AUTHORITY TO DRILL A WELL

CANADA

Exploratory ☒ Delineation ☐
Development ☐ Service ☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: Paramount et al Arrowhead N65 60° 40' 122° 45'

Operator: Paramount Resources Ltd. Drilling Program No.:

Contractor: Nabors Drilling Permit or Lease No.: EL383

Drilling Rig or Unit: 16 Estimated Well Cost: $3,500,000

Location-Unit: N Section: 65 Grid Area: 60° 40' 122° 45'

Coordinates: Lat.: 60° 34' 45.897" Long.: 122° 57' 18.623"

Area: Ft. Liard NWT Field/Pool: N/A

Elevation-RT/KB: Approx. 574 m (ASL) Seafloor: (BRT)

Approx. Spud Date: December 1, 1997 Estimated Days on Location: 60

Anticipated Total Depth: 2865 m Target Horizon(s) Tetcho and Nahanni

EVALUATION PROGRAM

Ten-metre sample intervals N/A

Five-metre sample intervals As specified from under surface casing to total depth.

Canned sample intervals N/A

Conventional cores at N/A

Logs and Tests GR-DSI-CAL
LDT-CNL-NGT-MLT-EDAC-DLT-MSFL-EMS
Zone of interest being drilled underbalanced.

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:	Setting Depth Below ~~Seafloor~~	Cementing Program (Volumes):
339 mm	81.1	K55	480	60T 'G' + 1% $CaCl_2$
244.5 mm	64.74	L80	1892	150 m inside sfc
177.8	38.69	L80	2564	150 m inside sfc

B O P. Equipment: 35 mPa Class IV stack and manifold with one (1) annular preventer and three (3) gates - 1 double and 1 single and double choke to kill.

Other Information:

Signed: A. Macdonald Title: Drilling and Completions Consultant

Date: November 7, 1997 Company: Paramount Resources Ltd.

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

Signed: Jerry Baker
Engineering Branch

Date: Dec 22/97

File: 9211-P33-10-1, WID 1833
UWI 300N656040122450

Canada

APPROVAL TO ALTER CONDITION OF A WELL

CANADA

APPLICATION TO ALTER CONDITION OF A WELL

This application form is to be submitted in triplicate to the District Conservation Engineer at least 45 days before commencement of operations.

Well Name: PARAMOUNT ET.AL ARROWHEAD N65 Area: FT. LIARD

Coordinates: Lat: 60°34'45.547" Long: 122°57'15.623"

Operator: PARAMOUNT RESOURCES Contractor: ALBERTA GOLD

Drilling Rig or Unit: 30 Depth: 2900 m

Date ATDW Issued: #1833 ? Date of Last Operation FEB 23/98

TYPE OF OPERATION

TO COMPLETE THE NAHANNI FOR GAS PRODUCTION

SUMMARY OF PROPOSED OPERATIONS

PERFORATE 2 & 3 SECTIONS W/IN THE NAHANNI
ACIDIZE EACH SET OF PERFORATIONS
2-3 DAY FLOW TEST OF EACH SECTION
SUSPEND WELLBORE

Signed: S. Muzakant Title: DRILLING CONSULTANT

Date: Mar 5/98 Company: Paramount Resources Ltd.

APPROVAL

An approved copy of this notice should be posted at each wellsite.

Signed: Perry Beler
Conservation Engineer

Date: Mar 9/98

Well Status

Suspended ☒
Completed ☐
Abandoned ☐

ATDW No: 1833 File: 9211-P33-10-1

UWI 300N656040122450

Canada

WELL TERMINATION RECORD (with attachment)

CANADA

WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations

WELL DATA

Well Name: Paramount et al Arrowhead N-65 Area: Fort Liard, N.W.T.

Grid Area: 60° 40' , 122° 45' Field/Pool: N/A

Permit or Lease No.: EL 383 Final Coordinates: Lat.: 60° 34' 45.897" Long: 122° 57' 18.623"

Drilling Unit: Nabors 16 Elevations-RT/KB: 574.6 m SF/GL: 567.9 m

Spud Date: 14 Jan 98 Rig Released: 27 Feb 98 Total Depth: 2925 m

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives.
339.7	81.1	J-55	480	60 t 0:1:0
244.5	64.74	L-80	1890	79.7 t
177.8	38.69	MN-80	2529	19.5 t
139.7	25.3	L-80	2856.09	5.2 m^3

PLUGGING PROGRAM

Approval of the following program was obtained by (person) N/A from

(person) ..... by means of

..... on ..... 19 .

Type of Plug:	Interval:	Felt:	Cement and Additives:
N/A			

Lost Circulation/Overpressure Zones: N/A

Equipment left on Seafloor (Describe): Wellhead

Provision for Re-entry (Describe and attach sketch): Well to be completed.

Cores: Type: N/A Intervals: .....

Other Downhole Completion/Suspension Equipment: Bridge plug at 2270 mKB, capped with 8 lineal meters of cement.

CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: S Maaskant P. Eng. Title: Drilling and Completion Consultant

Name: Shirley Maaskant Date: March 31, 1998

Acknowledged by: Jerry Baker
Engineering Branch

Date: April 29/98

File: .....

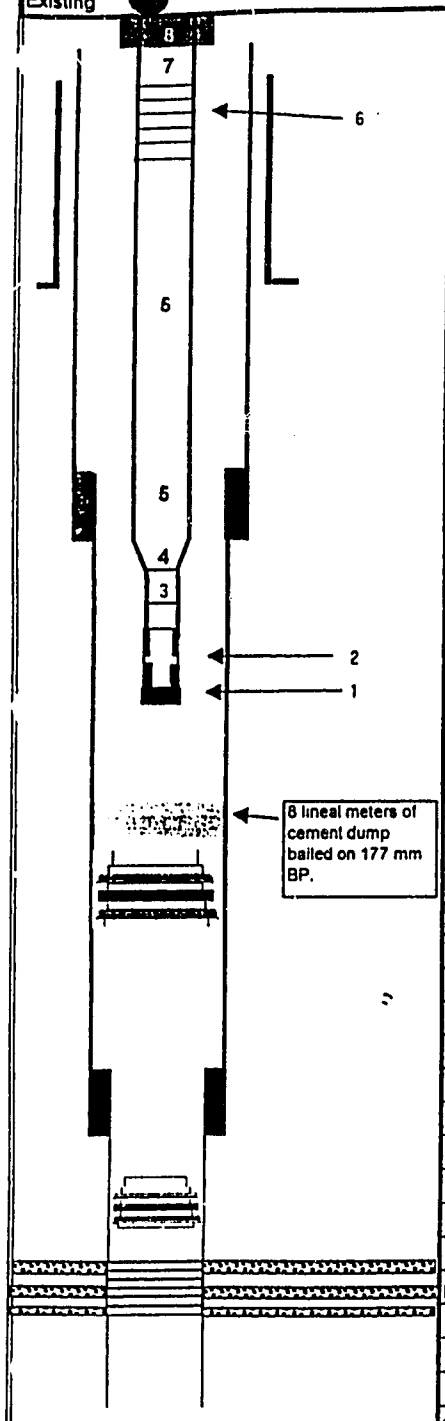
Well Status
Suspended ☒
Completed ☐
Abandoned ☐

Canada

PARAMOUNT RESOURCES LTD.

DOWNHOLE DIAGRAM

Existing



WELL NAME: Paramount et al Arrowhead

Prepared by: John Stroh / Rendy Hemmingsen | Date 98/03/24

Elevations:

KB (m)	574.60	KB to CF [m]	6.90	TD [m]	2925.00
GL (m)	567.90	PBTD [m]	2821.43	KB to TF	6.30

Tubulars	Size [mm]	Wt - Kg/m	Grade	No Jts.	Landing Depth [m]
Surface Casing	339.70	81.10	J-55, ST&C		480.00
Intermed Casing	244.50	64.74	L80, LT&C		1890.00
Product. Casing	177.80	38.69	MN80, LT&C		2529.00
Product. Liner	139.70	25.30	L80 FLUSH HYDRIL		2856.09
Production Tbg	88.90	13.84	J-55	234.00	2190.00

Wellhead Description:

Make / Type: ABB Vetco Gray, Flowing style, 2 - Master valves, 1 - Wing valve (choke)

Size / Rating: 2 - 35 Mpa 79 mm ID gate valves, 2 - 35 Mpa 50.8 mm ID Csg valves

Tbg. String:

Date of Tubing Description:

ITEM	Description	K.B.–Tbg. Flg.	Length (m) 6.3	Top @ KB Depth (m)
1	73 mm collar		0.13	2222.56
2	73 mm XN nipple, C/W 58.75 mm profile, 56.01 mm NOGO		0.31	2222.25
3	2 - 73 mm J-55 pup Jts. (3.07, 3.07)		6.14	2216.11
4	73 mm x 89 mm swage		0.14	2215.97
5	233 - 88.9 mm J-55, 13.84 kg/m Tbg.		2190.88	25.09
6	5 - 88.9 mm pup Jts. (.61, 1.21, 1.82, 2.43, 3.04 m)		9.11	15.98
7	1 - 88.9 mm J-55, 13.84 kg/m Tbg.		9.47	6.51
8	1 - 88.9 mm EUE Tbg hanger		0.21	6.30
				6.30
				6.30
				6.30
				6.30
				6.30
	Bottom of Tubing mKB		2222.69	

NOTES

Csg & Tbg inhibited with fresh water. Both sides topped off with diesel.

Cement in 139.7 mm Csg had been drilled to a depth of 2821.43 mKB

Parts of 139 mm retainer sitting @ 2799.1 mKB

139.7 mm BP set @ 2768.0 mKB

177.8 mm BP set @ 2770.0 mKB. Topped with 8 lineal meters of class G oilwell cement

Perforations:

Zone	Nahanni	Interval:	2777 - 2782, 2788 - 2790, 2791 - 2792 mKB.
Zone		Interval:	
Zone		Interval:	

Stimulation: 15 m³ of Nitrified 15% HCL w/ balls.

APPROVAL TO ALTER CONDITION OF A WELL

National Energy Board | Office national de l'énergie

APPROVAL TO ALTER CONDITION OF A WELL

This application is to be submitted to the Chief Conservation Officer at least 45 days before commencement of operations.

Well Name: Paramount Berkley Arrowhead N-65 Area: Ft. Liard

Operator: Paramount Resources Ltd. Contractor: Canalta

Drilling Rig or Unit: 42 Depth: 2925 m KB

Coordinates: Lat: 60° 34' 45.897" Long: 122° 57' 18.623"

Date ADW Issued: December 22, 1997 Date of last Operation: March 22, 1998

Elevation-KB[redacted]: 574.6 m (ASL) GL[redacted] 567.9 m

TYPE OF OPERATION

Complete well

SUMMARY OF PROPOSED OPERATIONS

Finish completion as outlined in previous Application to Alter approved March 9, 1998.

Signed: S. Maaskant
Responsible Officer

Title: Drilling and Completions Consultant

Name: Shirley Maaskant

Company: Paramount Resources Ltd.

Date: November 19, 1998

Phone: (403) 290-3600

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

Date: Dec. 11/98

Signed: for / Chief Conservation Officer

File: 9211-P33-10-1RE

WID: 1833, UWI 300N656040122451

Well Status

Suspended ☒

Completed ☐

Abandoned ☐

WELL TERMINATION RECORD (with attachment)

CANADA

WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations.

WELL DATA

Well Name: Paramount Berkley Arrowhead N-65 Area: Fort Liard

Grid Area: 60° 40' N, 122° 45' W Field/Pool:

Permit or Lease No.: EL 383 Final Coordinates: Lat.: 60° 34' 45.897" Long: 122° 57' 18.623"

Drilling Unit: Canalta #42 Elevations: RT/KB: 574.6m GL: 567.9m

Spud Date: Dec. 12, 1998 Rig Released: Feb. 3, 1999 Total Depth: 2925 mKB

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:
See attached casing and cementing summary.				

PLUGGING PROGRAM

Approval of the following program was obtained by (person) ..... from (person) ..... by means of ..... on ..... 19 .

Type of Plug:	Interval:	Felt:	Cement and Additives:

Lost Circulation/Overpressure Zones:

Equipment left on Seafloor (Describe):

Provision for Re-entry (Describe and attach sketch):

Cores: Type: ..... Intervals:

Other Downhole Completion/Suspension Equipment: Well completed as per previously submitted daily reports. Refer to attached bottom hole diagram.

CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: Dave Block P. Eng. Title: Engineering Consultant

Name: Dave Block Date: July 18, 2001

Acknowledged by: T. Marker Engineering Branch

Date: July 31/01

File: 9211-P32-10-1 WID 1833

UWI: 300N656040122451

Well Status
Suspended ☒
Completed ☐
Abandoned ☐

Canada

Paramount et al Arrowhead N-65
60^0 40' N, 122^0 45 ' W

Casing and Cementing Summary

Surface Casing:
339.7 mm, 81.1 kg/m, J-55 casing set at 480 mKB.
Cemented with 32.0 t 0:1:0 'G' + 1% $CaCl_2$ and 29.0 t 0:1:0 'G' + 2% $CaCl_2$.

