

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For: Terra Energy Partners**

Date: Saturday, December 16, 2017

## **WARE SR 34-12**

API # 05-045-23438-00

Terra WARE SR 34-12 Production

Job Date: Saturday, December 16, 2017

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

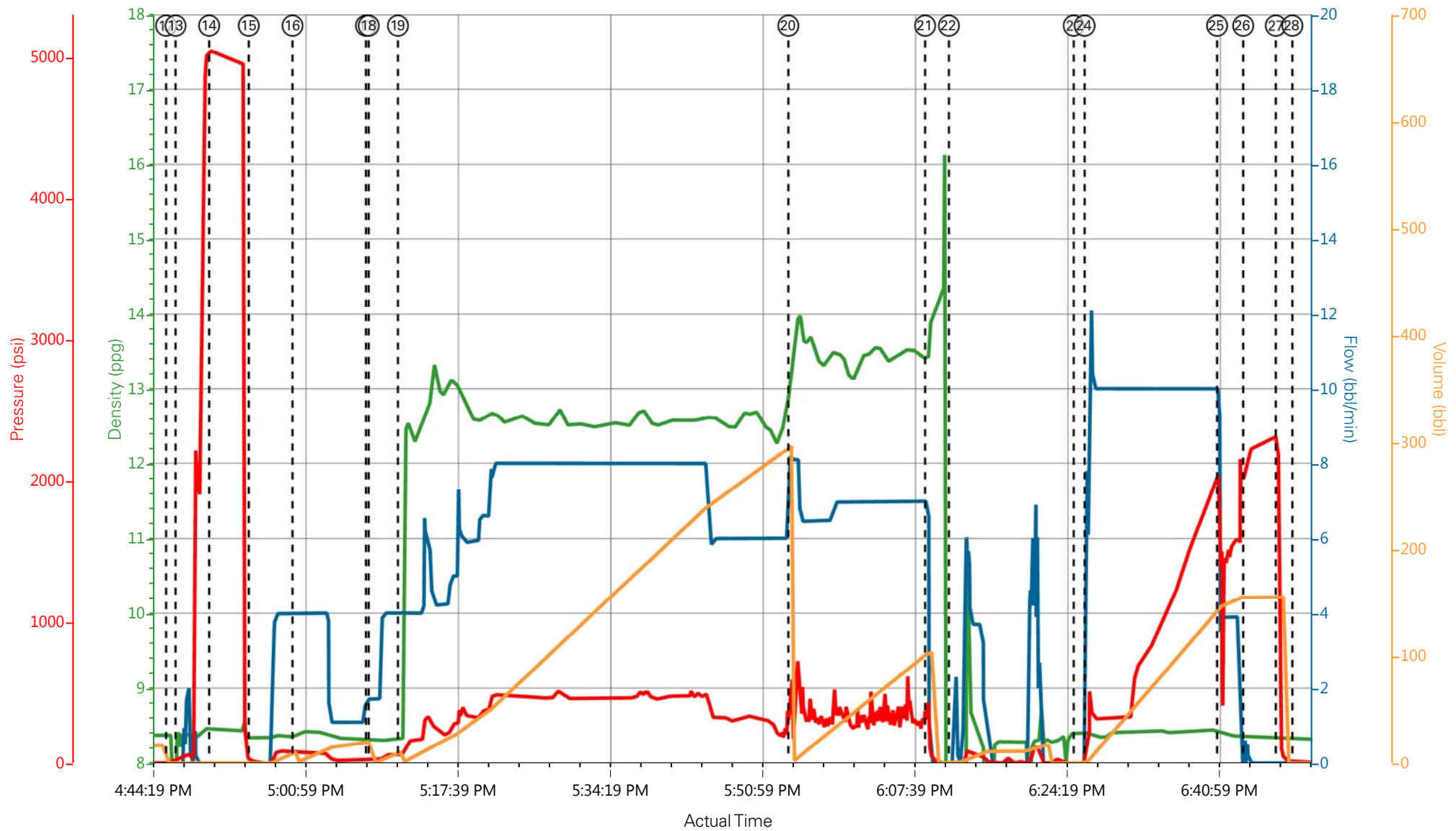
## 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Driv-Side Pump Pressure (psi)	Pump Stage Total (bbl)	Comments
Event	1	Call Out	12/15/2017	23:00:00	USER					ON LOCATION 05:30
Event	2	Pre-Convoy Safety Meeting	12/16/2017	02:15:00	USER					JOURNEY CREATED - ALL HES INCLUDED IN SAFETY MEETING
Event	3	Crew Leave Yard	12/16/2017	02:30:00	USER					1-F-550 PICKUP, 1-660 BULK TRUCK - ELITE PUMP TRUCK WAS WAITING IN THE FIELD FROM PREVIOUS JOB
Event	4	Arrive At Loc	12/16/2017	03:30:00	USER					HES ARRIVED 2 HOURS EARLY
Event	5	Assessment Of Location Safety Meeting	12/16/2017	03:45:00	USER					RIG WAS PULLING CASING OUT OF THE HOLE, THE RIG WAS UNABLE TO PUMP THROUGH THE FLOAT SHOE - COMPANY REP DECIDED TO PUSH THE ON LOCATION TIME TO 11:00 A.M.
Event	6	Pre-Rig Up Safety Meeting	12/16/2017	12:01:00	USER					JSA FILLED OUT - ALL HES INVOLVED IN SAFETY MEETING
Event	7	Rig-Up Equipment	12/16/2017	12:15:00	USER					RIG UP IRON TO THE RIG FLOOR AND WASH UP LINE TO THE PIT, WATER HOSES TO BOTH RIG UPRIGHTS AND BULK EQUIPMENT TO PUMP TRUCK
Event	8	Well Info	12/16/2017	13:35:00	USER					TD: 9607FT TP: 9597.72FT SJ: 31.31FT OH: 8.75" CSG: 4.5" 11.6# I-80 - WHILE THE RIG WAS RUNNING CASING THEY WERE UNABLE TO PUMP THROUGH THE SHOE AND DECIDED TO PULL CASING UPON PULLING CASING IT WAS DISCOVERED THAT THE FLOAT FLAPPER HAD BROKE OFF AND LANDED IN THE BOTTOM OF THE SHOE
Event	9	Water Test	12/16/2017	13:35:01	USER					TEMPERATURE: 65 CHLORIDES: 0 PH: 7
Event	10	Rig-Up Completed	12/16/2017	15:30:00	USER					COMPLETED SAFELY
Event	11	Pre-Job Safety Meeting	12/16/2017	15:45:00	USER					ALL HES, RIG CREW AND COMPANY REPS IN ATTENDANCE FOR SAFETY MEETING

