

HALLIBURTON

iCem[®] Service

Post Job Report

ANADARKO PETROLEUM CORP - EBUS

For: Randy Case

Date: Wednesday, June 18, 2014

Howard# 3C-29HZ

Anadarko - Howard# 3C-29HZ - Surface

Sincerely,

Andrew Ashby

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Howard 3C-29HZ** cement **Surface** casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton [Brighton]

Job Times

	Date	Time	Time Zone
Requested Time On Location	6/18	04:30	MTN
Called Out	6/18	00:30	MTN
On Location	6/18	05:00	MTN
Job Started	6/18	07:00	MTN
Job Completed	6/18	13:30	MTN
Departed Location	6/18	15:00	MTN

1.2 Cementing Job Summary*The Road to Excellence Starts with Safety*

Sold To #: 300466		Ship To #: 3117331		Quote #:		Sales Order #: 0901433836				
Customer: ANADARKO PETROLEUM CORP - EBUS					Customer Rep: Randy Case					
Well Name: HOWARD			Well #: 3C-29 HZ			API/UWI #: 05-123-37868-00				
Field: WATTENBERG		City (SAP): LOCHBUIE		County/Parish: WELD			State: COLORADO			
Legal Description: SE NW-32-1N-67W-2439FNL-1835FWL										
Contractor:				Rig/Platform Name/Num: Majors 29						
Job BOM: 7521										
Well Type: HORIZONTAL GAS										
Sales Person: HALAMERICA\HX46524				Srv Supervisor: Andrew Ashby						
Job										
Formation Name										
Formation Depth (MD)		Top		Bottom						
Form Type					BHST					
Job depth MD		986ft			Job Depth TVD					
Water Depth					Wk Ht Above Floor					
Perforation Depth (MD)				To						
Well Data										
	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Casing		9.625	8.921	36		J-55	0	978.18		
Open Hole Section			13.5				0	986		
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	9.625					Top Plug	9.625	1	HES	
Float Shoe	9.625			978.18		Bottom Plug	9.625		HES	
Float Collar	9.625			938.05		SSR plug set	9.625		HES	
Insert Float	9.625					Plug Container	9.625	1	HES	
	9.625					Centralizers	9.625		HES	
Miscellaneous Materials										
Gelling Agt		Conc		Surfactant		Conc		Acid Type	Qty	
Treatment Fld		Conc				Conc		Sand Type		

Fluid Data

Stage/Plug #: 1

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	Mud Flush III (Powder)	Mud Flush III	12	bbl	8.4				
42 gal/bbl									

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	Lead Cement	SWIFTCM (TM) SYSTEM	371	sack	14.2	1.54		6	7.64

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Displacement	Displacement	72.5	bbl	8.3				

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
4	Top Out	HALCEM (TM) SYSTEM	50	sack	15.8	1.15		5	4.98
4.98 Gal									

ft In Pipe	Amount	42 ft		
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Comment

1.4 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	70
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	Water
3	Actual mud density	lb/gal	8.7
4	Actual mud Plastic Viscosity (PV)	cP	
5	Actual mud Yield Point (YP)	lb _f /100ft ²	
6	Actual mud 30 min Gel Strength	lb _f /100ft ²	
7	Time circulated before job	HH:MM	
8	Mud volume circulated	Bbls	
9	Rate at which well was circulated	Bpm	
10	Pipe movement during hole circulation	Y/N	N
11	Rig pressure while circulating	Psi	
12	Time from end mud circulation to start of job	HH:MM	
13	Pipe movement during cementing	Y/N	N
14	Calculated displacement	Bbls	72.5
15	Job displaced by	Rig/HES	HES
16	Annular flow before job	Y/N	
17	Annular flow after job	Y/N	
18	Length of rat hole	Ft	7.82
19	Units of gas detected while circulating	Units	
20	Was lost circulation experienced at any time?	Y/N	

1.5 Water Field Test

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	145	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	< 600	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness		ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium		ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH ≥ 8.3).
Bicarbonates		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium		ppm	5000 ppm	High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides)
Iron	10	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	57.9	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

