




November 23, 1990

## WORKOVER PROGRAM

**PARAMOUNT et al CAMERON**  
**N - 28**  
**60° 10' 117° 30'**

Prepared by :

  
P. G. Besler  
Assistant Drilling Manager

Approved by :

  
L. Jeffries  
Drilling Manager

Distribution :

Besler	1 Field + 1 Office
Well File	Original
Partners	2

# WORKOVER PROGRAM

## PARAMOUNT et al CAMERON N - 28

### A. SAFETY

All operations are to be carried out in accordance with government regulations and recognized safety procedures. Operations are to be conducted in a manner that results in the greatest degree of protection possible for the public, on-site personnel and the environment.

### B. WORKOVER PROCEDURE

**NOTE :** Program may be modified at any time depending on results.

1. MISR c/w pump and clean tank. Extra "slop" tank required. MI and RU Northland frac separator test unit c/w flare stack and extra 63 m<sup>3</sup> tank. Spot tubing trailer with approximately 1600 m (167 joints) of 73.0 mm, 9.67 kg/m, J-55, EUE, ERW tubing.
2. Stump test BOP. Ensure well is dead. There are no open perforations and no tubing in well. Remove existing top section of wellhead from 279.4 mm flange and higher. Install new wellhead assembly with all flanged connections and sour trim valves. Remove tubing bonnet and install BOP's. Function test.
3. Pick up 165.1 mm (6-1/2") bit and 6 - 79.3 mm drill collars. Run in hole on 73.0 mm tubing. Tag cement at approx. 563 mKB. Use salt water for completion fluid. Drill out cement to liner top at 732 mKB. Work bit to remove as much cement as possible from the 219.1 mm intermediate casing. Circulate hole clean. Pull tubing and laydown 165.1 mm bit. Pick up 120.6 mm bit and 6 - drill collars. Run in on 73.0 mm tubing. Drill out liner to float collar at approximately 1576 mKB. Note liner wiper plug did not release from setting tool so there may be considerable cement in liner. Pull tubing and put 139.7 mm casing scraper one drill collar of bottom. Run in and scrape liner clean from 1550 to 1350 mKB. Circulate hole clean.
4. Rig up Computalog conductor wireline. Run CBL-VDL-GR-CCL over entire liner section. Repeat with 7 MPa pressure pass. Reference to Schlumberger CNL-LDT-DAC-GR main pass open hole log of 1990-03-08. Contact Calgary office with results prior to proceeding further. If bond is poor, remedial work may be required.
5. Close blind rams and pressure test casing to 14 MPa for 10 mins.
6. Pick up perforating gun, 101.6 mm ERHSC with 32 gram charges at 90° phasing and 13 spm. Run in and perforate the Keg River intervals 1541.5.0 to 1543.0 and 1538.0 to 1539.0 mKB.
7. Pick up the following bottom hole assembly :
 

2 jts	- 73.0 mm OD, 9.67 kg/m, J-55, EUE ERW tubing with wireline reentry guide on bottom;
1	- 139.7 mm x 73.0 mm Cardium "DGP" retrievable production packer;
1	- 139.7 mm x 73.0 mm Cardium "NFT" On/Off Seal unit with 57.12 mm "R" profile (55.80 mm no/go);
1 jt	- 73.0 mm tubing;
1	- 73.0 mm profile nipple with 58.72 mm "F" profile;

xx jts - 73.0 mm tubing to surface.

Run in hole to approx. 1545 m. Set packer with tail pipe at approx. 1545 mKB. Pressure test packer and annulus to 14 MPa for ten minutes.

8. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results. If results are poor, prepare to stimulate. Collect samples of fluids.
9. Fill tubing with salt water and unset packer.
10. RU Fracmaster CA unit. Conduct acid compatibility tests. Acid blend will depend on results. Typical blend may be 6 l/m<sup>3</sup> I-10, 1 l/m<sup>3</sup> D-3, 10 l/m<sup>3</sup> ASA-15, 0.2 kg/m<sup>3</sup> IS-2 and 6 kg/m<sup>3</sup> IS-3. Mutual solvent additives may be required in oil zone.

Prepare to and pickle tubing with 1.5 m<sup>3</sup> of 15% acid blend. Circulate acid down tubing at as slow a rate as possible. Bring acid to bottom of tubing. Reverse out spent acid to "slop" tank and neutralize with soda ash. Reverse circulate at least two (2) tubing volumes to remove all acid. Dump any contaminated fluids to "slop" tank and haul away for disposal.

