

PLUG AND ABANDONMENT PROCEDURE

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HART B GAS UNIT 2

Step	Description of Work
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 automation removal group at least 24 hr prior to rig move. Request they catch and remove plunger, isolate production equipment and remove any automation prior to rig MIRU.
2	MIRU slickline services. Pull bumper spring and tag bottom. Last tag recorded @ 8138' on 09/08/2008. Run gyro from 8106' to surface with stops every 100'. Forward results to Sabrina Frantz. RDMO slickline services.
3	Prepare location for base beam equipped rig. Install perimeter fence as needed.
4	Check and record Bradenhead pressure. If BH valve is not accessible, re-plumb so that valve is above GL.
5	MIRU, kill as necessary using clean fresh water with biocide. ND WH. NU BOP.
6	TOOH with tubing, SB.
7	PU casing scraper for 4 1/2", 11.6 #/ft casing. RIH with casing scraper on tubing to 8090'. POOH, LD scraper and SB tubing.
8	PU 4 1/2", 11.6 #/ft CIBP. RIH on tubing and set @ 8080'. Circulate one wellbore volume to remove any gas (about 125 bbls) to ensure quality CBL.
9	Pressure test the CIBP to 1000 psi for 15 minutes.
10	MIRU WL. Run CBL/CCL from 8050' to surface. Forward results to nicole.schaly@anadarko.com and brent.marchant@anadarko.com . Confirm with Evans Engineering before moving forward with Niobrara suicide squeeze.
11	Dump bail 2 sx of cement on CIBP set at 8080'.
12	PU and RIH with 2-1', 3-1/8" perf guns with 3 spf, 0.50" EHD, 120° phasing. Shoot 1' of squeeze holes at 7800' and 6990'. RD WL.
13	RU hydrotester. PU 4 1/2" CICR and RIH on tubing to set at 7020' while hydrotesting to 3000 psi.
14	Establish circulation with fresh water treated with biocide.
15	RU Cementers. Pump Niobrara suicide squeeze: 250 sx (428 cuft) 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 cuft/sk. Underdisplace by 3 bbls and unsting from CICR spotting at least 100' on top of squeeze holes. The plug will cover 7800' - 6890'. Volume based on 810' in 9" OH from caliper with 20% excess, 910' in 4 1/2" production casing with no excess. RDMO cementers.
16	PUH to 6700' and circulate tubing clean to ensure no cement is left in the tubing.
17	P&SB 4290' of tubing, LD remainder.
18	MIRU WL. PU and RIH with 2-1', 3-1/8" perf guns with 3 spf, 0.50" EHD, 120° phasing. Shoot 1' of squeeze holes at 5260' and 4260'. RD WL.
19	PU 4 1/2" CICR and RIH on tubing to set at 4290'.
20	Establish circulation with fresh water treated with biocide.

- 21 RU Cementers. Pump 20 bbl sodium metasilicate and a 5 bbl water spacer. Pump Sussex Suicide: 610 sx (701.5 cuft) Class "G" cement with 0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cuft/sx. Underdisplace by 3 bbls and unsting from CICR spotting at least 100' cement on top of squeeze holes. The plug will cover 5260' - 4160'. Volume based on 1000' in 10.5" OH from caliper with 20% excess, 1100' in 4 1/2" production casing with no excess. RDMO cementers.
- 22 PUH to 4000' and circulate to ensure no cement left in the tubing.
- 23 P & SB 1300' of tubing, LD remainder.
- 24 MIRU WL. RIH and cut casing at 1200'. RDMO WL.
- 25 Circulate with fresh water containing biocide to remove any gas.
- 26 NDBOP, NDTH. Install BOP on casing head with 4 1/2" pipe rams.
- 27 TOOH with 1200' of 4 1/2" casing, LD. Replace 4 1/2" pipe rams with 2 3/8" pipe rams.
- 28 RIH with 2 3/8" tubing to 1300' (100' into casing stub).
- 29 MIRU Cementers. Preceed cement with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 450 sx (599 cuft) Type III w/ cello flake and CaCl₂ as deemed necessary, mixed at 14.8 ppg and 1.33 cuft/sx (100' in 4 1/2" production casing with no excess, 547' in 12" OH from caliper with 20% excess, 203' in 8 5/8" surface casing with no excess). The plug will cover 1300' - 550'.
- 30 Pull up to 100' and circulate tubing clean using fresh water treated with biocide. TOOH.
- 31 WOC per cement company recommendation. Tag cement. Cement top needs to be above 553'.
- 32 MIRU WL. RIH 8 5/8" CIBP and set at 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
- 33 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.
- 34 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 35 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 36 Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
- 37 Welder cut casing minimum 5' below ground level.
- 38 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 39 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 40 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 41 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 42 Back fill hole with fill. Clean location, level.
- 43 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.