



**NWT Facility  
SUNCOR et al TWEED LAKE A-67  
Abandonment Program**

**Bottom Hole Location: 300A6767000125450**

Click here to enter text.

**Project Name:  
IO #:  
AFE Amount: \$**

**Rev #0**

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## I. OBJECTIVE

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The objective is to pressure test the casing to 7 MPa to ensure integrity and then run tubing to above the current cement top. Then circulate cement to surface and cut and cap the well.

## II. WELL DATA

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**Well Name: SUNCOR et al TWEED LAKE A-67**

<b>Permit Number:</b>	1555	<b>U.W.I:</b>	300A6767000125450
<b>AFE Number:</b>		<b>Working Interest %</b>	100%
<b>AFE Amount:</b>	\$		
<b>Spud Date:</b>	Nov 13/85	<b>Rig Release:</b>	Dec 23/85
<b>Elevations:</b>	<b>KB:</b> 397.1 m	<b>GL:</b> 390.9 m	<b>CF:</b> N/A
<b>Depths:</b>	<b>TD:</b> 1347.00 mKB	<b>PBTD:</b> 1308.0 mKB	<b>BGWP:</b> m
<b>Directional:</b>	<b>TVD:</b> Vertical	<b>Angle:</b> n/a	<b>KOP:</b> n/a
<b>Latitude:</b>	<b>66° 56' 11.60" N</b>	<b>Longitude:</b>	<b>125° 56' 18.88" W</b>

## III. TUBULAR & WELLHEAD DATA

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**Conductor:** 5 jts – 339.7 mm, 101.2 kg/m, K-55, BT&C csg set @ **61.5** mKB  
 Cemented w/: 20 tonne of G + 3.0 CaCl<sub>2</sub> @ 1870 kg/m<sup>3</sup> cement  
**2.5 m<sup>3</sup> good cement returns to surface**

**Surface Casing:** 62 jts – 244.5 mm, 59.53 kg/m, MN-80, LT&C set @ **754.0** mKB

ECP & DV toolset at 49.5 mKB

Cemented w/: 1 stage 36 tonne "G" neat + 15.5 tonne G + 2.0% CaCl<sub>2</sub>  
 2 stage 5 tonne of "G" + 2.0% CaCl<sub>2</sub>. Held okay, Good cement returns 1.5 m<sup>3</sup>, Bump Plug with 13 MPa.

**Production Casing:** 52 jts – 177.8 mm, 43.16 kg/m, N-80, LT&C csg set @ **1347.0** mKB

59 jts – 177.8 mm, 43.16 kg/m, S0095, LT&C csg set @ 769.6 mKB

Cemented w/: 3.0 m<sup>3</sup> scavenger, lead 28.4 tonne of "G" + 0.5% D65 @ 1890 kg/m, followed by tail of 2.3 tonne "G" + 2.0% CaCl<sub>2</sub>, bumped plug with 13 MPa. Bleed off float held.

Cement top calculated to be at 100 mKB. Bond log that was run on Feb 6/86 indicates cement top at approximately 676.0 mKB

**0.0 m3 of cement returns to surface** preflush water to surface

**Wellhead:**

245 mm x 279.4 mm Casing Bowl, 21 MPa, McEvoy  
279.4 mm x 179.4 mm Tubing Head, 21 MPa Cameron  
179.4 mm x 65.1 mm, Tubing Head Adapter Flange, 21 MPa  
65.1 mm, 35 MPa, Master Valve, Cameron  
65.1 mm x 52.4 mm 21 MPa Flow Tee, Cameron  
52.4 mm, 21 MPa, Gate Valve, Cameron

#### IV. ATTACHMENTS

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- Wellbore diagram

### Well History

Nov 1985      DRILLING HISTORY

This well was spud on November 13, 1985 and drilled as follows

#### **Conductor 1**

- Drilled 445 mm conductor hole to 65 mKB with Visgel/XC Polymer mud
- Ran 5 joints 340 mm 101 kg/m K-55 BT&C casing
- Landed at 61.5 mKB.
- Cemented in place with 18 tonnes Arctic Set

#### **Surface Hole**

- Started to make water at 145 m. Drilled down to 312 m and water rate was 23 m<sup>3</sup>/d.
- Rig up air drilling equipment and blow hole dry
- At a depth of 471 m water rate increased to 50 m<sup>3</sup>/d salinity was 200 ppm
- Drill ahead with foam from 312 mKB to 701 mKB tight connect. Clean out. Finish drilling to 754.0
- Logged (DIL-GR, NGT-GR-CNL) open hole to 754 mKB; casing shoe at 65 mKB
- Ran 245 mm 60 kg/m MN-80 LT&C casing (see casing record attached)
- Cemented with 36 tonnes class G cement (stage 1);
- Cemented with 5 tonnes class G + 2% CaCl<sub>2</sub> (stage 2); stage tool at 45 mKB
- 1.5 m<sup>3</sup> good cement returns to surface
- Weld on casing bowl (10 3000# x 9 5/8); pressure tested weld to 21 MPa.
- RIH with 216 mm bit and tagged DV closing plug at 49.6 m.
- Drilled out DV tool plug then continued to drill out cement from 295.5 m to 754 m with 216 mm bit.