Submitted Respectfully by: _____

1.6 Job Event Log

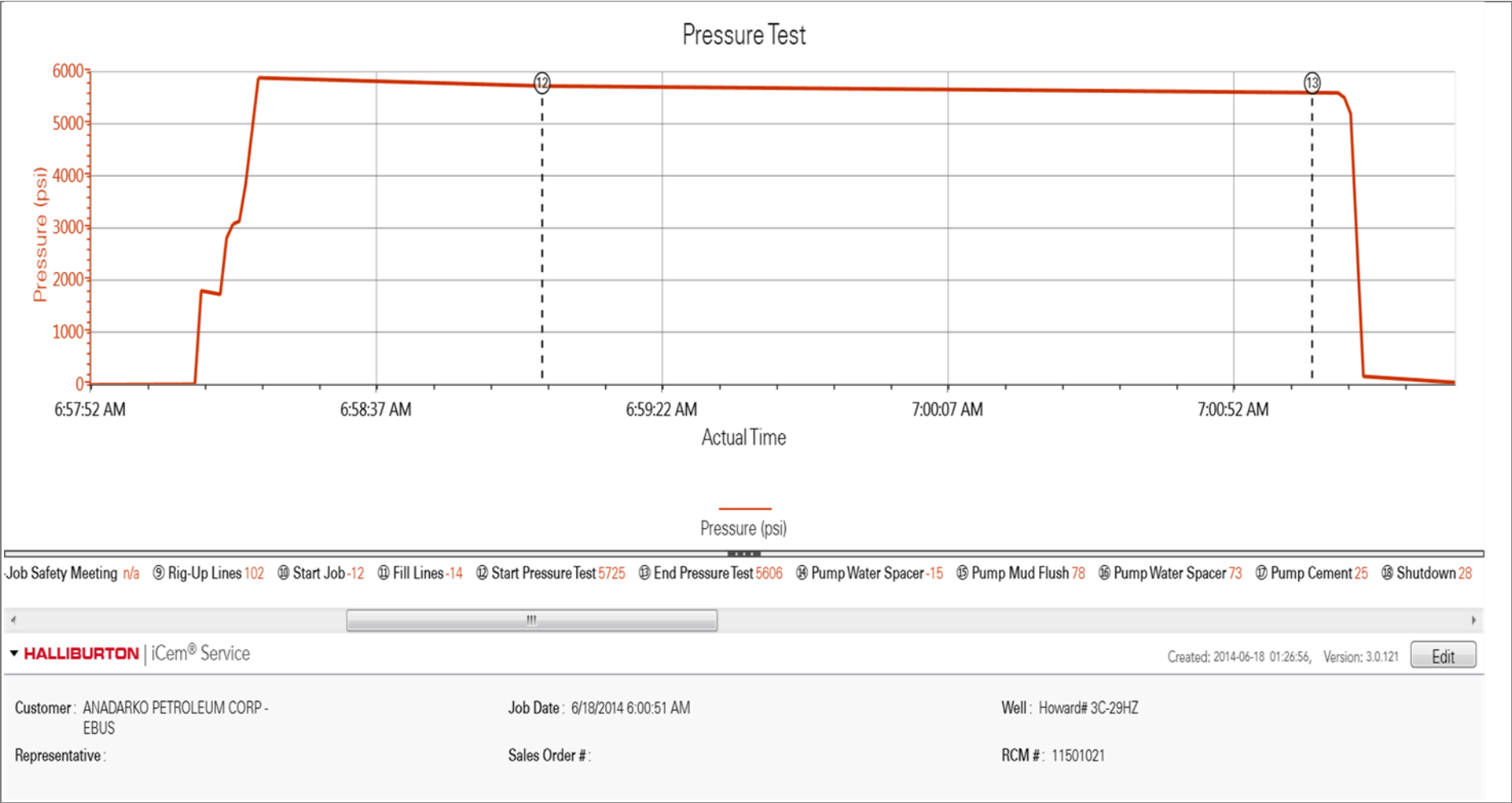
Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Pressure (psi)	Density (ppg)	Rate (bbl/min)	Pump Stage Total (bbl)	Comment
Event	1	Call Out	Call Out	6/18/2014	00:30:00	USER					Crew called out for job - on location @ 04:30
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	6/18/2014	03:30:00	USER					Met w/crew to discuss travel to location.
Event	3	Depart from Service Center or Other Site	Depart from Service Center	6/18/2014	04:30:00	USER					Gate checks and headed out.
Event	4	Arrive At Loc	Arrive At Loc	6/18/2014	05:00:00	USER					Arrived at location, signed in at entrance.
Event	5	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	6/18/2014	05:05:00	USER					Checked out the location for materials and layout for equipment.
Event	6	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	6/18/2014	05:15:00	USER					Met w/crew to discuss rigging up and the safety and hazards involved.
Event	7	Rig-Up Equipment	Rig-Up Equipment	6/18/2014	05:20:00	USER					Rig everything up.
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	6/18/2014	06:00:00	USER					Met w/crew, Co. Rep., and rig crew to discuss the job procedure and the hazards involved.
Event	9	Rig-up Lines	Rig-Up Lines	6/18/2014	06:15:00	USER	102.00	0.55	0.00	0.0	Finish rigging up floor, loaded the plug container - witnessed by Co. Rep.
Event	10	Start Job	Start Job	6/18/2014	06:35:00	COM13	-12.00	9.07	0.00	7.3	
Event	11	Other	Fill Lines	6/18/2014	06:40:30	COM13	-14.00	0.64	0.00	7.3	Fill lines w/3 bbls of water to test lines
Event	12	Test Lines	Start Pressure Test	6/18/2014	06:59:04	COM13	5725.00	8.45	0.00	3.0	Pressure Test lines to 5000 psi
Event	13	Test Lines	End Pressure Test	6/18/2014	07:01:05	USER	5606.00	8.49	0.00	3.0	
Event	14	Pump Spacer 1	Pump Water Spacer	6/18/2014	07:05:42	COM13	-15.00	8.30	0.00	0.0	10 bbls Water Spacer
Event	15	Pump Spacer 2	Pump Mud Flush	6/18/2014	07:09:21	COM13	78.00	8.32	4.00	10.5	12 bbls Mud Flush III
Event	16	Pump Spacer 1	Pump Water Spacer	6/18/2014	07:12:05	COM13	73.00	8.30	4.00	10.9	10 bbls Water Spacer

