

HALLIBURTON

iCem[®] Service

EXTRACTION

Date: Saturday, December 20, 2014

Diamond Valley East # 13

Frontier 10

Job Date: Wednesday, November 19, 2014

Sincerely,
Jennifer Dattolo

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Diamond Valley East #13** 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	11/19/14	1200	MST
On Location	11/19/14	1700	MST
Job Started	11/19/14	2135	MST
Job Completed	11/20/14	0010	MST
Departed Location	11/20/14	0145	MST

1.2 Cementing Job Summary

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 369404	Ship To #: 3594482	Quote #:	Sales Order #: 0901835025							
Customer: EXTRACTION OIL & GAS		Customer Rep:								
Well Name: DIAMOND VALLEY EAST	Well #: 13	API/UWI #: 05-123-40317-00								
Field: WATTENBERG	City (SAP): WINDSOR	County/Parish: WELD	State: COLORADO							
Legal Description: SW SW-23-6N-67W-992FSL-155FWL										
Contractor:		Rig/Platform Name/Num: FRONTIER 10								
Job BOM: 7522										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB21661		Srv Supervisor:								
Job										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type		BHST	225 degF							
Job depth MD	7727ft	Job Depth TVD								
Water Depth		Wk Ht Above Floor	5 ft							
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	0	9.625	8.921	36	BTC	J-55	0	804	0	0
Casing	0	7	6.276	26	BTC	P-110	0	7727	0	0
Open Hole Section			8.75				804	7743	0	0
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	7	1		7727	Top Plug	7	1	HES		
Float Shoe	7	1			Bottom Plug	7	1	HES		
Float Collar	7	1		7685	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 ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	Fresh Water	Fresh Water	10	bbl	8.33	0		6		
42 gal/bbl		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	

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(v. 4.1.85)

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Cementing Job Summary

2	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	20	bbl	11.5	3.73		6	
149.45 lbm/bbl		BARITE, BULK (100003681)							
24.20 gal/bbl		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
3	Lead Cement	ECONOCEM (TM) SYSTEM	475	sack	12.7	1.89		6	9.97
9.97 Gal		FRESH WATER							
61.10 lbm		TYPE I / II CEMENT, BULK (101439798)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
4	Tail Cement	EXPANDACEM (TM) SYSTEM	298	sack	13.8	1.67		6	7.71
0.10 %		HR-5, 50 LB SK (100005050)							
7.71 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
5	Displacement	Displacement	289.2	bbl	8.33				
Cement Left In Pipe		Amount	42 ft		Reason		Shoe Joint		
Comment									

1.3 Planned Pumping Schedule

1. Fill Lines with Water

- a. Density = 8.33ppg
- b. Volume = 2bbl

2. Pressure Test Lines to 5000 psi**3. Pump Water Spacer**

- a. Density = 8.33 lb/gal
- b. Volume = 10 bbl
- c. Rate = 4 bpm

4. Pump Tuned Light III Spacer

- a. Density = 11.5 lb/gal
- b. Volume = 40 bbl
- c. Rate = 3 bpm

5. Drop Bottom Plug**6. Pump EconoCem (Lead)**

- a. Density = 12.7 lb/gal
- b. Yield = 1.89 ft³/sk
- c. Water Requirement = 9.97 gal/sk
- d. Volume = 475 sks (160 bbls)
- e. Rate = 6 bpm

7. Pump ExpandaCem (Tail)

- a. Density = 13.8 lb/gal
- b. Yield = 1.67 ft³/sk
- c. Water Requirement = 7.71 gal/sk
- d. Volume = 298 sks (89 bbls)
- e. Rate = 6 bpm

8. Drop Top Plug**9. Start Displacement****10. Pump Displacement Mud**

- a. Density = 10.0 lb/gal
- b. Volume = 290 bbls
- c. Rate = 5 bpm

11. Land Plug – Anticipated Final Circulation Pressure 2750 psi

Calculated Total Displacement = 289 bbls

1.4 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	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	100	ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium	175	ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity	50	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		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	53	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

