9211-P28-1-6
Cttt

PETRO CANADA INC.

REPORT ON COMPLETION

OF

PCI CANTERRA TWEED A-67

January 29th to March 17, 1986

Prepared by: Chris Baillie

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District Comp. Supr.

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Northern District Manager
86/04/1

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86-03-25

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INTRODUCTION:

PCI Canterra Tweed Lake A-67 was drilled to TD at 1347 mKB on 85/12/23. A completion program was designed to investigate the deliverability and characteristics of the Mount Clark formation.

DISCUSSION:

Roll'n rig #35 was moved from Red Deer to the Tweed Lake location on 86/02/04. Cement was drilled out from 1308 mKB to 1331 mKB. Using 127 mm TCP guns, Schlumberger perforated the Mount Clark from 1290.5 to 1301.0 mKB at 39 JSPM. The well was swabbed in and flowed through a 31.75 mm orifice plate for 2 1/2 hours with a tubing pressure dropping from 2800-1800 kPa.

Dowell/Schlumberger pickled the tubing with 0.5 m^3 of 15% HCl and then performed a 6 m^3 15% HCl 67% methanol gas well acid wash/squeeze at 7.0 MPa. After swabbing and cleaning up, the well flowed at 43 10^3m^3 with 5800 kPa on the tubing. The tubing pressure climbed to 10.8 MPa after 8 hours of build-up.

Dowell/Schlumberger then performed a squeeze by pumping 3 m^3 of methanol, 6 m^3 of 7 1/2% HCl gas well acid, and 24 m^3 of 1 1/2% HF acid, 7 1/2% HCl acid, 10% mutual solvent, at 7.0 MPa. The resulting flow rate was 45 10^3m^3 at a tubing pressure of 3780 kPa. A build-up of 10 hours resulted in a tubing pressure of 11.0 MPa. A Halliburton RBP was set at 1288.5 mKB in order to investigate the upper Mount Clark. Using a 79 mm Computalog casing gun, the Mount Clark was perforated from 1278.5-1284.5 mKB at 13 JSPM.

Dowel/Schlumberger performed a 6 m^3 15% HCl, 67% methanol gas well acid wash/squeeze at 7.0 MPa. After the acid job a flow rate of 32.5 10^3m^3 at 4780 kPa was achieved. A 26 hour build-up resulted in a pressure of 10.9 MPa.

Dowell/Schlumberger then frac'd the upper Mount Clark with 8 tonnes of 20/40 sand in H_2O/Nz foam. A 2 rate test showed 58.6 10^3m^3 at 8.0 MPa and 82.0 10^3m^3 at 6.6 MPa. After 11 hours of build-up the pressure was 10.8 MPa.

The Halliburton bridge plug was removed and an RTTS packer set at 1288.6 mKB in order to frac the lower Mount Clark. 12 tonnes of 20/40 sand was pumped in H_2O/Nz foam. After the frac the well flowed at 120 10^3m^3 at 6.0 MPa and 102 10^3m^3 at 8.0 MPa. A 13 hour build-up gave a pressure of 10.9 MPa.

A further flow period at 6.0 MPa resulted in a rate of 98 10^3m^3. The well was shut in for 12 hours and the pressure increased to 10.8 MPa. Concern for hydrate formation resulted in flowing the well again at 8.0 MPa and 90 10^3m^3 then 6.0 MPa and 106 10^3m^3.

When the testing was concluded an EZ drill bridge plug was set at 1260 MKB and capped with cement to 1250.7 mKB. Roll'n rig #35 was moved back to Red Deer and released on 86/03/20.

CONCLUSION:

PCI Canterra Tweed Lake A-67 is presently a suspended gas well.

WELL DATA SUMMARY

LOCATION: PCI Canterra Tweed Lake A-67

DATE: 86/03/08

KB: 397.10 m GL: 390.90 m KB-CF: 6.35 m

KB-THF: 5.80 m TD: 1347.0 mKB PDB: 1250.7 mKB

~~SURFACE CASING:~~ CONDUCTOR CASING: 5 jts 340 mm, 101.2 kg/m, K-55, ST & C at 61.5 mKB

SURFACE CASING: 62 jts 245 mm, 60 kg/m, MN-80, LT&C at 754.0 mKB

~~PRODUCTION CASING:~~

PRODUCTION CASING: 132 jts, 178 mm, 43 kg/m, L-80 LT & C at 1347.0 mKB

LINER:

~~PRODUCTION~~ PACKERS: 1 Halliburton EZ drill bridge plug at 1260 mKB - capped with 9.3 m of class G cement

NIPPLES:

PERFORATIONS: Mount Clark (lower) 1290.5-1301.0 mKB - 399 23 gm charges

Mount Clark (upper) 1278.5-1284.5 MKB - 158 12 gm charges

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PERFORATING DATA

DATE: 86-02-10

Well Name PCI Canterra Tweed Lake LOCATION A-67

Reason for Perforating Obtain gas production

Formation Perforated Mount Clark

Description of Casing (Perforated Interval) Size 178 mm Weight 43 kg/m Grade L-80

K.B. to Casing Flange 6.35 m K.B. to Top Tubing Spool 5.80

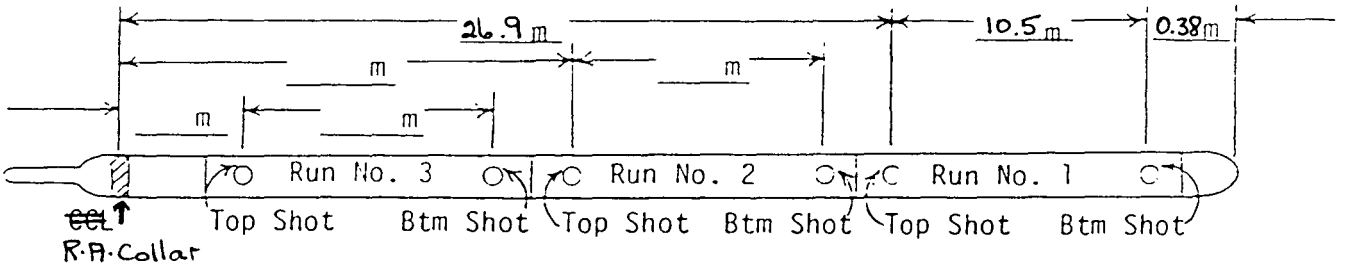
WIRELINE

Type of Gun and Size of Perforations Tubing conveyed - 23 gr

O.D. of Tool 127 mm No. of Runs 1

Fluid Level _____ Type of Fluid 10% KCl B.H. Temp 12°C

Run Number	Perforated Log Depth	Density of Shots (SPM)	Total No. of Shots
1	1290.5-1301.0 mKB	39	399



RECORD OF MEASUREMENTS

What Log was Used for Correlation Schlumberger BHC/sonic Date 85/12/15

Remarks: _____

LOG PRESENTATION:

1. Run pass across perf interval with collar locator showing 7 collars if possible. Also use tension device to show pick up off bottom where applicable.

2. When preparing to shoot, log 3 collars below perf interval. Stop and shoot gun. At that point shift pen recording collars and log 3 collars above the perforated interval. This method will allow for exact point where gun was fired to be determined from log.

   *NOTE: Mark with asterisk (*) collar used for positioning.

Work Supervised by: Jack McQuick

PETRO-CANADA

PERFORATING DATA

DATE: 86-02-10

Well Name PCI Canterra Tweed Lake LOCATION A-67

Reason for Perforating Obtain gas production

Formation Perforated Mount Clark

Description of Casing (Perforated Interval) Size 178 mm Weight 43 kg/m Grade L-80

K.B. to Casing Flange 6.35 m K.B. to Top Tubing Spool 5.80

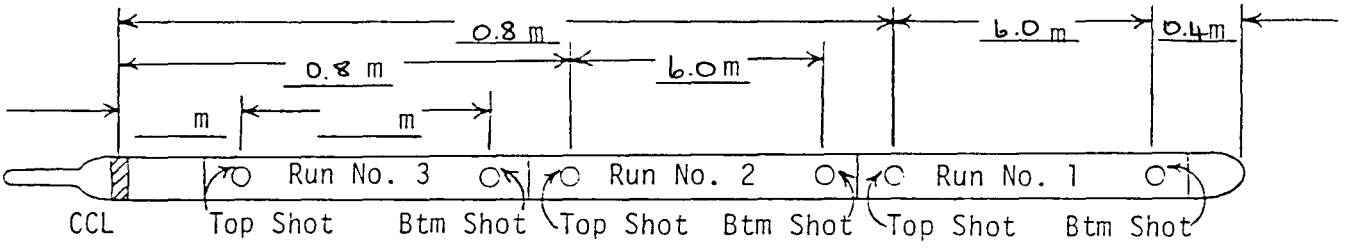
WIRELINE

Type of Gun and Size of Perforations 79 mm casing gun - 12 gm charges

O.D. of Tool 79 mm No. of Runs 2

Fluid Level 325 m Type of Fluid 10% KCl water B.H. Temp 12°C

Run Number	Perforated Log Depth	Density of Shots (SPM)	Total No. of Shots
1	1278.5-1284.5 mKB	13	79
2		13	79



RECORD OF MEASUREMENTS

What Log was Used for Correlation Computalog CBL Date 86/02/06

Remarks: Gun was run to PBTD at 1284.9 mKB and fired.
Four collars were logged above perf interval.

LOG PRESENTATION:

1. Run pass across perf interval with collar locator showing 7 collars if possible. Also use tension device to show pick up off bottom where applicable.

2. When preparing to shoot, log 3 collars below perf interval. Stop and shoot gun. At that point shift pen recording collars and log 3 collars above the perforated interval. This method will allow for exact point where gun was fired to be determined from log.

   *NOTE: Mark with asterisk (*) collar used for positioning.

Work Supervised by: Chris Baillie

PETRO-CANADA

ACID - CHEMICAL - SQUEEZE

WELL NAME	DATE
PCI Canterra Tweed Lake A-67	86-02-11

FORMATION TREATED: Mount Clark INTERVAL: 1290.5-1301.0 mKB PERFS/~~OPEN HOLE~~: 397

SERVICE COMPANY: Dowell Schlumberger PACKER TYPE: Nil AT: _____ K.B.