Establish feed rate at 7 MPa. Acidize perforations with 3.0 m<sup>3</sup> of 15 % HCl acid blend. Slowly wash 5 -100 litre stages by the perms then squeeze the remaining 2.5 m<sup>3</sup> into formation at low pressure. Overdisplace. Do not exceed 10 MPa while squeezing. Reverse circulate acid from well bore. Reestablish feed rate at 7 MPa unless well is taking fluid.

RO CA unit.

11. Set packer and pressure test annulus to 14 MPa. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results.
12. Kill well down tubing. Unset packer and circulate to salt water. Pull tubing assembly.
13. Rig up Computalog conductor wireline. Run in 139.7 mm Cardium Model RNT bridge plug and set at 1535 mKB. Pressure test bridge plug to 14 MPa. Pick up perforating gun, 101.6 mm ERHSC with 32 gram charges at 90° phasing and 13 spm. Run in and perforate the Keg River intervals 1521.0 to 1524.0 mKB.
14. Run in hole with previous tubing assembly to approx. 1526 m. Set packer with tail pipe at approx. 1526 mKB. Pressure test packer and annulus to 14 MPa for ten minutes.
15. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results. If results are poor, prepare to stimulate. Collect samples of fluids.
16. Fill tubing with salt water and unset packer.
17. RU Fracmaster CA unit.

Establish feed rate at 7 MPa. Acidize perforations with 2.250 m<sup>3</sup> of 15 % HCl acid blend. Slowly wash 5 -50 litre stages by the perms then squeeze the remaining 2.0 m<sup>3</sup> into formation at low pressure. Overdisplace. Do not exceed 10 MPa while squeezing. Reverse circulate acid from well bore. Reestablish feed rate at 7 MPa unless well is taking fluid.

RO CA unit.

18. Set packer and pressure test annulus to 14 MPa. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results.

19. Kill well down tubing. Unset packer and circulate to salt water. Pull tubing assembly.
20. Rig up Computalog conductor wireline. Run in 139.7 mm Cardium Model RNT bridge plug and set at 1510 mKB. Pressure test bridge plug to 14 MPa. Run in with dump bailer and place 5 m (64 lres) of Class G cement on top of bridge plug. Pick up perforating gun, 101.6 mm ERHSC with 32 gram charges at 90° phasing and 13 spm. Run in and perforate the Sulphur Point intervals 1404.0 to 1406.0 mKB.
21. Run in hole with previous tubing assembly to approx. 1408 m. Set packer with tail pipe at approx. 1408 mKB. Pressure test packer and annulus to 14 MPa for ten minutes.
22. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results. If results are poor, prepare to stimulate. Collect samples of fluids.
23. Fill tubing with salt water and unset packer.
24. RU Fracmaster CA unit. Conduct acid compatibility tests. Acid blend will depend on results. Typical blend may be 6 l/m<sup>3</sup> I-10, 1 l/m<sup>3</sup> D-3, 10 l/m<sup>3</sup> ASA-15, 0.2 kg/m<sup>3</sup> IS-2 and 6 kg/m<sup>3</sup> IS-3.  
  
Establish feed rate at 7 MPa. Acidize perforations with 2.250 m<sup>3</sup> of 15 % HCl acid blend. Slowly wash 5 -50 litre stages by the perms then squeeze the remaining 2.0 m<sup>3</sup> into formation at low pressure. Overdisplace. Do not exceed 10 MPa while squeezing. Reverse circulate acid from well bore. Reestablish feed rate at 7 MPa unless well is taking fluid.  
  
RO CA unit.
25. Set packer and pressure test annulus to 14 MPa. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results.
26. Kill well down tubing. Unset packer.
27. Circulate annulus to inhibited fresh water topped with diesel. Raise tubing and set packer with tubing bottom at 1404 mKB. If formation will not hold or takes too much fluid, run "RZG" plug in On/Off profile. Release tubing from packer and circulate inhibited fluid. Latch back onto packer.
28. Ensure well is dead. Remove BOP and install wellhead. Pressure test annulus to 14 MPa.
29. Rig to and swab well in. Swab until well flows or a steady inflow is established. Report results.
30. Release service rig and frac separator. Ensure wellsite is clean of any garbage and material spills. Bullplug all openings. Chain and lock wellhead. Note movement of all tangible materials on daily report.
31. Move in Northland test unit complete with tanks and flare stack. Rig up for well test.
32. Open well to flow on clean up with approx. 21% drawdown. Rate and pressure should be stable for approx. 24 hrs.
33. Shut in well. RU wireline unit. Run in and set off tandem 360 hr electronic recorders. Conduct flow test as follows:
  - shut in well for approx. 24 hrs and monitor build up of tubing pressure
  - run 4-point test at approx. 7, 14, 21 and 28% drawdowns with 4 hr flows and 4 hr shut ins
  - flow well on third rate for 72 hrs

