

## PLUG AND ABANDONMENT PROCEDURE

### RADEMACHER 13-30 (HSR)

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 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.
2	MIRU slickline services. Pull bumper spring and tag bottom.
3	Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level.
4	Prepare location for base beam equipped rig. Install perimeter fence as needed.
5	MIRU, kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt.
6	TOOH and stand back 2.063" IJ tbgr: 217 jts landed @ 7180'
7	MIRU Warrior WL. PU gauge ring for 3 1/2" 7.7# csg. RIH to 6950'.
8	RIH 3 1/2" CIBP and set at 6910' to abandon Cd/Nb perfs. PT Casing to 1000 psi for 15 minutes. RDWL.
9	TIH w/ 2.063" tbgr open-ended to CIBP at 6910'. Hydro-test tbgr to 3000 psi.
10	RU cementers and equalize a balanced plug above CIBP from 6920' to 6380' as follows: 20 sx "G" w/20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve 2:30 pump time, mixed at 15.8 ppg and 1.38 cuft/sk. (28 cuft of slurry).
11	POH 15 stands and circulate tbgr clean using fresh water treated with biocide. POH and LD WS to bring EOT to 4950'.
12	RU cementers and equalize a balanced plug from 4950' to 3830' as follows: 50 sx class "G", w/0.4% CD-32, 0.4% ASA-301, and CaCl <sub>2</sub> as deemed appropriate mixed at 15.8 ppg and 1.15 cuft/sk (58 cuft of slurry).
13	POH to ~3000. Circulate water containing biocide to clear tubing. WOC per cementing company recommendation.
14	Tag cement @ 3830'. POH and stand back 930' of tbgr.
15	ND BOP and wellhead. Install BOP on surface casing head with 3 1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
16	RU WL. Crack coupling or cut casing at 930'. RDMO WL. Circulate bottoms up and continue circulating to remove any gas from wellbore.
17	TOOH and LD 930' of 3 1/2" casing.

- 18 RIH with tubing open-ended to 930' (3 1/2" stub).
- 19 RU cementers. Pump 10 bbl SAPP (Sodium Acid Pyrophosphate) followed by 20 bbl (min) fresh water spacer immediately preceding cement.
- 20 Pump balanced Stub Plug: 180 sx Type III w/0 .25#/sk cello flake and CaCl<sub>2</sub> as deemed necessary mixed at 14.8 ppg and 1.33 cf/sx (239 cuft of slurry). Cement volume based on 200' in 8 5/8" csg, and 200' in 10" OH + 40% excess.
- 21 TOOH. WOC per cementing company recommendation. Tag Cement. TOC should be at or above 630'. If not, consult Evans Engineering.
- 22 MIRU WL. RIH 8 5/8" CIBP to 80'. Set and PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 23 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.
- 24 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 25 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 26 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 27 Welder cut 8 5/8" casing minimum 5' below ground level.
- 28 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 29 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 30 Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).
- 31 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 32 Back fill hole with fill. Clean location, level.
- 33 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.

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