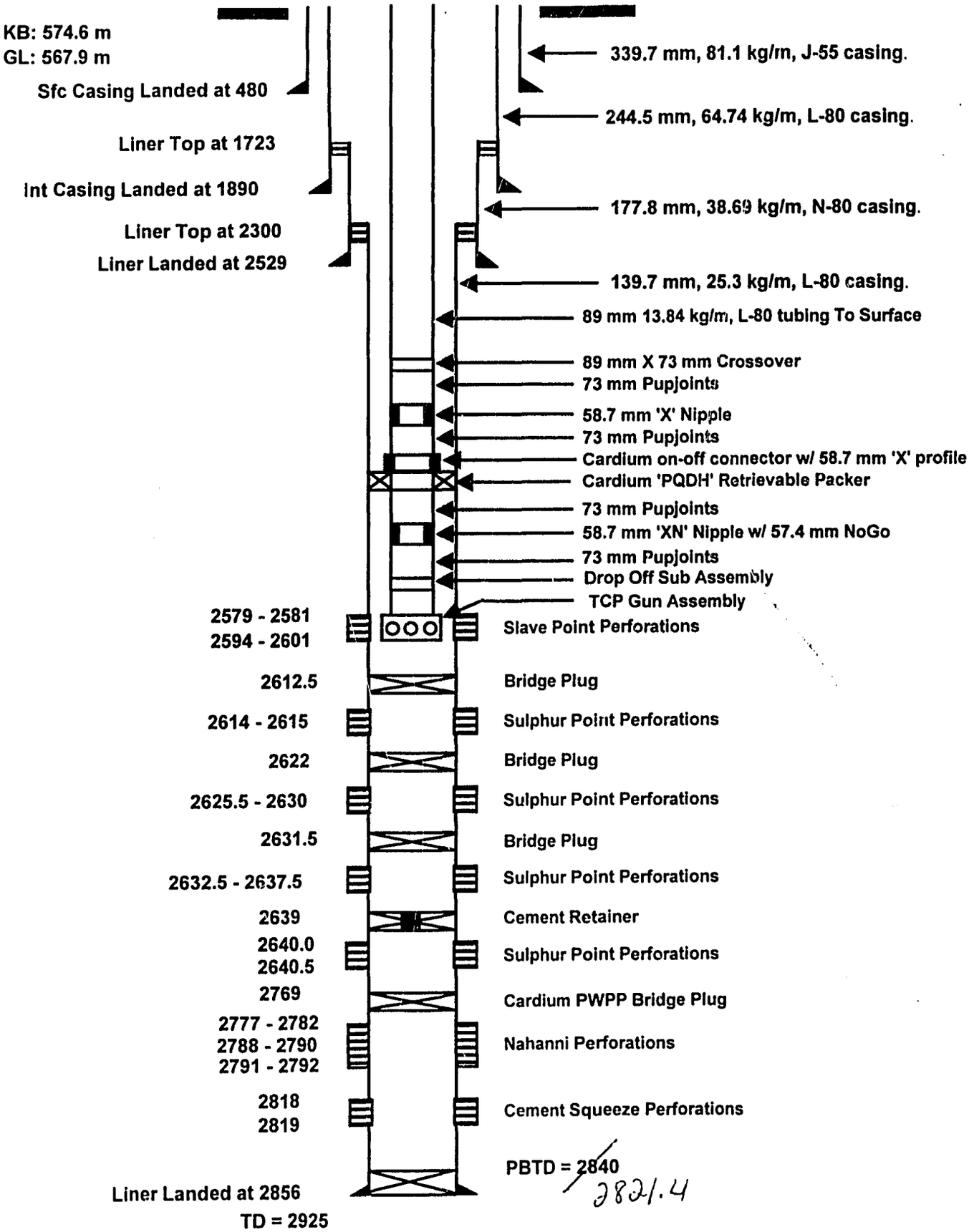
Intermediate Casing:
244.5 mm, 64.74 kg/m, L-80 casing set at 1890.0 mKB.
Cemented with 29 t LW-14 + 2% SMS + 2% LWA + 2% $CaCl_2$ and 43 t 0:1:0 'G' + 0.4% CFL-3 + 0.1% CFL-H + 0.2% SPC-2.

Liner #1:
177.8 mm, 38.69 kg/m, N-80 casing run from 1723 - 2529 mKB.
Cemented with 19.5 t Thermal 40 + 1% CFR + 0.35% CFL-2 + 0.35% CFL-H + 0.8% HTR-B + 1.3% LTR.

Liner #2:
139.7 mm, 25.3 kg/m, L-80 casing run from 2300 - 2856 mKB.
Cemented with 40.7 t Thermal 40 + 1% CFR + 0.8% CFL-2 + 1.2% LTR + 0.7% HTR-B.

PARA ET AL ARROWHEAD N-65

As at February 4, 1999



FINAL WELL REPORT

N.E.B. COPY
9211-P33-10-1
NID 1833

Paramount Resources Ltd.

FINAL WELL REPORT

PARAMOUNT ET AL ARROWHEAD N65

60^0 40' 122^0 45'

Latitude 60^0 34' 45.897" Longitude 122^0 57' 18.623"

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
JUL 27 1998

Prepared By: S. Maaskant, C.E.T.
Date: July 8, 1998

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1. INTRODUCTION

Summary

Paramount Resources Ltd. drilled Arrowhead N65 to evaluate the gas potential of the Nahanni formation and a secondary objective the Flett . Nabors rig 16 spudded this well January 14, 1998 and rig released February 27, 1998.

Minor fluid losses were encountered drilling surface hole overbalanced with minor gas volumes recorded. Logging proved the Flett to be xxxxxx.

The two intermediate sections of the well were drilled without problem utilizing an air hammer, circulating over to Cutter D to perform logging and casing operations. The second intermediate section was not logged as it covered the Fort Simpson Shale.

The Nahanni was drilled underbalanced utilizing nitrogen and foam. We encountered three specific gas bearing sections ranging from 5 to 28 10^3 m^3/d gas rates with significant water flow associated with each. A liner was cemented in place over the Nahanni to allow for segregation of these sections and in an attempt to shut off the water flow.

The well will be completed to evaluate the Nahanni gas potential.

Location Map (See Figure 1, Following Page)

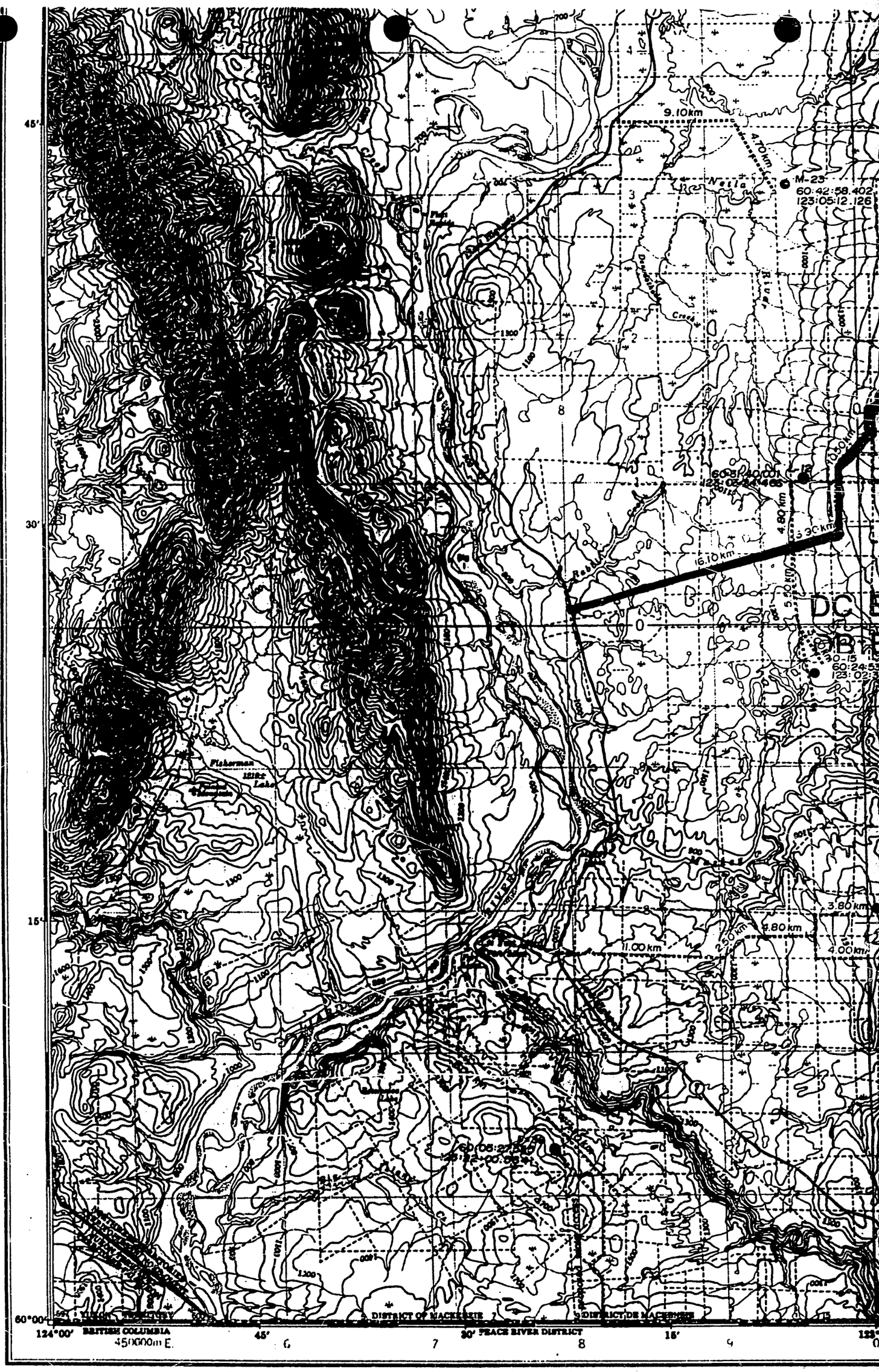


FIGURE 1
LOCATION MAP

Produced by the SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES. Updated from large scale maps. Information current as shown in diagram. Published in 1985.

Copies may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, or your nearest map dealer.

© 1985 Her Majesty the Queen in Right of Canada. Department of Energy, Mines and Resources.

Information concerning bench marks and horizontal survey monuments can be obtained from Geodetic Survey, Surveys and Mapping Branch, Ottawa.

FORT

NORTHWEST TERRITOR

TERRITOIRES DU NORD-OUE

Roads. loose or stabilized surface, all weather

Routes. gravier, à relevé, toute saison

2 lanes or more

less than 2 lanes

Scale 1:250

2. GENERAL DATA

WELL NAME:	Paramount Berkley Arrowhead N65
EXPLORATION AGREEMENT:	EL 383
DRILLING AUTHORITY:	1833 Issued December 22, 1997
GRID AREA:	60^0 40' 122^0 45'
CO-ORDINATES:	Latitude 60^0 34' 45.897" Longitude 122^0 57' 18.623"
UNIQUE WELL IDENTIFIER:	300N656040122450
LESSOR:	Shell Canada Ltd. entered into a formal agreement with Paramount covering parcel exploration licence 383.
OPERATOR:	Paramount Resources Ltd. 4000, 350 – 7 Ave. S.W. Calgary, Alberta T2P 3W5
DRILLING CONTRACTOR:	Nabors Drilling Limited 850, 505 – 3 St. S.W. Calgary, Alberta T2P 3E6
DRILLING RIG:	Nabors 16
POSITION KEEPING:	N/A
SUPPORT CRAFT:	N/A
DRILLING UNIT PERFORMANCE	N/A
DIFFICULTIES & DELAYS:	N/A

3. SUMMARY OF DRILLING OPERATIONS

ELEVATIONS: G.L.: 567.9 m
K.B.: 574.6 m

TOTAL DEPTH: Drilled:
Logged:
Plug Back:

SPUD DATE: 1998 – 01 – 14 @ 1400 hours

COMPLETED DRILLING DATE: 1998 – 02 – 14 @ 1830 hours

RIG RELEASE: 1998 – 02 – 26 @ 2400

WELL STATUS: STANDING CASED

HOLE SIZES, CASING See Table 1 – Bit Record

	Hole Size mm	Csg. Size mm	Wt. kg/m	Grade	Landed m
Surface	444	339.7	81.1	J55, ST&C	480
Intermediate 1	311	244.5	64.74	L80, LT&C	1890
Intermediate 2	216	177.8	38.69	MN80, LT&C	2529
Liner	152	139.7	25.3	L80 flush	2856.09

CASING CEMENTING: See Casing & Cementing Reports, Following Pages

SIDETRACKED HOLE: N/A

DRILLING FLUID: See Table 5

Surface Hole: Gel Chemical

1st Intermediate: Air

2nd Intermediate: Air / D-Vis

Main Hole: Nitrogem/Foam

FISHING: N/A

WELL KICKS:	N/A (Note: The Nahanni formation was drilled underbalanced)
LEAK-OFF TESTS:	(see attached) Gradient at 490 m 18.79 kPa/m, no breakdown Gradient at 1893 m 18.8 kKa/m, no breakdown
TIME DISTRIBUTION:	See Table 2
DEVIATION SURVEY:	See Attached
ABANDONMENT PLUGS:	N/A
COMPOSITE WELL RECORD:	See attached, this section

TABLE 1
BIT RECORD

BIT RECORD

#	Type	Size (mm)	In	Out	Total (m)	Hrs drilled	FOB (daN)	RPM	Cond. T B G
1a	ReedY11	444	0	185m	185m	28.25	3 /10	100/160	3-2-I
2a	S 13	444	185	395m	210m	28.25	3 /11	100/161	8-1-I
3a	SS 81	444	395	480m	85m	34.00	4 /6	160	2-2-I
1	HP51	311	480	490M	10M	1.50	4 / 5	45/50	3-3-I
2	HP43A	311	490	634M	144M	12.75	1/2	45/50	3-3-I
3	H425ZR3	311	634	1890M	1256M	57.25	1	AIR HAMMER	
1	FDT	216	1890	1893M	3M	1.75	3/4	40	1-1-I
2	H42R8R3	216	1893M	2515M	622M	28.75	0/1	AIR HAMMER	
3	HP 53A	216	2515M	2530M	15M	7.00	10/12	70/80	2-1-I
1	HZS84F	156	2530M	2847M	317M	33.25	10/12	50	6-8-I
2	HZS84F	156	2847M	2925M	78M	77.75	10	50	

BIT CONDITION		SCALE
Tooth Wear	(T)	0 - 8
Bearing Wear	(B)	0 - 8
Gauge	(G)	in or (mm) under
New Bit	T=0	B=0 G=in

PARAMOUNT BERKLEY ARROWHEAD N-65

CASING & CEMENTING REPORTS

PARAMOUNT RESOURCES LTD.