Surface hole

Day 9              Drilled to 105 m, mud weight 1040 kg/m<sup>3</sup>. Drilled out conductor to 105 m.

Day 10             Drilled to 151 m with air. Blue line extended to sump. Make water at 151 m to small to measure.

Day 11	Drilled to 217 m with air. Making water
Day 12	Drilled to 312 m with air. At 280 m making 23 m <sup>3</sup> /hr of fresh water. Put blue line over the side of the lease.
Day 13	Drilled to 420 m with air.
Day 14	Drilled to 471 m with air. At 447 m make 50 m <sup>3</sup> /hr of fresh water at 20 ppm from the circulating pressure the calculated fluid level is at 223 m after bit trip found fluid level at 224 m.
Day 15	Drilled to 558 m with air. Still making water at 50 m <sup>3</sup> /hr.
Day 16	Drilled to 613 m with air. Still making water at 50 m <sup>3</sup> /hr.
Day 17	Drilled to 658 m with air. Still making water at 50 m <sup>3</sup> /hr.
Day 18	Drilled to 723 m with air.
Day 19	Drilled to 754 m with air.

### Main Hole

- Displaced hole to mud (Visgel/XC Polymer mud).
- Through zone of interest, salt concentration in mud ~155,000 ppm. Mud additives included salt, XC, FLR100, caustic, barite, Q broxin, D foamer, and soda ash.
- Cored 1276-1283, 1287.6-1302, and 34 sidewall cores
- Logged (GR-MSFL, BHC-Sonic-GR-CAL, CNL-LDT-GR-NGT-AMS, BHC-Sonic-GR-CAL, ML-MLL, HDT, WST, RFT (1300 – 1196 m), CST)
- Performed 2 DSTs over Mt Clark and Mt Cap formations
- Ran 2 joints 178 mm 43 kg/m L-80 LT&C casing
- Ran 111 joints 178 mm 43 kg/m SOO95 LT&C casing
- Casing landed at 1347 mKB
- Cemented with 28.4 tonnes class G with 0.5 % D65
- tailed in with 2.3 tonnes class G with 2.5% CaCl<sub>2</sub>
- Displaced cement with drilling mud; DID NOT BUMP PLUG

Feb 1986      Moved Roll'n Rig from Red Deer to Lease. Install wellhead. Rigged in service rig. Run in the hole with a bit and scraper to PBTD at 1308.0 mKB. Rig in power swivel and drilled out cement to 1331.0 mKB. Circulate the hole clean with 10% KCl water. Pull out of the hole with tubing. Rig in wireline unit. Ran a CBL with a 7 MPa pressure pass. Cement top at 683.0 mKB. Run in the hole with 127.0 mm, 22 gm, 39 spm, 120 deg phasing TCP guns on 73.0 mm tubing. Swab the well down to 800 mKB. Perforate the Mount Clark formation from 1290.5 –

1301.0 mKB. Swab the well down to 1301 mKB. No gas to surface. Filled the casing a pressure test casing to 7 MPa. The guns did not fire. Pull out of the hole with the guns. Re-built guns and re-ran. Swabbed well down to 1000 mKB. Dropped the bar and guns fired. Pressure response on both the tubing and casing. Swabbed the well in and it started to flow. Killed the well with 24.0 m<sup>3</sup> of 10% KCl water. Pull out of the hole with the tubing. 2 shots misfired. Run in the hole with tubing. Rig in Dowell acid pumper and did a 6.0 m<sup>3</sup> 15% HCL job. Formation was tight and did not take the acid readily. Used 7 MPa at 0.1 m<sup>3</sup>/min rate to place acid. Pulled 18 swabs and the well started to flow. Did a second acid job with 6.0 m<sup>3</sup> of 7.5% HCl followed with 24. m<sup>3</sup> 1.5% HF and 7.5% HCl. Swab well back in with little change. Pull out of the hole with the tubing. Run in the hole with WR plug and set at 1288.5 mKB. PT to 7 MPa. Dump bail sand on plug. Run in the hole with perf guns same as before TCP on tubing. Perforate Mount Clark 1278.5 – 1284.5 mKB. Pull out of the hole with tubing and Run in the hole with packer. Did another 6.0 m<sup>3</sup> 15% HCl acid squeeze. Swabbed well in. Okay results. Rigged in fracing equipment. Pumped at 8 tonnes foamed water job with 20/40 sand. Foam quality was 65% at a rate of 2.5 m<sup>3</sup>/min. After frac the rate double to 82 e3m3/d. Killed the well unset the packer ran down and circulated the sand off of the WR plug. Latch onto and unset. Pull out of the hole with the tubing. Run in the hole with tubing and a packer. Set packer at 1288.6 mKB. Rigged in frac equipment and fraced the lower zone with 12 tonne foamed water at 2.5 m<sup>3</sup>/min with 75% quality. Rate on lower interval increase by a fracture of 5 to 120 e3m3/d. Killed well. Unset packer and pull out of the hole with the tubing. Move in rig up wireline unit. Run in the hole with a BP and set at 1260.0 mKB. Pressure testing the casing to 10 MPa for 15 minutes. PT good. Dump bail cement on plug. Cement top at 1250.7 mKB. Displace well 1.6 m<sup>3</sup> of the 10% NaCl kill fluid. Filled the casing with 1.6 m<sup>3</sup> of diesel. Rigged out and moved off.

