

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

API 47-103-02998 County Wetzel District Grant
Quad Pine Grove Pad Name WVDNR Pad 6 Field/Pool Name Jacksonburg
Farm name WV Conservation Commission Well Number WVDNR # 1413
Operator (as registered with the OOG) Triad Hunter, LLC
Address 777 Post Oak Blvd. Suite 910 City Houston State Texas Zip 77056

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4372904 Easting 529454
Landing Point of Curve Northing 4372948 Easting 529931
Bottom Hole Northing 4371508 Easting 530938

Elevation (ft) 1460' 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)
Synthetic Base Mud System

Date permit issued 6/9/14 Date drilling commenced 7/23/14 Date drilling ceased 10/11/14
Date completion activities began 11/15/14 Date completion activities ceased 12/21/14
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 Surface - 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1400' - 2400' Void(s) encountered (Y/N) depths N
Coal depth(s) ft Unknown Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
JKE 6/25/15
WS 7/01/15

API 47-103 - 02998 Farm name WV Conservation Commission Well number WVDNR # 1413

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"	100'	new	A53B 90 lb.	none	yes
Surface	17 1/2"	13 3/8"	1326'	new	J-55 54.5 lb.	none	yes - 60 bbls.cement returns
Coal							
Intermediate 1	12 1/4"	9 5/8"	3434'	new	J-55 36 lb.	none	yes - 33 bbls. cement returns
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	14,201'	new	P-110 20lb.	none	yes - 23 bbls. cement returns
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	190	15.6	1.18	224	surface	12+
Surface	Class A	1060	15.6	1.19	1261	surface	8 - 12
Coal							
Intermediate 1	Class A	1175	15.6	1.21	1422	surface	8 - 12
Intermediate 2							
Intermediate 3							
Production	Varcem / Halcem / Fracem	1170 / 460 / 710	13.6 / 15.2 / 15.2	1.46 / 1.28 / 2.08	3774	surface'	12+
Tubing							

Drillers TD (ft) 14,240' TMD 7632' TVD Loggers TD (ft) No open hole logs run in well
 Deepest formation penetrated Marcellus Shale Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) @ 5850'

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 _____
 13 3/8" - 1326' 4 centralizers
 9 5/8" - 3434' 9 centralizers
 5 1/2" - 14,201' 64 turbo centralizers in lateral & curve, and 13 bow centralizers in vertical section

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____ **RECEIVED**
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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____ JUN 18 2015

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____ WV Department of
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API 47- 103 - 02998 Farm name WV Conservation Commission Well number WVDNR # 1413

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	See Enclosed	Spread Sheet			

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations 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)
	See	Enclosed	Spread Sheet					

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Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS		
Marcellus Shale	7,632'	TVD	14,230' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3,800 psi Bottom Hole 7,105 psi DURATION OF TEST 840 hrs

OPEN FLOW Gas 6,000 mcfpd Oil 36 bpd NGL bpd Water 150 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
WVDNR # 1413 H	0		0		** The pilot hole for the WVDNR # 1413 H is the Mills Wetzel # 31 H-1, permit number 47-103-02339. A copy of the stratigraphic record for the pilot hole is enclosed with this filing. Formation identification was based on a correlation between the bond log from the WVDNR # 1413 H well and the open hole log from the Mills Wetzel # 31 H-1 well.
Big Injun Sand		2710'			
Warren Sand	3292'	3340'			
Geneseo	7380'	7416'	7864'	7921'	
Tully	7416'	7517'	7921'	8174'	
Marcellus	7517'	NL	8174'	NL	WVDNR # 1413 H
					KOP = 5825' VD
			Cased Hole Log	T.D. = 8230' MD	LP = 8400' MD
					BHL = 14,230' TMD

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Road, Suite 1000 City Houston State Texas Zip 77067

Logging Company Blue Dot Energy Services (KLX)
Address P.O. Box 784 City Bridgeport State WV Zip 26330

Cementing Company Halliburton Energy Services
Address 4999 East Point Drive City Zanesville State Ohio Zip 43702

Stimulating Company Producer Services Corp.
Address 109 S. Graham Street City Zanesville State Ohio Zip 43701

Please insert additional pages as applicable.

