

PLUG AND ABANDONMENT PROCEDURE (RE-ENTER)

UPRR 38 PAN AM GU H 2

- | Step | Description of Work |
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| 1 | Locate and expose casing stub. Extend 4 1/2" casing to GL and install 3M well head with 3000 psi ball valves in both outlets. Prepare location for workover rig. Install perimeter fence as needed. |
| 2 | Provide notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). |
| 3 | MIRU workover rig. NU 7 1/16" 3000 psi BOP stack on casing head. PT BOP and csg head per approved Form 2. Function test BOPE. NU rotating head on BOP. Hook up return line to shale shaker on flat tank |
| 4 | PU 3 7/8" mill tooth bit, necessary drill collars and drill pipe/work string (WS). Drill through existing cement plugs (at 0' - 190', 1070' - 2100', and 4420' - 4600' per Amoco reports) using water with biocide. |
| 5 | Once surface plug is drilled, RIH to 2 sk cement cap on CIBP @ 7880' (calculated top is 7854'). |
| 6 | TOOH standing back WS. LD bit and DCs. |
| 7 | MIRU WL. Run gyro survey from PBTD to surface. Run CBL from PBTD to surface. Forward results to Evans Engineering. |
| 8 | PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 7190' and 6770'. Adjust perf depths according to cement top per CBL. Desired bottom perf is 20' above TOC. |
| 9 | PU CICR. RIH and set at 6800'+/-20' pending collar locator on CBL. RD WL. |
| 10 | RIH w/ WS and stinger for CICR while hydrotesting to 3,000 psi. |
| 11 | RU Cementers. Pump Niobrara Suicide squeeze: 170 sx 50/50 Poz "G" w/ 20% silica flour, 3% gel, 0.1% sodium metasilicate and 0.4% FL-52 mixed at 13.5 ppg and 1.71 cf/sk. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer. Cement volume based on 9 1/2" hole with 20% excess. |
| 12 | PUH 10 stands. Circulate with water containing biocide to clear tubing. TOH standing back ~ 4300' of WS. |
| 13 | RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 4460' and 4260'. Adjust perf depths as necessary per CBL. |
| 14 | PU CICR. RIH and set at 4290'+/-20' pending collar locator on CBL. RD WL. |
| 15 | RIH w/ WS and stinger. |
| 16 | RU cementers. Pump 5 bbls water with biocide, 20 bbls Sodium Metasilicate solution, and another 5 bbl spacer immediately preceding cement. |
| 17 | Pump Sussex squeeze consisting of 130 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sk. Underdisplace and sting out of CICR to leave 3 bbls of cement on top of retainer. (Cement volume based on 10" hole with 20% excess). |
| 18 | PUH 10 stands. Circulate with water containing biocide to clear tubing. TOH standing back ~ 2200' of WS. |
| 19 | Consult with Evans Engineering to determine cement work required to isolate Fox Hills formation based on CBL. Also determine if any 4 1/2" casing can be recovered per CBL. |
| 20 | If no Fox Hills squeeze work is required, TIH WS open-ended to place cement plug in 4 1/2" casing covering leaks identified by Amoco between 2200' and surface. (830', 1349', 2169') |

- 21 RU Cementers. Mix and equalize cement plug (in stages as needed) from 2200' to 600'. Total slurry required: 90 sx Type III cement w/ CaCl₂ as deemed necessary mixed at 14.0 ppg and 1.53 cf/sk. If 4 1/2" casing cannot be cut off in open hole, extend plug to 100' from surface with addition of 30 sx cement and skip steps 23 & 24. TOH WS.
- 22 WOC per cement company recommendation. Tag top of plug.
- 23 Cut off 4 1/2" casing as deep as possible above TOC and below shoe of surface casing. LD casing.
- 24 TIH WS open-ended. RU cementers and spot cement plug from 100' inside 4 1/2' casing stub to 100' from surface: 60 sx Type III cement w/0.25 pps cello flake and CaCl₂ as deemed necessary mixed at 14.0 ppg and 1.53 cf/sk. Volume to be adjusted as necessary after CBL is run. WOC per cement company recommendation and tag plug at 100'.
- 25 MIRU WL. RIH 4 1/2" or 8 5/8" CIBP as needed to 100'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 26 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.
- 27 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 28 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 29 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 30 Welder cut casing minimum 5' below ground level.
- 31 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 32 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 33 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 34 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment is complete.
- 35 Back fill hole with fill. Clean location, level.
- 36 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.

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