CASING SUMMARY

WELL NAME Paramount Berkley Arrowhead LOCATION N-65 DATE 98/01/21

SURFACE (X) INTERMEDIATE ( ) PRODUCTION ( ) LINER ( )

Size: 339.7mm

KB: 6.7 m

KB - CF: 6.97 m

NO.	DESCRIPTION	MEASURED LENGTH	KB Depth
35	339.7 mm, 81.1 kg/m, J55, ST&C	481.16	
	Scratchers		
	Centralizers		

Total String	481.16	
minus KB to Csg Top (STICK UP)		Cut-off
Landed Depth KB	480.00	Jt. Length
Hole Depth KB		
Distance Csg Landed Off Bottom		

Cementing Company Sanjel

Wash-Type _____ Volume: _____

Cement Type Lead Slurry see attached cementing reports Volume: _____

Additives _____

Cement Type Tail Slurry _____ Volume: _____

Additives _____

Cement Type Above Stage Collar _____ Volume: _____

Additives _____

Displacement Rate: Max _____ m3/min Average _____ m3/min

Calculated Cement Top(s): (fill) _____ mKB (tail) _____ mKB

Returns: Mud _____ Cement 4 m3

String Wt. in Mud Wt of: _____ kg/m3 = _____ daN

Wt. set on slips: _____ daN

Remarks: _____

Supervisor _____

PARA-CSG_SUM1.xls

SANJEL CEMENTERS LTD.	DATE: January 20, 1998
	TICKET NUMBER: 51423

SANJEL CEMENTERS LTD.

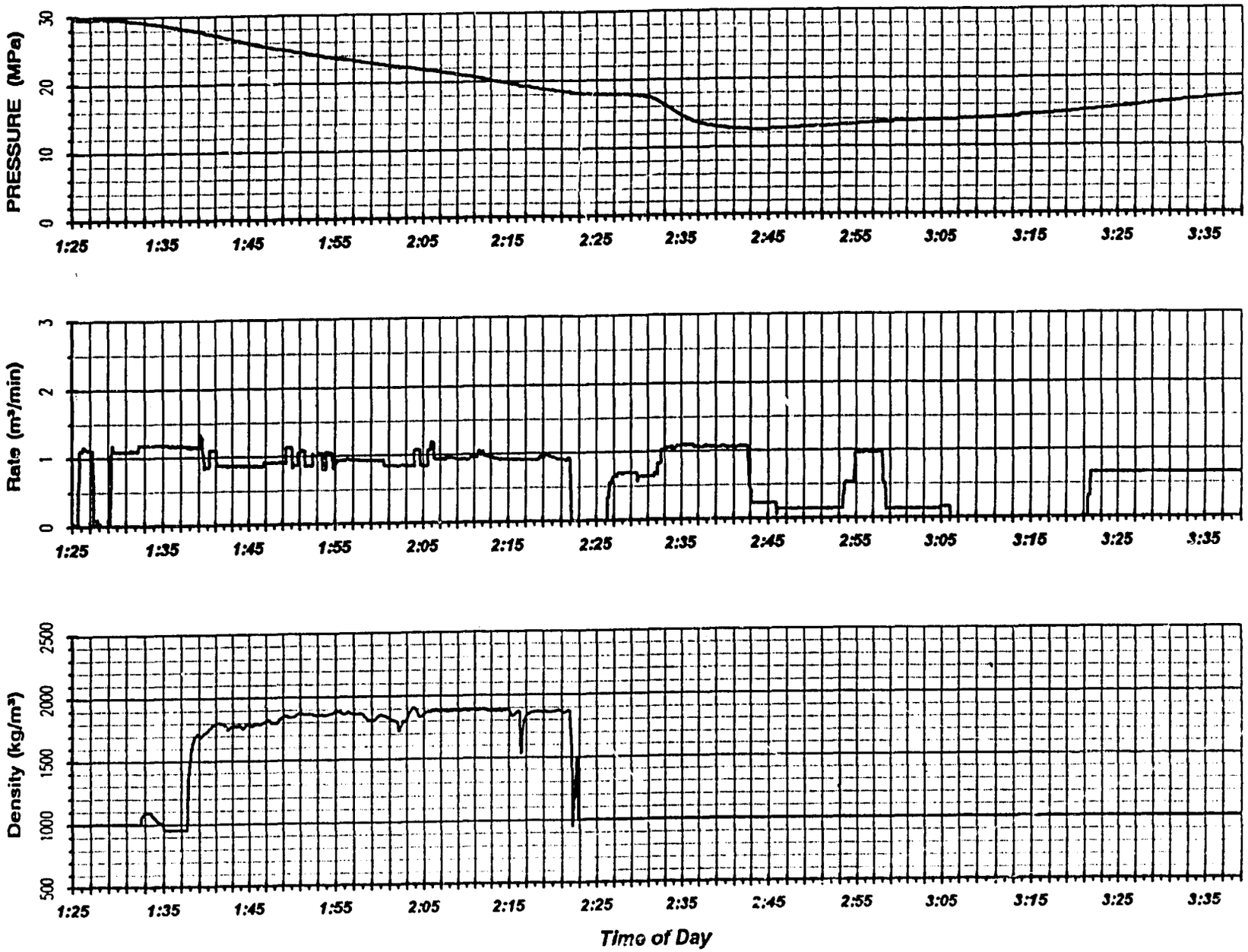
WELL NAME:	Paramount et al Arrow Head	TYPE OF JOB:	Surface Casing
COMPANY REPRESENTATIVE:	Rod McEachern	SANJEL REP.:	Wayne Bosse — UNIT #: 4429
L.S.D:		PDM OPERATOR:	SAM

WELL DATA		CASING						SPECIAL TOOLS	
Hole Size	444 mm	Size	339.7 mm	Weight	81.1 kg/m	Interval	481.11 m to surface	Type	
Depth	480 m	Size	mm	Weight	kg/m	Interval		Depth	m
Drill Pipe Size	mm	Size	mm	Weight	kg/m	Interval		Type	
Weight	kg/m	Size	mm	Weight	kg/m	Interval		Depth	m
Interval		Perforations at							

VOLUMES	SEMENT BLEND	DENSITY (kg/m³)	SLURRY VOLUME (m³)
32.0	0:1:0 "G" + 1.0% $CaCl_2$	1901	24.32
29.0	0:1:0 "G" + 2.0% $CaCl_2$	1901	22.04

	TIME	VOLUME (m³)	RATE (m³/min)	PRESSURE (MPa)	COMMENTS
Fill Lines	01:26	1.0	1.1	30.0	H_2O
Pressure Test					
Preflush	01:29	5.0	1.1	29.0	H_2O
Spacer	01:33	4.0	1.2	29.0	Visweep
Fill Cement	01:38	24.32	1.2	28.0	0:1:0 "G" + Additives mixed @1901 kg/m³
Tail Cement	02:03	22.04	0.8	22.0	0:1:0 "G" + Additives mixed @ 1901 kg/m³
Drop Plug	02:22				Pump out lines
Displacement	02:26	23.6	0.7 - 0.2	18.0 - 14.0	H_2O
Bump Plug					Float held. 4.0 m³ Cement returns.

Paramount et al Arrow Head
Surface Casing / January 20, 1998 / #51423



PARAMOUNT RESOURCES LTD.

CASING SUMMARY

WELL NAME PARAMOUNT ET AL. LOCATION ARROWHEADN65 DATE 98-02-01

SURFACE ( ) INTERMEDIATE (^) PRODUCTION ( ) LINER ( )

Size: 244.5 mm

KB: 6.7 m

KB - CF: 6.97M

NO.	DESCRIPTION	MEASURED LENGTH	KB Depth
136	244.5MM,64.74 KG/M,L80, LT/C	1891.36	1890.0
	Scratchers		
34	Centralizers		

Total String	1891.36	
minus KB to Csg Top (STICK UP)	1.36	Cut-off
Landed Depth KB	1890.00	Jt. Length
Hole Depth KB	1890.00	
Distance Csg Landed Off Bottom	NILL	

Cementing Company: SANJEL

Wash-Type: PRE FLUSH INVERT, INVERT SPACER Volume: 6M3

Cement Type Lead Slurry: LW14, 29 TONN, 1400 KG/M3 Volume: 47M3

Additives: 2%,SMS, 2% LWA, 2% CACL2,

Cement Type Tail Slurry: 0-1-0 G, 43TONN.,1901 KG/M3. Volume: 32.7 M3.

Additives: .4% CFL 3,.1% CFL-H,.2% SPC2,

Cement Type Above Stage Collar: Volume:

Additives:

Displacement Rate: Max 1 m3/min Average 0.7 m3/min

Calculated Cement Top(s): (fill) mKB (tail) mKB

Returns: Mud 157M3 Cement NILL m3

String Wt. in Mud Wt of: 980 kg/m3 = 116,000 daN

Wt. set on slips: 75,000 daN

Remarks: NO CEMENT RETURNS TO SURF ON CEMENT JOB , WORKED CSG 3-5M WHILE MIXING AND MOST OF THE DISPLACEMENT. RECOVERED APP.157 M3, OF CUTTER D" DRILLING FLUID.

Supervisor ROD. MacEACHERN

SANJEL CEMENTERS LTD.	DATE:	January 31, 1998
2400, 639 - 5th Ave. S.W. Calgary, Alberta T2P 0M9 Phone #: (403) 269-1420 Fax #: (403) 269-1433	TICKET NUMBER:	60259-60

SANJEL CEMENTERS LTD.

