



December 5, 2022

OROGO

Department of Industry, Tourism, and Investment Government of the Northwest Territories

P.O. Box 1320

Yellowknife NT X1A 2L9

Canada

Via Email Only

**Attn: Ms. Pauline de Jong
Regulator**

**Re: Information Request No. 1 Nogha M-17 Well Abandonment
ACW-2022-MGM-M-17-WID1970**

Attached please find a revised program for the above well abandonment to address OROGO's Information Request #1.

1.1 Isolation of Perforated Zones

The program has been revised to replace the installation of a bridge plug with a squeeze program for abandonment. As detailed in the attached program, MGM Energy (MGM) intends to squeeze off the perforations simultaneously, through the existing sliding sleeves in the completion assembly.

MGM is aware of the concern recently expressed by the Alberta Energy Regulator (AER) regarding this approach. The OROGO Guideline specifies "Each completed pool or zone must be abandoned separately, and all non-saline groundwater zones must be covered with cement or isolated from each other." As shown in the attached bond log segments (Attachment 1), there is excellent bond over each perforated interval and therefore the only potential communication between zones is inside the casing, through the perforations.

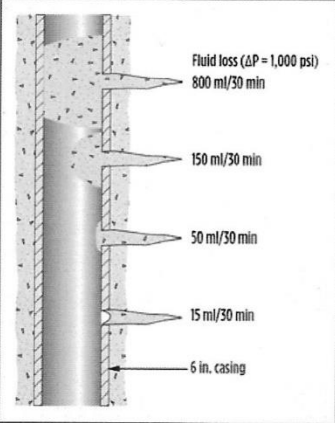
This assertion is supported by the attached email from Karel Sagasser P.Ge. (Attachment 2). If all perforations are squeezed off this communication cannot occur. The use of a typical oilfield cement with high fluid loss could result in the cement dehydrating and bridging off across an upper zone, thus preventing effective isolation of the lower zone(s). In contrast, a low fluid loss cement dehydrates extremely slowly and will only squeeze off the perforation tunnel. The sketch below, extracted from the Society of Petroleum Engineers course on Cement Remediation by SPE Distinguished Lecturer William Ott illustrates this phenomenon. For this reason, the squeeze in question has been specified with an extremely low fluid loss cement (15cc/30 minutes API) and a long thickening time. The limited growth of "nodes" inside the casing/tubing annulus in the M-17 well will ensure that all perforations can be squeezed off, effectively isolating the formations in question.

MGM further understands that the wells have been hydraulically fractured. Assuming that is the case, there will be “sand fallout” on top of the lower packers and it is unlikely that they can be released. It would be necessary to cut the tubing in several places and wash over and fish them separately. Due to the number of wells to be abandoned (six), the remote location, and the short winter season it may not be possible to abandon all the wells in the same season. MGM believes that the program outlined provides the best probability of successful abandonment of all wells in the winter season.

Squeeze Cementing

Squeeze Cementing Theory:

When squeezed against a formation of some permeability, rate at which slurry dehydration decreases is directly related to fluid-loss rate



Fluid loss ($\Delta P = 1,000$ psi)
800 ml/30 min
150 ml/30 min
50 ml/30 min
15 ml/30 min
6 in. casing

Node buildup after a 45 min squeeze using slurries with different water loss

WCT

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Extracted from “Cement Remediation” by William Ott P.E. – May 2015 Banff Alberta

1.2 Shallow Wellbore Plug

The A-3 plug set at 18mCF in the well is designed to be retrieved with wireline and this is use of a snubbing unit as referenced in the OROGO SB-01 is not applicable. The plug is designed to allow pressure equalization prior to releasing the hold down lock. This is standard procedure for slickline operations, but details of the procedure have been added to the revised program for increased clarity. In addition, a contingency operation in case the pressure cannot be equalized has also been included. The procedures required in OROGO SB-01 have also been added to the program.

1.3 Abandoned Well Marker

The illustration in the program has been updated to reflect the requirements of section 6E of the May 2022 OROGO Guidelines.

Should you require additional information regarding this application and project please contact me.

Furthermore, please accept this letter as permission to discuss this application and associated communications and operations with Paramount team members or Mr. Richard (Dick) Heenan of Heenan Energy Services Ltd. at (403) 818-4408 or dickheenan@shaw.ca if required.

Additional Note

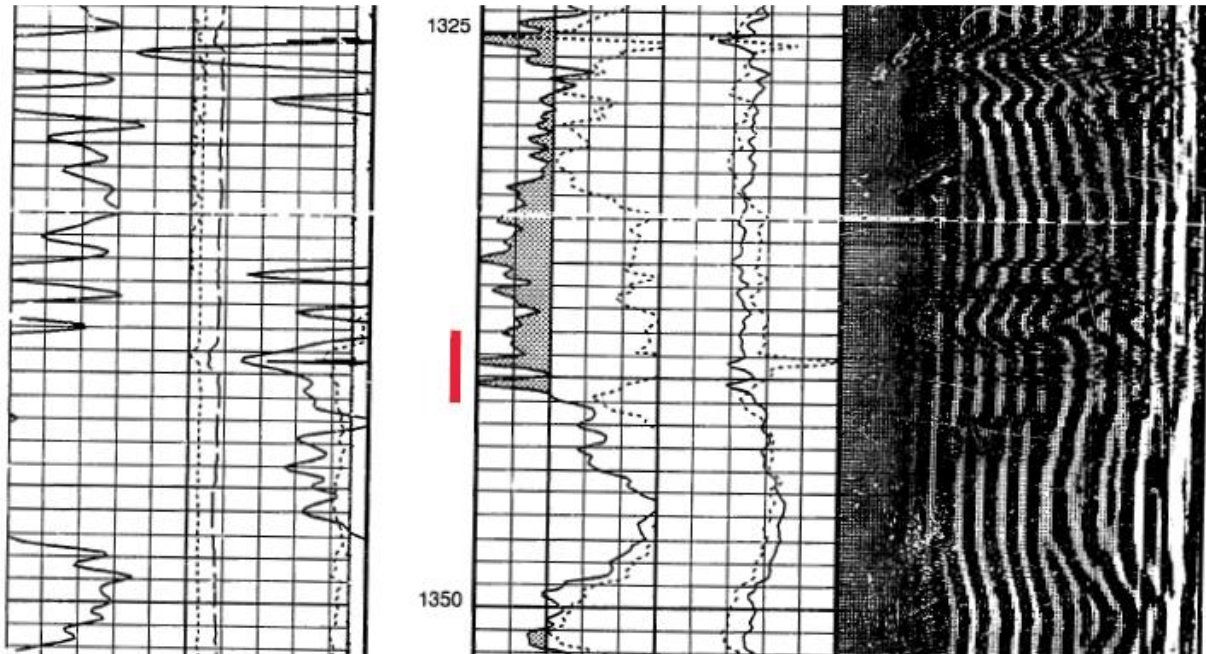
Since the original submission, a Cement Bond Log (CBL) dated March 22, 2003, has been located. Based on an evaluation of this log there is isolation of any potential potable groundwater. Specifically, the log shows excellent bond (>80% attenuation) below the surface casing shoe at 499mKB. Intervals of 100-80% attenuation include 500-501mKB, 509-512mKB, multiple sections 504-581mKB and numerous intervals below this. Even where attenuation is less than 80%, the Variable Density Log shows good formation arrivals, indicating good bond. Based upon this CBL results no further bond log or up hole squeeze is planned. An illustrative segment of the log is provided in Attachment 3 and the full log can be made available if required.

Respectively,
MGM Energy Ltd.

