

## 1 Job Details & Summary

### 1.1 Geometry

Type	Function	OD (in)	ID (in)	Weight (lb/ft)	Thread	Top (ft)	Bottom (ft)	Excess (%)
Open Hole	Outer	n/a	13.5	n/a	n/a	0	1552	25
Casing	Inner	9.625	8.921	36	LTC	0	1542	0

### 1.2 Equipment / People

Unit Type	Unit	Employee #1	Mileage
Cement Pump	101	Casciato, Luke	150
Bulk Trailer	502	Vasquez, Mike	150
Bulk Trailer	E435	Groneman, Josh	150
Cement Chemical	402	Dent, Jerod	150

### 1.3 Timing

Event	Date/Time
Call Out	5/19/2017 15:30
Depart Facility	5/19/2017 19:30
On Location	5/19/2017 20:00
Rig Up Iron	5/19/2017 21:00
Job Started	5/19/2017 22:28
Job Completed	5/19/2017 23:48
Rig Down Iron	5/20/2017 00:00
Depart Location	5/20/2017 02:00

### 1.4 General Job Information

Metrics	Value
Well Fluid Density	8.6 lb/gal
Well Fluid Type	WBM
Rig Circulation Vol	583 bbls
Rig Circulation Time	1 hours
Calculated Displacement	115.5 bbls
Actual Displacement	117 bbls
Total Spacer to Surface	20 bbls
Total CMT to Surface	29 bbls
Well Topped Out	No

### 1.5 Job Details

Metrics	Value
Flare Prior to Job	No
Flare During Job	No
Flare at End of Job	No
Well Full Prior to Job	Yes
Well Fluid Density Into Well	8.6 lb/gal
Well Fluid Density Out of Well	8.6 lb/gal

### 1.6 Job Details (cont.)

Metrics	Value
BHCT	88 °F
BHST	110 °F



### 1.7 Circulation

Lost Circulation Experienced
No

### 1.8 Job Execution Information

Job	Fluid	Product	Function	Density (lb/gal)	Yield (ft <sup>3</sup> /sk)	Water Rq. (gal/sk)	Water Rq. (gal/bbl)	Volume (sks)	Volume (bbl)	Top (ft)
1	1	Water	Flush	8.33			42.00		20.00	0
1	2	ALTCem S100-12	Lead	12.00	2.53	14.85		260.00	116.99	0
1	3	ALTCem S100-12	Tail	12.50	2.22	12.58		146.00	57.82	1045
1	4	Water	DisplacementFinal	8.33			42.00		117.00	0

### 1.9 Job Fluid Details

Job	Fluid	Type	Fluid	Product	Function	Conc.	Uom
1	2	Lead	ALTCem S100-12	AC3-10	Cement	100.00	%
1	2	Lead	ALTCem S100-12	ACL-10	Accelerator	2.00	lb/sk
1	2	Lead	ALTCem S100-12	ACL-20	Accelerator	5.00	%BWOB
1	2	Lead	ALTCem S100-12	ADF-11	Defoamer	0.30	%BWOB
1	2	Lead	ALTCem S100-12	ALC-10	LostCirculation	0.13	lb/sk
1	2	Lead	ALTCem S100-12	AXE-30	Extender	2.00	lb/sk
1	3	Tail	ALTCem S100-12	AC3-10	Cement	100.00	%
1	3	Tail	ALTCem S100-12	ACL-10	Accelerator	2.00	lb/sk
1	3	Tail	ALTCem S100-12	ACL-20	Accelerator	5.00	%BWOB
1	3	Tail	ALTCem S100-12	ADF-11	Defoamer	0.30	%BWOB
1	3	Tail	ALTCem S100-12	ALC-10	LostCirculation	0.13	lb/sk
1	3	Tail	ALTCem S100-12	AXE-30	Extender	2.00	lb/sk