- Sept 2009 Did a lease inspection. Flew to location. Did a bubble test on vent no issues. Serviced the wellhead. Pressure tested the casing to 1.0 MPa for 10 minutes, good. Filled the casing up with 160 l of Nalco R-7390 corrosion inhibitor. Rigged out.
- Sept 2013 Did a lease inspection. Flew to location. Did a bubble test on vent no issues. Serviced the wellhead. Rigged out.
- Aug 2019 A OROGO inspection report was done by Barlon Engineering. Did a bubble test which was negative and did a gas migration test which was negative. Serviced the wellhead.

**V. TUBULAR PROPERTIES**

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<b>O.D.</b> (mm)	<b>Weight</b> (kg/m)	<b>Grade</b>	<b>Thread</b>	<b>I.D. (MIN)</b> (Pin) (mm)	<b>Drift</b> <b>Diameter</b> <b>(MIN)</b> (mm)	<b>Coupling</b> <b>O.D.</b> (S&B) (mm)	<b>Capacity</b> <b>(MAX)</b> (m <sup>3</sup> /m)	<b>Collapse</b> (MPa)	<b>Burst</b> <b>Body</b> Connection (MPa)	<b>Tensile</b> (1000daN)
339.7	101.2	K-55	BT&C	315.3	311.4	365.1	0.07726	13.44	23.79	319.4
244.5	59.53	L-80	LT&C	224.4	218.4	269.9	0.039559	21.3	39.64	327.8
177.8	43.16	L-80	LT&C	157.1	153.9	194.5	0.019569	48.4	56.26	265.6
177.8	43.16	S0095	LT&C	157.1	153.9	194.5	0.019569	54.92	66.81	303.8

**VI. LANDING DEPTHS**

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Description	Landing Depth, mKB
Conductor	61.5
Surface Casing	754.0
Production Casing	1347.0

**VII. FORMATION TOPS**

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Formation Top	mSS	mKB	mTVD
Mount Kindel	389.1	9.0	
Franklin Mountain	321.1	76.0	
Saline River Salt	-329.9	727.0	
Saline River Salt Member	-398.9	796.0	
Shale Marker	-877.9	875.0	
High G.R. Shale Marker	-819.9	1217.0	
Mountain Clark	-880.9	1278.0	
Proterozoic	-901.9	1299.0	

**RESERVOIR PROPERTIES**

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**Formation:** Mount Clark  
**Fluid Type:** Gas  
**Interval (mKB):** 1278.5 – 1284.5, 1290.5 – 1301.0  
**Length (m):** 6.0, 10.5  
**TVD (m):** 1278.5 – 1284.5, 1290.5 – 1301.0  
**Pressure (kPa):** ~12.1 MPa  
**Temperature (°C):** 11.5  
**Max H<sub>2</sub>S / CO<sub>2</sub> (%):** 0/0



## VIII. SUNCOR REQUIREMENTS

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### **General:**

This well is part of a project which is proprietary to Suncor Energy Inc., Information is to be held strictly confidential, document not to be copied.

Well site Supervisors must ensure that the applicable Suncor Safe Work Practices are observed, including the following:

- Safety Orientation - All Onsite personnel must be oriented to site hazards and signed in on the sign-in log.
- All personnel performing work must have a valid Completions Work Permit prior to commencing work.
- Ground Disturbance deeper than 30 cm (including rig anchors) is not to be carried out without the direction of a Logistics representative.
- Hydrocarbon Exposure LEL monitors will be used by all personnel on any job where hydrocarbon vapors may be present.
- H2S Safe Work Practice will be observed by providing H2S detection equipment, trained personnel, and specified safety equipment when required.
- Ensure a Field Level Hazard Assessments (FLHA) to identify and document site specific hazards are completed prior to commencing work, before all critical tasks and at any change in scope during the task as per the Suncor Completions SWP.
- Directive 33 Well Servicing and Completions Operations—Requirement Regarding the Potential for Explosive Mixtures and Ignition in Wells – have documented practices available at the well site for the safe management of the potential for explosive mixtures and ignition in wells and associated surface equipment. A Fire and Explosion Hazard Management Plan is to be posted at the work site.

Ensure current MSDS sheets are onsite for all controlled products including produced fluids. Ensure that workers are made aware of the Hazards and safeguards.

All unplanned events that occur that cause or could have caused loss are to be reported to the Completions Superintendent immediately. Incidents with or without loss must reports must be utilized as directed by the Completions Superintendent.