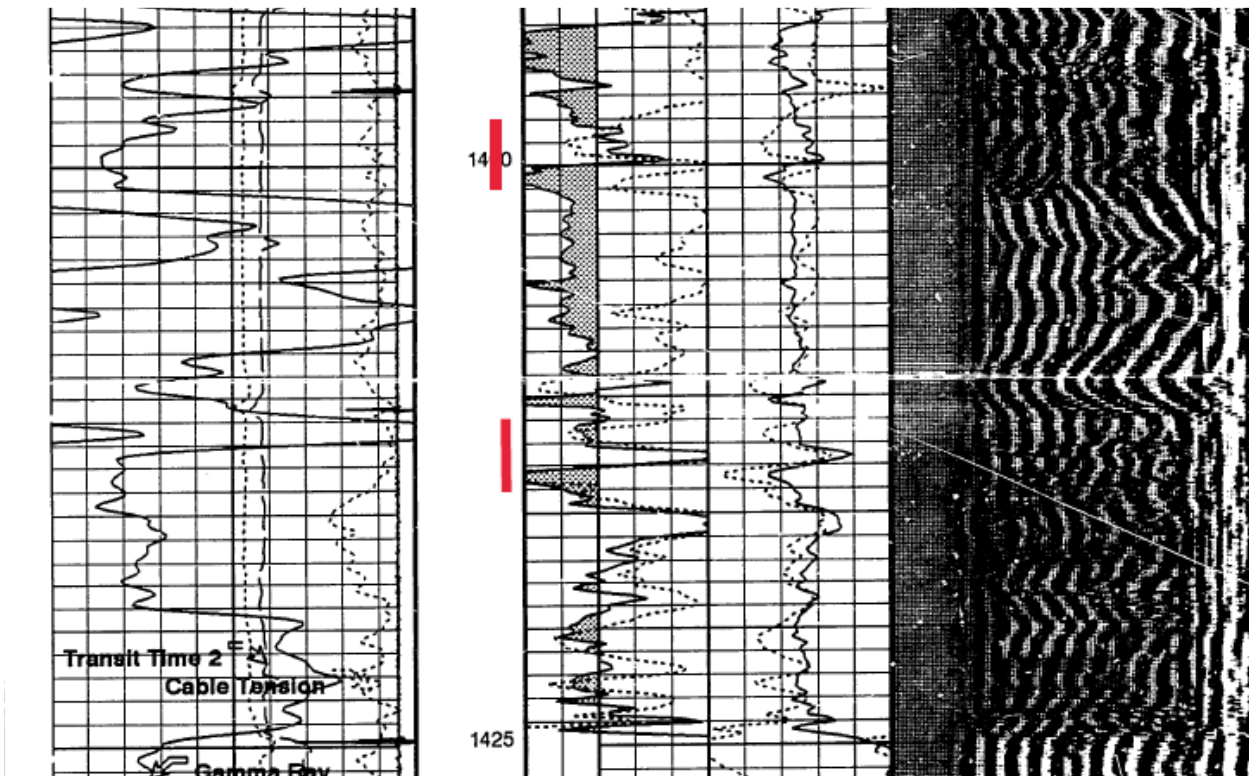
A handwritten signature in black ink, appearing to read 'John Hawkins', with a long horizontal flourish extending to the right.

John Hawkins, P. Eng.
Director Asset Management
403-817-5074

Attachment 1 – Bond Log Segments Over Perforated Intervals of M-17 – March 22, 2003



Showing 100%-80% bond quality over Mt Capp perforations – 1338-1341mKB



Showing 100% to 80% bond (shading in Track 2) over Mount Clark A (1398-1401mKB) and Mount Clark C (1411-1414mKB) – red bars indicate perforation

Attachment 2 – Email from Karel Sagasser P. Geo.

From: Karel Sagasser
To: John Hawkins
Cc: Dawn Kosloski; Corey Thomson; Tim Wood; Dick Heenan
Subject: RE: IR1 - ACW-2022-MGM-M-17-WID1970; M-17-66-40-125-45
Date: Monday, November 28, 2022 3:01:55 PM

Hi John,

In the Nogha M-17 Colville well, porous hydrocarbon bearing zones found at the following intervals:
1338.2 – 1341.8m MD (Mount Cap sandstone). This zone was perforated from 1338.0 to 1341.0m MD

1396.0 – 1401.4m MD (Mount Clark sandstone). This zone was perforated from 1398.0 to 1401.0m MD

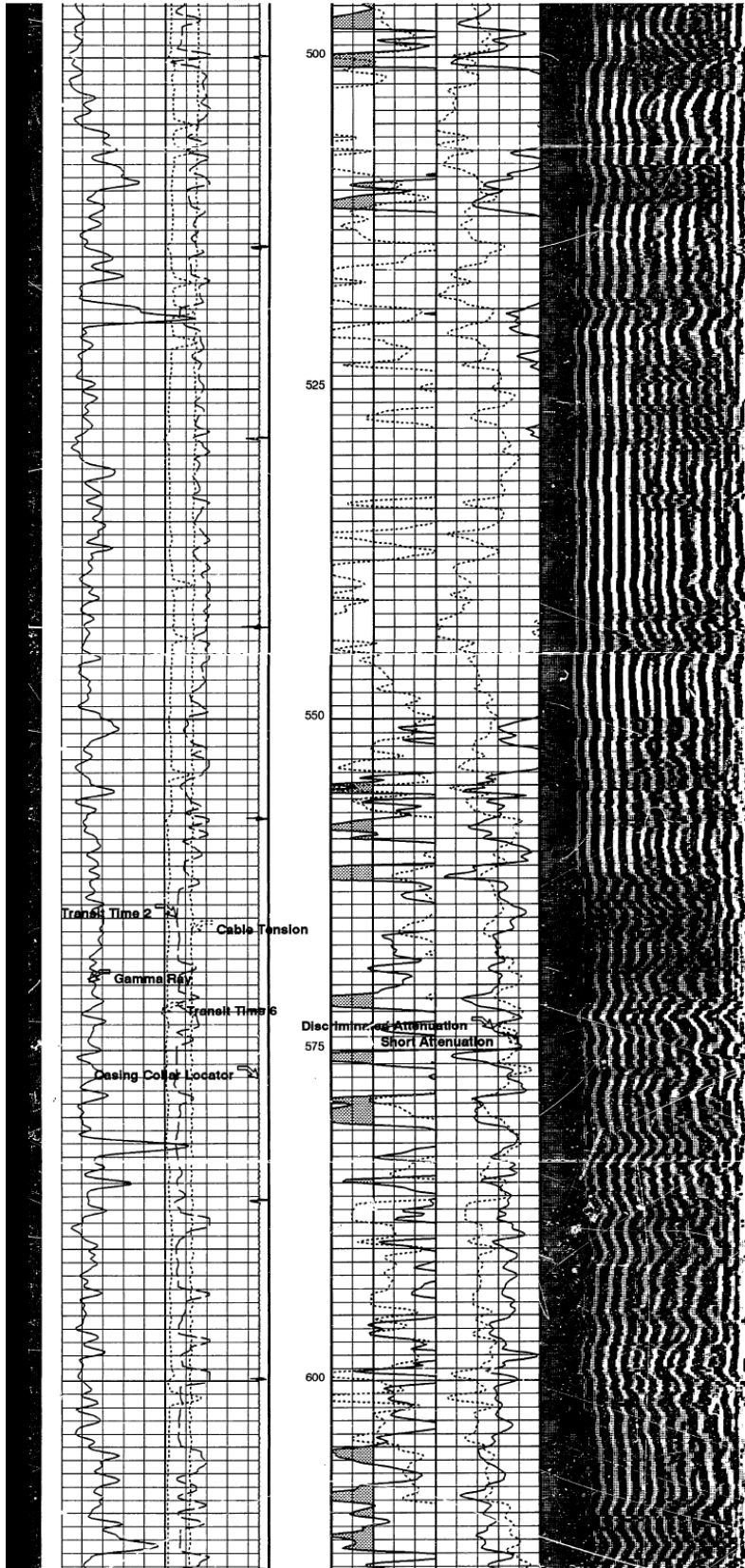
1408.0 – 1408.8m MD (Mount Clark sandstone). This zone was not perforated.

1412.2 – 1419.4m MD (Mount Clark sandstone). This zone was perforated from 1411.0 to 1414.0m MD

The Cement Bond Log shows good cement bond over all four porous hydrocarbon bearing zones. As there seems to be sufficient isolation over these zones there is no need to run another CBL or perform any perforation/cement squeeze operations.

Karel Sagasser

Attachment 3 – Uphole Bond Log Segment M-17 – March 22, 2003



Casing Shoe – 499mKB
Shading in Track2 indicates over 80% attenuation (excellent bond)

550mKB

600mKB



ABANDONMENT PROGRAM
OROGO Deadline April 1, 2024
OROGO LEVEL II WELLBORE

PARA ET AL NOGHA M-17
WID # 1970
POTENTIAL H₂S: 0.0%

PROCEDURE APPROVAL & DISTRIBUTION

DATE: November 29, 2022
WELL NAME: MGM ET AL NOGHA M-17
UWID: 300/M-17-6640-12545/2
OPERATIONS AREA: Coleville Lake **PROVINCE:** NWT
OBJECTIVE: Abandon Level II wellbore in accordance with OROGO abandonment guidelines.

AFE No: TBD
AMOUNT:
PRL Supplier Coding: PR210-9231-xxx (Abandonment program)

REGULATORY APPROVALS:
REQUIRED: YES
TYPE: OROGO Operations Authorization and ACW.
TYPE: Water License. Permit # TBD.
TYPE: Land Use Permit. Permit# TBD.

AUTHORIZATION RECEIVED by: **DATE:**
PROCEDURE COMPLIES WITH CONDITIONS OF AUTHORIZATION: YES **NO**


TYPE OF WORKOVER: (Abandonment):

PROCEDURE COMPLIES WITH PARAMOUNT RESOURCES LTD. POLICIES ON:


- 1) Paramount Well Control Manual
- 2) AER Servicing **BOP Class III** well.

DISTRIBUTION: FIELD: **CALGARY:** Corey Thomson/Well Files

PREPARED BY: Richard Heenan – Consultant **DATE:** November 29, 2022

REVIEWED AND APPROVED BY Corey Thomson – Engineer (ARO)  **DATE:** November 30, 2022

Tim Wood - Manager (ARO.)  **DATE:** December 1, 2022

John Hawkins - Director (ARO)  **DATE:** December 1, 2022

ABANDONMENT PROGRAM

OBJECTIVE

Suspended wellbore, OROGO Level II well bore. OROGO abandonment deadline April 1, 2022. Abandon the well as per approved ACW and OROGO guidelines. Cut and cap well.