Completed by Ben Smeltzer Telephone (740) 760-0570
Signature *Ben Smeltzer* Title Geologist Date June 18, 2015

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MILLS WETZEL # 31 H-1 (Pilot Hole for WVDNR # 1410, # 1411, # 1412, & # 1413)

Permit # 47-103-02339

Lithology / Formation	Depth	Shows / Comments
Gordon Sandstone	2952' - N/A	No open hole logs above 3062'
9 5/8" Casing Point	3062'	
shale & siltstone	3062' - 3586'	
First Warren Sand	3586' -3628'	
shale	3628' - 3643'	
Second Warren Sand	3643' - 3654'	
shale & siltstone	3654' - 4799'	
Riley	4799' - 4818'	
shale & siltstone	4818' - 5207'	
Benson Sandstone	5207' - 5240'	
shale	5240' - 5574'	Base Huron Shale @ 5293'
Alexander Siltstone	5574' - 5616'	
shale	5616' - 6275'	
Rhinestreet Shale	6275' - 6790'	Slight Show Gas
Mahantango Formation	6790' - 7048'	
Geneseo Formation	7048' - 7086'	
Tully Limestone	7086' - 7152'	
Marcellus Shale	7152' - 7208'	Show Gas
Onondaga Limestone	7208' -7238'	

Driller's T.D = N/A

Logger's T.D. = 7238'

**Note: Revised from original WR-35
filing.**

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WVDNR 1413H

API	Total Depth (ft) (PBD)	Landing Point MD (ft)	Landing Point Angle (Degrees)	Effective Lateral Length (ft)	TVD (ft)	Tubing Depth (ft)	Tubing Size (OD)	Tubing Angle (Degrees)		Casing Depth (ft)	Casing Size (OD)
47-103-02998	14,230	8,404	90	6,504	7,633					14,201	5 1/2 "

Stages	Perforations Intervals		Stage Intervals		Total Volume (bb)	Max Rate (bpm)	Formation Break (PSI)	Average Pressure (PSI)	80/100 Mesh Pumped (Lb)	30/50 Mesh Pumped (Lb)	20/40 Mesh /CRC Pumped (Lb)	Total Sand Pumped (Lb)	ISIP (PSI)	Completed per design	Notes on Frac
	Actual Length	Footage	Actual Length	Footage											
Stage 1	13,920'-14,081'	161	14,101'-13,904'	197	9,086	81	6,320	7,769	49,000	320,000	70,400	439,400	4,361		
Stage 2	13,718'-13,879'	161	13,904'-13,703'	201	11,269	74	N/A	7,833	49,000	20,500	0	69,500	4,309		
Stage 3	13,517'-13,678'	161	13,703'-13,496'	207	7,503	77	7,228	7,654	49,000	199,100	0	248,100	4,398		
Stage 4	13,315'-13,476'	161	13,496'-13,300'	196	7,098	77	7,253	7,213	49,000	214,300	0	263,300	5,074		
Stage 5	13,114'-13,275'	161	13,300'-13,098'	202	8,006	79	5,894	7,174	49,100	320,400	55,900	425,400	4,611		
Stage 6	12,912'-13,073'	161	13,098'-12,897'	201	9,353	75	6,821	6,988	49,000	255,300	90,200	394,500	5,984		
Stage 7	12,710'-12,872'	162	12,897'-12,695'	202	9,258	74	6,147	6,847	48,900	286,900	86,800	422,600	4,999		
Stage 8	12,509'-12,670'	161	12,695'-12,496'	199	8,956	70	6,855	6,841	49,000	308,000	24,500	381,500	5,800		
Stage 9	12,305'-12,467'	162	12,496'-12,292'	204	9,823	70	6,280	6,843	49,000	320,400	90,900	460,300	5,760		
Stage 10	12,106'-12,265'	159	12,292'-12,087'	205	3,821	70	7,321	7,483	4,500	700	0	5,200	5,365		
Stage 11	11,904'-12,066'	162	12,087'-11,889'	198	9,678	75	5,980	6,612	49,100	320,200	82,600	451,900	5,289		
Stage 12	11,701'-11,862'	161	11,889'-11,687'	202	10,679	70	5,493	7,166	49,600	320,400	92,000	462,000	6,336		
Stage 13	11,499'-11,660'	161	11,687'-11,486'	201	9,480	71	5,949	6,545	49,000	320,000	91,600	460,600	5,035		
Stage 14	11,300'-11,461'	161	11,486'-11,284'	202	9,576	71	6,324	6,918	49,000	320,000	69,500	438,500	5,137		
Stage 15	11,098'-11,262'	164	11,284'-11,085'	199	9,548	71	6,189	6,631	49,000	320,000	91,600	460,600	5,830		
Stage 16	10,895'-11,056'	161	11,085'-10,881'	204	10,389	70	6,701	6,691	49,300	323,400	91,600	464,300	5,486		
Stage 17	10,693'-10,854'	161	10,881'-10,676'	205	9,411	71	6,288	6,574	49,000	320,000	82,000	451,000	5,606		
Stage 18	10,469'-10,633'	184	10,676'-10,478'	198	10,682	70	6,288	6,937	49,000	320,000	90,900	459,900	5,591		
Stage 19	10,290'-10,451'	161	10,478'-10,277'	201	9,747	71	5,884	6,676	49,000	320,400	90,900	460,300	6,018		
Stage 20	10,088'-10,250'	162	10,277'-10,075'	202	9,705	70	6,500	6,629	49,000	320,000	90,900	459,900	5,094		
Stage 21	9,887'-10,048'	161	10,075'-9,873'	202	10,368	67	6,500	6,813	49,000	320,400	25,000	394,400	4,470		
Stage 22	9,685'-9,842'	157	9,873'-9,676'	197	10,049	72	6,163	6,781	49,000	320,400	90,900	460,300	na		
Stage 23	9,486'-9,647'	161													