Event	17	Pump Cement	Pump Cement	6/18/2014	07:17:32	COM13	25.00	9.60	2.00	11.4	371 sks SwiftCem @ 14.2 lbm/gal, 1.54 cuft/sk, 7.64 gal/sk
Event	18	Shutdown	Shutdown	6/18/2014	07:39:25	COM13	28.00	14.22	2.20	78.9	Used 2880 gal mix water.
Event	19	Drop Plug	Drop Plug	6/18/2014	07:54:34	COM13	-18.00	0.12	0.00	79.0	Witnessed by Co. Rep.
Event	20	Pump Displacement	Pump Displacement	6/18/2014	07:55:24	COM13	-18.00	0.12	0.00	79.0	72.5 bbls calculated displacement - getting good returns
Event	21	Other	Other	6/18/2014	08:10:42	USER	462.00	8.34	3.00	67.3	Final circulating pressure
Event	22	Bump Plug	Bump Plug	6/18/2014	08:10:59	COM13	1966.00	8.31	0.00	67.9	Bump plug up to 1200 psi per Co Rep.
Event	23	Bleed Casing	Bleed Casing	6/18/2014	08:11:25	USER	2009.00	8.31	0.00	67.9	Bleed pressure off to re-bump plug per Co. Rep.
Event	24	Bump Plug	Re-Bump Plug	6/18/2014	08:13:53	USER	1220.00	8.30	0.00	71.3	Re-bump plug at 1200 psi per Co. Rep.
Event	25	Other	Check Floats	6/18/2014	08:16:52	COM13	909.00	8.29	0.00	71.3	Floats held - 10 bbls spacer to surface - no cement to surface.
Event	26	Other	Other	6/18/2014	11:33:50	COM13	-27.00	8.13	0.00		
Event	27	Prime Pumps	Prime Pumps	6/18/2014	11:43:02	COM13	-25.00	8.26	0.00		
Event	28	Other	Pump water	6/18/2014	12:46:58	COM13	-34.00	4.30	1.10	0.1	2 bbls water to break circulation and ensure we can pump through the 1" pipe.
Event	29	Shutdown	Shutdown / Mix CaCl	6/18/2014	12:47:54	USER	36.00	8.09	2.00	1.7	Mix CaCl into mix water - get final volumes from Co. Rep.
Event	30	Mix Cement	Mix Cement	6/18/2014	13:05:00	USER	-41.00	8.10	0.00	2.0	Mix 50 sks cement.
Event	31	Pump Cap Cement	Pump Cap Cement	6/18/2014	13:14:07	USER	66.00	12.18	2.00	0.7	50 sks TopOut @ 15.8 lbm/gal, 1.15 cuft/sk, 5.00 gal/sk
Event	32	Shutdown	Shutdown / Finish mixing cement	6/18/2014	13:18:39	USER	63.00	11.50	0.00	9.4	mix the rest of the 50 sks - Seeing good cement to surface.
Event	33	Pump Cap Cement	Pump Cap Cement	6/18/2014	13:21:32	USER	7.00	8.24	1.10	9.4	Pump the last of the cap cement.

