

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513918

API: 47 - 103 - 03042

Submission:  Initial  Amended

Notes: Correction to Production Cement Top  
(MD)

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

API 47-103-03042 County WETZEL District GRANT  
Quad BIG RUN 7.5' Pad Name BIG192 Field/Pool Name             
Farm name RICHARD DALLISON ET AL Well Number 513918  
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 4,375,410.1 Easting 535,926.3  
Landing Point of Curve Northing 4,375,395.0 Easting 535,286.4  
Bottom Hole Northing 4,377,018.2 Easting 534,760.4

Elevation (ft) 1452 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 13.5 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 12/08/2014 Date drilling commenced 01/12/2015 Date drilling ceased 5/11/2015  
Date completion activities began 6/24/2015 Date completion activities ceased 7/2/2015  
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 549',581',780' Open mine(s) (Y/N) depths             
Salt water depth(s) ft 2257',2370' Void(s) encountered (Y/N) depths             
Coal depth(s) ft 743',804',919',1009',1240' Cavern(s) encountered (Y/N) depths             
Is coal being mined in area (Y/N) N

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DAB

API 47- 103 - 03042 Farm name RICHARD DALLISON ET AL Well number 513918

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	28"	26"	80'	NEW	A-500 40LB/FT	NONE	Y
Surface	17.5"	13.375"	1004'	NEW	J-55 54.5LB/FT	665'	Y
Coal							
Intermediate 1	12.375" & 12.25"	9.625"	2758'	NEW	A-500 40LB/FT	2123'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	14,699' MD	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

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	98	15.6	1.18	115.64	0	8
Surface	CLASS A	909	15.6	1.19	1081.71	0	8
Coal							
Intermediate 1	CLASS A / CLASS A	220 / 838	15.6 / 15.6	1.18 / 1.20	1265.2	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS H / CLASS H	821/762	15.2/15.6	1.25/2.06	2595.97	3,368' MD	72
Tubing							

Drillers TD (ft) 14,699' MD Loggers TD (ft) N/A  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5,034' 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- JOINTS: 1,11, 22

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET

PRODUCTION- 236 Composite Centralizers One on every joint from TD to 4,550' MD

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 \_\_\_\_\_

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PERFORATION RECORD

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

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)

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Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>7,628</u>	<u>TVD</u>	<u>8,615</u> MD
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2,108 psi Bottom Hole N/A psi DURATION OF TEST 90.00 hrs

OPEN FLOW Gas 11,058 mcfpd Oil N/A bpd NGL 0 bpd Water 677.8 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>		<u>BOTTOM</u>		<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	
	<u>0</u>		<u>0</u>		

Please insert additional pages as applicable.

Drilling Contractor ALPHA HUNTER DRILLING (RIG 6)  
Address P.O. BOX 430 City RENO State OH Zip 45773

Logging Company Phoenix Technology Services  
Address 1805 Brittmoores Road City HOUSTON State TX Zip 77043

Cementing Company ALLIED CEMENTING SERVICES  
Address 333 Technology Drive, Suite 290 City Canonsburg State PA Zip 15610

Stimulating Company C&J Energy Services  
Address 3990 Rogerdale City Houston State TX Zip 77042

Please insert additional pages as applicable.

Completed by Brae Maddox Telephone 412-395-5518  
Signature  Title Drilling Director Date 11/16/15

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Submission of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

513918-47-103-03042-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	6/24/2015	14,697.58	14,699.48	10	MARCELLUS
1	6/24/2015	14,552.00	14,673.00	32	MARCELLUS
2	6/24/2015	14,402.00	14,524.00	40	MARCELLUS
3	6/24/2015	14,252.00	14,374.00	40	MARCELLUS
4	6/24/2015	14,102.00	14,224.00	40	MARCELLUS
5	6/24/2015	13,952.00	14,074.00	40	MARCELLUS
6	6/25/2015	13,802.00	13,924.00	40	MARCELLUS
7	6/25/2015	13,652.00	13,774.00	40	MARCELLUS
8	6/25/2015	13,502.00	13,624.00	40	MARCELLUS
9	6/26/2015	13,352.00	13,474.00	40	MARCELLUS
10	6/26/2015	13,202.00	13,324.00	40	MARCELLUS
11	6/26/2015	13,052.00	13,174.00	40	MARCELLUS
12	6/26/2015	12,902.00	13,024.00	40	MARCELLUS
13	6/27/2015	12,752.00	12,874.00	40	MARCELLUS
14	6/27/2015	12,602.00	12,724.00	40	MARCELLUS
15	6/27/2015	12,452.00	12,574.00	40	MARCELLUS
16	6/27/2015	12,302.00	12,424.00	40	MARCELLUS
17	6/28/2015	12,152.00	12,274.00	40	MARCELLUS
18	6/28/2015	12,002.00	12,124.00	40	MARCELLUS
19	6/28/2015	11,852.00	11,974.00	40	MARCELLUS
20	6/28/2015	11,702.00	11,824.00	40	MARCELLUS
21	6/28/2015	11,552.00	11,674.00	40	MARCELLUS
22	6/28/2015	11,402.00	11,524.00	40	MARCELLUS
23	6/29/2015	11,252.00	11,374.00	40	MARCELLUS
24	6/29/2015	11,102.00	11,224.00	40	MARCELLUS
25	6/29/2015	10,952.00	11,074.00	40	MARCELLUS
26	6/29/2015	10,802.00	10,924.00	40	MARCELLUS
27	6/29/2015	10,652.00	10,774.00	40	MARCELLUS
28	6/30/2015	10,502.00	10,624.00	40	MARCELLUS
29	6/30/2015	10,352.00	10,474.00	40	MARCELLUS
30	6/30/2015	10,202.00	10,324.00	40	MARCELLUS
31	6/30/2015	10,052.00	10,174.00	40	MARCELLUS
32	6/30/2015	9,902.00	10,024.00	40	MARCELLUS
33	6/30/2015	9,752.00	9,874.00	40	MARCELLUS
34	7/1/2015	9,602.00	9,722.00	40	MARCELLUS
35	7/1/2015	9,452.00	9,574.00	40	MARCELLUS
36	7/1/2015	9,302.00	9,424.00	40	MARCELLUS
37	7/1/2015	9,152.00	9,274.00	40	MARCELLUS
38	7/1/2015	9,002.00	9,124.00	40	MARCELLUS
39	7/1/2015	8,854.00	8,972.00	40	MARCELLUS
40	7/1/2015	8,702.00	8,824.00	40	MARCELLUS

