

HALLIBURTON

iCem[®] Service

ENSIGN UNITED STATES DRILLING

For:

Date: Thursday, November 13, 2014

SRC Gies T-15-22NHZ Intermediate

Case 1

Sincerely,

Derek Trier

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **SRC Gies T-15-22NHZ** 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 [Brighton]

Job Times

	Date	Time	Time Zone
Called Out	11/13/14	0900	MTN
On Location		1524	
Job Started		1713	
Job Completed		1924	
Departed Location		2100	

1.2 Cementing Job Summary

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 301256	Ship To #: 3563531	Quote #:	Sales Order #: 0901818718							
Customer: ENSIGN UNITED STATES DRILLING		Customer Rep: .								
Well Name: SRC GIES	Well #: T-15-22NHZ	API/UWI #: 05-123-40014-00								
Field: WATTENBERG	City (SAP): EATON	County/Parish: WELD	State: COLORADO							
Legal Description: SE SE-15-7N-65W-272FSL-1127FEL										
Contractor:		Rig/Platform Name/Num: Ensign 134								
Job BOM: 7522										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB29087		Srcv Supervisor: BRANDON NIELSON								
Job										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type		BHST								
Job depth MD	7442ft	Job Depth TVD								
Water Depth		Wk Ht Above Floor								
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	38			0	672	0	
Casing		7	6.184	29	8 RD		0	7442	0	7211
Open Hole Section			6.75				672	5250		
Open Hole Section			8.75				5250	7454		7219
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	7	1		7442	Top Plug	7	1	HES		
Float Shoe	7	1			Bottom Plug	7	1	HES		
Float Collar	7	1			SSR plug set	7	1	HES		
Insert Float	7	1			Plug Container	7	1	HES		
Stage Tool	7	1			Centralizers	7	1	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 ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	CLEANSRACE R III	CLEANSRACER III	40	bbl	10.5	3.86	24.2	4		
35.10 galbbl			FRESH WATER							

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Cementing Job Summary

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
2	EconoCem B2	ECONOCHEM (TM) SYSTEM	461	sack	12.5	1.89		6	10.23
10.23 Gal		FRESH WATER							
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
3	FracCem	FRACCHEM (TM) SYSTEM	238	sack	13.5	1.74		6	8.27
8.27 Gal		FRESH WATER							
3 lbm		SILICALITE - COMPACTED, 50 LB SK (100012223)							
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
4	Displacement	Displacement	274.5	bbl	9				
Cement Left in Pipe		Amount	42 ft	Reason			Shoe Joint		
Comment 7.5 BBL CEMENT BACK									

1.3 **Planned Pumping Schedule**

ENSIGN SRC GIES T-15-22NHZ

901818718

- 1) TEST LINES TO 4000 PSI
- 2) 40 BBL TUNE SPACER @ 10.5 PPG
- 3) DBP
- 4) 461 SKS OR 155 BBL ECONOCHEM @ 12.5 PPG
- 5) 238 SKS OR 73.7 BBL FRACCHEM @ 13.5 PPG
- 6) SD
- 7) DTP
- 8) DISPLACE 274.5 BBL MUD
- 9) SLOW TO 3BPM IN LAST 10 BBL AND LAND PLUG WITH 500 PSI OVER FINAL CIRCULATING PRESSURE
- 10) CHECK FLOATS
- 11) END JOB

1.4 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	10
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	10.4
4	Time circulated before job	HH:MM	3
5	Mud volume circulated	Bbls	
6	Rate at which well was circulated	Bpm	
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	
9	Time from end mud circulation to start of job	HH:MM	:20
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	274.5
12	Job displaced by	Rig/HES	HES
13	Annular before job)?	Y/N	
14	Annular flow after job	Y/N	
15	Length of rat hole	Ft	8
16	Units of gas detected while circulating	Units	
17	Was lost circulation experienced at any time ?	Y/N	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	0	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	<200	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	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	64	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