REPORTING

- All rig calls and Daily Reports are to be directed to Corey Thomson (Superintendent/Engineer ARO)
 - Office: 403-261-1250
 - Cell: 403-835-4447
 - E-mail: corey.thomson@paramountres.com

PROGRAM SUMMARY

- Read & record SIP(s). Investigate status of SCVF/GM
- MIRU Service Rig, P-tank and associated equipment –
- MIRU slick line unit.
- Pull A-3 tubing plug from 18mcf.
Pull R plug from 1324 mKB
Open sliding sleeves
Perforate tubing above ON-OFF connector
- Circulate to kill fluid
- Rig up BOPs & test
- Release on-off connector @ 1328 mKB & pull out tubing
- RIH bit and scraper for 177.8mm casing on 73mm tubing string to PBTD.
Circulate clean. Pull bit and scraper.
- Set cement retainer @ +/- 1326 mKB & P-test
- Displace to fresh (non-saline) water
- Perform injection test
- Squeeze cement into perforations via sliding sleeves – spot excess on top of cement retainer
- Tag cement plug and record depth (Minimum of 15 meters above cement retainer required).
Pressure test to 7000 kPa for 10 minutes.
- Displace water from wellbore 100mKB to prevent freezing
- Cut and cap the casing strings with vented cap.
- Install well marker

SAFETY

A safety meeting is to be held with all service company personnel prior to each job. Wellsite supervisor must notify Contractors of known hazards of which Contractor(s) may be unaware. Wellsite supervisor must ensure that workers are aware of their responsibilities and duties under OH&S regulations and that workers comply with regulations. All service companies supplying materials will review Material Safety Data Sheets at this meeting for all products supplied and maintain these Material Safety Data Sheets available for worker's examination on location in compliance with WHIMIS regulations. All safety meetings will be recorded on the Paramount daily report and on the daily tour sheet.

Whenever possible, plan and conduct all workover procedures in a manner which will avoid the mixing of air & hydrocarbons in the well bore and connected surface piping. If mixing does occur, purge prior to pressurizing or exposing mixture to any other possible source of ignition.



Rig anchor locations if required will be approved by Paramount Wellsite Supervisor prior to installation.

REGULATIONS

All applicable regulations, including, but not limited to the specific approved OROGO ACW approval, OROGO Well Suspension and Abandonment Guidelines, Oil and Gas Occupational Safety and Health Regulations (NWT) and Occupational Health and Safety (OHS) Regulations (NWT) are to be strictly adhered to. Written instructions must be posted in doghouse or other conspicuous area prior to the wellsite supervisor leaving the lease. Wellsite supervisor must designate, in writing (see attached Form), a competent person to carry out principal contractor's responsibilities. All verbal notifications and approvals from government regulatory agencies will be recorded on Paramount's daily report tour sheet. The name of the individual contacted, and the subject matter of approval or notification should be recorded on same.

Paramount shall provide all staff and contractors for this program with the OROGO 24-hour incident reporting phone number (867-445-8551) prior to commencing any work or activity.

Paramount shall submit to OROGO an updated operator contact list for this program prior to any work or activity by email at orogo@gov.nt.ca.

Paramount shall submit to OROGO certificates and inspection documents for any service rig, well control and associated equipment (including boilers) at least 10 days prior to the rig commencing work by e mail at orogo@gov.nt.ca.

Paramount shall submit to OROGO all reports required under the Oil and Gas Drilling and Production Regulations in a timely manner to OROGO by email at orogo@gov.nt.ca.

Paramount shall submit to OROGO, completed Change of Well Status form 30 days after the service rig release date or when the abandonment operation has been finished.

WORK ORDERS/FIELD TICKETS

Delivery and field tickets for all work, services performed, or materials purchased must be signed by a Company wellsite supervisor. Record the AFE number and well location on all purchase and work tickets.

MATERIAL TRANSFERS

All materials shipped to this location that are not used must be transferred to an appropriate warehouse point. Transfers of any tubular materials must include complete tally. Company wellsite supervisor will complete such transfers and forward both copies to Calgary office for approval and further handling.



PARAMOUNT LAC MAUNOIR M-17 ABANDONMENT

WELL DATA AND WELLBORE CONFIGURATION

WELL DATA:

Surface Location: LAT: 66°36'45.216" N LONG: 125°48'30.708" W NAD83
UWI: 300/M-17-6640-12545/2
BGWP: 600m GL (Default)
WID#: 1970
OPERATING LICENCE# **NWT-OL-2014-009**
OROGO OA# **TBD**
OROGO ACW# **TBD**
Spud Date: February 25, 2003
Rig Release Date: March 20, 2003
KB: 354.6m
GL: 350.0m
KB-GL: 4.6m
PBTD Original: 1451.0m KB
TD: 1471.0m KB

CONDUCTOR: **Hole size 445mm to 60.0m KB.**
339.7mm, 101.71kg/m K-55 BT&C landed at 60m KB.
Cemented with 10T (7.5m³) Arctic Set cement + 0.5% D065 + 0.2% D046 + 0.3% D013with cement returns to surface.

SURFACE: **311 mm to 499.0mKB**
35 Joints. 244.5 mm, 59.53 kg/m, L-80, EWR set at 499.0m KB.
Cemented with 12T (11.3m³) Arctic Set + 0.5% D065 + 0.2% D046 + 0.3% D013 B139 at 1910kg/m³; tailed in with 17.5tonnes (13.3m³) 0:1:0 Class 'G' + 2.0% CaCl₂. 4.5m³ cement returns to surface

PRODUCTION: **Hole Size 216 mm to 1471.0m KB.**
104 Joints. 177.8 mm, 43.16kg/m, L-80, LT&C set at 1471.0mKB. Cemented with 32T (24.3m³) 0:1:0 Class 'G' + 0.5 D065 +0.3% D167 at 1935kg/m³ displaced with 28.5m³ of fresh water and plug down on March 19, 2003 at 0832hrs. 4.5m³ returns to surface.

PERFORATIONS: 1338.0 – 1341.0 Mount Cap
1398.0 – 1401.0 Mount Clark 'A'
1411.0 – 1414.0 Mount Clark 'C'



Formation Tops
geoSCOUT Ref Elev(m):

+350.0

Formation	TVD (m)	Elev (m)	MD (m)
Ofrnk_mtry	Cased	Cased	Cased
Cfr_mtcyc	397.7	-47.7	397.7
Csaln_rv	673.5	-323.5	673.5
Csaln_sa	767.5	-417.5	767.6
Csaln_cIL	795.1	-445.1	795.2
Cmt_cap	1096.6	-746.6	1096.9
Cmt_clark	1393.0	-1043.0	1393.4

GEOLOGICAL MARKERS KB ELEVATION 350.0m. FROM GEOLOGICAL PROG

Formation Top	General Lithology	Paramount Nogha M-17 Location			Comments
		344.00	***	***	
Ground	***	344.00	***	***	***
Kb	***	350.00	***	***	***
***	***	mTVD	MSS	isopach	***
Franklin Mtn - cherty	cherty carbonate	0.00	350.00	160.00	Could be karsted; Potential hard drilling; potential shallow water flows
Franklin Mtn - rhythmic	alternating dolomite and silty dolomite	160.00	180.00	382.00	
Franklin Mtn - cyclic	rhythmically bedded dolomite and red/green mudstone	542.00	-202.00	211.00	
Saline River - Upper Shale	shale and siltstone	763.00	-413.00	63.00	
Saline River - Upper Salt	salt, evaporites, siltstone and shale	826.00	-476.00	106.00	Potential drilling problems due to washouts
Saline River - Lower Shale	shale	932.00	-582.00	16.00	Equivalent to Saline River Shale seismic marker (BK)
Saline River - Lower Salt	salt, evaporites, siltstone and shale	948.00	-598.00	140.00	Potential drilling problems due to washouts
Seismic "M2" Marker	shale	1088.00	-738.00	102.00	At 1006 mkb in O-47
Mt. Cap - Upper Shale	shale and shaley siltstone	1190.00	-840.00	35.00	
Mt. Cap - Middle Zone **	dolomite, sandstone, siltstone and shale	1225.00	-875.00	12.00	Potential DST on penetration; Potential Core???
Seismic "P1" Marker	shale	1237.00	-887.00	105.00	At -1155 mkb in O-47
Mt. Cap - Lower Shale	shale and shaley siltstone	1342.00	-992.00	84.00	
Mt. Clarke - "A" Zone *	sandstone, siltstone and shale	1426.00	-1076.00	7.00	Depth from Seismic; Potential DST on penetration; Core #1 - part 1
Mt. Clarke - "B" Zone *	sandstone, siltstone and shale	1433.00	-1083.00	9.00	Potential DST on penetration; Core #1 - part 2
Mt. Clarke - "C" Zone *	sandstone, siltstone and shale	1442.00	-1092.00	10.00	Potential DST on penetration; Core #2
Proterozoic	Basalt (as in O-47)	1452.00	-1102.00	na	
PBTD	****	1510.00	-1160.00	58.00	****
TD	****	1510.00	-1160.00	****	****

SCVF: No vent flow present.