All wastes must be manifested and tracked when leaving the facility, to a non-Suncor owned disposal site, as per AER Directive 58. A fully completed AER Alberta Environment Waste Manifest is to be submitted with the final report for all Dangerous Oilfield Wastes (DOWs).

Conduct all operations in accordance with applicable IRP's, provincial acts and regulations pertaining to the AER.

Ensure a copy of the Suncor Corporate ERP is available on site. Complete and post the Suncor Completions Site Specific ERP.

An Assignment of Supervisor form must be completed and posted at location.

An injured worker transportation form must be posted on location. If the work site is greater than 40 minutes from an approved medical facility an alternate form of injured worker transportation with qualified emergency medical personnel must be present on location. Note: Suncor medic clinics qualify as an approved medical facility.

All employees and contractors certification of First Aid, H<sub>2</sub>S, WHMIS and TDG etc. must be verified before they are allowed access to work on site.

All contractors' competency must be verified before they are allowed access to work onsite. Frequent, task-specific, on-going competency assessments must also be conducted for the duration of a contractor's term in a specific position.

A site walk inspection must be conducted every day in conjunction with a morning operational / safety meeting outlining all safety hazards and planned procedures for the day. This must be recorded on the daily tour report.

Road use and pipeline crossing agreements and Temporary Diversion Licenses, when required, must be in place prior to commencing any operations.

Any operation outlined in this program or otherwise implied by the nature of the work to be conducted that requires clarification shall be discussed with Operations.

Calgary office, Completions Analyst, [Completions@Suncor.com](mailto:Completions@Suncor.com) will submit required AER DDS notifications.

**IX. CONTACTS****SUNCOR PRIMARY CONTACTS**

<b>Name</b>	<b>Title/Location</b>	<b>Office</b>	<b>Cellular</b>
Matt Crockett	Completions Engineer	403-296-5439	587-284-1549
Jonathan Koteles	Completions Supt.	403-296-8916	403-510-7217

**REGULATORY, HEALTH, & SAFETY AGENCIES**

<b>Name</b>	<b>Emergency #</b>	<b>Emergency #</b>	
SEC Calgary	403-296-3000	SEC Calgary	
Air Ambulance Service	1-800-661-3822	Air Ambulance Service	
RCMP – Fort McMurray	780-799-8888 (24hr)	RCMP – Fort McMurray	
Regional Hospital		Regional Hospital	
W.C.B.	1-866-922-9221	W.C.B.	
FOREST FIRE NWT	1-877-698-3473 (1-877-NWTFIRE)	FOREST FIRE NWT	
GNWT (Office of the Regulator of Oil and Gas Operations)	1-867-920-8130 (24hr) (Spill Response) 1-867-445-8551 (Incident Response) 1-867-767-9067	GNWT (Office of the Regulator of Oil and Gas Operations)	
Sathu Land and Water Board (SLWB)	1-867-598-2413	Sathu Land and Water Board (SLWB)	
Mackenzie Valley Land and Water Board (MVLWB)	1-867-669-0506	Mackenzie Valley Land and Water Board (MVLWB)	
NWT – Environment and Natural Resources  Sahtu Regional Office	1-867-587-2422 (General) 1-867-587-2422 (Wildfire)	NWT – Environment and Natural Resources  Sahtu Regional Office	
NWT – Environment and Natural Resources  Decho Regional Office	1-867-695-7450 (General) 1-867-695-7433 (Wildfire)	NWT – Environment and Natural Resources  Decho Regional Office	

**SERVICE COMPANY CONTACTS**

<b>Service Type</b>	<b>Company</b>	<b>Contact Name</b>	<b>Office Number</b>	<b>Cellular</b>

## X. PROCEDURE

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This program is to be used as a guide only. Field conditions and engineering decisions may change throughout the course of the job. However, do not change or deviate from this procedure without approval from the responsible Completions Superintendent.

1. Review the previous WellView report for this well. Flag any potential issues and discuss with the Calgary Superintendent.
2. Inspect the wellhead valves for sign of damage and discuss with the Permit Issuer before signing off on the permit. Obtain work permits (e.g. Hot Work Permit) and approvals to begin well work.
3. Follow all the current Covid-19 cleaning, physical distancing, mask, and FLHA protocols. Hold a safety orientation with a procedural meeting and conduct a pre-job hazard assessment with all onsite personnel and document in the Daily Report. Scout the location for construction requirements and confirm wellhead specifications.
4. If applicable ensure the Well Abandonment/Flaring notifications have been submitted at least 24 hours prior to the respective operations to the Calgary office, c/o Completions Analyst – [completions@Suncor.com](mailto:completions@Suncor.com)
5. Monitor LEL and H<sub>2</sub>S with personal monitors throughout the program.
6. Perform a 10-minute Surface Casing Vent Flow bubble test as per the outlined procedures in Well Suspension and Abandonment Guidelines and Interpretation Notes Section 4B. Notify the Operations Supervisor of the results and document the results in the Day #1 daily report. In the event of a positive gas flow, see Section 4B “Testing For SCVF” of OROGO Well Suspension and Abandonment Guidelines and Interpretations Notes.
7. Measure and record casing pressure. Notify Calgary operations if pressure exists.
8. Rig in the Precision service rig and equipment to OROGO, O.H. & S., and Suncor specifications. Stump test the annular BOP, double gate pipe rams, manifold, and lines to 1400 kPa low and 7 MPa high for 10 minutes each.
9. Check pressures on wellhead. Kill the well with fresh water if required.
10. Remove the wellhead top section. Install and function test BOP's. Pressure test the ring groove connection. Perform all pressure and function tests to OROGO and Suncor specifications.