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513918 - 47-103-03042-0000 - 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	6/24/2015	22.4	7,313.00	9,142.00	6,294.00	0	615	0
1	6/24/2015	84	8,587.00	8,966.00	3,829.00	201,200	5964	0
2	6/24/2015	91.2	8,572.00	8,928.00	4,165.00	201,500	5607	0
3	6/24/2015	91	8,696.00	9,133.00	4,149.00	201,200	5356	0
4	6/24/2015	91.9	8,700.00	9,260.00	3,758.00	201,200	5660	0
5	6/25/2015	91.4	8,882.00	9,367.00	4,781.00	201,300	5620	0
6	6/25/2015	94.8	8,934.00	9,227.00	4,718.00	199,600	5516	0
7	6/25/2015	99.7	8,601.00	9,217.00	4,752.00	200,000	5825	0
8	6/25/2015	99.2	8,822.00	9,170.00	4,898.00	204,300	5642	0
9	6/26/2015	84.1	8,933.00	9,227.00	5,017.00	202,400	5443	0
10	6/26/2015	88.5	8,969.00	9,233.00	4,633.00	200,900	5609	0
11	6/26/2015	95.7	8,432.00	9,248.00	5,859.00	202,100	6135	0
12	6/27/2015	100.2	8,366.00	8,723.00	5,432.00	200,200	5430	0
13	6/27/2015	91.9	8,829.00	9,373.00	5,509.00	201,100	5521	0
14	6/27/2015	98.6	8,777.00	9,387.00	4,626.00	202,200	6790	0
15	6/27/2015	99.8	8,577.00	9,049.00	4,737.00	200,400	5404	0
16	6/28/2015	103.2	8,415.00	8,894.00	4,633.00	203,800	5963	0
17	6/28/2015	98.9	8,873.00	9,253.00	5,359.00	201,200	5697	0
18	6/28/2015	98.50	8,629.00	9,424.00	4,830.00	201,800	6,800	0
19	6/28/2015	100.30	8,154.00	8,561.00	4,937.00	200,300	5,609	0
20	6/28/2015	101.30	8,294.00	8,629.00	4,853.00	199,000	5,345	0
21	6/28/2015	99.30	8,838.00	9,470.00	5,113.00	200,000	5,355	0
22	6/29/2015	99.40	8,461.00	8,993.00	4,866.00	200,400	5,189	0
23	6/29/2015	100.20	8,378.00	8,847.00	5,318.00	202,300	5,549	0
24	6/29/2015	101.6	8,350.00	8,928.00	5,640.00	201,700	5088	0
25	6/29/2015	100.5	8,397.00	8,962.00	5,190.00	200,500	5472	0
26	6/29/2015	100.6	8,145.00	8,922.00	5,332.00	203,400	5007	0
27	6/30/2015	101.3	8,225.00	9,023.00	4,940.00	200,200	5191	0
28	6/30/2015	103.1	8,074.00	8,507.00	4,939.00	201,000	5251	0
29	6/30/2015	99.7	8,400.00	8,981.00	5,344.00	203,200	5608	0
30	6/30/2015	100.7	8,410.00	8,929.00	5,647.00	201,200	5664	0
31	6/30/2015	101.4	8,084.00	8,796.00	5,659.00	201,000	5390	0
32	6/30/2015	102	8,204.00	8,761.00	5,232.00	202,600	5268	0
33	6/30/2015	99.9	8,111.00	8,607.00	5,174.00	201,400	5224	0
34	7/1/2015	99.5	8,197.00	8,834.00	5,211.00	200,700	5022	0
35	7/1/2015	100.8	8,303.00	8,609.00	5,613.00	202,000	5142	0
36	7/1/2015	100.8	8,416.00	8,652.00	5,544.00	201,100	5083	0
37	7/1/2015	100.7	8,070.00	8,362.00	5,359.00	200,600	5039	0
38	7/1/2015	101.2	8,082.00	8,426.00	5,503.00	199,900	4975	0
39	7/1/2015	97.4	8,304.00	8,570.00	5,482.00	200,000	5093	0
40	7/2/2015	98.2	8,282.00	8,568.00	4,840.00	200,700	4921	0

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Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	0	0	783	783
SAND/SHALE	0	0	746	746
WASHIGNTON COAL	746	746	748	748
SAND/SHALE	748	748	807	807
COAL	807	807	817	817
SAND/SHALE	817	817	922	922
COAL	922	922	927	927
SAND/SHALE	927	927	1,012	1,012
COAL	1,012	1,012	1,022	1,022
SAND/SHALE	1,022	1,022	1,243	1,243
PITTSBURGH COAL	1,243	1,243	1,248	1,248
SAND/SHALE	1,248	1,248	2,444	2,444
MAXTON	2,444	2,444	2,484	2,484
BIG LIME	2,484	2,484	2,623	2,623
BIG INJUN	2,623	2,623	2,874	2,874
WEIR	2,874	2,874	3,082	3,082
GANTZ	3,082	3,082	3,108	3,108
50F	3,108	3,108	3,193	3,193
30F	3,193	3,193	3,310	3,310
GORDON	3,310	3,310	3,390	3,390
4TH	3,390	3,390	3,539	3,539
BAYARD	3,539	3,539	3,965	3,965
WARREN	3,965	3,965	4,117	4,117
SPEECHLEY	4,117	4,117	5,006	5,006
RILEY	5,006	5,006	5,641	5,623
BENSON	5,641	5,623	5,967	5,878
ALEXANDER	5,967	5,878	6,546	6,291
RHINESTREET	6,546	6,291	7,812	7,197
SONYEA	7,812	7,197	8,031	7,355
MIDDLESEX	8,031	7,355	8,113	7,410
GENESSEE	8,113	7,410	8,255	7,496
GENESE0	8,255	7,496	8,305	7,522
TULLY	8,305	7,522	8,350	7,543
HAMILTON	8,350	7,543	8,615	7,628
MARCELLUS	8,615	7,628	14,699	7,648

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	6/24/2015
Job End Date	7/2/2015
State	West Virginia
County	Meigs
API Number	47-103-03042-00-00
Operator Name	EQIT Production
Well Name and Number	513918
Longitude	-80.56217000
Latitude	39.52760900
Datum	NAD83
Federal Well Well	NO
True Vertical Depth	7628
Oil Base Water Volume (bbl)	9218.244
Gel Base Water Volume	0