Tubing/Casing Data:

	Surface Casing	Prod. Casing	Production Tubing String	
Size O.D. (mm)	244.5	177.8	73.0	
Weight (kg/m)	59.53	43.16	9.67	
Grade	L-80	L-80	L-80	
Connection	LT&C	LT&C	EUE	
Drift I.D. (mm)	220.45	153.90	59.61	
I.D. (mm)	224.41	157.07	62.0	
Capacity (m ³ /m)	0.040326	0.019377	0.003019	
Collapse (MPa)	21.0	48.4	76.9	
Burst (MPa)	40.0	56.3	72.9	
Tension (daN)	323,000	261,100	64 500	
Annular Volume (m ³ /m)			0.015189	
Depth (mKB)	499.0	1471.0	1410.8	
Cementing	12 tonnes Arcticset & 17.5 tonnes G 4.9 m3 returns	35 tonnes G 2m3 returns		

Reservoir Data:

Formation	Mount Cap	Mount Clark 'A'	Mount Clark 'C'
Perforations (mKB)	1338.0 – 1341.0	1398.0 – 1401.0	1411.0 – 1414.0
Reservoir Pressure *	14,690 kPa	14,951 kPa	14,937 kPa
Reservoir Temperature	19.0°C	20.0°C	21.0°C
H ₂ S %	0	0	0

Pressures taken at run depth from buildup test.

Mt Cap gradient (highest open perforation) 10.97 kPa/m = 1120kg/m³



GENERAL REQUIREMENTS

- **Daily reports shall be e-mailed to the Operator's office by 7:00am each day.**
- Before commencing operations, the Wellsite Supervisor will complete a list of nearest available emergency services. This list along with a detailed and accurate description of directions to the location is to be posted in a conspicuous and accessible location known to all personnel.
- Emergency contact list should be completed, posted and available to all on site.
- Ensure that all personnel receive a Paramount orientation, are briefed on the wellsite hazards, safety and first aid equipment locations, escape routes and muster points upon their arrival to the lease. All personnel must be signed in after receiving their briefing and all personnel must sign out when departing the work site.
- Safety and well plan meeting to be held with all service company personnel prior to each job and meetings must be recorded on the Paramount's daily report and on the daily tour sheet.
- All applicable regulations, including, but not limited to the specific approved OROGO ACW approval, OROGO Well Suspension and Abandonment Guidelines, Oil and Gas Occupational Safety and Health Regulations (NWT) and Occupational Health and Safety (OHS) Regulations (NWT) are to be strictly adhered to. Written instructions must be posted in doghouse or other commonly visited area prior to Wellsite Supervisor leaving lease.
- The Wellsite Supervisor is responsible for assessing all worker's competency and ability to perform work.
- All service companies supplying materials will provide Material Safety Data Sheets for all products supplied and maintain these Material Safety Data Sheets available for worker's examination on location in compliance with WHIMIS regulations.
- The Wellsite Supervisor will ensure that dangerous goods shipped or received are classified, packaged, marked, labelled and documented in compliance with the Transportation of Dangerous Goods Regulations. If required, placards must be attached to vehicles transporting dangerous goods. All shipping documents must be forwarded to the Calgary office for filing.
- All operations carried out on behalf of the Operator shall be conducted in a safe and efficient manner in compliance with the Operator's safety regulations and all applicable acts and regulations.
- The Operator expects that all operations conducted will be designed to protect and maintain the quality and integrity of the environment and comply with all environmental acts and regulations.
- BOP equipment will be tested at least once daily, and any equipment found defective should be made serviceable before operations are resumed. Blowout prevention and man-down drills are to be performed weekly and are to be recorded on both the morning reports and tour reports.
- Whenever possible, plan and conduct all completion / workover procedures in a manner which will avoid the mixing of air & hydrocarbons in the wellbore and connected surface piping. If mixing does occur, purge prior to pressurizing or exposing mixture to any other possible source of ignition.
- During the absence of the Wellsite Supervisor, a qualified and competent alternate shall be designated, in writing, to carry out the principal Contractor's responsibilities. Written instructions must be posted in a conspicuous and accessible location known to all personnel prior to the Wellsite Supervisor leaving the location.
- All verbal notifications and approvals received on location from any regulatory agency must be documented and recorded on both morning reports and tour reports and should include a contact name from the agency, phone number and details of the subject matter.
- All field tickets and other supporting documentation submitted for materials purchased and/or services rendered require a correct AFE#, G/L number and accurate identification of the well location along with the Wellsite Supervisor's signature indicating acceptance to the same.



PARAMOUNT LAC MAUNOIR M-17 ABANDONMENT

ABANDONMENT PROGRAM

1. **Submit certificates and inspection documents for any service rig, well control and associated equipment (including boilers) at least 10 days prior to the rig commencing work** by e mail at orogo@gov.nt.ca.
2. The Wellsite Supervisor is responsible to notify (or verify notification has been completed) the OROGO, a minimum of 24 hrs prior to any well servicing abandonment operation.
3. The Wellsite Supervisor is responsible to notify (or verify notification has been completed) the OROGO, a minimum of 24 hours prior to any planned flaring operation. When a permit is applicable for sour gas flaring, a copy of such permit must be on site during any flaring operation and requirements of such permit must be strictly adhered to
4. The Wellsite Supervisor is responsible to verify notifications have been completed to all applicable residents, industrial operators, trappers & guiders within the categorized radius and/or within the emergency planning zone (EPZ) if applicable a minimum of 24 hours prior to any flaring operation.
5. Paramount shall provide all staff and contractors for this program with the OROGO 24-hour incident reporting phone number (867-445-8551) prior to commencing any work or activity.
6. Complete lease access and well handover process. Complete lease inspection. Note the condition of the lease, record any clean-up operations required to address any spills and record any other noteworthy findings on the first morning report. Discuss the transportation arrangements for the tanks and fluid with respect to other activity in the surrounding field area.
7. Prepare location for wireline unit, Service Rig, P-Tank and flare stack & support equipment.
8. Perform SCVF bubble-test, ensure SCV piping is exposed to determine if it is open and intact, read and record SIP's. Fill-out the 'Surface Casing Vent Flow / Gas Migration Data Sheet 'and examine surface casing vent for blow or suction. Check and monitor LEL and H₂S levels at wellhead and investigate for evidence of gas migration at surface. Confirm there is no H₂S.
9. Note: this well is not tied into a flowline.
10. MIRU service rig complete with a 21MPa Class III BOP stack. 73 mm rams, kill spool, rig pump, clean tank, and related auxiliary equipment (boiler) to OROGO, OH&S and PRL regulations and guidelines. Ensure Corporate Policies and Procedures are followed prior to commencing operations (see attached). Space out equipment in accordance with OROGO and OH&S requirements.
 - Ensure all necessary safety equipment is strategically positioned on site and tested to ensure proper operating condition prior to commencing with the workover operations.
 - All personnel must be familiar with the operation of all emergency equipment. Safety and BOP drills are to be conducted on a regular basis and recorded on the "Daily Completion / Workover Report"
 - Conduct a complete inspection of the service rig per requirements of AER Directive 37 and PRL guideline policy. Identify and remediate any deficiencies prior to initiating completion operations
 - Conduct an operational and safety meeting prior to installing BOPs onto the wellhead and pressure testing.
11. If necessary, install temporary rig anchors and conduct pull tests on each anchor to 20000 lbs. Install escape line anchor and pull test to 3000 lbs. Ensure PRL ground disturbance procedures are followed.