11. Run in with landing joint with a pressure tested safety valve (7 MPa) and screw into tubing hanger. Disengage the lag screws and pull out of the hole with the pup joint and tubing hanger. Laydown the hanger and pup joint.
12. Pick up, pin drift, and run in the hole with the following tubing configuration:
  - 1 – 152.0 mm EG3G retip tricone bit from J&L
  - 1 - 153.9 mm casing scraper
  - 1 - 88.9 mm REG to 88.9 mm EUE crossover
  - X – 88.9 mm, 13.84 kg/m, J-55, EUE tubing to surface
13. Run in the hole and tag plug back at ~1250.7 mKB. Work the scraper over the plug setting interval from 720 mKB to 650 mKB. Pull out of the hole with the tubing and lay down 500 mKB.
14. Move in rig up Reliance wireline unit. Run in the hole with a 153.9 mm gauge ring. Run in the hole with a RBL/GR/CCL and log from PB to surface. Correlate to the **Weatherford Photo Density Dual Spaced Neutron** log. Send the results to Matt [mcrockett@suncor.com](mailto:mcrockett@suncor.com) and Jonathan Koteles [jkoteles@suncor.com](mailto:jkoteles@suncor.com). A 7 MPa pressure pass may be required depending on cement quality. Send log to Becky Harish ([bharish@suncor.com](mailto:bharish@suncor.com)) to fill out DDS submission.
  - Pressure test lubricator and wellhead connections to 1.4 MPa (low) and 7.0 MPa (high) using water/methanol prior to every run or nitrogen.
15. Pressure test the casing to 7 MPa if a 7 MPa pressure pass was not performed during the bond log.
16. Make up and run in the hole with a Weatherford 177.8 mm permanent bridge plug and running tools. Correlate to the CCL log just run. Log the bridge plug onto depth and land the top of the plug at 695.0 mKB or approximately 10 meters below the cement top. Come off the plug and pull out of the hole.
17. Pressure test the bridge plug to 7 MPa for 15 minutes. Rig out wireline and pressure truck.
18. Move in rig up Weatherford. Make up and run in the hole to cut the casing. (Need to add in all the tools and running depth.) Assume the cut will be at 670 mKB.
19. Pull cutting tools out of the hole.

20. Rig in return lines from to production annuls valve to the rig tank. Pump fluid down the casing through the casing cut to circulate out the drilling mud.
21. Pull the casing. (Need to add in all the tools.)
22. Move in rig up Reliance wireline unit. Run in the hole with a 218.4 mm gauge ring. Run in the hole with a RBL/GR/CCL and log from PB to surface. Correlate to the **Weatherford Photo Density Dual Spaced Neutron** log. Send the results to Matt [mcrockett@suncor.com](mailto:mcrockett@suncor.com) and Jonathan Koteles [jkoteles@suncor.com](mailto:jkoteles@suncor.com). A 7 MPa pressure pass may be required depending on cement quality. Send log to Becky Harish ([bharish@suncor.com](mailto:bharish@suncor.com)) to fill out DDS submission.
  - Pressure test lubricator and wellhead connections to 1.4 MPa (low) and 7.0 MPa (high) using water/methanol prior to every run or nitrogen.

#### **Interval 280 to 400 mKB**

23. Move in rig up Lee Energy. Make up and run in the hole with the following assembly. Use the gator tool to cut each free joint of casing. The bottom most cut will be determine from the bond logging results. Top perf will be made at ~60.0 mKB.
  24. Run in the hole with 88.9 mm, 13.84 kg/m, J-55 EUE tubing open end and land tubing 5 m above the bridge plug at ~690.0 mKB.
  25. Rig up Sanjel cement pumper Suncor, AER, and OH&S regulations. **Prepare to cement the well with ?? tonne ( m<sup>3</sup>) of "G" + 0.5% CFR-2 + 0.3% CFL-3 + 0.5% CaCl<sub>2</sub> + 0.15% CDF-6P as per the attached program PRG2003855 Rev 0. Assume job from 420 to 200 mKB**
  26. Confirm that there is zero pressure on the casing and record in Wellview.
  27. Connect the cementing unit treating line to the tubing and pressure test the treating line and the tubing valve to 14 MPa for 10 minutes with fresh water and methanol.
  28. With the tubing landed at 2.0 m from plug depth, circulate 2.0m<sup>3</sup> ±20°C fresh water.
  29. Continuously mix and displace the cement plug.
- NOTE:** The approximate volume required is 24.3 m<sup>3</sup>. Open hole volume is 6.81 m<sup>3</sup> with 30% excess.
- NOTE:** At 200 L/min it will take approximately 122 minutes to circulate the cement in. Well may go on vacuum. Allow the cement plug to find its balance.

