

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas

Well Operator's Report of Well Work

Farm name: James B. Marshall Operator Well No.: HR 450

LOCATION: Elevation: 887' Quadrangle: Reedy WV 7.5'

District: Reedy County: Roane
Latitude: 14818' Feet South of 38 Deg. 55 Min. 00 Sec.
Longitude 5855' Feet West of 81 Deg. 25 Min. 00 Sec.

Company: Hard Rock Exploration

	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Address: <u>1244 Martins Branch Road</u> <u>Charleston WV, 25312</u>				
Agent: <u>Marc Scholl</u>	<u>13 3/8"</u>	<u>32'</u>	<u>32'</u>	<u>N/A</u>
Inspector: <u>Ed Gainer</u>	<u>9 5/8"</u>	<u>800'</u>	<u>800'</u>	<u>396 f3 CTS</u>
Date Permit Issued:	<u>7"</u>	<u>2289'</u>	<u>2289'</u>	<u>514 f3 CTS</u>
Date Well Work Commenced: <u>8/22/12</u>	<u>4.5"</u>	<u>7477'</u>	<u>7477'</u>	<u>140 f3</u>
Date Well Work Completed: <u>9/7/13</u>				
Verbal Plugging:	<u>Ran Gamma Log from (3790'MD(kop) - 4831'MD (Land))</u>			
Date Permission granted on:	<u>Ran Gyro Log from (3650' - Surface)</u>			
Rotary x Cable Rig	<u>Ran OH Log from 1735' - Surface</u>			
Total Depth (feet): <u>7553'TMD, 4500'TVD</u>				
Fresh Water Depth (ft.): <u>450'</u>				
Salt Water Depth (ft.): <u>1930', 2030'</u>				
Is coal being mined in area (N/Y)? <u>N</u>				
Coal Depths (ft.): <u>N/A</u>				

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OPEN FLOW DATA

Producing formation Lower Huron Shale Pay zone depth (ft) 4606'MD- 7553 'MD
4445'TVD - 4500' TVD

Gas: Initial open flow 50 MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow >1.5 MMCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests 72 Hours
Static rock Pressure 1240 psig (surface pressure) after _____ Hours

Second producing formation _____ Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

Signed: James B. Marshall
By: President
Date: 2/20/2013

Formation: Top: Bottom:

87-04702

Red Rock, Sand , Shale	0	1800
Salt Sands	1800	2080
Lime	2080	2110
Injun	2110	2165
Shale	2165	2452
Coffee Shale	2452	2467
Devonian Shale	2467	4310
Lower Huron Section	4310	TD

All Formation depths shown As TVD

08/31/12 Run Peak Completions pump out shoe with 14 stg open hole mechanical packers and frac sleeves. continue running casing total of 175 jts of R-3 4.5" 11.6ppf N-80 casing and frac packers to depth of 7477' GL and 7483' KB. start pumping 2 bbl water, drop ball for pump out shoe and follow with 2 bbl water. follow with N2 at 5000 scf/min. Land ball and pressure up to 3100psi. Hold pressure for 20 min. Continue to increase pressure to 3600 psi to shear pins in shoe. SWI. RU and perform annular squeeze with 100sx type 1 2% CaCl mixed at 14.6ppg. Follow with 3 bbl water.

NOTE: THERE ARE NO PERFORATED INTERVALS IN THIS STYLE OF COMPLETION. THE PACKERS WILL SERVE AS STAGE ISOLATION AND THE BALL ACTIVATED MECHANICAL SLEEVE SERVES AS THE MEANS OF COMMUNICATION FROM WELLBORE TO FORMATION. ALL DEPTHS ARE INDICATED BELOW.

Stage	Sleeve	Packer	Seat
1	7432.2	7341.1	N/A
2	7212.2	7121.1	1.15
3	6992.2	6901.1	1.28
4	6814.0	6722.9	1.40
5	6594.0	6502.9	1.53
6	6374.0	6282.9	1.65
7	6154.0	6062.9	1.78
8	5975.8	5884.7	2.03
9	5755.8	5664.7	2.28
10	5535.8	5444.7	2.53
11	5315.8	5224.7	2.78
12	5095.8	5004.7	3.03
13	4917.6	4826.5	3.28
14	4697.6	4606.5	3.53
Anchor		2591.0	

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9/6/12 - 09/07/12 MIRU Nabors Frac Crew. Casing pressure 1240 psi. Bring trucks to half rate and start increasing slowly according to pressure response. Pump total of 1 MMscf for Stg 1. Shut down and bleed off lines. Place 1.25" ball on frac gate and equalize. Drop ball for Stg 2 and wait for ball to drop. Start pumping at 15k scf/min and up rate to 20k and 30k to land ball and open sleeve. Increase rate to 100k scf/min and pump total of 1 MMscf N2. Repeat process for Stg 3- Stg 14.

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
Max P	4712	4840	5100	5400	5808	5944	5825
Avg P	4616	4002	4932	5126	5618	5860	5722
Max R	91.5	106.1	104.6	103	102	84	103
Avg R	88.7	103.2	103.3	103	88	81	101
5 Min	1870	N/A	N/A	1866	N/A	2182	N/A
	Stage 8	Stage 9	Stage 10	Stage 11	Stage 12	Stage 13	Stage 14
Max P	5442	4518	4440	4281	4250	4120	4132
Avg P	5378	4493	4353	4254	4173	4097	4115
Max R	103	103	110	103.5	107	104.7	102.7
Avg R	101.7	101.7	106	103	104	104	102
5 Min	2195	N/A	N/A	N/A	1981	N/A	1993

03/01/2013