

OCCIDENTAL PETROLEUM CORPORATION

Please contact your area engineer with any questions concerning this procedure.

1/13/2025

PLUG and ABANDONMENT PROCEDURE

RAINE 1-5A

API: 05-123-21103



Step Description

1	Review Previous Open Wells Reports/Well History. If you have questions or concerns, contact Foreman/Engineer.
2	SAFETY MOTTO: EVERYONE GOES HOME EVERY TIME
3	COA: Provide 48 hour notice to Colorado ECMC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.).
4	Notify Automation Removal Group at least 24 hours prior to rig move. Request they catch and remove plunger, isolate production equipment, and remove any automation prior to rig MIRU.
5	MIRU Slickline. Pull production equipment and tag bottom. Record tag depth, casing/tubing pressures and fluid level in Open Wells. Gyro was run on 12/08/11. RDMO Slickline.
6	Prepare location for base beam equipped rig. Install perimeter fence as needed.
7	COA: Verify Form 17 (State Bradenhead Test) has been run within 60 days of RU.
8	Refer to the Rockies Well Services Guidelines document whenever rigging up BOP and WL, or whenever tripping in or out of the well. Consult with Foreman/Engineer before deviating from these guidelines. All cement jobs (excluding injections squeezes) must be pumped at 4-6 BPM. All cement plugs pumped through tubing must use the Diverter tool. Final top-out can be pumped between 2-4 BPM.
9	Upon RU, check and record bradenhead pressure. If bradenhead valve is not accessible, re-plumb so that valve is above GL. Blow down bradenhead and leave open during working hours. Re-check pressure each day and input value in the "Casing press." box in Open Wells.
10	MIRU WO rig. Verify BOP and wellhead rating, inspect for appropriate API standards, pressure test BOP. Kill well as necessary using biocide treated fresh water. ND WH. NU BOP. Unland tbg. **Barrier Management** Fluid will be the only barrier while NU BOP. Stop and review JSA.
11	TOOH and SB 7035' of 2-3/8" tbg. LD remaining 2-3/8" tbg.
12	MIRU WL. PU and RIH with (4-1/2", 11.6#) gauge ring to 7730'. POOH.
13	PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7720' (no CCL coverage here). POOH. RIH and dump 2 sx cement on CIBP. POOH.
14	NIO INJECTION SQUEEZE
15	PU and RIH with one 4', 3-1/8" deep penetrating perf gun with 4 spf. Shoot squeeze holes at 7085'. POOH. RDMO WL.
16	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 7035'.
17	MIRU cementers. Make sure the tubing annulus is loaded with water then attempt to establish injection max pressure 6160 psi with water. If it won't inject then sting out, load tubing with cement a bbl short of EOT then sting back in, in the next step. Max pressure is 3500 psi with tubing full of cement unless pressure is applied to annulus.
18	Pump Niobrara Injection Squeeze: 100 sx (27.1 bbl or 152 cf) of the Niobrara Cement blend: Class G with 0.4% B547 Gas Block (Latex) and 0.4% D255 FLA (Fluid Loss) and 35% D066 Silica Flour and 0.2% D800 (Retardant) and 0.3% D065 (Dispersant). Underdisplace by 1 bbls. Volume is based on 50' in the casing below the CICR, cement squeezed into formation, and 60' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO cementers.
19	Pull out of cement. TOOH, SB 4339' of 2-3/8" tbg. LD remaining tbg.
20	SUSSEX INJECTION SQUEEZE
21	PU and RIH with one 4', 3-1/8" deep penetrating perf gun with 4 spf. Shoot squeeze holes at 4389'. POOH. RDMO WL.
22	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 4339'.
23	MIRU cementers. Make sure annulus is full of water then attempt to establish injection with water, max pressure is 4022 psi , pipe is light at max. If it won't inject then sting out and load tubing with cement a bbl short of EOT then sting back in, in the next step. Max pressure is 3501 psi , with tubing full of cement, pipe is light at max.