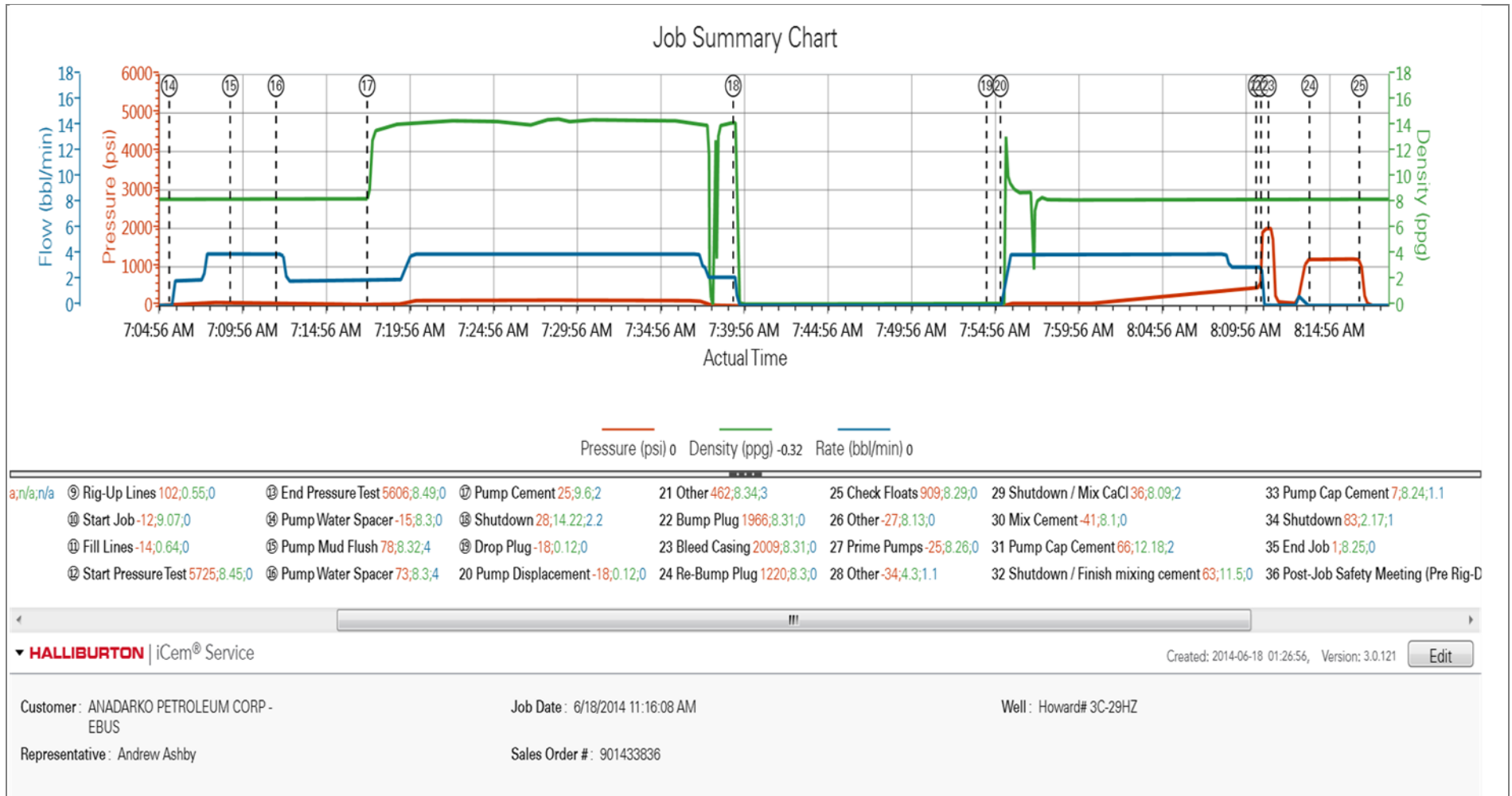
Event	34	Shutdown	Shutdown	6/18/2014	13:22:15	COM13	83.00	2.17	1.00	10.7	
Event	35	End Job	End Job	6/18/2014	13:30:00	USER	1.00	8.25	0.00	12.4	Job Complete, rig it all down.
Event	36	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	6/18/2014	13:35:00	USER	28.00	9.71	3.00	17.7	Met w/crew to discuss the safety and hazards or rigging down.
Event	37	Rig-Down Equipment	Rig-Down Equipment	6/18/2014	13:40:00	USER	32.00	8.10	3.10	32.7	Blow down the lines, and rig it all down.
Event	38	Depart Location	Depart Location	6/18/2014	14:50:00	USER					Thanks for using Halliburton!!!
Event	39	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	6/18/2014	15:00:00	USER					Met w/crew to discuss travel home.

