

STATE OF OHIO  
DEPARTMENT OF NATURAL  
RESOURCES

Division of Oil and Gas  
Resources Management  
WELL PERMIT

API WELL NUMBER  
34-099-2-3157-00-00

OWNER NAME, ADDRESS

R E DISPOSAL LLC  
366 WALKER DRIVE  
STATE COLLEGE PA 16801

DATE ISSUED

12/23/2015

PERMIT EXPIRES

12/22/2017

TELEPHONE NUMBER

(814) 278-7267

IS HEREBY GRANTED PERMISSION TO: Plug and Abandon

AND ABANDON WELL IF UNPRODUCTIVE

PURPOSE OF WELL: Water Injection - Disposal

COMPLETION DATE IF PERMIT TO PLUG: 10/5/2011

DESIGNATION AND LOCATION:

LEASE NAME NORTHSTAR KHALIL (SWIW #11)  
WELL NUMBER 3  
COUNTY MAHONING  
CIVIL TOWNSHIP COITSVILLE  
TRACT OR ALLOTMENT  
SURFACE FOOTAGE LOCATION 10,769' SL & 1012' WL OF COITSVILLE TWP.  
TARGET FOOTAGE LOCATION

SURFACE NAD27

X: 2520217  
Y: 524113  
LAT: 41.0898331172455  
LONG: -80.6126089450529

TARGET NAD27

TYPE OF TOOLS: Service Rig

PROPOSED TOTAL DEPTH 8774 FEET  
GROUND LEVEL ELEVATION 1036 FEET

GEOLOGICAL FORMATION(S):

KNOX-CONASAUGA FORMATION

SPECIAL PERMIT CONDITIONS:

CASING PROGRAM (CASING MUST BE CENTRALIZED AND IS SUBJECT TO APPROVAL OF THE OIL AND GAS INSPECTOR):

CASING IN HOLE:

13-5/8" - 50'  
10-1/2" - 1017'  
7-5/8" - 8080'  
4-1/2" - 7972'

This permit is NOT TRANSFERABLE. This permit, or an exact copy thereof, must be displayed in a conspicuous and easily accessible place at the well site before permitted activity commences and remain until the well is completed. Ample notification to inspector is necessary.

OIL AND GAS WELL INSPECTOR:

STEPHEN OCHS (330) 933-2090  
THOMAS HILL - Supervisor (330) 283-3204  
DISTRICT #: (330) 896-0616

FIRE AND EMERGENCY NUMBERS

FIRE: (330) 755-5115  
MEDICAL SERVICE (330) 746-7211

INSPECTOR NOTIFICATION

The oil and gas inspector must be notified at least 24 hours prior to:

1. Commencement of site construction
2. Pit excavation and closure
3. Commencement of drilling, reopening, converting or plugback operations
4. Installation and cementing of all casing strings
5. BOP testing
6. Well stimulation
7. Plugging operations
8. Well pad construction

The oil and gas inspector must be notified immediately upon:

1. Discovery of defective well construction
2. Detection of any natural gas or H2S gas during drilling in urban areas
3. Discovery of defective well construction during well stimulation
4. Determination that a well is a lost hole
5. Determination that a well is a dry hole

FLARING NOTIFICATION

The oil and gas inspector and local fire authority must be notified prior to flaring.

**Richard J. Simmers**

CHIEF, Division of Oil and Gas Resources  
Management

STATE OF OHIO  
DEPARTMENT OF NATURAL  
RESOURCES

Division of Oil and Gas  
Resources Management  
WELL PERMIT

API WELL NUMBER  
34-099-2-3157-00-00

SUZANNE REYNOLDS  
R E DISPOSAL LLC  
366 WALKER DRIVE  
STATE COLLEGE, PA 16801



## PLUG AND ABANDON PROCEDURE

**Well No:** Northstar Khalil #3 SWD  
**County:** Mahoning  
**Service Companies:**

**AFE #:** Unassigned, P&A  
**State:** Ohio

**Well Status:** Shutin, non-producing. Well is completed with 7 5/8" N-80 casing and isolated via packer and 4 1/2" P-110 tubing.

**Objective:** Unseat packer, pull tubing, plug and abandon per ODNR regulations via bridge plugs and cement.

**Service Companies:**

Workover Rig – Mercer Well Services  
BOP and Annular – Quail Oil Tools  
Wireline (casing cutters, CIBP) – Allied Horizontal Wireline  
Cement – Schlumberger

### CONTACT INFORMATION

REX: Director, Completions	Eric Ross	(817) 888-1410
Completions Engineer In-Charge	Josh Kahle	(814) 657-8927
Operations Engineer	Aaron Cox	(419) 615-9387
Manager, Field Operations	John Hagan	(814) 771-5556
Production Superintendent	Ritchie Larsh	(620) 432-3996
Director, HSE	Derek Smith	(814) 795-2524
HSE Manager	Shawn McGuigan	(814) 795-2819
Safety Specialist	Bill Everetts	(724) 747-8172
Environmental Specialist	Jim Noon	(814) 573-0425

### DIRECTIONS TO LOCATION

#### From Pittsburgh, PA

Go North on PA 60 towards Toll Rd/ New Castle, Ohio. Go 0.5 mi. Merge onto I-376 W. Take Exit 12 (Sampson St/ US 422 Bus W) exit toward Youngstown, Ohio. Keep left at fork & merge onto US 422 W/ Ben Franklin Hwy. Continue on US 422 E/ McCartney Rd to Coitsville, Ohio. Go past McDonalds. Then go past the next 3 lights. Go 100 yds turn left to Location (+/- 60' off of Hwy).

#### From Youngstown, Ohio.

Take US 422 E/ McCartney Rd east +/-4.0 miles to Coitsville, Ohio. Turn right (heading south) on Old McCartney road to Location (+/-60' off of Hwy).

### PERF DETAIL

No existing perforations, open hole injection only



## PROCEDURE

1. MIRU Workover rig and all ancillary equipment
2. Set BP valve and ND production tree
3. NU 7 1/16" – 5M X11" – 5M DSA
4. NU 7 1/16" 10K master valves and flow cross
5. Upon verification of notification of ODNR proceed with operations
6. MIRU casing crew and pumping unit
7. Mix 450 bbl 8.6 lb/gal brine
8. Pump 120 bbl 8.6 lb/gal brine into 4 1/2" tubing, record shutin pressure and monitor for 30 minutes
9. Bleed any pressure resulting from backside of 4 1/2" tubing
10. Latch onto 4 1/2" tubing and attempt to unlatch packer at depth of 7,968 ft

### **OPTION A: If packer unlatches;**

11. RU annular
12. LD 4 1/2" tubing with casing crew
13. Tally and record depths of all pipe removed
  - Send tally to office at end of job
14. BD packer assembly and set aside for inspection and reallocation

### **OPTION B: If packer does not unlatch or unable to get off of;**

11. MIRU e-line
12. RIH with 4 1/2" casing cutter
  - a. Ensure that wellbore is still loaded and fluid level is not below cutting depth
13. Engage cutter at approx. 7,950 ft or above top of packer
14. POOH and RD wireline for standby
15. RU annular
16. LD 4 1/2" tubing with casing crew
17. Tally and record depths of all pipe removed
  - a. Send tally to office at end of job
18. BD packer assembly and set aside for inspection and reallocation

### **OPTION C: If packer does not unlatch but able get off of;**

19. MIRU e-line
20. RU annular
21. LD 4 1/2" tubing with casing crew
22. Tally and record depths of all pipe removed
  - a. Send tally to office at end of job
23. BD packer assembly and set aside for inspection and reallocation

### **Continue to Plugging Procedure:**



*K*

#### PLUGGING PROCEDURE

1. TIH with open-ended work string to 8900' and circulate (linear ratio 0.459 bbl/ft) 408 bbl
2. RU cementing equipment
  - Provide closed loop system, open top tanks for returns
3. Pump 140 bbl Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk) and wash up lines
  - Refer to Schlumberger cementing procedure "Plug 1"
  - Calculation assumes PBTB of 8930', adjustments to cement volume must be made if PBTB varies significantly
  - If loss of circulation issues were apparent, consider adding LCM to cement
4. TOH to 1,000' (est. capacity 0.00338 bbl/ft, annular ratio 0.0400 bbl/ft), reverse out 44 bbl + surface vol. to clean up tbg
5. SI backside and attempt to squeeze per engineer's direction on site (max 10 bbl, 4,500 psi max)
6. SI well, leaving final squeeze pressure on tbg
  - Allow cement to set for a minimum of 12 hours
7. TIH and tag top of cement @ +/- 7,900' (assuming 10 bbl squeeze volume)
  - If TOC found is below 7,900', consult engineer for further instructions before proceeding
8. Pressure test to 5,000 psi for 30 minutes
  - If good test, continue with procedure
  - If failure occurs, repeat primary cementing procedure until a good test can be performed

See Diagram:

Zoom : 7500 ft

Top of Cement  
7900 ft

5" x 7 5/8" Packer  
7968 ft

5" x 7 5/8" Packer  
8013 ft

7 625 in Csg  
29.70 lbm/ft  
8094 ft

9 875 in  
0% Excess  
8930 ft

Cement Top  
8930 ft

Custom 2  
8.90 bbl

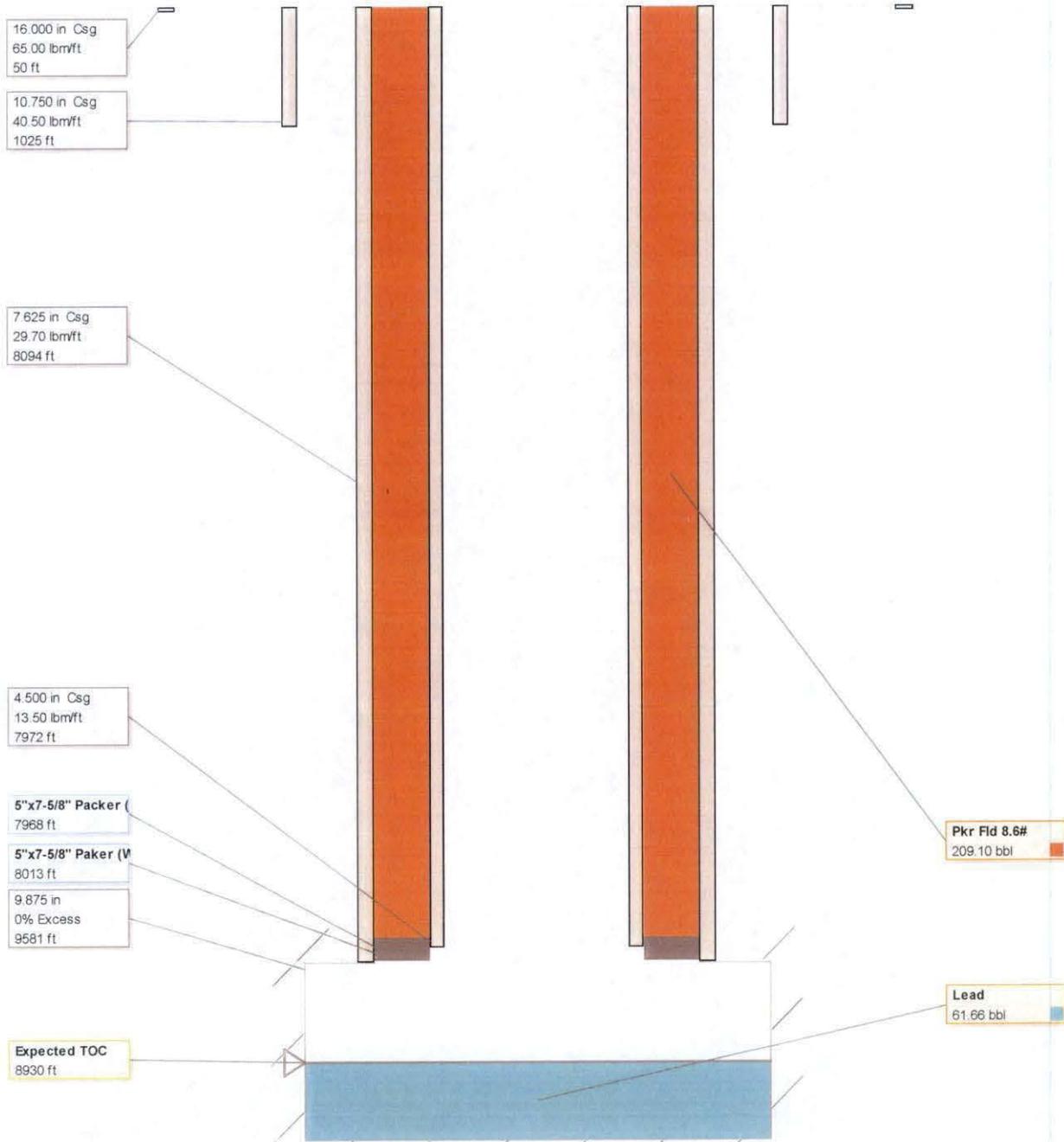
Custom 1  
79.19 bbl

Zoom : 8930 ft

**CURRENT WELLBORE SCHEMATIC**

Northstar SWD

Created on 2/14/2011 9:05:41 AM



i-Handbook\* - \*a mark of Schlumberger



Northstar SWD

Created on 2/14/2011 9:05:41 AM

Zoom 7501 ft

4.500 in Csg  
13.50 lbm/ft  
7972 ft

7.625 in Csg  
29.70 lbm/ft  
8094 ft

5"x7-5/8" Packer ( )  
7968 ft

5"x7-5/8" Packer (V)  
8013 ft

9.875 in  
0% Excess  
9581 ft

Expected TOC  
8930 ft

Pkr Fid 8.6#  
209.10 bbl

Lead  
61.66 bbl

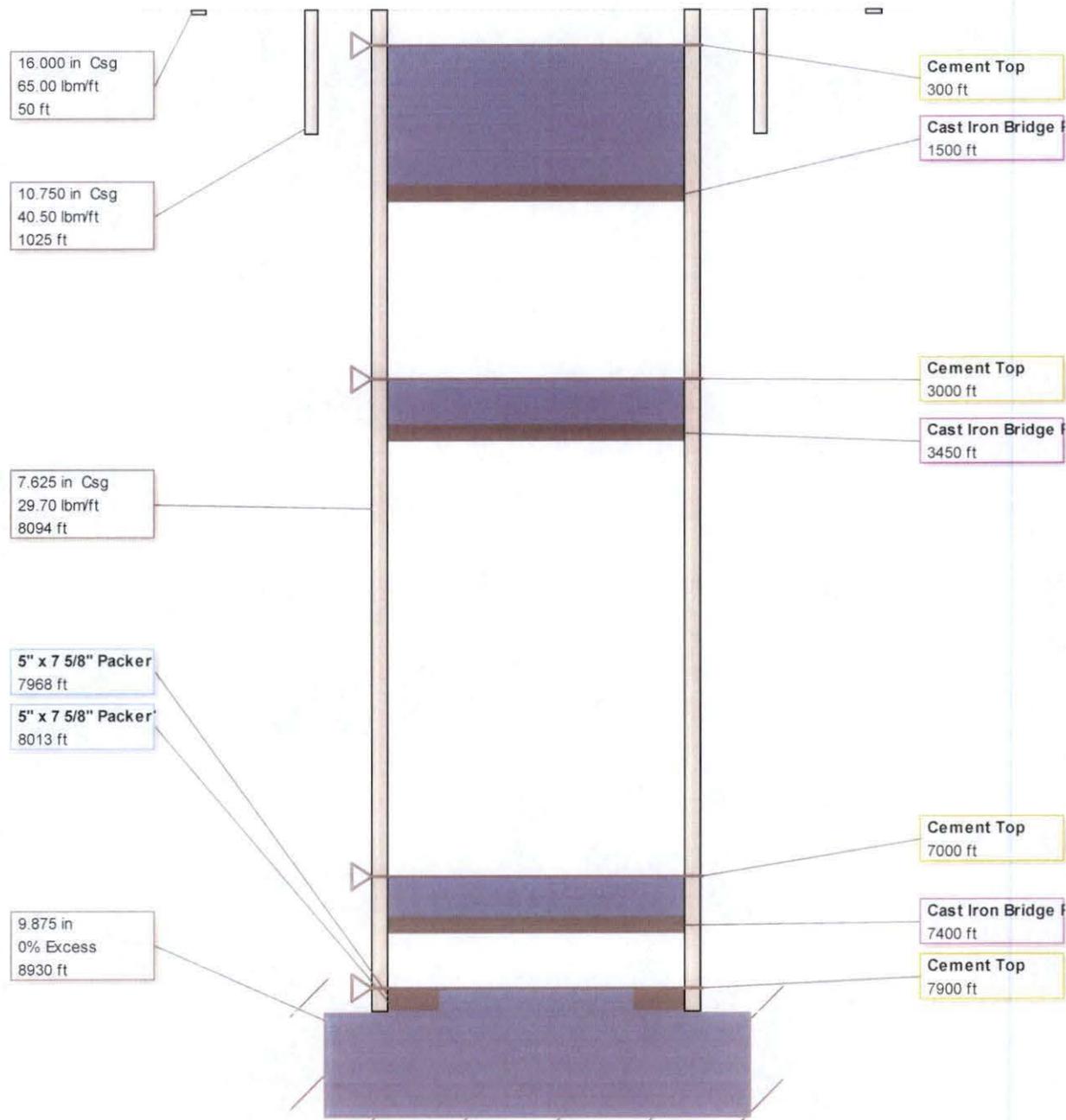
Zoom 9581 ft

i-Handbook\* - \*a mark of Schlumberger



9. TOH with work string
10. RU Wireline
11. RIH with CIBP and set at 7,400', POOH
12. RD wireline for standby
13. TIH with open-ended workstring to 7,370' and begin circulating
14. Pump 45 bbl of Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk) and wash up lines, reverse out if needed
- Refer to Schlumberger cementing procedure "Plug 2"
  - Calculation assumes new PBDT of 7,000', adjustments to cement volume must be made if PBDT varies significantly
  - Allow cement to set for a minimum of 12 hours
15. TIH and tag top of cement @ +/- 7,000'
- Report found TOC to engineer before proceeding
16. TOH with workstring
17. RU Wireline
18. RIH with CIBP and set at 3,450', POOH
19. RD wireline for standby
20. TIH with open-ended workstring to 3,400' and begin circulating
21. Pump 34 bbl of Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk) and wash up lines, reverse out if needed
- Refer to Schlumberger cementing procedure "Plug 3"
  - Calculation assumes new PBDT of 3,000', adjustments to cement volume must be made if PBDT varies significantly
  - Allow cement to set for a minimum of 12 hours
22. TIH and tag top of cement @ +/- 3,000'
- Report found TOC to engineer before proceeding
23. TOH with workstring
24. RU Wireline
25. RIH with CIBP and set at 1,500', POOH
26. RDMO wireline
27. TIH with open-ended workstring to 1,450' and begin circulating
28. Pump 61 bbl of Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk) and wash up lines, reverse out if needed
- Refer to Schlumberger cementing procedure "Plug 4"
  - Calculation assumes new PBDT of 300', adjustments to cement volume must be made if PBDT varies significantly
  - Allow cement to set for a minimum of 12 hours
29. TIH and tag top of cement @ +/- 300'
- Report found TOC to engineer before proceeding
30. TOH with workstring

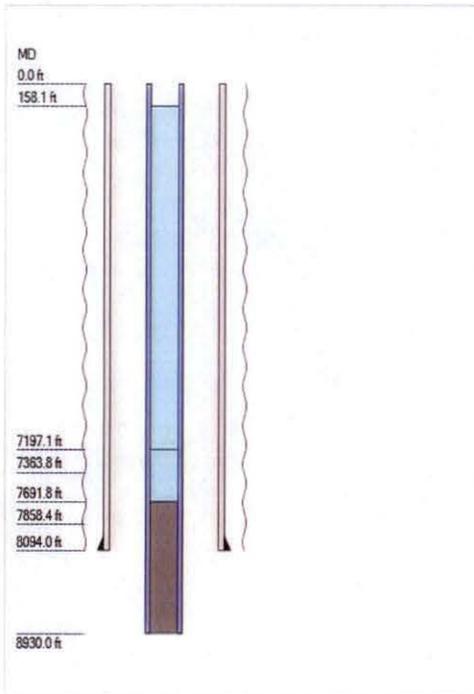
See Diagram:



i-Handbook\* - \*a mark of Schlumberger

31. Fill the remaining portion of the wellbore with gravel
32. Cut csg off +/- 5' below GL and begin reclaiming location

## Well Data – Plug 1



Well Data	
Job Type:	Plug
Total Depth (Measured):	8,930.0 ft
TVD:	8,930.0 ft
BHST (Tubular Bottom Static Temperature):	178.2 degF
BHCT (Tubular Bottom Circulating Temperature):	152.1 degF
Drilling Fluid:	10.00 lb/gal

Open Hole		
OH Diameter	Bottom Depth	Annular Excess
9.875 in	8,930.0 ft	10.0 %

Previous Casing				
OD	Weight	Grade	Inner Capacity	Bottom Depth
7 5/8 in	29.7 lbm/ft	M-65	0.26 ft <sup>3</sup> /ft	8,094.0 ft

Drill Pipe				
OD	Weight	Grade	Inner Capacity	Bottom Depth
2 3/8 in	6.7 lbm/ft	E-75	0.02 ft <sup>3</sup> /ft	8,930.0 ft

### IMPORTANT

The well data shown on this page is based on information available when this treatment program was prepared. This data must be confirmed on location with the customer representative prior to the treatment. Any changes in the well design need to be reviewed for their impact on the treatment design.

Fluid Placement					
Fluid Name	Volume, bbl	Top of Fluid, ft	Annular Length, ft	Length, ft	Density, lb/gal
CW100	20.0	7,363.8	494.6	494.6	8.33
Tail Slurry	91.6	7,858.4	1,071.6	1,071.6	15.60
Tail Slurry	4.0	7,691.8	0.0	1,238.2	15.60
CW100	1.6	7,197.1	0.0	494.6	8.33
Fresh Water	22.5	158.1	0.0	7,039.1	8.32
<b>Total Liquid Volume:</b>	<b>139.7</b>				

## Fluid Systems

CW100			
<b>System</b>		CW100	
<b>Density</b>		8.33 lb/gal	
<b>Total Volume</b>		21.58 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>
	D122A	Chem wash co	0.50 gal/bbl of Wash
	J237A	Fluid loss	0.25 gal/bbl of Wash

Tail Slurry (454 sacks, 94.0 lbm per sack of Blend)			
<b>System</b>		Conventional	
<b>Density</b>		15.60 lb/gal	
<b>Yield</b>		1.18 ft <sup>3</sup> /sk	
<b>Mix Water</b>		5.19 gal/sk	
<b>Mix Fluid</b>		5.30 gal/sk	
<b>Total Volume</b>		95.56 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>
	A	Cement	94.00 lb/sk BWOB
	D047	Antifoam	0.02 gal/sk VBWOB
	D080	Dispersant	0.04 gal/sk VBWOB
	D801	Retarder	0.05 gal/sk VBWOB

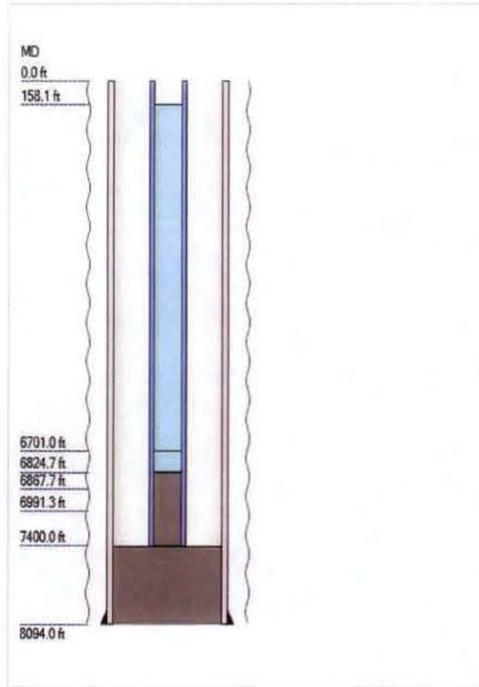
Fresh Water			
<b>System</b>			
<b>Density</b>		8.32 lb/gal	
<b>Total Volume</b>		22.53 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>

Some of the chemicals specified in this program may have toxic properties. All personnel should be familiar with the inherent dangers and appropriate safeguards to prevent accidental injury. Use of these chemicals may be governed by certain laws and regulations and should only be used in accordance with such. Please refer to the MSDS for the recommended safety precautions and required minimum personal protective equipment.