## 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 Frac Fluid (% by mass)	Comments
Water	Energy Services	Carrier/Seal Fluid	Water	7732-18-5	100.00000	90.1516	None
Sand (Proppant)	Energy Services	Proppant	Silica Substrate	14808-60-7	100.00000	9.4357	None
MC NX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.0575	None
OVER-12V	Energy Services	Friction reducer	Anionic water-soluble polymer	Proprietary	100.00000	0.0349	None
Hydrochloric Acid (15%)	Energy Services	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.0337	None
Super TSC LT	Energy Services	Scale control	Proprietary non-hazardous materials	Proprietary	100.00000	0.0264	None
PermVie VFR-10	Multi-Chem	Friction reducer	Hydroreated light paraffinum soluble	54742-47-6	30.00000	0.0095	None
			Ferronium chloride	12125-02-9	10.00000	0.0031	None
			Alcohol, C12-16 ethoxylated	98551-12-2	10.00000	0.0031	None

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Ingredient	Supplier	Product	Chemical Name	UN	HAZ	Quantity	Concentration	MSDS
A12	C and J Energy Services	Acid Inhibitor	H-Oxidationamide, n,n'-bis-2-hydroxy-ethyl-(2)	33-93-4		5.00000	0.00017	None
			Propargyl Acetate	57-83-0		40.00000	0.00017	None
			Glycol Ethers	111-78-2		40.00000	0.00017	None
			Propargyl Acetate	107-19-7		40.00000	0.00017	None
			Ethoxylated Nonylphenol	38412-54-4		13.00000	0.00005	None
			Propyl Chlorides-Quaternized	72480-70-7		10.00000	0.00005	None
SG-100	C and J Energy Services	Gelling agent	Solvent naphthalene	84742-47-8		85.00000	0.00019	None
DB-2	C and J Energy Services	Sol Breaker	Ammonium Persulfate	7727-54-0		100.00000	0.00000	None
			Silica, crystalline quartz	7631-86-9		30.00000	0.00000	None

\* 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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Welcome Michelle H., Operator OpNo: E1210363 [ Log Out ]



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Prepare Disclosure for FracFocus Submission

Fracturing Jobs | Disclosures

Disclosure has been submitted

Note: This window expires with 10 minutes of inactivity. After that you will be taken back to the dashboard.

Hydraulic Fracturing Data

Job Start Date: 6/24/2015 Job End Date: 7/2/2015 API Number: 47-103-03042-00-00 State & County: West Virginia - Wetzel

Well Name: 513918

Longitude: -80.58217 Latitude: 39.527509 Datum: NAD83 Federal/Tribal Well?

True Vertical Depth (ft): 7628 Total Water Vol (gal): 9218744 Total Non Water Vol: 0 Total Mass (lbs): 85329260



MSDS Chemical Ingredients

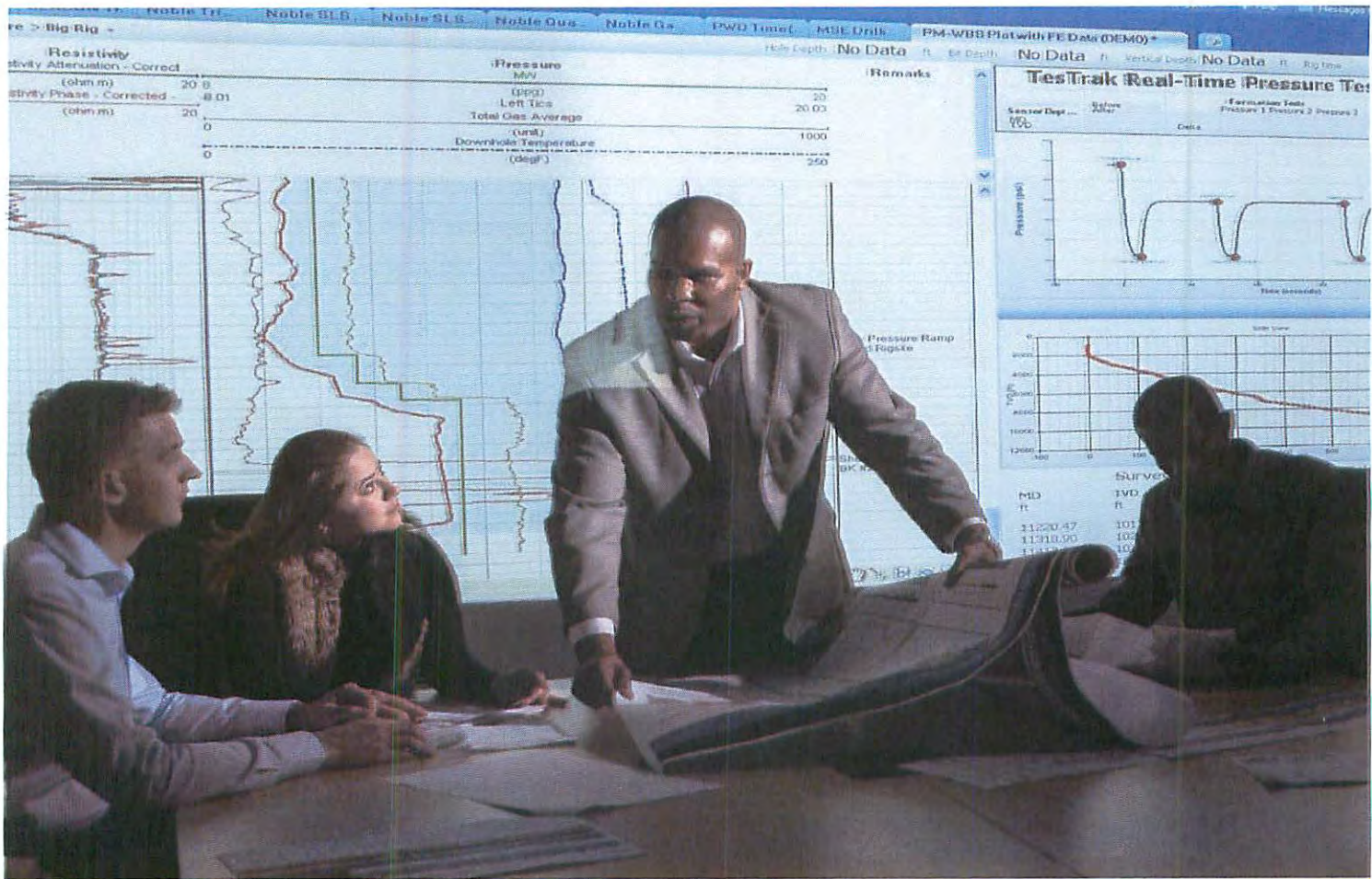
	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
<input type="button" value="Edit"/>	Water	C and J Energy Services	Carrier/Base Fluid	Water	7732-18-5	100%	00.1516142279%	None	76926246.10
<input type="button" value="Edit"/>	Sand (Proppant)	C and J Energy Services	Proppant	Silica Substrate	14808-60-7	100%	9.4335009768%	None	8049600
<input type="button" value="Edit"/>	MC MX 437-5	Multi Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60%	0575517804%	None	49103.854
<input type="button" value="Edit"/>	WFR-12W	C and J Energy Services	Friction reducer	Anionic water soluble polymer	Proprietary	100%	0349113007%	None	29789.764
<input type="button" value="Edit"/>	Hydrochloric Acid (15%)	C and J Energy Services	Acidizing	Hydrochloric Acid	7647-01-0	15%	0337472823%	None	28796.509
<input type="button" value="Edit"/>	Super TSC LT	C and J Energy Services	Scale control	Proprietary non-hazardous materials	Proprietary	100%	0264521169%	None	22571.556
<input type="button" value="Edit"/>		Multi Chem							