WELL NAME:	Paramount Arrowhead	TYPE OF JOB:	Intermediate Casing
COMPANY REPRESENTATIVE:	Rod MacEacheld	SANJEL REP.:	Sean Marshall — UNIT #: 4429
L.S.D:	Lot 60, 34 Long 122:57 #2449A	PDM OPERATOR:	SAM

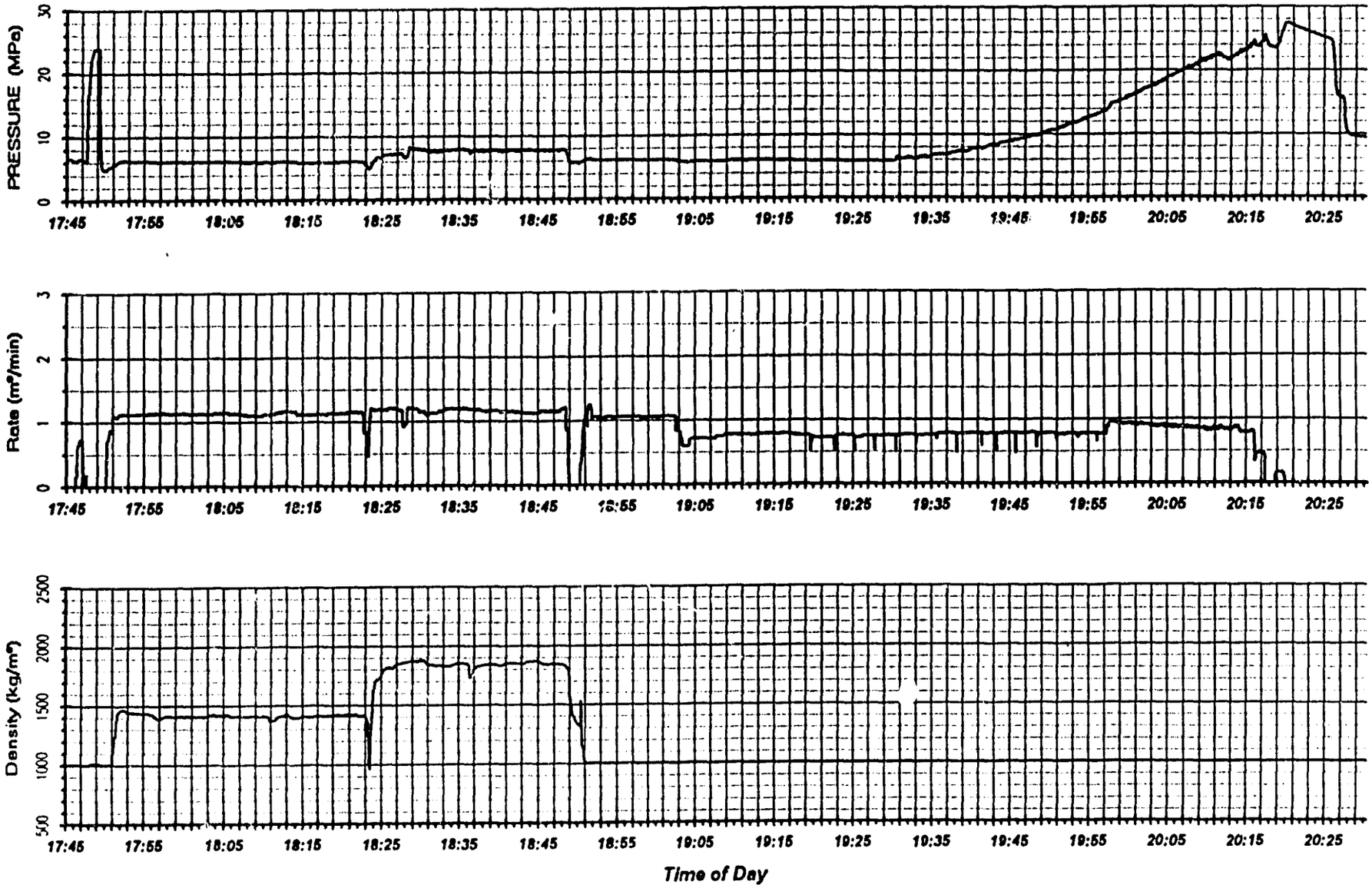
WELL DATA		TUBULARS					SPECIAL TOOLS
Hole Size	311 mm	Size	244 mm	Weight	53.57 kg/m	Interval 1891.35 m to surface	Type
Depth	1890 m	Size	mm	Weight	kg/m	Interval	Depth m
Drill Pipe Size	mm	Size	mm	Weight	kg/m	Interval	Type
Weight	kg/m	Size	mm	Weight	kg/m	Interval	Depth m
Interval		Perforations at					

TONNES	CEMENT BLEND	DENSITY (kg/m³)	SLURRY VOLUME (m³)
29.0	LW-14 + 2.0% SMS + 2.0% LWA + 2.0% $CaCl_2$	1400	47.0
43.0	0:1:0 'G' + 0.4% CFL-3 + 0.1% CFL-H + 0.2% SPC II	1901	32.7

DESCRIPTION	TIME	VOLUME (m³)	RATE (m³/min)	PRESSURE (MPa)	COMMENTS
Fill Lines	17:46	0.5	0.7	6.0	H_2O
Pressure Test	17:48			24.0	
Preflush	17:50	3.0	0.9	5.0	Invert Preflush
Spacer	17:51	3.0	1.2	6.0	Invert Spacer
Fill Cement	17:55	47.0	1.2	6.0	LW-14 + Additives mixed @ 1400 kg/m³
Tail Cement	18:24	32.7	1.2	6.0	0:1:0 'G' + Additives mixed @ 1901 kg/m³
Drop Plug	18:49				Pump out lines
Displacement	18:51	72.9	1.2 - 0.5	6.0 - 25.0	H_2O
Bump Plug	20:21			27.0	No Cement returns. Float held.

NOTE: Invert Preflush and Invert Spacer pumped by C & A.

Paramount Arrowhead
Intermediate Casing / January 31, 1998 / #60259 - 60260



PARAMOUNT RESOURCES LTD.

CASING SUMMARY

WELL NAME Paramount Berkley Arrowhead LOCATION N-65 DATE 98/02/06

SURFACE ( ) INTERMEDIATE (2) PRODUCTION ( ) LINER ( )

Size: 339.7mm

KB: 6.7 m

KB - CF: 6.97 m

NO.	DESCRIPTION	MEASURED LENGTH	KB Depth
58	177.8 mm, 38.69 kg/m, N80, LT&C	806.01	
	liner c/w Cardium spaded float shoe,		
	latch float collar, Cardium extended		
	bbl rotating liner hanger c/w		
	pack off element for a total length of		
	806.01 m. Overlap inside 244 mm		
	liner 167 m.		
	TOP OF LINER ASSEMBLY 1723.99 M		
	LANDED DEPTH 2529 M		
	Scratchers		
	Centralizers		

Total String	806.01	
minus KB to Csg Top (STICK UP)		Cut-off
Landed Depth KB	2529.00	Jt. Length
Hole Depth KB		
Distance Csg Landed Off Bottom		

Cementing Company Sanjel

Wash-Type _____ Volume: _____

Cement Type Lead Slurry see attached cementing reports Volume: _____

Additives _____

Cement Type Tail Slurry _____ Volume: _____

Additives _____

Cement Type Above Stage Collar _____ Volume: _____

Additives _____

Displacement Rate: Max _____ m3/min Average _____ m3/min

Calculated Cement Top(s): (fill) _____ mKB (tail) _____ mKB

Returns: Mud _____ Cement 2 m3

String Wt. in Mud Wt of: _____ kg/m3 = _____ daN

Wt. set on slips: _____ daN

Remarks: _____

Supervisor _____

PARA-CSG_SUM2.xls

SANJEL CEMENTERS LTD. [illegible]	DATE: February 07, 1998 TICKET NUMBER: 59590	SANJEL CEMENTERS LTD.

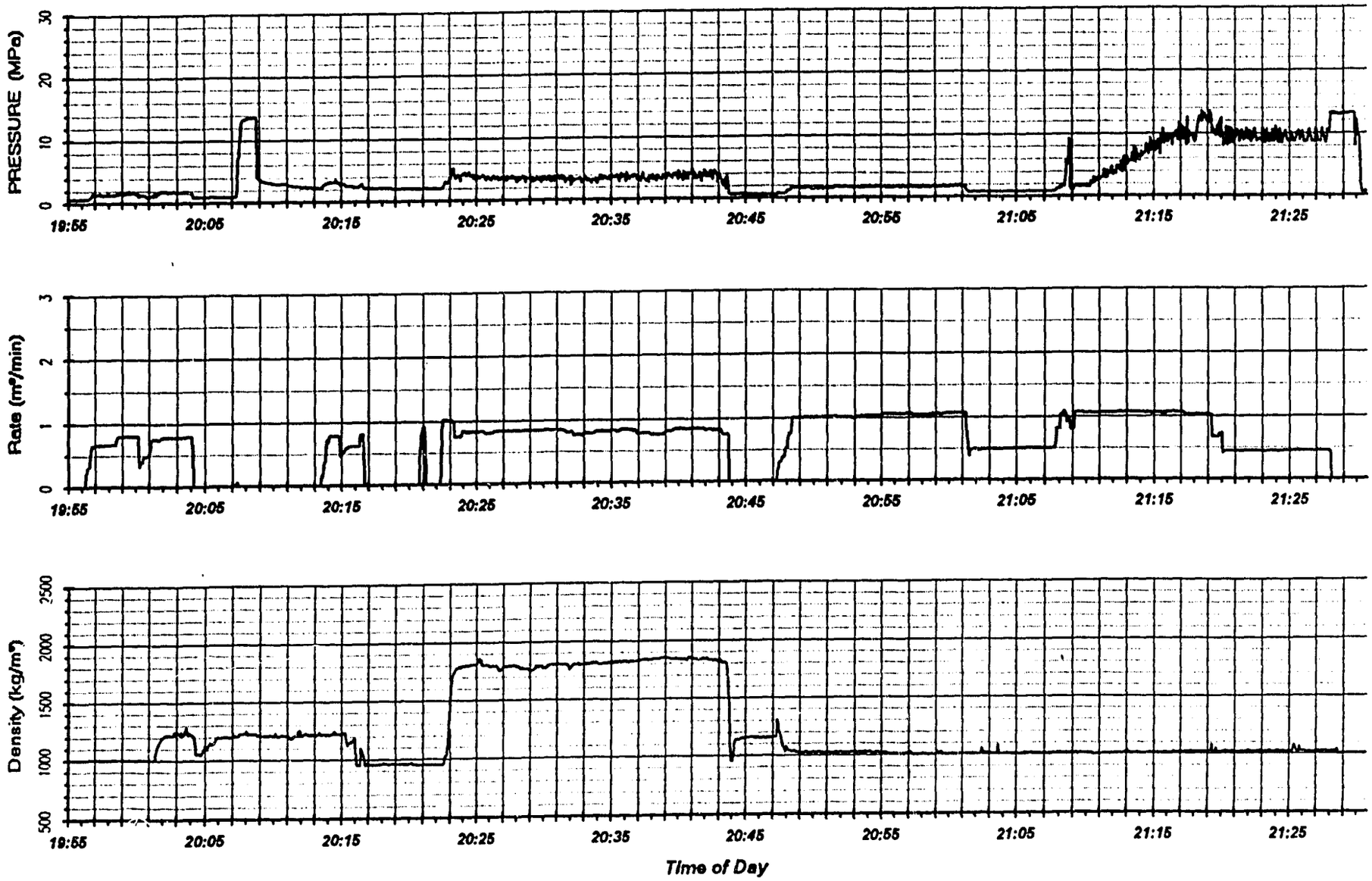
WELL NAME:	Paramount et al Arrowhead	TYPE OF JOB:	Liner
COMPANY REPRESENTATIVE:	Rod McEachern	SANJEL REP.:	Richard Harasen UNIT #: 4405
L.S.D:	N-65	PDM OPERATOR:	SAM

[illegible]		TUBULARS				SPECIAL TOOLS	
Hole Size	mm	Size 177.8 ~~30.00~~ mm	Weight 38.69 kg/m	Interval	1724 m to 2530 m	Type	Liner Hanger
Depth	2530 m	Size mm	Weight kg/m	Interval	1890 m to 2530 m	Depth	1724 m
Drill Pipe Size	mm	Size mm	Weight kg/m	Interval	1724 m to surface	Type	
Weight	kg/m	Size mm	Weight kg/m	Interval		Depth	m
Interval		Perforations at					

[illegible]	[illegible]	[illegible]	[illegible]
19.5	Thermal 40 + 1.0% CFR + 0.35% CFL-2 + 0.35% CFL-H + 0.8% HTR-B + 1.3% LTR	1885	14.6

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fill Lines	19:57	3.0	0.7	1.0	Invert preflush
Invert Spacer	20:02	2.0	0.8	2.0	Invert spacer @ 1200 kg/m³
Pressure Test	20:08			13.0	
Invert Spacer	20:16	1.0	0.6	2.0	Invert spacer @ 1200 kg/m³
Fill Cement	20:23	14.6	1.0	4.0	Thermal 40 mixed @ 1885 kg/m³
Drop Plug	20:43				Pump out lines
Displacement	20:48	31.7	1.0 - 0.4	1.0 - 10.0	H_2O
Bump Plug	21:28			13.0	Float held. Job complete.

Paramount et al Arrowhead / N-65
Liner / February 6, 1998 / #59590



LINER #2

CASING SUMMARY

WELL NAME PARAMOUNT ET AL. LOCATION _ ARROWHEADN65 DATE: 98-02-23/24

SURFACE ( ) INTERMEDIATE ( ) PRODUCTION ( ) LINER#2 (^)

Size:139.7

KB: 6.7 m

KB - CF: 6.97M

NO.	DESCRIPTION	MEASURED LENGTH	KB Depth
39	139.7MM,25.3KG/M,L80,RG.3,FLUSH HYD 511,ALGOMA,NEW,	553.33	
1	1-SMITH INTERNATIONAL LINER HANGER.	2.73	
	Scratchers		
	Centralizers		

	Total String	556.06	
minus	KB to Csg Top (STICK UP)		Cut-off
	Landed Depth KB	2858.09	Jt. Length
	Hole Depth KB	2925.00	
	Distance Csg Landed Off Bottom	68.91	

Cementing Company SANJEL

Wash-Type H2O Volume: 1.M3

Cement Type Lead Slurry THERIMAL 40.,7 TONNES DENSITY 1885KG/l Volume: 5.2 M3

Additives 1% CFR. .89% CFL2. . 1.2% LTR..7% H+R-B.

Cement Type Tail Slurry Volume:

Additives

Cement Type Above Stage Collar Volume:

Additives

Displacement Rate: Max 0.7 m3/min Average 0.5 m3/min

Calculated Cement Top(s): (fill) mKB (tail) mKB

Returns: Mud FULL Cement m3

String Wt. in Mud Wt of: 1075 kg/m3 = 57,000 daN

Wt. set on slips: daN

Remarks: LINER DIFFERENTIAL STUCK @ 2858.09M KB. CEMENTED LINER @ THIS DEPTH.FULL RETURN ON CEMENT JOB , PUT 30M CEMENT PLUG ON TOP OF THE LINER TOP.

