

# HALLIBURTON

iCem<sup>®</sup> Service

## EXTRACTION OIL & GAS

**For:**

Date: Thursday, October 16, 2014

**Diamond Valley East #2**

Surface

Sincerely,

**Sebastian Estensoro**

## Table of Contents

---

<b>1.1</b>	<b>Executive Summary</b>	<b>3</b>
<b>1.2</b>	<b>Cementing Job Summary</b>	<b>4</b>
<b>1.3</b>	<b>Conc</b>	<b>4</b>
<b>1.4</b>	<b>Planned Pumping Schedule</b>	<b>6</b>
<b>1.5</b>	<b>Job Overview</b>	<b>7</b>
<b>1.6</b>	<b>Water Field Test</b>	<b>8</b>
<b>1.7</b>	<b>Job Event Log</b>	<b>9</b>
<b>2.0</b>	<b>Custom Graphs</b>	<b>11</b>
<b>2.1</b>	<b>Custom Graph</b>	<b>11</b>
<b>3.0</b>	<b>Appendix</b>	<b>12</b>

---

**1.1 Executive Summary**

---

Halliburton appreciates the opportunity to perform the cementing services on the **Diamond Valley East #2** 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**

	<b>Date</b>	<b>Time</b>	<b>Time Zone</b>
<b>Called Out</b>			
<b>On Location</b>			
<b>Job Started</b>			
<b>Job Completed</b>			
<b>Departed Location</b>			

**1.2 Cementing Job Summary**

<b>Sold To #:</b> 369404	<b>Ship To #:</b> 3537223	<b>Quote #:</b>	<b>Sales Order #:</b> 0901742225
<b>Customer:</b> EXTRACTION OIL & GAS		<b>Customer Rep:</b> Hugh McCrew	
<b>Well Name:</b> DIAMOND VALLEY EAST	<b>Well #:</b> 2	<b>API/UWI #:</b> 05-123-38566-00	
<b>Field:</b> WATTENBERG	<b>City (SAP):</b> WINDSOR	<b>County/Parish:</b> WELD	<b>State:</b> COLORADO
<b>Legal Description:</b> SW SW-23-6N-67W-816FSL-155FWL			
<b>Contractor:</b> FRONTIER DRLG		<b>Rig/Platform Name/Num:</b> FRONTIER 10	

<b>Job BOM:</b> 7521	
<b>Well Type:</b> HORIZONTAL OIL	
<b>Sales Person:</b> HALAMERICA\H117930	<b>Srv Supervisor:</b> Devin Birchell

**Job**

<b>Formation Name</b>	
<b>Formation Depth (MD)</b>	<b>Top</b> <b>Bottom</b>
<b>Form Type</b>	BHST
<b>Job depth MD</b>	850ft <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**

	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	LTC	J-55	0	850		
Open Hole Section			13.5				0	850		

**Tools and Accessories**

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	9.625	1		850	Top Plug	9.625	1	HES
Float Shoe	9.625	1			Bottom Plug	9.625	1	HES
Float Collar	9.625	1			SSR plug set	9.625	1	HES
Insert Float	9.625	1			Plug Container	9.625	1	HES
	9.625	1			Centralizers	9.625	1	HES

**Miscellaneous Materials**

Gelling Agt	Conc	Surfactant	Conc	Acid Type	Qty
Treatment Fld	Conc		Conc	Sand Type	

**Fluid Data**

<b>Stage/Plug #:</b> 1
------------------------

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
1	Fresh Water Spacer	Mud Flush III	10	bbl	8.33			6	
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	Lead Cement	SWIFTCEM (TM) SYSTEM	350	sack	14.2	1.54		6	7.64
7.64 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	60	bbl	8.33			6	
		Amount	42 ft						
<b>Comment</b>									

## **1.4 Planned Pumping Schedule**

---

- 1. Fill Lines with Water**
  - a. Density = 8.33
  - b. Volume = 2
- 2. Pressure Test Lines to 2567psi**
- 3. Pump Mud Flush Spacer**
  - a. Density = 8.4 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 2 bpm
- 4. Pump SwiftCem (Lead)**
  - a. Density = 14.2
  - b. Yield = 1.54
  - c. Water Requirement = 7.64
  - d. Volume = 350 sks (96 bbls)
  - e. Rate = 5 bpm
- 5. Drop Top Plug**
- 6. Start Displacement**
- 7. Pump Displacement Water**
  - a. Density = 8.33 lb/gal
  - b. Volume = 60 bbls
  - c. Rate = 5 bpm
- 8. Land Plug – Anticipated Final Circulation Pressure 386 psi**