2.0 Attachments

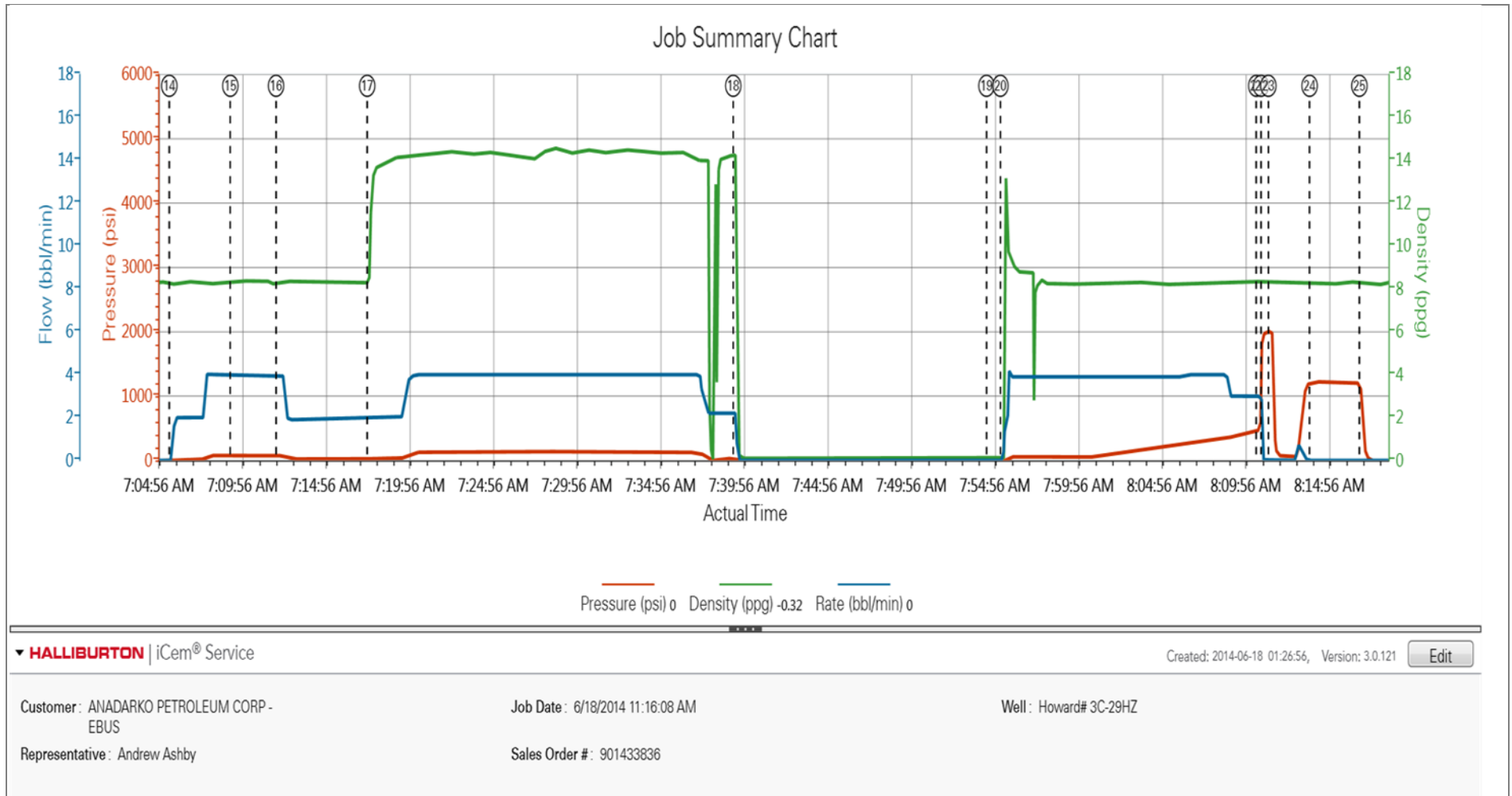
2.1 Anadarko - Howard# 3C-29HZ - Surface-Pressure Test.png