Supervisor ROD. MacEACHERN

CSG_SUM4.XLS

SANJEL CEMENTERS LTD.

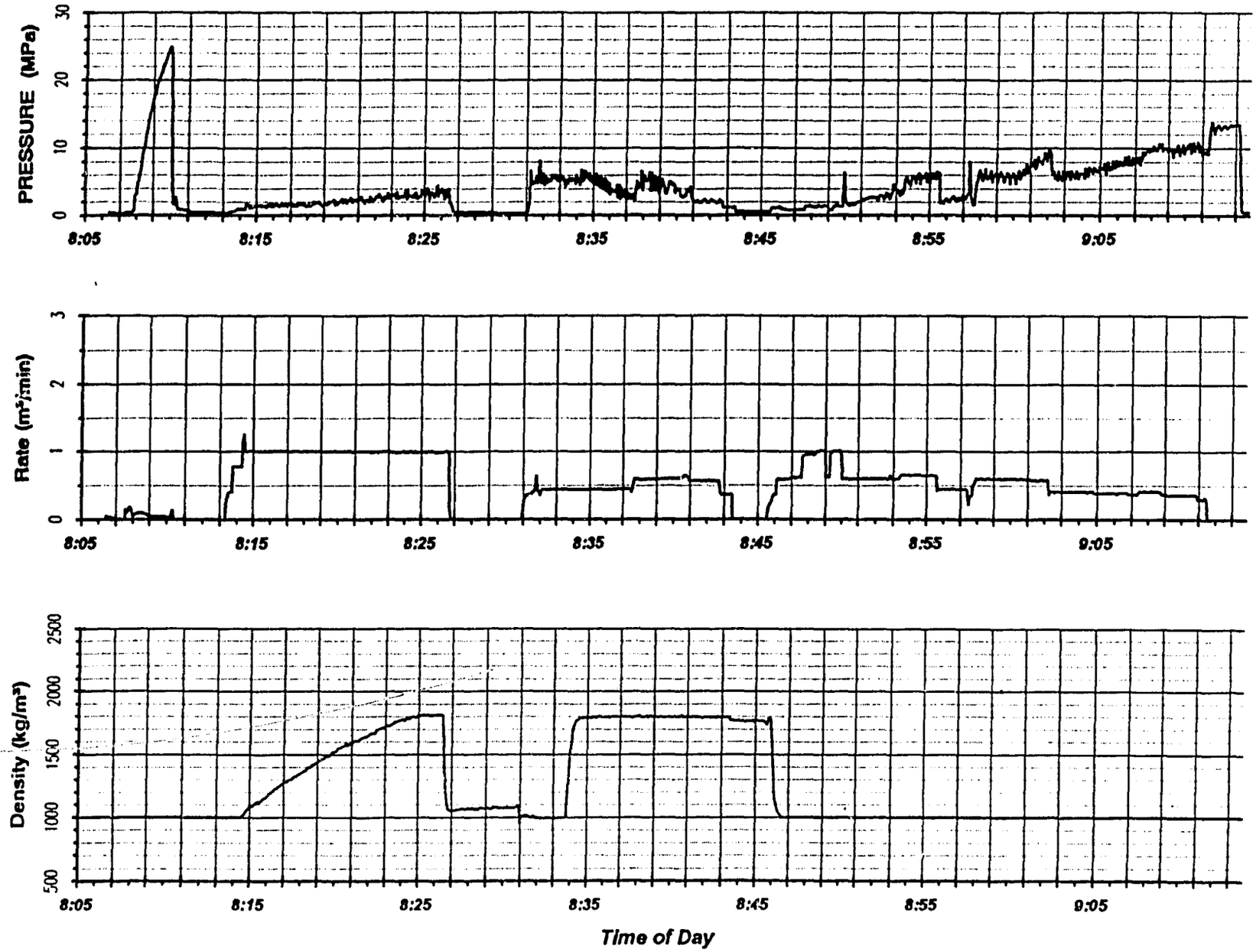
DATE:	February 24, 1998		
TICKET NUMBER:	60676		
WELL NAME:	Paramount et al Arrowhead	TYPE OF JOB:	Liner
COMPANY REPRESENTATIVE:	Rod McEachern	SANJEL REP.:	Richard Harasen — UNIT #: 4405
L.S.D:	N-65	PDM OPERATOR:	SAM

WELL DATA		TUBULARS				SPECIAL TOOLS	
Hole Size	mm	Size	139 mm	Weight	25.3 kg/m	Interval	2302.71 m to 2855.09 m	Type	Liner Hanger
Depth	2302.71 m	Size	mm	Weight	kg/m	Interval	2529 m to 2930 m	Depth	2299.94 m
Drill Pipe Size	mm	Size	mm	Weight	kg/m	Interval	2299.94 m to surface	Type	
Weight	kg/m	Size	mm	Weight	kg/m	Interval		Depth	m
Interval		Perforations at							

TIMES	CEMENT BLEND	DENSITY (kg/m³)	SLURRY VOLUME (m³)
7.0	Thermal 40 RAS + 1.0% CFR + 1.2% LTR + 0.7% HTR-B + 0.8% CFL-2	1885	5.2

	TIME	VOLUME (m³)	RATE (m³/min)	PRESSURE (MPa)	REMARKS
Pressure Test	08:09			25.0	
Preflush	08:14	1.0	1.2	1.0	H_2O
Batch Mix	08:15	7.0 L	1.0	1.0	Thermal 40 RAS + Additives batch mixed.
Cement	08:34	5.2	0.4	6.0	Thermal 40 RAS + Additives mixed @ 1885 kg/m³
Drop Plug	08:43				Pump out lines
Displacement	08:46	13.7	0.6 - 0.4	1.0 - 9.0	H_2O
Bump Plug	09:12			13.0	Float held.

Paramount et al Arrowhead / N-65
Liner / February 24, 1998 / #60676



PARAMOUNT BERKLEY ARROWHEAD N-65

MUD DATA

KBLAP 1

CONCORD DRILLING FLUIDS LTD.

WELL DATA RECAP & SUMMARY
TABLE 5
DRILLING FLUIDS

OPERATOR	PARAMOUNT RESOURCES	SPUD IN DATE	98-01-15	MUD VANS ON LOCATION	YES
WELL NAME	PARAMOUNT ARROWHEAD	DRILL OUT DATE	98-01-24		
LOCATION	N-65	T.D. DATE	98-02-14	HI - BOY ON LOCATION	NO
PROVINCE	NWT	RELEASE DATE	98-02-24		
CONTRACTOR	NABORS #16	TOTAL DEPTH m.	2925	PALLETS or TARPS USED	NO
CONCORD REP.	GARTH SHEWCHUK	TOTAL # DAYS	40		

SURFACE HOLE INTERVAL

HOLE SIZE mm.	444		
INTERVAL m.	0 - 480		
CASING SIZE mm.	339.7		
MUD SYSTEM	GEL CHEMICAL		
DRILLING HRS.	90.5	# BITS	3
REAMING HRS.		# DAYS	8
MUD COSTS	$8,264		

Spudded surface hole on January 15, 1998 with Gel Chemical. Drilled to 480 meters with minor lost circulation.

Ran and set 339.7 mm surface casing with no problems. Cemented.

		AVERAGE MUD COST / M.	$17.22
TOTAL METRES	480	AVERAGE R.O.P. M. / HR.	5.30

INTERMEDIATE HOLE INTERVAL

HOLE SIZE mm.	311		
INTERVAL m.	480 - 1890		
CASING SIZE mm.	244		
MUD SYSTEM	AIR		
DRILLING HRS.	61	# BITS	3
REAMING HRS.		# DAYS	5
MUD COSTS	N/A		

Drilled with air to 1890 meters with no hole problems.

Ran Casing and cemented with no hole problems.

		AVERAGE MUD COST / M.	$147.23
TOTAL METRES	686	AVERAGE R.O.P. M. / HR.	3.22

PRODUCTION HOLE INTERVAL

HOLE SIZE mm.	216		
INTERVAL m.	1890 - 2530		
CASING SIZE mm.	177		
MUD SYSTEM	AIR / D-VIS OPEN HOLE OIL		
DRILLING HRS.	37.5	# BITS	3
REAMING HRS.		# DAYS	8
MUD COSTS	$18,600		

Drilled with Air from 1890 metres to 2515 meters. Displaced hole to "D-VIS OPEN HOLE OIL" and drilled from 2515 - 2530 meters. Water invasion into oil from cementing the liner. Required 'hot lime' additions to absorb water out of the oil.

		AVERAGE MUD COST / M.	$29.06
TOTAL METRES	640	AVERAGE R.O.P. M. / HR.	17.07

BOTTOM HOLE INTERVAL

HOLE SIZE mm.	156		
INTERVAL m.	2530 - 2925		
CASING SIZE mm.	139.7		
MUD SYSTEM	NITROGEN / FOAM		
DRILLING HRS.	38.75	# BITS	2
REAMING HRS.	2	# DAYS	19
MUD COSTS	$137,722		

Drilled with Nitrogen from 2530 - 2630 meters. No geological samples.

Drilled with foam and nitrogen from 2630 - 2925 meters. Took on formation water near total depth of .6 - 1.0 m3 / min. It was decided to mud up with Polymer to the formation water and treat losses with Calcium Carbonate.

The well was logged. A 139.7 mm Liner was run. The liner got stuck at 2856 meters; cemented.

Bottom Hole Temperature = 150° C

		AVERAGE MUD COST / M.	$348.66
TOTAL METRES	395	AVERAGE R.O.P. M. / HR.	10.19

PRODUCTS USED							
GEL	463	HOT LIME	60	CALCIUM CARB.	429	ULTRA SEAL	48
BARITE	693	KWIK SEAL	5	DEFOAMER	1	UNI-FOAM	26
CAUSTIC SODA	61	X-CIDE 207	14	LIGNITE	10	VISCOM	28
VIS PLUS	40	SAWDUST	207	RHODOPOL	20	BENTONE 150	30
.BE	12	SODA ASH	2	RHODOCOMP	45	INHIBOX	16
.R D	15 m³	ZINC CARBONATE	21	SAPP	4	CEMENT	6
				SAFE T COAT	46		

ITEM / COST SUMMARY	DEPTHS m.	COSTS		
CIRCULATION (SURF)			INVOICED MUD COST	$184,585.28
CIRCULATION (MAIN)	2600 - 2926	$73,000.00	MUD COST / METRE	$56.27
ID LEG COST			EQUIPMENT RENTALS	$2,475.00
			TRUCKING COSTS	$21,455.00
M. JNGS			VAN / HIBOY RENTAL	$2,700.00
ANHYDRITE			SERVICE COSTS	$9,500.00
MUD BREAKERS			RESTOCKING	$173.90
SLOUGHING HOLE			TOTAL GST	$14,062.52
			TOTAL COSTS	$214,965.7

CONCORD FIELD REP.	GARTH SHEWCHUK	PHONE #	403 234 7771
CONCORD SALES REP.	DAN ANDERSON	PHONE #	250 785 4715

PARAMOUNT BERKLEY ARROWHEAD N-65

FORMATION LEAK-OFF TESTS

FALCON
PRESSURE TESTERS LTD.