## Pumping Schedule - 2 3/8 in Plug

Fluid Placement						
Fluid	Flow Rate, bbl/min	Volume, bbl	Stage Time, min	Cumul Volume, bbl	Cumul Time, min	Comments
CW100	3.0	20.0	6.7	20.0	6.7	
Tail Slurry	3.0	92.1	30.7	112.1	37.4	
	3.0	3.5	1.2	115.6	38.5	
CW100	3.0	1.6	0.5	117.1	39.0	
Fresh Water	3.0	22.5	7.5	139.7	46.6	
<b>Total Fluid Volume:</b>				<b>139.7</b>		
<b>Total Pump Time:</b>					<b>46.6</b>	

## Well Data – Plug 2



Well Data	
Job Type:	Plug
Total Depth (Measured):	8,930.0 ft
TVD:	8,930.0 ft
BHST (Tubular Bottom Static Temperature):	161.4 degF
BHCT (Tubular Bottom Circulating Temperature):	137.5 degF
Drilling Fluid:	10.00 lb/gal

Open Hole		
OH Diameter	Bottom Depth	Annular Excess
9.875 in	8,930.0 ft	0.0 %

Previous Casing				
OD	Weight	Grade	Inner Capacity	Bottom Depth
7 5/8 in	29.7 lbm/ft	M-65	0.26 ft <sup>3</sup> /ft	8,094.0 ft

Drill Pipe				
OD	Weight	Grade	Inner Capacity	Bottom Depth
2 3/8 in	6.7 lbm/ft	E-75	0.02 ft <sup>3</sup> /ft	7,400.0 ft

### IMPORTANT

The well data shown on this page is based on information available when this treatment program was prepared. This data must be confirmed on location with the customer representative prior to the treatment. Any changes in the well design need to be reviewed for their impact on the treatment design.

Fluid Placement					
Fluid Name	Volume, bbl	Top of Fluid, ft	Annular Length, ft	Length, ft	Density, lb/gal
Fresh Water	5.0	6,867.7	123.7	123.7	8.32
Tail Slurry	16.5	6,991.3	408.7	408.7	15.60
Tail Slurry	1.8	6,824.7	0.0	575.3	15.60
Fresh Water	0.4	6,701.0	0.0	123.7	8.32
Fresh Water	20.9	158.1	0.0	6,543.0	8.32
<b>Total Liquid Volume:</b>	<b>44.7</b>				

## Fluid Systems

Fresh Water			
<b>System</b>			
<b>Density</b>		8.32 lb/gal	
<b>Total Volume</b>		26.33 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>

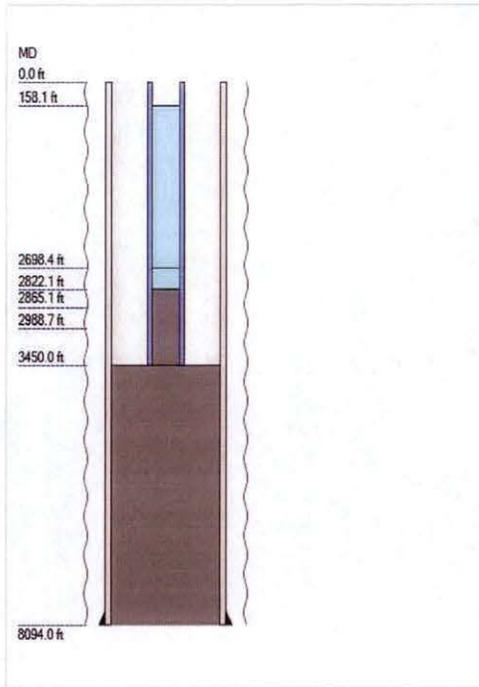
Tail Slurry (88 sacks, 94.0 lbm per sack of Blend)			
<b>System</b>			
<b>Density</b>		15.60 lb/gal	
<b>Yield</b>		1.18 ft <sup>3</sup> /sk	
<b>Mix Water</b>		5.20 gal/sk	
<b>Mix Fluid</b>		5.29 gal/sk	
<b>Total Volume</b>		18.37 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>
	A	Cement	94.00 lb/sk BWOB
	D047	Antifoam	0.02 gal/sk VBWOB
	D080	Dispersant	0.04 gal/sk VBWOB
	D801	Retarder	0.03 gal/sk VBWOB

Some of the chemicals specified in this program may have toxic properties. All personnel should be familiar with the inherent dangers and appropriate safeguards to prevent accidental injury. Use of these chemicals may be governed by certain laws and regulations and should only be used in accordance with such. Please refer to the MSDS for the recommended safety precautions and required minimum personal protective equipment.

## Pumping Schedule - 7 5/8 in Plug

Fluid Placement						
Fluid	Flow Rate, bbl/min	Volume, bbl	Stage Time, min	Cumul Volume, bbl	Cumul Time, min	Comments
Fresh Water	3.0	5.0	1.7	5.0	1.7	
Tail Slurry	3.0	18.4	6.1	23.4	7.8	
Fresh Water	3.0	21.3	7.1	44.7	14.9	
<b>Total Fluid Volume:</b>				<b>44.7</b>		
<b>Total Pump Time:</b>					<b>14.9</b>	

# Well Data – Plug 3



Well Data	
Job Type:	Plug
Total Depth (Measured):	8,930.0 ft
TVD:	8,930.0 ft
BHST (Tubular Bottom Static Temperature):	117.9 degF
BHCT (Tubular Bottom Circulating Temperature):	101.4 degF
Drilling Fluid:	10.00 lb/gal

Open Hole		
OH Diameter	Bottom Depth	Annular Excess
9.875 in	8,930.0 ft	0.0 %

Previous Casing				
OD	Weight	Grade	Inner Capacity	Bottom Depth
7 5/8 in	29.7 lbm/ft	M-65	0.26 ft <sup>3</sup> /ft	8,094.0 ft

Drill Pipe				
OD	Weight	Grade	Inner Capacity	Bottom Depth
2 3/8 in	6.7 lbm/ft	E-75	0.02 ft <sup>3</sup> /ft	3,450.0 ft

**IMPORTANT**

The well data shown on this page is based on information available when this treatment program was prepared. This data must be confirmed on location with the customer representative prior to the treatment. Any changes in the well design need to be reviewed for their impact on the treatment design.

Fluid Placement					
Fluid Name	Volume, bbl	Top of Fluid, ft	Annular Length, ft	Length, ft	Density, lb/gal
Fresh Water	5.0	2,865.1	123.7	123.7	8.32
Tail Slurry	18.7	2,988.7	461.3	461.3	15.60
Tail Slurry	2.0	2,822.1	0.0	627.9	15.60
Fresh Water	0.4	2,698.4	0.0	123.7	8.32
Fresh Water	8.1	158.1	0.0	2,540.4	8.32
<b>Total Liquid Volume:</b>	<b>34.2</b>				

## Fluid Systems

Fresh Water			
<b>System</b>			
<b>Density</b>		8.32 lb/gal	
<b>Total Volume</b>		13.53 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>

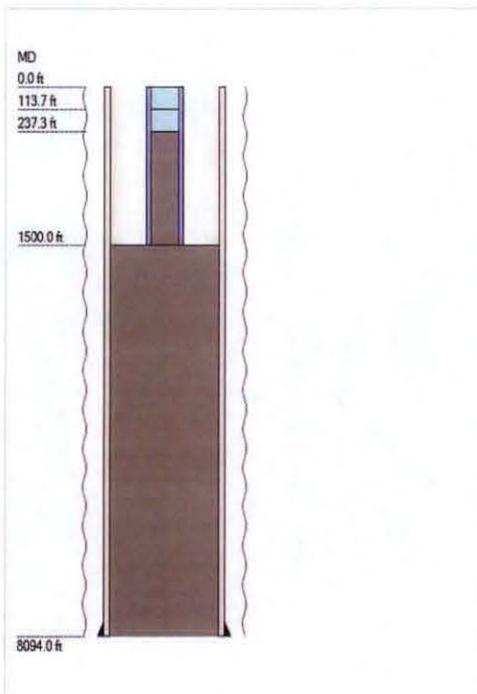
Tail Slurry (98 sacks, 94.0 lbm per sack of Blend)			
<b>System</b>			
<b>Density</b>		15.60 lb/gal	
<b>Yield</b>		1.18 ft <sup>3</sup> /sk	
<b>Mix Water</b>		5.19 gal/sk	
<b>Mix Fluid</b>		5.30 gal/sk	
<b>Total Volume</b>		20.66 bbl	
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>
	A	Cement	94.00 lb/sk BWOB
	D047	Antifoam	0.02 gal/sk VBWOB
	D080	Dispersant	0.04 gal/sk VBWOB
	D801	Retarder	0.05 gal/sk VBWOB

Some of the chemicals specified in this program may have toxic properties. All personnel should be familiar with the inherent dangers and appropriate safeguards to prevent accidental injury. Use of these chemicals may be governed by certain laws and regulations and should only be used in accordance with such. Please refer to the MSDS for the recommended safety precautions and required minimum personal protective equipment.

## Pumping Schedule - 7 5/8 in Plug

Fluid Placement						
Fluid	Flow Rate, bbl/min	Volume, bbl	Stage Time, min	Cumul Volume, bbl	Cumul Time, min	Comments
Fresh Water	3.0	5.0	1.7	5.0	1.7	
Tail Slurry	3.0	20.7	6.9	25.7	8.6	
Fresh Water	3.0	8.5	2.8	34.2	11.4	
<b>Total Fluid Volume:</b>				<b>34.2</b>		
<b>Total Pump Time:</b>					<b>11.4</b>	

## Well Data – Plug 4



Well Data	
Job Type:	Plug
Total Depth (Measured):	8,930.0 ft
TVD:	8,930.0 ft
BHST (Tubular Bottom Static Temperature):	96.5 degF
BHCT (Tubular Bottom Circulating Temperature):	84.5 degF
Drilling Fluid:	10.00 lb/gal

Open Hole		
OH Diameter	Bottom Depth	Annular Excess
9.875 in	8,930.0 ft	0.0 %

Previous Casing				
OD	Weight	Grade	Inner Capacity	Bottom Depth
7 5/8 in	29.7 lbm/ft	M-65	0.26 ft <sup>3</sup> /ft	8,094.0 ft

Drill Pipe				
OD	Weight	Grade	Inner Capacity	Bottom Depth
2 3/8 in	6.7 lbm/ft	E-75	0.02 ft <sup>3</sup> /ft	1,500.0 ft

### IMPORTANT

The well data shown on this page is based on information available when this treatment program was prepared. This data must be confirmed on location with the customer representative prior to the treatment. Any changes in the well design need to be reviewed for their impact on the treatment design.

Fluid Placement					
Fluid Name	Volume, bbl	Top of Fluid, ft	Annular Length, ft	Length, ft	Density, lb/gal
Fresh Water	5.0	113.7	123.7	123.7	8.32
Tail Slurry	51.1	237.3	1,262.7	1,262.7	15.60
Tail Slurry	4.0	237.3	0.0	1,262.7	15.60
Fresh Water	0.4	113.7	0.0	123.7	8.32
Fresh Water	0.4	0.0	0.0	113.7	8.32
<b>Total Liquid Volume:</b>	<b>60.9</b>				

## Fluid Systems

Fresh Water			
<b>System</b>			
<b>Density</b>	8.32 lb/gal		
<b>Total Volume</b>	5.76 bbl		
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>

Tail Slurry (262 sacks, 94.0 lbm per sack of Blend)			
<b>System</b>			
<b>Density</b>	15.60 lb/gal		
<b>Yield</b>	1.18 ft <sup>3</sup> /sk		
<b>Mix Water</b>	5.19 gal/sk		
<b>Mix Fluid</b>	5.30 gal/sk		
<b>Total Volume</b>	55.10 bbl		
<b>Additives</b>	<b>Code</b>	<b>Description</b>	<b>Concentration</b>
	A	Cement	94.00 lb/sk BWOB
	D047	Antifoam	0.02 gal/sk VBWOB
	D080	Dispersant	0.04 gal/sk VBWOB
	D801	Retarder	0.05 gal/sk VBWOB

Some of the chemicals specified in this program may have toxic properties. All personnel should be familiar with the inherent dangers and appropriate safeguards to prevent accidental injury. Use of these chemicals may be governed by certain laws and regulations and should only be used in accordance with such. Please refer to the MSDS for the recommended safety precautions and required minimum personal protective equipment.

## Pumping Schedule - 7 5/8 in Plug

Fluid Placement						
Fluid	Flow Rate, bbl/min	Volume, bbl	Stage Time, min	Cumul Volume, bbl	Cumul Time, min	Comments
Fresh Water	3.0	5.0	1.7	5.0	1.7	
Tail Slurry	3.0	55.1	18.4	60.1	20.0	
Fresh Water	3.0	0.8	0.3	60.9	20.3	
<b>Total Fluid Volume:</b>				<b>60.9</b>		
<b>Total Pump Time:</b>					<b>20.3</b>	

Logging Co. **AP; SCH** Core No \_\_\_\_\_ Sample No \_\_\_\_\_ API Well Number: **34-099-2-3157-00-00**  
 Log Types **GND; LL; CCL Cmmnt: LOG IN UIC** CD CA SD SA Permit Issued: **06/28/2011**  
 County: **MAHONING** Township: **COITSVILLE** T: R: \_\_\_\_\_ Quadrangle: **CAMPBELL** Zone **N**  
 Section: \_\_\_\_\_ Lot: \_\_\_\_\_ Tract: \_\_\_\_\_ Twp. Qtr. \_\_\_\_\_ Surface Coord X: **2520217** Y: **524113**  
 Measured: **10,769' SL & 1012' WL OF COITSVILLE TWP.** Bot Hole Coord X: \_\_\_\_\_ Y: \_\_\_\_\_  
 Class **SWIW** Tool **RTAF**  
 Landowner: **NORTHSTAR KHALIL (SWIW #11)** Acres **6.7** Well No. **3** Date Commenced: **08/18/2011**  
 Owner: **RE DISPOSAL LLC** Status **DR** Well No \_\_\_\_\_ Date Completed: \_\_\_\_\_  
 GL **1036** DF **1052** KB **1052** LTD **9580** DTD **9580** PB Depth \_\_\_\_\_ Date PB **06/03/2013**  
 TD Formation **PRECAMBRIAN** Prod. Form. \_\_\_\_\_  
 IP Natural **BO / MCF** IP AT **BO / MCF** Initial Rock Pressure \_\_\_\_\_ DST **#Erro** Date Abandoned \_\_\_\_\_  
 Perforations **PI: 8098-9581, Cmmnt: OPEN HOLE**  
 Stimulations \_\_\_\_\_

# Formations

FORMATION	TOP	BOTTOM	S*	REMARKS
BEREA SANDSTONE	421	576	L	
BIG LIME	3446	5047	L	
ORISKANY SANDSTONE	3658	3673	L	
SALINA DOLOMITE	3882		L	
LOCKPORT DOLOMITE	4718		L	
PACKER SHELL	5210	5244	L	
CLINTON SAND	5246	5368	L	
MEDINA SAND	5448	5462	L	
QUEENSTON FORMATIO	5462		L	
UTICA SHALE	7055	7224	L	GS
POINT PLEASANT FORMA	7224	7349	L	
TRENTON LIMESTONE	7349	7482	L	
BLACK RIVER GROUP	7482	7971	L	
GULL RIVER FORMATION	7971	8031	L	
GLENWOOD FORMATION	8031	8088	L	
BEEKMANTOWN DOLOM	8088	8301	L	
ROSE RUN SANDSTONE	8301	8432	L	
TREMPEALEAU FORMATI	8432	8660	L	
KNOX "B" ZONE	8660	8765	L	
CONASAUGA FORMATIO	8765	8827	L	
ROME FORMATION	8827	9314	L	
MT. SIMON SANDSTONE	9314	9490	L	
GRANITE WASH	9490	9499	L	
GRANITE	9499		L	

DeepestFMTN agrees with DGS-reference PG-23 | WELL PLUGGED BACK FROM PRECAMBRIAN BASEMENT TO A DEPTH OF 8774 FEET - TET

## Strings

FLD

\*Hole 2 Field Entry

CONDITION

Bot

1025

Diam

13.5

Top

0

LENGTH

Set Dt

String Comments Casing  
Condition, Weight and  
Cement Basket

# Cement

BOC  TOC  DT\_CM   WITNESSED

CMT\_CON  INSPECTOR

CLASS\_CMT:  SACKS  YIELD  WEIGHT

Cement 1

CLASS\_CMT2:  SACKS2  YIELD  WEIGHT

Cement 2

# Strings

FLD  CONDITION

Bot  Diam  Top  LENGTH  Set Dt

String Comments Casing  
Condition, Weight and  
Cement Basket

R-3 New 40.5lb pipe, guide shoe, float collar and 15 centralizers

# Cement

BOC  TOC  DT\_CM   WITNESSED

CMT\_CON  INSPECTOR

CLASS\_CMT:  SACKS  YIELD  WEIGHT

Cement 1

CLASS\_CMT2:  SACKS2  YIELD  WEIGHT

Cement 2

# Strings

FLD  CONDITION

Bot  Diam  Top  LENGTH  Set Dt

String Comments Casing  
Condition, Weight and  
Cement Basket

CEMENTED WITH 221 SACKS

# Cement

BOC  TOC  DT\_CM   WITNESSED

CMT\_CON  INSPECTOR

CLASS\_CMT:  SACKS  YIELD  WEIGHT

Cement 1

CLASS\_CMT2:  SACKS2  YIELD  WEIGHT

Cement 2

# Strings

FLD

Tubing 1

CONDITION

New

Bot 7986 Diam 4.5 Top 0 LENGTH Set Dt 12/17/2011

String Comments Casing  
Condition, Weight and  
Cement Basket

# Cement

BOC 0 TOC 0 DT\_CM   WITNESSEDCMT\_CON  INSPECTOR CLASS\_CMT:  SACKS  YIELD  WEIGHT 

Cement 1

CLASS\_CMT2:  SACKS2  YIELD  WEIGHT 

Cement 2

# Strings

FLD

Packer

CONDITION

New

Bot 7986 Diam Top 0 LENGTH Set Dt 12/17/2011

String Comments Casing  
Condition, Weight and  
Cement BasketBAKER LOK-SET T-440

# Cement

BOC 0 TOC 0 DT\_CM   WITNESSEDCMT\_CON  INSPECTOR CLASS\_CMT:  SACKS  YIELD  WEIGHT 

Cement 1

CLASS\_CMT2:  SACKS2  YIELD  WEIGHT 

Cement 2

# Production

Year	Company Name	Oil Barrels	Gas MCF	Brine Barrels	Days
------	--------------	-------------	---------	---------------	------

# Inspections

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 8/19/2011

**Date EXTENSION**

**Date PASSED**

8/19/2011

**CMMNT** Butch's Rat Hole and Anchor, drilled a 51' hole and installed/cemented 50' of new 20" conductor.

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 8/31/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Union Drilling Rig #52 drilling surface hole on fluid, at depth of 721'. Reported problems down hole with buried trash and debris. Gravel drilling pad enclosed with chain link fencing, security guard on duty, steel pits, closed loop mud system, no leaks or spills. No violations at this time.

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 9/2/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** I was on site for the cementing of the surface casing on Union Rig #52. Universal Well Service on site to cement. Union drilled a 13.5" hole to a total depth of 1025'. The surface pipe is new 10.5" J55, R-3 40.5 pounds/foot pipe. Union set surface pipe at 1019' KB (1003' in the ground). They ran a guide shoe, float collar and 15 centralizers on the casing. The centralizers were set on every other joint. Universal ran 150 pounds of Sweep in 1000 gallons of fresh water, 1000 pounds of gel and two sacks of unicele ahead of the cement. They then ran 449 sacks of Class A cement with 3% CaCl, 2% foam reducer and 1/4 sack of unicele. They displaced the cement to 940'. Displacement volume was 92.2 barrels. There was 30 barrels of good cement returned to surface. Sweep is sodium acid pyrophosphate and is listed as non-hazardous on the MSDS. Cement water pH was 8.

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 9/6/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Union Drilling Rig #52 drilling on fluid, at depth of 3851'. Gravel drilling pad enclosed with chain link fencing, security guard on duty, steel pits, closed loop mud system, no leaks or spills. No violations at this time.

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

9/6/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Tom Hill, Chris Grimm and myself performed a rig inspection on Union rig #52. The drilling depth was 3581 and drilling on fluid. The zone was Newburg. This inspection satisfies 1501:9-9-03. There were no violations at this time.

**Type Insp** Urban Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

9/13/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Union Drilling Rig #52 drilling 9-7/8" hole on fluid, at depth of 4824'. Gravel drilling pad enclosed with chain link fencing, security guard on duty, steel pits, closed loop mud system, no leaks or spills. Running RAM style BOP. Permit displayed at lease road entrance and in office. No violations at this time.

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

9/20/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Union Drilling Rig #52 drilling 9-7/8" hole on fluid, at depth of 7801'. Drilling in Black River Limestone. Oil/gas show in Utica Shale. Gravel drilling pad enclosed with chain link fencing, security guard on duty, steel pits, closed loop mud system, no leaks or spills. Running RAM style BOP. Permit displayed at lease road entrance and in office. No violations at this time.

**Type Insp** Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

9/22/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Union Drilling Rig #52 drilling 9-7/8" hole on fluid, at depth of 8138'. Changed from polycrystalline-diamond compact (PDC) bit to button bit. Gravel drilling pad enclosed with chain link fencing, security guard on duty, steel pits, closed loop mud system, no leaks or spills. Running RAM style BOP. Permit displayed at lease road entrance and in office. No violations at this time.



**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 10/10/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** On site with inspector Tom Hill to witness the pressure testing of the packer and 5" casing. Pressure test failed five (5) times. Aaron Wilhite instructed to call when ready to test again. No leaks or spills. No violations at this time.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 10/10/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** I was on site for the packer pressure test. The operator dropped the ball too expand the packer. Total depth of this well was 9581', with 7.625" casing set at 8098'. The packer was set at 8013' and the 5" casing was set at 7971'. The 1st test was conducted using the ODNR gauge. Operator pressured up to 2000 PSI. A valve was leaking and the annulus lost 100 PSI in 4min 34 seconds - test failed. 2nd test: Annulus charged to 2000 PSI and the annulus lost 200 PSI in 4 minutes 52 seconds - test failed. The ODNR gauge was leaking at the fitting because it has 3/8" threads and was threaded onto a 1/2" nipple provided by the rig. The 3rd test performed using the service company gauge: Annulus charged to 2050 PSI and lost 300 PSI in 15 minutes - test failed. The operator dropped 2nd ball to confirm that the packer had been expanded. The ball pressured to 1720 PSI and there was 50 PSI on the annulus. 4th test: Annulus charged to 2700 PSI. After 5 minutes the annulus pressure was 2550 PSI and after 14 minutes the annulus pressure was 2250 PSI - test failed. 5th test: Annulus charged to 2000 PSI. After 13 minutes the annulus pressure was 1725 PSI - test failed. There was a flow of fluid coming out of the 5" casing. When the annulus was pressurized the flow increased and when the pressure was released the flow decreased. The operator was informed to contact me when corrections have been made to the packer and they were ready to re-start the test.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 10/19/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** On site to witness packer being run into hole. Inspected packer before it went into hole. Packer is a new Baker Lockset T-440 ID 5 inch OD 6.75 inch. Team Oil Tools on location to supervise running of the packer. Packer will be set at 7990'. Operator to shoot off Weatherford permanent packer at 7993'. The Baker packer will be set three feet above the Weatherford packer. Pipe is new 4.5" Grade P-110 API, R-3, 13.5 pound pipe. Express on site to torque pipe. Carl Roberts on site for relief.

**Type Insp** Urban Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 10/24/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** U.D.I. #52 is rigging down and moving off location. The well head is shut in and fenced with orange temporary fencing. No leaks or spills. No violations noted.

**Type Insp** Urban Drill / Deepen / Reopen

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 11/4/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** All drilling equipment has been removed from location. The well head is shut in and fenced. There are no open pits. I took GPS readings on the well head. No leaks or spills. Security guard on duty. No violations at this time.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 12/6/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** Appalachian Well Survey was on site to run the gamma ray-collar locator correlation log. This is being done prior to completing the RAT and the step test on 12/8. No violations at this time.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 12/8/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** This well was drilled to a total depth (TD) of 9,581' with 7.625" casing set at 8,094' and 10.75" surface casing set at 1,016'. The 4.5" casing packer was set at 7,968'. The salt water injection zone extends from the bottom of the 7.625" casing to TD and includes the following formations, Knox, Rose Run, Copper Ridge, Conasauga, Rome, Mount Simon, granite wash and Precambrian basement. The purpose of today's actions were to determine where in this sequence the injected brine was going. On site personnel and contractors included Larry Smyers and Dave Jenkins (D&L Energy), Larry Shamblin (Core Laboratories) and Superior Well Service personnel providing a frac van, pump trucks, crane truck and field hands, and Appalachian Well Surveys providing open hole and cased hole logging tools.

Step I - On 12/6 Appalachian ran a gamma ray log to correlate with the open hole nuclear logs completed during the drilling phase. The gamma ray tool was run inside of the 4.5" casing set at 7,968' and into open hole. A new logger TD was established at 9,488' which is 93' shallower than the TD noted on the original drillers TD. This new depth places the bottom of the hole just below the Precambrian basement.

Step II - On 12/8 Core Lab placed radioactive ceramic beads (Scandium 46) in the top of the 4.5" casing and Superior Well Services displaced the beads using 288 barrels of brine at a rate of 3 to 7 barrels per minute (bpm). This volume was calculated as hole/casing capacity plus 10 barrels. The maximum injection pressure was 1700 pounds per square inch (psi) during initial displacement. Instantaneous Shutin Pressure (ISIP) was 1250 psi and after 5 minutes, pressure stayed at 1250 psi.

Step III - After the beads had been displaced and the pressure reduced on the well, Appalachian ran the gamma ray tool with collar locator to the bottom of the hole to quantify the bead distribution through the injection zone. (Refer to the log copies) The results indicated that the beads were distributed across the entire open hole injection zone over several different intervals. The beads were present in the bottom of the hole which indicates that fluid is passing through the granite wash.