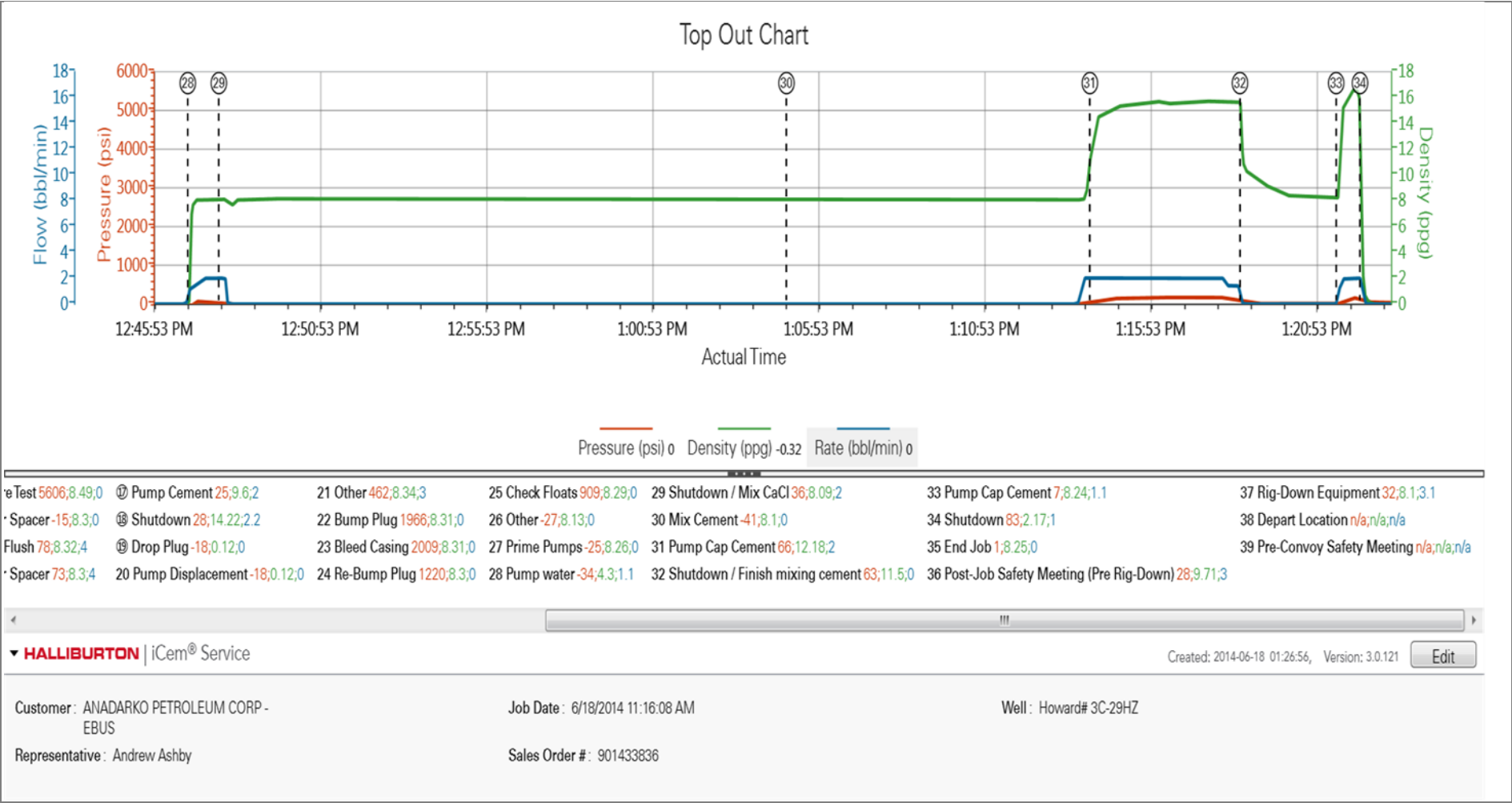
2.2 Anadarko - Howard# 3C-29HZ - Surface-Job Summary.png



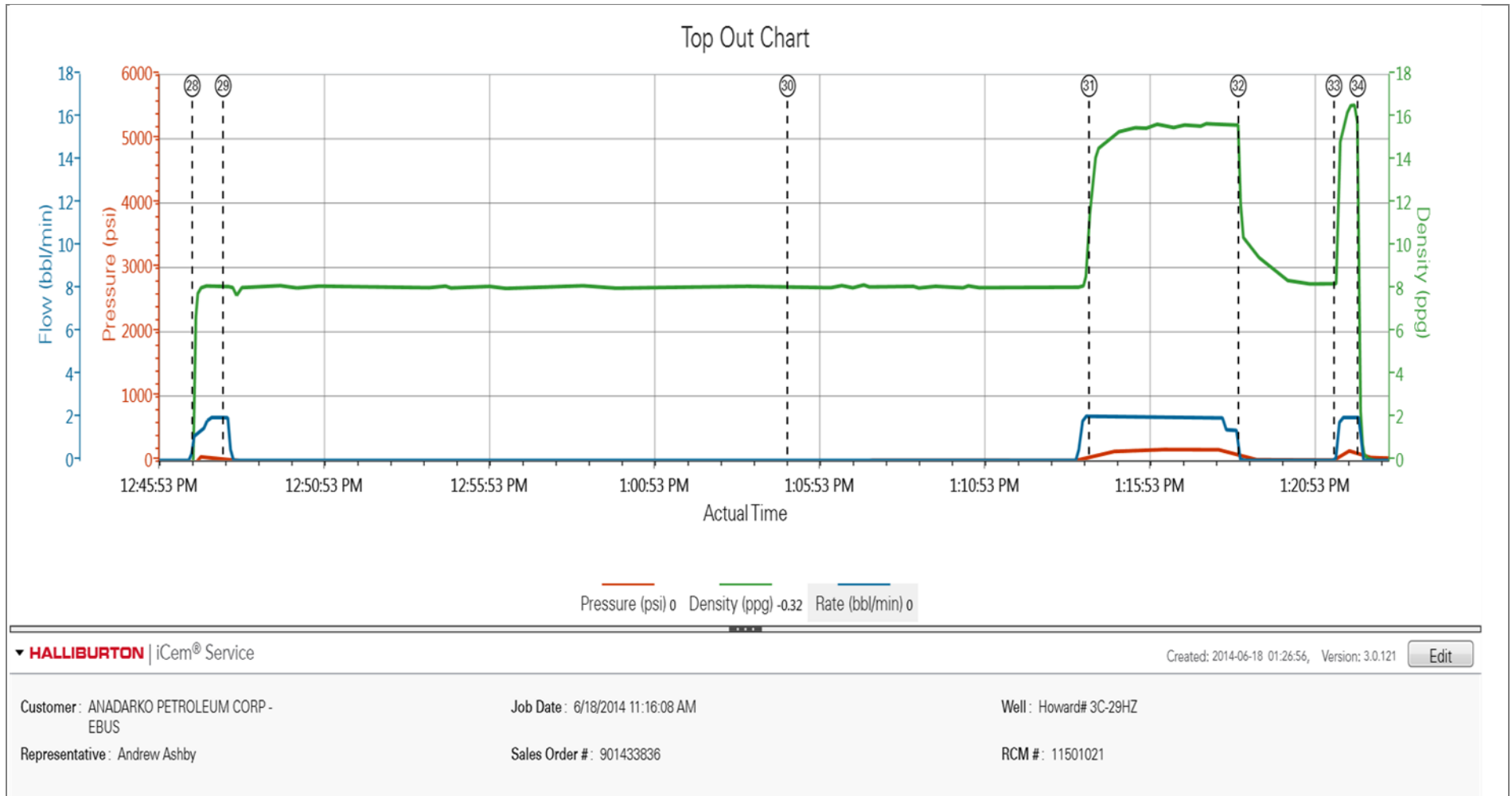
2.3 Anadarko - Howard# 3C-29HZ - Surface-Job Summary NE.png