Event	12	Start Job	12/16/2017	16:46:04	COM5					START JOB
Event	13	Fill Lines	12/16/2017	16:47:06	USER	8.34	2	38	2	FILL LINES TO PRESSURE TEST
Event	14	Test Lines	12/16/2017	16:50:47	COM5			5045		PRESSURE TEST LINES TO 5045 PSI - PRESSURE TEST GOOD
Event	15	Fresh Water Spacer	12/16/2017	16:55:07	COM5	8.34	2	48	10	10 BBL FRESH WATER SPACER PUMPED AT 2BPM PRESSURE WAS 48 PSI
Event	16	Mud Flush Spacer	12/16/2017	16:59:54	COM5	8.75	2	18	20	20 BBL MUD FLUSH SPACER PUMPED AT 2BPM PRESSURE WAS 18 PSI
Event	17	Check weight	12/16/2017	17:07:56	COM5	12.5				VERIFIED WEIGHT OF FIRST TUB OF CEMENT VIA PRESSURIZED MUD SCALES
Event	18	Fresh Water Spacer	12/16/2017	17:08:14	COM5	8.34	4	61	10	10 BBL FRESH WATER SPACER PUMPED AT 4BPM PRESSURE WAS 61 PSI
Event	19	Pump Lead Cement	12/16/2017	17:11:26	COM5	12.5	8	486	279.8	810 SKS OF NEOCEM CEMENT (279.8BBLS) 12.5PPG 1.94YIELD 9.6GAL/SK WEIGHT OF CEMENT VERIFIED VIA PRESSURIZED MUD SCALES THROUGHOUT LEAD CEMENT
Event	20	Pump Tail Cement	12/16/2017	17:54:08	COM5	13.3	7	503	81.6	265 SKS OF THERMACEM CEMENT (81.6BBLS) 13.3PPG 1.73YIELD 7.81GAL/SK WEIGHT OF CEMENT VERIFIED VIA MUD SCALES THROUGHOUT LEAD CEMENT
Event	21	Shutdown	12/16/2017	18:09:06	USER					SHUTDOWN END OF CEMENT
Event	22	Clean Lines	12/16/2017	18:11:42	USER					CLEAN LINES TO THE PIT WITH RIG SUPPLIED AIR AND WATER - READY TANKS FOR DISPLACEMENT
Event	23	Drop Top Plug	12/16/2017	18:25:21	USER					TOP PLUG AWAY DID NOT LAUNCH - SWAPPED LINES TO POSITIVE DISPLACEMENT
Event	24	Pump Displacement	12/16/2017	18:26:32	COM5	8.34	10	2090	138.3	FRESH WATER DISPLACEMENT WITH KCL, 1-GAL MMCR AND 3 POUNDS OF BE-6
Event	25	Slow Rate	12/16/2017	18:41:02	USER	8.34	4	1441	10	SLOWED RATE TO BUMP THE PLUG - PRESSURE PRIOR TO SLOWING WAS 2090 PSI AT 10 BPM - PRESSURE AFTER SLOWING TO 4 BPM WAS 1441 PSI
Event	26	Bump Plug	12/16/2017	18:43:53	COM5	8.34	4	1621	148.3	PLUG BUMPED AT CALCULATED DISPLACEMENT - PLUG BUMPED AT 1621 PSI TOOK TO 2220 PSI

