

PLUG AND ABANDONMENT PROCEDURE

Sam Funakoshi Gas Unit #1

Description of Work

Note: Production Casing = 4 1/2" OD, 11.6#/ft, K-55; Production Hole Drilled @ 7 7/8";

- 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 foreman or lead operator at least 24 hr prior to rig move. Request they catch and remove the plunger, isolate production equipment and remove any automation prior to rig showing up. Install perimeter fence as needed.
- 2 MIRU slickline services. Pull bumper spring and tag bottom. RDMO slickline services.
- 3 Notify IOC when rig mobilizes to location to generate workorder for flowline removal & one call for line locates.
- 4 Prepare location for base beam equipped rig. MI ~15 additional 2 3/8 " prod tbg jts.
- 5 MIRU, kill as necessary using clean fresh water with biocide and circulate. ND WH. NU BOP. Unseat landing jt, LD.
- 6 Notify cementers to be on call. Provide volumes listed below:
 - 6_1 Niobrara Suicide: 70 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 (18.1 bbls) (9 3/4 " + 20% Caliper Log in file)
 - 6_2 SX Suicide: 450 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/sx (88.7 bbls) (11 1/2 "+20% Caliper Log in file)
 - 6_3 Surface Suicide: 960 sx Type III CaCl₂ cement mixed at 14.0 ppg and 1.53 cf/sx (129.2 bbls) (745' inside 4 1/2" Prod Casing and 775' in 12 1/4" OH + 20% excess, and 2 bbls on top of CICR)
 - 6_4 Stub Plug: 100 sx Type III CaCl₂ cement mixed at 14.0 ppg and 1.53 cf/sx (27.1 bbls) (100' in 4 1/2" prod casing, 103' in 12 1/4" OH + 20% Caliper Log, and 117' in 8 5/8" surface casing)
- 7 TOOH 2 3/8 " production tubing. Stand Back.
- 8 MIRU WL. RIH gauge ring for 4 1/2" 11.6#/ft casing to 7930'.
- 9 RIH CIBP w/ WL. Set at 7835'. PU dump bailer, dump bail 2 sx class 'G' cement on CIBP. PT Casing to 1000 psi.
- 10 Run CBL from CIBP to Surface. Send results to Mark.Hinaman@anadarko.com immediately. RDWL.
- 11 PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 6970' and 6790'. Adjust perf heights according to cement location on CBL. Desired bottom perf is 20' above TOC; Desired top perf is 400' above 7190' (Niobrara Top).
- 12 PU CICR. RIH and set at approximately 30' below the top perf pending collar locator on CBL. RD WL.

- 13 RIH w/ 2 3/8 " tubing while hydrotesting to 3,000 psi.
- 14 RU Cementers. Pump Niobrara Suicide: 70 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 (18.1 bbls) (9 3/4 " + 20% Caliper Log in file) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 15 PUH 6 stands. Circulate 95 bbls water containing biocide to clear tubing.
- 16 Place 9.0 ppg mud containing biocide from 6630' to 4890' (~28 bbls). TOO H.
- 17 RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 4890' and 4280'.
- 18 PU CICR. RIH and set at approximately 30' below the top perf pending collar locator on CBL. RD WL.
- 19 RIH w/ 2 3/8 " tubing.
- 20 RU Cementers. Pump 5 bbl water w/ biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement.
- 21 Pump SX Suicide: 450 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/sx (88.7 bbls) (11 1/2 " +20% Caliper Log in file) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 22 PUH 5 stands. Circulate 60 bbls water containing biocide to clear tubing.
- 23 Place 9.0 ppg mud containing biocide from 4130' to 1410' (~44 bbls). TOO H & WOC 4 hrs.
- 24 RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 1410' and 635'.
- 25 PU CICR. RIH and set at approximately 30' below the top perf pending collar locator on CBL. RD WL.
- 26 RIH w/ 2 3/8 " tubing.
- 27 RU Cementers. Pump Surface Suicide: 960 sx Type III CaCl₂ cement w/ 0.25 pps cello flakemixed at 14.0 ppg and 1.53 cf/sx (129.2 bbls) (745' inside 4 1/2" Prod Casing and 775' in 12 1/4" OH + 20% excess, and 2 bbls on top of CICR) to place suicide squeeze between perfs. Pump all but 2 bbls. Sting out of CICR and spot 2 bbls on top of retainer.
- 28 TOO H circulating as necessary to clear tubing. Place 9.0 ppg mud containing biocide from 477' to 420'. WOC 4 hrs.
- 29 RU WL. Crack coupling or shoot off casing at or below 320'. RDMO WL. Circulate a full circulation with water containing biocide to remove any gas.
- 30 NDBOP, NDTH.
- 31 Install BOP on casing head with 4 1/2" pipe rams.

- 32 TOOH with 4 1/2" casing, LD.
- 33 RIH with 2 3/8 " tubing to 420'.
- 34 RU Cementers. Spot Stub Plug: 100 sx Type III CaCl₂ cement w/ 0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (27.1 bbls) (100' in 4 1/2" prod casing, 103' in 12 1/4" OH + 20% Caliper Log, and 117' in 8 5/8" surface casing).
- 35 Circulate 5 bbls water containing biocide to clear tubing.
- 36 TOOH. WOC 4 hrs. Tag Cement. Cement top needs to be above 150'; Proceed assuming TOC is above 150'. Otherwise, call production engineer.
- 37 MIRU WL. RIH 8 5/8" CIBP to 100'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 38 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hrs of the completion of the job.
- 39 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 40 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 41 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 42 Welder cut 8 5/8" casing minimum 5' below ground level.
- 43 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 44 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 45 Properly abandon flowlines per Rule 1103.
- 46 Back fill hole with fill. Clean location, level.
- 47 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.

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