

# HALLIBURTON

iCem<sup>®</sup> Service

## Post Job Report

**ENSIGN UNITED STATES DRILLING**

Date: Thursday, August 07, 2014

**SRC KIEHN 32-4NHZ**

Surface

Sincerely,  
**Justin Lansdale**

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## 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **SRC KIEHN 32-4NHZ 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 [Fort Lupton]

### Job Times

	Date	Time	Time Zone
<b>Requested Time On Location</b>	8/7	19:00	
<b>Called Out</b>	8/7	17:15	
<b>On Location</b>	8/7	19:10	
<b>Job Started</b>	8/7	21:15	
<b>Job Completed</b>	8/7	21:00	
<b>Departed Location</b>	8/8	00:00	

1.2 Cementing Job Summary

The Road to Excellence Starts with Safety

<b>Sold To #:</b> 301256		<b>Ship To #:</b> 3542584		<b>Quote #:</b>		<b>Sales Order #:</b> 0901569374	
<b>Customer:</b> ENSIGN UNITED STATES DRILLING				<b>Customer Rep:</b> Daniel Batchelor			
<b>Well Name:</b> SRC KIEHN			<b>Well #:</b> 32-4NHZ			<b>API/UWI #:</b> 05-123-39712-00	
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> JOHNSTOWN		<b>County/Parish:</b> WELD		<b>State:</b> COLORADO	
<b>Legal Description:</b> SW SE-4-4N-68W-201FSL-1718FEL							
<b>Contractor:</b> ENSIGN DRLG				<b>Rig/Platform Name/Num:</b> ENSIGN 131			
<b>Job BOM:</b> 7521							
<b>Well Type:</b> HORIZONTAL OIL							
<b>Sales Person:</b> HALAMERICA\HX38199				<b>Srvc Supervisor:</b> Steven Markovich			

**Job**

<b>Formation Name</b>			
<b>Formation Depth (MD)</b>	<b>Top</b>		<b>Bottom</b>
<b>Form Type</b>			<b>BHST</b>
<b>Job depth MD</b>	560ft		<b>Job Depth TVD</b>
<b>Water Depth</b>			<b>Wk Ht Above Floor</b>
<b>Perforation Depth (MD)</b>			<b>To</b>

**Well Data**

	<b>New / Used</b>	<b>Size in</b>	<b>ID in</b>	<b>Weight lbm/ft</b>	<b>Thread</b>	<b>Grade</b>	<b>Top MD ft</b>	<b>Bottom MD ft</b>	<b>Top TVD ft</b>	<b>Bottom TVD ft</b>
Casing		9.625	8.921	36			0	560		560

**Fluid Data**

<b>Stage/Plug #: 1</b>										
<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 ft<sup>3</sup>/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>	
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 <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	SwiftCem B2	SWIFTCEM (TM) SYSTEM	187	sack	13.4	1.79		6	9.48
94 lbm		<b>K (101439798)</b>							
9.48 Gal									
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Displacement	Displacement	40	bbl	9				
		<b>Amount</b>							
<b>Comment</b> 13bbbls of cement to surface									

### 1.3 Planned Pumping Schedule

Description	Stage No.	Density (ppg)	Rate (bbl/min)	Yield (ft <sup>3</sup> /sack)	Water Req. (gal/sack)	Volume (bbl)	Bulk Cement (sacks)	Duration (min)
Synergy Surface Mud	1	10.00	5.00			0.00		0.00
Mud Flush	2	8.40	5.00			12.00		2.40
Synergy 13.4 ppg SwiftCem	3	13.40	5.00	1.7875	9.486	59.53	187.00	11.91
Top Plug/Start Displacement								
Synergy Surface Mud	4-1	10.00	6.00			35.00		5.83
Synergy Surface Mud	4-2	10.00	2.00			5.05		2.52
<b>Total:</b>						<b>111.58</b>		<b>22.66</b>

\*Pump schedule may include additional rows for displacement if "Automatic Rate Adjustment" was enabled and ECDs approached the fracture gradient.

### 1.4 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	70
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	9.6
4	Actual mud Plastic Viscosity (PV)	cP	
5	Actual mud Yield Point (YP)	lb <sub>f</sub> /100ft <sup>2</sup>	
6	Actual mud 30 min Gel Strength	lb <sub>f</sub> /100ft <sup>2</sup>	
7	Time circulated before job	HH:MM	01:00
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	00:05
13	Pipe movement during cementing	Y/N	N
14	Calculated displacement	Bbls	40
15	Job displaced by	Rig/HES	HES
16	Annular flow before job	Y/N	N
17	Annular flow after job	Y/N	N
18	Length of rat hole	Ft	
19	Units of gas detected while circulating	Units	
20	Was lost circulation experienced at any time?	Y/N	N

**Lost Circulation Details**

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## 1.5 Water Field Test

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Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	6	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	<3000	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	<1500	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	<500	ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium	<500	ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity	<1000	ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH ≥ 8.3).
Bicarbonates	<1000	ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium	<5000	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	<300	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	68	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

***Submitted Respectfully by: Steven Markovich***

## 1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	PS Pump Press (psi)	PS Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comment
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	8/7/2014	19:10:00	USER					Arrived on location rig still running casing approx 3 joints
Event	2	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	8/7/2014	19:15:00	USER					JSA and Hazard hunt with HES crew
Event	3	Rig-Up Equipment	Rig-Up Equipment	8/7/2014	19:20:00	USER					Rigged up HES lines and equipment
Event	4	Safety Meeting - Pre Job	Safety Meeting - Pre Job	8/7/2014	21:00:00	USER	-1.20	12.00	0.00	0.0	JSA with HES and rig crew on job procedure
Event	5	Start Job	Start Job	8/7/2014	21:15:20	COM6	12.78	18.00	0.00	9.9	
Event	6	Test Lines	Test Lines	8/7/2014	21:24:15	COM6	11.34	3169.00	0.00	12.3	Test lines to 2500psi
Event	7	Pump Spacer 1	Pump Spacer 1	8/7/2014	21:28:50	COM6	11.26	20.00	0.00	0.0	Pump 12bbls of Mud Flush with Dye in it
Event	8	Pump Cement	Pump Cement	8/7/2014	21:49:02	COM6	13.47	52.00	1.70	1.1	Pump 60bbls of 13.4ppg cement
Event	9	Shutdown	Shutdown	8/7/2014	22:13:36	COM6	-10.80	30.00	0.00	60.5	
Event	10	Drop Top Plug	Drop Top Plug	8/7/2014	22:16:03	COM6	-11.94	15.00	0.00	60.5	Plug pre loaded in HES head
Event	11	Pump Displacement	Pump Displacement	8/7/2014	22:19:28	COM6	4.19	14.00	1.20	0.1	Pump 40bbls of water. Traces of mudflush and dye at 8 bbls away. Cement to surface at 27 away giving us 13bbls to surface
Event	12	Bump Plug	Bump Plug	8/7/2014	22:37:07	COM6	7.98	887.00	0.00	40.8	Final lift pressure 225psi. Checked floats floats good.
Event	13	End Job	End Job	8/7/2014	22:58:51	COM6	8.33	18.00	1.90	58.1	Thank you Markovich and crew

## 2.0 Attachments

### 2.1 SRC KIEHN C-4NHZ-Custom Results.png