Step IV - After Appalachian was released, Superior began reconnecting to the wellhead to start the Step test. The operator noticed that the annular pressure which was reading 0 psi while displacing the tracer was now over 600 psi. Assuming that this was a false reading due to wet connections, they were cleaned and dried. The annular pressure however returned to 620 psi. The annulus was blown down to 100 psi and within 10 minutes, the pressure had returned to 635 psi. It appears very likely that the 4.5" packer has failed and will need to be reset. The Step Test was cancelled and the contractors were released.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 12/15/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** I witnessed a partial running into the hole with the 4.5" casing injection string. I also witnessed the UIC test. The hole was already filled with packer fluid, since the packer was left in the hole. Only the on/off tool was replaced. The 7" Baker 600-292 Hornet packer has been set at 7875' (top) and 7882' (bottom). The workover rig had pumped 155 barrels of packer fluid down the annulus and up the tubing. The annulus was then pressured up to 2000 PSI and it held for 15 minutes. The UIC passed. There were no violations at this time.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 12/17/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** I witnessed the UIC test again with Rex Resources. Superior performed the UIC test. A permanent 7.625" packer had been set at 8045' with one joint of tail pipe below. On 10/17/11 the top of the packer was shot off leaving the packer and tail pipe in the hole. On 10/19/11 a Lok-Set packer and 4.5" casing was run into the hole and set in 30,000 PSI compression. This packer had failed during a pump rate test around 12/7/11 due to the rubbers relaxing causing the failure. On 12/17/11 the UIC was tried again with Superior pressuring up the annulus to 2000 PSI. Pressure loss was 13 PSI in 15 minutes. The UIC test passed.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 12/30/2011

**Date EXTENSION**

**Date PASSED**

**CMMNT** I was called out to witness annular pressure being blown down. The pressure gauge reading was 2800 PSI on the annulus at the time of my arrival. A Rex Energy representative opened up the annulus and blew down the pressure to 500 PSI. Blow down took approximately 5 minutes after which the well was shut in. Annular pressure holding at 500 PSI, injection string pressure at 0 PSI.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected** 1/3/2012

**Date EXTENSION**

**Date PASSED**

**CMMNT** I was on location to follow up on the annular pressure blow down completed on 12/30/2011. The annular pressure is holding at 500 PSI. The injection casing pressure is at 0 PSI. No leaks or spills were noted.



**Type Insp** UrbanPreliminary Restoration **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 9/18/2012 **Date EXTENSION** **Date PASSED**  
**CMMNT** On 9/18/2012, North Region Manager Tom Hill and myself met with Rex Energies Personal at the above location to discuss the restoration of the location. They are in the legal phase of getting total control of this location. We agreed to let them put a gate with a lock and identification sign at the entrance of the location, check all silt fence around location repair if needed and also install a fence around a large hole 10' wide x 10' long 5' deep.

**Type Insp** UrbanPreliminary Restoration **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 10/11/2012 **Date EXTENSION** **Date PASSED** 10/11/2012  
**CMMNT** My inspection of the above location found: They have installed an entrance gate. Repaired the silt fence. Installed and replace sections of the security fence. They fenced in a large 10' by 10' by 4' deep hole. The compliance Notice is passed 10/11/2012

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 12/18/2012 **Date EXTENSION** **Date PASSED**  
**CMMNT** I performed an inspection at the above location. This well is not in operation at this time.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 1/14/2013 **Date EXTENSION** **Date PASSED** 1/14/2013  
**CMMNT** My inspection found no activity on site. No additional work has been done on the facility.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 5/8/2013 **Date EXTENSION** **Date PASSED**  
**CMMNT** My inspection found no activity on site. No additional work has been done on the facility.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

5/31/2013

**Date EXTENSION**

**Date PASSED**

**CMMNT** Rex Energy is in the process of filling six 500 barrel frac tanks to be used in there injection test on the above location. As I was on location there was a truck hauling brine came on location ( Wes Baker Trucking #903 ) this truck was not registered with the UIC Division of ODNR. I instructed him that he could not haul brine in Ohio with out been regisitered with the UIC Division. I called Deputy Chief Robert Worstall about this. He called Sean Wessert from Rex Energy and also informed him. The tanks were filled by a registered hauler.

**Type Insp** Plug / Plug Back

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

6/3/2013

**Date EXTENSION**

**Date PASSED**

6/3/2013

**CMMNT** My inspection of the plug-back operation was accompanied by John Fleming. The well was plugged from 9504 feet to 8773 feet, through coil tubing, using 295 sacks Class-A cement. The well site and cement operation met all requirements.

Later, the plug was tagged at 8773 feet. One foot of the plug was drilled, leaving the new total depth at 8774 feet.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

6/10/2013

**Date EXTENSION**

**Date PASSED**

**CMMNT** I was on location with UIC Inspector Steve Ochs during the injection test. See Steves report.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

6/10/2013

**Date EXTENSION**

**Date PASSED**

6/10/2013

**CMMNT** An injection test was performed on the well. A total of 649 barrels of brine were pumped in one hour and forty-five minutes.

John Fleming was also onsite. All conditions were acceptable.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 7/10/2013 **Date EXTENSION** **Date PASSED**  
**CMMNT** I performed a status check on the above location. The 500 barrel frac tanks that were on location has been removed. At this time there is know activity on location. Gates are locked.

**Type Insp** Administrative Inspection **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 8/15/2013 **Date EXTENSION** **Date PASSED**  
**CMMNT** I meet with Deputy Chief Bob Worstall at the above location. We performed a status check on this location, at present there is no activity. The location is secured with a locked gate at the entrance of the location. Well head is locked out. No noticed violation at this time.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 10/15/2013 **Date EXTENSION** **Date PASSED**  
**CMMNT** There were no changes at the well site and no sign of activity.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 10/29/2013 **Date EXTENSION** **Date PASSED**  
**CMMNT** I performed a status check on the above location. Gates are locked. At present there is no active at this location.

**Type Insp** Surface Facility Construction **Date NOV** **Date REMDYRQ**  
**Date Well Inspected** 10/31/2013 **Date EXTENSION** **Date PASSED**  
**CMMNT** My inspection was accompanied by Andrew Adgate. There were no changes at the well site.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**

**Date Well Inspected** 2/4/2014 **Date EXTENSION** **Date PASSED**

**CMMNT** There were no changes found on site.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**

**Date Well Inspected** 6/30/2014 **Date EXTENSION** **Date PASSED**

**CMMNT** An inspection of the well site found no recent sign of activity. The well remains shut-in and disconnected. The surface facility construction has not started.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**

**Date Well Inspected** 9/15/2014 **Date EXTENSION** **Date PASSED**

**CMMNT** There was no sign of recent activity. No apparent changes on location.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**

**Date Well Inspected** 12/30/2014 **Date EXTENSION** **Date PASSED**

**CMMNT** The well remains shut-in. There was no indication of recent activity.

**Type Insp** Salt Water Injection Well **Date NOV** **Date REMDYRQ**

**Date Well Inspected** 3/27/2015 **Date EXTENSION** **Date PASSED**

**CMMNT** No recent active. Wellhead remains shut-in. No equipment on location. Gate locked at the entrance.

**Type Insp** Salt Water Injection Well

**Date NOV**

**Date REMDYRQ**

**Date Well Inspected**

7/24/2015

**Date EXTENSION**

**Date PASSED**

**CMMNT** The inspection was a follow-up on Chief's Order No. 2014-421.

There were no changes onsite, since the last inspection.

TOC 15'  
BELOW SURFACE

700' - Plug

16" casing  
16" - 65# CASING  
50'

10 3/4" CIBP @ 700'  
1025'  
10.250' 40.5" CASING

627' Plug

Cut 7 7/8 @ 3700'  
- CIBP 3800'

NO CEMENT CBL - CCL  
BEHIND PIPE

7 5/8 CEMENT RETAINER 4900'  
- PERM - 5382 - 5385  
- PERM - 5481 - 5485  
7 5/8 CIBP - 5495' } SQUEEZE  
42 Shot

6670' TOC CBL

6917 TOC

528' Plug

- CBL - showed TOC @ 6670  
BETWEEN 7 7/8 casing - 9 7/8 BORE

7 7/8 CIBP @ 7495

Cut 4.5" casing @ 7950

5 x 7 7/8 PACKER - 7969

5 x 7 7/8 PACKER - 8013

4.5" 13.7" x  
7972

4.5" 13.5" CASING  
7972

8006 TOC

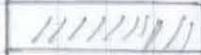
7 5/8 - 29.7  
8094

7 5/8 - 29.7" CASING  
8094'

3409923157  
NORTHSTAR KHACIL  
SWIW 11

- 9 7/8 OPEN HOLE

8791' TAGGED TOC













## DAILY P&A REPORT

Well Information					
Well Name	NorthStar Khalil #3 (Salt Water Disposal Well)	Plugging Start	10/02/17 08:30	Report #	9
AFE#		Plugging End		Report Date	10/8/17
County	Mahoning	Daily NPT	3.0	Report Time	6:00
State	Ohio			Days From Start	48
Workover Rig		<b>Present Operations</b>	Pulling and laying down 4.5" casing		

Operations Summary				
From	To	Hours	Phase	Description
06:00	16:30	10.5	Other	Waited on cement.
16:30	17:00	0.5	Other	Tripped in the hole with 2-3/8" tubing and tagged top of cement @ 8006 ( 96' plug)'. ODNR rep. John Fleming satisfied with 88' of cement inside of casing.
17:00	17:30	0.5	Other	Established circulation and closed annular. Pressure tested cement plug and 4-1/2" casing to 800 psi for 30 minutes w/C&J cementers and pressure dropped 8% to 730. Test approved by ODNR rep. John Fleming. Press Bled pressure off and opened annular.
17:30	21:00	3.5	Other	Tripped out 255 joints of 2-3/8" tubing the hole standing back.
21:00	21:30	0.5	Rig Up / Down	RU e-line and 5.5" jet cutter.
21:30	22:30	1	Wireline / Slickline	RIH to 7950' WLM. Fire jet cutter at 7950'. POOH with e-line, RD e-line unit.
22:30	03:00	4.5	Other	MU TTS 4.5 casing spear. Spear casing and release pins and work at 165K. Movement on hanger was 2". ND 5-1/8" frac valve and 5-1/8" spool. Spear 4.5 casing and pull 7" hanger. Casing pulling free. RU casing crew. Prepare to lay down 4.5" casing.
03:00	06:00	3	NPT - Other	Kimzey Casing Services, waiting on tong dies.
<b>Daily Total</b>		<b>24</b>		

### Forward Plan

Lay down casing, NU BOP, RU e-line set 7-5/8" CIBP



















# Plug Report

API Well Number:

**34-099-2-3157-00-00**

Well Owner:	<b>8893 R E DISPOSAL LLC</b>	Permit Issued:	<b>06/28/2011</b>
Lease Name:	<b>NORTHSTAR KHALIL (SWIW #11)</b>	Date Completed:	
County:	<b>MAHONING</b>	Well No.:	<b>3</b>
Township:	<b>COITSVILLE</b>	Plug_Start:	<b>10/2/2017</b>
Driller:	<b>UNION DRLG</b>	Plug_End:	<b>10/17/2017</b>
Status:	<b>PA</b>	PlugBack:	
Plugging Company:		Duration:	<b>0</b>
GPS Lat:	<b>0.000000</b>	DNR Notified?:	<b>Yes</b>
Cement Manufacturer:	<b>CEMEX</b>	Reason for Plugging:	<b>Incap. of Prod./Inj.</b>
Long:	<b>0.000000</b>	Plug Description:	<b>Cement</b>
Cement Contractor:	<b>C&amp;J ENERGY SERVICES LTD</b>	Clay/Cement Tickets Rec:	<b>Yes</b>
Clay Company:			
Footage Calls:	<b>10,769' SL &amp; 1012' WL OF COITSVILLE TWP.</b>		
Plug Back Frm:		PlugBackDepth:	<b>0</b>
		PluggingTotalDepth:	<b>8791</b>

Comment: 10/2/2017 ) Team Energy moved the work over rig on location to start the plugging operations of this SWIW well. I met with Larry Boone and Arron Wilhite Wellsite Consultant we discussed the proposed and approved plugging plan of this well. The cementing contractor will be C&J Energy Services and Renegade Wireline Service will set the Cast Iron Bridge Plug (CIBP) and casing cutters and perforating. Silver Creek will install the flow back equipment. Team Energy ran 8791' of 2-3/8" tubing in the well TD they set the tubing at 8780' . ( 1st open hole plug) 10/3/2017. C&J Energy Service was on location to pump a 200' foot cement plug in the 9-7/8" well bore. They pumped 211 barrels of water and displaced the 9.6 ppg water out of the well bore. They pumped 19 bbls of class H cement 16.4 ppg 1.06 yld (100 sks). Estimated top of cement (TOC) at 8580'. They pulled 10 joints (383') and reversed circulated with 68 bbls of water to clear tubing received 1 bbl of cement to surface. Installed TIW valve and closed annular wait 8 hours on cement. I received a phone call at 2100 hr. stating that they tagged the cement at 8073' (500') higher than calculated, I called Deputy Chief Dave Claus and discussed this with him, we shut them down until we met in the Uniontown Office and go over the cement calculations before gone forth. We instructed them that they would need to drill out the plug and cement the plug again.10/3/2017) Team Energy tripped the 2-3/8" tubing out of the well and strapped the tubing which was correct and ran back in the well and tagged the cement at 8673'. The tubing was setting down on the edge of the packers. That gave them a false reading. When that was verified they proceed with their plugging operation. Plug 2) 9-7/8" open hole 10/5/2017) C&J Energy Services broke circulation with 4.5 bbls of water and pumped 300 lbs of gel spacer 25 lbs of cell flake 3 bbls of water followed by 305 sks of class H cement 16.4 ppg 1.06 yld and displaced with 29 bbls of water (8668'- 8060' 608' plug). Wait 9 hrs on cement. Plug 3) 9-7/8" Team Energy tripped in with 2-3/8" tubing and tagged the cement top at 8095' ( 578' plug ). Set tubing at 8070' and broke circulation with 4.5 bbls and pumped the 4th stag plug with 20 sks of class H cement and displaced with 28 bbls of water. Estimated cement top 7894'. Wait 8 hr on cement. 10/6/2017) cement top was tagged at 8095' 0' cement retained from Plug #4). Plug #5) C&J Energy Services pumped 131 bbls bottoms up to balance the well bore. Set tubing at 8095' pumped 25 bbls of water to establish circulation followed by 37 sks of class H cement 16.4 ppg 1.06 yld Displaced with 28 bbls of water. Estimated TOC 7688'. Tripped in well with 2-3/8" tubing and tagged cement at 8006'- (96') plug with 88' inside of 4.5" casing. C&J Well Services circulated 5bbls of water. The annular valves were closed and they performed an 800 lb psi test for 30 minutes. Pressure dropped to 730 psi. Test passed. Tripped 2-3/8" tubing out of the well. Renegade Wireline Service cut the 4.5" casing at 7950'. Team Energy tripped out 191jts of 4.5" casing. 10/8/2017). Renegade Wireline ran a CBL/CCL log inside the 7-5/8" casing from 7900' to surface. This was witness by Inspector Bob Roush. The TOC estimated at 6670'. Renegade Wire Line set a CIBP at 7495'. 10/9/2017) Team Energy ran 7471' of 2-3/8" tubing and pumped 280 bbl of fresh water to displace the well bore for 1-st stage of the 7-7/8" casing plug. C&J Energy Service pumped 140 sks of class H cement 16.4ppg 1.06 yld followed by 27 bbls of displacement. Estimated TOC 6950' shut in wait on cement. Team Energy tripped 2-3/8" tubing back in the well and tagged TOC at 6917'. They tripped the tubing out of the well and Renegade Wire Line set a CIBP at 5495' inside the 7-5/8" casing they tripped out of the hole and ran back in with a perforating gun with depths at 5481'-5485'-5382'-5385' (42) shots, tagged CIBP at 5495'. Team Energy and Baker Hughes tripped in hole with 156 jts of 2-3/8" tubing (4900') set a cement retainer, to perform a squeeze job, pumped 15 bbls of water to establish circulation, stung into retainer and pressure tested to 500 psi good test. 10/10/2017) Team Energy stung back into retainer and C&J Energy Services pumped 5 bbls of water to establish injection rate @ 1500 psi 2.8 bpm and pumped 410 sks of class A cement 15.6ppg 1.18 yld and displaced with 18 bbl of water shut in with 730 psi on the back side wait on cement.(18) hrs. Renegade Wire Line ran a CBL/CCL from 4859' to 3500' no cement bond. 10/11/2017 The decision by (ODNR) Deputy Chief Bob Worstall and Deputy Chief Dave Claus and UIC Manager Andrew Agate and myself is to drill out 7-5/8" casing cement at 4860' to 4900' and drill out the cement retainer at to 4900' to 5070' and run a new bond log if no cement bond we will consult with Rex and ODNR before moving forward. 10/12-17 /2017 drilling out the cement to 5070'. Renegade Wire Line ran a bond log from 4500' to 5070' no cement bond. ODNR decision is to run a free point at 3815' to find free pipe. KLX Wire Line Service on location to find free pipe. Baker Hughes on location to set 7-5/8" center spear to pull casing. Team Energy pulled 196,000 lbs could not get 7-5/8" casing out of the casing hanger. KLX could not indicate free point at 3818'. The decision by ODNR was made to set a CIBP at 3800' and cut 7-5/8" casing at 3700' trip casing and run 2-3/8" tubing. Rex Energy pumped 400 bbls of water to balance the well. C&J Energy Service pumped 5 bbls of water followed by 24 sks of class A cement 15.6 ppg 1.18 yld. Displaced with 11 bbls of water estimated TOC 3200'. Team Energy ran 2-3/8 tubing and

tagged cement at 3173' (627') plug. C&J Energy Service pumped 190 bbl of Gel spacer 8.6 ppg 3172' to 1120'. C&J Energy Services pumped 108 bbls of water to balance the well followed by 90 sks of class A cement 2% calcium at 15.6 ppg 1.12 yld estimated TOC 925'. Team Energy ran 2-3/8" tubing and tagged TOC at 942' (183') plug. Renegade Wire Line set a 10.75" CIBP at 700'. Team Energy ran 693' of 2-3/8" tubing. C&J Energy Service pumped 1 bbl established circulation and pumped 315 sks of class A cement 2% calcium 15.6 ppg 1.12 yld. Estimated TOC 10' from surface. Check cement top at 15' from surface. 10.750" casing was cut off 6' below surface ID plate was welded on the 10.75" casing tin horn was removed and back filled with lime stone.

## FormTops

Formation	TOP	BOT METH_	Producing	NonStandard	CMMNT
BEREA SANDSTONE	421	576 L	No		
BIG LIME	3446	5047 L	No		
ORISKANY SANDSTONE	3658	3673 L	No		
SALINA DOLOMITE	3882	L	No		
LOCKPORT DOLOMITE	4718	L	No		
PACKER SHELL	5210	5244 L	No		
CLINTON SAND	5246	5368 L	No		
MEDINA SAND	5448	5462 L	No		
QUEENSTON FORMATION	5462	L	No		
UTICA SHALE	7055	7224 L	No		GS
POINT PLEASANT FORMATION	7224	7349 L	No		
TRENTON LIMESTONE	7349	7482 L	No		
BLACK RIVER GROUP	7482	7971 L	No		
GULL RIVER FORMATION	7971	8031 L	No		
GLENWOOD FORMATION	8031	8088 L	No		
BEEKMANTOWN DOLOMITE	8088	8301 L	No		
ROSE RUN SANDSTONE	8301	8432 L	No		
TREMPEALEAU FORMATION	8432	8660 L	No		
KNOX "B" ZONE	8660	8765 L	No		
CONASAUGA FORMATION	8765	8827 L	No		
ROME FORMATION	8827	9314 L	No		
MT. SIMON SANDSTONE	9314	9490 L	No		
GRANITE	9499	L	No		
GRANITE WASH	9490	9499 L	No		

## Plug Details

**PLUG**  **TYP**  **Density**  **Tons Cla**  **GEL\_VIS**   
**INTERVAL\_BOT**  **INTERVAL\_TOP**  **Weight**  **Stat**  **CLASS\_CMT**

Cemntd Dt 10/3/2017 Bot 8791 Top 8580 Sack 100 Notification  Failed  Wit

FMTN\_C MT. SIMON SANDSTONE Inspector JOHN FLEMING

Spacer Type FRESH WATER VISCOSITY  SPACER\_WEIGHT:   CIRCULATION

DISPLACEMENT\_VO 29 CEMENT\_ADDITIVES:

CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT Pulled 10 jts of tubing reverse circulated 68 bbls to clear tubing shut in to wait on cement

PLUG  TYP Cement Density  Tons Cla  GEL\_VIS

INTERVAL\_BOT  INTERVAL\_TOP  Weight 16.4 Stat  CLASS\_CMT Type H Cement

Cemntd Dt 10/4/2017 Bot 8668 Top 8060 Sack 341 Notification  Failed  Wit

FMTN\_C ROME FORMATION Inspector JOHN FLEMING

Spacer Type FRESH WATER VISCOSITY  SPACER\_WEIGHT:   CIRCULATION

DISPLACEMENT\_VO 28 CEMENT\_ADDITIVES: 300 lbs of gel spacer 25 lbs flake

CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT Pulled 18 stands of tubing wait on cement 9 hrs

PLUG  TYP Cement Density  Tons Cla  GEL\_VIS

INTERVAL\_BOT  INTERVAL\_TOP  Weight 16.4 Stat  CLASS\_CMT Type H Cement

Cemntd Dt 10/5/2017 Bot 8168 Top 7989 Sack  Notification  Failed  Wit

FMTN\_C TREMPEALEAU FORMATION Inspector JOHN FLEMING

Spacer Type FRESH WATER VISCOSITY  SPACER\_WEIGHT:   CIRCULATION

DISPLACEMENT\_VO 28 CEMENT\_ADDITIVES:

CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT Pulled 12 jts reversed circulate

PLUG  TYP Cement Density  Tons Cla  GEL\_VIS

INTERVAL\_BOT  INTERVAL\_TOP  Weight 16.4 Stat  CLASS\_CMT Type H Cement

Cemntd Dt 10/5/2017 Bot 8096 Top 7895 Sack  Notification  Failed  Wit

FMTN\_C UTICA SHALE Inspector JOHN FLEMING

Spacer Type FRESH WATER VISCOSITY  SPACER\_WEIGHT:   CIRCULATION

DISPLACEMENT\_VO 25 CEMENT\_ADDITIVES:

CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT Pulled 10 stands reversed circulate

PLUG  TYP Cement Density  Tons Cla  GEL\_VIS   
INTERVAL\_BOT 5462 INTERVAL\_TOP 5210 Weight 15.6 Stat  CLASS\_CMT Class A Cement  
Cemntd Dt 10/9/2017 Bot 5485 Top 4900 Sack 410 Notification  Failed  Wit   
FMTN\_C CLINTON SAND Inspector JOHN FLEMING  
Spacer Type FRESH WATER VISCOSITY  SPACER\_WEIGHT:   CIRCULATION  
DISPLACEMENT\_VO 28 CEMENT\_ADDITIVES:   
CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT Perfortated Medina and Clinton formations from 5481' to 5485' and 5382' to 5385' to perform the cement squeeze over the Medina and Clinton formations. Bond log showed 0 cement bond

PLUG  TYP Cement Density  Tons Cla  GEL\_VIS   
INTERVAL\_BOT 5109 INTERVAL\_TOP 3518 Weight 15.6 Stat  CLASS\_CMT Class A Cement  
Cemntd Dt 10/16/2017 Bot 3800 Top 3173 Sack 90 Notification  Failed  Wit   
FMTN\_C BIG LIME Inspector JOHN FLEMING  
Spacer Type FRESH WATER VISCOSITY  SPACER\_WEIGHT:   CIRCULATION  
DISPLACEMENT\_VO 11 CEMENT\_ADDITIVES:   
CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT cut 7-5/8" casing at 3700' set a CIBP at 3800'

PLUG  TYP Cement Density  Tons Cla  GEL\_VIS   
INTERVAL\_BOT 578 INTERVAL\_TOP 498 Weight 15.6 Stat  CLASS\_CMT Class A Cement  
Cemntd Dt 10/17/2017 Bot 1125 Top 942 Sack 90 Notification  Failed  Wit   
FMTN\_C SURFACE Inspector JOHN FLEMING  
Spacer Type FRESH WATER GEL VISCOSITY  SPACER\_WEIGHT: 9  CIRCULATION  
DISPLACEMENT\_VO  CEMENT\_ADDITIVES:   
CMT\_CONTRACTOR C&J ENERGY SERVICES LTD

CMMNT pumped 190 bbl Gel spacer from 3173' to 1125'

PLUG  TYP  Density  Tons Cla  GEL\_VIS   
INTERVAL\_BOT  INTERVAL\_TOP  Weight 15.6 Stat  CLASS\_CMT Class A Cement  
Cemntd Dt 10/17/2017 Bot 700 Top 0 Sack 315 Notification  Failed  Wit   
FMTN\_C SURFACE Inspector JOHN FLEMING  
Spacer Type  VISCOSITY  SPACER\_WEIGHT:   CIRCULATION  
DISPLACEMENT\_VO  CEMENT\_ADDITIVES: 2% calcium  
CMT\_CONTRACTOR C&J ENERGY SERVICES LTD  
CMMNT Cast Iron Bridge plug was set at 700' inside of the 10-3/4" casing and a cement plug was set fro 700' to surface

The inspector's signature below attests that he/she accurately recorded information pertaining to the plugging operation actually witnessed, and by the information provided on the dates and times listed above. The inspector's signature does not imply that the owner/operator has successfully plugged the well bore in compliance with the objectives stated in Section 1501:9-11-03 or 4101:10-1-02 of the Ohio Administrative Code, or that plugging materials for untested plug(s) actually remained across the intervals that they were intended to seal.

