

# HALLIBURTON

iCem<sup>®</sup> Service

## **SYNERGY OIL & GAS LP**

**For: Brandon Lorenz**

Date: Tuesday, May 12, 2015

**SRC Cannon K-16CHZ**

Intermediate

Job Date: Monday, May 11, 2015

Sincerely,

Derek Trier

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## Table of Contents

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1.0	Cementing Job Summary .....	4
1.1	Executive Summary .....	4
1.2	Planned Pumping Schedule .....	7
1.3	Job Overview .....	8
1.4	Water Field Test.....	9
2.0	Real-Time Job Summary .....	10
2.1	Job Event Log .....	10
3.0	Attachments.....	12
3.1	SYNERGY SRC CANNON K-16CHZ-Custom Results.png.....	12
3.2	SYNERGY SRC CANNON K-16CHZ-Custom Results (1).png .....	13

## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **SRC Cannon K-16CHZ** cement **Intermediate** 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 [Ft. Lupton]**

#### Job Times

	Date	Time	Time Zone
Called Out Time:	5/11/2015	0800	MTN
Arrived On Location At:		1200	
Job Started At:		1230	
Job Completed At:		1500	
Departed Location At:		1600	



## Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 359915		Ship To #: 3630452		Quote #:		Sales Order #: 0902395620					
Customer: SYNERGY RESOURCES CORPORATION				Customer Rep: KEVIN							
Well Name: SRC CANNON				Well #: K-16CHZ		API/UWI #: 05-123-40786-00					
Field: WATTENBERG		City (SAP): BERTHOUD		County/Parish: WELD		State: COLORADO					
Legal Description: SE SE-16-4N-68W-1241FSL-280FEL											
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 131							
Job BOM: 7522											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HB29087					Srcv Supervisor: Joseph Fantasia						
Job											
Formation Name											
Formation Depth (MD)		Top			Bottom						
Form Type				BHST							
Job depth MD		7183ft		Job Depth TVD		6543					
Water Depth				Wk Ht Above Floor		5					
Perforation Depth (MD)		From			To						
Well Data											
Description	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			0	586	0	0	
Casing		7	6.276	26		P-110	0	7183	0	0	
Open Hole Section			8.75				586	7198	0	0	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make			
Guide Shoe	7			7183	Top Plug	7		HES			
Float Shoe	7				Bottom Plug	7		HES			
Float Collar	7				SSR plug set	7		HES			
Insert Float	7				Plug Container	7		HES			
Stage Tool	7				Centralizers	7		HES			
Miscellaneous Materials											
Gelling Agt		Conc		Surfactant		Conc		Acid Type		Qty	Conc
Treatment Fld		Conc		Inhibitor		Conc		Sand Type		Size	Qty
Fluid Data											
Stage/Plug #: 1											
Fluid #	Stage Type	Fluid Name			Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
Fluid #	Stage Type	Fluid Name			Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	WATER	WATER WITH DYE			10	bbl	11.5	3.86			

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*Cementing Job Summary*

2	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	20	bbl	11.5	3.86			
36 gal/bbl		FRESH WATER							
145.18 lbm/bbl		BARITE, BULK (100003681)							
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>	<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
3	ElastiCem B2	ELASTICEM (TM) SYSTEM	800	sack	13.8	1.6		6	7.09
0.25 %		HR-5, 50 LB SK (100005050)							
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>	<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
4	Displacement	Displacement	264	bbl	10.6				
<b>Cement Left In Pipe</b>	<b>Amount</b>	<b>ft</b>	<b>Reason</b>				<b>Shoe Joint</b>		
<b>Comment APPROX 3 BBLs CEMENT TO SURFACE</b>									

## 1.2 Planned Pumping Schedule

Customer: SYNERGY  
 Well Name/ Number: SRC CANNON  
 Job Type: INTERMEDIATE  
 SO#: ENSIGN 131

# Pump Schedule

Event	Pressure (psi)	Rate (bpm)	Volume (bbl)	Sacks	Density (ppg)	Yield (ft <sup>3</sup> /sk)	WR (gal/sk)
START JOB							
FILL LINES							
PRESSURE TEST	4000	1	2		8.33		
SW SPACER	400	5	10		8.33		
TUNED SPACER	400	4.4	20		11.5	3.86	
CEMENT	640	8	228	800	13.8	4.6	7.09
DROP TOP PLUG							
DISPLACEMENT	1400	8	264		10.6		
SLOW RATE	1800	3			10.6		
BUMP PLUG	1672	3	264		10.6		
CHECK FLOATS							
END JOB							

