

PLUG AND ABANDONMENT PROCEDURE

EAST RINN # 1

- | Step | Description of Work |
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| 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. Pull bumper spring and drift and tag to sand covered RBP @ 7701'. |
| 3 | MIRU Wireline. Run gyro from 7436' to surface. |
| 4 | Prepare location for base beam equipped rig. |
| 5 | MIRU workover rig. Spot trailer with at least 17 jts of 2-3/8" tbg. Circulate well with water w/ biocide to kill the well. ND wellhead. NU BOPs. Unseat landing jt. |
| 6 | POOH 2-3/8" tbg and stand back. |
| 7 | RIH 2-3/8" tbg and latch for 4-1/2" RBP. RIH to RBP w/ sand cap at 7701'. Circulate sand to surface. Latch on and retrieve RBP'. POOH and LD RBP. |
| 8 | PU csg scraper for 4-1/2" 11.6# and RIH to 8020'. POOH and LD scraper. (Note: 4-1/2" csg set at 8020' and well was deepend to Dakota to 8145') |
| 9 | MIRU Wireline. RIH with 4-1/2" CIBP to 8000' +/- 10'. Dump bail 2 sks cmt on top. |
| 10 | RIH with 4-1/2" CIBP to 7820' +/- 10'. Dump bail 2 sks cmt on top. |
| 11 | RIH with 4-1/2" CIBP to 7410'. PT csg to 1000 psi for 15 minutes. Dump bail 2 sks cmt on top. |
| 12 | RIH with 2- 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120 phasing. Shoot 1' of squeeze holes at 6980' and 6750'. RDMO WL. |
| 13 | Notify Cementers to be on call. |
| 14 | PU CICR and RIH on 2-3/8" tbg while hydrotesting to 3000 psi. Set at 6780'. |
| 15 | "RU Cementers. Establish injection and pump Niobrara suicide squeeze: 188 cu-ft (110 sks) 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 yield with 20% excess and 10"" hole size. Underdisplace by 3 bbls and sting out of CICR leaving 17 cu-ft (10 sks) on top of the CICR. Need to leave at least 100' above squeeze perfs. |
| 16 | PUH to leave end of 2-3/8" tbg at 5000' while circulating hole clean. |
| 17 | MIRU Wireline. RIH with 2- 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120 phasing. Shoot 1' of squeeze holes at 5000' and 4030'. RDMO WL. |
| 18 | RU Cementers. Establish circulation through perfs and Pump Sussex Suicide plug: 908 cu-ft (790 sks) "G" w/0.25pps cello flake, 0.4% CD-32, 0.4% ASA-301 with CaCl2 as necessary. Mixed at 15.8 ppg, 1.15 cuft/sack. Cement to be proceeded with sodium metasilicate mixed in 20 bbls freshwater per cementing company recommendation. Underdisplace by 3 bbls and sting out of CICR leaving at least 100' of cement over SQZ perfs in casing. |
| 19 | PUH to 3700' and circulate hole clean. |

- 20 POOH, standing back 1050' and laying down the rest.
- 21 ND BOP and wellhead. Install a BOP on surface casing head with 4 1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
- 22 MIRU Wireline. Cut off 4-1/2" csg at 950' per CCL. RDMO WL. Circulate bottoms up using water and biocide to remove any gas from wellbore.
- 23 POOH and LD 4-1/2" csg. Remove the 4-1/2" pipe rams and Install 2-3/8" pipe rams.
- 24 RIH w/ 2-3/8" tbg open ended 100' past the 4-1/2" csg stub to 1050'.
- 25 MIRU Cementers. Pump Fox Hills Balanced plug: Pump mud flush of 10 bbls SAPP followed by 20 bbls fresh water ahead of 585 cu-ft (440 sx) Type III w/cello flake and CaCl₂ as deemed necessary, mixed at 1.33 cf per sack, 14.8 ppg. Plug size is based on 12.5" hole with 40% excess covering 1050' to shoe of surface casing at 536' plus capacity of surface casing to 300'.
- 26 PUH to 200' and circulate excess cement of hole. TOH and WOC per cement company recommendation.
- 27 RIH w/ 2-3/8" tbg and tag top of plug. Plug needs to be tagged at 336' or shallower. POOH and LD 2-3/8" tbg.
- 28 RU wireline. RIH and set CIBP in the 8 5/8", 24# surface casing at 80'. PT CIBP and surface casing to 1000 psi for 15 minutes. Assuming successful test, RD wireline.
- 29 RDMO workover rig.
- 30 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.
- 31 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 32 Excavation crew to notify One Call to clear area around wellhead and flowlines.
- 33 Excavate hole around surface casing of sufficient size to allow welder to cut off 8 5/8" casing at least 5' Below ground level (depending on land owner requirements).
- 34 Properly abandon flowlines per Rule 1103.
- 35 Fill surface casing with cement (4500 psi compressive strength, no gravel).
- 36 Spot weld steel marker plate on top of sfc casing stub. Marker shall be labeled with well name, well number, legal location (1/4 1/4 descriptor) and API number.
- 37 Back fill hole with native material. Reclaim location to landowner specifications
- 38 Submit Form 6 to COGCC. Provide "As plugged" wellbore diagram identifying the specific plugging completed.

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