\_\_\_\_\_  
(Signature of Inspector)

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Date Plugging Completed

OWNER AFFIDAVIT

By signing this affidavit, you are swearing or affirming that the information it contains is true and accurate.

I, \_\_\_\_\_, after being first duly cautioned and sworn, state that I have personal knowledge of all the facts contained in this Affidavit, that I am competent to testify to the matters stated herein, and that the following are true to the best of my knowledge and belief:

1. That I am the owner or operator agent who placed plugging material in the well referenced in this plugging report;
2. That the attached clay or cement tickets, affidavits, and/or bill of lading are the actual records for such materials used to plug the well referenced in this report; and
3. That I have read this plugging report, and the plugging materials were properly placed at the depths indicated on this plugging report in accordance with Chapter 1509 of Ohio Revised Code, Section 4101:10 et seq. of the Ohio Administrative Code and/or 1501:9-11-01 et seq. of the Ohio Administrative Code;

Further Affiant sayeth naught.

In testimony whereof, I have herewith subscribed my name this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Date Plugging Completed

\_\_\_\_\_  
Signature of Owner or Operator Agent

The foregoing instrument was sworn to, subscribed and acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_

\_\_\_\_\_  
Notary Public Signature

**This report shall be submitted to the ODNR Division of Oil and Gas Resources Management within 30 days after the date the surface hole is plugged.**



## PLUG AND ABANDON PROCEDURE

**Well No:** Northstar Khalil #3 SWD  
**County:** Mahoning  
**State:** Ohio

**API #:** 34-099-2-3157-00-00  
**AFE #:** Unassigned, P&A  
**Company:** R E Disposal LLC

**Well Status:** Shut in, non-producing. Well is completed with 7-5/8" N-80 casing and isolated via packer and 4-1/2" P-110 tubing.

**Objective:** Isolate open-hole section, unseat packer, pull tubing, plug and abandon per mutual agreement with the Ohio Department of Natural Resources.

### **Service Companies:**

Workover Rig – Team Services  
BOPE – KLX  
Wireline (casing cutters, CIBP) – Renegade  
Flowback Equipment – Silver Creek  
Cement – C&J Energy Services

### **CONTACT INFORMATION**

REX: Director, Drilling	Bill Martin	(724) 584-2834
Drilling Engineer	Adam Tabita	(724) 989-6353
Drilling Field Coordinator	Andrew Campolongo	(814) 883-6176
Manager, Field Operations	John Hagan	(814) 771-5556
Director, Production	Ritchie Larsh	(620) 432-3996
Director, HSE	Derek Smith	(814) 795-2524
Manager, HSE	Shawn McGuigan	(814) 795-2819
Safety Specialist II	Bill Everetts	(724) 747-8172
Manager, Waste	Jim Noon	(814) 573-0425
Wellsite Consultant (Day)	Aaron Wilhite	(769) 834-5539
Wellsite Consultant (Night)	Larry Boone	(817) 727-6381

### **DIRECTIONS TO LOCATION**

#### **From Pittsburgh, PA**

Go north on PA 60 towards the toll road to New Castle, Ohio. Go 0.5 miles, merge onto I-376 W. Take Exit 12 (Sampson St/ US 422 Bus W) toward Youngstown, Ohio. Keep left at fork & merge onto US 422 W/ Ben Franklin Hwy. Continue on US 422 / McCartney Road to Coitsville, Ohio. Go past the McDonalds, then travel past the next 3 lights. Continue 100 yds and turn left to location (~ 60' off of hwy).

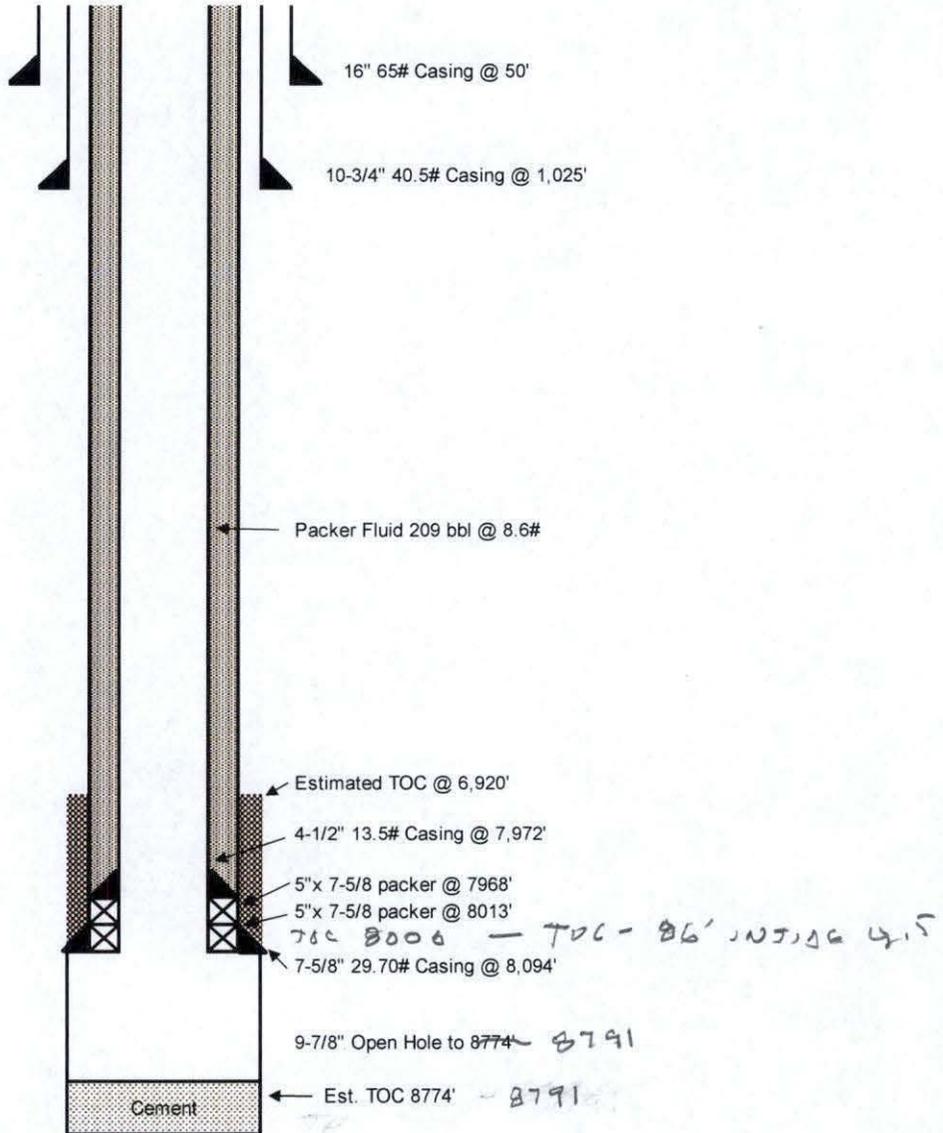
#### **From Youngstown, OH**

Take US 422 E/ McCartney Road east +/-4.0 miles to Coitsville, Ohio. Turn right (heading south) on Old McCartney road to location (~ 60' off of hwy).

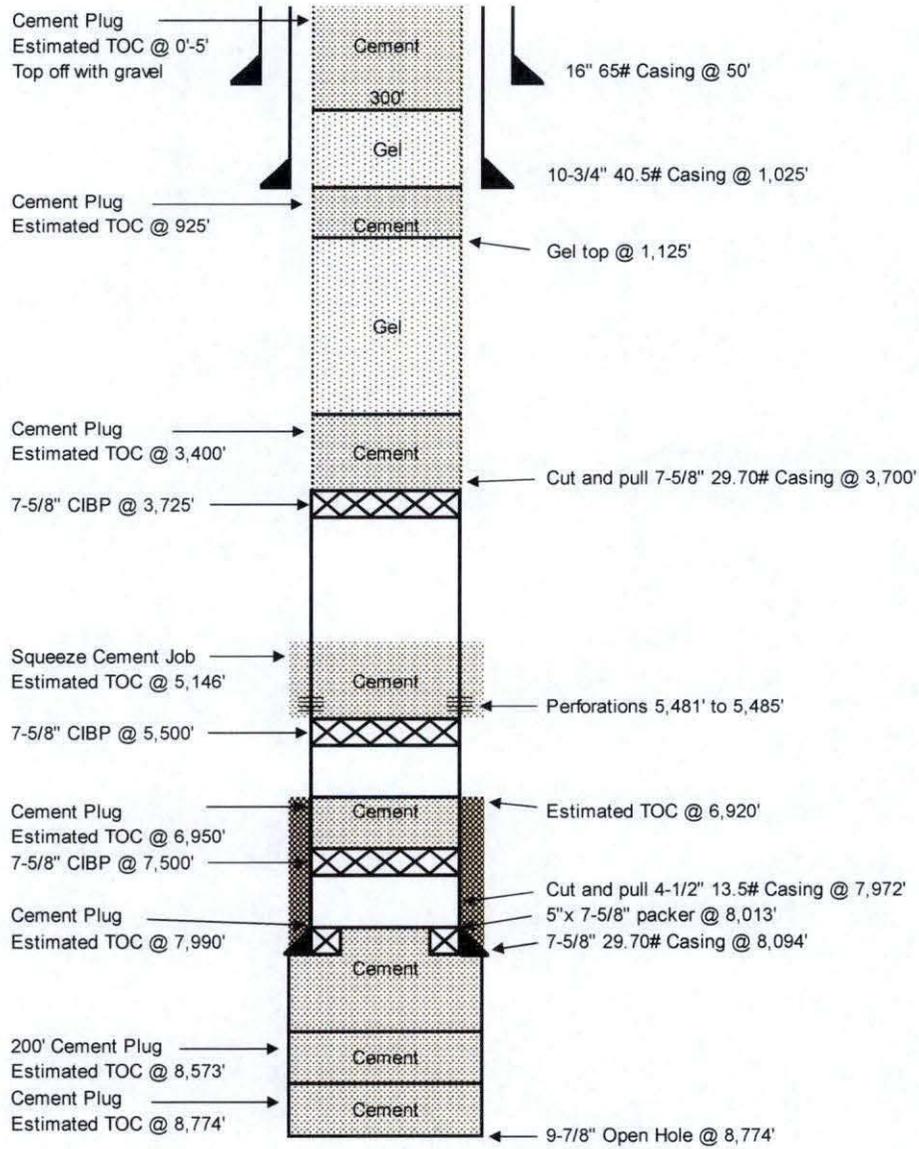
### **PERFORATION DETAIL**

No existing perforations, open-hole injection only.

**Northstar Khalil #3 SWD (Current)**  
Wellbore Schematic



**Northstar Khalil #3 SWD (Post P&A)**  
Wellbore Schematic



**PROCEDURE**

1. Move in and rig up workover rig and all ancillary equipment.
2. Set back-pressure valve and nipple down existing 5-1/8" 5M valve.
3. Nipple up 7-1/16" 5M master valve, flow cross and annular.
4. Notify ODNR of intent to plug. Verify notice has been received, then proceed with operations.
5. Open up backside 7-5/8" valve and bleed pressure off, flaring if necessary.
6. A) If opening wellbore on a vacuum, skip to Step #10.  
B) If pressure is present on 4-1/2" tubing, then:
  - Mix 450 bbl of 8.6 ppg brine.
  - Pump 120 bbl 8.6 ppg brine into 4-1/2" tubing, record shut-in pressure and monitor for 30 minutes.
  - Repeat kill cycle, if necessary, and adjust weighted fluid to compensate.
7. Trip in hole with open-ended 2-7/8" work string to determine true plug-back total depth (PBSD).
8. Trip out of the hole 100' above PBSD and circulate 410 bbl freshwater (linear ratio 0.459 bbl/ft).
9. Rig up cementing equipment.
10. Pump a 200-foot balanced cement plug (Class A, 15.6 ppg, 1.18 ft<sup>3</sup>/sk) from 8,774' to 8,574'.
  - Pump a 7-bbl hi-vis gel spacer ahead of balanced plug
  - LCM or other fluid loss prevention methods may be required as this wellbore likely will not hold a column of fluid.
  - Add retardant as necessary. **DO NOT CEMENT TOP PACKER IN PLACE.**
  - In the case of multiple cement stages, additional time may be needed to trip out of the hole and re-tag for verification of cement top.
11. Trip out of hole to 7,900' (annular ratio 0.0094 bbl/ft), reverse out to clean up tubing.
12. Wait on cement for a minimum of 8 hours.
13. Trip in hole and tag top of cement @ +/- 8,574'.
  - If TOC found is below 8,574', consult drilling engineer for further instructions before proceeding
14. Rig up cementing equipment.
15. Pump a 584-foot cement plug (Class A, 15.6 ppg, 1.18 ft<sup>3</sup>/sk) from 8,574' to 7,990' and wash up lines.
  - Displace with 7 bbl 6% gel for spacer
  - **DO NOT CEMENT TOP PACKER IN PLACE.**
  - LCM or other fluid loss prevention methods may be required as this wellbore likely will not hold a column of fluid.
  - **May have to perform as a multi-stage plug and add retardant as necessary**
  - Calculation assumes new PBSD of 8573', adjustments to cement volume must be made if PBSD varies significantly
16. Trip out of hole to 7,500' (annular ratio 0.0094 bbl/ft), reverse out to clean up tubing.
17. Wait on cement for a minimum of 12 hours.
18. Trip in hole and tag top of cement @ +/- 7,990'.
  - If TOC found is below 7,990', consult drilling engineer for further instructions before proceeding
19. Pressure test to 5,000 psi for 30 minutes.
  - If good test, continue with P&A procedure.
  - If failure occurs, repeat primary cementing procedure at adjusted volumes until a good test can be performed
20. Trip out of hole with tubing.
21. Bleed off and flare any pressure from backside of 4-1/2" tubing.
22. MU 4-1/2" stabbing joint.
23. Latch onto 4-1/2" tubing and attempt to unlatch packer at depth of 7,968'.
  - **If packer does not unlatch, refer to Contingency A1**
24. RU annular and ancillary equipment for 4-1/2" casing.
25. Lay down 4-1/2" tubing with casing crew.
  - Tally and record depths of all pipe removed
  - Send tally to office at end of job
26. R/U wireline unit, RIH with CBL/VDL/CCL/GR to 7,950 ft and log to surface.
  - Expected top of cement to be 6,920' MD.
  - **If cement top is not within an acceptable range above the top of the Utica, refer to Contingency B1**
27. RIH, set CIBP at 7,500' MD, POOH.
28. POOH, RD wireline unit for standby.
29. TIH with open-ended work string to 7,400' and begin circulating.
30. RU cement equipment.
31. Pump 550' cement plug (Class A, 15.6 ppg, 1.18 ft<sup>3</sup>/sk) from 7,500' to 6,950' and wash up lines, reverse out if needed.
32. TOH to 6,500' (annular ratio 0.0404 bbl/ft), reverse out to clean up tubing.
33. TIH and tag top of cement @ +/- 6,950' MD
  - a. If TOC found is below 6,950' MD, consult drilling engineer for further instructions before proceeding
34. POOH with tubing.
35. RIH, set CIBP at 5,500 ft, POOH.
36. RIH with perforation guns (4-ft guns, 6 spf).
  - a. Perforation depths @ 5,481 ft to 5,485 ft
37. POOH, RD wireline unit for standby.
38. TIH with cement retainer to 5,146' MD.
39. RU cement equipment.
40. Cement and squeeze both sets of perforations and casing.



- b. Calculation assumes new PBDT of 5,146', adjustments to cement volume must be made if PBDT varies significantly
  - c. Allow cement to set for a minimum of 8 hours
41. Unlatch cement retainer and wash up pipe.
  42. Trip out of hole with tubing.
  43. After WOC, TIH and tag top of cement @ +/- 5,146'.
  44. Report found TOC to drilling engineer before proceeding
  45. POOH with work string.
  46. RU Wireline.
  47. RIH, set CIBP @ 3,725' MD, POOH.
  48. RIH with casing cutter, make cut on 7-5/8" casing @ 3,700', POOH.
  49. RD wireline for standby.
  50. MIRU casing crew and ancillary equipment.
  51. LD 7-5/8" casing with casing crew.
    - b. Tally and record depths of all pipe removed
    - c. Send tally to office at end of job
  52. RD casing crew for standby.
  53. TIH with open-ended work string to 3,670' and begin circulating.
  54. RU cementer equipment.
  55. Pump 30 bbl of Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk), wash up lines and reverse out if needed.
    - d. Calculation assumes new PBDT of 3,400', adjustments to cement volume must be made if PBDT varies significantly
    - e. Allow cement to set for a minimum of 12 hours
  56. TIH and tag top of cement @ +/- 3,400'.
  57. Report found TOC to drilling engineer before proceeding.
  58. POOH with work string.
  59. Stabilize open hole portion below 1,125' MD with gel.
  60. TIH with open-ended work string to 1,075 ft and begin circulating.
  61. RU cement equipment.
  62. Pump 20 bbl of Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk), wash up lines and reverse out if needed.
    - f. Calculation assumes new PBDT of 925 ft, adjustments to cement volume must be made if PBDT varies significantly
    - g. Allow cement to set for a minimum of 12 hours
  63. TIH and tag top of cement @ +/- 925' MD.
    - h. Report found TOC to drilling engineer before proceeding
  64. Stabilize open hole portion below 300' MD with gel.
  65. TIH with open-ended work string to 200' MD and begin circulating.
  66. RU cement equipment.
  67. Pump 29 bbl of Class A cement (15.6 ppg, 1.18 ft<sup>3</sup>/sk), wash up lines and reverse out if needed.
    - i. Calculation assumes new PBDT of 3 ft, adjustments to cement volume must be made if PBDT varies significantly
    - j. Allow cement to set for a minimum of 12 hours
  68. Monitor for fallout and grout as necessary. Report found TOC to engineer before proceeding.
  69. Cut remaining sections of 16" and 10-3/4" casing 5 feet below grade.
  70. Set ID plate on remaining casing cutoff and weld completely.
  71. Fill the remaining portion of the wellbore with gravel to grade.
    - k. Remove cellar ring and fill remaining void with aggregate.  
(Note: Material dependent upon landowner agreement.)
  72. Begin reclaiming location, if necessary.



## CONTINGENCY PLAN

### A1: If packer does not unlatch:

1. MIRU wireline truck, make up 4-1/2" casing cutter.
2. Run in hole with 4-1/2" casing cutter.
3. Ensure that wellbore is still loaded and fluid level is not below cutting depth.
4. Engage cutter at ~ 7,950' MD or above top of packer.
5. POOH and RD wireline for standby.
6. RU annular.
7. Lay down 4-1/2" tubing with casing crew.
  - Tally and record depths of all pipe removed
  - Send tally to office at end of job
8. Break out packer assembly and set aside for inspection and reallocation.
9. L/D 4-1/2" tubing with casing crew.
10. Continue to Procedure Step 26.

### B1: If cement top is not within an acceptable range above the top of the Utica:

1. RIH, set CIBP at 7,500' MD. POOH.
2. RIH with squeeze guns (4 ft guns, 6 spf).
  - a. Perforation depths @ 7,486' to 7,490' MD
3. POOH, RD wireline unit for standby.
4. TIH with cement retainer to 6,955 ft.
5. RU cement equipment.
6. Cement and squeeze both sets of perforations and casing.
  - a. Allow cement to set for a minimum of 8 hours
7. Unlatch cement retainer and wash up pipe.
8. TOH with BHA.
9. TIH and tag top of cement @ ~ 6,955'. If TOC is below 6,955', contact drilling engineer.
10. Continue to Procedure Step 35.

Customer: R.E. Gas Development			Date:				Serv. Supervisor: KRIS COOK				
Cust. Rep.: Aaron			Ticket #: BPA-1710-0032				Serv. Center: Black Lick, PA				
Lease: Northstar Khalil SWD 0			API Well #:				County: Mahoning State: OH				
Well Type:			Rig: 0 0				Type of Job: Plug				
Materials Furnished by C&J ENERGY SERVICES											
Plugs		Casing Hardware				Physical Slurry Properties					
						Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)
Spacer 1:	Water					-	8.34				
Lead	CJ910 + 2% CJ110					90	15.6	1.20	5.24	19	11
Tail:	CJ910 + 2% CJ110					315	15.6	1.20	5.24	67	39
Displacement Chemicals:											
OPEN HOLE DATA				TUBULAR DATA							
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
9 7/8		1125'	Casing	2 3/8	4.7		1125		1.98		
			Drill Pipe	2 3/8	4.7				2.01		
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
10 3/4	32.75	10.18	1025					1125	1125		
WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY				
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
							0 PLUG FROM 1,125' TO 925'				
6:00 AM							0 ARRIVED ON LOCATION				
6:15 AM							0 PRE RIG UP MEETING				
6:30 AM							0 SET TRUCKS UP				
7:15 AM							0 SAFETY MEETING				
7:41 AM	2	375			5		5 MIX AND PUMP 2000' GEL PLUG				
8:45 AM							5 SHUT DOWN/ RIG PULLED TUBING				
11:09 AM	4.5	570-830			125	130	PUMP WATER TO BALANCE WELL				
11:37 AM	3.6	360			19.3	149.3	MIX AND PUMP CEMENT @ 15.6 PPG				
						149.3	WEIGHED CEMENT WITH PRESSURIZED MUD SCALES				
11:47 AM	2	45			2.5	151.8	PUMPED WATER DISWPLACEMENT				
11:49 AM						151.8	SHUT DOWN/ RIG PULLED TUBING				
12:00 PM	3.5	325			7	158.8	PUMPED WATER TO REVERSE CIRCULATE				
						158.8	GOT .25 BBLs CEMENT BACK				
12:06 PM						158.8	SHUT DOWN AND WASHED UP				
12:06 PM	TO	23:00				158.8	WAIT ON CEMENT AND RIG				
						158.8					
						158.8	PLUG FROM 700' TO SURFACE				
11:00 PM	2	35			2.5	161.3	BREAK CIRCULATION				
11:02 PM	4	320			67.5	228.8	PUMP CEMENT				
							KNOCK OFF AND WASH UP				
12:15 PM							RACK UP				
12:30 PM							JOB COMPELETE				
Left Yard	10/16/17 5:00 AM			Left Loc.	10/17/17 12:30 PM			Start Pump	10/16/17 7:41 AM		
Arrived Loc.	10/16/17 6:00 AM			Returned Yd	10/17/17 2:30 AM			End Pump			
Bumped Plug (psi)	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	KRIS COOK			
	320			1	Yes	830	14	Service Supervisor			

Customer: R.E. Gas Development	Date: 10/5/2017	Serv. Supervisor: Dave
Cust. Rep.:	Ticket #: BPA-1710-0010	Serv. Center: Black Lick, PA
Lease: Northstar Khalil SWD 0	API Well #:	County: Mahoning State: OH
Well Type:	Rig: 0 0	Type of Job: Plug

Materials Furnished by C&J ENERGY SERVICES

Plugs	Casing Hardware	Physical Slurry Properties					
		Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)
Spacer 1: 6% Gel		-	8.7				
Lead							
Tail: CJ916 + 0.1% CJ210F + 0.5 LB/SK CJ600		376	16.4	1.06	4.29	71	38

Displacement Chemicals:

OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
9 7/8		8668	Casing	2 3/8	4.7		8668		1.98		
			Drill Pipe	2 3/8	4.7		8168		2.01		

PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
4 1/2	13.5	3.992	8084								

WELL FLUID		DISPLACEMENT FLUID (STG 1)		DISPLACEMENT FLUID (STG 2)		WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME				
H2O	8.3 ppg	29 bbl	H2O	8.3 ppg	28 bbl	H2O	8.3 ppg	450	

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
2:00 AM						0	CALLED IN FOR JOB
5:00 AM						0	PRE CONVOY SAFETY MEETING
7:45 AM						0	ARRIVE ON LOCATION
7:55 AM						0	PRE JOB SAFETY MEETING
8:05 AM						0	SPOT TRUCKS, RUN LINES TO WELL
8:40 AM						0	SAFETY MEETING
9:00 AM	2	1120			4.5	4.5	PUMP H2O TO BREAK CIRCULATION
9:05 AM	2.5	1100			7	11.5	MIX AND PUMP GEL SPACER 300 LBS 25 LBS FLAKE
9:19 AM	2.5	1200			3	14.5	PUMP H2O SPACER
9:21 AM	2.8	1100-125			58	72.5	MIX AND PUMP CEMENT @ 16.4 PPG 8668'-8060
9:21 AM	2.8					72.5	WEIGH CEMENT WITH MUD SCALES 16.4=16.4 PPG
9:45 AM						72.5	PUMP H2O DISPLACEMENT
						72.5	PULL 18 STANDS
10:35 AM	2.8	125-1200			28	100.5	REVERSE CIRCULATE WELL 0.5 bbl back
						100.5	WAIT 9 HOURS TAG CEMENT TOP
						100.5	TAG CEMENT TOP @ 8169
1:30 AM	2.5	720			4.5	105	PUMP H2O TO BREAK CIRCULATION
1:32 AM	2.5	830			9	114	MIX AND PUMP CEMENT @ 16.4 PPG 8168'-7989
						114	WEIGH CEMENT WITH MUD SCALES 16.4=16.4 PPG
1:36 AM	2.5	765-900			28	142	PUMP H2O DISPLACEMENT
						142	PULL 5 STANDS
2:10 AM	2.5	1220			43	185	REVERSE CIRCULATE WELL 0.5 bbl back
2:45 PM							TAG CEMENT TOP @ 8096
4:19 PM	2	700			7		PUMP H2O TO BREAK CIRCULATION

