

OPENHOLE RE-ENTRY PLUG AND ABANDONMENT PROCEDURE

DEEMS 1

Step	Description of Work
1	Locate and expose 8 5/8" casing stub. Extend stub to surface and install 8 5/8"x 11" SOW, 3M casing head with 3000 psi ball valves in both outlets. Prepare location for workover rig. Install perimeter fence as needed.
2	Provide notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.).
3	MIRU workover rig equipped for openhole re-entry work. NU 9" 3000 psi BOP stack on casing head. PT BOP and csg head per approved Form 2. Function test BOPE . NU rotating head on BOP. Hook up return line to shale shaker on flat tank. Spot trailer with 233 jnts of 2-7/8" WS, necessary drill collars and bits.
4	PU 7 7/8" rock bit, necessary drill collars and drill pipe/work string (WS). Drill through existing cement plugs at surface (10 sk) and at the base of surface casing (15 sk plug ~380'-425') using fresh water with biocide.
5	Once surface cement plugs are drilled, displace hole with drilling mud and continue in hole. Consider rigging up mud mixing equipment on site.
6	RIH to 1380' and drill out 35 sk plug.
7	Continue to RIH, circulating and cleaning the hole to the 5-1/2" casing stub at 6388'.
8	POOH and lay down drill bit and drill collars as necessary.
9	Notify Cementers to be on call.
10	RIH while hydrotesting to 3000 psi open ended to the 5-1/2" casing stub @ 6388'. Attempt to re-enter the 5-1/2" stub. Circulate and RIH to 10sx cement plug at PBDT at 7144'. Circulate out sand/fill but no need to run in with a bit. Contact Evans Engineering if unable to get at least 100' into the stub.
11	RU VES. Run gyro from EOT to surface. Send results to Sabrina Frantz and the COGCC. RD VES.
12	RU Cementers. Pump Nio stub plug. Spot cement plug consisting of 342 cu-ft (200 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 yield. Volume based on 756' inside the 5-1/2" csg and 400' in the openhole assuming 8.5" hole size and 20% excess.
13	POOH to ~ 5000' and circulate hole clean with mud. WOC per cement company recommendation. Tag plug at 6050'. LD WS to place end of WS at 5164'.
14	Pump Sussex balanced plug. Spot cement plug consisting of 1208 cu-ft (1050 sx) "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 preceded by sodium metasilicate mixed in 20 bbls water per cementing company recommendation. Calculated top of plug is 4156' based on 13.5" hole with 20% excess.
- 15 POOH to ~ 3600' and circulate clean. WOC per cement company recommendation. Tag plug at 4156'. LD WS to place end of WS at 1300'.
 - 16 Pump Fox Hills balanced plug. Pump mud flush of 10 bbls SAPP then 20 bbls water spacer ahead of 1330 cu-ft (1000 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 13.5" hole with 40% excess covering 1300' to shoe of surface casing at 430' plus capacity of surface casing to 230'. TOH and WOC per cement company recommendation
 - 17 Tag top of plug at 230'. POOH and LD WS.
 - 18 PU casing scraper for 8-5/8" and RIH to 100'. POOH and LD scraper and WS.
 - 19 RU WL. Run 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 WL. RDMO WO Rig.
 - 20 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.
 - 21 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
 - 22 Excavation crew to notify One Call to clear area around wellhead and flowlines.
 - 23 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).
 - 24 Properly abandon flowlines per Rule 1103.
 - 25 Fill surface casing with cement (4500 psi compressive strength, no gravel).
 - 26 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.
 - 27 Back fill hole with native material. Reclaim location to landowner specifications
 - 28 Submit Form 6 to COGCC. Provide "As plugged" wellbore diagram identifying the specific plugging completed.

Reed Boeger – Sr. Production Engineer
970-506-5987 – Office 512-217-1852 – Cell
Reed.boeger@anadarko.com