TUBING SIZE: 73 mm DEPTH: 1304.85 Perf Pup CASING SIZE: 177.8 mm DEPTH: 1347 mKB

TUBING CAPACITY: 3.9 m^3 MAX. ALLOWABLE TREATING PRESSURE: 7000 kPa

CASING CAPACITY - BASE OF TUBING TO PERFS: 0 m^3 ANNULUS CAPACITY: 19.83 m^3

TYPE TREATMENT AND OBJECT: Wash 2m^3 of 15% HCl with 67% Methanol to clean out perfs. Squeeze 4m^3 of 15% HCl 67% Methanol to formation, max. surface press = 7 MPa

MATERIALS: MIXED: Inhibitor (0.4% A166-4 L/m^3 + 0.5 kg/m^3 of A179) (Quantity, Concentrations, Etc.) 4 m^3 of acid overflush

BACKWASHED: 2 m^3 of acid (Quantity) TO FORMATION: with 0.1 m^3 10% KCl water (Quantity)

PROGRAM

Pump 0.5 m^3 of 15% HCl acid at 0.04 m^3/min to bottom of tubing and reverse circ. out for cleaning tubing. Stage wash 2 m^3 15% HCl 67% Methanol five min between stages. Squeeze 4 m^3 15% HCl 67% Methanol, maximum surface press 7 MPa

TIME RECORD

TIME	PRESSURES MPa		m^3 PUMPED	PUMP RATE m^3 / MIN	REMARKS
	CASING	TUBING			
6:05					Hold safety meeting
6:10			.3	.15	Break circulation
6:12					Press. test lines to 21 MPa (tbg line)
6:14					Press. test csg. line 10 MPa
6:21	2	2	.5	.05	Start tubing cleaning acid
6:31	2	2		.05	End of tubing cleaning acid
6:32	2	2	3.4	.05	Start displacement
7:40				.05	End displacement
7:41			3.9	.17	Start backwash
8:00					End backwash (Rezero)
8:07				.33	Start 7 1/2% HCl gas well acid
8:22	2	2	4.3	.29	Stop first wash over perfs
8:36	2	2	.4	.1	Second wash
8:45	4	4	.4	.1	Third wash
8:57	5	5	.4	.1	Fourth wash

SUPERVISOR: Jack M. Quick

ACID-CHEMICAL-FRACTURE-SQUEEZE

SHEET 2

WELL NAME: PCI Canterra Tweed Lake A-67	DATE: 86-02-11

TIME	PRESSURES		m^3 Pumped	Pump Rate m^3/m	Sand kg/m^3	REMARKS
	CSG	TBG				
9:07	5.5	5.5	.4	.1		Fifth wash
9:22	6.5	6.5				Squeeze acid
9:25	7	7				Squeeze acid 7 MPa bleeding down
			0.18			to 6 MPa in 3 min intervals
						for 5 min stages
9:37						Start 10% KCl water behind
9:40						Shut in tbg and csg and circulate
						manifold to prevent freezing
9:45	7	7	.023			Squeeze acid to formation
9:50	6.5	6.5	.023			" " "
9:55	7	7	.023			" " "
9:59	7	7	.023			" " "
10:05	7	7	.023			" " "
10:07	7	7	.023			" " "
10:10	7	7	.023			End Hesitation Squeeze
10:17	6.5	6.5		.03		Pump steadily
10:35	6.5	6.5		.03		Stop pump
10:36	1	1	.472			Bleed off fast to truck
10:37	7	7				Repressure
10:40						Repeat bleeding off and press. up
10:41	7	7		.073		Squeeze at steady rate
11:32	7	7	3.21			Acid in formation
11:35	7	7	.1	.1		Overdisplace acid 0.1 m^3
11:39	1.5	1.7	6.5	.33		Backwash wash acid
12:00						Rig out acid pumper

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ACID - CHEMICAL - SQUEEZE

WELL NAME	DATE
PCI Canterra Tweed Lake A-67	86/02/14

FORMATION TREATED: Mount Clark | INTERVAL: 1290.5-1301.0 mKB | PERFS/~~OPEN HOLE~~: perfs 399

SERVICE COMPANY: Dowell/Schlumberger | PACKER TYPE: None | AT: _____ K.B.

TUBING SIZE: 73 mm 9.67 kg/m | DEPTH: 1297 mKB | CASING SIZE: 178 mm 43 kg/m | DEPTH: 1347 mKB

TUBING CAPACITY: 3.89 m^3 | MAX. ALLOWABLE TREATING PRESSURE: 7,000 kPa

CASING CAPACITY - BASE OF TUBING TO PERFS: 0.08 m^3 | ANNULUS CAPACITY: 19.71 m^3

TYPE TREATMENT AND OBJECT: 24 m^3 7 1/2% HF with 1 1/2% HCl acid job spear headed with 6 m^3 of 7 1/2% HCl and 3 m^3 of Methanol. To obtain gas production

MATERIALS: MIXED: In the 7% HCl: A-166 at 24 l. A-179 at 3 kg (in 6 m^3 of HCl) (Quantity, Concentrations, Etc.)

In 24 m^3 of 7 1/2% HF: 2400 l U-66, 120 l F-78, 3.6 kg Fe Stabilizer 48 l A-200

BACKWASHED: _____ (Quantity) | TO FORMATION: _____ (Quantity)

PROGRAM

Pump 3.0 m^3 of Methanol into formation at 0.3 m^3/min at 9 MPa. Follow with 6 m^3 7 1/2 HCl maximum rate at limiting surface press 7 MPa. Follow with 24 m^3 of 1 1/2% HF 7 1/2% HCl acid maximum rate at limiting surface press 7 MPa

TIME RECORD

TIME	PRESSURES MPa		m^3 PUMPED	PUMP RATE m^3 / MIN	REMARKS
	CASING	TUBING			
					Hold Safety Meeting
01:00	10	21			Press test lines Tbg 21 MPa, Csg 10 MPa
01:10	1.5	1.5	3.0	.4	Spot Methanol
01:40	1.8	1.8			End of Methanol
01:48	1.8	1.8	.9	.4	Start 7 1/2% HCl
01:53	9.0	9.0	3.0	.3	Shut in casing, inject Methanol
02:17	9.0	9.0			Methanol in formation
02:18	6.0	6.0	2.1	.05	Start squeeze 7 1/2% HCl
02:50	6.0	6.0	3.9	.065	Start pumping HF
03:40	5.0	5.0	.65	.065	7 1/2% HCl acid in formation, Squeezing HF
04:00	4.0	4.0	1.0	.1	Increase rate
04:10	5.0	5.0	3.6	.21	Increase rate
04:30	6.0	6.0	15.9	.21	HF in formation, start displacement
05:32	6.0	6.0	5.9	.3	Displacement complete
05:47	6.0	6.0			Instant shut down pressure 6 MPa
06:03	3.0	3.0			After 15 min shut in 3 MPa

SUPERVISOR: Jack M. Quick

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ACID - CHEMICAL - SQUEEZE

WELL NAME	DATE
PCI Canterra Tweed Lake A-67	86/02/21

FORMATION TREATED Mount Clark INTERVAL 1278.5-1284.5 mKB PERFS/OPEN HOLE perfs

SERVICE COMPANY Dowell/Schlumberger PACKER TYPE RTTS AT Not set K.B.

TUBING SIZE 73 mm DEPTH. 1284.8 CASING SIZE 177.8mm 43 kg/m DEPTH. 1347 mKB

TUBING CAPACITY 3.85 m^3 MAX. ALLOWABLE TREATING PRESSURE 7 MPa

CASING CAPACITY - BASE OF TUBING TO PERFS Nil m^3 ANNULUS CAPACITY 19.52 m^3

TYPE TREATMENT AND OBJECT Acid wash and squeeze. Wash 2 m^3 15% HCl 67% Methanol in .15 m^3 wash five min between washes. Squeeze 4 m^3 15% HCl 67% Methanol.

MATERIALS: MIXED 7 MPa max squeeze pressure. 4 m^3 acid overflush
(Quantity, Concentrations, Etc.)

BACKWASHED 2 m^3 of wash acid (Quantity) TO FORMATION .1 m^3 10% KCl water. (Quantity)

PROGRAM

Stage wash 2 m^3 15% HCl 67% Methanol five min between stages

Squeeze 4 m^3 15% HCl 67% Methanol maximum surface press 7 MPa.

TIME RECORD

TIME	PRESSURES		m^3 PUMPED	PUMP RATE m^3 / MIN	REMARKS
	CASING	TUBING			
6:05	MPa	MPa			Safety Meeting
6:07					Press test surf lines to 18 MPa
6:12		1.0	4.00	0.50	Fill hole with 10% KCl water
6:20			3.90	0.40	Circulate acid down to perfs
6:33	2.0	2.0	0.15	0.15	Wash #1
6:40	2.0	2.0	0.15	0.15	Wash #2
6:45	2.0	2.0	0.15	0.15	Wash #3
6:50	2.0	2.0	0.15	0.15	Wash #4
6:57	2.0	2.0	0.15	0.15	Wash #5
7:03	2.1	2.1	0.15	0.15	Wash #6
7:08	2.5	2.5	0.15	0.15	Wash #7
7:15	5.0	5.0	0.15	0.15	Wash #8
7:21	3.5	3.5	0.15	0.15	Wash #9
7:28	3.5	3.5	0.15	0.15	Wash #10
7:34	3.5	3.5	0.15	0.15	Wash #11

SUPERVISOR

ACID-CHEMICAL-FRACTURE-SQUEEZE

SHEET 2

WELL NAME: PCI Canterra Tweed Lake A-67	DATE: 86-02-21

TIME	PRESSURES		m^3 Pumped	Pump Rate m^3/m	Sand kg/m^3	REMARKS
	CSG	TBG				
	MPa	MPa				
7:40	3.53	3.5	0.15	0.15.		Wash #12
7:46	3.5	3.5	0.15	0.15		Wash #13
7:57	6	6	0.15			Shut in to squeeze
8:07	6	6				Bleed back to truck,press up 4 times
8:17	6	6				Shut in and squeeze
8:44	4.7	4.7	0.9			Start water behind acid 3.9 m^3
8:52						Circulate Manifold
8:58	5	5				Squeeze acid
9:11	4.5	4.5				Slight bleed off
9:12	6	6				Squeeze
9:27	5	5				1 MPa bleed off 15 min
9:28						Circ manifold
9:37	4.5	4.5				Press inject squeeze acid
9:39	6	6				Bleed back to truck,press up 4 times
9:40	6	6				Squeeze acid
9:59	5	5				1 MPa bleed off
10:00	6	6				Squeeze
10:10	6	6				Bleed back and press up
10:34	5	5				1 MPa bleed off
10:37	6	6				Squeeze
10:46	6	6				Bleed back to truck,press up 4 times
10:57						Circ manifold
11:02	6	6				Bleed back to truck,press up 4 times
11:13	6	6				Squeeze
11:42	5	5				1 MPa bleed off
11:44	6	6				Squeeze
12:01	5.5	5.5				Slight bleed off
12:02	6	6				Squeeze 0.9 m^3 acid in formation
12:38	5	5				Bleed back to truck,press up twice
1:03	7	7				Press up squeeze
1:27	6.5	6.5				Bleed back to truck,press up twice
1:55						Circ manifold

ACID-CHEMICAL-FRACTURE-SQUEEZE

SHEET 2

WELL NAME:	PCI Canterra Tweed Lake A-67	DATE:	86-02-21

TIME	PRESSURES		m^3 Pumped	Pump Rate m^3/m	Sand kg/m^3	REMARKS
	CSG	TBG				
	MPa	MPa				
2:00	6.5	6.5	3.2	.09		Squeeze rate increases
2:33	5.5	5.5		.09		Squeeze acid to formation
2:33	5.5	5.5				Instant shut down press
2:43	2	2				After 10 min shut in press 2 MPa
2:44	1	1				Backwash 'wash' acid
3:06	1	1		.3		Wash acid at surface
3:15	1	1		.2		Acid to pit
3:20	1	1				Stop pump. Job complete.
						Rig out Dowell

PETRO-CANADA

WELL FRACTURING REPORT

DATE: 86-02-02

WELL NAME AND LOCATION: PCI Canterra Tweed Lake A-67

NAME OF FORMATION: Mount Clark (Lower) | PERFORATIONS: 1290.5-1301.0 mKB

STATUS: Exploratory gas well

RIGGED UP (Company) Dowell/Schlumberger

RIGGED UP (Special Equipment)

SET RELIEF VALVE AT 18.0 MPa PSI TEST ANNULUS OF 178 mm by 73 mm

PSI TO — MPa HELD OK — KEPT — MPa ON ANNULUS DURING FRAC

FRAC MATERIALS	SIZE/MESH	AMOUNT TONNES
Sand	20/40	12.0

DISPLACED ___ m^3 ___ PERCENT ___ ACID WITH N_2 or CO_2 VOL RATIO ___ m^3/m^3.

