

## Grant Brothers 31-11 #2: Plug & Abandonment

- 1 Provide 48 hour 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 hours prior to rig move. Request they isolate production equipment and remove any automation equipment prior to MIRU.
- 2 Prepare location for base beam equipped rig. Install perimeter fence as needed.
- 3 Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level
- 4 MIRU WO rig. Kill well as necessary with water and biocide. ND wellhead.
- 5 NU ratigan and rod table on top of flow tee.
- 6 Unseat pump and TOO H with rod string (206 total rods with insert pump seated at 5161'). Lay down all rods and have them sent to A&W's Yard for storage.
- 7 ND rod table, ratigan, and flow tee. NU BOP.
- 8 Install 2-3/8" lift sub to unland tubing string (165 total joints landed at 5187'). Release tubing anchor. TOO H standing back 4650' 2-3/8" tubing. Lay down tubing anchor, mud anchor, and any extra tubing.
- 9 PU & TIH with casing scraper for 5-1/2" 15.5# production casing to 4650' (**last tagged at 5228' on 8/21/08**). TOO H and stand back 4600' of 2-3/8" tubing. LD casing scraper and extra tubing.
- 10 MIRU slickline. Run gyro survey inside 5-1/2" 15.5# production casing from 4550' (~100' above top Sussex perms) to surface with stops every 100'. Forward gyro survey data and invoices to Sabrina Frantz. RDMO slickline.
- 11 MIRU hydrotester. PU CICR with 2-3/8" tubing and TIH while hydrotesting the 2-3/8" tubing to 3000psi. Set CICR at 4600' (collars at 4583' and 4614'). RDMO hydrotester.
- 12 Connect to the 2-3/8" tubing and establish an injection rate through CICR of at least 1 bbl/min into the open Sussex perms with an injection pressure less than 2000psi. **If injection rate at least 1 bbl/min and injection pressure less than 2000psi proceed to next step, otherwise contact engineering.**
- 13 MIRU cementing services. Establish injection with water through CICR and pump 20 bbls sodium metasilicate, 5 bbl water spacer, 75 sx Class "G" cement with 0.25 pps cello flake, 0.4% CD-32 and 0.4% ASA-301 mixed at 15.8ppg and 1.15 cuft/sx (cement volumes based on 50sx to squeeze Sussex perms and 5-1/2" casing capacity with no excess from 4700' to 4500'). Underdisplace cement in tubing using 15 bbls water (2.8 bbls short of CICR set at 4600') and spot remaining cement on top of CICR. TOO H and stand back 2-3/8" tubing so EOT at +/- 4300'. Reverse circulate using approx. 33 bbls water (2 times tubing volume) or until returns are clean. RDMO cementing services.
- 14 TOO H and stand back 4210' of 2-3/8" tubing and LD extra tubing.
- 15 MIRU wireline. PU and RIH with 3-1/8" perf guns and shoot squeeze holes at 4380' using 3 SPF, 0.5" EHD, 1' net, 3 total shots.
- 16 PUH with perf guns and shoot squeeze holes at 4180' using 3 SPF, 0.5" EHD, 1' net, 3 total shots. RDMO wireline.
- 17 PU & TIH with CICR on 2-3/8" tubing. Set CICR at 4210' (no collar locator ran at this depth to correlate to).
- 18 Establish circulation through squeeze holes to surface with water. **If circulation is established, proceed to next step; otherwise contact engineering for revised procedure steps.**
- 19 MIRU cementing services. Establish circulation with water through CICR and pump 20 bbls sodium metasilicate, 5 bbl water spacer, 110 sx Class "G" cement with 0.25 pps cello flake, 0.4% CD-32 and 0.4% ASA-301 mixed at 15.8ppg and 1.15 cuft/sx (cement volumes based on 9" caliper plus 20% excess from 4380' to 4180' and 5-1/2" casing capacity with no excess from 4380' to 4000'). Underdisplace cement in tubing using 11 bbls water (5.3 bbls short of CICR set at 4210') and spot remaining cement on top of CICR. TOO H and stand back 2-3/8" tubing so EOT at +/- 3800'. Reverse circulate using approx. 30 bbls water (2 times tubing volume) or until returns are clean. RDMO cementing services.
- 20 TOO H and stand back 1350' of 2-3/8" tubing and LD extra tubing.
- 21 MIRU wireline. RIH and jet cut 5-1/2" production casing at 1250'. RDMO wireline. Circulate bottoms up and continue circulating to remove any gas from wellbore.

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- 22 ND BOP. Install BOP on surface casing head with 5-1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
- 23 TOO and LD 1250' of 5-1/2" casing.
- 24 TIH w/ 2-3/8" tubing open ended to 1350' (100' inside the 5-1/2" stub).
- 25 MIRU cementing services. Establish circulation with water and pump 10 bbls SAPP mud flush, 20 bbls fresh water spacer, then balanced stub plug using 360 sx Type III cement with cello flake and CaCl<sub>2</sub> as necessary, mixed at 14.8 ppg and 1.33 cuft/sx (cement volumes based on 100' inside 5-1/2" casing, 634' in 9" hole with 40% excess, and 200' in 8-5/8" surface casing). RDMO cementing services.
- 26 TOO and LD 2-3/8" tubing until EOT at +/- 200'. Circulate down tubing and up surface casing/tubing annulus until returns are clean to ensure CIBP can be set in clean surface casing. Finish TOO and LD 2-3/8" tubing. WOC to set up per cementing company recommendation.
- 27 PU and TIH with 2-3/8" tubing to tag cement plug at +/- 416'. If cement is not at or above 416' contact engineer, otherwise proceed to next step.
- 28 TOO and lay down all 2-3/8" tubing.
- 29 MIRU wireline. PU and RIH with CIBP (8-5/8", 23#/ft). Set CIBP at 80' and pressure test the CIBP to 1000psi for 15mins. If pressure test fails contact engineering, otherwise proceed to next step.
- 30 RDMO wireline. RDMO WO rig.
- 31 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of completion of job.
- 32 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 33 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 34 Excavate hole around surface casing enough to allow welder to cut casing minimum of 5' below ground level.
- 35 Welder cut casing minimum of 5' below ground level.
- 36 Fill casing to surface using 4500psi compressive strength cement (NO GRAVEL).
- 37 Spot weld on steel marker plate. Marker should contain well name, well number, legal location (1/4 1/4 descriptor), and API number.
- 38 Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com)
- 39 Properly abandon flowline per Rule 1103. File electronic Form 42 once abandonment complete.
- 40 Back fill hole with fill. Clean and level location.
- 41 Submit Form 6 to COGCC ensuring to provide "As Performed" WBD identifying operations completed.

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