

# **PLUG AND ABANDONMENT PROCEDURE**

## **William E Gee Gas Unit 2**

**Engineer: Nicole Schaly (419.908.8781)**

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 catch and remove plunger, isolate production equipment and remove any automation prior to rig MIRU.

MIRU slickline services. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 7917' (halfway between J sand perfs) making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO slickline services.

Prepare location for base beam equipped rig. Install perimeter fence as needed.

Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL.

MIRU, kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt, LD.

TOOH and SB 2 3/8" production tubing (243 jts landed @ 7853').

RIH casing scraper on 2 3/8" tubing for 4 1/2", 10.5 #/ft - 11.6 #/ft casing to 7850'. P & LD scraper, SB 6780' tubing, LD remainder.

MIRU WL. Set CIBP at 7830' to abandon J sand perfs. Pressure test CIBP to 1000 psi. Dump bail 2 sx cement on top of CIBP.

RIH 2 3/8" tbg to minimum of 2000'. Circulate hole to remove trapped gas.

Run CBL from 7750' to surface. Email results to [brent.marchant@anadarko.com](mailto:brent.marchant@anadarko.com) and [nicole.schaly@anadarko.com](mailto:nicole.schaly@anadarko.com). Results of this CBL may change the depth of the squeeze perfs over the Niobrara.

PU and RIH with 2-1' 3-1/8" perf guns with 3 spf, 0.5" diam 120° phasing. Shoot 1' of squeeze holes at 7200' and 6750'. RD WL.

MIRU hydrotester. PU 4 1/2" CIGR and RIH on 2 3/8" tubing while hydrotesting. Set CIGR at 6780'.

RU Cementers. Establish injection and circulation through squeeze holes. Pump Niobrara Suicide Squeeze: 150 sx (257 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/sx. Underdisplace by 3 bbls and unsting from CIGR spotting at least 100' cement on top of squeeze holes. The plug will cover 7200' - 6750'. Volume based on 450' in 9.5" OH from caliper with 20% excess, 450' inside 4 1/2" csg with no excess. RD cementers.

PUH to 6500' and circulate tubing clean to ensure no cement is left in the tubing.

P & SB 4230', LD remainder.

MIRU WL. PU and RIH with 2-1' 3-1/8" perf guns with 3 spf, 0.5" diam 120° phasing. Shoot 1' of squeeze holes at 4650' and 4200'. RD WL.

RU 4 1/2" CICR and RIH on 2 3/8" to set CICR at 4230'.

RU Cementers. Pump 20 bbl sodium metasilicate and a 5 bbl water spacer to establish injection and circulation. Pump Sussex Suicide: 470 sx (541 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 4650' - 4200'. Volume based on 450' in 12" OH from caliper with 20% excess, 450' in 4 1/2" production casing with no excess. RDMO cementers.

PUH to 4000' and circulate to ensure no cement left in the tubing.

P & SB 1350' of tubing, LD remainder.

RU WL. RIH and cut casing at 1250'. RDMO WL.

Circulate with fresh water containing biocide to remove any gas.

NDBOP, NDTH. Install BOP on casing head with 4 1/2" pipe rams.

POOH with 1250' of 4 1/2" casing, LD. Remove 4 1/2" pipe rams and install 2 3/8" pipe rams.

RIH with 2 3/8" tubing to 1350'.

MIRU Cementers. Precede cement with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 580 sx (772 cuft) Type III w/ cello flake and CaCl<sub>2</sub> as deemed necessary, mixed at 14.8 ppg and 1.33 cuft/sx (100' in 4 1/2" production casing with no excess, 632' in 12" OH from caliper with 40% excess, 218' in 8 5/8" surface csg with no excess). The plug will cover 1350' - 400'. RD cementers.

Pull up to 200' and circulate tubing clean using fresh water treated with biocide. TOOH.

WOC per cement company recommendation. Tag cement. Cement top needs to be above 400'.

MIRU WL. RIH 8 5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.

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 hrs of completion of the job.

Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.

Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.

Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.

Welder cut casing minimum 5' below ground level.

Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).

Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.

Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).

Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.

Back fill hole with fill. Clean location, level.

Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.