THROUGH ___ mm TUBING MAXIMUM PSI ___ MPa.

FRACTURED FORMATION WITH ☑ WATER ☐ OIL ☑ N_2 ☐ CO_2 VOLUME RATIO 407-656 m^3/m^3.

BATCH	AMOUNT TONNES	MATERIAL	SIZE/MESH	AVE CONC kg/m^3	AVE RATE m^3/m	AVE. PRESSURE
1	12.0	Sand	20/40	340-1370	0.6	25 MPa
2			*	120-480	2.5	
3						

* Note: Batch 1 concentrations at blender, batch 2 at wellhead with/NZ

ADDITIONAL COMMENTS: Mixed 1.2 kg/m^3 of J266 gelling agent in 32 m^3 of 3% KCl water and 30% Methanol. Add 8 l/m^3 of F52.1 foaming agent on the fly. Frac'd well as per attached schedule

FRAC THROUGH TBG. ☑ TBG/CSG ☐ CSG ☐

FLUID IN TBG. ☐ TBG/CSG ☐ CSG ☐ — m^3

FRAC FLUID

	TYPE	BATTERY	COMPANY	
FLUID TRUCKED IN	Water	Slough		22.4 m^3
FLUID TRUCKED IN	Methanol			9.6 m^3
FLUID TRUCKED IN				m^3

TOTAL FRAC FLUID PRIOR TO FRAC 32.0 m^3

TOTAL FRAC FLUID AFTER FRAC m^3

TOTAL FRAC FLUID TO RECOVER 32.0 m^3

PETRO-CANADA'S REPRESENTATIVE Chris Baillie

HIS/HER COMPANY AFFILIATION Comp Sup

ACID-CHEMICAL-FRACTURE-SQUEEZE

SHEET 2

WELL NAME: PCI Canterra Tweed Lake A-67	DATE: 86-03-02

TIME	PRESSURES		m^3 Pumped	Pump Rate m^3/m	Sand kg/m^3	REMARKS
	CSG	TBG				
	MPa	MPa				
15:50	-	-	-	-	-	Safety Meeting
16:08	0	50.0				Press test surface lines
16:18	0	15.0	0.95	0.6		Fill hole
16:21	0	23.0	12.50	0.6		Start pad
16:41	0	23.5	1.80	0.8	340	Start sand at 340 kg/m^3
16:43	0	23.5	1.80	0.8	685	Increase sand to 685 kg/m^3
16:46	1	23.5	2.80	0.8	1000	" " 1000 "
16:49	1	25.0	5.40	0.8	1375	" " 1370 "
16:55	2	27.0	1.20	0.8		Start flush
16:56	3	29.0				Stop pumps
16:56	3	20.0				ISIP
17:01	3	12.5				5 min SI
	* Above concentrations and volumes at blender (i.e. not including N_2)					
	N_2					
15:50	0					Safety meeting
16:08	0	50.0				Pressure test surface lines
16:18	0	15.0	3.9	2.5		Fill hole
16:21	0	23.0	49.9	2.5		Start pad
16:41	0	23.0	5.0	2.5	120	Start sand at 120 kg/m^3
16:43	0	23.5	5.0	2.5	240	Increase sand to 240 "
16:46	1	23.5	8.0	2.5	360	" " 360 "
16:49	1	25.0	15.3	2.5	480	" " 480 "
16:55	2	27.0	3.4	2.5		Start flush
16:56	3	29.0				Stop pumps
16:56	3	20.0				ISIP
17:01	3	12.5				5 min SI
	* Above concentrations and volumes include N_2					

ACID-CHEMICAL-FRACTURE-SQUEEZE

SHEET 2

WELL NAME: PCI Canterra Tweed Lake A-67	DATE: 86-02-26

TIME	PRESSURES		m^3 Pumped	Pump Rate m^3/m	Sand kg/m^3	REMARKS
	CSG	TBG				
	MPa	MPa				
15:00	-	-	-	-	-	Safety Meeting
15:11	0	50.0				Press test surface lines
15:34	5.0	11.0	1.0	0.6		Fill hole
15:36	14.0	23.0	5.7	0.6		Start pad
15:45	14.0	24.0	1.4	0.8	360	Start sand at 360 kg/m^3
15:48	14.0	26.0	1.4	0.8	685	Increase to 685 kg/m^3
15:49	14.0	26.0	1.4	0.8	1030	" " 1030 "
15:51	14.0	27.0	3.7	0.8	1370	" " 1370 "
15:53	14.0	27.0	1.2	0.8		Start flush
15:55	14.0	27.0				Stop pumps
15:55	14.0	16.0				ISIP
15:58	14.0	14.0				3 min shut in
	* Above concentrations and volumes at blender (i.e. not					
	including N_2)					
15:00						Safety meeting
15:11		50.0				Pressure test lines
15:34	5.0	11.0	3.0	2.5		Fill hole
15:36	14.0	23.0	22.7	2.5		Start pad
15:45	14.0	24.0	4.0	2.5	120	Start sand at 120 kg/m^3
15:48	14.0	26.0	4.0	2.5	240	Increase to 240 kg/m^3
15:49	14.0	26.0	4.0	2.5	360	" " 360 "
15:51	14.0	27.0	10.7	2.5	480	" " 480 "
15:53	14.0	27.0	3.4	2.5		Start flush
15:55	14.0	27.0				Stop pumps
15:55	14.0	16.0				ISIP
15:58	14.0	14.0				3 min shut in
	* Above concentrations and volumes are including N_2					
	(i.e. at wellhead)					

PETRO-CANADA

WELL FRACTURING REPORT

DATE: 86-02-26

WELL NAME AND LOCATION: PCI Canterra Tweed Lake A-67

NAME OF FORMATION: Mount Clark (Upper) | PERFORATIONS: 1278.5 to 1284.5 mKB

STATUS: Exploratory gas well

RIGGED UP (Company) Dowell/Schlumberger

RIGGED UP (Special Equipment)

SET RELIEF VALVE AT 18 MPa PSI TEST ANNULUS OF 178 mm by 73 mm

PSI TO ___ MPa HELD OK -✓ KEPT 14 MPa ON ANNULUS DURING FRAC

FRAC MATERIALS	SIZE/MESH	AMOUNT TONNES
Sand	20/40	8.0

DISPLACED ___ m^3 ___ PERCENT ___ ACID WITH N_2 or CO_2 VOL RATIO ___ m^3/m^3.

THROUGH ___ mm TUBING MAXIMUM PSI ___ MPa.

FRACTURED FORMATION WITH ☑ WATER ☐ OIL ☑ N_2 ☐ CO_2 VOLUME RATIO 407-656 m^3/m^3.

BATCH	AMOUNT TONNES	MATERIAL	SIZE/MESH	AVE CONC kg/m^3	AVE RATE m^3/m	AVE. PRESSURE
1	8.0	Sand	20/40	360-1370	0.6	26 MPa
2				120-480	2.5	
3						

* Note: Batch 1 concentrations at the blender, batch 2 at the formation

ADDITIONAL COMMENTS: Mixed 1.2 kg/m^3 of J266 gelled agent in 23.7 m^3 of 3% KCl water (and 30% Methanol). Added 8 l/m^3 of F52.1 foaming agent on the fly. Frac'd well as per attached schedule

FRAC THROUGH TBG. ☑ TBG/CSG ☐ CSG ☐

FLUID IN TBG. ☐ TBG/CSG ☐ CSG ☐ — m^3

FRAC FLUID

	TYPE	BATTERY	COMPANY	
FLUID TRUCKED IN	Water	Slough		16.6 m^3
FLUID TRUCKED IN	Methanol			7.1 m^3
FLUID TRUCKED IN				m^3

TOTAL FRAC FLUID PRIOR TO FRAC 23.7 m^3

TOTAL FRAC FLUID AFTER FRAC 8.0 m^3

TOTAL FRAC FLUID TO RECOVER 15.7 m^3

PETRO-CANADA'S REPRESENTATIVE Chris Baillie

HIS/HER COMPANY AFFILIATION Comp Sup

PETRO-CANADA

CASING AND TUBING TALLY SHEET

WELL NAME	LOCATION	DATE (YR-MO-DAY)
PCI Canterra Tweed Lake	A-67	85/02/18
TYPE OF STRING: 9.67 kg/m, J-55, EUE tubing	SIZE: 73.0 mm	

NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	TOTAL / m
1	9.10	11	9.16	21	9.11	31	8.78	41	9.11	51	9.12	1 92.32
2	9.20	12	9.10	22	9.43	32	9.08	42	9.11	52	9.10	2 92.52
3	9.50	13	9.17	23	9.15	33	9.10	43	9.11	53	9.12	3 92.11
4	9.07	14	9.74	24	9.11	34	9.15	44	9.42	54	9.10	4 91.62
5	9.15	15	9.13	25	9.42	35	9.16	45	9.12	55	9.18	5 92.37
6	9.10	16	9.16	26	9.10	36	9.12	46	9.12	56	9.05	6 91.74
7	9.13	17	9.84	27	9.11	37	9.11	47	9.20	57	9.10	
8	9.11	18	9.10	28	9.46	38	9.80	48	9.10	58	9.11	
9	9.76	19	9.06	29	9.11	39	9.15	49	9.42	59	9.75	
10	9.20	20	9.06	30	9.11	40	9.17	50	9.66	60	9.11	
TOTAL	92.32		92.52		92.11		91.62		92.37		91.74	552.68

NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	TOTAL / m
61	9.14	71	9.45	81	9.16	91	9.11	101	9.10	111	9.10	1 91.52
62	9.11	72	9.10	82	9.10	92	9.11	102	9.11	112	9.14	2 91.80
63	9.10	73	9.14	83	9.70	93	9.38	103	9.10	113	9.15	3 93.30
64	9.18	74	9.06	84	9.70	94	9.15	104	9.16	114	9.46	4 91.86
65	9.12	75	9.15	85	9.60	95	9.12	105	9.37	115	8.95	5 92.62
66	9.15	76	9.15	86	9.10	96	9.45	106	9.15	116	9.10	6 91.35
67	8.80	77	9.10	87	9.11	97	9.16	107	9.15	117	9.10	
68	9.16	78	9.10	88	9.57	98	9.14	108	9.21	118	9.10	
69	9.62	79	9.10	89	9.14	99	9.11	109	9.45	119	9.15	
70	9.14	80	9.45	90	9.12	100	9.13	110	9.82	120	9.10	
TOTAL	91.52		91.80		93.30		91.86		92.62		91.35	552.45

NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	TOTAL / m
121	9.15	131	9.10	141	9.14	151		161		171		1
122	9.11	132	9.12	142	9.20	152		162		172		2
123	9.12	133	9.11	143	9.18	153		163		173		3
124	9.40	134	9.16	144	9.11	154		164		174		4
125	9.14	135	9.11	145	9.22	155		165		175		5
126	9.11	136	9.34	146	9.10	156		166		176		6
127	9.14	137	9.15	147		157		167		177		
128	9.14	138	9.10	148		158		168		178		
129	9.12	139	9.11	149		159		169		179		
130	9.10	140	9.10	150		160		170		180		
TOTAL	91.53		91.40									

NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	NO.	LENGTH / m	TOTAL / m
181		191		201		211		221		231		1
182		192		202		212		222		232		2
183		193		203		213		223		233		3
184		194		204		214		224		234		4
185		195		205		215		225		235		5
186		196		206		216		226		236		6
187		197		207		217		227		237		
188		198		208		218		228		238		
189		199		209		219		229		239		
190		200		210		220		230		240		
TOTAL												

REMARKS:

226 jts delivered to location.
146 jts used + 80 jts new transferred to PCI stockyard in Norman Wells

SIGNATURE OF COMPANY REPRESENTATIVE

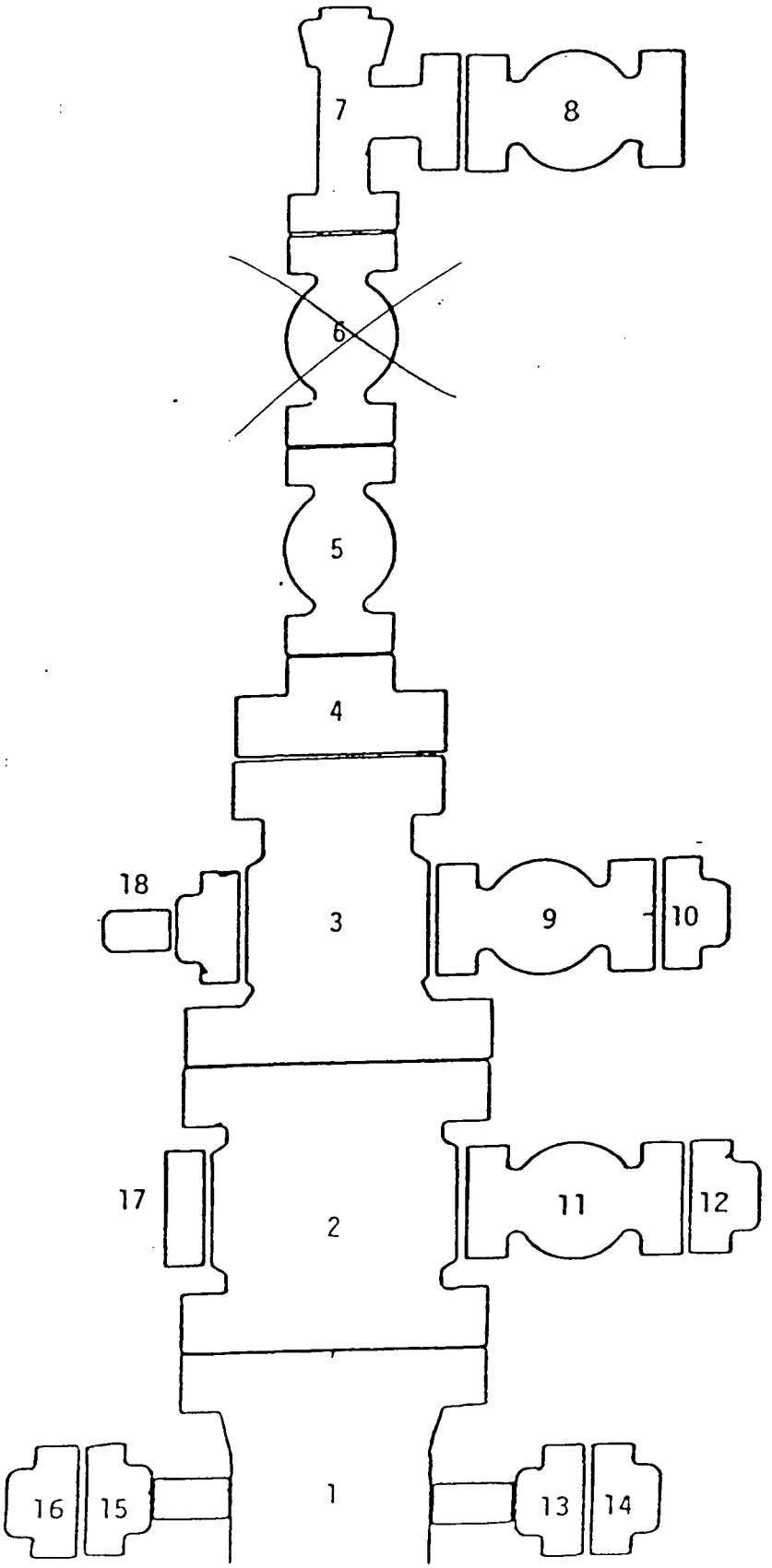
Chris Baillie

All joints delivered to lease must be tallied.
Circle joints not run and left on rack.

PUMPING WELLHEAD DETAIL

LOCATION: PCI Canterra Tweed Lake A-67

DATE: 86-03-08



1. 245 mm x 279.4 mm 21 MPa McEvoy casing bowl. W.O. GR-5788698
3. 279.4 mm x 179.4 mm x 21 MPa Cameron tubing spool. 15055-20-10-10
4. 179.4 mm x 65.1 mm 21 MPa Cameron bonnet
5. 65.1 mm x 63.5 mm bore - 21 MPa Cameron gate valve. S/N - 101390
7. 65.1 mm x 52.4 mm x 73 mm EUE 21 MPa Cameron flowtee
8. 52.4 mm x 50.8 mm bore - 21 MPa Cameron gate valve. S/N FB-150840
9. 52.4 mm x 50.8 mm bore - 21MPa Cameron gate valve S/N 121620
10. 52.4 mm x 50.8 mm LP - 21 MPa Cameron companion flance
13. Std surface vent assembly
15.. 52.4 mm x 21 MPa blind flange
18. 52.4 mm x 50.8 mm LP 21MPa Cameron companion flange

Note: All outlets are bull plugged and valves chained

73 mm Cameron dognut w/BPV threads left in tubing spool

Master & wing valves are washed and

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-01-29 / 86-02-04 - - $218,960

Moved camp from Norman Wells to lease and rig up. Move Roll'n rig #35 from Red Deer to lease and spotted.

86-02-05 - - $259,015

Install derrick on rig and rig up rig. Clean out cellar, install tubing hanger spool. Energize seals and test to 10 MPa, held ok. Install surf casing vent. Install prefabs and BOP's. Repair controls on draw works. Ran in bit and scraper on drifted and measured 73mm tbg, tag PBTD at 1308 mKB. Circulate mud out of well with water.

86-02-06 - - $305,301

Install packoff. Pick up power swivel. Drill out cement from 1308m KB to 1331m KB. Circulate hole clean with fresh water, clean out rig tank and mix up 10% KCl solution. Rig out packoff and power swivel. Circulate hole over to 10% KCl water. Pulled out of hole with 73mm tbg and layed down bit and scraper. Computalog ran CBL VDL GR CCL from 1329m up to 1190 mKB. Ran pressure pass with 7 MPa. Cement top at 683m KB. Schlumberger making up 127mm guns with 39 SPM.

86-02-07 - - $346,858

Schlumberger loading 127mm guns, 10.5m with 39 SPM. Pick up 12.2m of 127mm guns. Pick up sub backed out of guns while screwing guns together. Last 12.2m of 127mm guns down hole. Make up Schlumberger sub to fish guns and ran in well on 73mm tbg. Screw into fish. Swab tbg down to 1000m and rig up to pull tbg. Pulled 94 jts of 73mm tbg - 95th jt was wet. Swabbed tbg down remaining 440m and pulled out of hole with fish. Layed down 127mm guns. Made up and ran Schlumberger tbg conveyed perforating assembly on 73mm tbg. Spaced out tbg, landed dognut and rigged in computalog. Ran positioning log and space out. Run after positioning log correlated to Schlumberger BHC Sonic dated 85.12.15, 127mm guns set to shoot. Mount Clark formation from 1290.5m to 1301.0m KB with 39 SPM, 22 gram charges at 120° phasing. Rig out computalog. Remove BOP's and install wellhead.

86-02-08 - - $359,341

Rig to swab. Swab tbg and annulus down to 800m KB. Rig out swab equipt. Schlumberger drop bar to fire 127mm guns at 39 SPM to perforate Mount Clark formation from 1290.5m to 1301.0m KB. Small initial puff of air. Install gauge in Wellhead 0 pressure after 50 min. Remove gauge well dead. Rigged up to swab. Swab well down from 800m to 1025m in 13 swabs and recovered 4.1m^3 of 10% KCl water. No gas to surface. Shut well in rig outswab equipt. Fill hole. Pressure on annulus to 7 MPa no feed rate to formation. Mix up 8m^3 of 10% KCl water. Circ hole, no gas recovery. Remove wellhead, install BOP's, rig up floor. Hoist 73mm tbg to recover guns.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-09 - - $383,322

Finish pulling out of hole. Lay down Schlumberger 127mm guns. Guns did not fire. Schlumberger rebuilding firing head for guns. Make up and ran Schlumberger's 127mm guns and perforating assembly on 73mm tbg. Ran 138 jts. At Schlumberger's request, tbg was pulled in order to re-load primer cord in firing head. Reran 127mm guns on 138 jts of 73mm tbg, spaced out with same pups and landed dognut leaving RA collar at correlated depth. Remove BOP's, installed wellhead and rigged up to swab. Pull 13 swabs, swab well down to 1000m. Schlumberger drop bar to fire 127mm guns with 39 shots per meter. Perforate Mount Clark formation from 1290.5m to 1301m KB. At 07:00 hours, pressure at 1550 kPa.

86-02-10 - - $412,524

Well shut in. Tbg press came up to 3000 kPa, annulus up to 2900 kPa. Pump 0.6m of methanol in annulus. Open tbg to tank through 2mm choke tbg press came down to 1200 kPa in 5 min. Annulus press 2900 kPa. Open choke to 19mm choke, tbg went dead. Annulus stayed at 2900 kPa. Rig to swab. Pull 6 swabs, recovered 5.83m^3 10% KCl water. Well started flowing. Shut well in. Rig out swab equipt. Tbg press rose from 2400 kPa to 3300 kPa and casing press from 1700 kPa to 3500 kPa in 4 hours. Installed a 3.175mm orifice plate and flowed the well through a critical flow prover. Pumped methanol down annulus at 15 l/hr. Flowing temperature at flow prover was constant at -5°C.

Flow test results:

Time	Tbg press	Csg press
16:00	2800kPa	3500kPa
16:30	2700	3200
17:00	2400	3000
17:30	2200	2800
18:00	2000	2625
18:30	1800	2575

Shut in at 18:30

Rigged out flow equipt and mixed 3 sacks of KCl to bring solution up to 10%. Killed well by circulating 24m^3 of 10% KCl. Removed wellhead, installed BOP's and rigged up to pull 73mm tbg. Mixed 34 sacks of KCl in 8m^3 of fresh water for a 10% solution. Hoist 73mm tbg, lay down Schlumberger 127mm guns, 397 shots fired and 2 shots missfired. Run in 73mm EUE tbg with Baker R nipple with 57.15mm profile, on bottom then 0.61m 73mm pup, one jt 73mm tbg, one 1.23m perforated pup, 73mm tbg to surface. Land perforated pup at 1304.85m KB. Rig in Dowell acid pumper, Held safety meeting. Press test lines to 21MPa. Acidize tbg with 0.5m^3 HCl. Pump acid down tbg at .04^3/min to 1302m.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-11 - - $435,793

Reverse circulate out 0.5m^3 of HCl acid from tubing. Start acid wash and squeeze with 6m^3 15% HCl with 67% methanol. Pump 4.3m^3 acid down tbg, acid across perfs, stop pump. Stage 4 more washes of .4m^3 acid. Wait 10 min between washes. Increase back press on each wash from 2 MPa to 6.5 MPa. On last wash 6.5 MPa after 10 min went down to 6.2 MPa. Squeeze 4m^3 of 15% HCl with 67% methanol. First .3m^3 squeezed went in intervals by building pressure up to 7 MPa. Stop pump for 3 to 5 min for press to come down to 6 MPa. Release press back to pumper down to 0 MPa from 7 MPa, repeat 3 times. Squeezed the remainder of acid 3.4m^3 to formation at .073m^3/min at 7 MPa. The last 0.3m^3 of acid + 0.1m^3 of overflush squeezed away at 0.1m^3/min at 6 MPa. Reverse circulate wash acid to pit. Hoist 2 jts of 73mm tbg, leaving perforated pup at 1285.9m KB and tail pipe at 1297.2m KB. Removed BOP's, installed 70 MPa frac head and top section of wellhead. Rigged up to swab. Pulled 18 swabs and recovered 21m^3 of gasified KCl water containing spent acid. Casing press increased from 0 to 1240 kPa in the last 6 swabs. Well started flowing and was shut in to install choke. Well shut in, install choke, allowed tbg press to increase to 2800kPa. Flow well to pit through choke. Take readings.

