

Mark and I spoke. We would also like to add to pull 3-5 stds above theoretical TOC and flush the DS after both plugs. Thank you.

Best Regards,

Brandon Hilts

On Mar 26, 2017, at 10:33 PM, Mark Mewshaw <mmewshaw@terraep.com> wrote:

Gentlemen,

Attached is Terra Energy Partners Plug & Abandon Procedure and Cement Details. Please call with any questions or suggestions.

Thanks,

Mark D. Mewshaw | Drilling & Completions Manager | TEP Rocky Mountain LLC | 4828 Loop Central Dr., Suite 900, Houston, TX 77081

☎ (Office) 832-726-1147 | ☎ (Mobile) 304-612-7844 | ✉ mmewshaw@terraep.com

<image001.png>

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<TR 334-27-597 Balanced Plug Cement Calculations.docx>

<TEP TR 334-27-597 PTA Proposal.pdf>



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12K

Andrews - DNR, David <david.andrews@state.co.us>

Mon, Mar 27, 2017 at 3:06 AM

To: Brandon Hilts <BHilts@terraep.com>, Craig Burger - DNR <craig.burger@state.co.us>

Cc: Mark Mewshaw <mmewshaw@terraep.com>, Lynn Cass <LCass@terraep.com>, Tyler Gillam <tgillam@terraep.com>, Ted Ragsdale <TRagsdale@terraep.com>

Craig,

The procedure looks OK to me. This is the same well that Terra sidetracked last week. Please get back with Brandon and Mark today to approve the P&A.

Thanks,

Dave

[Quoted text hidden]

Burger - DNR, Craig <craig.burger@state.co.us>

Mon, Mar 27, 2017 at 7:20 AM

To: "Andrews - DNR, David" <david.andrews@state.co.us>

Cc: Brandon Hilts <BHilts@terraep.com>, Mark Mewshaw <mmewshaw@terraep.com>, Lynn Cass <LCass@terraep.com>, Tyler Gillam <tgillam@terraep.com>, Ted Ragsdale <TRagsdale@terraep.com>

All,

As discussed yesterday this procedure is acceptable.

I will put documentation in the well file and there is no need to file a Form 6 Notice of Intent. Please file the Form 6 Subsequent Report as usual.

Thanks

[Quoted text hidden]

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Craig Burger, P.E.

Northwest Area Engineer



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TR 334-27-597 Balanced Plug Calculations

Info:

8-3/4" hole Capacity: 0.06757 bbls/ft,

9-5/8" Casing Capacity: 0.07729 bbl/ft

Mud weight: 8.8 ppg

Surface Casing Depth: 2799 ft

Tubular Data:

4-1/2" DP open ended, 19.5 #/ft, 6-1/4" TJ OD x 2-3/4" TD ID

Capacity: 0.01369 bbls/ft

Open Ended Displacement: 0.0071 bbls/ft

Annular Data:

8-3/4" x 4-1/2" Capacity: 0.01755 bbls /ft

8.921" x 4-1/2" Capacity: 0.018987 bbls/ft

Cement Data:

Cement Type: Class G Slurry Density: 15.8 ppg

Plug #1: 40 bbl TS III Spacer, 165 sks 15.8# G Cement w/Retarder, 1.15 ft³/sk, 5.0 gal Water Requirement

Plug #2: 20 bbl Water Spacer, 105 sks 15.8# G Cement w/Retarder, 1.15 ft³/sk, 5.0 gal Water Requirement

Plug #3: 10 bbl Water Spacer, 20 sks 15.8# G Cement w/CaCl, 1.16 ft³/sk, 4.82 gal Water Requirement

Calculations:

1. Volume of cement plug required for 1st plug from 4500' to 4200' = $0.06757 \text{ bbls/ft} \times 300 \text{ ft} = 20.72 \text{ bbls} \times 50\% \text{ excess} = 30.4 \text{ bbls}$ Halliburton is bringing 165sks x 1.15 ft³/sk *.1781 = **33.79 bbls**
2. Volume of cement plug required for 2nd plug from 2699' to 2899' = $0.06757 \text{ bbls/ft} \times 100 \text{ ft} = 10.14 \text{ bbls} \times 50\% \text{ excess} + 0.7729 \text{ bbls/ft} \times 100 \text{ ft} = 17.86 \text{ bbls}$ Halliburton is bringing 105sks x 1.15 ft³/sk *.1781 = **21.5 bbls**
3. Volume of cement plug required for 3rd plug from 54' to 4' (4' below ground level) = $0.7729 \text{ bbls/ft} \times 50 \text{ ft} = 3.86 \text{ bbls}$ Halliburton is bringing 20 sks x 1.16 ft³/sk *.1781 = **4.13 bbls**

Procedure:

1. Run in hole with 4-1/2" open ended drill pipe to 4500' for balanced plug #1.
2. Pump 34.6 bbls of spacer ahead of cement.
3. Pump 33.79 bbls of 15.8 ppg cement.
4. Displace with 5.4 bbls of space behind cement.
5. Displace with **19.25 bbls** of 8.8 ppg mud. Calculation based on underdisplacement of 10 bbls.
6. POOH at a controlled speed to 2899 ft for balanced plug #2.
7. Pump 11.62 bbls of water spacer ahead of cement.
8. Pump 21.5 bbls of 15.8 ppg cement.
9. Displace with 8.38 bbls of water space behind cement.
10. Displace with 10.13 bbls of 8.8 ppg mud. Calculation based on underdisplacement of 10 bbls.
11. POOH at a controlled speed to 54 ft for balanced plug #3.
12. Pump 5 bbls of water spacer ahead of cement.
13. Pump 4.13 bbls of 15.8 ppg cement.
14. Pull out cement and stand back drill pipe.
15. Have sugar water ready to flush stack out through casing valve.
16. Release rig and skid rig to 4th well on pad.