<https://www.fracfocusdata.org/Operators/WorkQueue/PrepareDisclosure.aspx>

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# EQT Production Company

WV 513918 - 5.5 in. Long String - Cement PTR

Prepared for:

Timothy Rash

Drilling Engineer

EQT Production Company

E-mail: [TRash@eqt.com](mailto:TRash@eqt.com)

Prepared by:

Harrison Schwartz

Field Engineer

Baker Hughes - Pressure Pumping - Clarksburg, WV

E-mail: [Harrison.Schwartz@bakerhughes.com](mailto:Harrison.Schwartz@bakerhughes.com)



Mix Water, Spacer & Cement QA/QC



Company Name: EQT Date: 5/11/2015

Well Name: WV 513918 Job Type: 5.5"

Rig Name/Number: Savanna 654

**Mix Water:**

(contact engineer if mix water is outside the guidelines below)

pH:	<u>6.5</u>	(6-8; <6 Retards, >8 accelerates)
Specific Gravity:	<u>1.002</u>	(1.000 to 1.005)
Temperature:	<u>76</u>	(less than 100°F)
Chlorides:	<u>0</u>	(less than 2000 mg/L Cl)
Total Hardness:	<u>120</u>	(less than 450 mg/L CaCO3)
Sulfates:	<u>0</u>	(Class H - less than 3000 mg/L SO4; All others- less than 1500 mg/L SO4)

**Cement:**

Lead Temperature: 76 °F (record value after mixed)  
Tail Temperature: 78 °F (record value after mixed)

Tested By: Brian Lough

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# Clarksburg District Lab Cement Lab Report

Phone: (304) 624-9802

Test Number: 189101792  
Report Number: 050515 - 1792

Test Date: 5/5/2015

## WELL INFORMATION

Operator: EQT  
API #:  
Well Name: Robinson WV 513918  
Slurry Type: Tail  
Blend Type: Field  
Comments:

County: Wetzel  
State: WV  
Requested By: Blake David  
TVD: 7603 MD: 15658  
District: Clarksburg

## TEST DATA AND SCHEDULE

Time To Temp (min): 39.41  
Initial Press (psi): 530  
Final Press (psi): 3850  
BHST (deg F): 145  
BHCT (deg F): 145  
Comments:

Displacement Fluid Density (lb/gal): 8.34  
Mix Water Density (lb/gal): 8.34  
Mix Water Type: Rig Water  
Surf Temp (deg F): 60  
Job Type: Long String FB

## SLURRY AND TEST RESULTS

Vendor: Joppa

Slurry: Class 'H' + 0.35% ASA-301 + 0.30% BA-10A + 75.00 lb/sk ASCA-1 + 0.50% MPA-170 + 0.05% R-3

Density: 15.6 lb/gal  
Yield: 2.06 CuFt/sk

Pump Time (50 Bc): 5:03  
Pump Time (70 Bc): 5:38  
Pump Time (100 Bc): 7:01

Mix Water: 8.433 gal/sk (74.82%)

Total Mix Liquid: 8.433 gal/sk

Fluid Loss: cc/30 min

Free Water (ml): (Tested at 90 Degrees)

Gel Strength 10 Sec: 0 (lbs/ft<sup>2</sup>)

Gel Strength 10 Min: 0 (lbs/ft<sup>2</sup>)

Compressive Strength

Rheology (PL=Power Law, BP=Bingham Plastic)

Temp	Time	Strength	Type	Temp	600	300	200	100	6	3	n'	k'	Yp	Pv	Best

Comments:

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# CEMENT JOB REPORT



CUSTOMER EQT PRODUCTION COMP,	DATE 11-MAY-15	F.R.# 10011155178	SERV. SUPV. Brian Lough
LEASE & WELL NAME ROBINSON #WV 513918 - API 47103030420000	LOCATION GRANT	COUNTY-PARISH-BLOCK Wetzel West Virginia	
DISTRICT Clarksburg	DRILLING CONTRACTOR RIG # SAVANNA 654	TYPE OF JOB Long String	

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	MECHANICAL BARRIERS	MD	TVD	HANGER TYPES	MD	TVD
5-1/2" Top Cem Plug, Nitri cvr, Pl	Float Collar, AI Flap, 5-1/2 - 8rd Guide Shoe, Cement Nose, 5-1 1/2						

MATERIALS FURNISHED BY BJ	LAB REPORT NO.	PHYSICAL SLURRY PROPERTIES					
		SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY
Ultra Flush II			14.5				50
Class H + Additives		821	15.2	1.25	5.72		182.77
Class H - Acid Soluble		762	15.6	2.06	8.39		279.28
Inhibited Spacer with sugar water (100 lbs sugar)			8.34				19.83
Treated Water			8.34				295
2% KCl Brine			8.43				10
100 lbs of sugar on the side			8.34				25
Available Mix Water <u>500</u> Bbl. Available Displ. Fluid <u>500</u> Bbl.		TOTAL				861.87 264.07	

HOLE			TBG-CSG-D.P.					COLLAR DEPTHS				
SIZE	% EXCESS	DEPTH	ID	OD	WGT.	TYPE	MD	TVD	GRADE	SHOE	FLOAT	STAGE
8.5	10	14687	4.778	5.5	20	CSG	14687	7628		14705	14692	

LAST CASING				PKR-CMT RET-BR PL-LINER				PERF. DEPTH			TOP CONN		WELL FLUID	
ID	OD	WGT	TYPE	MD	TVD	BRAND & TYPE	DEPTH	TOP	BTM	SIZE	THREAD	TYPE	WGT.	
8.8	9.63	40	CSG	2761	2761					5.5	BUTT	WATER BASED M	13.7	