**NOTE:** Have Sanjel provide 2 cement samples at surface to monitor on location. Ensure they are kept in the heated environment and monitor that the samples gel and set up in a reasonable time.

30. Once the plug has been placed for the full length of the plug weight, which should bring the plug top to 200 mKB. Pull the tubing up to 180 mKB and wash out the tubing with 1.5x tubing volume  $\pm 20^{\circ}\text{C}$  fresh water. If unable to gain circulation during cementing operations do not attempt to back wash, continue with pulling and standing tubing.

31. Next day Run in the hole and tag for the cement top. Report results to Calgary.

### **Interval 70 to 226**

32. Perforate the next intervals.

33. Rig up Sanjel cement pumper Suncor, AER, and OH&S regulations. Prepare to cement the well with ?? tonne ( $13.2 \text{ m}^3$ ) of "G" + 0.5% CFR-2 + 0.3% CFL-3 + 0.5%  $\text{CaCl}_2$  + 0.15% CDF-6P as per the attached program PRG2003855 Rev 0. Assume job from 200 to 30 mKB

34. Confirm that there is zero pressure on the casing and record in Wellview.

35. Connect the cementing unit treating line to the tubing and pressure test the treating line and the coil to 14 MPa for 10 minutes with fresh water and methanol.

36. With the tubing landed at 2.0 m from plug depth, circulate  $2.0 \text{ m}^3 \pm 20^{\circ}\text{C}$  fresh water.

37. Continuously mix and displace the cement plug.

**NOTE:** The approximate volume required is  $13.2 \text{ m}^3$ . Open hole volume is  $6.43 \text{ m}^3$  with 30% excess.

**NOTE:** At 200 L/min it will take approximately 66 minutes to circulate the cement in. Well may go on vacuum. Allow the cement plug to find its balance.

**NOTE:** Have Sanjel provide 2 cement samples at surface to monitor on location. Ensure they are kept in the heated environment and monitor that the samples gel and set up in a reasonable time.

38. Once the plug has been placed for the full length of the plug weight, which should bring the plug top to 30 mKB. Pull the tubing up to 25 mKB and wash out the tubing with 1.5x tubing volume  $\pm 20^{\circ}\text{C}$  fresh water. If unable to gain circulation during cementing operations do not attempt to back wash, continue with pulling and standing tubing.

39. Next day Run in the hole and tag for the cement top. **If the cement is above the top perforation by 10 m then we will pressure to 7 MPa for 15 minutes.** Report results to Calgary.

**NOTE: Plan B**

If the casing was not successfully pulled due to some issue that was not anticipated the perforation will be made through both the production and surface casing in a similar depth as planned previously.

**Interval 280 to 400**

**Interval 70 to 226**

Perforation placement need to be determined within each of the interval but will be the same as for the removal of the casing string. Cementing operations will be similar, but chemical loading might need to be adjusted.

40. Fill out the attached “Surface Abandonment Handover Form” and turn the well over to logistics for cut and cap. Note the date of the gas migration test in the document. Send form to Greg [gheffel@suncor.com](mailto:gheffel@suncor.com) & Jonathan [jkoteles@suncor.com](mailto:jkoteles@suncor.com).
41. Winterize the well and wellhead to ensure no freezing issues will occur. Leave wellhead in D13 compliance. Rig out and release all services Move all equipment off location.

**Surface Abandonment Requirements**

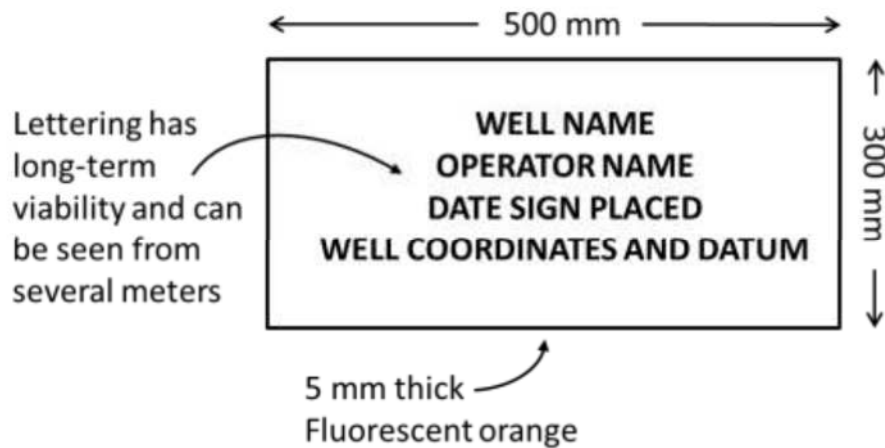
42. To comply with OROGO Abandonment Section 6E Surface Abandonment Guidelines. Immediately upon Completion of the downhole abandonment work, Suncor Logistics team will receive the “Surface Abandonment Handover Form”.
43. Suncor Logistics will move onto location and perform the below procedure:
- Remove the Wellhead
  - Cut off casing strings minimum 1 meter below natural ground level
  - Surface, intermediate and production casing strings must be capped at surface with a vented capping system: a steel plate that is fastened and installed in a manner as to prevent any potential for pressure to build up within the casings from the shallowest zonal abandonment to the surface, while restricting access to the casing strings at surface.
  - Field verified coordinates for the well center must be provide to OROGO as part of the Well Operations report. Geodetic datum must be specified NAD83