**Calculated Total Displacement = 60 bbls**

**1.5 Job Overview**

---

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

**1.6 Water Field Test**

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH		----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides		ppm	3000 ppm	Can shorten thickening time of cement
Sulfates		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		ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature		°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

**Submitted Respectfully by:** \_\_\_\_\_

**1.7 Job Event Log**

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Truck 1 Pr (psi)	Truck 1 Dens (ppg)	Truck 1 Slry Rt (bbl/min)	Comment
Event	1	Call Out	Call Out	10/15/2014	18:30:21	USER				called cement crew for extraction oil&gas surface
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/15/2014	22:15:24	USER				discussed route weather other traffic following distance
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	10/15/2014	22:30:12	USER				called journey and departed for location
Event	4	Arrive At Loc	Arrive At Loc	10/15/2014	23:30:45	USER				ended journey and talked to company rep
Event	5	Wait on Customer or Customer Sub-Contractor Equip - Start Time	Wait on Customer or Customer Sub-Contractor Equip - Start Time	10/16/2014	00:30:12	USER				wait for rig and casing crew to finish running casing
Event	6	Wait on Customer or Customer Sub-Contractor Equipment - End Time	Wait on Customer or Customer Sub-Contractor Equipment - End Time	10/16/2014	02:30:12	USER				wait for casing crew to rig down
Event	7	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	10/16/2014	02:35:21	USER				discuss spotting equipment hand placement swing path
Event	8	Rig-Up Equipment	Rig-Up Equipment	10/16/2014	02:40:12	USER				spot equipment and rig up water hoses and iron to red zone
Event	9	Pre-Job Safety Meeting	Pre-Job Safety Meeting	10/16/2014	03:17:07	USER	-7.00	1.80	0.00	discuss job procedures with rig and cement crew
Event	10	Rig-Up Completed	Rig-Up Completed	10/16/2014	03:17:20	USER	-7.00	1.80	0.00	rigged up to casing and stand pipe
Event	11	Prime Pumps	Prime Pumps	10/16/2014	03:17:38	USER	-7.00	1.80	0.00	prime pump and lines ready for pressure test
Event	12	Test Lines	Test Lines	10/16/2014	04:04:45	COM1	-5.00	10.45	0.00	test pump and lines to 2567 psi
Event	13	Pump Spacer 1	Pump Spacer 1	10/16/2014	04:09:33	COM1	-6.00	10.44	0.00	pump 10 bbls mud flush III
Event	14	Pump Lead Cement	Pump Lead Cement	10/16/2014	04:17:35	COM1	9.00	10.54	2.10	pump 96 bbls (350 sks) 14.2 ppg
Event	15	Drop Top Plug	Drop Top Plug	10/16/2014	04:41:58	USER	-16.00	13.19	0.00	drop top plug with driller witnessing
Event	16	Clean Lines	Clean Lines	10/16/2014	04:42:34	USER	-16.00	13.31	0.00	cleaned pump and lines on top of plug
Event	17	Pump Displacement	Pump Displacement	10/16/2014	04:43:21	COM1	-15.00	13.47	0.00	pump 60 bbls fresh water
Event	18	Spacer Returns to Surface	Spacer Returns to Surface	10/16/2014	04:56:12	USER	174.00	8.07	5.40	with 30 bbls displacement away spacer returns to surface

## EXTRACTION OIL &amp; GAS

901742225

Case 1

Event	19	Cement Returns to Surface	Cement Returns to Surface	10/16/2014	04:59:45	USER	245.00	8.02	4.00	with 40 bbls displacement away space cement to surface (20 bbls)
Event	20	Bump Plug	Bump Plug	10/16/2014	05:03:52	USER	281.00	8.11	3.00	bump plug with 386 psi and took pressure to 745 psi
Event	21	Check Floats	Check Floats	10/16/2014	05:09:19	USER	889.00	8.09	0.00	checked floats, floats held with 1.5 bbls back
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	10/16/2014	05:16:21	USER	-26.00	-0.33	0.00	discussed hand placement swing path pinch points
Event	23	End Job	End Job	10/16/2014	05:18:11	COM1	-26.00	-0.31	0.00	job completed
Event	24	Rig-Down Equipment	Rig-Down Equipment	10/16/2014	05:20:12	USER	51.00	8.01	0.00	rig down water and bulk hoses and all iron
Event	25	Rig-Down Completed	Rig-Down Completed	10/16/2014	06:00:12	USER				walk around to ensure everything is properly put away
Event	26	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/16/2014	06:05:12	USER				discussed route weather other traffic following distance
Event	27	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	10/16/2014	06:10:25	USER				thank you for using halliburton energy services



3.0 Appendix

---