## 1.3 Job Overview

		<b>Units</b>	<b>Description</b>
1	Surface temperature at time of job	°F	60
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	10.6
4	Time circulated before job	HH:MM	100
5	Mud volume circulated	bbls	480
6	Rate at which well was circulated	bpm	8
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	psi	750
9	Time from end mud circulation to start of job	HH:MM	0:15
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	bbls	264
12	Job displaced by	Rig/HES	HES
13	Annular flow before job	Y/N	N
14	Annular flow after job	Y/N	N
15	Length of rat hole	ft	15
16	Units of gas detected while circulating	units	0
17	Was lost circulation experienced at any time?	Y/N	N

## 1.4 Water Field Test

Item	Recorded Value	Units	Max Acceptable Limit	Potential Problems in Exceeding Limit
pH	7.5	-	6.0-8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	<200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	350	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	0	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	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	55	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

## 2.0 Real-Time Job Summary

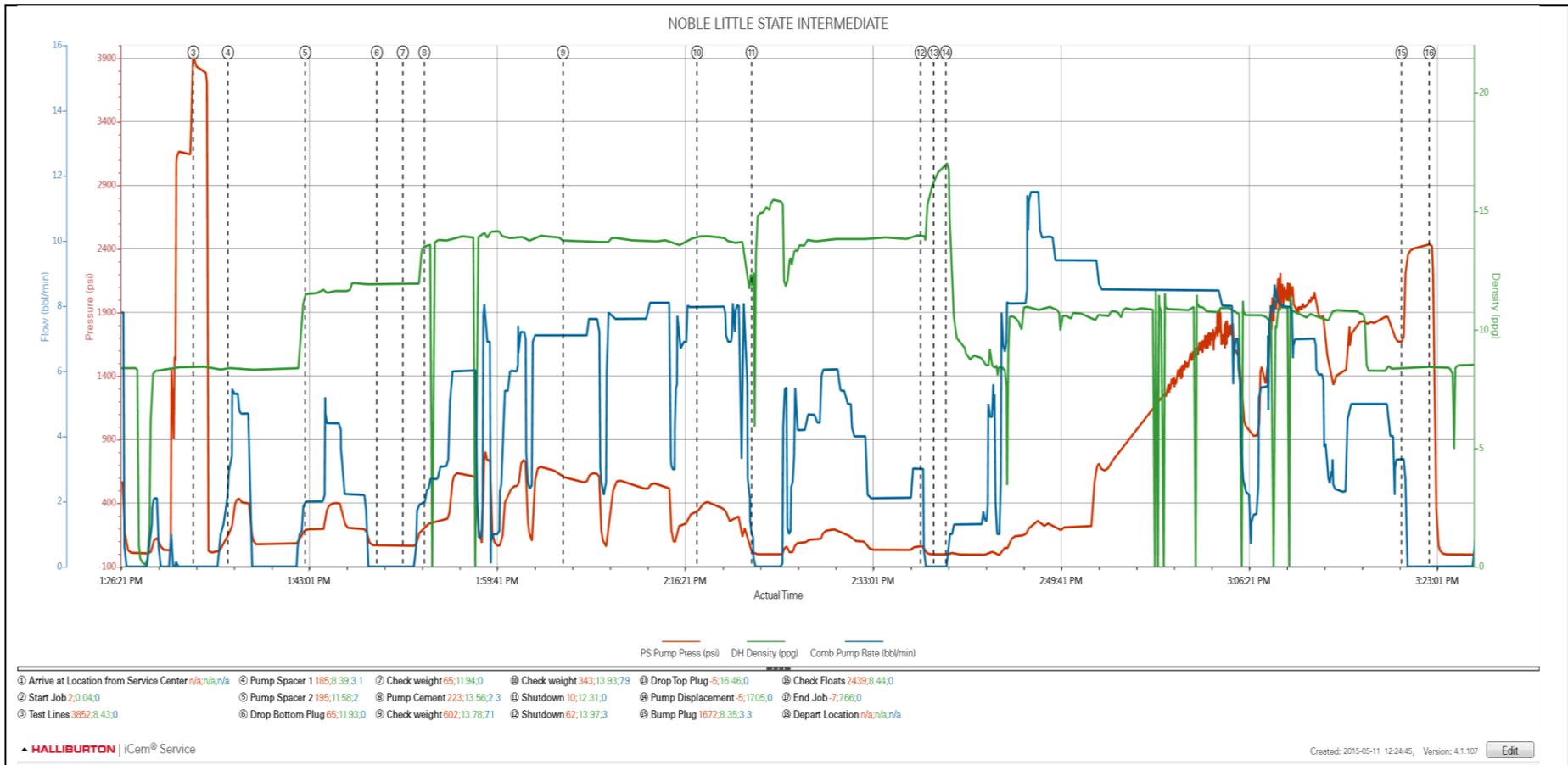
### 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Comments
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	5/11/2015	12:30:00	USER				ARRIVE AT LOCATION. RIG ON BOTTOM CIRCULATING. HELD SITE ASSESSMENT AND PRE RIG UP SAFETY MEETING WITH CREW PRIOR TO RIGGING UP EQUIPMENT.
Event	2	Start Job	Start Job	5/11/2015	13:18:25	COM5				HELD PRE JOB SAFETY MEETING WITH ALL PRESENT PERSONELL PRIOR TO JOB.
Event	3	Test Lines	Test Lines	5/11/2015	13:32:55	USER	3852.00	8.43	0.00	PRESSURE TEST LINES TO 4000 PSI.
Event	4	Pump Spacer 1	Pump Spacer 1	5/11/2015	13:35:59	COM5	185.00	8.39	3.10	PUMP 10 BBLS WATER WITH 2 LBS RED DYE ADDED.
Event	5	Pump Spacer 2	Pump Spacer 2	5/11/2015	13:42:50	COM5	195.00	11.58	2.00	PUMP 20 BBLS TUNED SPACER MIXED AT 11.5 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE.
Event	6	Drop Bottom Plug	Drop Bottom Plug	5/11/2015	13:49:10	COM5				BOTTOM PLUG PRELOADED AND DROPPED AFTER TUNED SPACER. WITNESSED BY CUSTOMER.
Event	7	Check Weight	Check weight	5/11/2015	13:51:29	COM5	65.00	11.55	0.00	SCALE SLURRY
Event	8	Pump Cement	Pump Cement	5/11/2015	13:53:24	USER	223.00	13.8	2.30	PUMP 228 BBLS (800 SKS) ELASTICEM MIXED AT 13.8 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE.
Event	9	Check Weight	Check weight	5/11/2015	14:05:42	COM5	602.00	13.78	7.10	SCALE SLURRY
Event	10	Check Weight	Check weight	5/11/2015	14:17:34	COM5	343.00	13.93	7.90	SCALE SLURRY
Event	11	Shutdown	Shutdown	5/11/2015	14:22:24	USER				SHUTDOWN TO GET BUILD PRESSURE ON BULK TRUCK.
Event	12	Shutdown	Shutdown	5/11/2015	14:37:22	COM5				
Event	13	Drop Top Plug	Drop Top Plug	5/11/2015	14:38:33	COM5				TOP PLUG PRE LOADED. DROPPED DURING