DISPL. VOLUME		DISPL. FLUID		CAL. PSI		CAL. MAX PSI		OP. MAX		MAX TBG PSI		MAX CSG PSI		MIX WATER
VOLUME	UOM	TYPE	WGT.	BUMP PLUG	TO REV.	SQ. PSI	RATED	Operator	RATED	Operator	RATED	Operator	TANKS	
325	BBLS	2% KCl Brine	8.43	400C	0	0	0	0	10112	500C			TANKS	

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

PRESSURE/RATE DETAIL					EXPLANATION		
TIME HR:MIN.	PRESSURE - PSI		RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW <input checked="" type="checkbox"/> CO. REP. <input checked="" type="checkbox"/>	
	PIPE	ANNULUS				TEST LINES	770C PSI
						CIRCULATING WELL - RIG <input checked="" type="checkbox"/> BJ <input checked="" type="checkbox"/>	
21:00						ARRIVE ON LOCATION. JOB TIME 2200 HOURS	
21:01						STAGE EQUIPMENT ON LEASE ROAD. WAIT ON RIG	
22:30						SPOT EQUIPMENT ON LOCATION	
22:40						SAFETY MEETING WITH BHI CREW	
22:50						RIG IN TO WELL & TANKS	
02:40						SAFETY MEETING WITH RIG CREW & CO.MAN	
03:20	890		5	5	H2O	LINE FILL	
03:22	0		1	1	H2O	PRESSURE TEST BHI IRON TO 6500 PSI	
03:25						RELEASE PRESSURE / LOAD PLUG	
03:34	786		5.5	50	PREFLUS	ULTRAFLUSH	
03:42	550		5.4	183	CEMENT	821 SACKS CLASS H+ .15% R-3+.75 GAL/SACK FP-13L+.2% MPA-170. TEMP 76 DEGREE f	
04:15	555		5.4	279	CEMENT	762 SACKS CLASS H+ .05%R-3+.35% ASA-30T+.3% BA-10A+.75 GAL/SACK FP-13L+75 LBS PER SACK ASA-1+.5% MPA-170. TEMPS 78 DEGREE f	
05:09	0		6	10	H2O	SHUT DOWN / FLUSH LINES / DROP PLUG	
05:15	168E		7.1	20	H2O	START DISPLACEMENT WITH INHIBITED SPACER. 2 GPT TECHNICAL	

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# CEMENT JOB REPORT



PRESSURE/RATE DETAIL						EXPLANATION	
TIME HR:MIN.	PRESSURE - PSI		RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	SAFETY MEETING: BJ CREW <input checked="" type="checkbox"/> CO. REP. <input checked="" type="checkbox"/>	
	PIPE	ANNULUS				TEST LINES	7700 PSI
						CIRCULATING WELL - RIG <input checked="" type="checkbox"/> BJ <input checked="" type="checkbox"/>	
						HIB 606+.5 GAL/BBL SR-33L+ .25 GPT ALPHA 1427. + 100 LBS OF SUGAR	
05:20	4000		7.1	295	H2O	CONTINUE DISPLACEMENT WITH TREATED H2O	
06:02	3795		4	10	H2O	2% KCL BRINE ON LAST OF DISPLACEMENT	
06:07	4500				H2O	LAND PLUG. TOTAL DISPLACEMENT 335 BBLS	
06:50	0					RELEASE PRESSURE / CHECK FLOATS. 5.5 BBL RETURN TO PUMPER	
06:55	0					END JOB. SPACER TO SURFACE. I HAD CALCULATED TOP OF TAIL TO BE AT 8705 / TOP OF LEAD 1711 / TOS AT 660 WITHOUT EXCESS.	

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL. PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERVICE SUPERVISOR SIGNATURE:
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	4000	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	0	844	0	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

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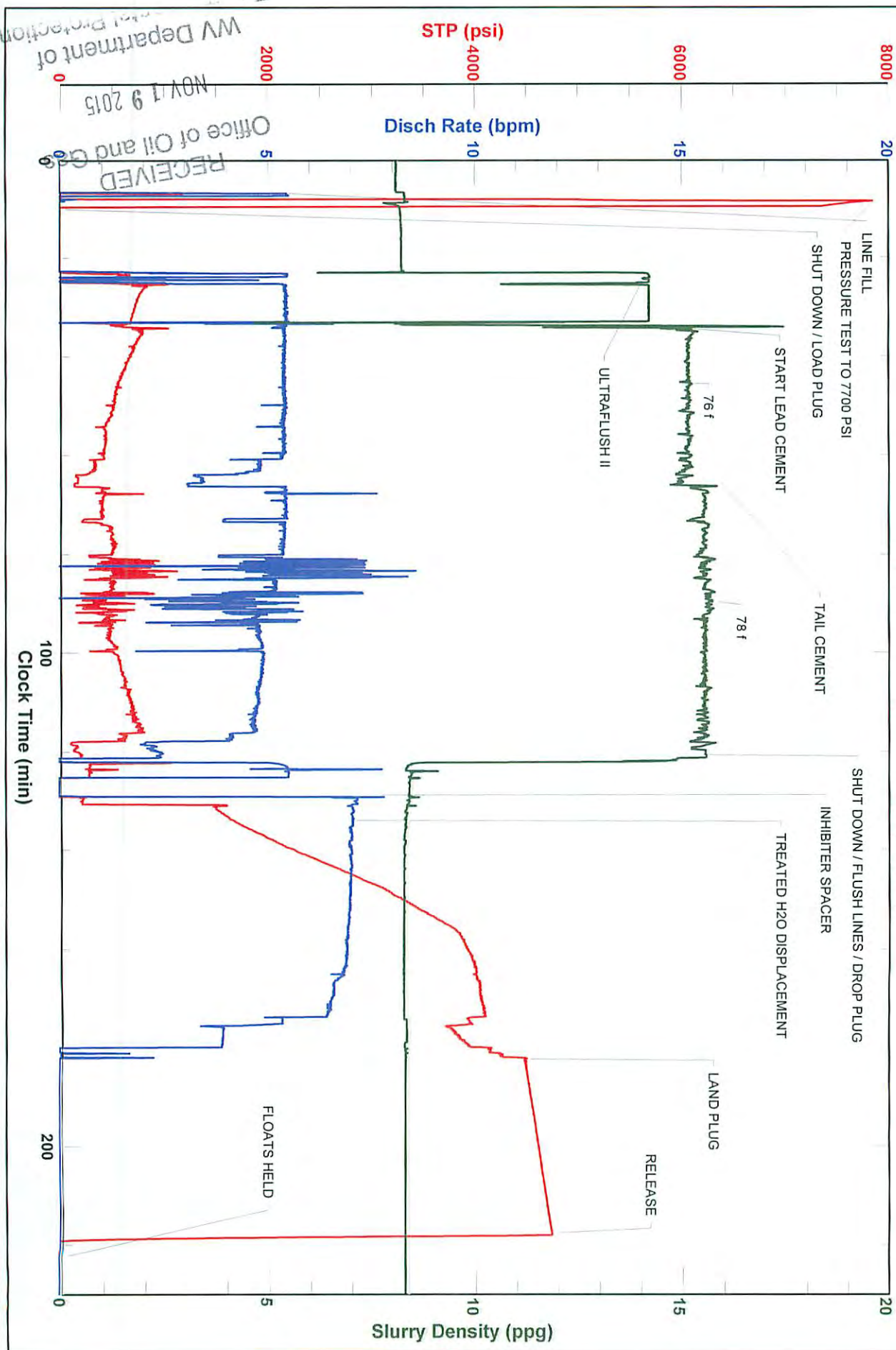
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Baker Hughes JobMaster Program Version 4.00  
Job Number: 10011155178  
Customer: EQT  
Well Name: ROBINSON WV 513918

