

# HALLIBURTON

iCem<sup>®</sup> Service

## EXTRACTION OIL & GAS

**For:**

Date: Tuesday, March 17, 2015

**3**

Case 1

Job Date: Friday, February 27, 2015

Sincerely,

**Sebastian Estenssoro**

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## 1.0 Cementing Job Summary

### 1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Kodak 3**, cement **Production Liner** 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
Requested Time On Location:		
Called Out Time:	2/27/2015	0800
Arrived On Location At:		1320
Job Started At:		1639
Job Completed At:		2030
Departed Location At:		2145

## 1.2 Planned Pumping Schedule

Event	Pressure (psi)	Rate (bpm)	Volume (bbl)	Sacks	Density (ppg)	Yield (ft3/sk)	WR (gal/sk)
Fill Lines	275	2	2	N/A	8.33	N/A	N/A
Test Lines	4000	0	0	N/A	8.33	N/A	N/A
Pump Spacer	450	4	40	N/A	11.5	3.76	24.2
Pump Cement	385	7	214	721	13.8	1.67	7.73
Clean Lines	100	2	10	N/A	8.33	N/A	N/A
Drop Plug	100	1	0	N/A	8.33	N/A	N/A
Pump Displacement	173-2850	7,6,2	224	N/A	8.33	N/A	N/A
Bump Plug	2850	2	0	N/A	8.33	N/A	N/A
Test Backside	2500	1	1	N/A	8.33	N/A	N/A
Roll Hole	2000-250	7	168	N/A	8.33	N/A	N/A

## Cementing Job Summary

HALLIBURTON

**Sold To #:** 369404 **Ship To #:** 3647448 **Quote #:** 0022007308 **Sales Order #:** 0902165632

**Customer:** EXTRACTION OIL & GAS **Customer Rep:** **API/UWI #:** 05-123-41120-00 **State:** COLORADO

**Well Name:** KODAK **Well #:** 3 **County/Parish:** WELD

**Field:** WATTENBERG **City (SAP):** WINDSOR **Rig/Platform Name/Num:** FRONTIER 10

**Legal Description:** NW NW-27-GN-07W-1245FNL-1043FWL

**Contractor:** FRONTIER DRLG

**Job BOM:** 7525 **Srvc Supervisor:** Chris Turner

**Well Type:** HORIZONTAL OIL **Job**

**Sales Person:** HALAMERICA/HX40837

Formation Name	Top	Bottom
Formation Depth (MD)		BHST
Form Type		Job Depth TVD
Job depth MD	16900ft	Wk Ht Above Floor
Water Depth		To
Perforation Depth (MD)	From	

		Well Data					Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread						
Drill Pipe		4	3.34	14			L-80	0	6634		
Casing		7	6.184	29			L-80	0	7547		
Casing		4.5	4	11.0				6634	16868		
Open Hole Section			6					7517	10000		

Tools and Accessories					Type	Size in	Qty	Make
Type	Size in	Qty	Make	Depth ft				
Guide Shoe	4.5			16868	Top Plug	4.5		HES
Float Shoe	4.5			6.37	Bottom Plug	4.5		HES
Float Collar	4.5				SSR plug set	4.5		HES
Insert Float	4.5				Plug Container	4.5		HES
Stage Tool	4.5				Centralizers	4.5		HES

Miscellaneous Materials								
Gelling Agt		Conc		Surfactant		Conc	Acid Type	Qty
Treatment Fld		Conc		Inhibitor		Conc	Sand Type	Size
								Conc
								Qty

Fluid Data									
Stage/Plug #: 1									
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
1	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	40	bbl	11.5	3.76	24.2	6	
	36.09 gal/bbl								
	149.34 lbm/bbl								
FRESH WATER									
BARITE, BULK (100003681)									

iCem® Service

(v. 4.1.107)

Created: Tuesday, March 17, 2015

## HALLIBURTON

## Cementing

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	Tail Cement	ECONOCEM (TM) SYSTEM	721	sack	13.8	1.67	7.73	6	7.73
7.73 Gal		FRESH WATER							
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	223	bbl	8.33				
Cement Left In Pipe		Amount	6.37 ft	Reason		Shoe Joint			

## 1.3 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	24
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	Wbm
3	Actual mud density	lb/gal	9.3
7	Time circulated before job	HH:MM	01:15
8	Mud volume circulated	bbls	Bottoms Up
9	Rate at which well was circulated	bpm	3
10	Pipe movement during hole circulation	Y/N	N
12	Time from end mud circulation to start of job	HH:MM	00:25
13	Pipe movement during cementing	Y/N	N
14	Calculated displacement	bbls	233.74
15	Job displaced by	Rig/HES	Hes
18	Length of rat hole	ft	10
19	Units of gas detected while circulating	units	0
20	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	-	6.0-8.0	Chemicals in the water can cause severe retardation
Chlorides	250	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	100	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	65	ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium	0	ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity	0	ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH $\geq$ 8.3).
Bicarbonates	0	ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium	100	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	65	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