Event	27	Check Floats	12/16/2017	18:47:27	USER	2220	FLOATS HELD 1.5BBLS BACK TO TANKS - THERE WERE GOOD RETURNS THROUGHOUT CEMENT JOB
Event	28	End Job	12/16/2017	18:49:16	COM5		THANK YOU FOR CHOOSING HALLIBURTON CEMENT CARL KUKUS AND CREW
Event	29	Pre-Rig Down Safety Meeting	12/16/2017	18:55:00	USER		JSA REVIEWED - ALL HES INVOLVED IN SAFETY MEETING
Event	30	Rig-Down Equipment	12/16/2017	19:00:00	USER		WASH UP AND BLOW DOWN PUMP TRUCK - RIG DOWN ALL LINES AND EQUIPMENT
Event	31	Rig-Down Completed	12/16/2017	20:00:00	USER		COMPLETED SAFELY
Event	32	Pre-Convoy Safety Meeting	12/16/2017	20:15:00	USER		JOURNEY CREATED - ALL HES INVOLVED IN SAFETY MEETING
Event	33	Crew Leave Location	12/16/2017	20:30:00	USER		1-F-550 PICKUP, 1-ELITE PUMP TRUCK, 1-660 BULK TRUCK

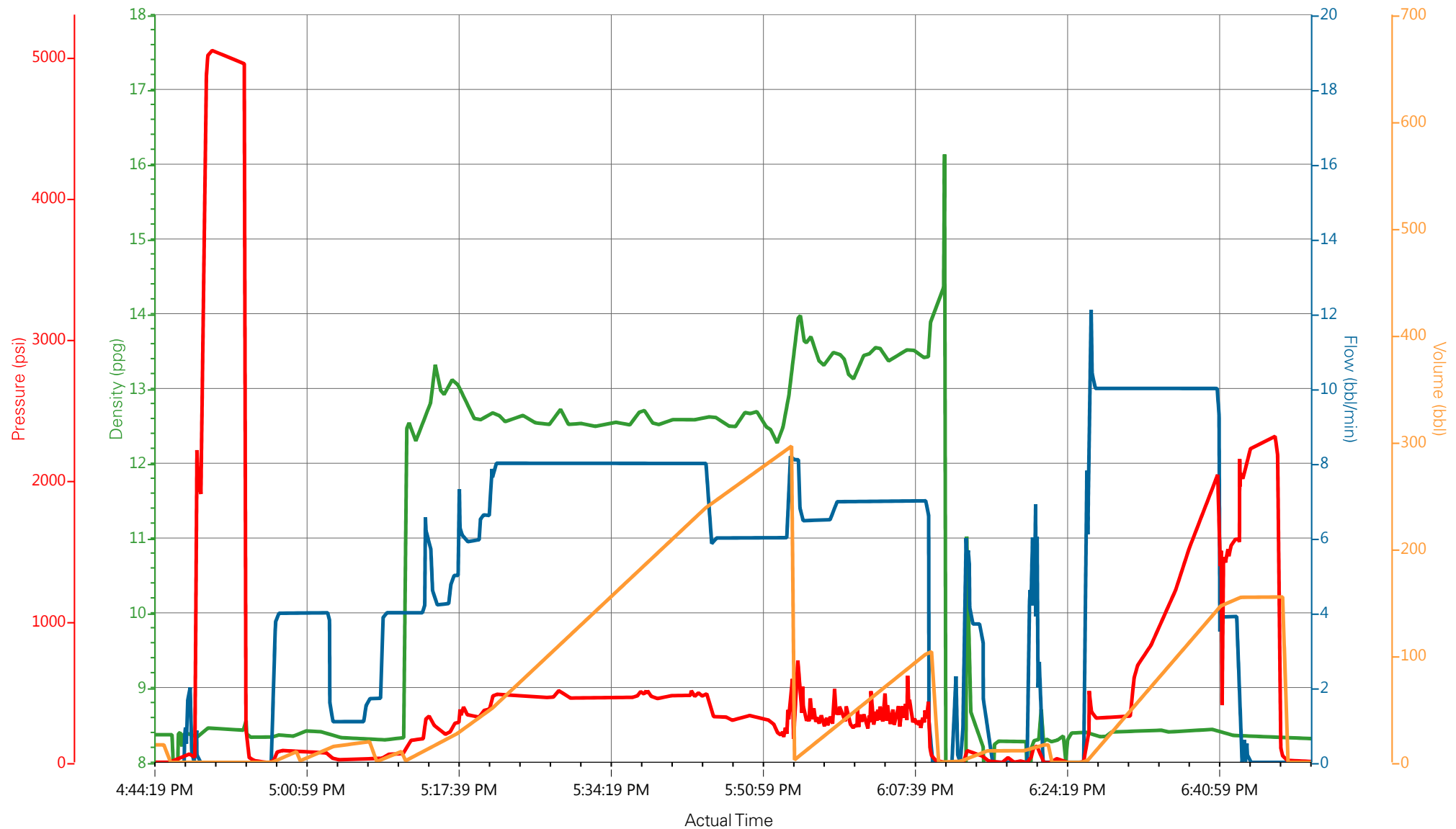
# TEP - WARE SR 34-12 - 904501393 - 4 1/2" PRODUCTION