### EQT - WV 513918 - 5.5in Long String





**BAKER HUGHES INC.**

Clarksburg District Lab  
 2228 Philippi Pike  
 Clarksburg, WV 26301  
 PHONE: 304-624-9802

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NEA Laboratory Report

PROJECT: 42715

DATE : 4/27/2015

COMPANY NAME EQT

RIG NAME Savanna 654

WELL NAME / NUMBER Well 513920

API NUMBER

CASING SIZE / JOB TYPE 5 1/2"

WELL DATA

MD 15658 ft

TVD 7603 ft

BHST 145 °F (est.)

BHCT 145 °F

Requested By: Tom Hilpisch

Company Rep: Syed Rehan

Prepared By: JoElla/Lynn

FLUID SPECIFICATIONS

1) Rig Mud	<u>WBM</u>	Sg	1.55
		DENSITY (PPG)	12.9
2) Spacer	<u>Ultra Flush II</u>	Sg	1.74
	<u>3ppb ASA-301</u>	DENSITY (PPG)	14.5

(D) RESULTS

Mud%	Spacer%	300 RPM	200 RPM	100 RPM	60 RPM	30 RPM	20 RPM	10 RPM	6 RPM	3 RPM	600 RPM
100	0	35	28	19	16	13	12	10	9	8	51
75	25	54	46	34	29	25	24	22	21	18	83
50	50	62	53	41	35	30	29	25	25	23	88
25	75	63	54	43	38	33	30	26	25	21	85
0	100	58	51	42	39	34	32	28	25	22	77

Comments:

Barite(1217144N), Ultra Flush II(10221401), ASA-301(G01131502)

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# Clarksburg District Lab Cement Lab Report

Phone: (304) 624-9802

Test Number: 189101791  
Report Number: 050515 - 1791

Test Date: 5/5/2015

## WELL INFORMATION

Operator: EQT  
API #:  
Well Name: Robinson WV 513918  
Slurry Type: Lead  
Blend Type: Pilot  
Comments:

County: Wetzel  
State: WV  
Requested By: Harrison Schwartz  
TVD: 7603 MD: 15658  
District: Clarksburg

## TEST DATA AND SCHEDULE

Time To Temp (min): 39.41  
Initial Press (psi): 530  
Final Press (psi): 3850  
BHST (deg F): 145  
BHCT (deg F): 145  
Comments:

Displacement Fluid Density (lb/gal): 8.34  
Mix Water Density (lb/gal): 8.34  
Mix Water Type: Tap Water  
Surf Temp (deg F): 60  
Job Type: Long String PT

## SLURRY AND TEST RESULTS

Vendor: Joppa  
Slurry: Class 'H' + 0.20% MPA-170 + 0.15% R-3

Density: 15.2 lb/gal  
Yield: 1.25 CuFt/sk  
Mix Water: 5.731 gal/sk (50.85%)  
Total Mix Liquid: 5.731 gal/sk  
Fluid Loss: 50 cc/30 min  
Gel Strength 10 Sec: 0 (lbs/ft<sup>2</sup>)

Pump Time (50 Bc): 4:43  
Pump Time (70 Bc): 4:56  
Pump Time (100 Bc): 5:05

Free Water (ml): 0 (Tested at 45 Degrees)  
Gel Strength 10 Min: 0 (lbs/ft<sup>2</sup>)

Compressive Strength				Rheology (PL=Power Law, BP= Bingham Plastic)											
Temp	Time	Strength	Type	Temp	600	300	200	100	6	3	n'	k'	Yp	Pv	Best
Amb	73	32	23	13	3	3	0.59	0.008	3.0	29.5	BP				
	145	101	66	52	37	20	18	0.287	0.105	21.5	46.6	BP			

Comments: Rheology: Amb: 60RPM (9cP) 30RPM (6cP), 145F: 60RPM (31cP) 30RPM (27cP)