8704 - 107th Street, Fort St. John, B.C. V1J 5R6 TELEPHONE (604) 785-4540

FORMATION PRESSURE TEST

Oil Company Paramount Res Date 98-1-24

Location Lat 60°-34' Long 122°-57' Contractor Nabour's #16

Piston Size 25 mm

Stroke Length 79 mm

Depth of Casing 480

Depth Drilled Out 490

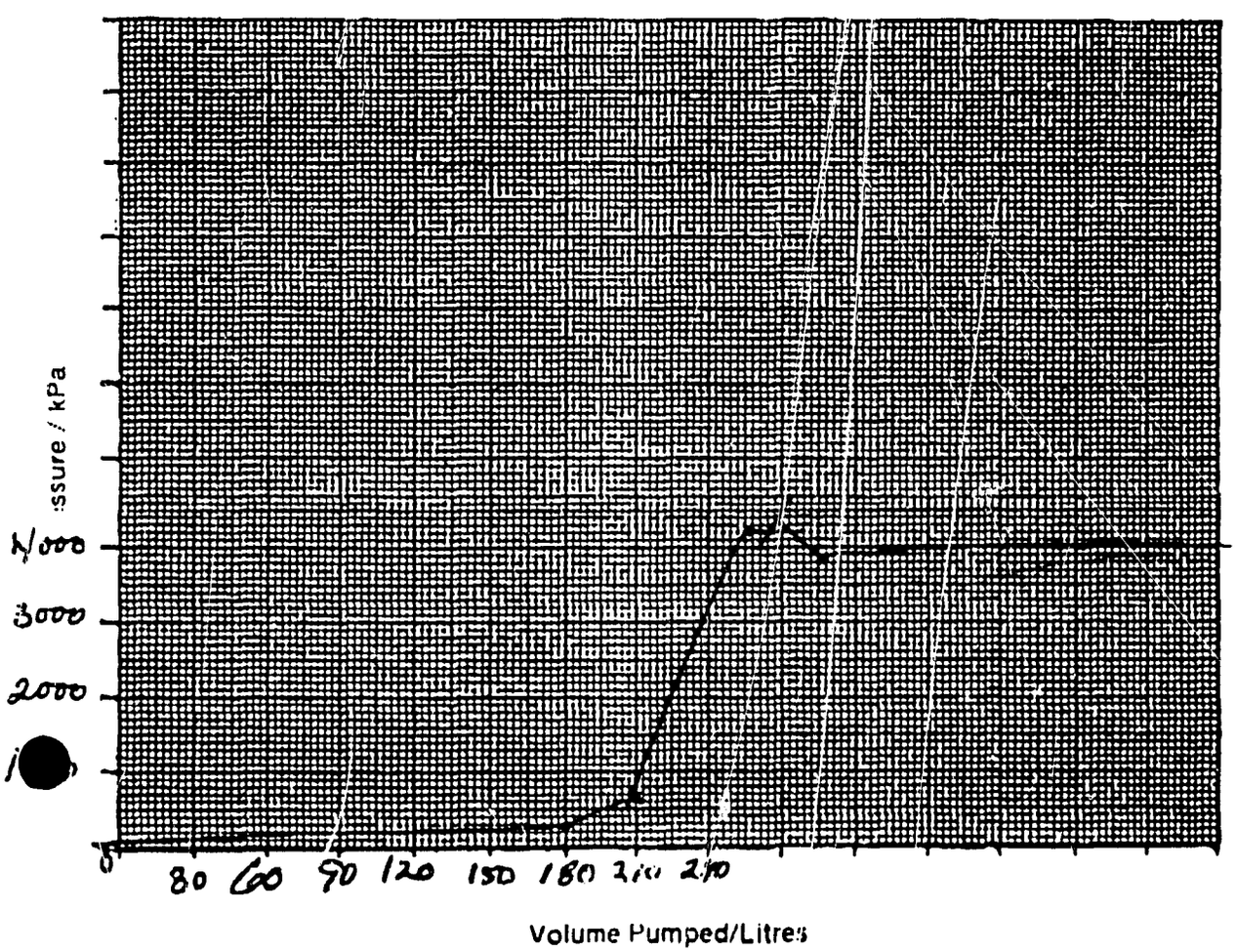
Gradient of Fluid in Hole 1050

Hydrostatic Pressure 4944

Leak-Off Pressure 4176

Total Pressure at Shoe 9020

Formation Gradient 18.79

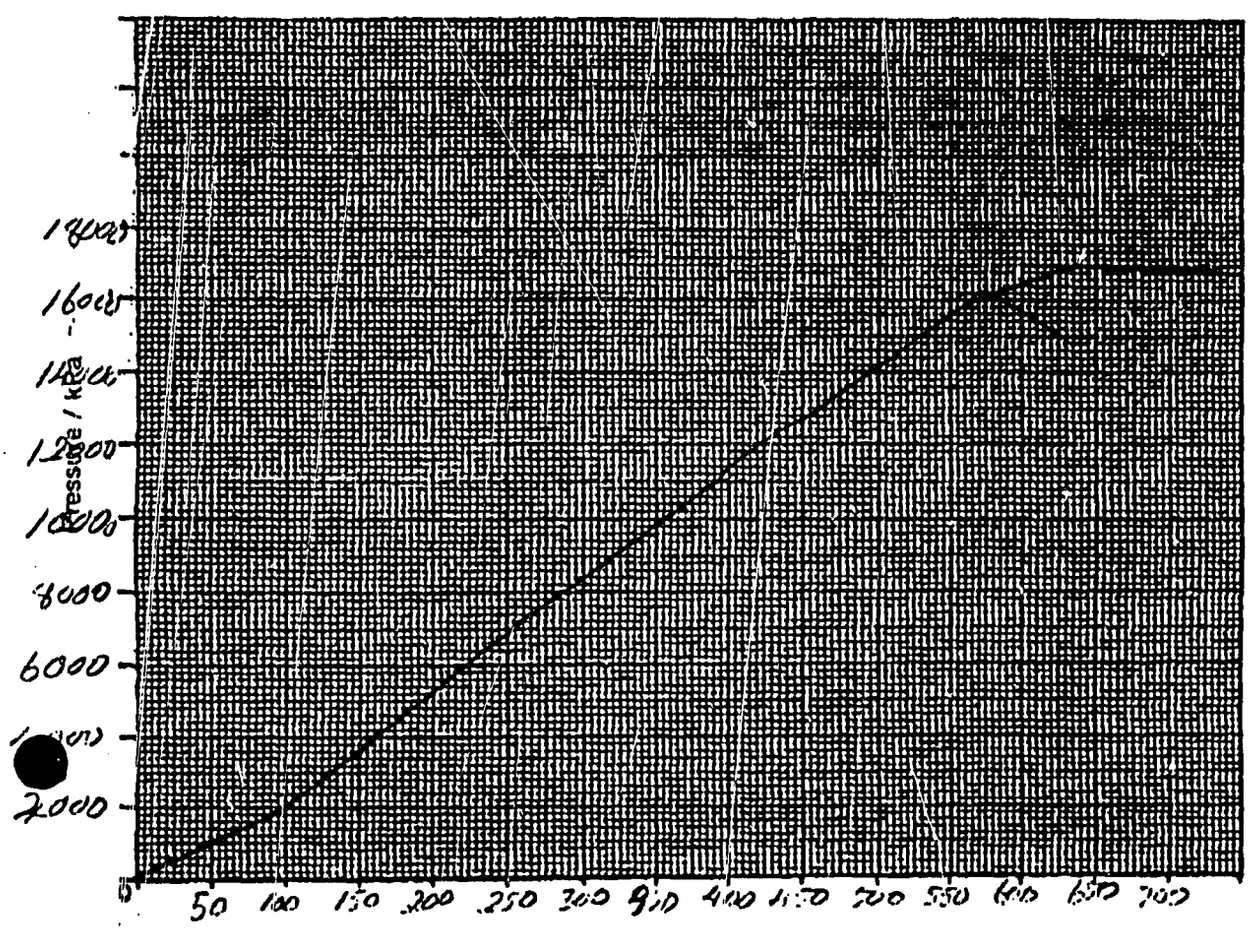


FALCON
PRESSURE TESTERS LTD.
8704 - 107th Street, Fort St. John, B.C. V1J 5R6 TELEPHONE (604) 785-4540

FORMATION PRESSURE TEST

Oil Company PARAMOUNT RESOURCES Date FEB 02/98
Location LAT 60-34 - Long 122-57 Contractor NABORS 16

Piston Size 25.4 MM
Stroke Length 80 MM
Depth of Casing 1890
Depth Drilled Out 1893m/KB
Gradient of Fluid in Hole 9.81
Hydrostatic Pressure 18540
Leak-Off Pressure 17000
Total Pressure at Shoe 35540
Formation Gradient 18.80



266-6032

PARAMOUNT BERKLEY ARROWHEAD N-65

TIME DISTRIBUTION

DRILLING RIG TIME DISTRIBUTION

PARAMOUNT BERKLEY ARROWHEAD N-65

	JANUARY																	FEBRUARY					
DATE	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6
DAYS FROM SPUD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
DRILLING	13	15.25	21.25	17	19	15	15	5.5					11.25	19.25	21.5	8				1.75	10.75	15.75	3.25
TRIPS		6.75		5.5	3.5	6	6	5		1.5	0.5	1.5	4	2.5		8.25	13.75			4.5	7	7.75	15.5
RIG SERVICE		0.75	0.5	0.5	0.25	0.5	0.5				0.25	3	0.5	0.5	0.5	0.25	1.25	0.25	0.25	0.25	0.5		0.75
SURVEY	1.5	1.25	2.25	1	0.75	0.75	0.75	1				0.25	2	1.25	2	2					2.5		1
REAM & COND																							
COND MUD	3.5																						
CIRCULATE					0.5	1	1	3.5		0.25		0.5		0.5		1.25	7.5		5.5	3.25	2.5		2.5
RIG REPAIRS						0.75	0.75																
CSG & CMT								9	6.25									8.75	11.75				
FISHING																							
LOGGING																		7.5					
CORING																							
TESTING																							
WAITING TIME																							
NU & PT									17.75	22.25	6.5								6	10.75			
DRILL OUT											16.75	11								3.5			
LOST CIRC																							
LD DP & DC																							
PLUG/ABAND																							
RIG UP OTHER	5											7.75	6.25			4.25	1.5	7			0.75		0.75
SAFETY MTG	1																	0.5	0.5			0.5	0.25
TOTAL	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24

TABLE 2
TIME DISTRIBUTION

DRILLING RIG TIME DISTRIBUTION

PARAMOUNT BERKLEY ARROWHEAD N-65

7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL	
24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
6.25				6	9	18.25		7											259	DRILLING
5.25	7.5		3.5		4.75		8.5	2.5	4	7	8.5	5.5	8	6	6.5	12.25		7.75	197	TRIPS
0.25	0.25	0.5	0.25	0.25	0.5	0.5	0.25	0.25		0.25	0.25	0.5	0.5	0.25	0.25	0.5		0.25	17	RIG SERVICE
0.75																			21	SURVEY
		2.5						2			2.5	3							10	REAM & COND
									4.75										8.25	COND MUD
5	4.25			14	5.75	4.75	13.5	0.5		6.75	3	15	0.75	1.5	5.25	7.5		3.25	120.5	CIRCULATE
				2			1.75							2.25					7.5	RIG REPAIRS
2.5	11.25															2	24	1.5	77	CSG & CMT
																			0	FISHING
									4.75	5	7.75		14.75	14	12	1.75			67.5	LOGGING
																			0	CORING
																			0	TESTING
								11.75	10.5	5									27.25	WAITING TIME
1			2.75		4													0.5	71.5	NU & PT
				1.75															33	DRILL OUT
																			0	LOST CIRC
		19																8.75	27.75	LD DP & DC
																			0	PLUG/ABAND
2.75	0.5	1.75	17.5								2							2	59.75	RIG UP OTHER
0.25	0.25	0.25				0.5													4	SAFETY MTG
																			0	
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	1008	TOTAL

PARAMOUNT BERKLEY ARROWHEAD N-65

DEVIATION RECORD

DEVIATION SURVEY RECORD

Depth (m)	Deviation	Azimuth	Depth (m)	Deviation	Azimuth
46m	1		2155m	4	
64m	3/4		2241m	2 1/4	
83m	0		2270m	4 1/8	
100m	0		2300m	5	
127m	1/4		2308m	5	
145m	1/2		2385m	3	
173m	1		2414m	2 3/4	
183m	0		2443m	2 7/8	
199m	1/4		2471m	2	
227m	1/4		2503m	1	
242m	3/4		2529m	1	
266m	1/2				
284m	1/2				
303	1/2				
323	1/2				
342m	3/4				
361	1/2				
380m	1/2				
404m	1				
424m	1				
443m	1/2				
462m	2				
471m	2				
480m	1 3/4				
522m	2				
627m	3				
650	2 1/4				
737m	1				
824m	3/4				
920m	3/4				
1014m	1				
1106m	1				
1220m	1				
1330m	3/4				
1445m	1				
153m	1 1/2				
1618m	1 3/4				
1700m	2				
1806m	2				
1884m	2 1/4				
1890m	2 3/4				
1956m	3				
1984m	3				
2012m	2				
2099m	2				

WELLTYPE: WELL98 CLIENT: PARAMOUN Attn: Greg Elliot

Well Name: N65
FEB. 4/98 Computation Method: 1 (Minimum Curvature)
Plane Of Vert Section 0.00 Height Of TVD Origin Above Field Datum 0.00
Distance Units used m Dogleg Base Length Used 30
Grid Convergence 0.000 Magnetic Declination 0.000