DH Density (ppg) 1.67 Comb Pump Rate (bbl/min) 0 DS Pump Press (psi) 1 Pump Stg Tot (bbl) 0

- |                             |                   |   |                    |                    |                          |              |               |
|-----------------------------|-------------------|---|--------------------|--------------------|--------------------------|--------------|---------------|
| ① Call Out                  | ③ Crew Leave Yard | ⑤ Assessment Of Location Safety Meeting | ⑦ Rig-Up Equipment | ⑨ Water Test       | ⑪ Pre-Job Safety Meeting | ⑬ Fill Lines | ⑮ Fresh Water |
| ② Pre-Convoy Safety Meeting | ④ Arrive At Loc   | ⑥ Pre-Rig Up Safety Meeting             | ⑧ Well Info        | ⑩ Rig-Up Completed | ⑫ Start Job              | ⑭ Test Lines | ⑯ Mud Flush   |

# TEP - WARE SR 34-12 - 904501393 - 4 1/2" PRODUCTION



DH Density (ppg) 1.67    Comb Pump Rate (bbl/min) 0    DS Pump Press (psi) 1    Pump Stg Tot (bbl) 0

# HALLIBURTON

## Rockies, Grand Junction

### Lab Results- Lead

#### Job Information

<b>Request/Slurry</b>	2437722/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	11/DEC/2017
<b>Submitted By</b>	Patrick Ealey	<b>Job Type</b>	Production Casing	<b>Bulk Plant</b>	Grand Junction
<b>Customer</b>	Terra Energy Partners	<b>Location</b>	Garfield	<b>Well</b>	SR 34-12

#### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9594 ft	<b>BHST</b>	116°C / 241°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9472 ft	<b>BHCT</b>	77°C / 171°F
<b>Pressure</b>	5930 psi				

#### Drilling Fluid Information

<b>Mud Supplier Name</b>	<b>Mud Trade Name</b>	<b>Density</b>
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#### Cement Information - Lead Design



<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		NeoCem Lead				Slurry Density	12.5	lbm/gal
						Slurry Yield	1.941	ft3/sack
						Water Requirement	9.623	gal/sack
						Total Mix Fluid	9.623	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