12. Move in three 200bbl (32m³) tanks for wellbore displacement. Haul in approximately 32m³ fresh water and 32 m³ (plus rig tank circulating volume) of 1120kg/m³ NaCl brine.
One empty tank will be required for diesel/frac oil returns (+/- 25m³) from well.
Ensure bits, scrapers, and pressure test packers for 177.8mm and a few spare 73mm tubing joints are available.
13. Conduct daily pre-job safety meeting and equipment inspection.
14. MIRU slick line unit with lubricator and BOPs. Purge and pressure test the lubricator to 1400kPa (low) and 14MPa (high) with Nitrogen gas. Purge the lubricator each time before running in the hole with tools. Hang the wireline sheave in the derrick.
15. Note: This well contains a shallow hookwall tubing plug at 19mCF.
Follow procedures in OROGO Safety Bulletin SB01 2021 – Shallow Wellbore Plugs (copy attached at the end of this program).
Specifically a hazard analysis for the operation considering the specific surface equipment must be performed and documented. A copy is to be submitted to OROGO prior to operations and a summary of operations must be submitted to OROGO – note timing requirements in the bulletin.
As this plug is retrieved with a slickline unit no snubbing unit is required.
16. Fill the tubing with water to 18mCF (about 50 liters) if needed and pressure up to 9,000kPa.
This is to confirm equalization as below.
17. RIH with sinker bars and knockout rod to break Kobe sub at base of A pack off.
(Kobe sub presumed to be in place – but not documented.)
Confirm required length & diameter of probe with slickline contractor.
If Kobe sub is successfully broken, pressure above will drop indicating equalization.
Allow pressures to stabilize.
18. Pull slip stop, A-3 plug, and collar stop located at 18mcf.
(2.5" JUC pulling tool required).
Note: If unsuccessful in equalizing pressure below plug, maintain 9000kPa on plug until elements are released and pressures equalized. This will prevent the plug from being blown up hole.
19. Pull 58.75 R plug @ 1324mKB.
20. Run blind box and tag PBTD and record depth.
Confirm as a minimum access to 55.58mm X nipple at 1328mKB.
Do not go below tubing bottom @ 1410mKB
21. Open sliding sleeves at 1385mKB and 1402mKB
(both Weatherford XA SSD w/ 58.75mm X profile - up to open)
22. Perforate the tubing at 1326mKB (in the 3m pup above the ON-OFF connector)
23. Forward circulate to 1120kg/m³ NaCl or KCl brine.
Returns are expected to be diesel/frac oil (approximately 25m³).
Oil will be hauled to licensed disposal or to approved waste oil burners in Colville Lake, Fort Good Hope, Norman Wells – note oil is not a substitute for diesel in many uses (Reid Vapor Pressure 9kPa)
24. Confirm tubing and annulus are dead.
25. Install the working spool and BOPs onto the BOP test stump. If required warm up the BOP stack with steam. Function test the blind rams and pipe rams on the test stump. Close the blind rams and pressure test the working spool, the blind rams and BOP flange to 1.4 and 21MPa for 10 minutes each. Install a ported tubing pup and stabbing valve through the BOPs on the BOP test stump. Pressure test the pipe rams and stabbing valve to 1.4MPa and 21MPa for 10 minutes each. Pressure test annular preventer to 7000 KPa for 10 minutes.



26. Conduct an accumulator function test. Recharge the accumulator, shut off the pump and record the accumulator pressure. Close each ram and record the start and end pressures and the time to close each ram. Recharge the accumulator and record the time for the accumulator to recharge to the original pressure. Ensure that hand wheels are available and are the correct type and size for all the BOP rams. Record the number of turns to close each ram manually.
27. Tie in circulating lines with a return line tied into 'P' tank or rig tank as required. Properly stake surface lines and pressure test lines and manifold to 1,400kPa (low) and 21MPa (high) and hold each for ten (10) minutes.
28. Pressure test the annulus 1,400kPa (low) and 21MPa (high) and hold each for ten (10) minutes.
29. Remove top section of wellhead.
Install a 73mm landing pup in the tubing hanger with an open stabbing valve. Close the stabbing valve. Strip the BOPs over the landing pup and nipple up the stack. Close the pipe rams on the landing pup and pressure test the BOP connection to the wellhead to 1.4MPa (low) and 21MPa (high) for 10 minutes each.
30. Release the Guiberson HD On-OFF connector at 1328 mKB by setting string in compression and turning left one – quarter turn.
31. Pull out of hole with the 73mm tubing while and visually inspect out of the hole for re use. Stand the tubing string.
32. RIH with bit and casing scraper for 177.8mm casing to PBTD (+/- 1327mKB)
Pull out of hole and stand tubing string.
33. Set a Cement retainer as close as practical to the ON-OFF connector @ 1328mKb, but at least 5m from a casing collar.
Wireline or tubing set is acceptable.
34. Pressure test retainer to 21MPa (wellhead rating).
35. RIH with 73mm workstring.
36. Forward circulate with fresh water to remove all brine from annulus (approximately 26 m3).
Store brine in tanks on surface for use on other wells and finally haul to approved disposal.
Record on tour sheet and daily report "Displaced well to fresh (non-saline) water" – use this exact wording
37. Sting into the cement retainer.
Pressure test the annulus to 21MPa (wellhead rating) for 10 minutes.
38. Perform injection test with water – start at lowest pump rate possible and increase by 0.25m3/min (or as limited by equipment on site).
If injection rate (with water) is more than 0.5m3/min at 15mPa or less – use hesitation squeeze with cement.
If injection is less than 0.1m3/min at 21MPa contact Calgary office for further steps.
39. Pull out of cement retainer.
40. Mix cement for squeeze (5m3) – batch mix is preferable but not required.
Cement blend to be lab tested in advance to 15cc/30minute API fluid loss and minimum 5 hours thickening time. Reservoir temperature is 24C.
Use fresh water for mixing. Do not use water containing tannins (brownish colour).
41. Mix and circulate cement to bottom of workstring (+/- 1325mKB) with fresh water.
42. Stab into cement retainer.
43. Squeeze cement into perforations, via open sliding sleeves in completion string.
Slowly squeeze cement into perforations. Gradually increase squeeze pressure until formation will take cement. Parting (fracture) pressure is estimated at 11MPa surface pressure – if possible do not exceed



that pressure. Increase as needed to maximum 30MPa surface pressure if formation will not take cement. Maximum surface squeeze pressure 30MPa (31kPa/m at lowest perforation 1411mKB).

Note:

Theoretical cement volume to fill tubing and annulus over target area is 2.5m³.

It is likely that the perforations will be squeezed of before this volume is pumped and the full volume of cement will not be squeezed. Any excess will be placed on top of cement retainer.

Maintain squeeze pressure for up to 3 hours if formation is still accepting cement. (Maximum 4.0m³ cement to be squeezed.)

As above, perform hesitation squeeze if squeeze pressure is not rising during the job.

Record final squeeze pressure.

Monitor annular pressure during squeeze to ensure that the cement retainer is not leaking.

44. Pull out of cement retainer. Spot remaining cement on top of retainer. (Minimum 0.5m³ cement = 25 linear meters).
45. Pull up 50m above calculated cement top and back wash (reverse circulate) two tubing volumes.
46. When cement has set (per cement company), pressure test plug to 7MPa for 10 minutes. Record results in Daily Report and in Tour Book.
47. RIH and tag cement top – minimum set down weight 1800Dan – top of cement must be 15 meters above cement retainer or higher. Top up cement plug if needed. Record results in Daily Report and in Tour Book.
48. Pull out of hole and lay down the 73mm tubing. Ensure thread protectors are used.
49. Evaluation of cement bond log run March 22, 2003, shows excellent bond at the surface casing shoe and numerous intervals below this, therefore no further bond log or perforation/squeeze is planned.
50. Cap end of tubing and RIH to 500m. This will displace 2m³ of water to lower final fluid level to 100m to prevent freezing due to permafrost. POOH. Do not fill hole.
51. Remove BOPs and rig out. Cover exposed flange securely if well is not to be immediately cut and capped.
52. Prepare “as built” downhole abandonment diagram – using attached proposed diagram as a guide.

Surface Abandonment:

Cut and cap the casing strings at least 1 m below ground level with vented cap as per the procedure below or with Hydro jet vented cap system.

53. Confirm LEL and H₂S are zero. Reconfirm no indications of gas migration.
54. Excavate a 2.5m deep bell hole around the wellhead ensuring that walls of the bell hole are sloped at a maximum of 45 degrees for safe entry and egress and to prevent sloughing in.
55. Confirm surface casing vent is open. Cut a small hole 30 cm below the surface casing bowl and investigate for trapped gas and fluids. Check and monitor LEL and H₂S levels. Attach wellhead to lifting unit (rig, backhoe, picker, etc.). Pull slight tension Weld cut three (3) windows in the surface casing to access the innermost casing string ensuring that 50% of the circumferential metal remains to prevent possible collapse of the surface casing from the weight of the wellhead. While exercising caution, weld cut the innermost string.

NOTE:



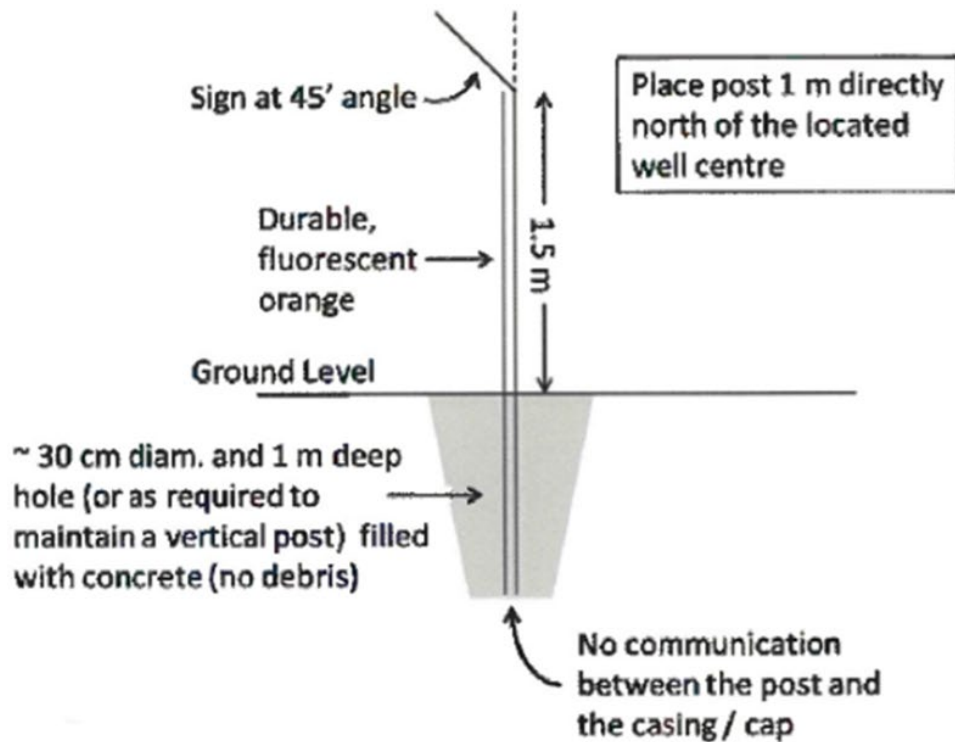
Innermost string can be expected to suddenly drop once completely cut.
Do not place pry bars, hands or fingers in the windows.

