

PLUG AND ABANDONMENT PROCEDURE

BRATTAIN L 12-16JI

- | Step | Description of Work |
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| 1 | Provide 48 hr notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Call IOC (970-506-5980) at least 24 hr prior to rig move. Request they isolate production equipment and remove any automation prior to rig MIRU. |
| 2 | Prepare location for base beam equipped rig. Install perimeter fence as needed. |
| 3 | Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL. |
| 4 | MIRU workover rig. Circulate well with water w/ biocide to kill the well if needed. ND wellhead. NU BOPs. Unseat landing jt. Spot trailer with 29 jts of 2-3/8" tbgs. (NOTE: casing leak was found during Bradenhead activity between 991' and 1023') |
| 5 | MIRU Slickline. Set plug in XN nipple at 7013'. PT tbgs to 3000 psi. Pull plug and RDMO Slickline. |
| 6 | PU 2 jts of 2-3/8" tbgs and RIH to RBP at 7180'. Circulate the 2 sack sand cap off RBP. Latch and release RBP. |
| 7 | POOH and stand back 2-3/8" tbgs. Lay down RBP, retrieving head and XN profile. |
| 8 | Notify Cementers to be on call. |
| 9 | RIH on 2-3/8" tbgs. Tag CIBP w/ cement cap at 7930'. Pick up 5 feet. |
| 10 | RU Cementers. Pump Niobrara plug consisting of 110 cu-ft (80 sx)"G" w/ 20% silica flour, 0.4% CD -32, 0.4% ASA -301 and R-3 to achieve 2:30 pump time mixed at 15.8 ppg and 1.38 cuft/sk. Calculated top in the 4-1/2" csg is 6750'. RD Cementers. |
| 11 | PUH to 6400' and circulate hole clean with fresh water w/ biocide. POOH standing back 134 jts and laying down the remainder. |
| 12 | MIRU WL. PU and RIH with 1- 1' 3-1/8" perf guns with 3 spf, 0.5" diam, 120° phasing. Shoot 1' of squeeze holes at 4760'. RDMO WL. Note: We plan to circulate the suicide plug through the csg holes at ~1000'. |
| 13 | PU retrievable packer and RIH to 1200'. Set packer and establish circulation through bottom sqz holes at 4760' and csg holes at ~1000'. POOH and LD packer. |
| 14 | PU 4-1/2" CICR and RIH on 2-3/8" tbgs and set at 4240'. |
| 15 | RU Cementers. Establish circulation through sqz holes at 4760' and casing leak holes at ~1000'. Pump 5 bbls fresh water followed by 20 bbls Sodium Metasilicate followed by 5 bbls fresh water spacer. Pump Sussex Suicide plug: 288 cu-ft (250 sks) "G" w/ 0.25pps cello flake, 0.4% CD-32, 0.4% ASA-301 with CaCl ₂ as necessary. Underdisplace by 3 bbls and sting out of CICR. Spot final 3 bbls on top of CICR. Mixed at 15.8 ppg, 1.15 cuft/sack. Volume is based on 9" hole plus 20% excess and 4-1/2" csg up to 4060'. RD Cementers |

- 16 PUH to ~3800' and circulate hole clean with fresh water w/ biocide. POOH standing back 34 jts 2-3/8" tbg. Lay down stinger and remaining jts.
- 17 ND BOP and wellhead. Install a BOP on surface casing head with 4 1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
- 18 MIRU Wireline. Cut off 4-1/2" csg at 1150' per CCL. RDMO WL. Circulate bottoms up using water and biocide to remove any gas from wellbore. (Do not reverse circulate)
- 19 POOH and LD 4-1/2" csg. Remove the 4-1/2" pipe rams and Install 2-3/8" pipe rams.
- 20 MIRU Cementers. Fox Hills Suicide Squeeze: Pump mud flush of 10 bbls SAPP and 20 bbl water ahead of 293 cu-ft (220 sx) Type III w/cello flake and CaCl₂ as deemed necessary, mixed at 1.33 cf per sack, 14.8 ppg. Plug size is based on 9" hole with 40% excess covering 1200' to surface csg shoe at 710' and capacity in the 8-5/8" csg to 500'. RD Cementers.
- 21 PUH to 300' and circulate hole clean. POOH and LD tbg. WOC at least 4 hours per cementing company recommendation.
- 22 RU WL. RIH and tag top of plug. Plug needs to be tagged at 500' or shallower. Contact Reed Boeger in Evans after tag to confirm.
- 23 RIH and set CIBP in the 8 5/8", 24# surface casing at 80'. PT CIBP and surface casing to 1000 psi for 15 minutes. Assuming successful test, RDMO wireline. RDMO WO Rig.
- 24 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hrs of completion of the job.
- 25 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 26 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 27 Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
- 28 Welder cut casing minimum 5' below ground level.
- 29 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 30 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 31 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 32 Back fill hole with fill. Clean location, level.
- 33 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.

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