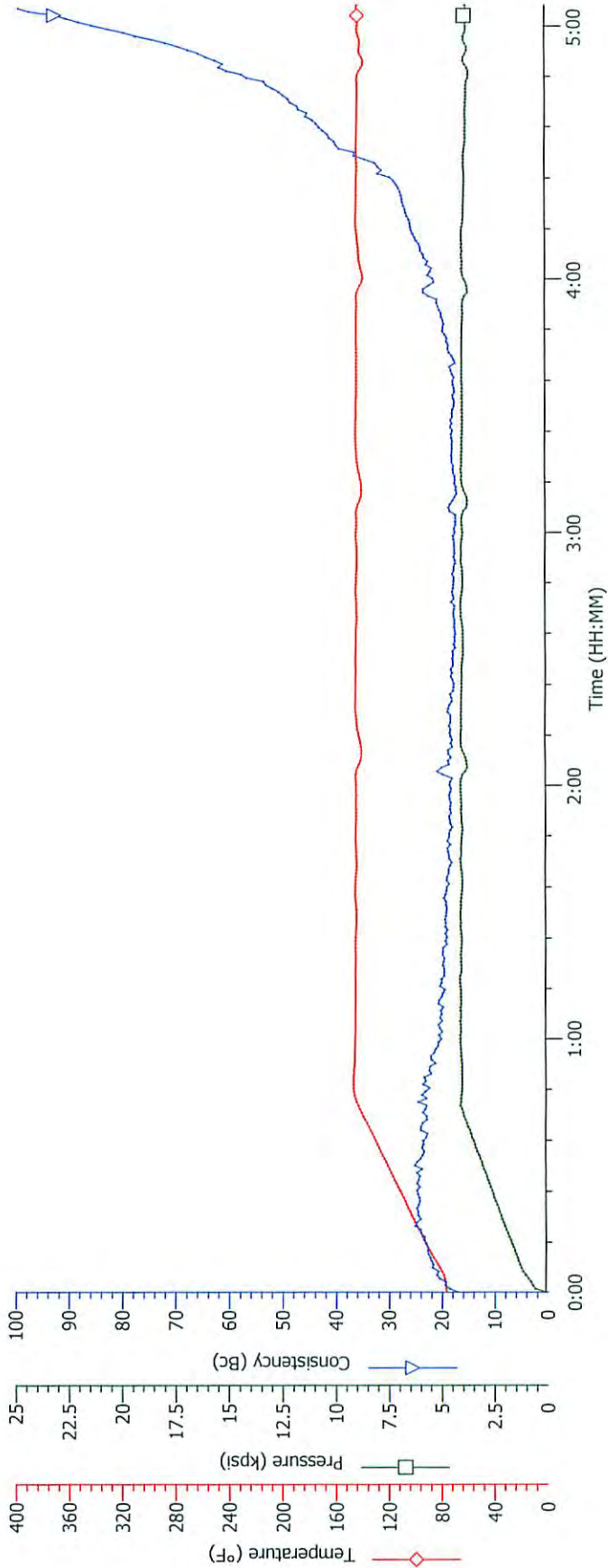
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50Bc:4:43:20  
70Bc:4:55:50  
100Bc:N/A

EQT

Instrument: 385-2 7222-385  
Test Start: 5/5/2015 10:26:38 AM  
EQT Robinson WV 513918 15:2ppg 145F Class H LS Lead PT 050515-1791-385.tst



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## Clarksburg District Lab Cement Lab Report

Phone: (304) 624-9802

Test Number: 189101785  
Report Number: 050415-1785

Test Date: 5/4/2015

### WELL INFORMATION

Operator: EQT  
API #:  
Well Name: Robinson WV 513918  
Slurry Type: Tail  
Blend Type: Pilot  
Comments:

County: Wetzel  
State: WV  
Requested By: Harrison Schwartz  
TVD: 7603 MD: 15658  
District: Clarksburg

### TEST DATA AND SCHEDULE

Time To Temp (min): 39.41  
Initial Press (psi): 530  
Final Press (psi): 3850  
BHST (deg F): 145  
BHCT (deg F): 145  
Comments:

Displacement Fluid Density (lb/gal): 8.34  
Mix Water Density (lb/gal): 8.34  
Mix Water Type: Tap Water  
Surf Temp (deg F): 60  
Job Type: Long String PT

### SLURRY AND TEST RESULTS

Vendor: Joppa

Slurry: Class 'H' + 0.35% ASA-301 + 0.30% BA-10A + 75.00 lb/sk ASCA-1 + 0.50% MPA-170 + 0.05% R-3

Density: 15.6 lb/gal  
Yield: 2.06 CuFt/sk

Mix Water: 8.433 gal/sk (74.82%)

Total Mix Liquid: 8.433 gal/sk

Fluid Loss: 34 cc/30 min

Gel Strength 10 Sec: (lbs/ft<sup>2</sup>)

Pump Time (50 Bc): 3:51

Pump Time (70 Bc): 3:58

Pump Time (100 Bc): 4:44

Free Water (ml): 0 (Tested at 45 Degrees)

Gel Strength 10 Min: (lbs/ft<sup>2</sup>)

#### Compressive Strength

Temp	Time	Strength	Type
------	------	----------	------

#### Rheology (PL=Power Law, BP= Bingham Plastic)

Temp	600	300	200	100	6	3	n'	k'	Yp	Pv	Best
Amb	231	148	105	61	17	15	0.533	0.05	16.3	133.1	BP
145F	264	177	135	89	29	23	0.449	0.105	34.1	149.0	BP

Comments: Rheology: Amb 60rpm(43cP), 30rpm(29cP), 145F 60rpm(69cP) 30rpm(51cP) / Class H(1212141618), ASA-301(G01131502), BA-10A(02814Y20S2), ASCA-1(19041415), MPA-170(0001833564), R-3(MM11E15S298)

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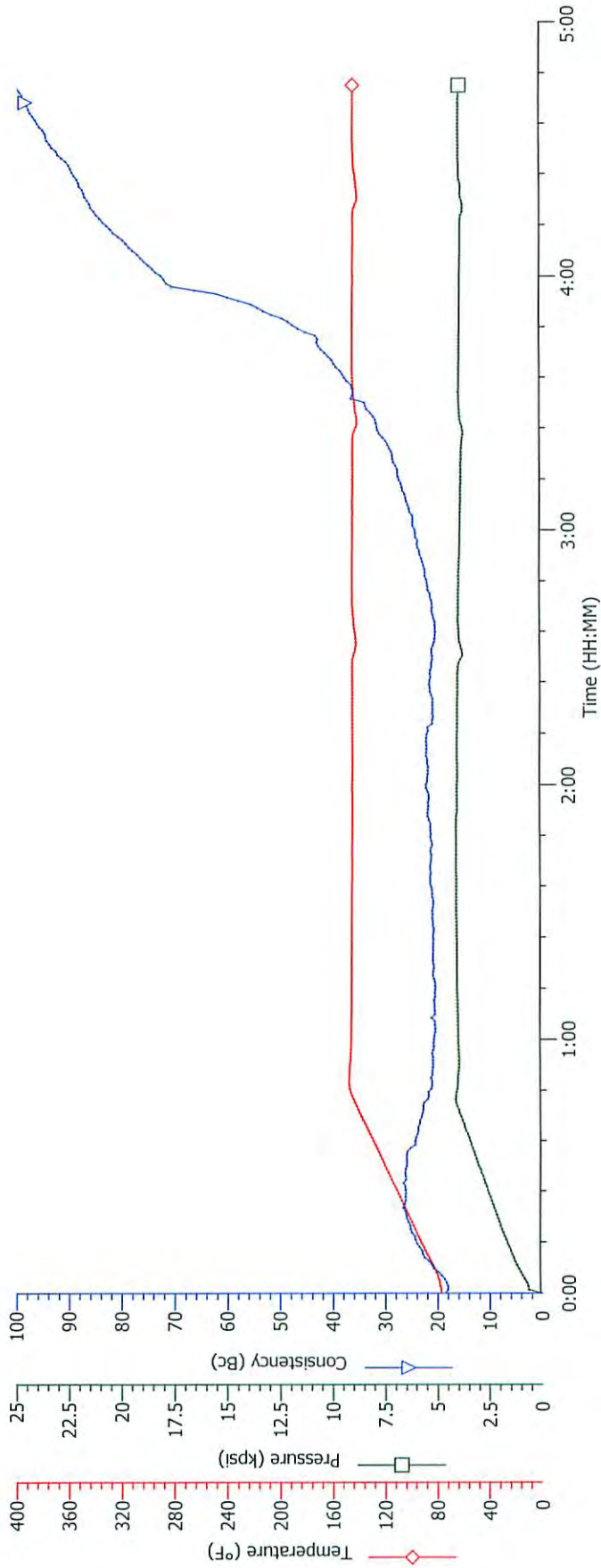
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50Bc:3:50:50  
70Bc:3:57:30  
100Bc:4:44:10