24	Pump Sussex Squeeze: 100 sx (21.2 bbl or 119 cf) of the Sussex AGM: Class G with 0.4% B547 Gas Block (Latex) and 2% D053 Expansion (Gyp) and 0.25% D255 FLA (Fluid Loss)0.3% D065 (Dispersant). Underdisplace by 1 bbls. Volume is based on 50' in the casing below the CICR, cement squeezed into formation, and 64' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
25	TOOH and SB 1760' of 2-3/8" tbg. LD stinger, and remaining tbg.
26	COA: Confirm and document static conditions in the well before placing the next plug. If there is evidence of pressure or fluid migration at any time after placing the Sussex plug, contact Engineering.
27	Upper Pierre or Bradenhead CICR Squeeze without Packer Run
28	MIRU WL. PU and RIH with one 4', 3-1/8" perf gun with 4 spf. Shoot 16 squeeze holes at 2200'. POOH.
29	Initiate circulation at low rate monitoring returns for fluid. Add mud thinner to hydrate/clean mud. Slowly increase circulation rate to 4-6 BPM using mud thinner and gel polymer sweeps as needed.
30	Pump 35 bbls of 160F HSF (0.5 gals/bbl or 1.5 lbs/bbl) and let soak for ~2 hours.
31	Continue circulating at 4-6 BPM if possible. If returns show hydrocarbons or a 1 hr build-up shows pressure, swab and vent well and clean open tank. Circulate clean fluid before pumping cement.
32	MIRU WL. PU and RIH with one 4', 3-1/8" perf gun with 4 spf. Shoot 16 squeeze holes at 1700'. POOH. RDMO WL.
33	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 1760'.
34	MIRU cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Squeeze: 160 sx (34.5 bbl or 194 cf) of the Lower AGM blend: Class G with 0.4% B547 Gas Block (Latex) and 1% S001 CC (Calcium Chloride) and 4% D053 Expansion (Gyp). Underdisplace by 1.5 bbls. Volume is based on 440' in the casing below the CICR, 500' in the casing-hole annulus with 25% excess, and 95' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
35	Pull out of cement. TOOH to 1565'. Reverse circulate a minimum of 2 hole volume after cementing to ensure no cement is left in the tbg or annulus.
36	TOOH and SB 1550' of 2-3/8" tbg. LD stinger, and remaining tbg.
37	COA: WOC 8 hours. If there is evidence of pressure or fluid migration, contact Engineering as there will need to be additional remediation attempts before the SC shoe plug.
38	CUT AND PULL CASING
39	MIRU WL. RIH and jet cut 4-1/2", 11.6# casing at 1500'. RDMO WL.
40	Attempt to establish circulation with biocide treated fresh water. Circulate in 50 bbls of HSF and displace to the cut. Soak for 1+ hr then circulate out. This will cover all remaining HSF needs for this well.
41	ND BOP. ND TH. Un-land casing. Rig max pull shall be 100,000#. Max pull over string weight shall be 50,000#. If unable to unland, contact Foreman/Engineer. **Barrier Management** Fluid will be the only barrier while unlanding casing. Stop and review JSA.
42	Install BOP on casing head with 4-1/2", 11.6# pipe rams. **Barrier Management** Fluid will be the only barrier while NU BOP. Stop and review JSA.
43	TOOH and LD all 4-1/2", 11.6# casing. Remove 4-1/2", 11.6# pipe rams and install 2-3/8" pipe rams.
44	SHOE PLUG
45	TIH with 2-3/8" tubing to 1550'. Establish circulation to surface with biocide treated fresh water.
46	Initiate circulation at low rate monitoring returns for fluid. Add mud thinner to hydrate/clean mud. Slowly increase circulation rate to 4-6 BPM using mud thinner and gel polymer sweeps as needed.
47	Continue circulating at 4-6 BPM if possible. If returns show hydrocarbons or a 1 hr build-up shows pressure, swab and vent well and clean open tank. Circulate clean fluid before pumping cement.
48	COA: Verify and document that all pressure and fluid migration has been eliminated prior to placing the SC shoe plug at 1550'. If there is evidence of pressure or fluid migration, contact Engineering.
49	MIRU cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Surface Casing Shoe Plug: Pump 385 sx (83 bbl or 466 cf) of the Upper AGM blend: Class G with 0.4% B547 Gas Block (Latex) and 1.5% S001 CC (Calcium Chloride) and 4% D053 Expansion (Gyp). Volume is based on 50' in 4-1/2", 11.6# production casing with no excess. 871' in 7.875" bit size open hole with 100% excess factor. 204' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 1550'-425'. Plug length exceeds 500'. Consult with Foreman or Engineer on splitting up the plug. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during job.

50	COA: If cement was not circulated to surface, then WOC 4 hours. Tag TOC. TOC must be 579' or shallower. If tag is too deep or there is evidence of pressure or fluid migration, contact Engineering.
51	Pull out of cement. TOOH to 300'. Forward circulate tbg clean with fresh water. TOOH & SB 300' of tubing. WOC 4 hours.
52	Note: Plug can be tagged after a 4 hour WOC, but must have a 6 hour WOC prior to pressure testing.
53	ND 7-1/16" BOP. NU 9" or 11" BOP. RIH with bit and scraper. Clean csg and tag TOC. Circulate Clean. POOH. PT casing to 500 psi. Contact engineering if test fails.
54	SURFACE PLUG
55	MIRU WL. PU and RIH with (8-5/8", 24#) CIBP and set at 300'. POOH. RDMO WL.
56	TIH with 2-3/8" tubing to 300'. Either swab well down or use rig air to remove water from well. (Note: Do not exceed 175 psi if using rig air). If either methods cannot be performed, contact engineering to discuss excess cement volume for top out plug.
57	MIRU Cementers. Pump Surface Plug: Pump 90 sx (19.4 bbl or 109 cf) of the Surface AGM blend: Class G with 0.4% B547 Gas Block (Latex) and 2% S001 CC (Calcium Chloride) and 4% D053 Expansion (Gyp). Volume based on 300' inside 8-5/8", 24# surface casing with no excess. Cement will be from 300' to surface. Verify and document cement to surface. Collect wet and dry samples of cement to be left on rig.
58	TOOH and insert ~5' of 2-3/8" Tbg. Circulate FW to clean Csg & Csg Valves. LD final joint of 2-3/8" Tbg. RDMO cementers. ND BOP. Install night cap. RDMO WO rig.
59	Instruct cementing, tools and wireline contractors to e-mail copies of all job logs/job summaries to DJVendors@oxy.com within 24 hours of completion of the job.
60	Supervisor submit paper copies of all invoices, logs, and reports to Well Services Engineering Specialist.
61	Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
62	Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
63	Welder cut casing minimum 5' below ground level.
64	Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
65	Obtain GPS location data as per ECMC Rule 215 and provide to GPS Teams page and Oxy GIS database.
66	Properly abandon flow lines per Rule 1105. File electronic Form 42 and/or Form 44 once abandonment is complete.
67	Back fill hole with fill. Clean location, and level.
68	Submit Form 6 Subsequent Report to ECMC ensuring to provide 'As performed' WBD identifying operations completed.

Deepest WW 1 mile: 580'; FHM: 1133'; Sussex Top: 4389'; Sussex Base: 4615'; Shannon Base: Absent; Niobrara Top: 7085'

WELL HAS GYRO. Gyro was run on 12/08/11.

No known casing integrity issues.

SUSSEX PRODUCTIVE WITHIN 1 MILE

Well was drilled by .

Vertical Well.