56. Complete weld cut of the surface casing, lift, and remove wellhead from bell hole.
57. Stitch weld (non-sealing) steel plate "surface casing and production casing.
Weld inscribe the LSD on top of the steel plate and document with a digital photograph.
58. Install abandoned well sign as below.
Verify well coordinates (decimal format to 4 decimal places) in header with handheld GPS field measurement – use NAD 83 Datum
Record well coordinates on daily report.
A buried 5 gallon pail filled with cement may be helpful in supporting the well sign (as below)

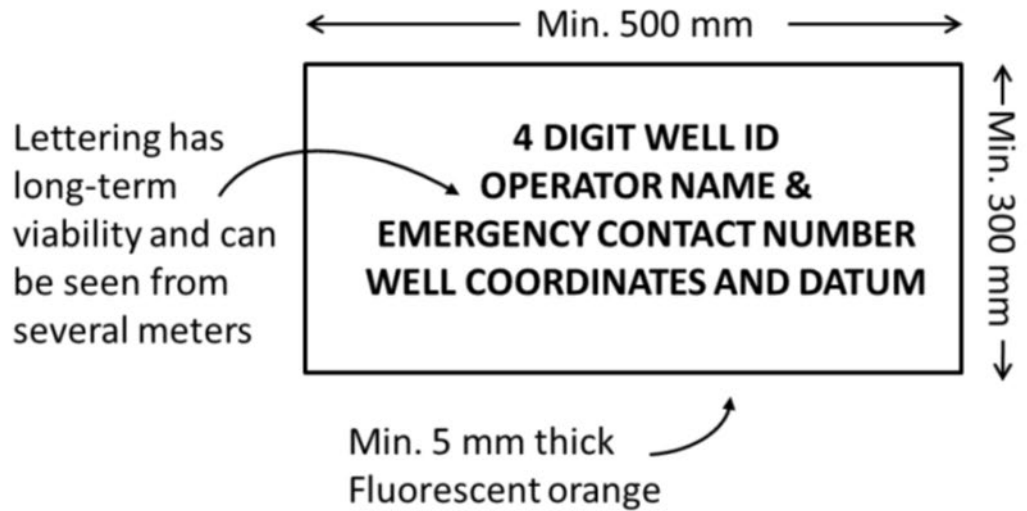
DO NOT WELD SIGNPOST TO CASING.

Well Suspension and Abandonment Guidelines and Interpretation Notes

Post Requirements



**Visible Well
Marker**



59. Prepare field sketch of lease indicating well location, signpost (1 meter north of well) and any relevant features. Submit with daily report.
60. Backfill and compact the excavation, clean up lease and rig out and release all services.



CORPORATE CONTACTS

Paramount Resources Ltd.
2800, 421 - 7th Avenue, SW
Calgary, AB
T2P 4KP

ARO (Calgary):

	<u>Business</u>	<u>Residence</u>	<u>Cellular</u>	<u>Fax</u>
Corey Thomson Engineer, Abandonments E-mail: Corey.Thomson@paramountres.com	(403) 261-1250		(403) 835-4447	(403) 261-1349
Tim Wood Manager, ARO E-mail: Tim.Wood@paramountres.com	(403) 290-2919		(403) 803-8410	(403) 261-1349

MORNING REPORTS (Calgary):

	<u>Business</u>	<u>Residence</u>	<u>Cellular</u>	<u>Fax</u>
Corey Thomson Abandonment Engineer E-mail: Corey.Thomson@paramountres.com	(403) 261-1250		(403) 835-4447	(403) 261-1349
Tim Wood Abandonment Manager E-mail: Tim.Wood@paramountres.com	(403) 290-2919		(403) 803-8410	(403) 261-1349



CORPORATE POLICY & PROCEDURES

- All operations carried out on behalf of the Operator shall be conducted in a safe and efficient manner in compliance with the Operator's safety regulations and all applicable acts and regulations.
- The Operator expects that all operations conducted will be designed to protect and maintain the quality and integrity of the environment and comply with all environmental acts and regulations.
- All contractors on location must have as a minimum a valid H₂S ticket (if necessary), WHMIS, and be fully covered by the NWT Worker's Compensation Board (WCB) where applicable, carry a minimum of \$5,000,000 liability insurance.
- Before commencing operations, the Wellsite Supervisor will complete a list of nearest available emergency services. This list along with a detailed and accurate description of directions to the location is to be posted in a conspicuous and accessible location known to all personnel.
- Any excavation or installation of anchors (if required) on location shall follow Paramount's Ground Disturbance Requirements:
 - a. Contact 1st Call (Review Paramount's Grey book)
 - b. Prior to excavation – obtain Ground Disturbance Permit
 - i. If pipeline in area, arrange for Hydrovac and hand expose lines within 5 meters of excavation.
- Prior to commencing operations, the Wellsite Supervisor shall:
 - Read and record SIP(s). Examine surface casing vent for blow or suction, record and report findings. Check and monitor LEL and H₂S levels at wellhead and investigate for evidence of gas migration at surface.
- Before commencing operations, the Wellsite Supervisor in conjunction with the Rig Manager will conduct an initial rig inspection using a CAODC or equivalent inspection form. A detailed rig inspection is to be completed weekly thereafter. Confirmation of these inspections is to be recorded on both the morning report and tour report.
- Have on-site access to the AER Drilling/ Servicing Regulations - Directive 36, Workplace Health and Safety Regulations, NWT Oil and Gas Operations Act, NWT Drilling and Production Regulations, OROGO Well Suspension and Abandonment Guidelines.
- The Wellsite Supervisor and Rig Manager will conduct daily walk-around inspections and complete a daily rig inspection report in an effort to identify deficiencies regarding well control and safety related items.
- The Wellsite Supervisor must ensure that all pertinent data (tubulars, logs, tests etc.) are properly recorded on the tour sheets and that samples, where required are collected as required by well licence. Also, the Wellsite Supervisor must ensure that trip sheets are properly completed and maintained.
- During cold weather operations, the Wellsite Supervisor must ensure that Precautions are taken to prevent freezing of the bleed-off and kill lines
- The Wellsite Supervisor must ensure that all personnel are advised and instructed not to trespass off the demised property.
- Safety meetings are to be held every day with wellsite personnel and recorded on both the morning reports and tour reports. Pre-job safety/orientation meetings are to be held prior to commencing new or non-routine work at which time the Wellsite Supervisor shall advise all personnel of known hazards, special precautions and procedures. Hazard assessments must be conducted in accordance to Workplace Health and Safety Regulations and documented accordingly.
- BOP equipment will be function tested at least once daily and any equipment found defective should be made serviceable before operations are resumed. Blowout prevention drills are to be performed weekly and are to be recorded on both the



morning reports and tour reports. **All appropriate Certifications for equipment used will be on-site and available for review.** Communicate this information with the contracted services.

- The Wellsite Supervisor will ensure that service companies supplying products and/or materials that require Material Safety Data Sheets review and advise wellsite personnel with the potential hazards associated and the appropriate emergency response to be undertaken when handling the same. As well, in compliance with WHMIS regulations, all MSDS are to be posted in a conspicuous and accessible place known to all personnel for their information and emergency reference. Site Specific Orientation to all personnel on-site must be given for all chemicals and materials used.
- The Wellsite Supervisor will ensure that dangerous goods shipped or received are classified, packaged, marked, labeled and documented in compliance with the Transportation of Dangerous Goods Regulations. If required, placards must be attached to vehicles transporting dangerous goods. All shipping documents must be forwarded to the Calgary office for filing.
- The Operator expects full compliance with all conditions detailed on the Land Use Permit and Water Permit, OA and ACW.
- During the absence of the Wellsite Supervisor, a qualified and competent alternate shall be designated, in writing, to carry out the principal Contractor's responsibilities. Written instructions must be posted in a conspicuous and accessible location known to all personnel prior to the Wellsite Supervisor leaving the location.
- All verbal notifications and approvals received on location from any regulatory agency must be documented and recorded on both morning reports and tour reports and should include a contact name from the agency, phone number and details of the subject matter.