Total	-	3,727	-	4,425	203,485	-	-	-	1,034,500	6,090,800	1,408,200	8,533,500	-		
Average	-	162	-	201	9,249	73	6,399	6,983	47,023	276,855	64,009	387,886	5,264		

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WVDNR Well Number Permit Number District / County
 1413 H 47-103-02998 Grant / Wetzel

CHEMICAL SUMMARY

STAGE #	SURFACTANT (gals.)	BIOCIDE (gals.)	SCALE INHIBITOR (gals.)	FRICTION REDUCER (gal.)	LINEAR GEL (gal.)	SP BREAKER (Qts.)	28% HCL ACID (gals.)	15% HCL ACID (gals.)
1	0	100	50	410	493	2.5	3,000	3,000
2	467	100	65	490	388	1.9	3,000	3,000
3	300	70	60	300	334	1	3,000	3,000
4	305	65	60	300	539	1	3,000	3,000
5	360	55	50	307	559	2.5	3,000	3,000
6	410	110	100	440	609	2.5	3,000	3,000
7	410	125	105	430	641	2.6	3,000	3,000
8	370	100	39	382	549	2.1	3,000	3,000
9	384	110	105	540	523	2.6	3,000	3,000
10	15	50	30	180	0	0	1,500	3000
11	425	130	105	480	654	2.7	0	3000
12	432	122	32	548	770	3.2	0	3000
13	320	125	50	440	637	2.5	0	3000
14	410	125	80	425	686	2.9	0	3000
15	405	73	60	435	527	2.2	0	3000
16	431	106	36	484	757	3.4	0	3000
17	410	120	65	425	571	2.2	0	3000
18	400	108	60	425	733	3.5	0	3000
19	325	100	30	437	772	2.7	0	3000
20	465	100	60	362	524	2.3	0	3000
21	485	100	58	425	672	3	0	3000
22	387	87	53	391	593	2.5	0	3000
TOTALS:								
23	7,916	2,181	1,353	9,056	12,531	52	28,500	66,000
<i>Stages</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Qts.</i>	<i>Gals</i>	<i>Gals</i>