2.4 Anadarko - Howard# 3C-29HZ - Surface-Top Out.png

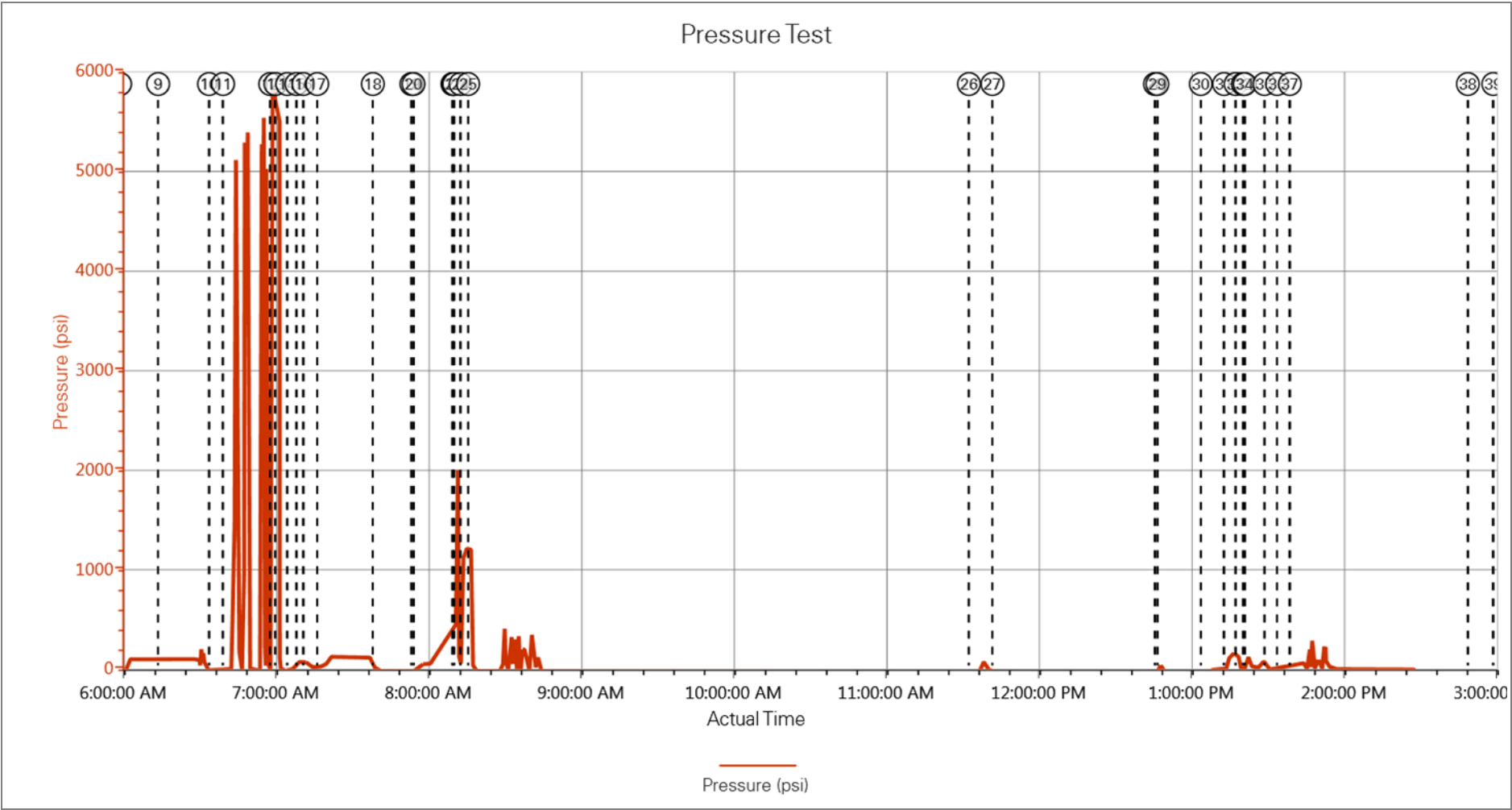


2.5 Anadarko - Howard# 3C-29HZ - Surface-Top Out NE.png