Daily reports shall be prepared by the Wellsite Supervisor and e-mailed (faxed) to the Operator's Calgary office by 07:00Hrs. every morning.

- All field tickets and other supporting documentation submitted for materials purchased and/or services rendered require a correct AFE# and accurate identification of the well location along with the Wellsite Supervisor's signature indicating acceptance to the same.
- All rental equipment must be accounted for and returned promptly upon conclusion of operations. Rental Sheets must be utilized.
- All surplus material and/or equipment must be accounted for and either returned for credit or material transferred to the appropriate warehouse point accordingly. Disposition of scrap material must be documented.
- All Accidents or Incidents shall be reported immediately to the Calgary Office - Attention: Corey Thomson or Richard Bean. Complete the Paramount Safe Incident Report and conduct the necessary Investigations immediately. Fax copy to Calgary within 6 hours of incident.
- Ensure that all garbage and debris has been removed from the location. and that any environmental concern has been addressed. Contact the Construction foreman with any concerns.
- Prepare a final wellbore diagram with all pertinent information recorded.
- Forward all paperwork including field logs and computer data files to the Calgary office including copies of all field logs. A paper and digital copy of all Paramount operation reports should be provided. All field tickets, Material Transfers, Incident Reports, well test reports, rig inspection reports and service reports shall be included with the operation report package.



Alternate Cut and Cap Operation

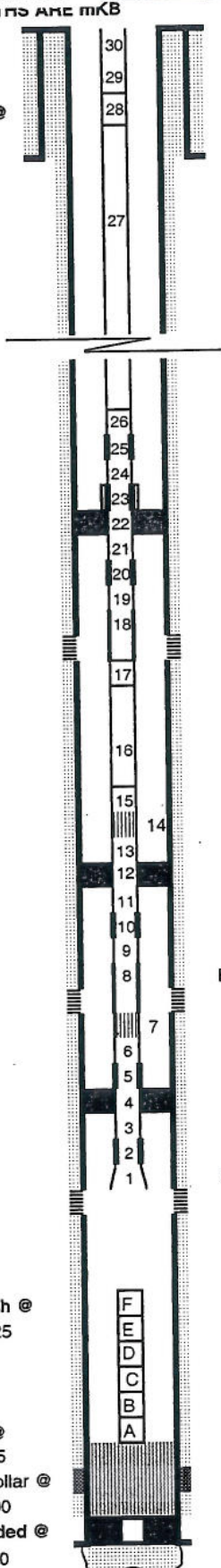
If available, a proprietary Hydrojet cut and cap system may be used to cut the casing(s) a minimum of 1 m below ground level and install a vented (non-sealing) cap on the casing stub below ground level once all downhole operations have been completed and tested as per the program.

In summary the steps are:

- Remove wellhead from the top of the well (down to surface casing bowl flange)
- Place the hydraulic pipe cutter inside the innermost casing
- Apply high-pressure water and abrasive to the cutting tip (typically 1-2m below grade).
- Rotate the cutting tip to sever the casing from the inside out.
(Typically it takes 20 minutes to an hour to complete the cut)
- Remove tool and pull the casing stub out of the ground.
- Compression fit vented cap to the below-ground casing strings.
(Welded options are available for jurisdictions where this is required)
- Backfill the hole (typically about the diameter of the surface casing drill bit)
- Install independent well signpost as per OROGO requirements (detailed above)



Surf. Csg. @
499.0



WELL NAME: APACHE NOGHA M-17		DATE: 2004-03-09		
PREPARED BY: M/ Periard/B. Beitz		Licence No: WID 1970		
ELEVATIONS (meters):		KB to CF Dist. H 6.00		
TD 1,471.00	KB Elev. 344.00	KB to Ground 6.00		
PBTB 1,452.65	Ground Elev. 350.00	6.00		
CASING/TUBING	SIZE (mm)	WEIGHT (Kg/m)	GRADE	DEPTHS (m)
Surface Casing	244.50	53.50	J-55	499.00 35 Jts
			LT&C	
Production Casing	177.80	43.16	PS-80	1,471.00 103 Jts
			LT&C	
Prod Liner				
Tubing	73.00	9.67	L-80	1,410.79 141 Jts
			EUE	

BOTTOM HOLE ASSEMBLY:

ITEM	DESCRIPTION	LENGTH (m)	Top at (m KB)
1	1- 73mm re-entry guide	0.15	1,410.64
2	1- 73mm 55.58mm x 51.05mm NoGo "RN" nipple	0.50	1,410.14
3	1- 73mm L-80, 9.67 kg/m, EUE pup joint	1.24	1,408.90
4	1- 73mm x 177.8mm Halliburton G-77 hydraulic set packer	1.67	1,407.23
5	1 - 73 mm 55.58 mm R nipple	0.47	1,406.76
6	1- 73mm L-80, 9.67 kg/m, EUE pup joint	3.08	1,403.68
7	1- 73mm XA SSD w/ 58.75mm X profile (up to open) closed	1.12	1,402.56
8	2- 73mm x 93.5mm O.D. blast joints(2 x 2.98m)	5.96	1,396.60
9	1- 73mm L-80, 9.67 kg/m, EUE pup joint	2.47	1,394.13
10	1- 73mm 58.75mm X nipple	0.37	1,393.76
11	1- 73mm L-80, 9.67 kg/m, EUE pup joint	3.07	1,390.69
12	1- 73mm x 177.8mm Halliburton G-77 hydraulic set packer	1.67	1,389.02
13	1- 73mm L-80, 9.67 kg/m, EUE pup joint	3.07	1,385.95
14	1- 73mm XA SSD w/ 58.75mm X profile (up to open) closed	1.12	1,384.83
15	1- 73mm L-80, 9.67 kg/m, EUE pup joint	1.94	1,382.89
16	4- 73mm L-80, 9.67 kg/m EUE tbg joints	38.58	1,344.31
17	1- 73mm L-80, 9.67 kg/m, EUE pup joint	1.85	1,342.46
18	2- 73mm x 93.5mm O.D. blast joints(2 x 2.98m)	5.96	1,336.50
19	1- 73mm L-80, 9.67 kg/m EUE pup joint	3.07	1,333.43
20	1-73mm 58.75mm X nipple	0.37	1,333.06
21	1- 73mm L-80, 9.67 kg/m EUE pup joint	3.07	1,329.99
22	1- 73mm x 177.8mm Halliburton G-77 hydraulic set packer	1.67	1,328.32
23	1- 73mm Guiberson HD On/off w/ 58.75 mm X profile	0.61	1,327.71
24	1- 73mm, L-80, 9.67 kg/m, EUE pup joint	3.07	1,324.64
25	1- 73mm 58.75mm X nipple Plug in place	0.37	1,324.27
26	1- 73mm, L-80, 9.67 kg/m, EUE pup joint	3.07	1,321.20
27	136- 73mm L-80, 9.67 kg/m, EUE joints A-3 plug set @ 20 mcf	1,304.49	16.71
28	1- 73mm L-80, 9.67 kg/m, EUE pup joint	1.86	14.85
29	1- 73mm L-80, 9.67 kg/m, EUE joint	9.52	5.33
30	73mm x 179mm Extended kneck tbg hanger c/w BPV threads	0.20	5.13
	Tbg Correction (+0.20 m) 8000 daNs Compression (- 0.52 m)	-0.32	
	TALLY	1,405.34	
	KB TO TUBING HEAD	5.45	
	TUBING BOTTOM	1,410.79	

PERFORATION INTERVALS

1411.0-1414.0 mKB- Mount Clark "C"
1398.0-1401.0 mKB- Mount Clark "A"
1338.0-1341.0 mKB- Mount Cap

NOTE:	Length	Top @
A- 127mm ERHSC casing gun	3.50	1449.15
B- Mechanical firing gun	0.14	1449.01
C- 60.3mm L-80 pup joint	2.46	1446.55
D- 60.3mm differential ported sub	0.25	1446.30
E- 60.3mm L-80 pup joint	1.86	1444.44
F- 60.3mm x 47.5mm jar down tbg release	0.19	1444.25