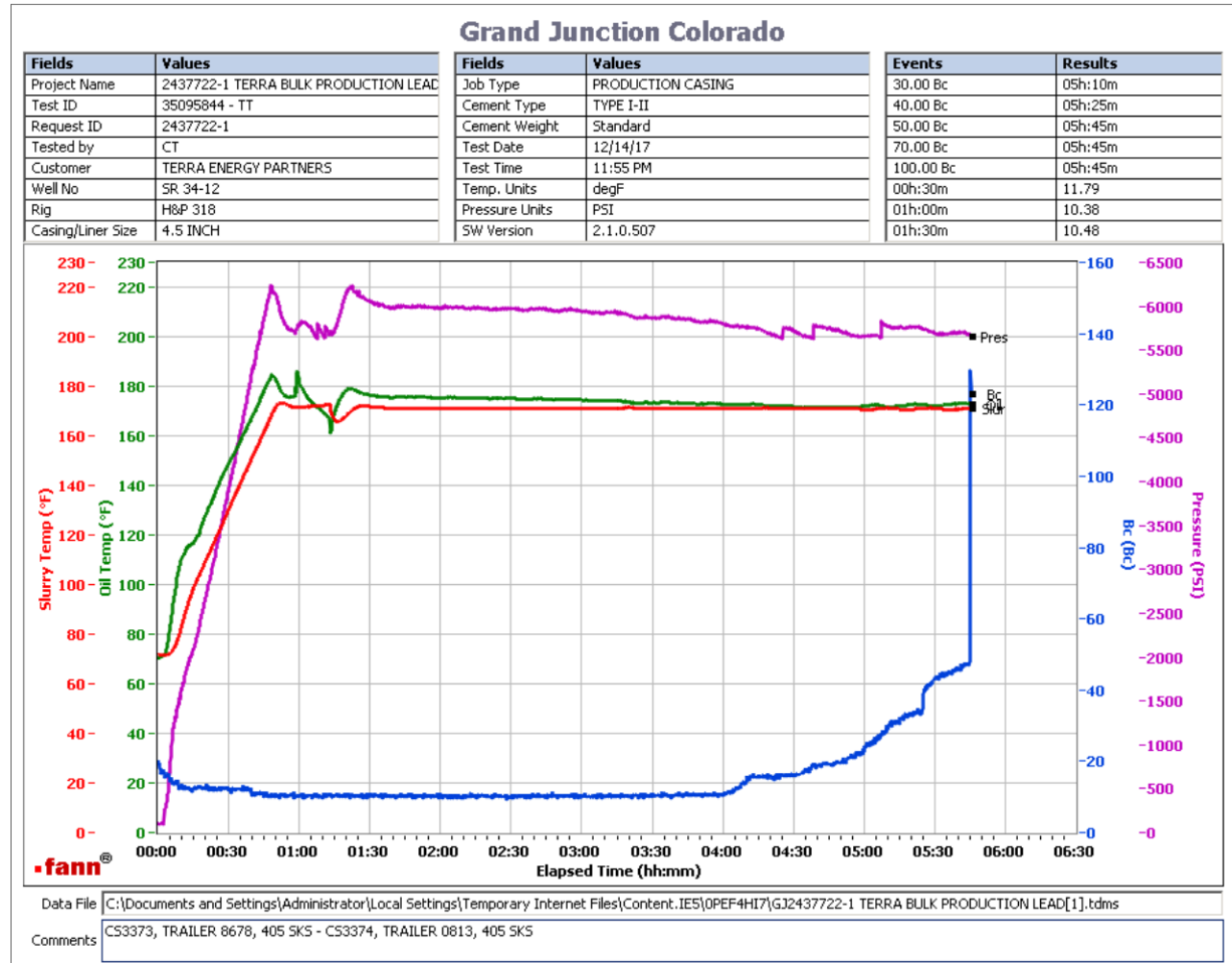
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# **Operation Test Results Request ID 2437722/1**

## **Thickening Time - ON-OFF-ON**

**14/DEC/2017**

Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
171	5930	48	5:10	5:45	5:45	5:45	20	58	15	10



Total sks=810  
 CS3373, Trailer 8678, 405 sks  
 CS3374, Trailer 0813, 405 sks

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

<b>Request/Slurry</b>	2437723/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	11/DEC/2017
<b>Submitted By</b>	Patrick Ealey	<b>Job Type</b>	Production Casing	<b>Bulk Plant</b>	Grand Junction
<b>Customer</b>	Terra Energy Partners	<b>Location</b>	Garfield	<b>Well</b>	SR 34-12

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9594 ft	<b>BHST</b>	116°C / 241°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9472 ft	<b>BHCT</b>	77°C / 171°F
<b>Pressure</b>	5930 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	<b>Mud Trade Name</b>	<b>Density</b>
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### Cement Information - Tail Design