- shut in well and monitor surface build up for 8-12 hrs

34. Rig out test unit. Ensure all materials and garbage are cleaned up and removed from wellsite.
35. Rig up wireline after recorders have run out and pull recorders. Run static gradient. Run in and set 57.12 mm 'RZG' plug in 'R' profile of On/Off unit. Bleed off pressure from tubing and fill with inhibited fresh water and diesel cap.
36. Ensure all openings are bullplugged. Chain and lock wellhead.

## C. BOP EQUIPMENT

Use 179.4 mm 20.7 MPa BOP's complete with blind rams, tubing rams, and annular to meet COGLA requirements. Function test and pressure test BOP's to 14 MPa.

Service Rig Manager and Wellsite Supervisor are to have valid PITS "Well Service Blowout Prevention" and "H2S Alert" certificate on site.

## D. REPORTING

Wellsite Supervisor will report previous 24 hours operations ending at 0800 hours to Calgary Office at designated time.

## E. GENERAL

1. All invoices are to be sent to the following address :  
  
 Paramount Resources Ltd.  
 4000, 350 - 7th Avenue S. W.,  
 CALGARY, ALBERTA,  
 T2P 3W5
2. P. O. Numbers are not used by Paramount. All field tickets must be signed by the Wellsite Supervisor and clearly marked with the well location as well as the AFE Number and Sub Item Number ( ie : Stimulation is 21780-324 ).
3. All operations must be duly and accurately recorded on Daily Well Completion and Servicing Report.
4. Only authorized personnel directly involved with the operations are to be allowed on the wellsite.
5. Safety meetings to discuss program are to be held prior to commencing well completion, perforating, stimulation and testing.
6. Full co-operation by field personnel is to be maintained with the COGLA and other government agencies.
7. Under no circumstances will the possession and use of alcoholic beverages or illegal drugs be permitted on the wellsite or campsite.
8. Report movement of all tangible materials such as tubing, on the daily report when movement occurs. Tallies should be with "threads on" for inventory purposes.

**F. PERSONNEL CONTACTS**

	<u>Office</u>	<u>Home</u>	<u>Mobile</u>
Phil Besler ( Completions )	266-2047	948-5367	
Lloyd Jeffries ( Completions Alt.)	266-2047	269-2475	560-0631
COGLA	Yellowknife	920-8175	
R.C.M.P.	Hay River	874-6555	
Emergency Support	Ambulance	Hay River High Level	874-6512 926-2545
	Hospital	Hay River High Level	874-6512 926-3791

**G. CONTRACT SERVICES**

<u>SERVICE</u>	<u>COMPANY</u>	<u>CONTACT</u>	<u>LOCATION</u>	<u>TELEPHONE</u>
Service Rig	Flint #771	J. Suffern D. Gerow	Calgary High Level	263-6910 926-2234
Wellhead	Cooper/WKM	M. Urich	Calgary Edmonton	261-2800 434-3476
Bond Log / Perforating	Computalog	K. Tipper D. Knops	Calgary High Level	265-6060 926-4481
Slickline/ Well Testing	Northland	R. Linder/ D. Homan	Calgary Gr. Prairie	255-9700 539-3257
Stimulation	Fracmaster	C. Schesnuik	Calgary Gr. Prairie	262-2222 539-6060
Tools	Cardium	K. Stewart	Calgary High Level	262-9586 926-4046

1990 / 11 / 23

# WELL INFORMATION

## PARAMOUNT et al CAMERON N - 28 60°10' 117°30'

G. L. E. :	760.10 m	SPUD :	1990-02-26 @ 0500 hrs
K. B. E. :	764.10 m	R. R. :	1990-03-19 @ 0800 hrs
Tbg. Dist. "h" :	m	DAYS :	21
T. F. E. :	m		
Dist. "H" :	4.36 m	ADW :	1413
C. F. E. :	759.74 m	CLASSIFICATION :	Exploratory
		UWI :	300N286010117300
P. B. T. D.:	(563) m	FIELD :	n/a
T. D. :	1590.00 m		