Time	Tbg Press (kPa)	Csg Press (kPa)	Choke Setting (mm)
1:00	2800	2800	3.175
1:30	2925	3000	3.175
2:00	3200	3400	3.175
2:30	3800	4200	4.762
3:00	3900	4900	4.762
	Well started to kick small amount of fluid		
3:30	2450	5300	5.556
4:00	2200	5600	5.556
4:30	2650	6050	4.762
5:00	2000	6700	4.762
	Shut tbg in press build up to 2425 kPa at 06:15 hours		
	Flow well to pit through choke		
6:30	2575	7600	3.175
7:00	2150	8000	2.381

86-02-12 - - $456,965

Flow well through choke to pit.

Time	Tbg Press (KPa)	Csg Press (KPa)	Choke Setting (mm)
7:30	2100	8200	2.381
8:00	1700	8425	5.959
8:30	3500	8100	7.937
9:00	5900	6700	7.937
9:30	5600	6600	6.746
10:00	6000	6900	6.746
10:30	6200	7000	6.746
11:00	6400	7100	6.746
11:30	6600	7200	6.746

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-12 - - $456,965

Start slugging water and acid at 08:00 hrs. to 09:00 hrs. From 09:00 to 11:30 light spray of water and acid. Hooking up to separator. Flowed well through separator.

Time (hrs)	Tbg Press (kPa)	Csg Press (kPa)	Choke (mm)	Rate (10^3m^3)	Temp (Deg C)	Fluid (m^3)
13:00	5680	5880	6.35	27.2	3	0.16
14:00	4720	5600	6.35	23.9	3	-
15:00	3870	5270	7.14	29.6	0	0.12
16:00	3370	4120	7.94	33.8	1	0.04
17:00	3150	3850	7.94	34.7	2	-
18:00	3170	3770	8.33	37.5	2	0.08
19:00	3080	3630	8.73	40.3	2	-
21:00	3230	3680	8.73	42.8	2	-
22:00	3700	4070	7.94	40.85	2	-
23:00	3900	4260	7.94	42.82	2	-
24:00	4180	4590	7.54	42.82	2	.02
01:00	4550	4950	7.14	42.26	2	-
02:00	4670	5080	7.14	43.11	2	-
03:00	4710	5130	7.14	43.95	2	-
04:00	5080	5470	6.75	42.26	2	-
05:00	5180	5570	6.75	43.11	2	-
06:00	5210	5610	6.75	43.39	2	-
07:00	5600	5950	6.35	40.85	2	Total water and acid $0.42m^3$

Total production 19 hrs. 30.67 10^3m^3

86-02-13 - - $470,958

Flow well through separator.

07:30	5640	6060	6.35	-	-	-
08:00	5680	6100	6.35	41.98	2	-
09:00	5700	6120	6.35	42.82	2	-
10:00	5710	6120	6.35	42.82	2	.02
11:00	5740	6150	6.35	43.11	2	-
12:00	5780	6180	6.35	43.39	2	-
13:00	5790	6200	6.35	43.67	1	-
14:00	5800	6210	6.35	43.95	1	-

Shut in at 14:00 for build-up. Total gas flared during 26 hr. test 43.24 10^3m^3. Total acid water produced $0.44m^3$.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-13 - - $470,958

Build-up test.

Time (hrs)	Tbg Press (kPa)	Csg Press (kPa)
14:05	6500	6690
14:10	6940	7040
14:15	7290	7470
14:20	7650	7770
14:30	8250	8420
14:40	8780	8990
14:50	9150	9420
15:00	9550	9840
15:15	9920	10330
15:30	10190	10500
16:00	10450	10890
16:30	10600	10940
17:00	10680	10960
17:30	10720	10970
18:00	10770	10970
19:00	10780	10980
20:00	10780	10980
21:00	10790	11000
22:00	10800	11000

End build-up test and rig up Dowell/Schlumberger to perform acid squeeze on Mount Clark formation. Rig up to circulate well over to 10% KCL water. Hold safety meeting. Circulate 24.6m^3 of 10% KCL and killed well. Rigged Dowell's squeeze manifold to the wellhead. Pressure test lines to 21 mPa. Do acid squeeze on Mount Clark formation from 1290.5m to 1301.0m. Pump 3m^3 Methanol ahead followed by 6m^3 of 7 1/2% HCL, with 0.4% A66, + 0.5 kg/m^3 of A179. Followed with 24m^3 of 1 1/2% HF 7 1/2% HCL acid with 240OL-U-66, + 120L-F-78, + 3.6 kg - FeST, + 48L-A-200. Pump methanol to perfs followed by 7 1/2% HCL. Close annulus valve, squeeze methanol into formation at 0.3m^3/min at 9 mPa. Squeeze 6m^3 of 7 1/2% HCL acid to formation at 0.05m^3 per min at 6 mPa. Squeeze 24m^3 of 1 1/2% HF 7 1/2% HCL acid to formation starting at .065m^3/min for 4.5m^3 pressure 6 mPa dropping to 5 mPa. Pick up rate to .1m^3 pressure at 4 mPa. Pick up rate to .21m^3/min for 5m^3, pressure at 5 mPa. Pick up rate to .28m^3/min for 13.5m^3 pressure at 6 mPa. Displace acid with 5.9m^3 10% KCL water at rate .3m^3/min, pressure at 6 mPa, instantaneous shut in 6 mPa. After 15 min. shut in 3 mPa. Rig to swab. Pull one swab.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-14 - - $537,190

Pull 16 swabs pressure on annulus camp up to 2200 kPa, well started kicking. Well flowing acid and water 10% KCl. Well shut in. Pressure build up to 1900 kPa on tbg 3625 kPa on annulus. Flow well to pit through choke.

Time	Tbg Press (kPa)	Csg Press (kPa)	Choke (mm)
16:00	1150	3825	6.35
16:30	1000	3975	6.35
17:00	800	4100	6.35
17:30	800	4425	6.35
18:00	800	4600	6.35
18:30	900	4900	6.35
19:00	1050	5000	6.35
19:30	2200	5000	6.35
20:00	2200	4500	6.35
20:30	2100	4400	6.35
21:00	1800	4200	6.35
21:30	1750	4300	6.35
22:00	1900	4500	6.35
22:30	1900	4600	6.35
23:00	1900	4600	6.35

From 16:00 hours to 20:00 hours flow was slugging water and acid decreasing to 23:00 hours.
23:45 Hook up to separator
23:45 to 07:10 Norward flowing well through separator.

Time	Tbg Press (kPa)	Csg press (kPa)	Choke (mm)	Rate (10^3m^3)	Temp (°C)	Fluid (m^3)
24:00	4170	5420	8.33	15.64	3	
01:00	2500	3400	7.94	28.12	3	
02:00	2150	3300	7.14	18.88	5	.03
03:00	2460	3590	7.14	20.29	5	.04
04:00	2670	3690	7.14	22.54	5	.03
05:00	2760	3740	7.14	23.67	5	.06
06:00	2800	3770	7.14	24.23	3	
07:00	2880	3830	7.14	24.82	3	.08

Gas flared last 7.25 hours = 19.04 10^3m^3
Total water in last 7.25 hours = 0.24 m^3

86-02-15 - - $553,034

Norward flowing well through separator

07:30	2950	3880	7.14		3	
08:00	3000	3900	7.14	25.55	3	.08
09:00	3030	3880	7.14	26.51	3	
10:00	3080	3920	7.14	27.05	2	.09
11:00	3160	3980	7.14	27.64	2	.045
12:00	3200	4010	7.14	28.46	2	
13:00	3240	4020	7.14	29.02	2	.09
14:00	3300	4040	7.14	29.86	2	.09

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-15 (contd.)

15:00	3330	4050	7.14	30.43	2	
16:00	3340	4060	7.14	30.71	1	
17:00	3370	4090	7.14	31.84	1	
19:00	3450	4110	7.14	32.40	0	.08
20:00	3480	4120	7.14	32.68	0	
21:00	3510	4150	7.14	32.96	0	.08
22:00	3410	4040	7.54	35.78	0	
23:00	3310	3880	7.54	34.94	0	
24:00	3310	3870	7.54	34.94	0	.120
01:00	3320	3870	7.54	35.22	0	
02:00	3360	3870	7.54	35.78	0	
03:00	3390	3900	7.54	36.34	0	.10
04:00	3440	3930	7.54	36.63	0	
05:00	3460	3930	7.54	36.91	0	
06:00	3530	3980	7.54	37.47	0	
07:00	3550	3990	7.54	37.47	0	

Total gas flared in last 24 hours = 32.33 10^3m^3
Cumm gas flared since 23:45 hours Feb 14/86 = 51.37 10^3m^3
Total water produced in last 24 hours = $1.015m^3$
Cumm water produced since 23:45 hours Feb 14/86 = $1.255m^3$

86-02-16 - - $567,528

08:00	3540	3980	7.54	37.19	0	.10
09:00	3570	4030	7.54	37.19	0	
10:00	3630	4080	7.54	38.03	0	.07

Shut well in, rig up rapid wireline, run recorders. Record casing pressure build up.

10:25		4470				
10:30		4780				
10:45		5880				
11:00		6700				
11:30		8180				
12:00		9200				
13:00		10270				
13:47	10600	10620				
13:53	10570	10600 - pressure up to choke				

Norward flow well through separator

14:30	8100	8500	7.54	62.26	0	
15:00	7010	7440	7.54	47.33	1	
16:00	5720	5310	7.54	43.95	.5	
17:00	4230	4750	7.94	51.84	0	
18:00	3520	4040	8.33	42.54	1	
19:00	3440	3950	8.33	40.29	1	

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-16 (contd.)

20:00	3450	3930	8.33	39.73	1	
21:00	3490	3960	8.33	40.57	1	
22:00	3510	3960	8.33	40.85	1	
23:00	3510	3960	8.33	41.13	1	
24:00	3560	4000	8.33	41.42	1	
01:00	3600	4020	8.33	41.98	1	
02:00	3630	4030	8.33	42.26	1	
03:00	3650	4040	8.33	42.82	1	
04:00	3680	4050	8.33	42.82	1	
05:00	3690	4070	8.33	43.11	1	
06:00	3710	4070	8.33	43.67	1	.120
07:00	3750	4100	8.33	44.23	1	

Gas flared in last 24 hours = 38.33 10^3m^3
Total gas flared = 88.70 10^3m^3
Water produced in last 24 hours = .120m^3
Total water produced =1.375m^3

86-02-17 - - $582,707

Norward flowing well through separator.