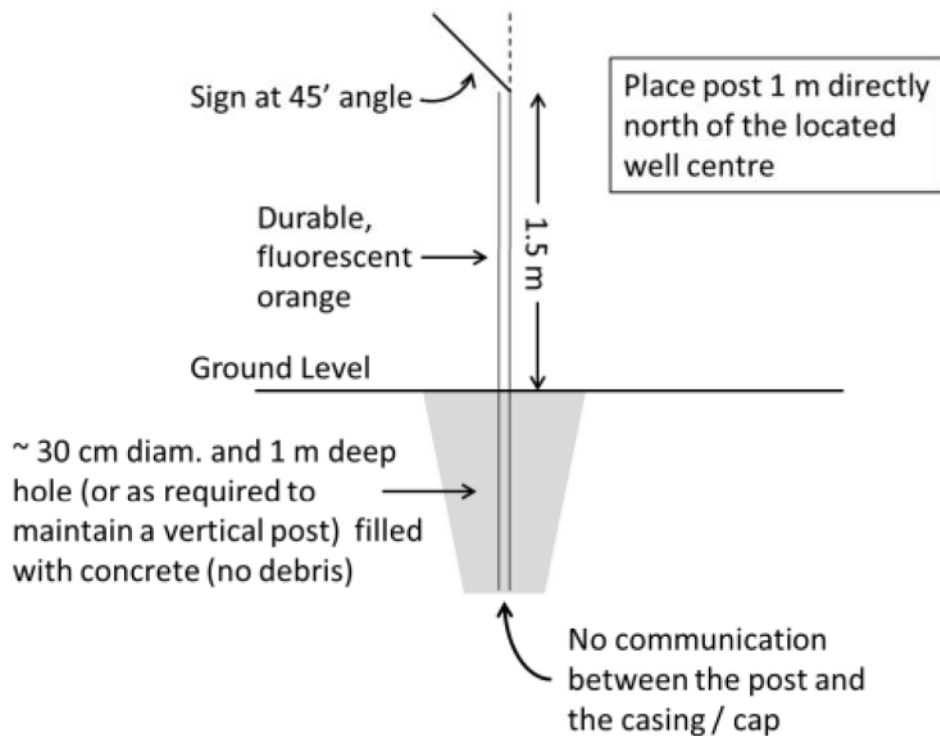
recommended. Coordinates must be to 4 decimal places or in degrees, minutes and seconds to 2 decimal places.

- A field sketch of the area must also be submitted as part of the Well Operations Report.
- After surface abandonment is completed, the well must be marked with a durable post and sign as shown below.

**Sign Requirements**



**Post Requirements**



- Ensure all debris associated with entire well operation is removed.
- Take pictures of lease and cut and capped well with signage.
- Submit all information and pictures to [mcrockett@suncor.com](mailto:mcrockett@suncor.com) and applicable Logistics team lead.

#### 44. Finalize Documentation

- Ensure tubing tallies are entered and correct in Wellview.
- Ensure WellView schematic is accurate, as built, drawing.
- Take a picture of final wellhead and add as WellView attachment.
- Attach electronic copies of well related information to WellView file, if applicable.
- Well Site Supervisor emails Project Engineer of the end date of the operation in Wellview and files end of well (EOW) documentation in the Completion Microsoft Teams EOW WSS Entry
  - Completion Teams Folder>General> EOW> End of Well WSS Entry
  - License # \_ Well Name\_ EOW
- Issue Work Orders to vendors - following completion of the requested work, field operations will confirm that the field ticket is complete and accurate in writing, by signing the field ticket and providing a separate work order.