Top of fish @
1,444.25

PBTB @
1,452.65

Float Collar @
1456.00

anded @
,471.0

TD @ 1471.0

Nogha M-17 - Proposed Abandonment

KB 350 mASL
GL 344 mASL

499 mKB

Wellbore displaced
to fresh water

Retainer & Cement Cap
+/- 1327 mKB
Packer & On-off
1328 mKB

Mt Cap
1338-1341 mKB

Packer
1389 mKB

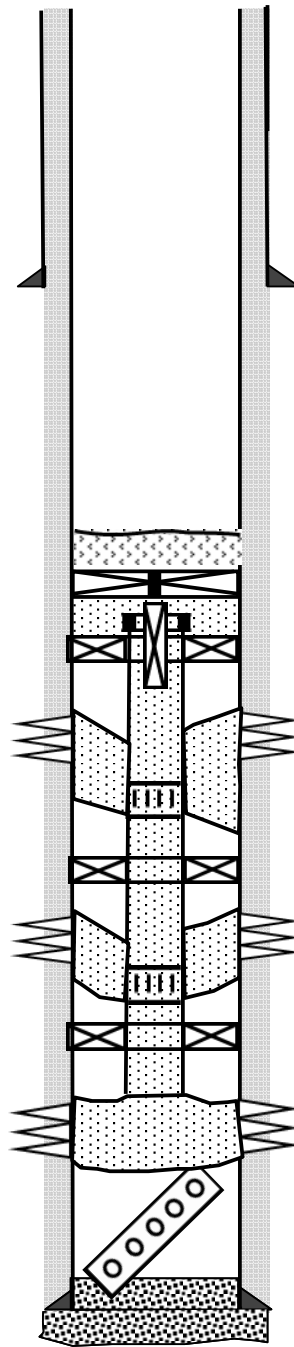
Mt Clark
1398-1401 mKB

Packer
1407 mKB

Mt Clark
1411-1414 mKB

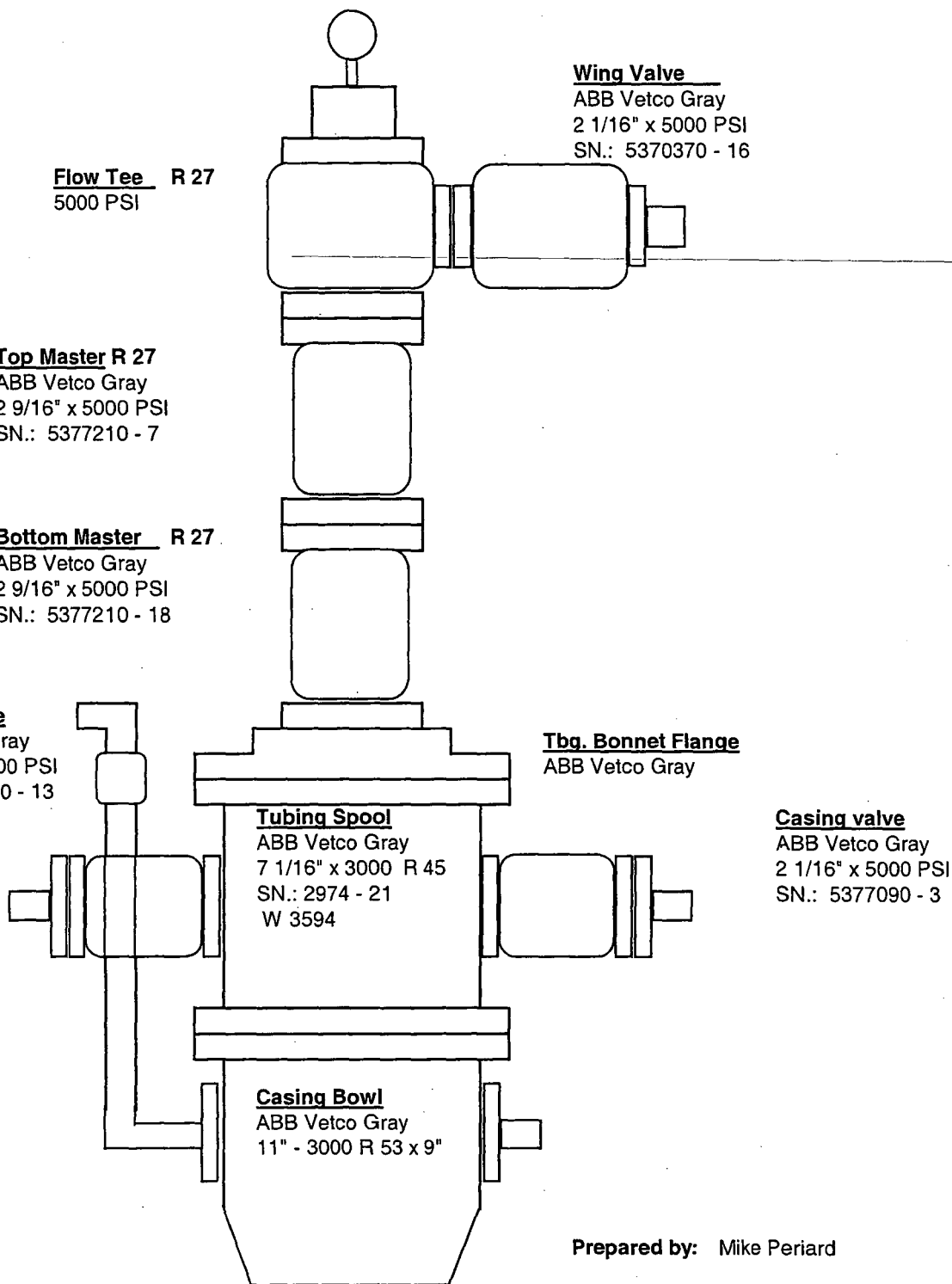
Top of fish 1444 mKB

PBTD 1452 mKB
TD 1471 mKB



Not to scale:
DH 20221125

W:



Prepared by: Mike Periard

Safety Bulletin: Shallow Wellbore Plugs

INTRODUCTION

Some historical suspension operations used shallow wellbore plugs (plugs at approximately 50 mKB). These plugs must be milled out during well abandonment or reactivation programs. Milling out these plugs can pose significant safety risks because the operator cannot properly kill the well with a weighted fluid or assess actual pressures beneath the plug prior to downhole intervention.

The Office of the Regulator of Oil and Gas Operations (OROGO) regulates the safety of oil and gas operations by requiring operators to submit:

- Safety plans (for the Regulator's approval);
- Well-specific suspension and abandonment procedures (for the Regulator's approval);
- Investigation reports for any safety incidents or accidents; and
- Incident status reports.

This safety bulletin lists the factors and requirements operators must address for any wellbore plug that does not allow the wellbore to be safely killed by over balancing the plug, including a margin of safety, with weighted fluid and the drill string. These factors and requirements must be also be addressed in cases where such a wellbore plug is suspected, but not confirmed, to be present based on historical records.

BACKGROUND

During abandonment and suspension operations within OROGO's area of jurisdiction in the Northwest Territories, milling out of a shallow wellbore plug has caused loss of well control, jacking of the tubing string, uncontrolled releases of gas and a serious lost time injury that could have resulted in death.

AGGRAVATING FACTORS

- Unavailable or incomplete historical information on previous well interventions and monitoring;
- Inability to measure any real time potential pressures under the plug;
- Lack of adequate hazard identification, hazard assessment and control measures; and
- Use of unsecure pressurized hoses and equipment during milling operations.

If you would like this information in another official language, contact us at (867) 767-9097.

REQUIREMENTS

As of April 23, 2021, all Well Approval applications submitted to OROGO for wellbore interventions must include the following information where any wellbore plug is identified or suspected, requires removal and cannot be over balanced with a combination of weighted fluid and weight on string.

- **Risk Assessment and Well Control:**
 - The operator must assume reservoir pressure is present below the plug.
 - If the combination of kill fluid density and weight-on-bit (drill string) does not overbalance the estimated reservoir pressure at the actual plug depth, a snubbing unit is required.
- **Engineering Controls:**
 - Snubbing units must be installed before starting milling operations for the removal of any applicable wellbore plug. The snubbing unit must remain in place until the plug has been removed and pressures equalized or the well bore sufficiently killed with weighted fluid.
- **Administrative/Elimination:**
 - Before milling out the wellbore plug, operators must conduct and record an on-site risk assessment and hazard analysis of the task. This should include, but not be limited to:
 - i. Identifying hazards and mitigations if pressure is found;
 - ii. Reviewing blow out preventer and evacuation procedures;
 - iii. Inspecting and securing the rig, hoses and other equipment that may encounter pressures from the wellbore;
 - iv. Identifying danger zones and ensuring only essential staff are present and safely positioned to avoid the identified potential hazards in the immediate work area during the milling operations; and

- v. Alerting the medic to be on standby and ensuring they are present for all steps above.

- **Reporting:**

- Operators must submit to OROGO at orogo@gov.nt.ca:
 - A record of the risk assessment and hazard analysis for the operation, as described above, no less than an hour before it begins; and
 - A summary of the operations related to the milling of the plug within an hour of its completion.
- Operators must report all incidents and near misses as soon as circumstances permit, as required under the [Oil and Gas Drilling and Production Regulations](#), to OROGO at 867-445-8551.

Notes:

1. The operator must still comply with any other applicable Act, Regulation or other regulatory requirement, including those of the NT/NU Workers Safety and Compensation Commission.
2. The operator must bring any conflict between this bulletin and its internal policies to the attention of OROGO in its application for a Well Approval. The conflict must be addressed to the satisfaction of the Chief Safety Officer before the Regulator issues the Well Approval.



Michael W. Martin
Chief Safety Officer
Office of the Regulator of Oil and Gas Operations
www.orogo.gov.nt.ca