Left Yard	10/5/17 5:10 AM	Left Loc.		Start Pump	10/5/17 9:00 AM
Arrived Loc.	7/10/17 7:45 AM	Returned Yd		End Pump	

Bumped Plug (psi)	Final Differential (psi)	Floater Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	Dave Service Supervisor
	1200		80	0.5	Yes			





Customer: R.E. Gas Development	Date: 10/5/2017	Serv. Supervisor: Dave
Cust. Rep.:	Ticket #: BPA-1710-0010	Serv. Center: Black Lick, PA
Lease: Northstar Khalil SWD 0	API Well #:	County: Mahoning State: OH
Well Type:	Rig: 0 0	Type of Job: Plug

Materials Furnished by C&J ENERGY SERVICES

Plugs	Casing Hardware	Physical Slurry Properties					
		Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbbls)	Mix Water (bbbls)
Spacer 1: 6% Gel		-	8.7				
Lead							
Tail: CJ916 + 0.1% CJ210F + 0.5 LB/SK CJ600		376	16.4	1.06	4.29	71	38

Displacement Chemicals:

OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBGRDP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
9 7/8		8668	Casing	2 3/8	4.7		8668		1.98		
			Drill Pipe	2 3/8	4.7		8168		2.01		

PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
4 1/2	13.5	3.992	8084								

WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY				
H2O	8.3 ppg	29 bbl	H2O	8.3 ppg	28 bbl	H2O	8.3 ppg	450			

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
2:00 AM					0	0	0 CALLED IN FOR JOB
5:00 AM					0	0	0 PRE CONVOY SAFETY MEETING
7:45 AM					0	0	0 ARRIVE ON LOCATION
7:55 AM					0	0	0 PRE JOB SAFETY MEETING
8:05 AM					0	0	0 SPOT TRUCKS, RUN LINES TO WELL
8:40 AM					0	0	0 SAFETY MEETING
9:00 AM	2	1120			4.5	4.5	PUMP H2O TO BREAK CIRCULATION
9:05 AM	2.5	1100			7	11.5	MIX AND PUMP GEL SPACER 300 LBS 25 LBS FLAKE
9:19 AM	2.5	1200			3	14.5	PUMP H2O SPACER
9:21 AM	2.8	1100-125			58	72.5	MIX AND PUMP CEMENT @ 16.4 PPG 8668'-8060
9:21 AM	2.8					72.5	WEIGH CEMENT WITH MUD SCALES 16.4=16.4 PPG
9:45 AM					29	72.5	PUMP H2O DISPLACEMENT 19
						72.5	PULL 18 STANDS
10:35 AM	2.8	125-1200			28	100.5	REVESE CIRCULATE WELL 0.5 bbl back
						100.5	WAIT 9 HOURS TAG CEMENT TOP
						100.5	TAG CEMENT TOP @ 8169
1:30 AM	2.5	720			4.5	105	PUMP H2O TO BREAK CIRCULATION
1:32 AM	2.5	830			9	114	MIX AND PUMP CEMENT @ 16.4 PPG 8168'-7989
						114	WEIGH CEMENT WITH MUD SCALES 16.4=16.4 PPG
1:36 AM	2.5	765-900			28	142	PUMP H2O DISPLACEMENT
						142	PULL 5 STANDS
2:10 AM	2.5	1220			43	185	REVESE CIRCULATE WELL 0.5 bbl back
2:45 PM							TAG CEMENT TOP @ 8096
4:19 PM	2	700			7		PUMP H2O TO BREAK CIRCULATION

Left Yard	10/5/17 5:10 AM			Left Loc.				Start Pump	10/5/17 9:00 AM		
Arrived Loc.	7/10/17 7:45 AM			Returned Yd				End Pump			
Bumped Plug (psi)	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	Dave			
	1200		80	0.5	Yes			Service Supervisor			

10/5  
305  
11/6  
29.81

Customer: R.E. Gas Development	Date: 10/3/2017	Serv. Supervisor: Dave Deyarmin
Cust. Rep.: Aaron Wilhite	Ticket #: BPA-1710-0007	Serv. Center: Black Lick, PA
Lease: Northstar Khalil SWD 0	API Well #:	County: Mahoning State: OH
Well Type:	Rig: 00	Type of Job: Plug

Materials Furnished by C&J ENERGY SERVICES

Plugs	Casing Hardware	Physical Slurry Properties					
		Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)
Spacer 1: Water		-	8.34				
Lead	CJ916 + 0.1% CJ210F + 0.5 LB/SK CJ600	200	16.4	1.06	4.29	38	20
Tail:	CJ916 + 0.1% CJ210F + 0.5 LB/SK CJ600	205	16.4	1.06	4.29	39	21

Displacement Chemicals:

OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
9 7/8		8780	Casing	2 3/8	4.7		8773		1.98		
			Drill Pipe	2 3/8	4.7		8773		2.01		

PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
7 5/8	24	7.03	8084					8773	8773		

WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY				
H2O	8.3 ppg	31 bbl	H2O	8.3 ppg				450			

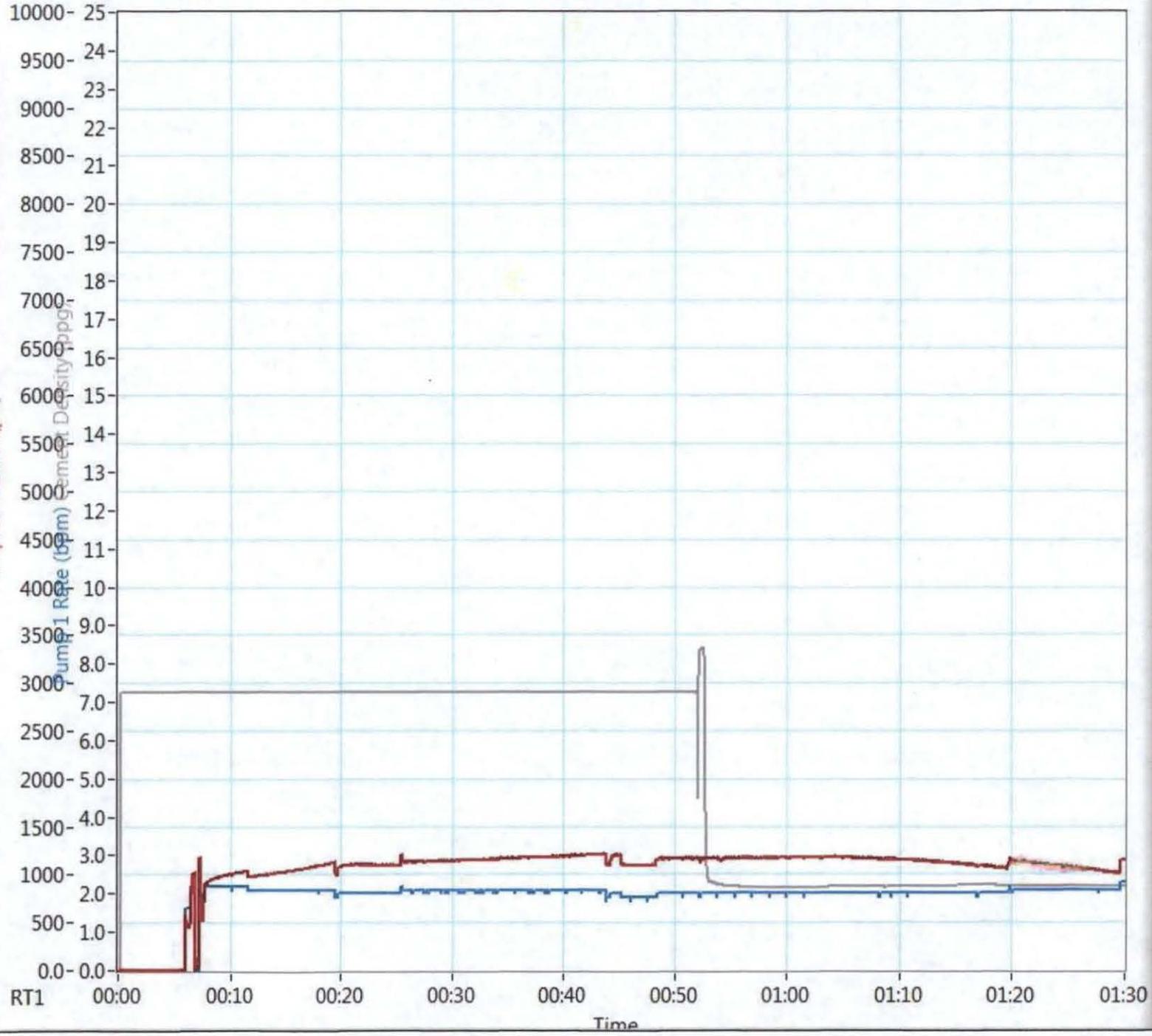
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
4:00 AM						0	0 CALLED IN FOR JOB
5:45 AM						0	0 PRE CONVOY SAFETY MEETING
8:30 AM						0	0 ARRIVE ON LOCATION
8:40 AM						0	0 PRE JOB SAFETY MEETING
8:45 AM						0	0 SPOT TRUCKS,RUN LINES TO WELL,PRIME PUMPS
9:30 AM						0	0 SAFETY MEETING
10:16 AM	2	810			5	5	5 PUMP H2O WELL CIRCULATION
11:15 AM	2.5	1100			211	216	216 PUMP H2O BOTTOMS UP
1:20 PM	2.5	480			19	235	235 MIX AND PUMP CEMENT @ 16.4 PPG
1:20 PM						235	235 WEIGH CEMENT WITH MUD SCALES 16.4=16.4
1:33 PM	2.5	20			31	266	266 PUMP H2O DISPLACEMENT
1:47 PM						266	266 PULL 5 STANDS TUBING
2:00 AM	2-3	1100			68	334	334 REVERSE OUT
							WAIT 8 HOURS TAG TOP OF PLUG
12:30 PM							TAG CEMENT TOP @ 8073
10:30 AM							CREW RELEASED
11:00 AM							RACK UP TRUCKS
							JOB COMPLETE

Left Yard	10/3/17 5:50 AM	Left Loc.	11:00 10-417	Start Pump	10/3/17 10:15 AM
Arrived Loc.	10/3/17 8:30 AM	Returned Yd		End Pump	10/3/17 2:00 PM

Bumped Plug (psi)	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	Dave Deyarmin
				1.5	Yes			Service Supervisor

CNX GAS CO LLC / NORTHSTAR SWD / AIR DROP PLUG

Cement Report

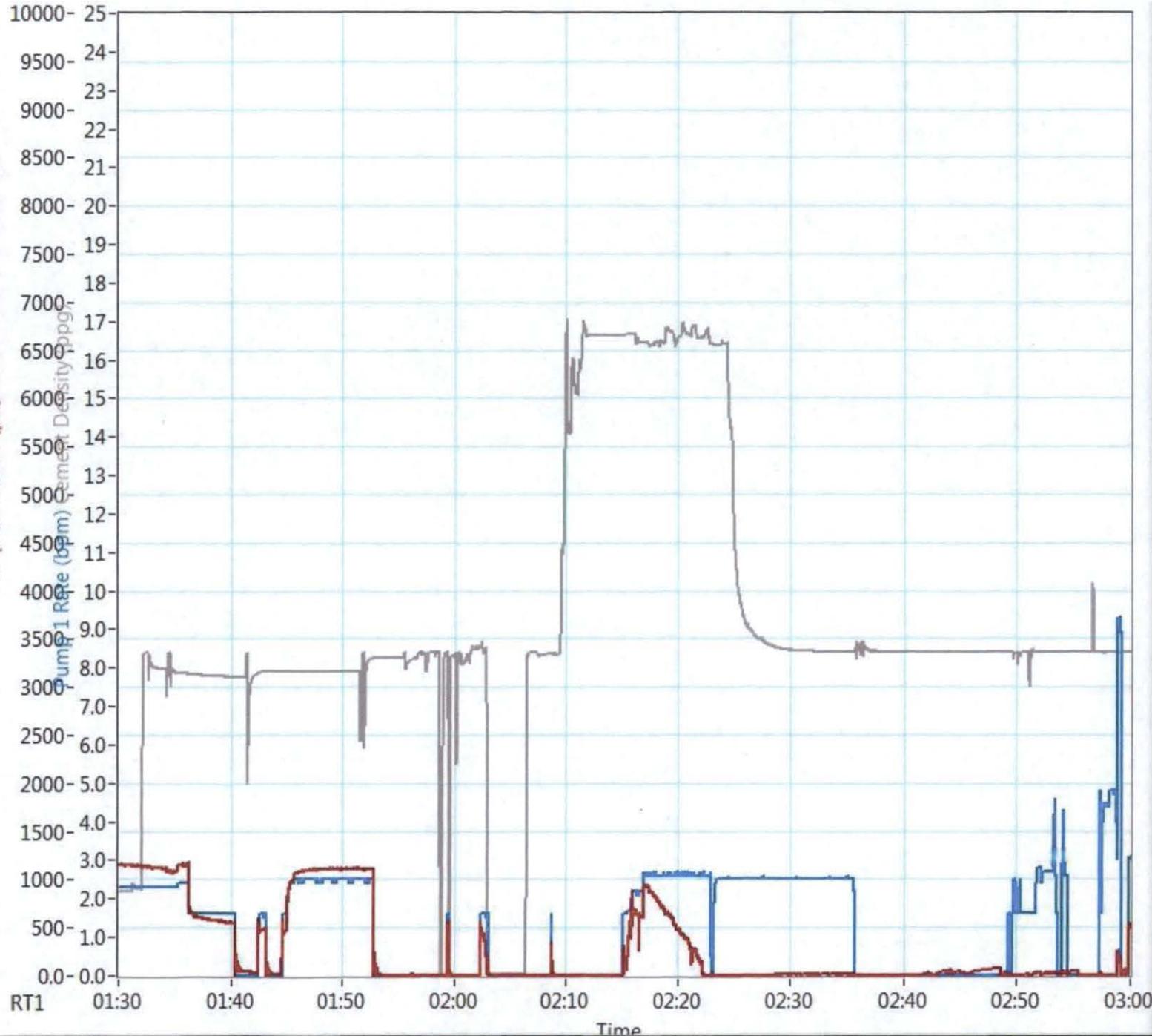


Plug - Recorded Time Plot 1 - 1 of 3

S-0000001710007-00 / Tue, Oct 03, 2017  
Page 6 of 13

CNX GAS CO LLC / NORTHSTAR SWD / AIR DROP PLUG

Cement Report

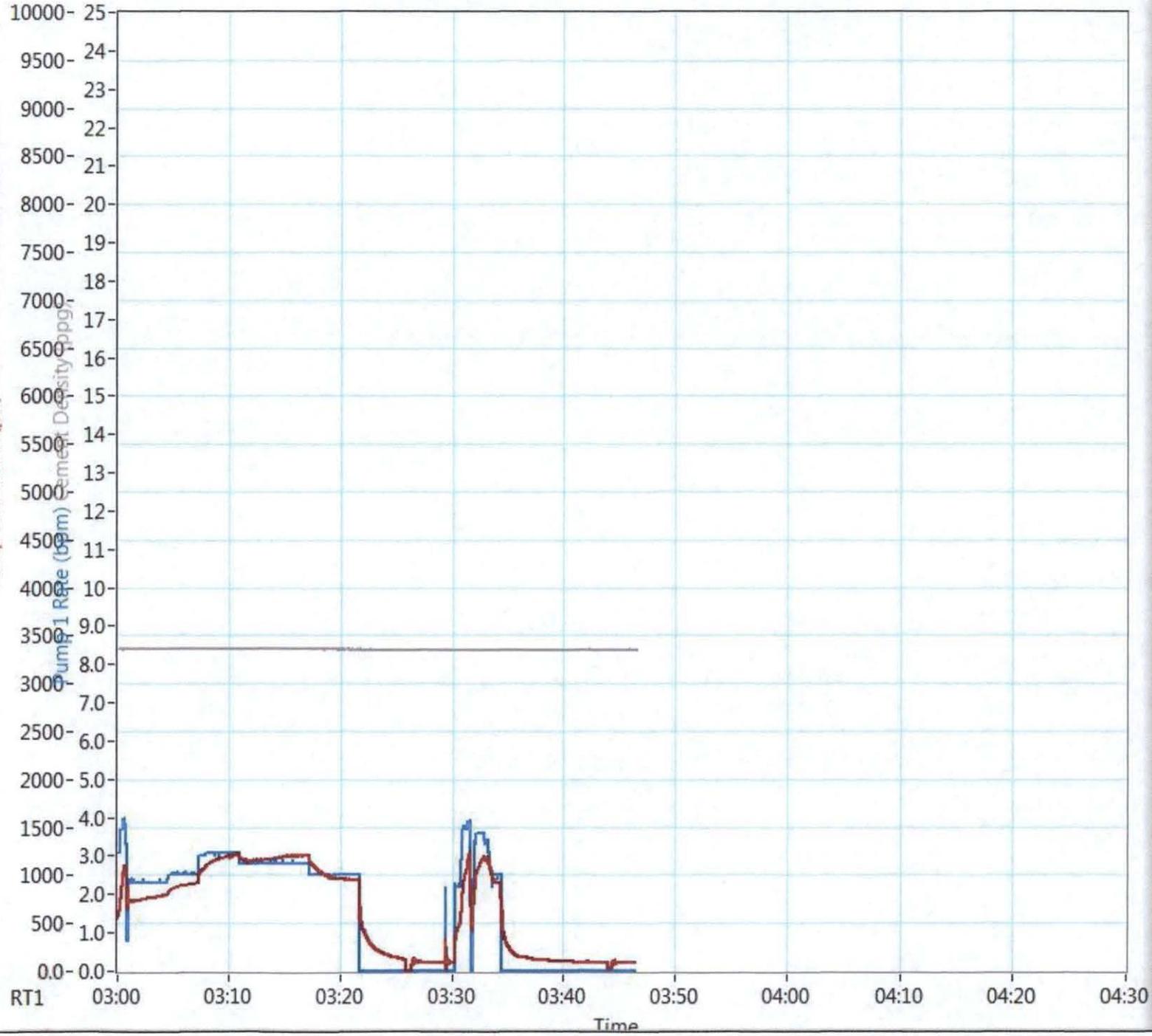


Plug - Recorded Time Plot 1 - 2 of 3

S-0000001710007-00 / Tue, Oct 03, 2017  
Page 8 of 13

CNX GAS CO LLC / NORTHSTAR SWD / AIR DROP PLUG

Cement Report



Plug - Recorded Time Plot 1 - 3 of 3

S-0000001710007-00 / Tue, Oct 03, 2017  
Page 10 of 13

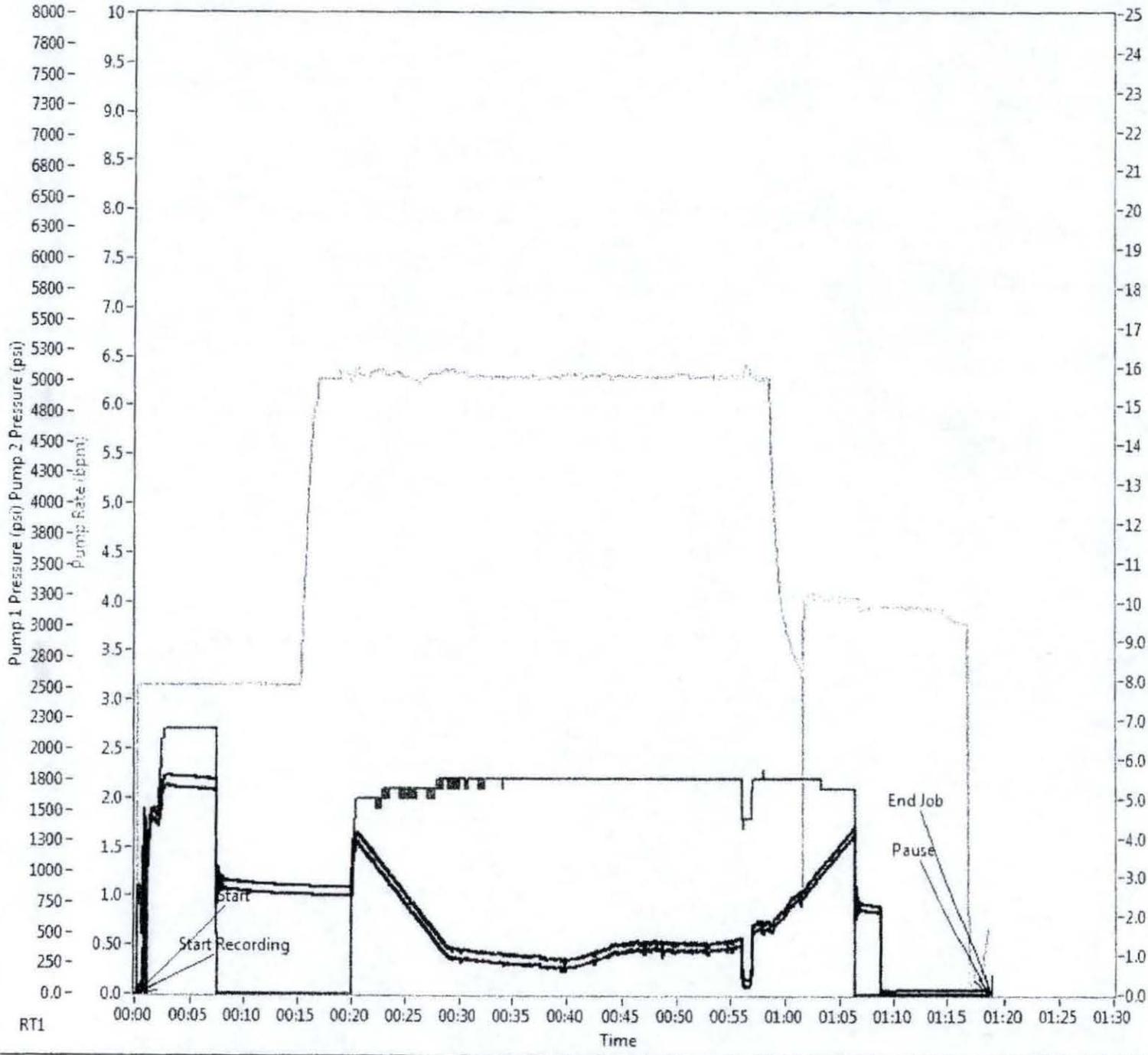




R. E. Gas Development / Northstar Khailil SWD / Balance Plug Cement Job -

Cement-Report

Plug Job - Recorded Time Plot 1 - 1 of 1



Plug Job - Recorded Time Plot 1 - 1 of 1

BPA-000001710-0015 / Mon, Oct 09, 2017

Page 7 of 10

Customer: R.E. Gas Development			Date: 10/8/2017			Serv. Supervisor: Anthony Barbara					
Cust. Rep.: Aaron			Ticket #: BPA-1710-0012			Serv. Center: Black Lick, PA					
Lease: Northstar Khalil SWD 0			API Well #:			County: Mahoning State: OH					
Well Type:			Rig: 0 0			Type of Job: Plug					
Materials Furnished by C&J ENERGY SERVICES											
Plugs		Casing Hardware				Physical Slurry Properties					
						Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)
Spacer 1:	Water					-	8.34				
Lead											
Tail:	CJ916 + 0.1% CJ210F + 0.5 LB/SK CJ600					140	16.4	1.06	4.29	26	14
Displacement Chemicals:											
OPEN HOLE DATA				TUBULAR DATA							
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSGT/BGDP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
9 7/8			Casing	2 3/8	4.7		7482		1.98		
			Drill Pipe	2 3/8	4.7		7482		2.01		
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
7 5/8	24	7.03	7482					7482	7482		
WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY				
H2O	8.3 ppg	27 bbl	H2O	0.2 ppg				1000			
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
11:00 AM							0 Yard Call				
12:30 PM							0 Pre convoy meeting				
5:00 PM							0 Waiting off location				
8:00 PM							0 Arrive back on Location/ waiting for Crew				
1:15 AM							0 Pre Rig Up Meeting				
1:30 AM							0 Rig Up				
2:00 AM							0 Waiting of rig				
2:25 AM							0 Safety Meeting with Rig crew and Company Man				
2:40 AM	3.5	1855			330	330	Roll Hole H2O temp-67.6				
3:10 AM	3.5	1955				330	Roll Hole Check @ 200bbls				
4:02 AM	3	835			25	355	Pump Cement @ 16.4# PPG temp going down hole -80.3				
						355	Weigh with Pressurized Scales				
4:13 AM	3.5	185			27	382	Displace Cement				
4:22 AM						382	Pull 14 Stands				
4:54 AM	3.5	1280			40	422	Reverse Circulate Got back 1bbl of Cement				
5:05 AM							End. Wash up				
5:17 AM							Rig Down				
Left Yard	10/8/17 1:00 PM			Left Loc.	10/9/17 6:00 AM			Start Pump	10/9/17 2:40 AM		
Arrived Loc.	10/8/17 5:00 PM			Returned Yd				End Pump			
Bumped Plug (psi)	Final Differential (psi)	Floater Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	Anthony Barbara			
			0	1	Yes	2000		Service Supervisor			