EQT

Instrument: 386-3 7222-386  
Test Start: 5/4/2015 3:42:44 PM  
EQT Robinson WV 513918 15.6ppg 145F Class H LS Tail PT 050415-1785-386.tst



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# Clarksburg District Lab Cement Lab Report

Phone: (304) 624-9802

Test Number: 189101796  
Report Number: 050515 - 1796

Test Date: 5/5/2015

## WELL INFORMATION

Operator: EQT  
API #:  
Well Name: Robinson WV 513918  
Slurry Type: Lead  
Blend Type: Field  
Comments:

County: Wetzel  
State: WV  
Requested By: Harrison Schwartz  
TVD: 7603 MD: 15658  
District: Clarksburg

## TEST DATA AND SCHEDULE

Time To Temp (min): 39.41  
Initial Press (psi): 530  
Final Press (psi): 3850  
BHST (deg F): 145  
BHCT (deg F): 145  
Comments:

Displacement Fluid Density (lb/gal): 8.34  
Mix Water Density (lb/gal): 8.34  
Mix Water Type: Rig Water  
Surf Temp (deg F): 60  
Job Type: Long String FB

## SLURRY AND TEST RESULTS

Vendor: Joppa  
Slurry: Class 'H' + 0.20% MPA-170 + 0.15% R-3

Density: 15.2 lb/gal  
Yield: 1.25 CuFt/sk  
Mix Water: 5.731 gal/sk (50.85%)  
Total Mix Liquid: 5.731 gal/sk  
Fluid Loss: cc/30 min  
Gel Strength 10 Sec: 0 (lbs/ft<sup>2</sup>)

Pump Time (50 Bc): 5:01  
Pump Time (70 Bc): 5:13  
Pump Time (100 Bc): 5:26

Free Water (ml): (Tested at 90 Degrees)  
Gel Strength 10 Min: 0 (lbs/ft<sup>2</sup>)

<b>Compressive Strength</b>				<b>Rheology</b> (PL=Power Law, BP= Bingam Plastic)											
Temp	Time	Strength	Type	Temp	600	300	200	100	6	3	n'	k'	Yp	Pv	Best

Comments:

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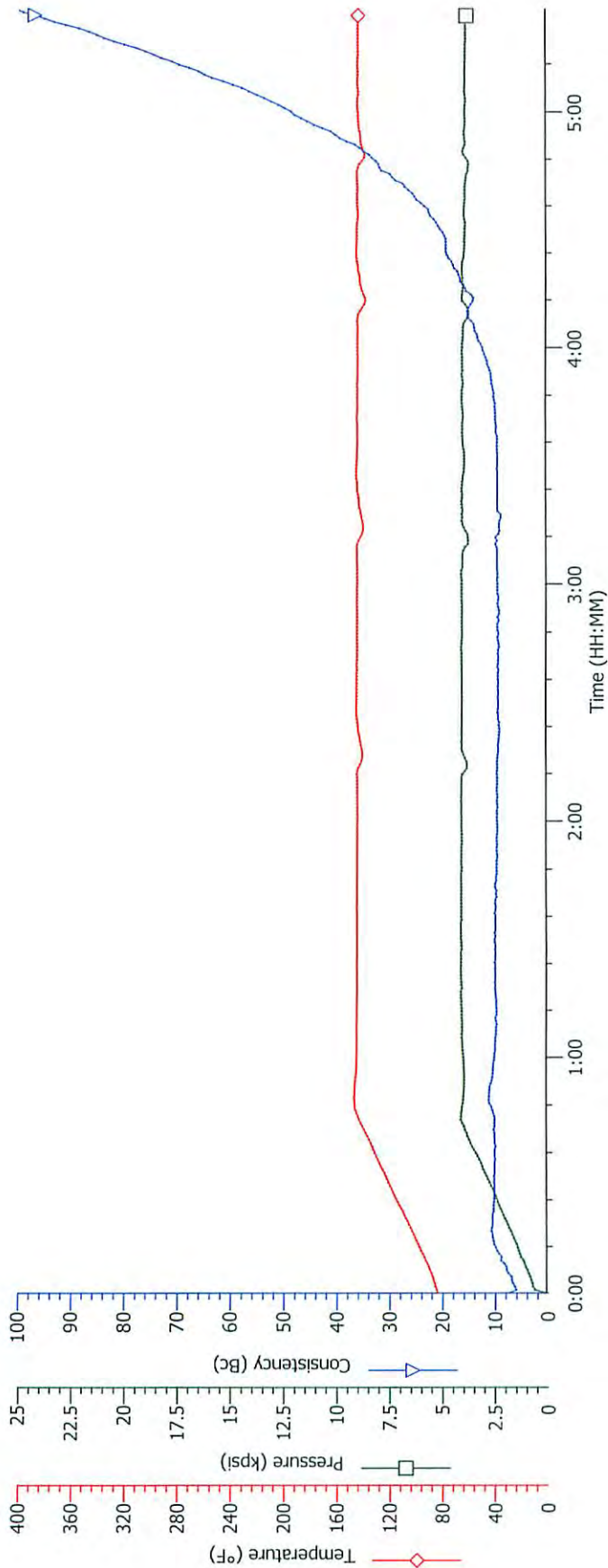
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50Bc:5:00:50  
70Bc:5:12:30  
100Bc:5:25:50

EQT

Instrument: 385-2 7222-385  
Test Start: 5/6/2015 7:08:17 AM  
EQT Robinson WV 513918 15.2ppg 145F Class H LS Lead FB 050615-1796-385.tst



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