08:00	3760	4110	8.33	44.51	1	
09:00	3770	4110	8.33	44.80	1	
10:00	3770	4110	8.33	44.80	1	
11:00	3790	4130	8.33	44.80	0	0.06
12:00	3820	4150	8.33	45.08	0	

Shut well in.
Build up test.

12:05	4480	4600
12:10	4930	4920
12:15	5170	5430
12:20	5660	5670
12:25	5920	6160
12:30	6400	6480
12:45	7160	7430
13:00	8160	8250
13:15	8620	8860
13:30	9330	9400
13:45	9600	9720
14:00	9930	9950
14:30	10330	10350
15:00	10580	10610
15:30	10720	10740
16:00	10820	10850
17:00	10900	10940
18:00	10940	10980
19:00	10970	11010
20:00	10990	11030
20:30	11000	11040
21:00	11000	11040
21:30	11000	11040
22:00	11000	11050

22:00 end build up.
Pull temp and press recorders and rig up to run static gradient. Rig out rapid wireline. Kill well with 25.1m^3 of 10% KCl water. Mix up 4.8m^3 of 10% KCl water. Remove wellhead, install BOP's, rig up floor and rotate tongs to warm up oil. Replace tong hose.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-18 - - $602,901

Warm up tongs, function test BOP's, tarp in BOP's. Hoist 73mm tbg and stand in derrick. Made up and ran a Halliburton model 3 reetrievable bridge plug on 73mm tbg. Attempted to set plug at 1288.5m KB - plug had slipped out of overshot and fallen down hole. Run 4 jts of 73mm tbg and tag plug at 1328m KB. Hatched on to plug and pulled up to 1288.5m KB. Set bridge plug and pressure tested to 14MPa for 15 mins with no leak off. Dump 1 1/2 sacks of 20/40 sand on top of plug. Pulled out of hole with 73mm tbg and layed down overshot. Rigged up Schlumberger to run GR strip over interval. Ran GR tool and tagged sand on RBP at 1287m KB. Confirmed cellar sufficient for perforating. Pulled GR tool and layed down. Made up 127mm perforating guns. Make up Schlumberger 127mm conveyed tbg gun on 73mm tbg. Run in hole, land tbg hanger. Rig up Schlumberger wireline, run log to position guns. Space out gun to shoot Mount Clark formation 1278.5 to 1284.5m KB. Run after positioning log, rig out Schlumberger, remove BOP's

86-02-19 - - $623,546

Install wellhead and tarp in. Rig to swab. Pull swabs. Swab well down to 600mKB. Rig out swab equip. Dropped bar to fire 127mm guns at 39 JSPM across Mount Clark from 1278.5 to 1284.5mKB. Guns did not appear to fire. Rigged in Rapid Wireline and fished bar out of tbg. Impression on bar indicated contact with the firing head. Dropped bar again to fire guns. Guns did not appear to fire. Fished bar out of tbg and rigged out Rapid. Filled hole with $10.9m^3$ of 10% KCl, removed wellhead and installed BOP's. Installed working floor, pre-fabs and tarped in BOP's. Pulled 73mm tbg and layed down Schlumberger's TCP guns. Guns had not fired. Wait on delivery of Schlumberger's perforating charges.

86-02-20 - - $638,892

Waiting on delivery of Schlumberger perforating charges. Schlumberger making up 127 mm gun, 6m with 39 shots per meter. Ran 127 mm guns on 73 mm tbg and spaced out with same pups leaving RA collar at correlated depth. Landed dognut, leaving guns across Mount Clark from 1278.5 to 1284.5 mKB. Removed BOP's, installed wellhead and rigged up to swab. Swabbed well down to 600 m and rigged out swab equip. Schlumberger dropped bar to fire 127 mm guns at 39 JSPM. Guns did not appear to fire. Rigged up rapid wireline to pull bar, Rapid skid unit's transmission not operational. Rig up swab lubricator. Run overshot on sand line and retrieve bar. Impression on bar indicated contact with firing head. Removed wellhead, installed BOP's and rigged up to pull pipe. Pulled 73 mm tbg and layed down TCP guns. Guns did not fire. Make up F nipple on bottom of tbg, run in 70 jts. Rig to swab. Swab well down to 300 mKB. Rig out swab equip. Hoist 73 mm tbg.

Note: Schlumberger do not have enough parts to make up another TCP gun in Canada. Schlumberger released.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-21 - - $681,007

Wait for computalog wireline truck for perforating. Rig up computalog. Ran 79 mm csg guns on wireline and perforated Mount Clark formation from 1278.5 to 1284.5 mKB. Make two runs at 13 JSPM per run and fired a total of 158 12 gram charges. Ran in hole with an overshot for Halliburton's RBP, an R nipple, a 1.28 m pup, 1 jt of tbg, a Halliburton RTTS packer and tbg to surface. Spaced out with pups and landed overshot at 1284.8 mKB. Rigged up Dowell to perform a 6 m^3 15% HCl acid squeeze with 67% methanol. Held safety meeting and press tested surface lines to 21 MPa, Pumped 4.05 m^3 of acid down tbg and stopped pumps for 5 min. Repeated .15m^3 stage washes 12 more times. Washed a total of 2.0 m^3 of acid by perfs raising back press from 2500 kPa to 3500 kPa. Squeeze 4 m^3 of 15% HCl 67% methanol, first 0.8 m^3 squeezed in intervals by pressuring up to 7 MPa, stop pump. Press would bleed down to 6 MPa in 10 to 20 min. Build press to 7 MPa, and release press back to pumper to 0 MPa, several times for 6 hours. Finally acid started to feed to formation. Remainder of 3.2 m^3 of acid and overflush squeezed away at .09 m^3 min. Press at 6.5 MPa going down to 5.5 MPa at end of squeeze. Shut in press 5.5 MPa after 10 min 2 MPa. Back wash out wash acid. Rig out Dowell. Pull up set RTTS packer at 1257.70 mKB end of tailpipe at 1271.48 mKB. Remove BOP's, install wellhead.

86-02-22 - - $718,800

Pressure test seals in frac head to 14 MPa, ok. Rig to swab, pull 3 swabs recover 4.5 m^3 of 10% KCl water and spent acid, well started to kick. Shut well in, Rig up choke. Rig out swab equip. Press build up to 4100 kPa. Flowed well to pit for clean up.

Time (hours)	Tbg press (kPa)	Choke (mm)	Fluid (m^3)
10:00	2480	6.35	steady spray of acid/water
10:15	960	6.35	"
10:30	1100	5.56	"
10:45	1240	5.56	"
11:00	1380	5.56	"
11:30	1450	5.56	"
12:00	1580	5.16	"
12:30	1690	5.16	"
13:00	1790	5.16	"
13:30	2000	5.16	"

Shut well in and hooked up lines to separator. Flowed well through separator .

Time (hours)	Tbg press (kPa)	Choke (mm)	Gas Rate ($10^3 m^3$)	Fluid (m^3)	Temp (°C)
14:00	7280	6.35			4
14:15	4880	6.35			4
14:30	4300	6.35			4
14:45	4080	6.35			4
15:00	4100	6.35	26.46		4
15:15	4150	6.35	(H_2S - 0%)		4
15:30	4190	6.35			4

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-22 (contd.)

16:00	4200	6.35	27.61	0.021	4
16:30	4200	6.35		(ph=1)	4
17:00	4210	6.35	27.61	0.020	4
18:00	4210	6.35	27.61		3
19:00	4320	6.35	27.75	0.140	2
20:00	4350	6.35	28.46		2
21:00	4390	6.35	29.02		1
22:00	4440	6.35	29.58	0.140	1
23:00	4490	6.35	29.86		1
24:00	4500	6.35	30.15		1
01:00	4550	6.35	30.71	0.140	1
02:00	4580	6.35	30.71		1
03:00	4640	6.35	30.99		1
04:00	4670	6.35	31.55		1
05:00	4670	6.35	31.55	0.150	1
06:00	4710	6.35	31.84		1
07:00	4720	6.35	31.84		1

Total gas flared since 14:00 hours Feb 22, 1986 = 20.98 $10m^3_m3$
Total water produced since 14:00 hours = $0.611m^3$

86-02-23 - - $733,066

Norward flow well through separator

07:30	4720	6.35			1
08:00	4740	6.35	31.84		1
09:00	4740	6.35	32.12	0.120	1
10:00	4760	6.35	32.12		1
11:00	4760	6.35	32.40		1
12:00	4760	6.35	32.40		1
13:00	4780	6.35	32.68		0
14:00	4800	6.35	32.96	0.150	0

Shut well in build up. Total gas flared in 24 hour period was 30.40 10^3m^3. Total acid/water dumped in 24 hour period was 0.881 m^3

Time	Tbg press	Time	Tbg press
14:05	6370	16:00	10450
11:10	7500	16:30	10540
14:15	8290	17:00	10620
14:20	8850	18:00	10670
14:25	9240	19:00	10760
14:30	9470	20:00	10800
14:35	9660	21:00	10800
14:40	9780	22:00	10830
14:45	9880	23:00	10840
14:50	9970	24:00	10840
14:55	10030	01:00	10840
15:00	10090	02:00	10840
15:15	10200	03:00	10840
15:30	10290	04:00	10850
15:45	10380	05:00	10850
		06:00	10850
		07:00	10850

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-24 - - $747,332

Well shut in. Recording pressure build up.

Time	Tbg Press (kPa)	Time	Tbg Press (kPa)
08:00	10850	12:00	10860
09:00	10860	13:00	10860
10:00	10860	14:00	10860
11:00	10860	18:00	10870

Waiting for frac equip to arrive at lease. Tubing press at 07:00 hours = 10880 kPa.

86-02-25 - - $821,218

Wait for Nitrogen pumper. The rest of frac equipt on lease and rigging up. Dowell reported to us Nitrogen pumper was repaired and left Norman Wells at 22:30 hours.