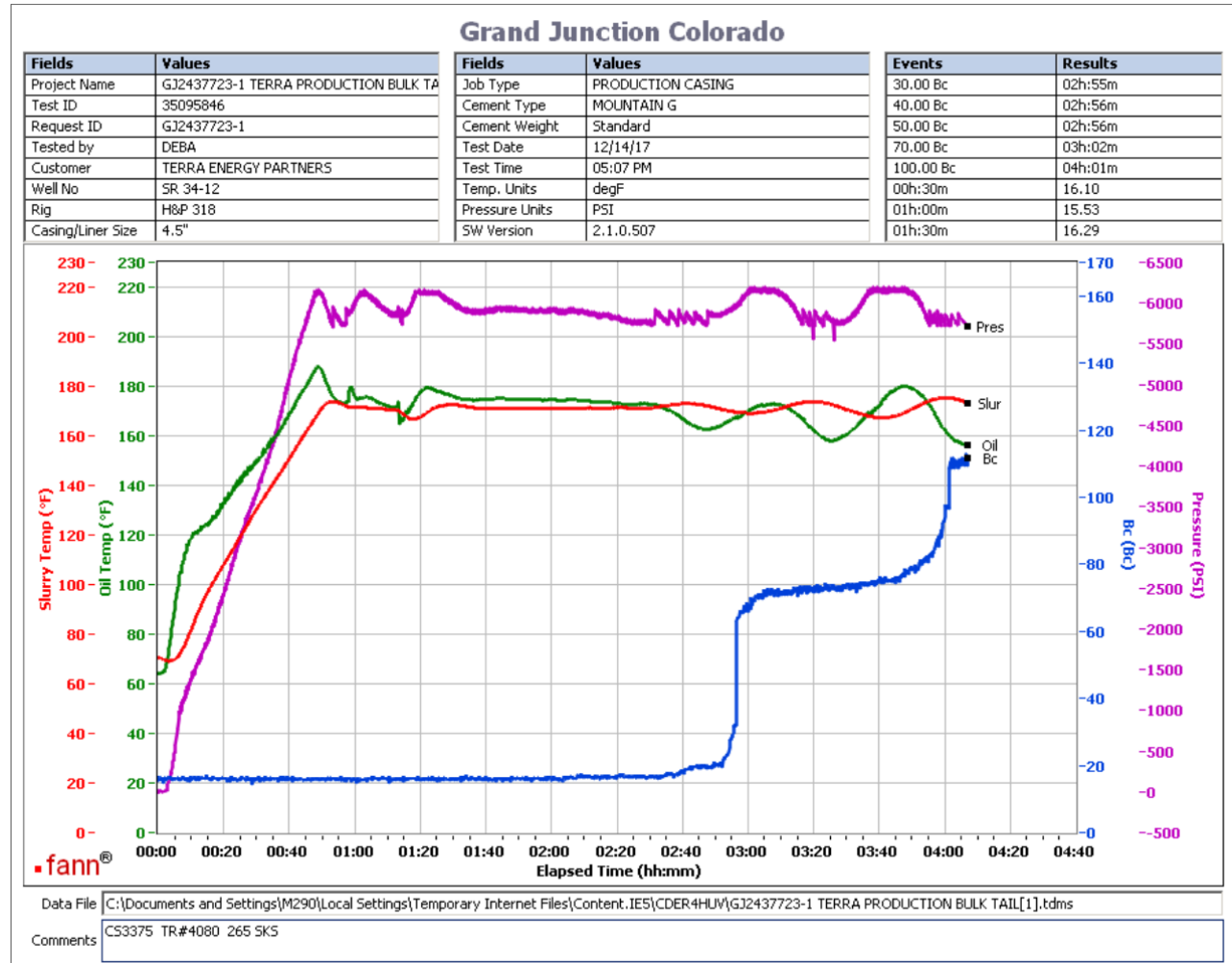
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		ThermaCem Tail				Slurry Density	13.3	lbm/gal
						Slurry Yield	1.733	ft3/sack
						Water Requirement	7.799	gal/sack
						Total Mix Fluid	7.799	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Thickening Time - ON-OFF-ON

14/DEC/2017

Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
171	5930	48	2:55	2:56	3:02	4:01	16	58	15	16



265 sks tail  
 CS3375 TR#4080 265 SKS  
 Deflection: 16 - 16  
 Heat of hydration occurred around 2:30.

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