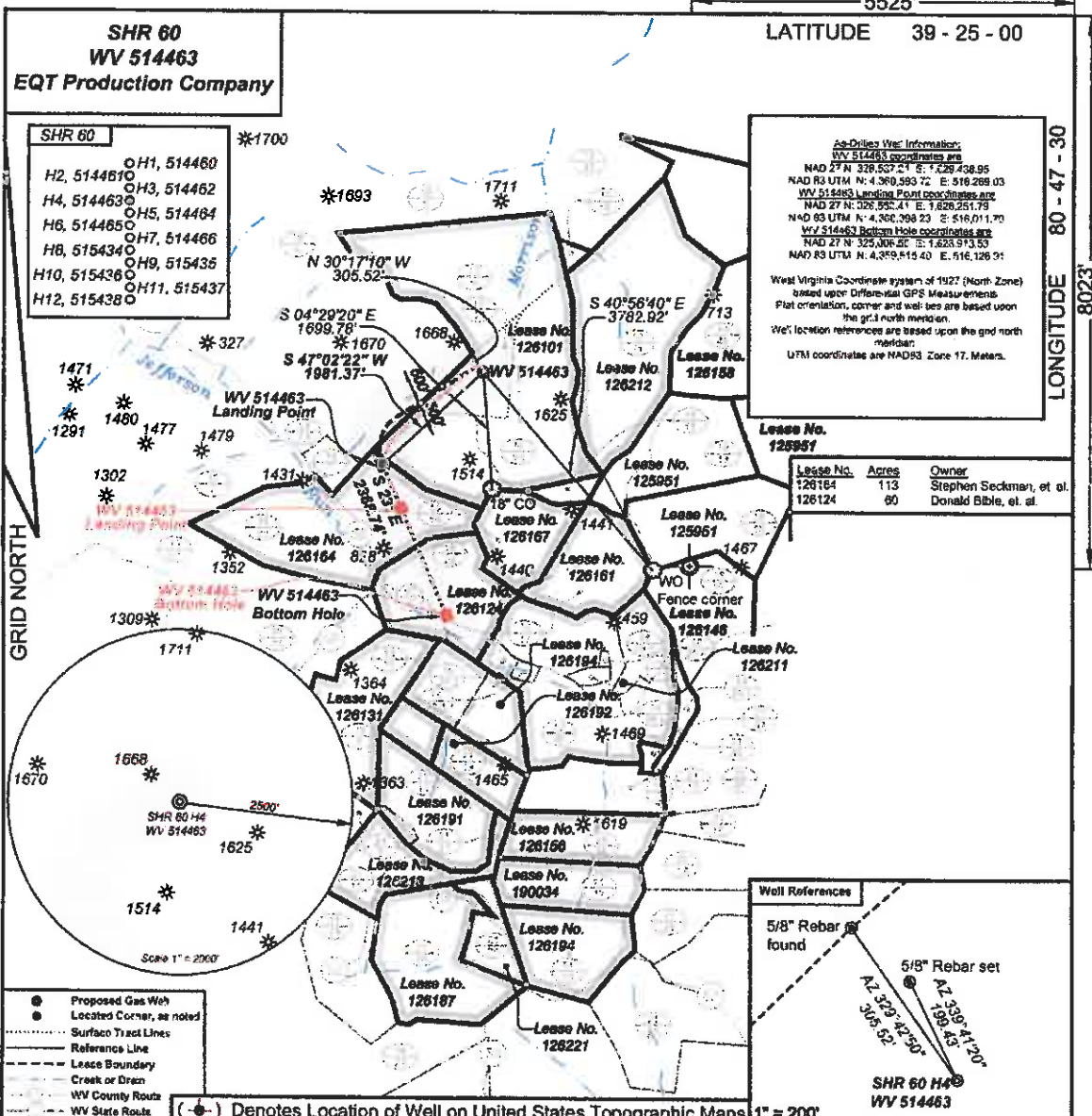
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API 47-950-2220	514463			SHR60
Final Formations				
Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	29	29
COAL	29	29	33	33
SAND/SHALE	33	33	430	430
COAL	430	430	434	434
SAND/SHALE	434	434	696	696
COAL	696	696	700	700
SAND/SHALE	700	700	885	885
COAL	885	885	889	889
SAND/SHALE	889	889	1325	1325
COAL	1325	1325	1329	1329
SAND/SHALE	1329	1329	1545	1545
MAXTON	1545	1545	1839	1839
BIG LIME	1839	1839	2261	2260
WEIR	2261	2260	2379	2378
GANTZ	2379	2378	2472	2471
50F	2472	2471	2697	2696
GORDON	2697	2696	3017	3015
BAYARD	3017	3015	3349	3347
WARREN	3349	3347	3444	3442
SPEECHLEY	3444	3442	3865	3862
BALLTOWN A	3865	3862	4003	4000
BALLTOWN B	4003	4000	4300	4296
BRADFORD	4300	4296	4564	4560
RILEY	4564	4560	4981	4976
BENSON	4981	4976	5232	5227
ALEXANDER	5232	5227	5826	5805
RHINESTREET	5826	5805	6124	6017
RHINESTREET UPPER	6124	6017	6280	6078
SONYEA	6280	6078	7198	6393
MIDDLESEX	7198	6393	7328	6435
GENESSEE	7328	6435	7594	6510
GENESEO	7594	6510	7696	6539
TULLY	7696	6539	7800	
HAMILTON	7800	6562	7906	
MARCELLUS	7906	6578	10261	6606