MD	Inc	Dir	Tvd	Vsec	Lat	Dep	Build	Turn	Dleg	Tool
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
480.0	1.75	0.00	479.9	7.3	7.3	0.0	0.1	0.0	0.1	
522.0	2.00	0.00	521.9	8.7	8.7	0.0	0.2	0.0	0.2	
550.0	2.00	0.00	549.9	9.7	9.7	0.0	0.0	0.0	0.0	
588.0	2.13	0.00	587.9	11.0	11.0	0.0	0.1	0.0	0.1	
627.0	3.00	0.00	626.8	12.8	12.8	0.0	0.7	0.0	0.7	
650.0	2.25	0.00	649.8	13.8	13.8	0.0	-1.0	0.0	1.0	
737.0	1.00	0.00	736.8	16.3	16.3	0.0	0.4	0.0	0.4	
824.0	0.75	0.00	823.8	17.6	17.6	0.0	-0.1	0.0	0.1	
920.0	0.75	0.00	919.7	18.9	18.9	0.0	0.0	0.0	0.0	
1014.0	1.00	0.00	1013.7	20.3	20.3	0.0	0.1	0.0	0.1	
1106.0	1.00	0.00	1105.7	21.9	21.9	0.0	0.0	0.0	0.0	
1220.0	1.00	0.00	1219.7	23.9	23.9	0.0	0.0	0.0	0.0	
1330.0	0.75	0.00	1329.7	25.6	25.6	0.0	-0.1	0.0	0.1	
1445.0	1.00	0.00	1444.7	27.4	27.4	0.0	0.1	0.0	0.1	
1533.0	1.50	0.00	1532.7	29.3	29.3	0.0	0.2	0.0	0.2	
1618.0	1.75	0.00	1617.6	31.7	31.7	0.0	0.1	0.0	0.1	
1700.0	2.00	0.00	1699.6	34.4	34.4	0.0	0.1	0.0	0.1	
1806.0	2.00	0.00	1805.5	38.1	38.1	0.0	0.0	0.0	0.0	
1884.0	2.25	0.00	1883.5	41.0	41.0	0.0	0.1	0.0	0.1	
1890.0	2.75	0.00	1889.5	41.2	41.2	0.0	2.5	0.0	2.5	
1956.0	3.00	0.00	1955.4	44.5	44.5	0.0	0.1	0.0	0.1	
1984.0	3.00	0.00	1983.3	46.0	46.0	0.0	0.0	0.0	0.0	
2012.0	2.00	0.00	2011.3	47.2	47.2	0.0	-1.1	0.0	1.1	
2099.0	2.00	0.00	2098.2	50.3	50.3	0.0	0.0	0.0	0.0	
2155.0	4.00	0.00	2154.2	53.2	53.2	0.0	1.1	0.0	1.1	
2182.0	3.50	0.00	2181.1	55.0	55.0	0.0	-0.6	0.0	0.6	
2212.0	2.75	0.00	2211.1	56.6	56.6	0.0	-0.8	0.0	0.7	
2241.0	2.25	0.00	2240.0	57.9	57.9	0.0	-0.5	0.0	0.5	
2270.0	4.13	0.00	2269.0	59.5	59.5	0.0	1.9	0.0	1.9	
2300.0	5.00	0.00	2298.9	61.9	61.9	0.0	0.9	0.0	0.9	
2308.0	5.00	0.00	2306.9	62.6	62.6	0.0	0.0	0.0	0.0	
2330.0	4.00	0.00	2328.8	64.3	64.3	0.0	-1.4	0.0	1.4	
2349.0	4.00	0.00	2347.8	65.6	65.6	0.0	0.0	0.0	0.0	
2369.0	3.88	0.00	2367.7	67.0	67.0	0.0	-0.2	0.0	0.2	
2385.0	3.00	0.00	2383.7	67.9	67.9	0.0	-1.6	0.0	1.6	
2414.0	2.75	0.00	2412.6	69.4	69.4	0.0	-0.3	0.0	0.3	
2443.0	2.88	0.00	2441.6	70.8	70.8	0.0	0.1	0.0	0.1	
2474.0	2.00	0.00	2472.6	72.1	72.1	0.0	-0.8	0.0	0.8	

PARAMOUNT BERKLEY ARROWHEAD N-65

COMPOSITE WELL RECORD

4. GEOLOGY

Drill Cuttings	See following pages for sample descriptions
Sample Distribution:	Washed Cuttings, 5 meter intervals Surface to Total Depth Two Sets I.S.P.G., Calgary One Set Paramount
Cores	N/A
Lithology:	See following pages for descriptions
Stratigraphic Column	See Figure 2
Biostratigraphic Column	N/A

PARAMOUNT BERKLEY ARROWHEAD N-65

FORMATION TOPS (m)

GL: 567.9 M
K.B.: 574.6 M

FORMATION	PROGNOSIS	SAMPLE	LOGS	LOG/ SAMPLE SUBSEA
CRET SCATTER ✓	311	276 ?	491	+ 83.6
CRET GARBUTT ✓	349	328 ?	539	+ 35.6
MISS CHINKEH ✓			632	- 57.4
MISS FLETT ✓	451	628	635	- 60.4
MISS BANFF ✓	829	810	779	- 204.4
MISS EXSHAW ✓	1329	1318	1316	- 741.4
DEV KOTCHO ✓	1343	1329	1330	- 755.4
DEV TETCHO ✓	1720	1725	1728	- 1153.4
KAKISA ✓		1845	1844	- 1269.4
FT. SIMPSON ✓	1892	1870	1870	- 1295.4
DEV MUSKWA ✓	2542	2498		- 1923.4
SLAVE POINT ✓		2520		- 1945.4
WATT MTN ✓		2565		- 1990.4
SULPHUR PT ✓		2573		- 1998.4
NAHANNI ✓	2564	2639		- 2064.4
HEADLESS SH ✓		2740		- 2165.4
LANDRY (MANETOE) ✓		2768		- 2193.4
ARNICA ✓		2834		- 2259.4
TOTAL DEPTH	2864	2925		- 2350.4

PARAMOUNT BERKLEY ARROWHEAD N-65

DRILLING CUTTINGS &

LITHOLOGY DESCRIPTIONS

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
55 - 80	No sample - NO SAMPLE - predominant lost circulation material;
80 - 100	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, fair to poor intergranular porosity, no visual show, slightly calcareous, trace carbonaceous laminae in part; **SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part;
100 - 120	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, fair to poor intergranular porosity, no visual show, slightly calcareous, trace carbonaceous laminae in part; **SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part;
120 - 125	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part;
125 - 145	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, slightly silty in part;
145 - 175	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, slightly silty in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
175 - 195	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part, scattered argillaceous laminae; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, slightly silty in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite;
195 - 205	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite;
205 - 215	**SANDSTONE** - gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, slightly silty, occasionally calcareous in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
215 - 220	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
220 - 225	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, slightly silty, moderately siliceous in part, trace calcareous streaks in part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
225 - 230	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, slightly silty, moderately calcareous in part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part; **LIMESTONE** - white, translucent, cryptocrystalline, no visual show, no visible porosity, trace sandy streaks in part;
230 - 235	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, moderately calcareous in part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
235 - 255	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, moderately calcareous in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
255 - 275	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
275 - 295	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
295 - 315	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
315 - 335	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
335 - 355	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, trace silty streaks;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
355 - 385	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, with scattered argillaceous laminae, slightly silty, grading to **SILTSTONE** in part, trace kaolinitic in part, trace calcareous streaks in small part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks;
385 - 415	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, with scattered argillaceous laminae, slightly silty, grading to **SILTSTONE** in part, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks; **LIMESTONE** - white, translucent, cryptocrystalline, no visual show, no visible porosity, trace sandy streaks in part;
415 - 430	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks;
430 - 445	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks. trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks;
445 - 455	**SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous in part, trace silty streaks in small part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
455 - 470	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous in part, trace silty streaks in small part;
470 - 480	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous in part, trace silty streaks in small part;
TD SFC HOLE: 480M	
480 - 490	**SHALE** - medium gray, subfissile, rare pyrite, trace silty streaks in small part;
490 - 505	**SHALE** - medium gray, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SILTSTONE** - medium gray, salt and pepper, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite;
505 - 515	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SILTSTONE** - medium gray, salt and pepper, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SANDSTONE** - light gray, salt and pepper, quartz, trace chert, predominant siliceous cement, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, with scattered argillaceous laminae, slightly silty, grading to **SILTSTONE** in part, trace dolomitic streaks in small part, trace pyrite in small part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
515 - 525	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SILTSTONE** - medium gray, salt and pepper, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SANDSTONE** - light gray, salt and pepper, quartz, trace chert, predominant siliceous cement, very fine grained, subangular, well sorted, no visual show, no visible porosity, scattered argillaceous laminae, slightly silty, rare dolomitic streaks in small part, trace pyrite;
525 - 535	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SANDSTONE** - light gray, brown, quartz, trace chert, predominant siliceous cement, fine grained to very fine grained and some medium grained, subangular to subrounded, well sorted, light brown oil stain, milky white cut, no visible porosity, secondary dolomite cement in part, slightly argillaceous, slightly silty, trace pyrite;
535 - 540	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SANDSTONE** - light gray, brown, quartz, trace chert, predominant siliceous cement, fine grained to very fine grained and some medium grained, subangular to subrounded, well sorted, light brown oil stain, milky white cut, no visible porosity, secondary dolomite cement in part, slightly argillaceous, slightly silty, trace pyrite;
540 - 560	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;
560 - 580	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
580 - 600	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;
600 - 620	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;
620 - 630	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite; **SHALE** - Kaolin, white , fissile;
630 - 640	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite; **LIMESTONE** - brown, medium gray in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, slightly argillaceous in part, trace pyrite;
640 - 650	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite; **LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite;
650 - 660	**SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks; **LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
660 - 670	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks;
670 - 685	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks;
685 - 690	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, slightly argillaceous in part, slightly fossiliferous; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks;
690 - 695	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, trace coral fragments, microcrystalline to cryptocrystalline, no visual show, no visible porosity, slightly argillaceous in part, slightly fossiliferous; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, moderately calcareous, grading to Marlstone in part;
695 - 700	**SHALE** - medium gray, subfissile - fissile, soft, trace pyrite, trace micromicaceous, moderately calcareous, grading to Marlstone in part;
700 - 710	**SHALE** - medium gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous, grading to Marlstone in part;
710 - 730	**SHALE** - medium gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous, grading to Marlstone in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
730 - 750	**SHALE** - medium gray, becoming dark gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous, grading to Marlstone in part;
750 - 760	**SHALE** - medium gray, becoming dark gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous;
760 - 770	**SHALE** - dark gray, black, fissile, soft, slightly carbonaceous, trace pyrite;
770 - 780	**LIMESTONE** - mottled buff - light brown, fragmental in part, trace indistinct fossil fragments in part, microcrystalline to medium crystalline, dull yellow fluorescence, weak milky cut, no visible porosity, clean, slightly dolomitic with dolomite micro fracture fill (?), slightly fossiliferous;
780 - 785	**LIMESTONE** - medium gray, massive, trace indistinct fossil fragments in part, microcrystalline, no visual show, no visible porosity, moderately argillaceous, grading to calcareous SHALE in part, slightly fossiliferous;
785 - 790	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous;
790 - 800	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous; **SANDSTONE** - light gray - brown, predominantly quartzose, predominant siliceous cement, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly silty, trace dolomitic cement, trace pyrite; **LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline, no visual show, no visible porosity, clean, slightly fossiliferous;
800 - 805	**SHALE** - dark gray, black, fissile, soft, slightly carbonaceous, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
805 - 810	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous; **SANDSTONE** - medium gray, predominantly quartzose, predominant siliceous cement, very fine grained to silt grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, trace dolomitic cement, trace pyrite; **SHALE** - gray - green, soft, fissile, moderately calcareous, grading to calcareous Marlstone in part, scattered quartz grains floating;
810 - 815	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous; **SANDSTONE** - medium gray, predominantly quartzose, predominant siliceous cement, very fine grained to silt grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, trace dolomitic cement, trace pyrite;
815 - 830	**SHALE** - medium gray, dark gray in part, fissile, soft, moderately calcareous; **LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline, no visual show, no visible porosity, clean, slightly fossiliferous; **SHALE** - gray - green, soft, fissile, moderately calcareous, grading to calcareous Marlstone in part, scattered quartz grains floating;
830 - 840	**LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline to fine crystalline, no visual show, no visible porosity, clean, slightly fossiliferous;
840 - 850	**LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline to fine crystalline, no visual show, no visible porosity, clean, slightly fossiliferous; **LIMESTONE** - mottled buff - light brown, trace indistinct fossil fragments in part, microcrystalline to medium crystalline, <u>bright yellow fluorescence, streaming milky cut</u>, no visible porosity, clean, slightly oolitic, slightly fossiliferous;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
850 - 860	**SHALE** - medium gray, light gray in part, subfissile, moderately calcareous; **LIMESTONE** - mottled buff - light brown, trace indistinct fossil fragments in part, microcrystalline to medium crystalline, bright yellow fluorescence, streaming milky cut, no visible porosity, slightly oolitic, slightly fossiliferous, slightly argillaceous in part;
860 - 880	**SHALE** - medium gray, light gray in part, subfissile, moderately calcareous;
880 - 895	**SHALE** - medium gray, light gray in part, subfissile, moderately calcareous;
895 - 905	**SHALE** - medium gray, subfissile - fissile, soft, slightly calcareous in part, trace pyrite;
905 - 930	**SHALE** - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite;
930 - 955	**SHALE** - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite;
955 - 985	**SHALE** - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
985 - 1015	**SHALE** - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1015 - 1045	**SHALE** - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1045 - 1050	**SHALE** - dark gray, medium gray in part, fissile, soft, slightly carbonaceous, trace pyrite in small part, slightly calcareous;
1050 - 1080	**SHALE** - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1080 - 1100	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1100 - 1130	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1130 - 1160	SHALE - medium gray, becoming dark gray in part, subfissile, soft, slightly calcareous, trace pyrite in small part;
1160 - 1190	SHALE - medium gray, becoming dark gray in part, subfissile, trace calcareous in small part, scattered pyrite disseminated throughout;
1190 - 1220	SHALE - medium gray, becoming dark gray in part, subfissile, scattered pyrite disseminated throughout;
1220 - 1250	SHALE - medium gray, becoming dark gray in part, subfissile, scattered pyrite disseminated throughout;
1250 - 1280	SHALE - dark gray, medium gray in part, fissile, soft, slightly carbonaceous in small part, trace pyrite disseminated throughout;
1280 - 1300	SHALE - dark gray, medium gray in part, fissile, soft, slightly carbonaceous in small part, trace pyrite disseminated throughout;
1300 - 1305	SHALE - dark gray, brown in part, fissile, soft, slightly carbonaceous in small part, trace pyrite disseminated throughout;
1305 - 1315	SHALE - dark gray, brown in part, fissile, slightly carbonaceous, scattered pyrite crystals;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1315 - 1330	SHALE - medium gray in part, subfissile - fissile, moderately calcareous, marly in part, scattered pyrite disseminated throughout; SHALE - dark gray, brown in part, fissile, slightly carbonaceous, scattered pyrite crystals; SHALE - dark gray to black, brown in part, fissile, possible micro fractures in part, slightly carbonaceous, scattered pyrite crystals, trace calcareous streaks;
1330 - 1360	SHALE - medium gray in part, subfissile - fissile, moderately calcareous, marly in part, scattered pyrite disseminated throughout;
1360 - 1390	SHALE - medium gray in part, light gray in part, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1390 - 1420	SHALE - medium - light gray, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1420 - 1450	SHALE - medium - light gray, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1450 - 1480	SHALE - medium - light gray, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1480 - 1510	SHALE - medium - light gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite;
1510 - 1540	SHALE - medium - light gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite;
1540 - 1570	SHALE - medium - light gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite; SHALE - medium gray, subfissile - fissile, scattered pyrite disseminated throughout;
1570 - 1600	SHALE - medium gray, subfissile - fissile, scattered pyrite disseminated throughout;
1600 - 1630	SHALE - medium gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1630 - 1660	**SHALE** - medium gray, subfissile - fissile, becoming medium - dark gray brown in part, moderately calcareous, marly in part, trace pyrite;
1660 - 1690	**SHALE** - medium gray, subfissile - fissile, becoming medium - dark gray brown in part, moderately calcareous, marly in part, trace pyrite;
1690 - 1720	**SHALE** - medium gray, subfissile - fissile, becoming medium - dark gray brown in part, moderately calcareous, marly in part, trace pyrite;
1720 - 1725	**SHALE** - medium gray, dark gray brown, subfissile - fissile, moderately calcareous, trace pyrite in part;
1725 - 1735	**LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, trace pyrite;
1735 - 1750	**SHALE** - medium gray, dark gray brown, blocky, moderately calcareous, trace pyrite in part; **LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, grading to moderately argillaceous in part, trace pyrite;
1750 - 1755	**SHALE** - medium gray, dark gray in part, blocky, moderately calcareous, trace pyrite; **LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, grading to moderately argillaceous in part, trace pyrite;
1755 - 1760	**SHALE** - medium gray, dark gray brown, blocky, moderately calcareous, trace pyrite in part; **LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, trace pyrite;
1760 - 1770	**SHALE** - medium gray, blocky, moderately calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, grading to very fine grained **SANDSTONE** in part, no visual show, no visible porosity, slightly argillaceous in part, slightly calcareous;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1770 - 1775	SHALE - medium gray, blocky, moderately calcareous, trace pyrite in part, scattered SILTSTONE streaks; SILTSTONE - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous SHALE in part, slightly calcareous;
1775 - 1780	SHALE - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered SILTSTONE streaks; SILTSTONE - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous SHALE in part, trace calcareous streaks in part, becoming dolomitic in part, trace siliceous cement;
1780 - 1785	SHALE - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered SILTSTONE streaks; SILTSTONE - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous SHALE in part, trace calcareous streaks in part, becoming dolomitic in part, trace siliceous cement;
1785 - 1790	SHALE - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered SILTSTONE streaks;
1790 - 1800	SHALE - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered SILTSTONE streaks;
1800 - 1815	SHALE - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered SILTSTONE streaks; SILTSTONE - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous SHALE in part, trace calcareous streaks in part, becoming dolomitic in part, trace siliceous cement;
1815 - 1845	SHALE - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered SILTSTONE streaks;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1845 - 1850	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, grading to very fine grained **SANDSTONE** in part, no visual show, no visible porosity, slightly argillaceous in part, trace calcareous, becoming slightly dolomitic in part, trace siliceous cement;
1850 - 1860	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, moderately calcareous, grading to silty **LIMESTONE** in part, trace siliceous cement;
1860 - 1865	**SHALE** - medium gray, subfissile, blocky in part, slightly calcareous, trace pyrite in small part;
1865 - 1870	**SHALE** - medium gray, subfissile, blocky in part, slightly calcareous, trace pyrite in small part; **LIMESTONE** - medium gray brown, cryptocrystalline to microcrystalline, no visual show, no visible porosity, moderately argillaceous, trace pyrite, scattered silty streaks, grading in part to calcareous **SILTSTONE**; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, moderately calcareous, grading to silty **LIMESTONE** in part, trace siliceous cement;
1870 - 1890	**SHALE** - medium gray, blocky in part, moderately calcareous, trace pyrite disseminated throughout, scattered **SILTSTONE** streaks;