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****CELLS WITH BLUE BACKGROUND ARE THE ONLY CELLS TO BE EDITED****

Fracture Start Date/Time:	11/15/14 12:43
Fracture End Date/Time:	12/21/2014 16:55
State:	WV
County:	Wetzel
API Number:	47-103-02998-0000
Operator Number:	494494833
Well Name:	WV DNR 1413
Federal Well:	No
Longitude:	-80.65758
Latitude:	39.50517
Long/Lat Projection:	NAD27
True Vertical Depth (TVD):	7,632'
Total Clean Fluid Volume* (gal):	11,102,028



Additive	Specific Gravity	Additive Quantity	Mass (lbs)
Water	1.00	11,102,028	92,646,424
Sand (Proppant)	2.65	11,251,000	11,251,000
Hydrochloric Acid (7.5%)	1.04	87,000	755,056
PROHIB II	0.97	177	1,433
PRO FR 2000	1.00	11,645	97,178
PRO GEL 4.0L	1.04	15,697	136,231
PRO BREAKER 4	1.26	16	166
MB 7530	1.24	2,917	30,185
PRO SCALE STOP 2000	1.06	1,555	13,755
STIMOIL EN	1.26	10,206	107,313

gal
lb
gal
gal
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gal

Ingredients Section:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Company 1	Carrier Base Fluid	Water	7732-18-5	100.00%	92,646,424	88.20215%	
Sand (Proppant)	PSC	Proppant	Silica Substrate		100.00%	11,251,000	10.71129%	
Hydrochloric Acid (7.5%)	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	7.50%	56,629	0.05391%	
PROHIB II	Producers Service Corp	Inhibitor	Ethoxylated Nonylphenol	68412-54-4	10.00%	143	0.00014%	
			Dimethylcocoamine, bis(chloroethyl)ether, diquatmar	68607-28-3	60.00%	860	0.00082%	
			Ethylene Glycol	107-21-1	40.00%	573	0.00055%	
			Glycol Ethers	111-76-2	40.00%	573	0.00055%	
			Methanol	67-56-1	30.00%	430	0.00041%	
			Propargyl Alcohol	107-19-7	30.00%	430	0.00041%	
PRO FR 2000	Producers Service Corp	Friction Reducer	Petroleum Distillate	064742-47-8	24.00%	23,323	0.02220%	
PRO GEL 4.0L	Producers Service Corp	Gelling Agent	Distillates (Petroleum), hydrotreated light	64742-47-8	65.00%	88,550	0.08430%	
			Nonylphenol, Ethoxylate	9016-45-9	5.00%	6,812	0.00648%	
			Guar Gum	9000-30-0	50.00%	68,116	0.06485%	
			Nonionic Surfactant	60828-78-6	5.00%	6,812	0.00648%	
PRO BREAKER 4	Producers Service Corp	Breaker	Nonionic Surfactant	60828-78-6	5.00%	6,812	0.00648%	
			Ethylene Glycol	107-21-1	40.00%	66	0.00006%	
			Sucrose	57-50-1	40.00%	66	0.00006%	
			Polyether Polyol	9003-11-6	1.00%	2	0.00000%	
			Sodium Bicarbonate	144-55-8	1.00%	2	0.00000%	
			Hexamethylenetetramine	100-97-0	1.00%	2	0.00000%	
			Proprietary Ingredient	Proprietary	1.00%	2	0.00000%	
			Proprietary Ingredient	Proprietary	1.00%	2	0.00000%	
			Proprietary Ingredient	Proprietary	1.00%	2	0.00000%	
			Water	7732-18-5	Proprietary	0	0.00000%	
MB 7530	Producers Service Corp	Biocide	Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione	533-74-4	24.00%	7,244	0.00690%	
			Sodium Hydroxide	1310-73-2	4.00%	1,207	0.00115%	
PRO SCALE STOP 2000	Producers Service Corp	Scale Inhibitor	Organic Phosphate	71050-62-9	25.00%	3,439	0.00327%	
STIMOIL EN	Producers Service Corp	Surfactant	Isopropyl Alcohol	67-63-0	30.00%	32,194	0.03065%	
			Citrus Terpenes	68647-72-3	5.00%	5,366	0.00511%	

Total Slurry Mass (Lbs)
105,038,739

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