86-02-26 - - $904,932

Temp = 42°C. Wait for Dowell N_2 pumper. All frac equip on lease. Rigged in N_2 Pumper. Mixed 1.2 kg/m^3 of J266 gelling agent in 23.7 m^3 of 3% KCl water. Warmed up pumpers and surface lines. Held safety meeting. Press tested surface lines to 50 MPa. Filled hole with 3.8 m^3 of 75% quality nitrogen/water foam. Pumped a 22.7 m^3 75% quality foam pad at 2.5 m^3/min and an average press of 23 MPa. Press increased from 11-23 MPa with no breakdown. Pumped 8.0 tonnes of 20/40 sand in 22.7 m^3 of 65% foam at 2.5 m^3/min and 26 MPa. Sand concentration increased from 120 - 480 kg/m^3. Flushed sand with 3.4 m^3 of 65% foam at 2.5 m^3/min and 27 MPa. ISIP was 16 MPa. Rigged out Dowell and installed top section of wellhead. Installed choke. Press 1 1/2 hours after frac was 10300 kPa. Opened well on a 19.1 mm choke to clean-up. Flowed N_2 water and sand back to pit. Continued clean-up

Time(hrs)	Choke (mm)	Tbg Press(kPa)	Remarks
18:00	19.1	1380	
19:00	19.1	1030	Steady mist of water. Reduce choke
20:00	7.9	3850	
21:00	7.9	3950	Flame not staying lit
22:00	7.1	4400	Reduce choke.
23:00	7.1	4400	Flame not staying lit.
24:00	7.1	4400	
01:00	7.1	4400	
02:00	7.1	4200	Choke washed setting
03:00	6.35	4100	will not be correct.
05:00	5.16	5700	Very light mist of
06:00	5.16	6200	frac fluid with gas.
06:30	5.16	6200	

Shut well in. Norward hooking up to flow through separator.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-27 - - $930,626

Temp. equals -37 degrees celcius
Norward testers flowing well through seperator

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3)	Temp(C)	Fluid(m^3)
07:00	9860	5.56	59.45	1	
07:15	8650	6.75		0	
07:30	8320	6.75		-1	
08:00	8140	6.75	59.45	-1	
09:00	8100	6.75	58.88	-1	
10:00	8110	6.75	58.88	-1	
11:00	8110	6.75	58.88	-1	
11:30	8090	6.75	58.60	-1	
12:00	8090	6.75	58.60	-1	
12:30	8090	6.75	58.60	-1	
13:00	8090	6.75	58.60	-1	0.090
13:30	8090	6.75	58.60	-1	ph 1.0
14:00	8090	6.75	58.60	-1	0.150
14:10	Shut in to run recorders				
14:30	9600	Tubing pressure recorded with gauge not dead weight!			
14:45	10050	"			"
15:00	10250	"			"
15:15	10250	"			"
15:30	10250	"			"
16:00	10450	"			"
16:30	10050	"			"
17:00	10660	"			"
	Flow well to separator				
17:05	9720	6.75		-3	
17:10	9120	6.75		-2	
17:15	8910	6.75		-2	
17:30	8700	6.75		-2	
18:00	8410	6.75	61.70	-2	
	Open choke and change orifice plate				
18:15	7640	7.54		-2	
18:30	7490	7.54		-2	
19:00	7380	7.54	74.66	-2	
20:00	7270	7.54	71.84	-2	0.160
21:00	7200	7.54	70.43	-2	0.150
	Open choke				ph 1.0 trace
22:00	6850	7.94	76.07	-2	of fines
23:00	6840	7.94	75.51	-2	0.180
	Open choke				
24:00	6520	8.33	78.61	-2	
01:00	6550	8.33	79.73	-2	0.160
02:00	6540	8.33	79.73	-2	0.130
03:00	6570	8.33	79.73	-2	
04:00	6600	8.33	80.30	-2	0.160
05:00	6600	8.33	81.42	-2	
06:00	6590	8.33	80.86	-2	0.140
07:00	6580	8.33	81.42	-2	

Flowed well for 21 hours in last 24 hours. Total gas flared in 21 hours was 61.85 10^3m^3. Total water produced in 21 hours was 1.32m^3.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-02-28 - - $ 952,291

Temp. equals minus 42°C
Norward testers flowing well through separator.

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3)	Temp(C)	Fluid(m^3)
07:30	6580	8.33			
08:00	6580	8.33	81.42	-2	.120
09:00	6600	8.33	81.42	-2	
10:00	6620	8.33	81.42	-2	.120
11:00	6630	8.33	81.70	-2	
12:00	6630	8.33	81.70	-2	0.150
13:00	6620	8.33	81.99	-2	
14:00	6620	8.33	81.99	-2	0.120
15:00	6620	8.33	81.99	-2	
16:00	6630	8.33	81.99	-2	0.110
17:00	6630	8.33	81.99	-2	
18:00	6630	8.33	81.99	-2	0.140

Shut well in for build-up. Total gs flared in past 11 hours 37.48 10^3m^3. Total fluid dumped in past 11 hours 0.760m^3.
Total gas flared in past 32 hours 99.33 10^3m
Total fluid dumped in past 32 hours 2.08m^3.

Time(hrs)	Tbg Press(kPa)	Time(hrs)	Tbg Press(kPa)
18:05	8570	18:25	9710
18:10	9220	18:30	9790
18:15	9440	18:45	9960
18:20	9600	19:00	10090
19:15	10170	22:00	10530
19:30	10240	22:30	10590
19:45	10270	23:00	10620
20:00	10330	24:00	10680
20:30	10410	01:00	10720
21:00	10470	02:00	10760
21:30	10510	03:00	10800
		04:00	10810
		05:00	10830

Rig up Rapid Wireline. Pull pressure recorders. Run gradient.

86-03-01 - $976,327

Temp equals 42 degrees celcius
Rapid Wireline run gradient. Kill well with 5.2m^3 10% KCL water. Remove wellhead, install BOP. Pressure test BOPs and annulus to 10 MPa. Unseat RTTS packer. Circulate down annulus up tubing. Well dead. Install pack off and pick up 2 jts of 73mm tubing. Reverse circulate sand off the top of Halliburtons RBP. Latch onto plug and release. Well flowing up both tubing and casing. Circulate one complete hole volume with 10% KCl water - gas to surface. Well still flowing. Weight up to 12% KCl (170 kg/m^3) and circulate well over. Well dead. Removed pack off, tarped in working floor and rigged up to pull tbg. Pulled 73mm tbg., layed down RBP and redressed RTTS packer. Make up 177.8mm RTTS packer with 0.14m nipple in bottom of packer. R nipple 57.15mm profile on top of packer, one 0.28m pup and tbg. to surface. Ran 10 jts. tbg. stop to thaw out airlines. Work on airlines. Temp. -38 degrees. Running in 73mm tbg. with RTTS packer. Replacing air control valve on panel. Running in 73mm tbg.

86-03-02 - - $ 1,093,862

Temp. equals minus 38°C
Run in 73mm tbg. with RTTS packer to 1225m. Rig up Computalog. Could not get down tbg. with GR tool, ice in tbg. Circulate tbg. for 15 min. Computalog ran tracer log from 1305m up to 1250m. Rig out Computalog. Run in 73mm tbg. to 1289m. Circulate tbg. for 15 min. Set RTTS packer element at 1288.6m. Bottom of nipple in packer at 1289.90m KB. Packer set with 7200 daN compression. Remove BOPs install wellhead. Pressure test seals in frac head to 14 MPa - O.K. Rigged up to swab. Pulled 3 swabs and well started flowing. Recovered 8.6m^3 of 10-12% KCl water. Rigged in Dowell to perform 12 tonne foam frac. Mixed 1.2 kg/m^3 of J-266 gelling agent in 32m^3 of 3% KCl water and 30% methanol. Warmed up pumpers and surface lines. Held safety meeting. Pressure tested lines to 50 MPa. Filled hole with 3.9m^3 of 75% quality nitrogen/water foam. Pumped a 49.9m^3 75% quality pad at 2.5m^3/min. and a pressure increasing from 15 MPa to 23.0 MPa with no breakdown. Pumped 12.0 tonnes of 20/40 sand in 33.3m^3 of 65% foam at 2.5m^3/min. and 25.0 MPa. Flushed sand with 3.4m^3 of 65% foam at 2.5m^3/min. and 28 MPa. Pumps stopped at 29.0 MPa and the ISIP was 20.0 MPa leaking off to 20.0 MPa in 5 minutes. Rigged out Dowell, installed top section of wellhead and choke. Opened choke to 19.1mm and flowed water, N2 and sand to pit. Replaced badly washed seat and stem in choke and continued clean-up.

Time(hrs)	Choke(mm)	Tbg. Press.(kPa)	Remarks
21:00	6.35	9650	Flowing N2, water & sand
21:30	6.35	8500	
22:00	6.35	6000	
22:30	6.35	5900	
23:00	6.35	5500	Slugging frac fluid
23:30	6.35	5250	
24:00	6.35	5050	
01:00	6.35	5050	
02:00	6.35	5050	Choke washed some setting
03:00	5.55	6000	will not be correct.
04:00	5.55	7100	
05:00	5.55	6900	
06:00	5.55	6600	Light mist of frac fluid.
07:00	5.55	7000	

86-03-03 - - $ 1,137,424

Norward testers hooking well up to separator. Norward flowing well through separator.

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3/d)	Temp(C)	Fluid(m^3)
07:30	10200	4.76			
07:45	9400	6.75			
08:00	8920	8.33	81.98	3	
08:30	8020	8.33		4	
09:00	7570	8.33	83.96	3	
09:30	7280	8.33		0	0.020
10:00	7650	8.33	78.89	1	
10:30	7980	8.33		3	
11:00	8000	8.33	81.99	3	0.150
11:30	6830	9.92	106.78	2	0.460
12:00	6580	9.92	114.10	2	0.300

Continued on page 16

86-03-03cont.-

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3/d)	Temp(C)	Fluid(m^3)
12:30	6380	9.92		2	
13:00	6290	9.92	117.77	1	0.400
13:30	6230	9.92		1	
14:00	6170	9.92	118.89	1	0.400
14:30	6130	9.92		1	0.140
15:00	6050	9.92	119.74	1	0.100
15:30	6000	9.92		1	0.160
16:00	5940	9.92	120.30	1	0.130

16:01 Shut in to run recorders.

Total gas flared during clean-up through separator was 36.28 10^3m^3. Frac fluid dumped was $2.38m^3$. Rigged in Rapid Wireline to run recorders. Ran a 57.9mm gauge ring to the R-nipple at 1287m KB. Gauge ring was haning up in ice while running in. Pumped $0.6m^3$ of methanol while running gauge ring. Ran dart to 460m - hanging up in tubing. Pumped another $0.6m^3$ of methanol and worked dart to 650m. Pumped $0.1m^3$ of methanol but could not move dart. Worked line on surface and pulled up to 455m. Continued to work on dart and line parted approx. 15m above rope socket. Mixed $3m^3$ of 10% KCl water and heated up rig tank. Rigged up to kill well down tbg. with $4m^3$ of hot 10% KCl water.

86-03-04 - - $1,156,261

Temp. = 30 degrees C. Pumped $8.1m^3$ of 10% KCl down tubing and killed well. Rigged in Rapid Wireline and ran a 57.9mm gauge ring and tagged wire at 1277m KB. Ran a 58.4mm inside wire-grab and tagged wire at 1277m KB. Worked tool and started up hole with fish. Pulled 15m of wire, stem and running tool for dart out of the hole. Dart was not in tool. Ran 40.6mm blind box and confirmed dart was on R-nipple at 1287m KB. Ran pressure and temperature recorders and landed on dart. Rigged out Rapid. Rigged up to swab. Swabbed $4.6m^3$ of KCl water to rig tank and well was flowing. Flowed well on 9.92mm choke for clean-up for 1/2 hour. Shut well in and hooked up lines to separator for further clean-up.

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3)	Temp(C)	Fluid(m^3)
16:30	10200	7.14			
17:00	8880	7.94	90.72	5	
17:30	8550	7.94		5	
18:00	8280	7.94	98.05	4	0.10
18:30	7950	7.94		4	
19:00	8070	7.54	94.10	4	0.20
19:30	8010	7.54		4	0.12
20:00	8110	7.14	90.44	4	0.10
21:00	7900	7.14	99.17	4	0.24
Shut in well to inspect choke					
22:00	8890	6.35	63.95	4	
23:00	8020	7.94	96.07	2	0.12
24:00	8030	7.54	93.82	2	0.22
01:00	7600	7.54	107.34	2	0.24
02:00	7820	5.95	103.40	2	0.24
03:00	7670	5.95	109.88	3	0.21
04:00	7840	5.16	106.78	3	
05:00	7740	5.16	110.16	2	0.12
06:00	7430	5.16	109.60	1	0.26
07:00	6250	3.57	132.14	1	0.26

Fluid sample shows ph = 1.0, BS & W = 0.2% Water = 99.8% Choke is washed - setting will not be correct. Total gas flare over 14 1/2 hrs=59.38. Total fluid dumped over 14 1/2 hrs=$2.53m^3$. Temp. = $-35^{\circ}C$.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-03-05 - - $1,175,630

Temp. equals minus 35°C
Continue to flow well through Norward's separator.