Submitted Respectfully by:

## 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	Call Out	Call Out	2/27/2015	08:00:00	USER				Call out for job
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	2/27/2015	12:05:00	USER				Pre convoy safety meeting with crew to discuss route and driving safety
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	2/27/2015	12:15:00	USER				Depart from yard with approval from journey management
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	2/27/2015	13:20:00	USER				Arrive safely at location
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	2/27/2015	13:25:00	USER				Pre rig up safety meeting with crew to discuss rig up and the hazards of the rig up
Event	6	Rig-Up Equipment	Rig-Up Equipment	2/27/2015	13:35:00	USER				Rig up all equipment on the ground and get equipment to rig floor
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	2/27/2015	15:02:31	USER				Pre job safety meeting with crew, rig crew, and customer to discuss job procedures and safety throughout the job
Event	8	Rig-up Lines	Rig-up Lines	2/27/2015	15:02:41	USER				Rig up lines to Third Party tool
Event	9	Start Job	Start Job	2/27/2015	16:38:08	COM4	60.00	8.38	0.00	Fill Lines with 2 BBL of Fresh Water
Event	10	Test Lines	Test Lines	2/27/2015	16:42:31	COM4	40.00	8.25	0.00	Test Lines to 4000 psi, good test no leaks
Event	11	Check Weight	Check weight	2/27/2015	16:48:44	COM4	51.00	8.33	0.00	Check weight of spacer being mixed up, weight was 11.2 ppg. Calibrated recirc to that weight
Event	12	Pump Spacer 1	Pump Spacer 1	2/27/2015	16:53:18	COM4	54.00	8.30	0.00	Pump 40 BBL of Tune Spacer @ 11.5 PPG. 4 bpm 425 psi
Event	13	Check Weight	Check weight	2/27/2015	17:08:17	COM4	32.00	9.96	0.00	Check weight of Spacer, weight was 11.5 ppg
Event	14	Pump Cement	Pump Cement	2/27/2015	17:10:02	COM4	32.00	9.89	0.00	Pump 214 BBL of Cement @ 13.8 PPG. 6 bpm 385 psi
Event	15	Check Weight	Check weight	2/27/2015	17:14:07	COM4	687.00	13.88	4.90	Check weight of cement, weight was 13.85
Event	16	Check Weight	Check weight	2/27/2015	17:33:07	COM4	374.00	13.88	6.00	Check weight of cement, weight was 13.8

Event	17	Pump Cement	Pump Cement	2/27/2015	17:56:59	COM4	45.00	13.60	0.00	Check Weight of cement. Weight was 13.85
Event	18	Drop Top Plug	Drop Top Plug	2/27/2015	18:05:00	COM4	60.00	8.46	0.00	Drop Dart
Event	19	Pump Displacement	Pump Displacement	2/27/2015	18:06:04	COM4	35.00	8.48	0.00	Pump 234 BBL of Fresh Water displacement. First 10 BBL had MMCR. Slow down @ 70 gone to shear dart. Dart sheared at 75 BBL gone. Slow down last 10 to land plug 800 psi over final circulating pressure.
Event	20	Displ Reached Cmnt	Displ Reached Cmnt	2/27/2015	18:11:51	COM4	1138.00	8.31	6.00	Displacement reached cement @ 33 BBL into displacement
Event	21	Bump Plug	Bump Plug	2/27/2015	18:51:55	COM4	2848.00	8.33	0.00	Bump plug @ 224 BBL of Displacement. Final circulating pressure 1975 psi, Bumped @ 2850 psi. 2 BBL back when bled off
Event	22	Other	Other	2/27/2015	18:55:10	COM4				Bleed off pressure. 2 BBL back
Event	23	Circulate Well	Circulate Well	2/27/2015	19:13:30	COM4				Fill Lines to Backside
Event	24	Shutdown	Shutdown	2/27/2015	19:14:40	COM4				
Event	25	Test Lines	Test Lines	2/27/2015	19:23:03	COM4				Test Backside to 2500 . Tested 3 times, all 3 times were within acceptable limit of amount of pressure that could be lost
Event	26	Other	Other	2/27/2015	19:49:41	COM4				Bleed off pressure
Event	27	Circulate Well	Circulate Well	2/27/2015	20:00:28	COM4				Clean hole with 168 BBL of Fresh Water. 40 BBL of Cement back
Event	28	Shutdown	Shutdown	2/27/2015	20:25:56	COM4				
Event	29	End Job	End Job	2/27/2015	20:26:13	COM4				
Event	30	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	2/27/2015	23:00:00	USER				Pre rig down safety meeting with crew
Event	31	Rig-Down Equipment	Rig-Down Equipment	2/27/2015	23:10:00	USER				Rig down all equipment
Event	32	Rig-Down Completed	Rig-Down Completed	2/27/2015	23:20:00	USER				Rig down completed
Event	33	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	2/27/2015	23:40:00	USER				Depart location for yard

## 3.0 Attachments

### 3.1 Extraction Kodak 3 Liner.png