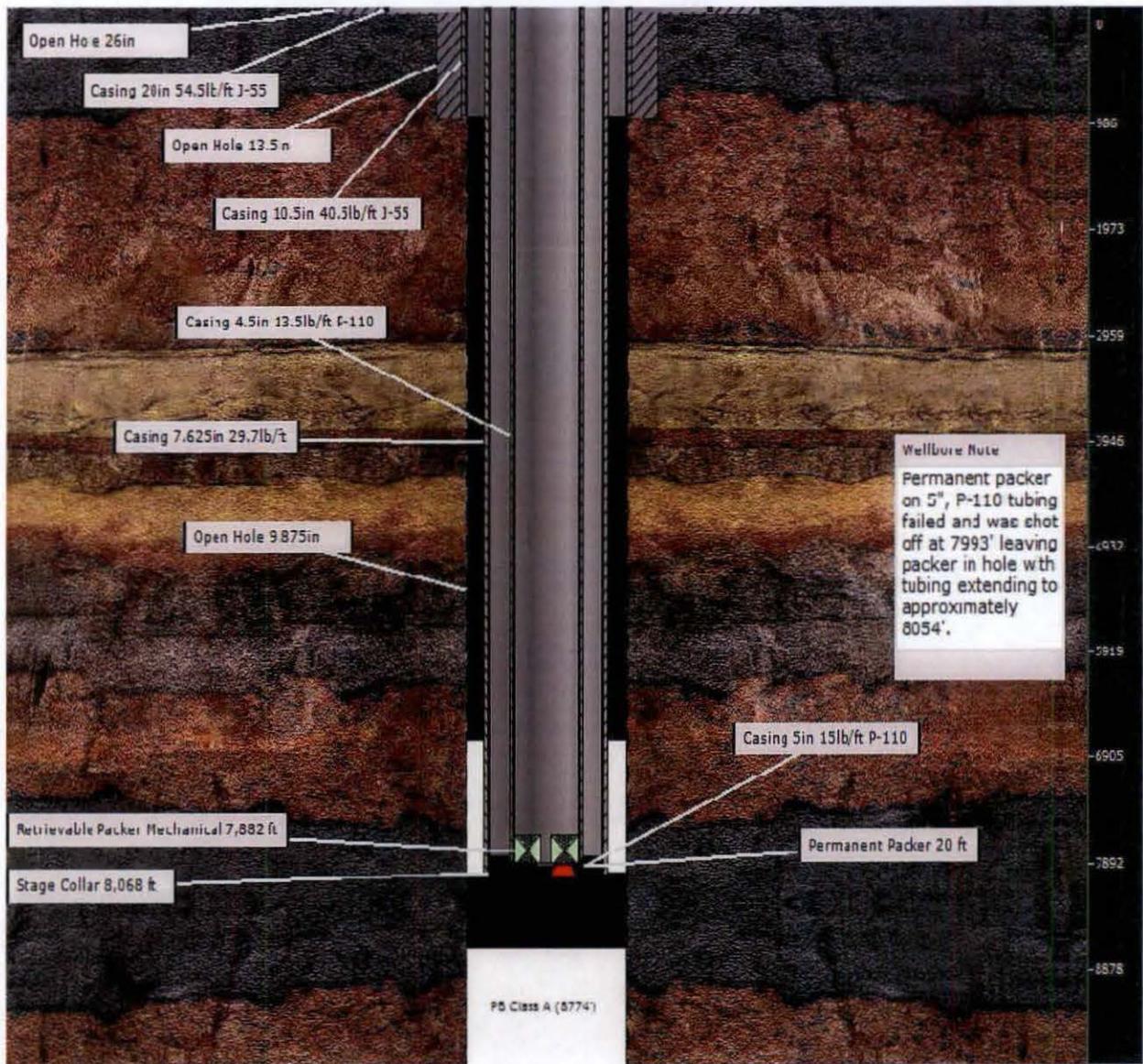
Customer: R.E. Gas Development			Date: 10/9/2017			Serv. Supervisor: Anthony Barbara					
Cust. Rep.:			Ticket #: BPA-1710-0015			Serv. Center: Black Lick, PA					
Lease: Northstar Khalil SWD 0			API Well #:			County: Mahoning State: OH					
Well Type:			Rig: 0 0			Type of Job: Squeeze					
Materials Furnished by C&J ENERGY SERVICES											
Plugs		Casing Hardware				Physical Slurry Properties					
						Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)
Spacer 1:	Water					-	8.34			20	
Lead											
Tail:	CJ910 + 0.4% CJ511 + 0.1% CJ210F					410	15.6	1.18	5.21	86	51
Displacement Chemicals:											
OPEN HOLE DATA				TUBULAR DATA							
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
			Casing	2 3/8	4.7		5485		1.98		
			Drill Pipe	2 3/8	4.7		4900		2.01		
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
7 5/8	24	7.03	5485					5485	4885		
WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY	450			
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
6:00 PM						0	Yard Call				
6:50 PM						0	Pre Convoy Meeting				
7:15 PM						0	Leave Yard				
9:15 PM						0	Arrive on Location				
9:20 PM						0	Pre Rig up Meeing				
9:30 PM						0	Rig Up				
10:20 PM						0	Safety Meeting with Rig Crew and Company Man				
10:42 PM	1.3	1300			1	1	Establish Injection rate				
	2	1430			9	10	Injection test rate				
	2.8	1770			7	17	Injection test rate				
11:00 PM	2	1200			1	18	Mix and Pump Cement @15.6# PPG				
						18	Weighed with Pressurized Scales				
11:21 PM	2	280			44	62	Cement Pressure rate Check				
11:26 PM	2	310			10	72	Cement Pressure rate Check				
11:46 PM	2	400			31	103	End Cement				
11:40 PM	2	520			1	104	Start Displacement				
11:47 PM	2	1240			27.5	131.5	End Displacement				
11:48 PM		720				131.5	Shut Down				
11:49 PM						131.5	Sting Out				
11:54 PM						131.5	Wash up Truck				
12:10 AM						131.5	Rig Down				
						131.5					
						131.5					
						131.5					
Left Yard	10/9/17 7:15 PM			Left Loc.	10/10/17 12:45 AM			Start Pump			
Arrived Loc.	10/9/17 9:15 PM			Returned Yd	10/10/17 2:30 AM			End Pump			
Bumped Plug (psi)	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	Anthony Barbara			
			750		No	1770	0	Service Supervisor			

Northstar Khalil #3 (SWIW #11)  
(Plugging Procedure Outline and Considerations)

- ❖ Well Information:
  - API# 34-099-2-3157-00-00, Mahoning County, Coitsville Township.
  - Conductor hole SPUD on 8/18/2011
  - Drilled 9.875" OH to TD of 9580' (KB +16') on 10/05/2011.
  - Drilled by UDI Rig #52
  
- ❖ Casing in Hole:
  - 50' of 54.5lb/ft. (?) conductor, cemented to surface.
  - 1019' (KB) of 40.5lb/ft., J-55, 10.5" casing cemented to surface.
  - 8096' (KB) of 29.7lb/ft., N-80, 7.625" casing. Run with a shoe and collar on bottom, a formation packer from 8093'-8071', and a two stage cementing tool at 8068' (KB). Cemented with 221 sacks of Type I cement at 15.7lbs/gal., and a yield of 1.2ft<sup>3</sup>/ft.
  
- ❖ Tubing & Packers in Hole
  - 8045' of 5", 15lb/ft., P-110 tubing set with a permanent packer at 8013". Packer could not pass pressure test and was shot off at a depth of 7993' with tail pipe left below packer at approximately 8054' (per inspection report).
  - 7968' of 4.5", 13.5lb/ft., P-110 tubing set at 7968' with a 7", Baker Hughes Hornet packer (Model # 600-292) set from 7875'-7882' (per inspection report).
  
- ❖ Other information
  - On 6/03/2013, the 9.875" open hole was plugged back with a coiled tubing unit from a depth of 9504' to 8773' with 295 sacks of Class A cement. The plug was tagged and one (1) foot of plug was drilled to confirm the cement (per inspection report).
  - There is currently 677' of 9.875" open hole below the 7.625" casing shoe.
  - TOC in the annulus between the 9.875" open hole and 7.625" casing is calculated at approximately 6836' and will need to be verified by a cement bond log (CBL).
  
- ❖ Questions:
  - Will the pulling and recovering of the 4.5" tubing and 7.625" production string require the use of a center spear?

## Plugging Procedure

- 1) Check for pressure in all annuli prior to commencement of operations (each day) and flare gas as necessary.
  - a) Note: The Northstar United #2 (5 miles to the northwest of this location) had 1100psi on the surface-production casing annulus and had to be flared for 6 hours to blow it down. Minimal pressure was found the following day and was flared off in 10 minutes.
- 2)

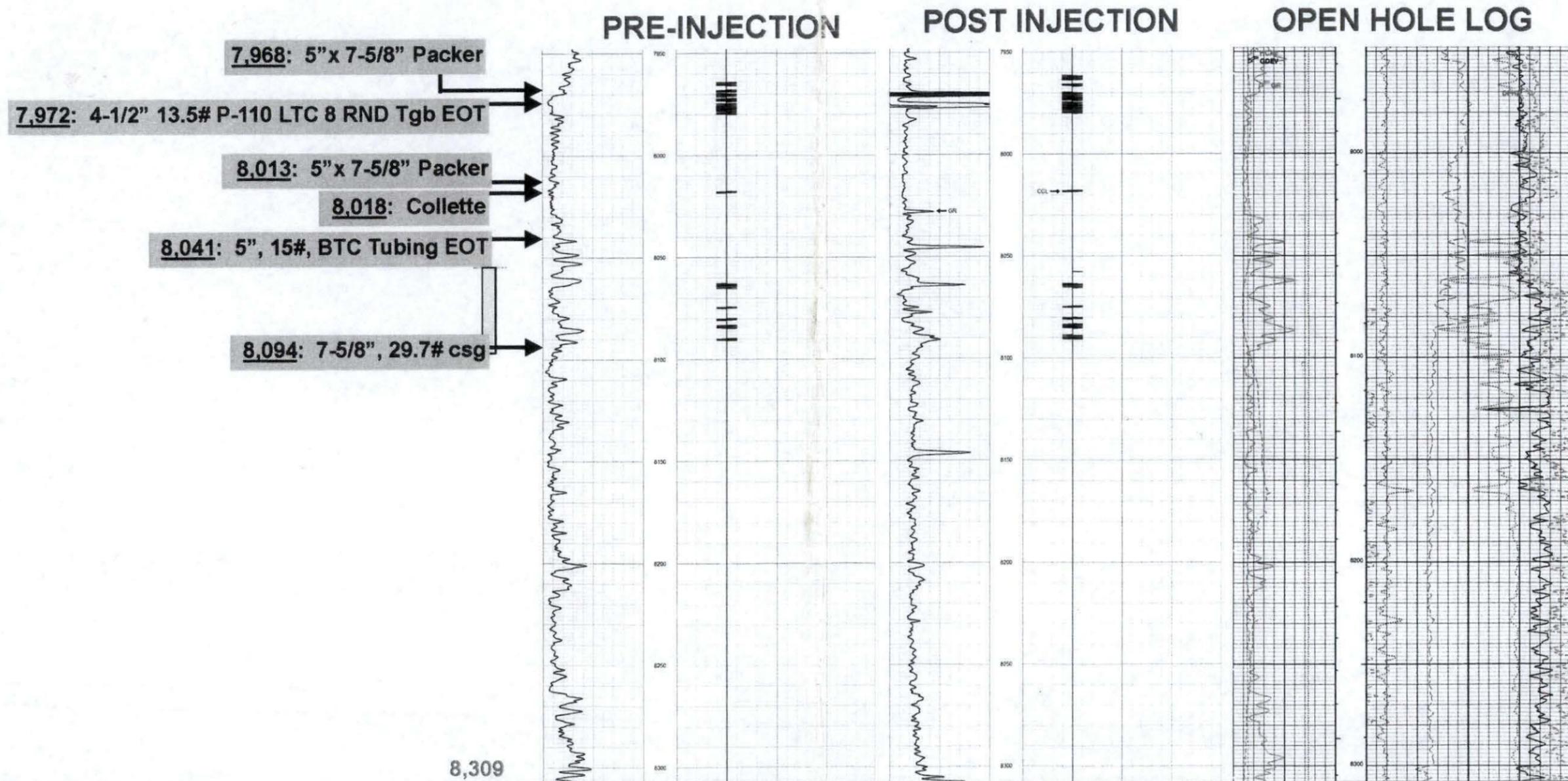


Measured Depth - 9865 ft

Legend:

-  Open Hole
-  Retrievable Packer Mechanical
-  Permanent Packer
-  Stage Collar
-  Casing

# NORTHSTAR KHALIL 3 SWD



8,930

PROPOSED TOP OF CEMENT

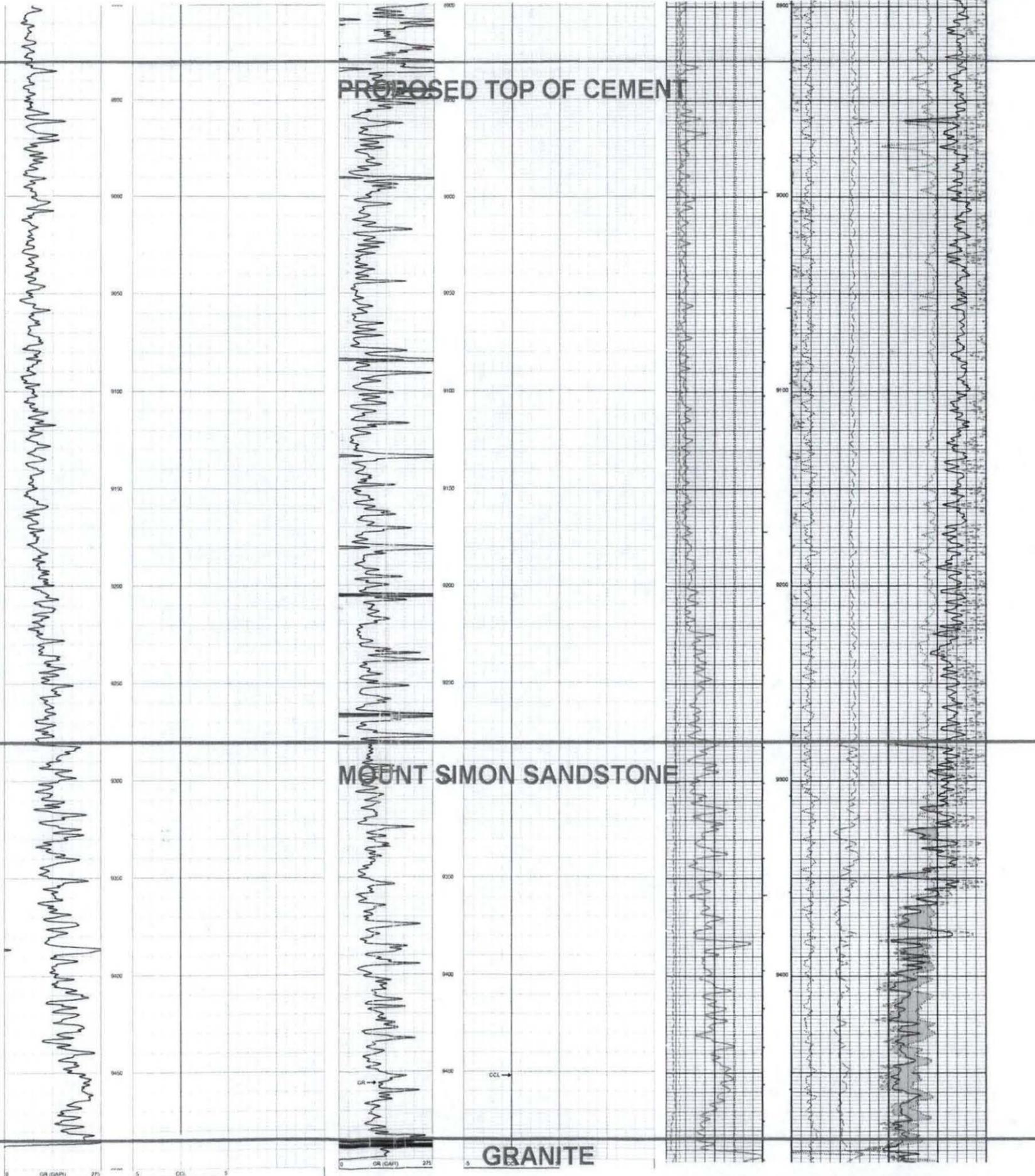
9,280

MOUNT SIMON SANDSTONE

9,486

GRANITE

Open Hole TOC @ 9,581



**Please note areas of high radioactivity associated with injection into the Rose Run, Trempealeau, and Conasauga formations.**

8,431

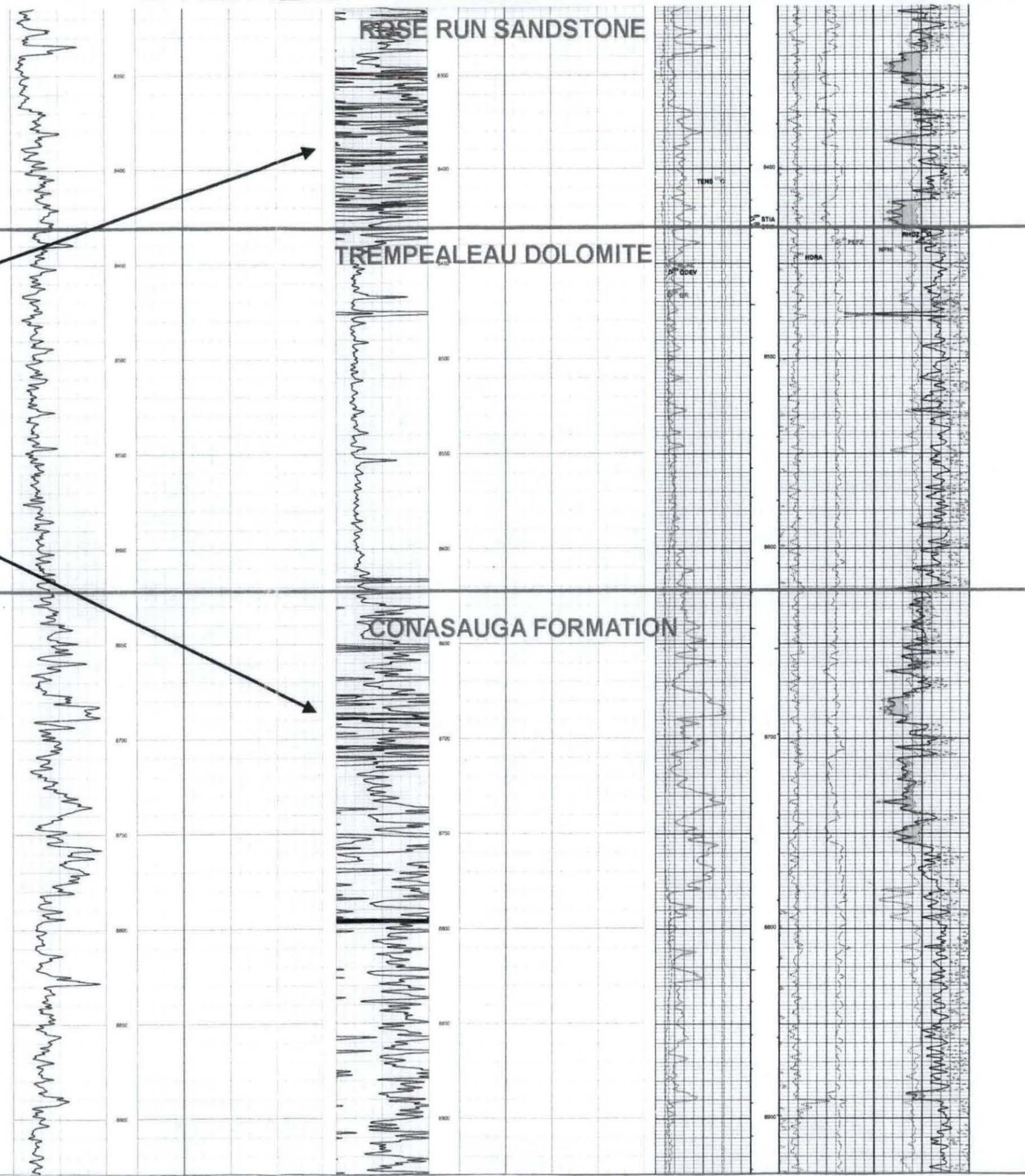
8,622

8,930

ROSE RUN SANDSTONE

TREMPEALEAU DOLOMITE

CONASAUGA FORMATION



# wellPORT

## CEMENT REPORT



### Title Page

Field Ticket

XXXXX-000001710-  
0030

Date

Sun, Oct 15, 2017

Service Center

Black Lick ( 22 )  
Nabors Completion &  
Production Services  
Route 119 N  
Black Lick PA 15716  
724-248-1001  
724-248-1005

Service Representative(s)

KRIS COOK

Job Type

Balance Plug Cement Job -

Lease Project

NORTH STAR

Number / ID

Township

County

MAHONING

State

OH

Physical Location

Country

Customer

REX ( REX1 )

Mailing Address

Division / District

Customer Representative(s)

clayton

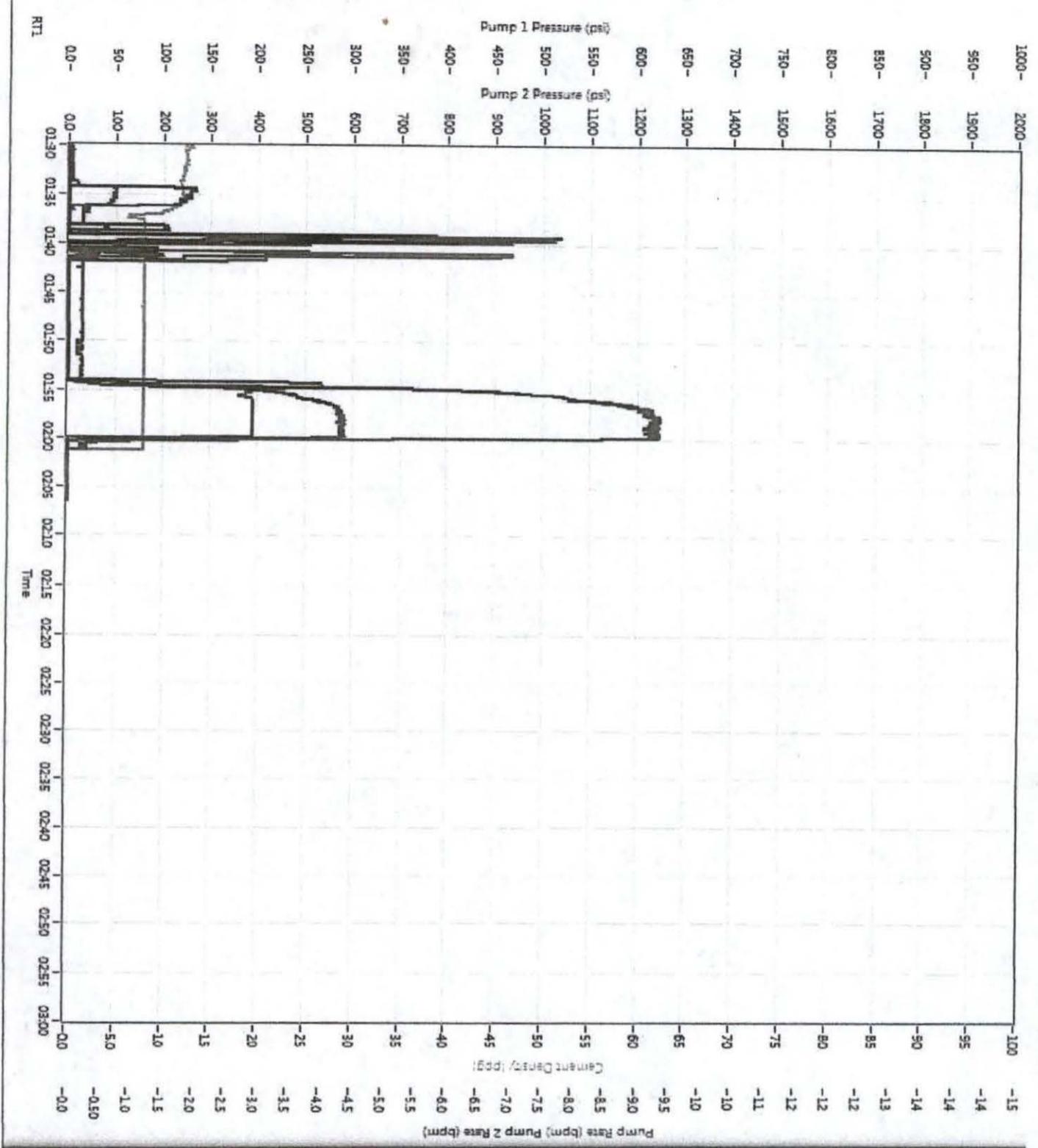
PO/RFQ/AFE Code

Customer: R.E. Gas Development		Date: 10/15/2017		Serv. Supervisor: Kris Cook							
Cust. Rep.: Aaron		Ticket #: BPA-1710-0031		Serv. Center: Black Lick, PA							
Lease: Northstar Khalil SWD 0		API Well #:		County: Mahoning State: OH							
Well Type:		Rig: 00		Type of Job: Plug							
Materials Furnished by C&J ENERGY SERVICES											
Plugs		Casing Hardware		Physical Slurry Properties							
				Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)		
Spacer 1:											
Lead											
Tail: CJ910				250	15.6	1.18	5.22	52	31		
Displacement Chemicals:											
OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
9 7/8		3800'	Casing	2 3/8	4.7		3725		1.98		
			Drill Pipe	2 3/8	4.7		3,775'		2.01		
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
10 3/4	32.75	10.18	1025					3725	3725		
WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY				
BRINE	9.2 ppg	11.4 bbl	H2O	8.3 ppg				500			
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
8:00 AM						0	CALLED IN FOR JOB				
10:00 AM						0	PRE CONVOY MEETING				
10:30 AM						0	LEAVE YARD				
1:00 PM						0	ARRIVE ON LOCATION				
1:30 AM						0	PRE RIG UP MEETING				
1:35 AM						0	SPOT UNITS AND SET UP				
2:00 PM	TO	15:30				0	WAIT ON RIG TO BE READY				
3:55 PM	2.5		575		20	20	PUMP WATER AHEAD				
4:03 PM	3-3.5		240-665		56	76	MIX AND PUMP CEMENT				
						76	TRUCK DENSITY WAS 3/10PPG OFF MIXED AT 15.9PPG				
4:20 PM	4.2		0-375		11.4	87.4	PUMPED WATER DISPLACMENT				
						87.4	SHUT DOWN/WELL WAS ON A VACUUM				
4:47 PM	3		575		18.5	105.9	REVERSE CIRCULATED THE WELL				
4:55 PM							SHUT DOWN				
5:30 PM							LEFT LOCATION				
Left Yard	10/15/17 9:00 AM			Left Loc.	17:3010-15-17			Start Pump	1/0/1900 1:55:00 PM		
Arrived Loc.	10/15/17 1:00 PM			Returned Yd	10/15/17 6:30 PM			End Pump	10/15/17 4:55 PM		
Bumped Plug (psi)	Final Differential (psi)	Floater Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	Kris Cook			
	575				Yes	575	0	Service Supervisor			