Submitted Respectfully by: Rayland Thompson

1.5 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DS Pump Press (psi)	Comb Pump Rate (bbl/min)	DH Density (ppg)	Comments
Event	1	Arrive at Shop	Arrive at Shop	11/19/2014	08:00:00	USER				Arrive @ yard for winterizing the truck
Event	2	Call Out	Call Out	11/19/2014	12:00:00	USER				Called out for Oil & Gas Diamond Valley East 7" intermediate Extraction load equipment & chemicals for job
Event	3	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	11/19/2014	15:15:00	USER				Pretrip/Gate check all equipment use of journey management
Event	4	Crew Leave Yard	Crew Leave Yard	11/19/2014	15:30:00	USER				Crew convoy to location
Event	5	Arrive At Loc	Arrive At Loc	11/19/2014	17:00:00	USER				close journey Talk with coman Hughes Mcgroun Get #s check Water & discuss spotting of equipment
Event	6	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	11/19/2014	17:10:00	USER				Discuss spotting of equip. with crew
Event	7	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	11/19/2014	17:25:00	USER				Discussed hazards of rig up ith crew
Event	8	Rig-Up Equipment	Rig-Up Equipment	11/19/2014	17:40:00	USER				Rig up Halliburton Lines &Hoses to rig
Event	9	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	11/19/2014	21:00:00	USER				Discussed with All parties involved the job being proformed & the hazards involved with the job
Event	10	Prime Pumps	Prime Pumps	11/19/2014	21:20:00	COM7				Prime pumps
Event	11	Start Job	Start Job	11/19/2014	21:35:52	COM7	0.00	0.00	8.33	Start Job
Event	12	Test Lines	Test Lines	11/19/2014	21:35:57	COM7	5000.00	0.00	8.33	Test kickouts to 500 psi Test lines to 5000 psi
Event	13	Pump Spacer 1	Pump Fresh Water Spacer	11/19/2014	21:57:02	COM7	4.00	4.00	8.33	Pump 10 bbls fresh water spacer
Event	14	Pump Spacer 2	Pump Tuned Spacer III	11/19/2014	22:00:16	COM7	381.00	3.00	11.50	Pump 40 bbls Tuned Spacer III @ 11.5 #

Event	15	Pump Lead Cement	Pump Lead Cement	11/19/2014	22:13:28	COM7	334.00	6.00	12.70	Pump 160 bbls Lead cmt 425 sks @ 12.7 #
Event	16	Pump Tail Cement	Pump Tail Cement	11/19/2014	22:40:19	COM7	277.00	6..00	13.80	Pump 89 bbls Tail cmt 298 sks @ 13.8 #
Event	17	Pump Displacement	Pump Displacement	11/19/2014	23:01:56	COM7	6.00	5.00	10.00	Pump 290 bbls WBM Displacement
Event	18	Displ Reached Cmnt	Displ Reached Cmnt	11/19/2014	23:35:36	COM7	486.00	5.00	10.00	Displacement Reached Cmt @ 140 bbls gone into disp
Event	19	Bump Plug	Bump Plug	11/20/2014	00:05:47	COM7	2500.00	0.00	10.00	Bump Plug @ 290 bbls gone 500 Psi over psi to land
Event	20	Other	Check Floats	11/20/2014	00:07:24	COM7	0.00	0.00	10.00	Check Floats got back 3 bbls
Event	21	End Job	End Job	11/20/2014	00:10:20	COM7	0.00	0.00	8.33	End Job
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	11/20/2014	00:25:41	USER				Discussed with crew the hazards of rigging down
Event	23	Rig-Down Equipment	Rig-Down Equipment	11/20/2014	00:36:46	USER				Rig-down Halliburton Lines & hose
Event	24	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	11/20/2014	01:30:00	USER				Discussed route & hazards on roadway
Event	25	Crew Leave Location	Crew Leave Location	11/20/2014	01:45:00	USER				Thank you for choosing Halliburton

2.0 Attachments

1.1 Frontier 10 Results.png