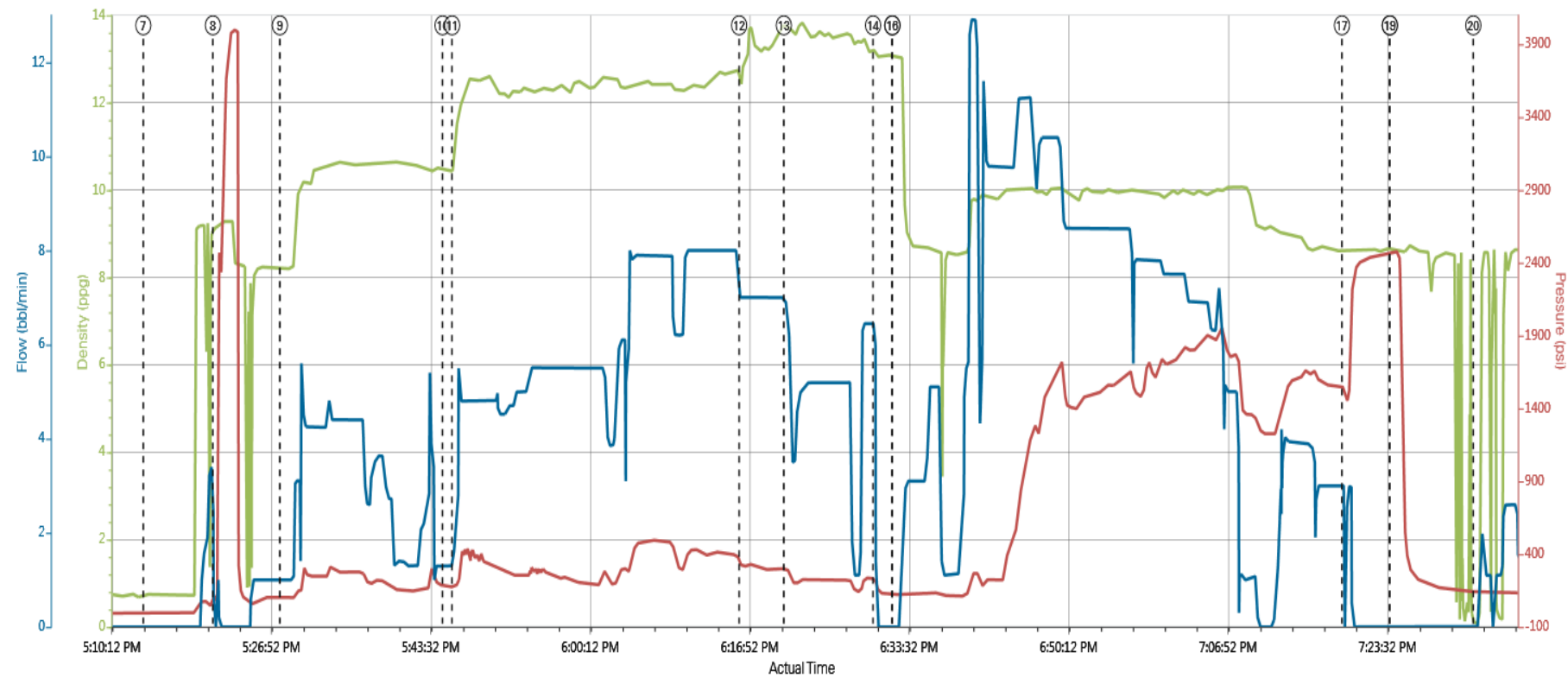
Submitted Respectfully by: _____

1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Combined Pump Rate (bbl/min)	Downhole Density (ppg)	Pass-Side Pump Pressure (psi)	Comment
Event	1	Call Out	Call Out	11/13/2014	09:00:00	USER				REQUESTED ON LOCATION AT 1300.
Event	2	Crew Leave Yard	Crew Leave Yard	11/13/2014	14:00:00	USER				WAITED FOR LAB TEST, HAD A SAFETY STAND DOWN.
Event	3	Arrive At Loc	Arrive At Loc	11/13/2014	15:24:00	USER				
Event	4	Rig-up Lines	Rig-up Lines	11/13/2014	15:45:00	USER				
Event	5	Rig-Up Completed	Rig-Up Completed	11/13/2014	16:40:00	USER				
Event	6	Safety Meeting	Safety Meeting	11/13/2014	16:45:00	USER				
Event	7	STRTJOB	STRTJOB	11/13/2014	17:13:43	COM4				
Event	8	Pressure Test	Pressure Test	11/13/2014	17:21:00	USER	0.00	4000.00	89.00	TESTED LINES TO 4000 PSI NO VISIBLE LEAKS.
Event	9	Pump Spacer	Pump Spacer	11/13/2014	17:28:00	USER	1.00	10.50	101.00	40 BBL TUNES SPACER MIXED AT 10.5 PPG WITH FRESH WATER. PUMPED AT 2.7 BPM AND 200 PSI
Event	10	Drop Bottom Plug	Drop Bottom Plug	11/13/2014	17:45:00	USER				PLUG PRE LOADED WITNESSED BY TOOL PUSHER.
Event	11	Pump Lead Cement	Pump Lead Cement	11/13/2014	17:46:00	USER	2.00	12.5	176.00	461 SKS OR 155 BBL ECONOCEM MIXED AT 12.5 PPG WITH FRESH WATER. PUMPED AT 8 BPM AND 434 PSI.
Event	12	Pump Tail Cement	Pump Tail Cement	11/13/2014	18:16:00	USER	7.00	13.5	316.00	238 SKS OR 74 BBL FRACCEM MIXED AT 13.5 PPG WITH FRESH WATER. PUMPED AT 5 BPM AND 221 PSI.