										SHUTDOWN. WITNESSED BY CUSTOMER.
Event	14	Pump Displacement	Pump Displacement	5/11/2015	14:39:38	COM5	900.00	17.05	0.00	PUMP 264 BBLS DISPLACEMENT. 244 BBLS MUD AND 20 BBLS WATER TO FINISH. GOOD RETURNS THROUGHOUT. CEMENT TO SURFACE AT 261 BBLS AWAY. APPROX 3 BBLS CEMENT TO SURFACE.
Event	15	Bump Plug	Bump Plug	5/11/2015	15:20:01	COM5	1672.00	8.35	3.30	PLUG LANDED AT 1672 PSI. PRESSURE BROUGHT TO 2200 PSI AND HELD 3 MIN.
Event	16	Check Floats	Check Floats	5/11/2015	15:22:28	USER	2439.00	8.44	0.00	FLOATS HELD 2 BBLS BACK.
Event	17	End Job	End Job	5/11/2015	15:35:17	COM5				HELD PRE RIG DOWN SAFETY MEETING WITH CREW PRIOR TO RIGGING DOWN EQUIPMENT.
Event	18	Depart Location	Depart Location	5/11/2015	16:00:00	USER				JOURNEY MGMNT PRIOR TO LEAVING LOCATION.

## 3.0 Attachments

### 3.1 SYNERGY SRC CANNON K-16CHZ-Custom Results.png



3.2 SYNERGY SRC CANNON K-16CHZ-Custom Results (1).png