Working Interest Owners :	(OP)	Paramount	74.0%
		Tarragon	25.0%
		Camreco	1.0%

**SURFACE HOLE :** Piloted 222.2 mm to 250 m, encountered gravel and boulders. Reamed 381.0 mm to 244 m.

**SURFACE CASING :** Set 16 jts of 298.5 mm OD., 62.5 kg/m, H-40, 8-rd ST&C, ERW, (IPSCO) at 203.3 mKB. (Could not get to bottom.)  
Cement with 28 tonnes 0:1:0 Class "G" + 2% CaCl<sub>2</sub> (100% excess).  
FLOT @ 348 m = 17.6 kPa/m

**INTERMEDIATE HOLE :** Drilled 269.8 mm to 834 m.  
Mud system : 203-834 m, gel-chem  
Note : Started drilling with air, hole made water. Mudded up and lost circulation but regained.

**INTERMEDIATE CASING :** Set 64 jts of 219.1 mm, 35.7 kg/m, IK-55, 8-rd ST&C, ERW, (IPSCO) casing at 834.29 mKB.  
Cemented with 18 t 0:1:8 + 0.75% T-10 and 14.3 t 0:1:0 'G' + 0.8% NFL + 0.1% SPC12000. ( Good cement returns to surface. )  
FLOT @ 839 m = 22 kPa/m

**MAIN HOLE :** Drilled 200.0 mm to 1590 m.  
Mud system : 834 - 1328 m, air & foam  
1328 - 1590 m, gel-chem

**CORES :** n/a

**LOGS :** 1990-03-08 Schlumberger  
Phasor - SFL - GR  
CNL - LDT - DAC - GR  
ML - GR - XY  
BHC Sonic - GR

**D. S. T. 's :**

**DST #1 :** SULPHUR POINT - 1390.8 to 1417.0 mKB  
**Times :** 20 / 30 / 60 / 120  
**PF :** VSAB in 1 min. GTS in 2 min.  
**VO :** VSGB immediately at 149,538 m<sup>3</sup>/d.  
**Rec. :** 66 m drilling mud,  
 38 m fresh water (10000 ppm).  
**T = 50.9°C @ 1395 m**  
**IHP :** 15948 kPa      **PFP :** 6397 kPa  
                                  **FPFP :** 7879 kPa      **ISIP :** 9793 kPa  
                                  **IFP :** 6741 kPa  
**FHP :** 15724 kPa      **FFP :** 7793 kPa      **FSIP :** 9776 kPa

**PRODUCTION CSG. :** 1590.5 m to 732.03 m - set 66 jts of 139.7 mm OD., 23.1 kg/m, K-55,  
 8rd LT&C, ERW (IPSCO).  
 Cemented with 35.6.0 t 0:1:4 + 0.75% T-10 and 29.0 t 0:1:0 'G' + 0.8 %  
 NFL-3 + 0.1% SPC12000.

**WELLHEAD :****WALKER**

298.5 mm SOW x 346.1mm 20.7 MPa Walker Type "7" casinghead with  
 LPSO's ( S/N ???)  
 346.1 mm 20.7 MPa x 279.4 mm 20.7 MPa Walker Type "EGA" casing head  
 with 2 - 52.4 mm SSO's ( S/N 1060102) & 1 - 50.4 mm 20.7 MPa Walker  
 FO LP gate valves w/T-21 trim (S/N 12423-44)  
 279.4 mm 20.7 MPa x 179.4 mm 20.7 MPa Walker Type "GOF" tubing head  
 with 2 - 52.4 mm LPSO's ( S/N 1174301) & 2 - 50.4 mm 20.7 MPa Walker  
 FO LP gate valves w/T-21 trim (S/N 124233-51, -23)  
 179.4 mm x 73.0 mm EUE Walker Type "GA-1" tubing hanger  
 179.4 mm 20.7 MPa x 73.0 mm EUE Walker GT tubing head adapter  
 (S/N 1223508)  
 1 - 73.0 mm 20.7 MPa EUE Walker FO gate valve w/T-21 trim (S/N 1033227)  
 73.0 mm EUE x 50.4 mm LPSO x 73.0 mm EUE Walker FTS flow tee  
 (S/N 1108238)  
 50.4 mm 20.7 MPa Walker FO LP gate valve w/T-21 trim (S/N 1242321)