## 2 Job Logs

Line	Event	Date (MM/DD/YY)	Time (HH:MM)	Density (lb/gal)	Pump Rate (bpm)	Pump Volume (bbls)	Pipe Pressure (psi)	Comment
1	Call Out	5/19/2017	15:30					BJ Crew was called out to Cub Creek Litzenberger 7 Surface
2	Pre-Convoy Safety Meeting	5/19/2017	19:00					BJ Crew discussed Hazards of driving, road conditions, ice on roads, and wildlife.
3	Depart Facility	5/19/2017	19:30					BJ Crew departs facility to head to Cub Creek location
4	Arrive on Location	5/19/2017	20:00					BJ Crew arrives on location
5	Assess Location	5/19/2017	20:15					BJ Crew conducts walk around of location, discussed how crew was to spot in and hazards associated with, such as blind spots, low lighting.
6	Spot Equipment	5/19/2017	21:00					BJ Crew spots in equipment.
7	Pre-Rig Up Safety meeting	5/19/2017	21:10					BJ Crew discussed hazards of rig up such as, slips trips and falls, hammer swings ect.
8	Rig Up	5/19/2017	21:15					BJ Crew rigs up all ground fittings and iron
9	Other	5/19/2017	21:30					Rig lands 9.625" J55 36# casing at 21:30, Circulated for 1 hour at 10 BPM with 300psi, for a total of 583 BBL of WBM
10	Safety Meeting	5/19/2017	22:00					BJ Crew, Rig Crew, and customer representative discussed job procedure, as well as all hazards associated with such as, pinch points, overhead loads, pressure on lines, ect.
11	Start Job	5/19/2017	22:28					BJ Crew begins job
12	Fill Lines	5/19/2017	22:29	8.33	2	2	70	Fill lines with 2 BBL H2O to prime lines to conduct pressure test
13	Shutdown	5/19/2017	22:30					Shutdown to close in well and pressure test
14	Pressure Test	5/19/2017	22:31	8.33			3000	Pressure test held at 3000 psi, test held, bled back to truck
15	Pump Spacer	5/19/2017	22:34	8.33	2	10	70	Pumped 10 BBL of H2O at 2BPM, while mixing tub of cement.
16	Increase Rate	5/19/2017	22:40	8.33	6	10	70	Pumped 10 BBL of H2O with dye at six BBL a minute
17	Pump Lead	5/19/2017	22:42	12	6	117	200	Mixed and pumped 200 BBL of lead cmt at 12PPG, 6 BPM with 200 PSI

18	Pump Tail	5/19/2017	22:57	12.5	6	56	220	mixed and pumped 56 BBL of tail cmt at 12.5 PPG, 6BPM with 220 PSI.
19	Shutdown	5/19/2017	23:15					Shutdown to drop top plug
20	Plug Away	5/19/2017	23:18	12.5	2	1	0	Pumped remaining 1 BBL of cmt on top of plug as per customer representatives request. Representative verified plug leaving plug container
21	Begin Displacement	5/19/2017	23:19	8.33	6	20	200	pumped 20 BBL of displacement at 6 BPM
22	Increase Rate	5/19/2017	23:21	8.33	8	85	300	Increased rate to 8 BPM
23	Spacer to Surface	5/19/2017	23:28	8.33				At 68 BBL of displacement away we received spacer to surface.
24	Cement to Surface	5/19/2017	23:32					At 88 BBL of Displacement we received cmt to surface, for a total of 29 BBL of cmt
25	Slow Rate	5/19/2017	23:36	8.33	2	12	350	at 105 BBL of displacement slowed rate to 2 BPM to land plug
26	Shutdown	5/19/2017	23:44					117 BBL of displacement Shutdown, did not land plug. Held for 3 Min as per customer representatives request.
27	Check Floats	5/19/2017	23:47					floats held, .5 BBL in return
28	Pre-Rig Down Safety Meeting	5/19/2017	23:50					BJ Crew discussed hazards of rig down such as, pinch points, slips trips and falls, and hammer swings.
29	Rig Down	5/20/2017	00:00					BJ Crew rigged down all iron and fittings
30	Pre-Convoy Safety Meeting	5/20/2017	01:30					BJ Crew discussed all hazards with driving and desired routes to facility.
31	Depart Location	5/20/2017	02:00					BJ Crew departs location, heads for facility

### 3 Water Analysis

Metrics	Value	Recommended
Water Source	Upright Rig Tank	
Temperature	60 °F	50-80 °F
pH Level	7	5.5-8.5
Chlorides	1500 mg/L	0-3000 mg/L
Total Alkalinity	180	0-1000
Total Hardness	>375 mg/L	0-500 mg/L
Carbonates	0 mg/L	0-100 mg/L
Sulfates	>200 mg/L	0-1500 mg/L
Potassium	1500 mg/L	0-3000 mg/L
Iron	0.5 mg/L	0-300 mg/L

### 4 Pump Diagrams