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**SHR 60**  
**WV 514463**  
**EQT Production Company**

5525'  
 LATITUDE 39 - 25 - 00

- SHR 60 \*1700
- H2, 514461
  - H3, 514462
  - H4, 514463
  - H5, 514464
  - H6, 514465
  - H7, 514466
  - H8, 515434
  - H9, 515435
  - H10, 515436
  - H11, 515437
  - H12, 515438

**As-Drilled Well Information:**  
 WV 514463 coordinates are:  
 NAD 27 N: 328,537.24 E: 1,229,438.95  
 NAD 83 UTM N: 4,360,593.72 E: 916,269.03  
 WV 514463 Landing Point coordinates are:  
 NAD 27 N: 328,535.41 E: 1,228,251.79  
 NAD 83 UTM N: 4,360,398.93 E: 916,071.70  
 WV 514463 Bottom Hole coordinates are:  
 NAD 27 N: 325,006.25 E: 1,623,913.53  
 NAD 83 UTM N: 4,359,515.40 E: 916,126.91

West Virginia Coordinate system of 1927 (North Zone) based upon Differential GPS Measurements. Flat orientation, corner and well ties are based upon the grid north meridian. Well location references are based upon the grid north meridian. UTM coordinates are NAD83 Zone 17, meters.

Lease No.	Acres	Owner
126164	113	Stephen Seckman, et al.
126124	60	Donald Bible, et al.

GRID NORTH

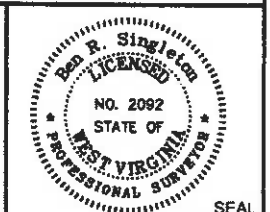
80 - 47 - 30  
 LONGITUDE

- Proposed Gas Well
  - Located Corner, as noted
  - Surface Tract Lines
  - Reference Line
  - - - Lease Boundary
  - Creek or Drain
  - WV County Route
  - WV State Route
- (⊕) Denotes Location of Well on United States Topographic Maps 1" = 200'



*I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Department of Environmental Protection.*

*Ben R. Singleton*  
 P.S. 2092



FILE NO: 208-13  
 DRAWING NO: 208-13 SHR 80 H4  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1:2500  
 PROVEN SOURCE OF ELEVATION: NGS CORS Station

**STATE OF WEST VIRGINIA**  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

DATE: September 15 20 16  
 OPERATOR'S WELL NO.: WV 514463  
 API WELL NO: 47  
 STATE: RECEIVED

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
 LOCATION: ELEVATION: Ground 1,018' Proposed 1,011' WATERSHED Morrison Run of McElroy Creek QUADRANGLE: Shire  
 DISTRICT: McElroy COUNTY: Tyler  
 SURFACE OWNER: Vivian J. Wells, et al. ACREAGE: 35.38  
 ROYALTY OWNER: George Birklein, et al. LEASE NO: 126101 ACREAGE: 60.00  
 PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OR ABANDON  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY)  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus ESTIMATED DEPTH: TVD 8,896'

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Ray  
 ADDRESS: 115 Professional Place PO Box 280 ADDRESS: 115 Professional Place PO Box 280  
 Bridgeport, WV 26330 Bridgeport, WV 26330

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**514463-47-095-02220-0000- Perforations**

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	10/3/2016	10229	10255	10	MARCELLUS
1	10/19/2016	10068	10190	32	MARCELLUS
2	10/19/2016	9868	10030	40	MARCELLUS
3	10/20/2016	9668	9830	40	MARCELLUS
4	10/20/2016	9468	9630	40	MARCELLUS
5	10/20/2016	9268	9430	40	MARCELLUS
6	10/20/2016	9068	9230	40	MARCELLUS
7	10/21/2016	8868	9030	40	MARCELLUS
8	10/21/2016	8668	8830	40	MARCELLUS
9	10/21/2016	8468	8630	40	MARCELLUS
10	10/21/2016	8268	8430	40	MARCELLUS
11	10/22/2016	8068	8230	40	MARCELLUS
12	10/22/2016	7868	8030	40	MARCELLUS

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514463-47-095-02220-0000 - 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	10/19/2016	13	7,616	9,212	3,947	0	962	0
1	10/19/2016	101	7,426	8,555	3,595	599,140.80	12,248	0
2	10/19/2016	101	7,477	8,574	3,832	601,740.10	11,909	0
3	10/20/2016	101	7,534	8,034	3,891	599,010.60	12,090	0
4	10/20/2016	100	7,449	8,930	3,927	601,240.10	12,176	0
5	10/20/2016	101	7,634	8,915	3,891	601,096.10	11,914	0
6	10/20/2016	100	7,360	9,066	4,107	599,200.50	11,831	0
7	10/21/2016	98	7,895	9,401	3,721	598,219.30	12,833	0
8	10/21/2016	100	7,977	9,659	4,092	600,729.00	12,965	0
9	10/21/2016	99	7,855	9,453	3,712	599,061.30	12,238	0
10	10/21/2016	100	7,342	7,748	4,501	603,011.50	11,738	0
11	10/22/2016	100	7,106	7,373	4,512	600,630.90	11,534	0
12	10/22/2016	101	7,251	8,513	4,004	604,871.00	11,815	0

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