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3)	Temp(C)	Fluid(m^3)	
07:00	6250	3.57	132.14	1	0.26	
Shut well in to inspect choke-replaced seat & stem						
07:30	9780	7.94		1		
08:00	8660	7.94	96.07	1		
09:00	8300	8.33		0		
09:30	7940	8.33	110.72	2	0.10	
10:00	7890	8.33	110.44	1	0.08	
11:00	7930	7.94	108.47	0	0.16	
12:00	8210	7.54	98.60	0		
13:00	8040	7.54	104.24	3	0.12	
14:00	7790	7.54	108.75	0	0.10	
15:00	8270	6.35	98.89	0		
16:00	8050	6.35	102.27	1	0.06	
17:00	7950	5.95	105.65	2	0.08	
17:45	Shut well in and replaced seat & stem					
17:55	10040	Open well slowly				
18:30	8600	7.94		1		pH = 1.0
18:40	7820	8.73				Fines=trace
18:45	8230	8.33				
19:00	8110	8.33	105.37	0		
19:15	8130	8.14				
19:30	8150	8.14	103.96	0		
19:35	7970	7.74				

Continue to flow well through separator. Working choke in order to maintain 8000 kPa wellhead pressure.

19:54	7980	7.34				
20:00	8160	7.34	103.68	0	0.11	
20:08	8210	7.54				pH = 1
20:15	8020	7.24				Fines= .1%
20:30	8230	7.34		0	0.10	
21:00	8080	7.44	101.71	0		Someapparent
21:11	7960	7.14				Crushed sand
21:14	7990	7.04				in fines.
21:28	7980	6.75				
21:30	8010	6.75		0	0.12	
22:00	8050	6.55	101.98	0		pH = 1
22:03	7960	6.35				Fines=trace
22:08	7820	5.95				
22:20	7880	5.56				
22:22	7890	5.16				
22:25	7960	4.76				
22:30	8000	4.76		0	0.12	
22:32	7970	4.37				
22:42	7930	3.57				
22:44	7900	2.78				
22:47	7920	1.98				
22:50	7920	0				
23:00	7880	0	109.32	0	0.10	

Choke washed to the point where 8000 kPa back pressure on wellhead could no longer be held. Well was shut-in for build-up. Total gas flared in 15 1/2 hrs. = 67.41 10^3. Total fluid produced in 15 1/2 hrs. = 1.39m^3. Cummulative gas flare in 38.2 hrs. = 163.07 10^3m^3. Cummulative water produced in 38.2 hrs. = 6.30m^3.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-03-05 - Cont.

NOTE: Choke settings are incorrect due to washing and because of constant working of choke, rates are averaged. (Last 5 hrs. of test choke was constantly worked).

Build up Test:

Time(hrs)	Tbg Press(kPa)	Time(hrs)	Tbg Press(kPa)
23:02	9300	01:00	10580
23:04	9550	02:00	10650
23:06	9720	03:00	10690
23:08	9840	04:00	10710
23:10	9910	05:00	10750
23:15	10040	06:00	10770
23:20	10140	07:00	10800
23:25	10220		
23:30	10260		
23:45	10370		
24:00	10440		
24:30	10510		

86-03-06 - - $ 1,219,611

Temp. = 35 degrees C. Continue build up test

Time(hrs)	Tbg. Press.(kPa)
07:00	10800
08:00	10810
09:00	10830
10:00	10850
11:00	10870
12:00	10880

Pumped 1.6m^3 of methanol down tubing and shut well in. Hooked up flow lines to separator and opened choke slowly for second portion of flow test.

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3)	Temp(C)	Fluid(m^3)	
13:30	6600	9.53	109.88	4		
14:00	6100	8.33	96.64	2		
14:30	Shut well in, replaced washed stem & seat with a 7.94mm positive choke.					
15:00	10220	Open Well				
15:30	8430	7.94	74.38	3	0.06	
16:00	8020	7.94	76.92	1		
	Opening by-pass valve in order to draw down well.					
16:30	6850	7.94				
17:00	7720	7.94	71.28	1	0.060	
17:30	7850	7.94	69.03	4	pH=5	
18:00	7660	7.94	70.15	1	0.060	
18:30	7640	7.94		1	Sal=125000ppm	
18:40	Shut-in. Remove positive choke & installed stem & seat.					
19:00	7900	9.13	112.13	0	Fines=0.1%	
19:30	6550	9.13	92.69	0	0.120	
20:00	6670	9.13	85.65	0		
20:30	6270	9.53	92.69	0	0.140	
21:00	6220	9.53	90.72	0	0.120	
22:00	6070	9.53	91.85	0	0.080	
23:00	6060	9.53	92.97	0	0.080	
24:00	6020	9.53	91.85	0	0.110	

86-03-06 - (Contd)

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate (10^3m^3)	Temp (C)	Fluid(m^3)
01:00	6000	9.53	96.36	0	0.120
02:00	6270	9.13	93.54	0	0.120
03:00	6300	9.13	93.54	0	0.100
04:00	6130	9.33	96.36	0	0.100
05:00	6070	9.33	96.36	0	0.100
06:00	6080	9.33	96.92	0	0.100
07:00	6080	9.33	96.92		

Water sample at 04:00 pH=5, Sal= 152000 ppm & Fines = .1%

Total gas flared in 17.25 hours 64.20 10^3m^3.
Total fluid produced in 17.25 hours 1.3m^3
Orifice plate was calipered at 00:30 hours - O.K. Meter was monitored - O.K.

86-03-07 - - $ 1,237,294

T = 35 degrees C
Continue second portion of flow test

07:00	6080	9.33	96.92	0	0.10
08:00	6050	9.33	98.05	-1	0.06
09:00	6060	9.33	98.05	0	0.12
10:00	6080	9.33	98.05	0	0.11

Shut well in for build-up.
Gas flared in last 3 hrs. = 12.26 10^3m^3
Fluid produced in last 3 hrs.= 0.29m^3. Samples show pH = 5 to 6, Sal = 170000ppm and a trace of fines.
Build-up Test

Time(hrs)	Tbg Press(kPa)	Time(hrs)	Tbg. Press(kPa)
10:02	8070	13:35	10340
10:04	8550	14:00	10390
10:06	8780	15:00	10480
10:08	8920	16:00	10550
10:10	9000	17:00	10600
10:15	9190	18:00	10660
10:20	9300	19:00	10700
10:25	9400	20:00	10730
10:30	9480	21:00	10760
10:45	9650	22:00	10780
11:00	9770	End Build-up Test.	
11:15	9870		
11:30	9960		
12:00	10090		

Rapid ran a 49mm gauge ring to 1272m KB. No constrictions while running or pulling but gauge ring has "slushy" hydrates on it at surface.

Open well slowly through Norward's testing unit. Draw tubing pressure down to 8000 kPa and attempt to stabilize.

86-03-07 - Contd. - $ 1,237,294

Time(hrs)	Tbg Press(kPa)	Choke(mm)	Rate(10^3m^3)	Temp(C)	Fluid(m^3)
22:15	10080	5.16			
22:20	9600	6.35			
22:30	8850	7.14	90.16	1	
23:00	8200	7.94	98.05	0	
23:30	8180	7.94	96.64	0	
24:00	7950	7.94	98.05	0	0.05
01:00	8030	7.54	88.74	0	pH=5,Fine=.1%
02:00	7820	7.54	88.46	0	Sal=111500ppm

Start opening choke to draw down tubing to a stabile 6000 kPa.
Continue flow test:

02:30	6620	8.73	103.68	0	0.10
03:00	6310	9.33	107.34	0	pH=5,Fine=.1%
03:30	6050	9.33	107.62	0	0.12
04:00	6040	9.33	106.78	0	Sal=152000ppm
05:00	5970	9.33	106.22	0	0.12
06:00	6030	9.23	105.09	0	0.12

Shut well in - end test.
Total gas flared in last 7.8 hrs. = 32.57 10^3m^3
Total fluid produced in last 7.8hrs= $0.46m^3$
Cummulative gas flared on test = 272.1 10^3m^3
Cummulative fluid produced on test = $8.9m^3$
Rigged in Rapid Wireline to retrieve pressure recorders. T = 27 degrees C

86-03-08 - - $ 1,284,372

T = 27 degrees C
Rapid ran a 49mm gauge ring to 1272m KB and pulled same. Ran pulling tool and pulled pressure and temperature recorders to surface. Ran a static gradient with 6-3 minute stops and 1-5 minute on bottom. Killed well by pumping $1.6m^3$ of methanol ahead of $7.9m^3$ of 10% NaCl water down tubing. Rapid ran a 57.9mm gauge to 1280m KB and pulled the same. Ran a SB pulling tool and attempted to recover dart. Pulled out of hole with tool-did not recover the dart. Re-ran JDC pulling tool and pulled out of hole with the dart. Filled tubing, removed wellhead and frachead and installed BOP's. Unset Halliburton RTTS packer, pulled 2 jts. and installed pack off spool. Reverse circulated out sand down to 1313m KB. Pulled 40 jts. of 73mm tubing and rigged in Computalog. Ran a RA tracer log from 1313m KB to 1250m KB. Gamma ray intensity increased through interval of interest from 1290.5 to 1301.0m KB. Pulled remainder of 73mm tubing and layed down RTTS packer. Computalog ran and EZ drill bridge plug to 1260m KB. Pulg would not set. Pulled plug and redressed firing head assembly. Re-ran Halliburton EZ drill plug and set at 1260m KB. Pressure tested plug and casing to 10 MPa for 15 minutes with no leak off. Mixed 6 sacks of class G cement in fresh water and dump bailed on plug in 3 runs. Cement top to 1250.7m KB. Rigged out Computalog. Ran 42 jts. of bull plugged tubing to 385m and displaced $1.6m^3$ of 10% NaCl water to the pit. Removed BOP's and installed wellhead. Topped off well with $1.6m^3$ of diesel.
T = 44 degrees C.

Final Completion Report!!!!
Rig moving reports will continue.

PCI CANTERRA - TWEED L. A-67 TIGHT HOLE MOUNT CLARK

86-03-09 - - $1,301,456

Rigged out service rig and equipment. Moved all equipment off pad for lease clean up and rig move.

86-03-10 - - $1,318,550

Moving camp from site to Norman Wells.

86-03-11 - - $1,326,285

Moved remainder of Western Geophysical camp to Norman Wells. Moved 30% of Roll'n #35 from location to Norman Wells.

86-03-12 - - $1,336,760

Trucks returning to location for remainder of service rig.

86-03-13 - - $1,341,473

Trucks arrived on location, loading remaining rig equipment.

86-03-14 - - $1,350,562

Load remainder of rig equipt and start move back to Norman Wells.

86-03-15 - - $1,365,995

Unload rig and equipt in Norman Wells. Waiting for Land Transport to move equipt South.

86-03-16 - - $1,444,669

Loaded rig in Norman Wells and started move back to Red Deer.

86-03-17 - - $1,535,394

Moving rig and equipment back to Red Deer. Extended costs to include trip back.

FINAL REPORT