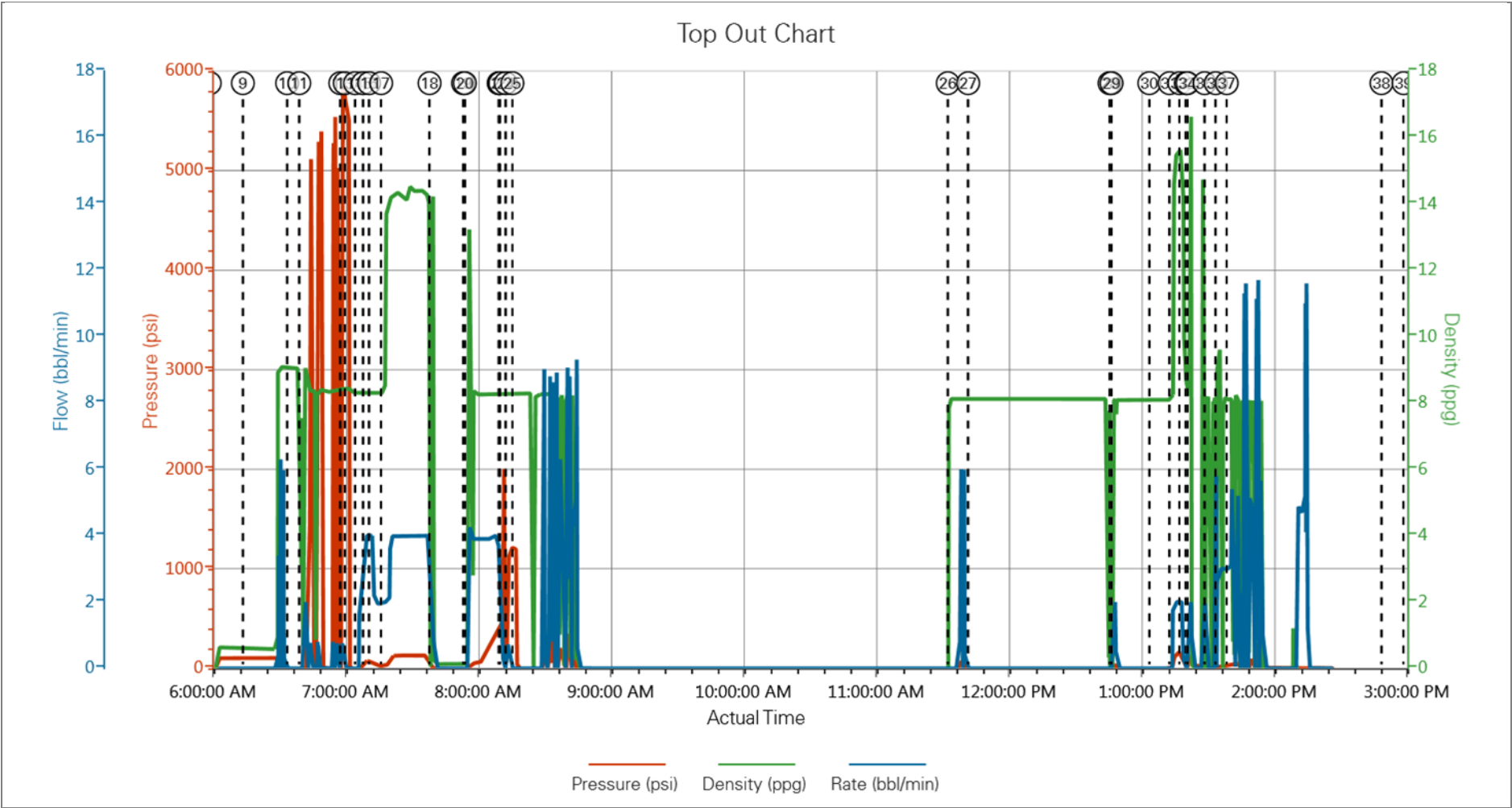


3.0 Custom Graphs

3.1 Custom Graph



3.2 Custom Graph



4.0 Appendix

Insert Planned Pump Schedule from Proposal or actual Job Procedure built for job