REX / NORTH STAR / Balance Plug Cement Job -

Cement Report

Surface Casing - Recorded Time Plot 1 - 2 of 2



Surface Casing - Recorded Time Plot 1 - 2 of 2

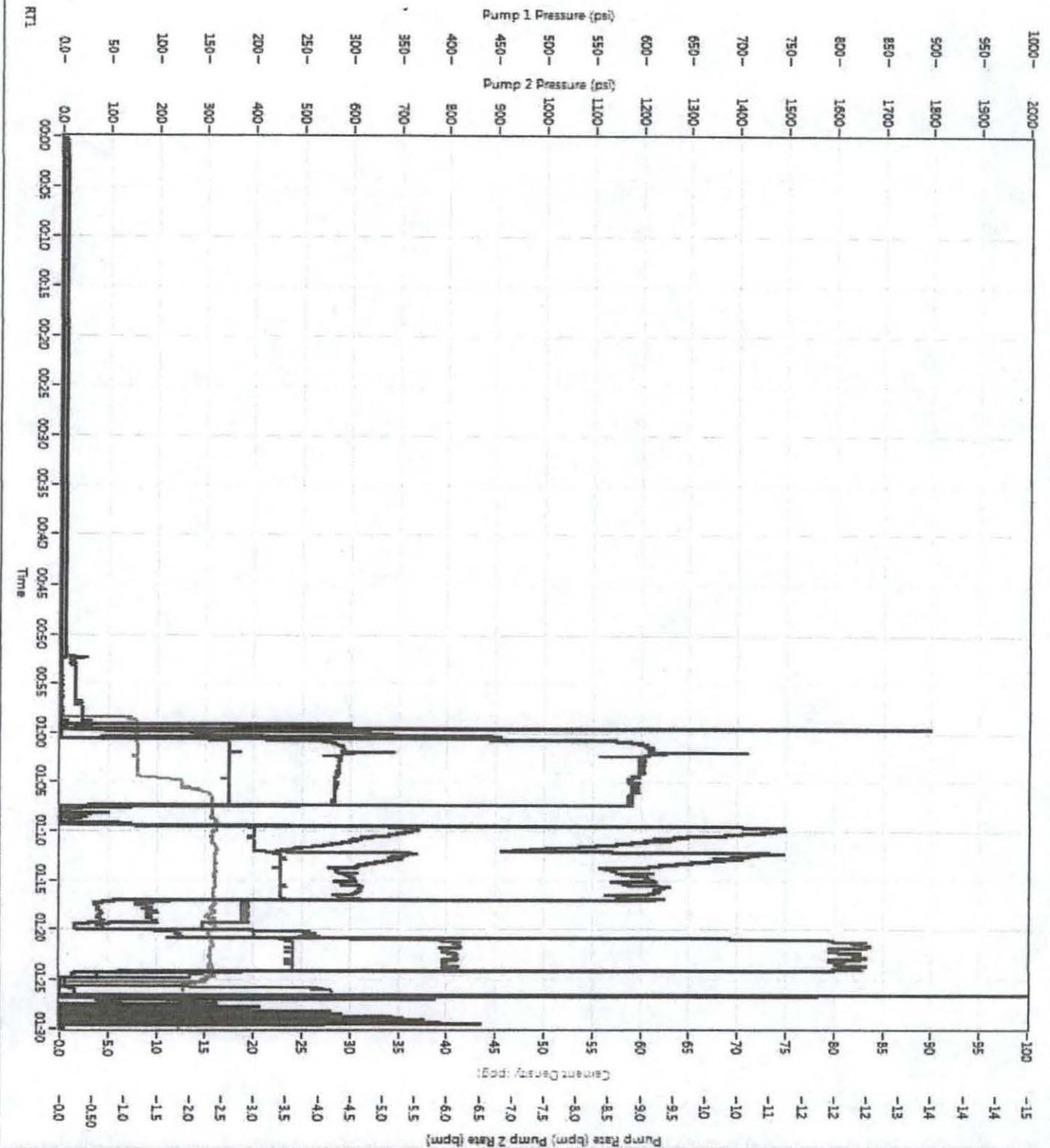
XXXXX-000001710-0030 / Sun, Oct 15, 2017

Page 8 of 11

REX / NORTH STAR / Balance Plug Cement Job -

Cement Report

Surface Casing - Recorded Time Plot 1 - 1 of 2



Surface Casing - Recorded Time Plot 1 - 1 of 2

XXXXX-00001710-0030 / Sun, Oct 15, 2017

Page 7 of 11



COMPANY DETAILS

Company: REX

Email:

Contact:

Phone:

JOB DETAILS

DATE October 06, 2017

START TIME 0:01:05

Operator:

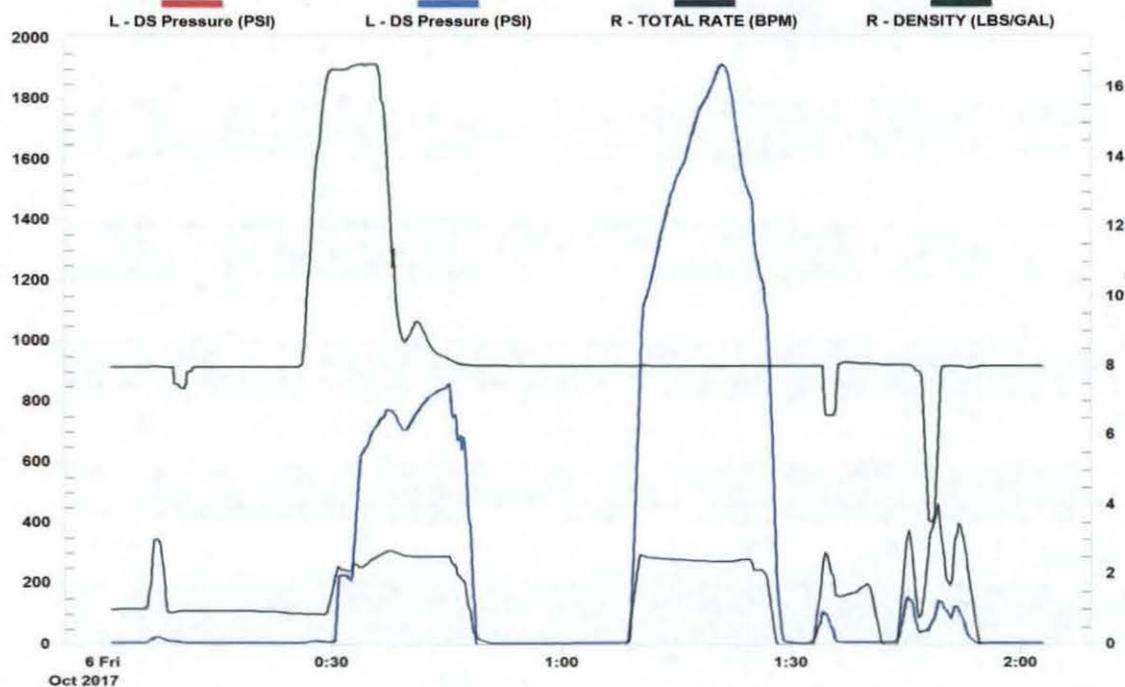
END TIME 2:02:31

LSD#:

Ticket#:

Comments:

SUMMARY GRAPH





COMPANY DETAILS

Company: REX  
Contact:  
Phone:

Email:

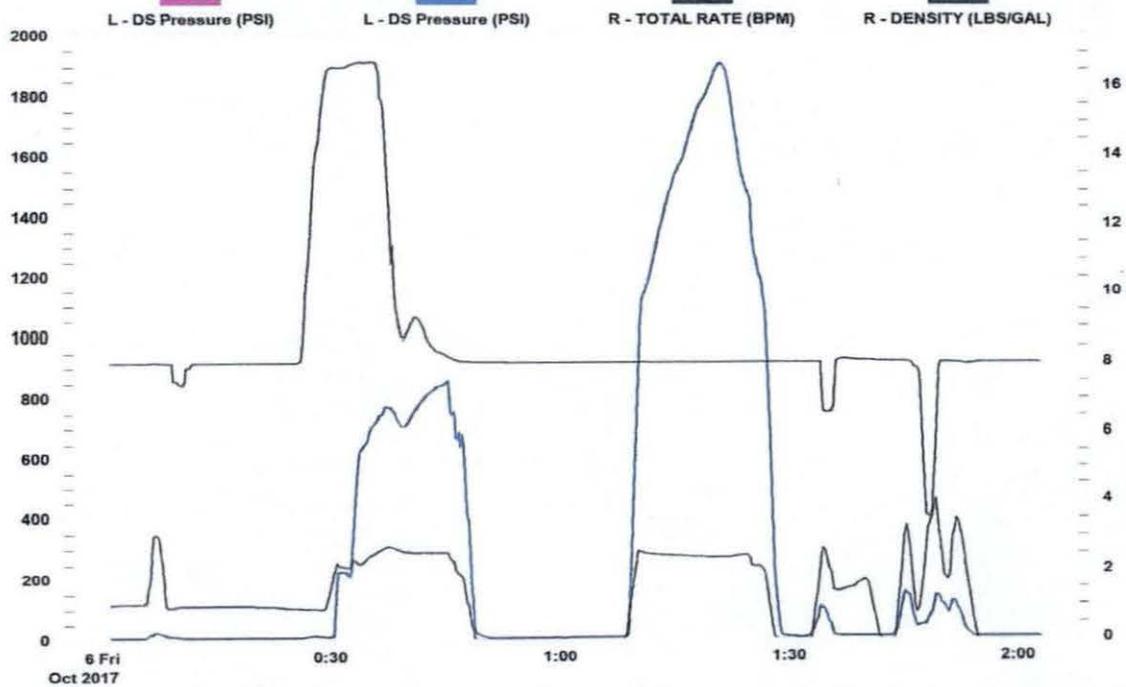
JOB DETAILS

DATE October 06, 2017  
START TIME 0:01:05  
END TIME 2:02:31  
Ticket#:

Operator:  
LSD#:

Comments:

SUMMARY GRAPH





COMPANY DETAILS

Company: REX  
Contact:  
Phone:

Email:

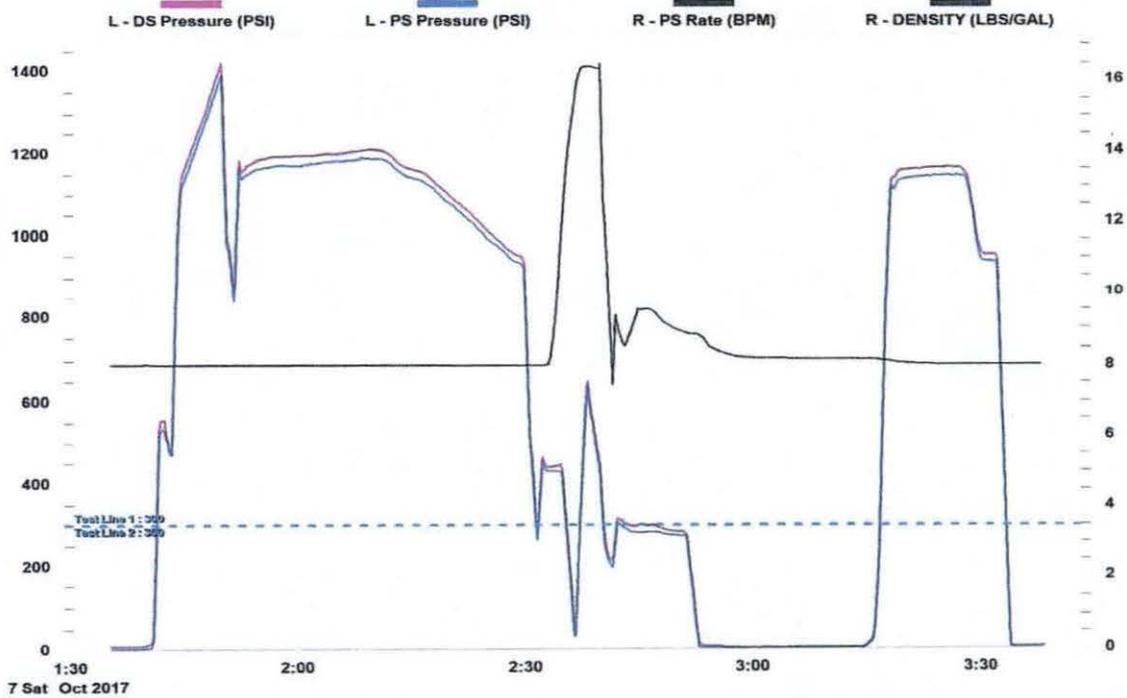
JOB DETAILS

DATE October 07, 2017  
START TIME 1:35:13  
END TIME 3:38:21  
Ticket#:

Operator:  
LSD#:

Comments:

SUMMARY GRAPH





COMPANY DETAILS

Company: REX  
Contact:  
Phone:

Email:

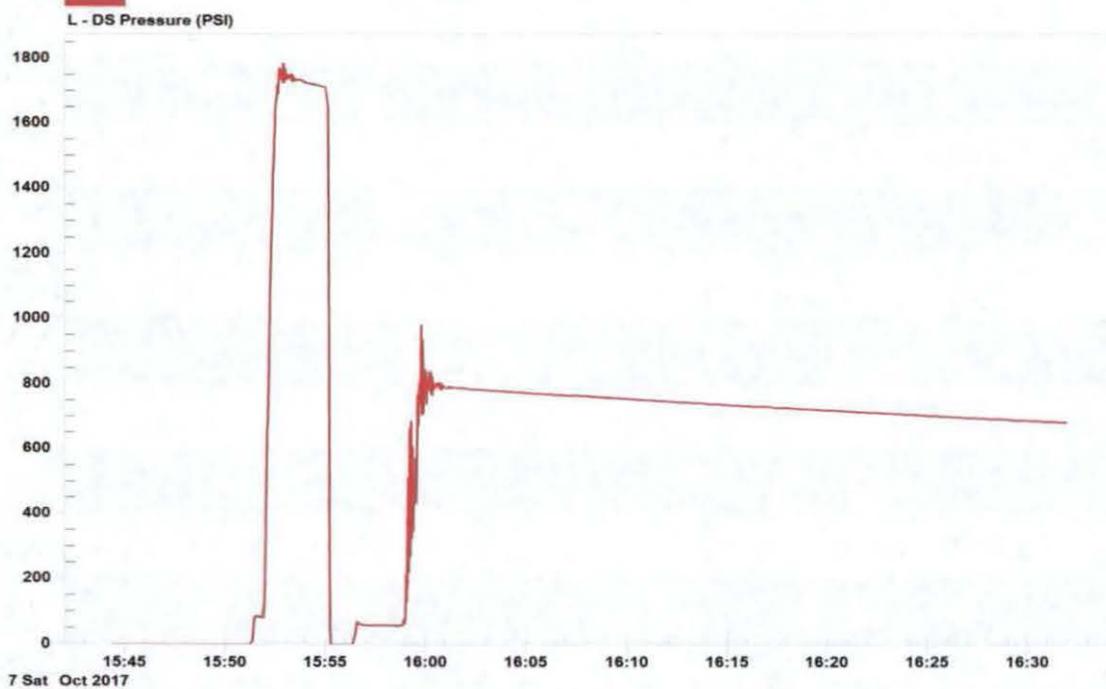
JOB DETAILS

DATE October 07, 2017  
START TIME 15:44:22  
END TIME 16:32:00  
Ticket#:

Operator:  
LSD#:

Comments:

SUMMARY GRAPH





COMPANY DETAILS

Company: REX  
Contact:  
Phone:

Email:

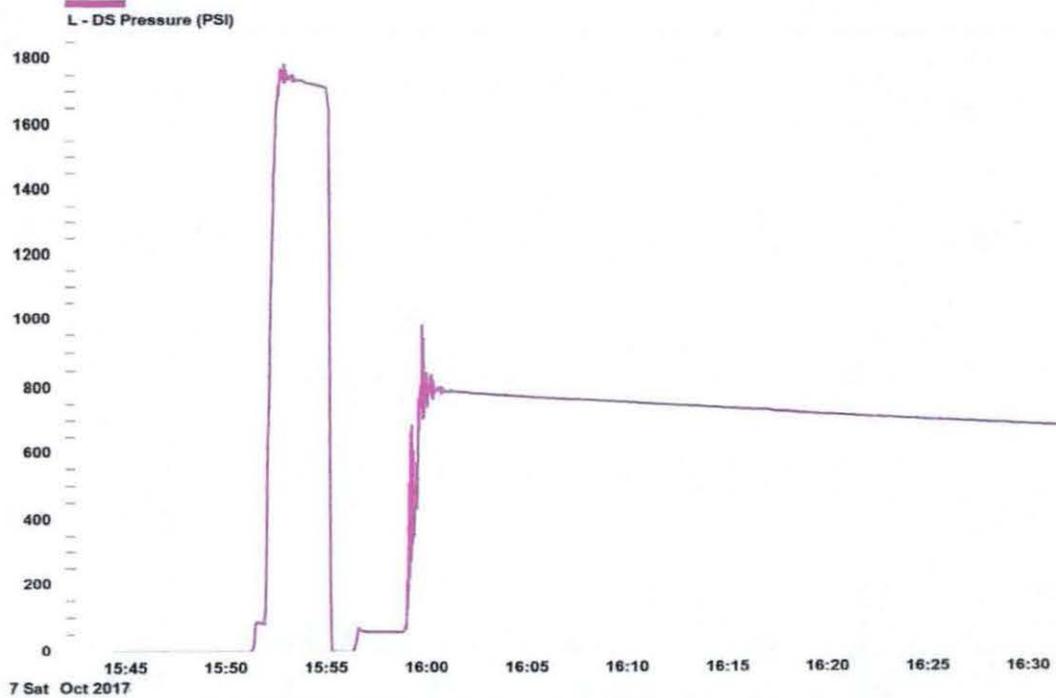
JOB DETAILS

DATE October 07, 2017  
START TIME 15:44:22  
END TIME 16:32:00  
Ticket#:

Operator:  
LSD#:

Comments:

SUMMARY GRAPH





COMPANY DETAILS

Company: REX

Email:

Contact:

Phone:

JOB DETAILS

DATE October 07, 2017

START TIME 1:35:13

Operator:

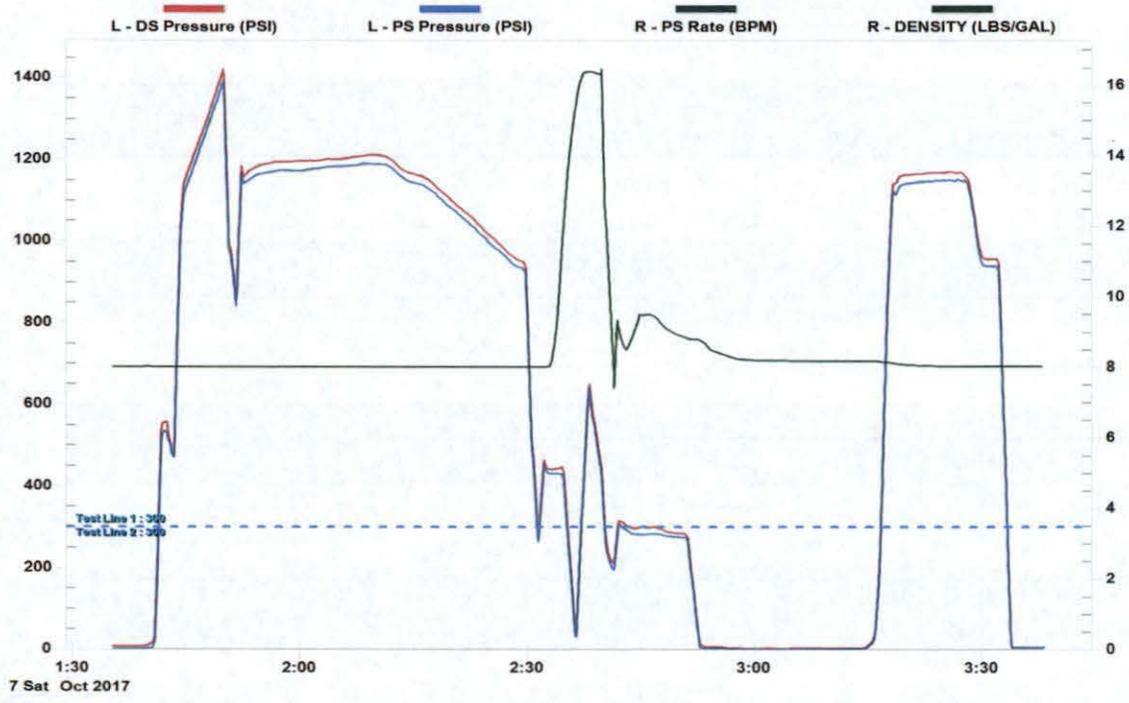
END TIME 3:38:21

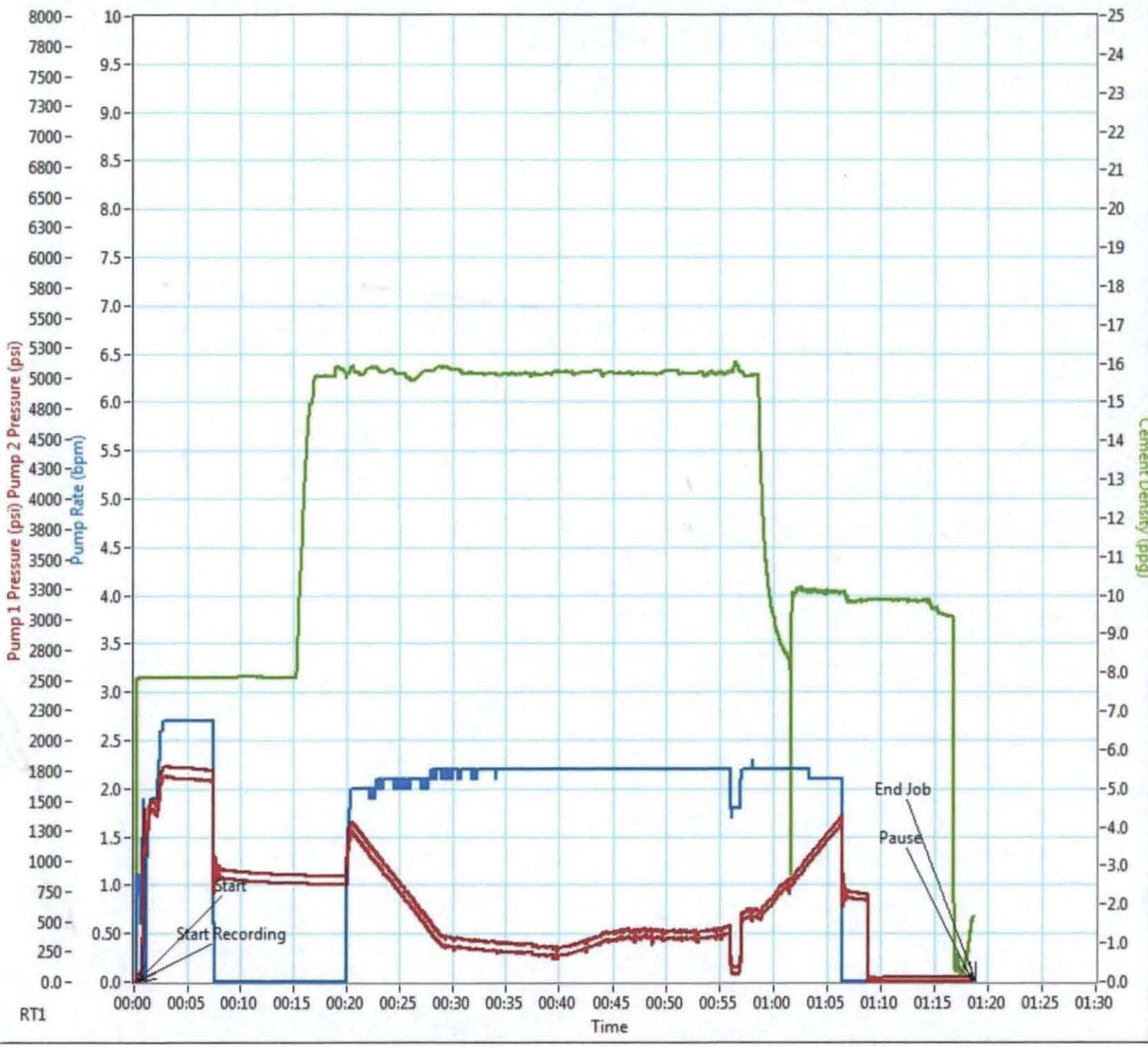
LSD#:

