

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

Well Operator's Report of Well Work

Farm name: Blumig Family Associates Operator Well No.: HR 491
LOCATION: Elevation: 1110' Quadrangle: Reedy WV 7.5'
District: Spring Creek County: Wirt
Latitude: 2946' Feet South of 38 Deg. 55 Min. 00 Sec.
Longitude 581' Feet West of 81 Deg. 22 Min. 30 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>33'</u>	<u>33'</u>	<u>N/A</u>
Inspector: <u>Joe Taylor</u>	<u>9 5/8"</u>	<u>969'</u>	<u>969'</u>	<u>492ft3 CTS</u>
Date Permit Issued: <u>12/21/12</u>	<u>7"</u>	<u>2741'</u>	<u>2741'</u>	<u>586ft3 CTS</u>
Date Well Work Commenced: <u>2/7/13</u>	<u>4.5"</u>	<u>8056'</u>	<u>8056'</u>	<u>130 ft3</u>
Date Well Work Completed: <u>3/17/13</u>				
Verbal Plugging:	<u>Gamma Log from (3990' MD, 4910'TVD) KOP-4045'</u>			
Date Permission granted on:	<u>Ran Gyro Log from (Surface)</u>			
Rotary x Cable Rig	RECEIVED Office of Oil & Gas			
Total Depth (feet): <u>8213'TMD, 4649'TVD</u>				
Fresh Water Depth (ft.): <u>None</u>				
Salt Water Depth (ft.): <u>1550', 2088'</u>				
Is coal being mined in area (N/Y)? <u>N</u>				
Coal Depths (ft.): <u>N/A</u>				

OPEN FLOW DATA

Producing formation Lower Huron Shale Pay zone depth (ft) 4366'MD- 8213'MD
4354'TVD - 4649' TVD

Gas: Initial open flow Trace MCF/d Oil: Initial open flow Bbl/d
Final open flow >2 MMCF/d Final open flow Bbl/d
Time of open flow between initial and final tests 72 Hours
Static rock Pressure 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 WELBORE.

Signed: *James Taylor*
By: President
Date: 5/17/2013

105-01365

Formation:	Top:	Bottom:
Soil/Sand/Shale	0	1960
Salt Sand	1960	2170
Big Lime	2170	2225
Big Injun	2225	2260
Dev. Shale	2260	2660
Coffee Shale	2660	2675
Devonian Shale	2675	4649
Lower Huron Section	4459	4649

All depths shown As TVD

2/17/13

Run casing with 16 stage Peake Completion open hole mechanical packer system with Total of 180jts of R-3 4.5" 11.6ppfM-80 to depth of 8056'kb. Could not get last two jts in hole due to stacking out again. Land casing hanger in head and ND BOP. MIRU Nabors Packer set crew. Pump 3 bbl water, and drop ball for shoe and 5 bbl water. Follow with N2 at 6-7k scf/min. Land ball and pressure up to 3150 psi with 143k scf N2 and hold pressure for packer operation. Pump 5 bbls cmt at 15 ppg and let air balance out. Pump 10 bbl cmt at 15 ppg and wait for air. Finish with 7 bbl cmt and 2-3 bbl water. Pumped total of 100sx type 1 3% CaCl

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

Stage	Sleeve	Sleeve ID	Ball Size	Packer
1	8056.00	P/O Shoe	N/A	7870.80
2	7734.52	1.156	1.250	7643.77
3	7507.59	1.281	1.375	7411.24
4	7275.06	1.406	1.500	7179.21
5	7043.03	1.531	1.625	6946.88
6	6810.60	1.656	1.750	6714.45
7	6578.27	1.781	1.875	6482.12
8	6345.94	1.906	2.000	6249.79
9	6113.61	2.031	2.125	6017.46
10	5881.68	2.156	2.250	5785.43
11	5649.15	2.281	2.375	5553.00
12	5417.42	2.531	2.750	5321.27
13	5185.69	2.781	3.000	5099.04
14	4962.66	3.031	3.250	4832.11
15	4695.83	3.281	3.500	4599.58
16	4463.10	3.531	3.750	4366.95
Anchor				2906.60

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03/13/13 MIRU Nabors. Start pumping at 25k scf/min and open Stg 1 shoe at 4435 psi. Continue to up rate and pump total of 1MM scf N2. Shut down (5min - 1806psi). Drop 1.25" ball for Stg 2. Start pumping ball down at 25k scf/min. Land ball at 163k scf. Up rate and open sleeve at 4010 psi. Up rate and pump total of 1MM scf N2. Shut down and change out high volumes. Load and drop 1.375" ball for Stg 3. Start pumping at 25k scf/min and land ball at 113k scf. Up rate and open sleeve at 3760 psi. Continue to increase rate and pump total of 1MM scf N2. Shut down and drop 1.5" ball for Stg 4. Repeat process for Stgs 4-Stg 16. (treatment Data on Pg. 3)

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	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
Max P	<u>5880</u>	<u>5700</u>	<u>5897</u>	<u>5775</u>	<u>5723</u>	<u>5760</u>	<u>5802</u>	<u>5889</u>
Avg P	<u>5834</u>	<u>5530</u>	<u>5763</u>	<u>5622</u>	<u>5692</u>	<u>5700</u>	<u>5713</u>	<u>5812</u>
Max R	<u>89.0</u>	<u>89.0</u>	<u>103.9</u>	<u>104.7</u>	<u>107.4</u>	<u>107.0</u>	<u>103.5</u>	<u>100.0</u>
Avg R	<u>87.7</u>	<u>87.7</u>	<u>100.0</u>	<u>103.6</u>	<u>106.6</u>	<u>106.0</u>	<u>102.0</u>	<u>96.8</u>
Shut In	<u>1806-5min</u>	<u>N/A</u>	<u>2545-5min</u>	<u>1972-5min</u>	<u>N/A</u>	<u>N/A</u>	<u>2226-5min</u>	<u>N/A</u>
	Stage 9	Stage 10	Stage 11	Stage 12	Stage 13	Stage 14	Stage 15	Stage 16
Max P	<u>5598</u>	<u>5194</u>	<u>4880</u>	<u>5239</u>	<u>4881</u>	<u>5371</u>	<u>4180</u>	<u>3642</u>
Avg P	<u>5525</u>	<u>5158</u>	<u>4769</u>	<u>5154</u>	<u>4696</u>	<u>5293</u>	<u>4045</u>	<u>3628</u>
Max R	<u>107.0</u>	<u>106.0</u>	<u>105.0</u>	<u>109.0</u>	<u>103.2</u>	<u>105.0</u>	<u>107.6</u>	<u>105.0</u>
Avg R	<u>105.0</u>	<u>105.8</u>	<u>103.0</u>	<u>108.0</u>	<u>102.0</u>	<u>104.0</u>	<u>103.0</u>	<u>103.3</u>
Shut In	<u>N/A</u>	<u>1905-5min</u>	<u>N/A</u>	<u>N/A</u>	<u>1990-5min</u>	<u>N/A</u>	<u>N/A</u>	<u>1605-5min</u>

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