Event	13	CHKWGHT	CHKWGHT	11/13/2014	18:20:40	COM4	6.90	13.79	297.00	
Event	14	Shutdown	Shutdown	11/13/2014	18:30:00	USER				
Event	15	Drop Plug	Drop Plug	11/13/2014	18:32:00	USER				PLUG PRE LOADED WITNESSED BY TOOL PUSHER
Event	16	Pump Displacement	Pump Displacement	11/13/2014	18:32:01	USER				274.5 BBL 10.4 PPG MUD. PUMPED AT 8.5 BPM AND 1559 PSI. CEMENT RETURNED TO SURFACE 267 BBL INTO LEAVING US WITH 7.5 BBL BACK TO

										THE SLOPE TANK.
Event	17	Bump Plug	Bump Plug	11/13/2014	19:19:00	USER	0.00	8.60	1528.00	PLUG LANDED AT 1605 PSI.
Event	18	Check Floats	Check Floats	11/13/2014	19:24:00	USER	0.00	8.62	2473.00	RELEASED PRESSURE AT 2476 PSI. FLOATS HELD.
Event	19	End Job	End Job	11/13/2014	19:24:01	USER	0.00	8.62	2473.00	
Event	20	ENDJOB	ENDJOB	11/13/2014	19:32:44	COM4	0.00	0.07	141.00	

Custom Results



DH Density (ppg) PS Pump Press (psi) Comb Pump Rate (bbl/min)

① Call Out n/a;n/a;n/a ④ Rig-up Lines n/a;n/a;n/a ⑦ STRJOB 0.76;-5;0 ⑩ Drop Bottom Plug 10.46;182;1.3 ⑬ CHKWGHT 13.79;297;6.9 ⑮ Pump Displacement 12.98;124;0 ⑰ End Job 8.62;2473;0
② Crew Leave Yard n/a;n/a;n/a ⑤ Rig-Up Completed 0.75;-3;0 ⑧ Pressure Test 9.13;89;0 ⑪ Pump Lead Cement 10.92;176;2 ⑭ Shutdown 13.09;217;1.4 ⑯ Bump Plug 8.6;1528;0 20 ENDJOB 0.07;141;0
③ Arrive At Loc n/a;n/a;n/a ⑥ Safety Meeting 0.73;-4;0 ⑨ Pump Spacer 8.19;101;1 ⑫ Pump Tail Cement 12.46;316;7 ⑬ Drop Plug 13;124;0 ⑮ Check Floats 8.62;2473;0