**END OF PROGRAM**

**XI. PROGRAM SIGN OFF**

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**PREPARED BY:**

\_\_\_\_\_  
**Matt Crockett**  
**Sr. Engineer, Completions**

\_\_\_\_\_  
**Date**

**APPROVED BY:**

**Tier 1:**

\_\_\_\_\_  
**Jonathon Koteles**  
**Superintendent, Completions**

\_\_\_\_\_  
**Date**

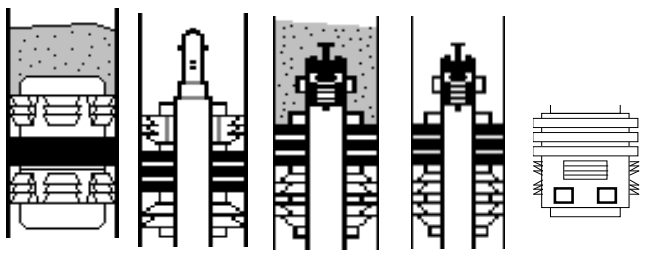
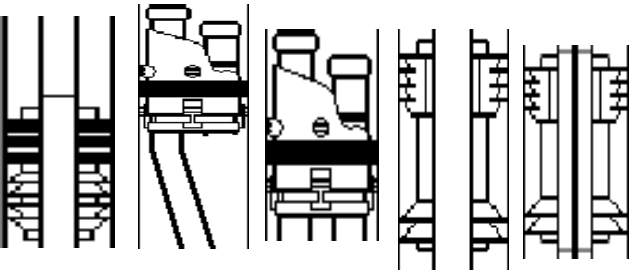
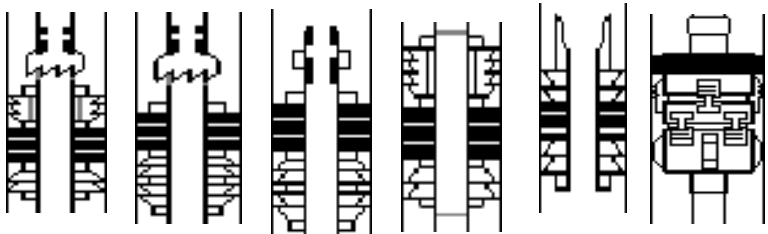
**APPROVED BY:**

**Tier 1:**

\_\_\_\_\_  
**Bill Plaxton**  
**Specialist Completions Engineering**

\_\_\_\_\_  
**Date**







# Surface Abandonment of Cased Well - Handover Document

**\*\* For Corehole Abandonment (OSE): see Surface Abandonment OSE Corehole Form**

(Completions) Downhole Abandonment Date: \_\_\_\_\_  
(Logistics) Surface Abandonment Date: \_\_\_\_\_

Wellsite (Name + UWI): \_\_\_\_\_

MSL # \_\_\_\_\_

Completions Supervisor: \_\_\_\_\_

Logistics Supervisor: \_\_\_\_\_

		Y	N	N/A
1	Pressure test passed? Read & record shut-in casing pressure _____ kPa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Cement depth consistent with D20?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Other D20 consideration explain:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Well head removed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Solar Panels and other hardware removed / deactivated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Safe Work Permit from Operations received by Logistics?	<input type="checkbox"/>		<input type="checkbox"/>
7	On-site safety meeting held?	<input type="checkbox"/>		
8	Ground Disturbance Authorization received?	<input type="checkbox"/>		<input type="checkbox"/>
9	Hot work permits received?	<input type="checkbox"/>		<input type="checkbox"/>
10	Personal 4-head gas monitoring in place?	<input type="checkbox"/>		<input type="checkbox"/>
11	LEL tested at wellhead? <i>Note: If reading exceeds 0%, stop work &amp; contact Calgary.</i>	<input type="checkbox"/>		<input type="checkbox"/>
12	Surface casing vent flow test was performed. <i>Note: If flow detected, stop work &amp; contact Calgary.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Other Hazardous material used during down hole abandonment <i>Explain</i> _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Mitigative measures taken to deal with Hazardous material: <i>Explain</i> _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Depth to cement: _____ <i>(Required: Depth or Unknown)</i> If Unknown - why? (Frozen, etc.) _____ <i>Note: If &gt;8m Stop and review with Calgary office</i> Fill to 3 meters below ground level with Cement if greater than 8m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Depth to water: _____ <i>(Required: Depth or Unknown)</i>			
17	Nu Wave Technology used?	<input type="checkbox"/>	<input type="checkbox"/>	
18	Intermediate/production casing(s) capped with steel plate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Surface casing capped with steel plate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Welding & venting procedures documented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Casings cut off and capped greater than 1m* below final contour elevation? <i>*Note: 2m below final contour elevation if located on peat lands or if within 15km of urban development (50 houses or see survey plan)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Job documented with pictures? See 2nd tab	<input type="checkbox"/>		

23 Additional Comments Completions :  
Type of Fluid left above Plug: \_\_\_\_\_  
\_\_\_\_\_

24 Additional Comments Logistics :  
\_\_\_\_\_  
\_\_\_\_\_

25 Completions Supervisor: Fill in Red Highlighted and forward to Completions Superintendent and Logistics Field Representative.

26 Logistics Supervisor: Save Document as PDF including **UWI in the document name** and within 48 hours of work being completed.  
Forward to: LOGISTIC@suncor.com, Logistics Superintendent, gbis@telus.net, sun.jodymccconnell@ddmail.ca  
**NOTE:** cc Tanya Richens (trichens@suncor.com if within Firebag or Mackay River EPEA Boundary)

2 Photos Required: 1. Close up of the capped casing.

2. Cap in relation to excavated hole, needs to show that cap is under final ground level