Ticket#:

Comments:

SUMMARY GRAPH

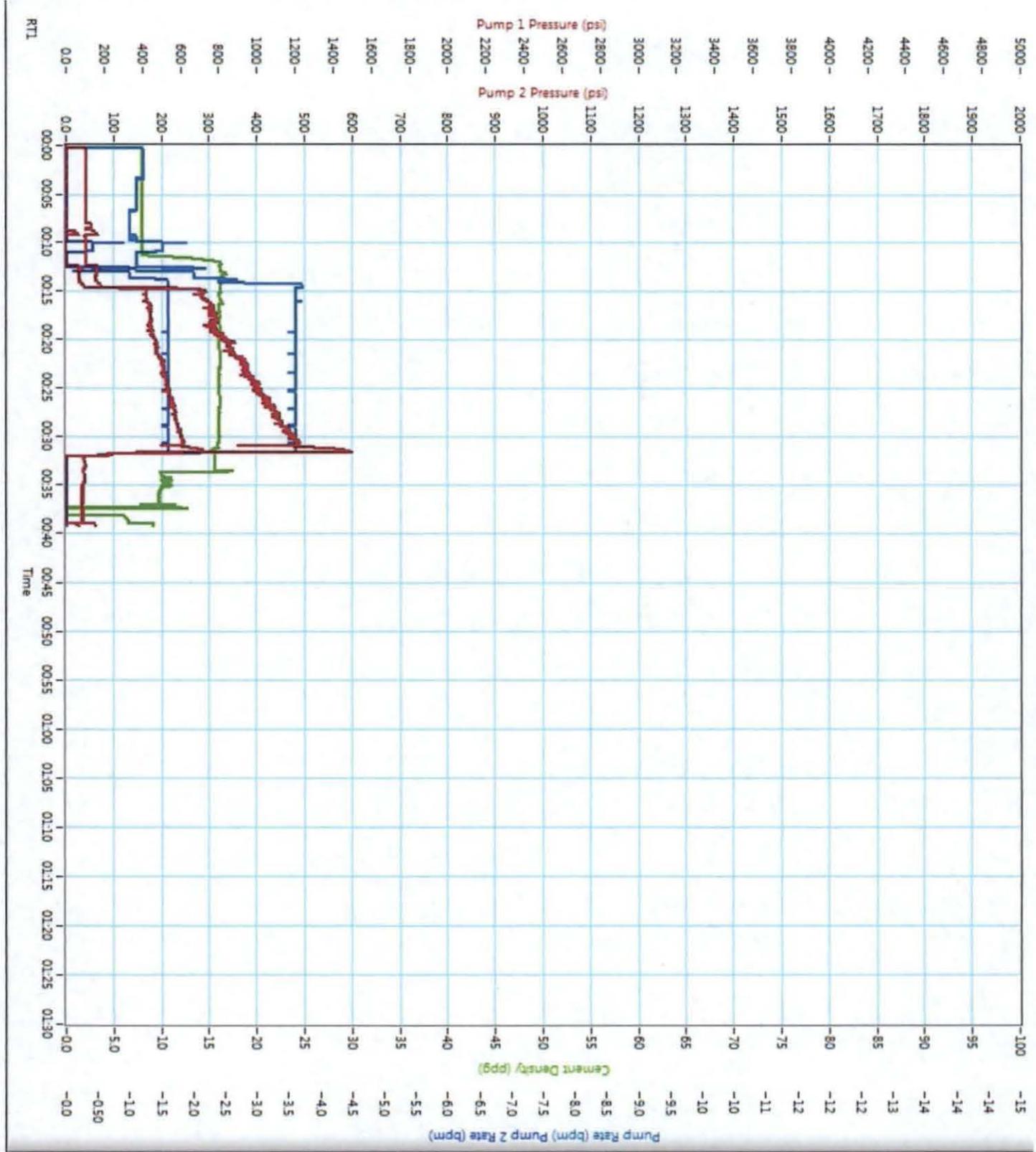




REX / NORTH STAR / Balance Plug Cement Job -

Cement Report

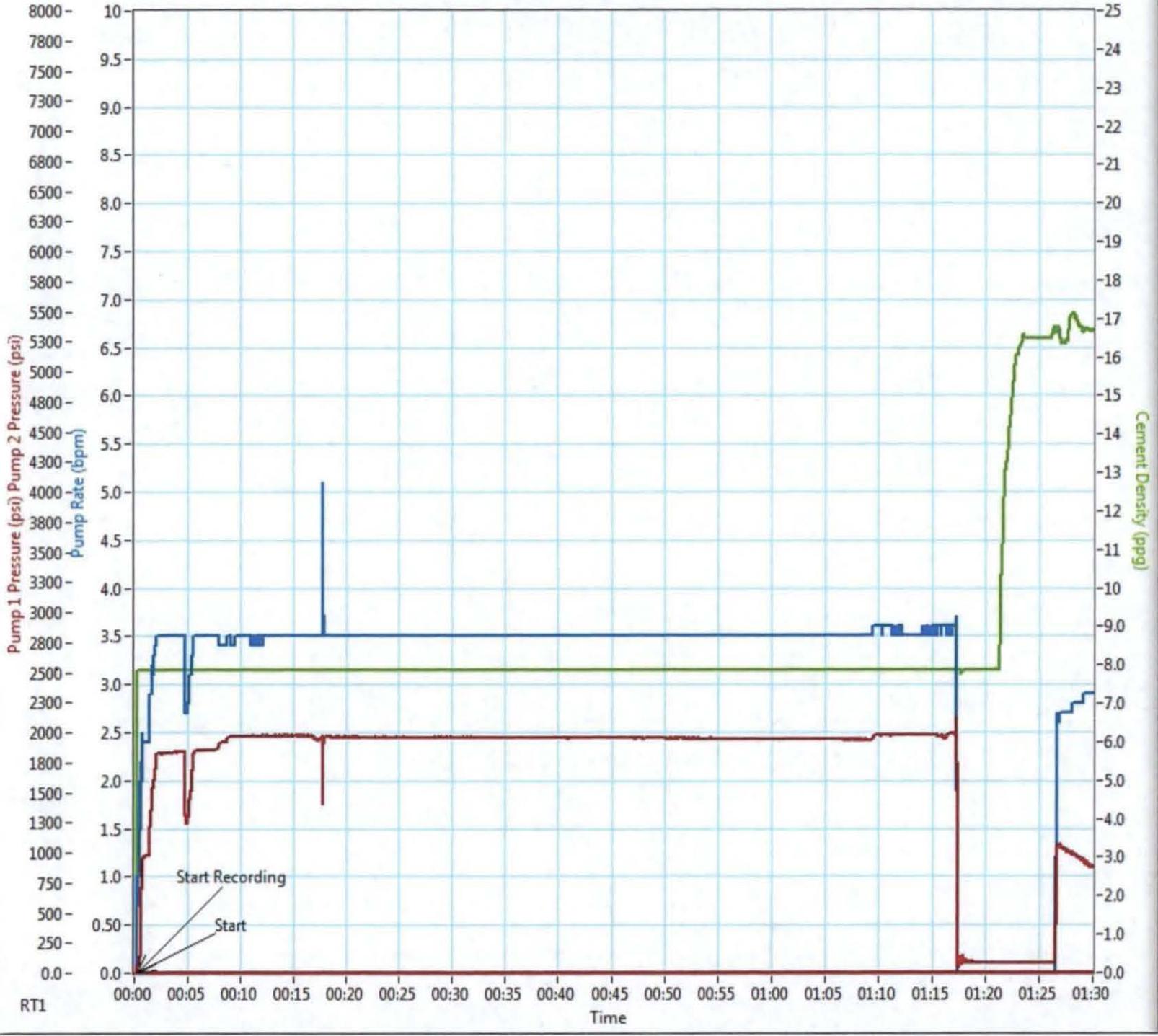
Balanced Plug 700' TO SURFACE - Recorded Time Plot 1 - 1 of 1

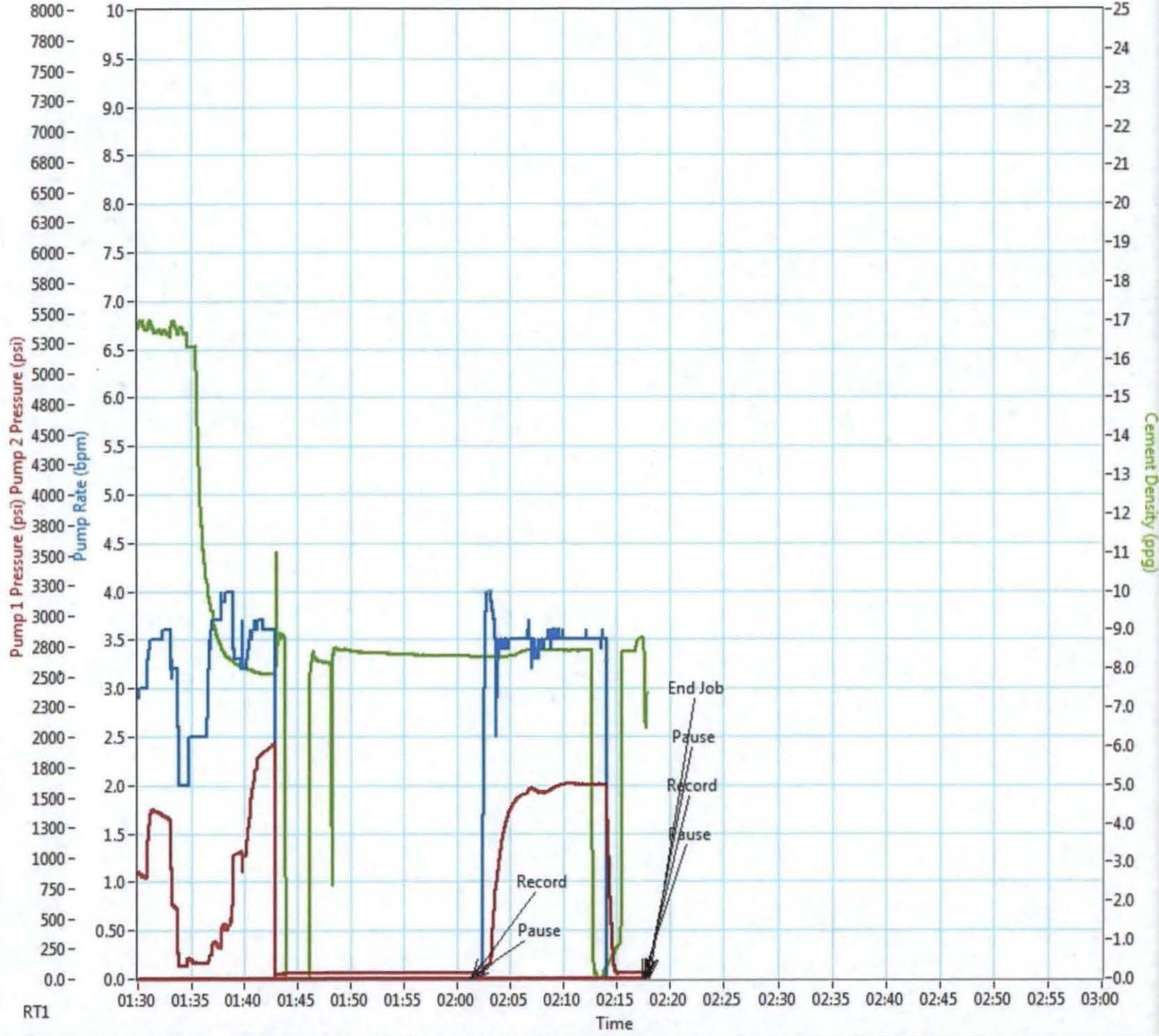


Balanced Plug 700' TO SURFACE - Recorded Time Plot 1 - 1 of 1

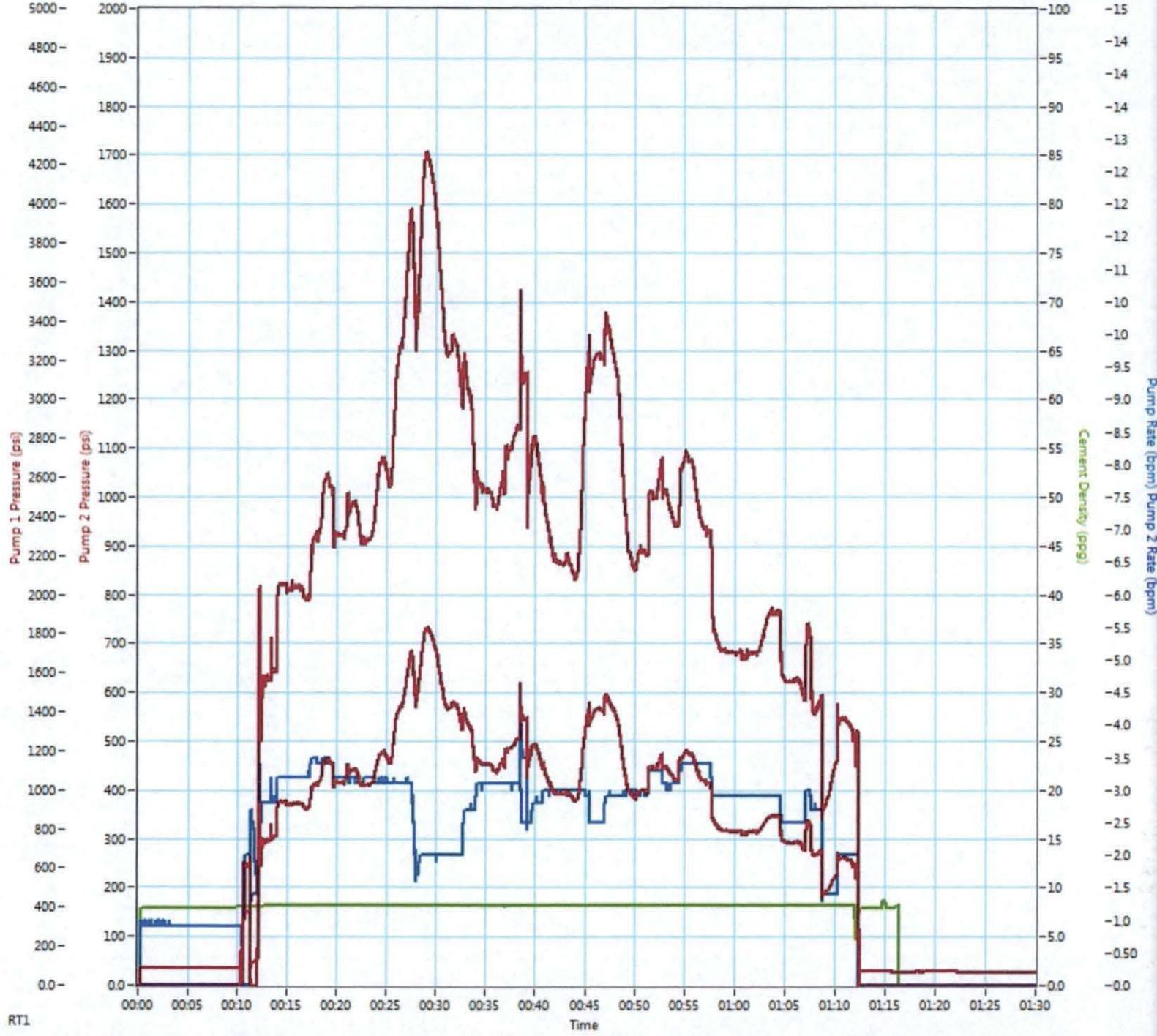
XXXXX-000001710-3101 / Mon, Oct 16, 2017

Page 7 of 10





Balanced Plug - Recorded Time Plot 1 - 1 of 3



GEL PLUG

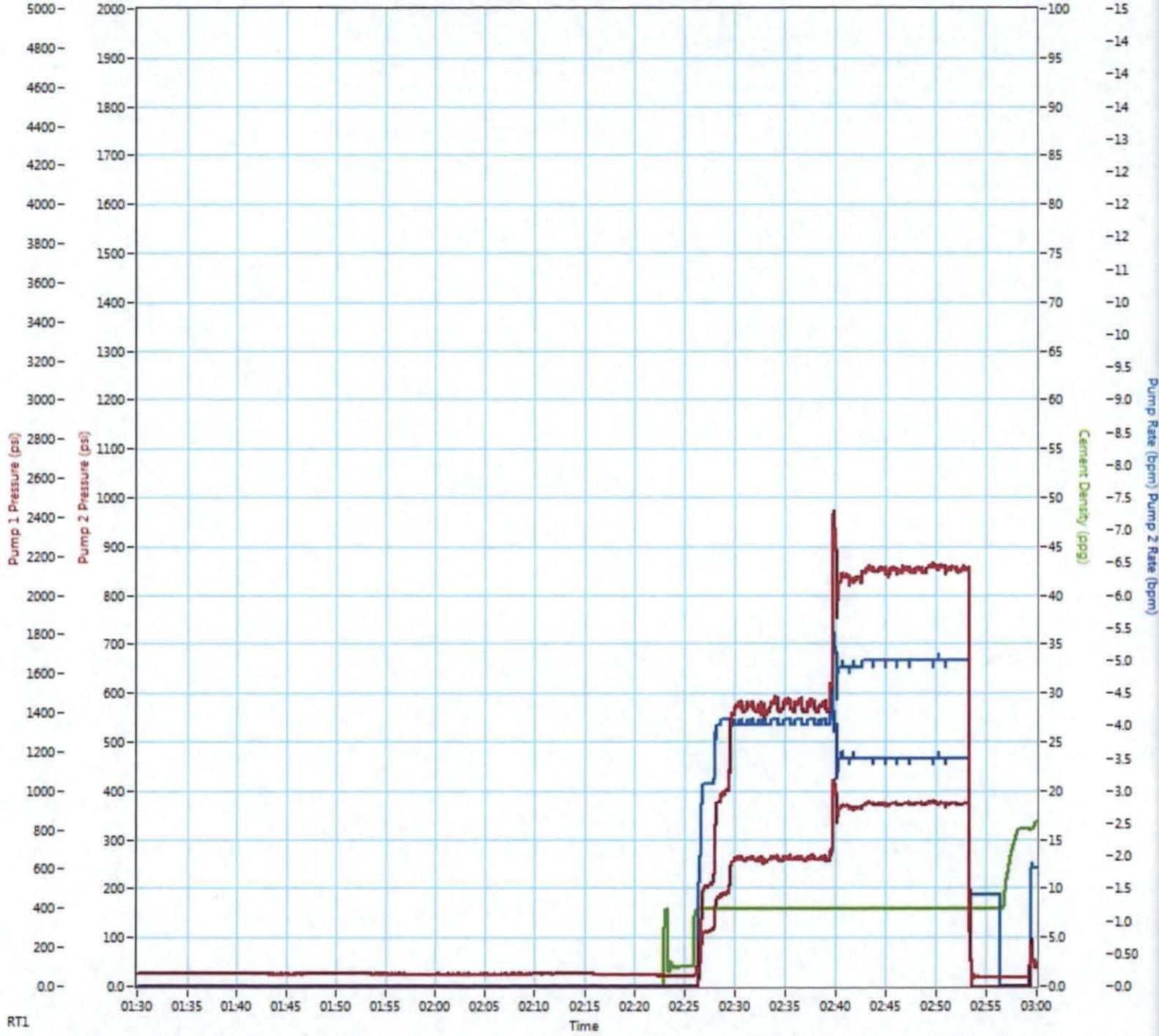
XXXXXX-000001710-0031 / Mon, Oct 16, 2017

Page 7 of 12

REX / NORTH STAR / Balance Plug Cement Job -

*Cement-Report*

Balanced Plug - Recorded Time Plot 1 - 2 of 3



CEMENT PLUG FROM 1,125' TO 925'

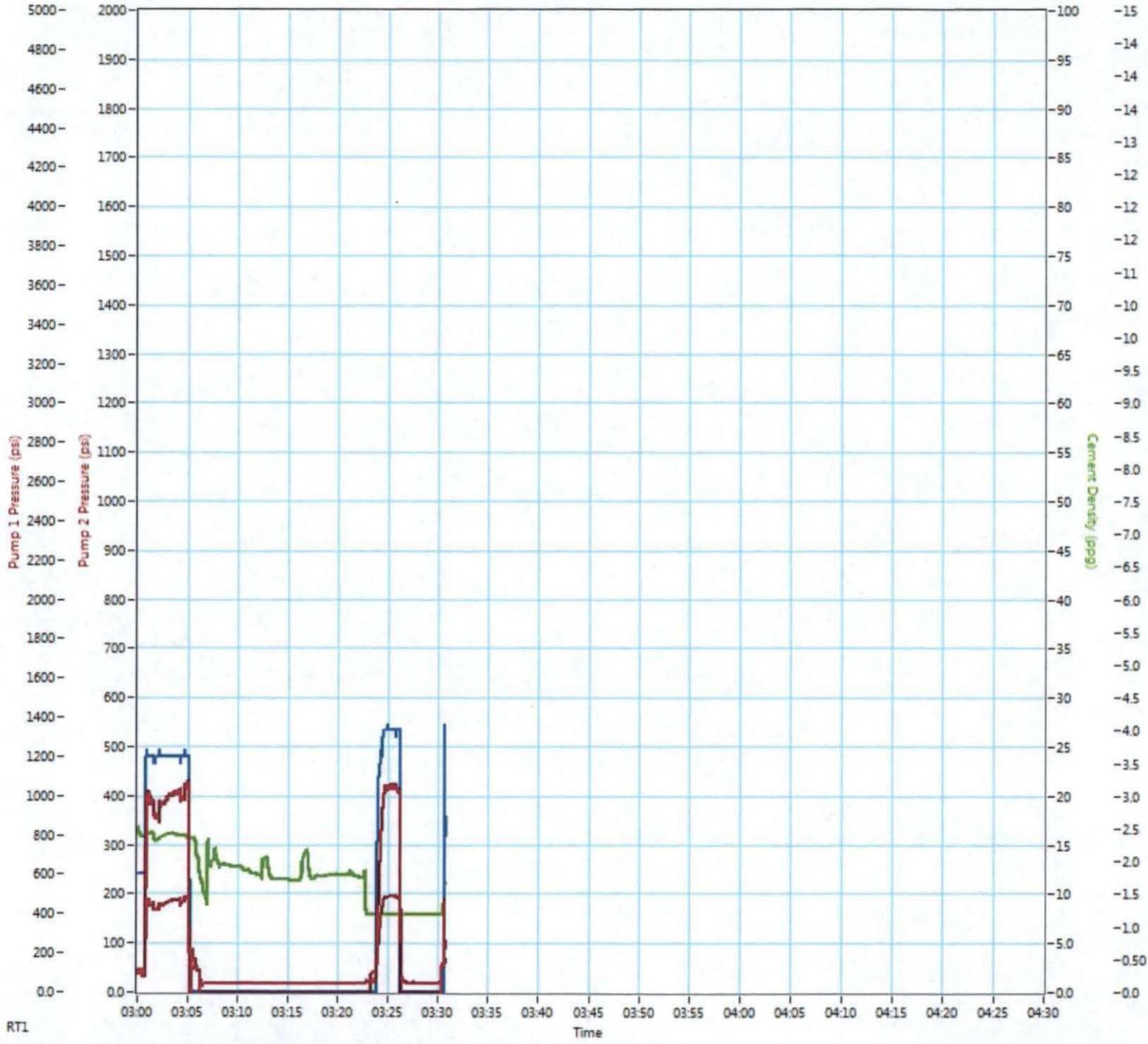
XXXXX-000001710-0031 / Mon, Oct 16, 2017

Page 8 of 12

REX / NORTH STAR / Balance Plug Cement Job -

Cement Report

Balanced Plug - Recorded Time Plot 1 - 3 of 3



CEMENT PLUG FROM 1,125' TO 925'

XXXXX-000001710-0031 / Mon, Oct 16, 2017

Page 9 of 12