**PRODUCING ZONE :** potential KEG RIVER oil or gas? / SULPHUR POINT gas

**PERFORATIONS :** Correlate to Schlumberger CNL - LDT - GR - DAC Main Pass of 1990-03-18 :

potential KEG RIVER      1538.0 - 1539.0 & 1541.5 - 1543mKB  
                                  1521.0 - 1524.0 mKB  
 potential SULPHUR POINT      1404.0 - 1406.0 mKB

**CASED HOLE LOGS :** n/a

**WORKOVERS :** n/a

**PRODUCTION TUBING :**

- none in hole



# PARAMOUNT et al CAMERON

N - 28

60° 10' 117° 30'

1990-11-23

Rev. 0.0

## WELL COMPLETION SCHEMATIC

KBE : 764.10 m

GLE : 780.10 m

Tbg. "h" : ? m

Csg. "H" : 4.36 m

TFE : ? m

CFE : 759.74 m

381.0 mm hole to 244 m.

Set 298.5 mm, 62.5 kg/m,  
H-40, ST&C ERW casing  
@ 203.3 m.

Cemented to surface with  
28 t Class A + 2% CaCl<sub>2</sub>.

Set 219.1 mm, 35.7 kg/m,  
IK-55, ST&C, ERW casing  
@ 834.2.0 m.

Cemented with  
18.0 t 0:1:8 + 0.75% T-10 and  
14.3 t 0:1:0 'G' + 0.8% NFL +  
0.1% SPC12000.

269.8 mm hole to 834 mKB.

Set 139.7 mm, 23.1 kg/m,  
IK-55, LT&C, ERW casing  
@ 1590.5 to 732.0 m.

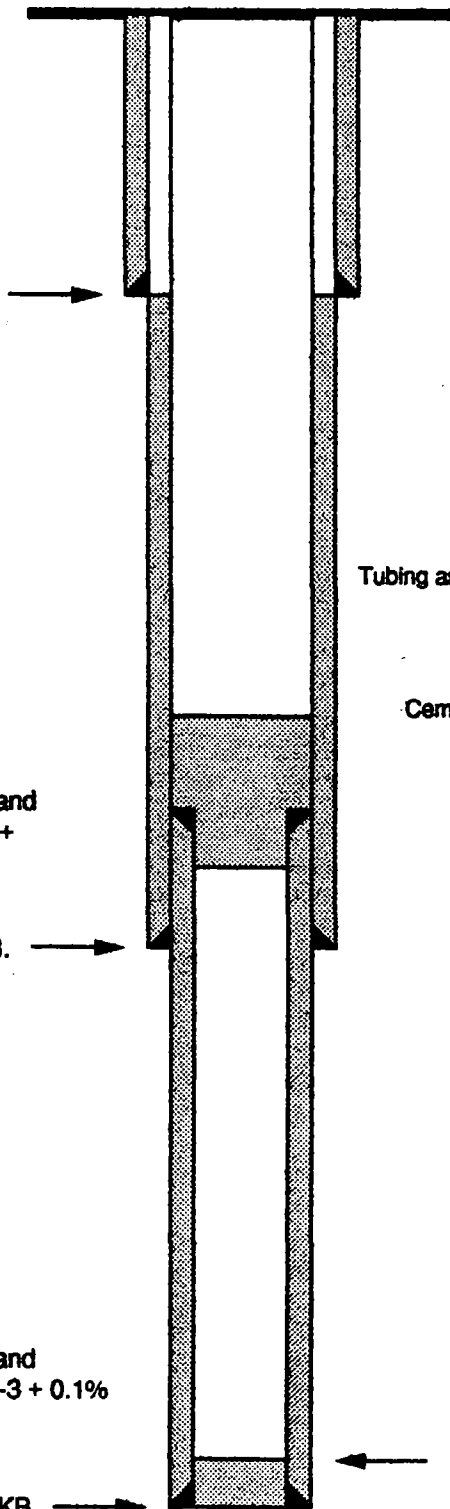
Cemented with  
35.6 t 0:1:4 + 0.75% T-10 and  
29.0 t 0:1:0 'G' + 0.8% NFL-3 + 0.1%  
SPC12000.

200.0 mm hole to 1590 mKB.

Tubing as follows from top:  
- none in well

Cement at 563 m

PBTD 1576 mKB ?



SCAMERON N-28

CNL-LOT-DAC-RR Keg River

1500

1990-03-18

KBE: 764.1 m

Proposed

1525

Proposed

Proposed

1550

CAMERON N-28

CNL-LDT-

Sulphur Pt

1990-03-18

KBE: 764.1 m

1400

Proposed

DST #1

1425