TD Intermediate Hole 1890m

1890 - 1905	**SHALE** - medium gray, subfissile - blocky, becoming light gray in part, moderately calcareous streaks, trace pyrite disseminated throughout, scattered **SILTSTONE** streaks in small part;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1905 - 1935	**SHALE** - medium gray, subfissile - blocky, becoming light gray in part, moderately calcareous streaks, trace pyrite disseminated throughout, scattered **SILTSTONE** streaks in small part;
1935 - 1965	**SHALE** - medium gray, subfissile - blocky, moderately calcareous streaks, trace pyrite disseminated throughout, trace **SILTSTONE** streaks in small part;
1965 - 1995	**SHALE** - medium gray, subfissile - blocky, slightly calcareous in part, trace pyrite disseminated throughout, trace **SILTSTONE** streaks;
1995 - 2025	**SHALE** - medium gray, subfissile - blocky, slightly calcareous in part, trace pyrite disseminated throughout, trace **SILTSTONE** streaks;
2025 - 2055	**SHALE** - medium gray, subfissile - blocky, scattered calcareous streaks, trace pyrite disseminated, trace **SILTSTONE** streaks in small part;
2055 - 2080	**SHALE** - medium gray, subfissile - blocky, scattered calcareous streaks, trace pyrite disseminated, trace **SILTSTONE** streaks in small part;
2080 - 2105	**SHALE** - medium gray, subfissile - blocky, slightly calcareous streaks, trace pyrite, trace **SILTSTONE** streaks in small part;
2105 - 2130	**SHALE** - medium gray, subfissile - blocky, slightly calcareous streaks, trace pyrite, trace **SILTSTONE** streaks in small part;
2130 - 2155	**SHALE** - medium gray, subfissile - blocky, slightly calcareous streaks, trace pyrite, rare **SILTSTONE** streaks in small part;
2155 - 2185	**SHALE** - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2185 - 2215	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2215 - 2245	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2245 - 2275	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2275 - 2305	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2305 - 2320	SHALE - medium gray, becoming dark gray, subfissile - blocky, rare clear dolomite (micro fracture fill ?), trace calcareous streaks in small part, trace pyrite;
2320 - 2335	SHALE - medium gray - dark gray, subfissile - blocky, rare clear dolomite (micro fracture fill ?), trace calcareous streaks in small part, trace pyrite;
2335 - 2350	SHALE - medium gray - dark gray, subfissile - blocky, rare clear dolomite (micro fracture fill ?), trace calcareous streaks in small part, trace pyrite;
2350 - 2380	SHALE - medium gray - dark gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2380 - 2400	SHALE - dark gray to medium gray, slightly brown in part, subfissile, slightly micromicaceous, trace pyrite, rare calcareous streaks in small part;
2400 - 2410	No sample - Blooey line problems;
2410 - 2430	SHALE - dark gray, subfissile, slightly micromicaceous, trace pyrite, rare calcareous streaks in small part;
2430 - 2435	SHALE - medium gray - dark gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite; SHALE - dark gray, subfissile, slightly micromicaceous, trace pyrite, rare calcareous streaks in small part;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2435 - 2445	**SHALE** - dark gray - black, brown in part, fissile - subfissile, slightly carbonaceous in part, scattered pyrite throughout, moderately calcareous;
2445 - 2455	**SHALE** - dark gray brown, fissile - subfissile, slightly carbonaceous in part, scattered pyrite throughout, slightly calcareous in part, becoming dolomitic in small part;
2455 - 2470	**SHALE** - medium gray - dark gray brown, subfissile - blocky, rare calcareous streaks, trace pyrite;
2470 - 2475	**SHALE** - medium gray - dark gray brown, subfissile - blocky, scattered calcareous and trace quartz veining, scattered calcareous fracture fill in part, trace calcareous streaks, trace pyrite;
2475 - 2490	**SHALE** - medium gray - dark gray brown, subfissile - blocky, scattered calcareous and trace quartz veining, scattered calcareous fracture fill in part, trace calcareous streaks, trace pyrite; **SHALE** - dark gray brown, subfissile, becoming black, fissile, slightly carbonaceous in part, trace pyrite throughout;
2490 - 2500	**SHALE** - black, fissile, slightly carbonaceous in part, scattered pyrite throughout;
2500 - 2505	**SHALE** - black, brown in part, fissile - subfissile, slightly calcareous, scattered pyrite throughout;
2505 - 2515	**SHALE** - black, brown in part, fissile - subfissile, moderately calcareous, scattered pyrite throughout;
2515 - 2520	**SHALE** - black, brown in part,, moderately calcareous streaks, grading to argillaceous **LIMESTONE** in part, scattered pyrite; **LIMESTONE** - light gray, brown, dark gray in part, mottled in part, microcrystalline to cryptocrystalline and some medium crystalline, fragmental in part with rare clear and translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace slickensides in part, rare oolitic streaks, scattered argillaceous laminae, scattered dolomitic streaks, occasional silty;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2520 - 2525	**SHALE** - black, brown in part, moderately calcareous streaks, grading to argillaceous **LIMESTONE** in part, scattered pyrite; **LIMESTONE** - dark gray, brown, light gray in part, mottled in part, microcrystalline to cryptocrystalline and some medium crystalline, scattered clear calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace slickensides in part, trace argillaceous laminae;
2525 - 2530	**LIMESTONE** - medium - dark gray, brown, light gray in part, mottled in part, microcrystalline to cryptocrystalline and some medium crystalline, scattered clear calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity;
TD Mainhole section	2530m
2530 - 2640	No sample - No sample returns while drilling with N2;
2640 - 2655	**LIMESTONE** - light gray, medium gray brown, occasionally mottled in part, microcrystalline and some medium crystalline, trace fracture porosity, scattered clear and white calcite fracture fill - trace euhedral crystals in part, no visual show, no visible porosity, scattered pyrite in part; **LIMESTONE** - light gray, medium gray brown, occasionally mottled in part, microcrystalline and some medium crystalline, scattered clear and white calcite fracture fill - trace euhedral crystals in part, no visual show, no visible porosity, scattered pyrite in part;
2655 - 2660	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline and some medium crystalline, scattered clear calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated;
2660 - 2665	No sample - No sample returns while drilling with N2;
2665 - 2680	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline and some medium crystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2680 - 2695	No sample - No sample returns while drilling with N2;
2695 - 2700	LIMESTONE - medium - dark gray brown, microcrystalline to cryptocrystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated;
2700 - 2720	LIMESTONE - medium - dark gray brown, microcrystalline to cryptocrystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite veining in part, rare dolomite fracture fill in small part, trace pyrite disseminated; LIMESTONE - medium - dark gray brown, microcrystalline to cryptocrystalline, trace fracture porosity in part, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining;
2720 - 2740	LIMESTONE - medium - dark gray brown, microcrystalline to cryptocrystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite veining in part, rare dolomite fracture fill in small part, trace pyrite disseminated; LIMESTONE - medium - dark gray brown, microcrystalline to cryptocrystalline, trace fracture porosity in part, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining;
2740 - 2745	LIMESTONE - medium - dark gray brown, occasionally light brown in part, microcrystalline to cryptocrystalline, trace white - translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, rare dolomitic fracture fill in small part, trace pyrite veining;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2745 - 2765	**LIMESTONE** - medium - dark gray brown, occasionally light brown in part, microcrystalline to cryptocrystalline, trace white - translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, rare dolomitic fracture fill in small part, trace pyrite veining;
2765 - 2770	**LIMESTONE** - medium - dark gray brown, light gray in part, microcrystalline to cryptocrystalline, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining in small part, trace dolomite streaks in part;
2770 - 2780	**LIMESTONE** - medium - dark gray brown, light gray in part, microcrystalline to cryptocrystalline, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining in small part, trace dolomite streaks in part; **DOLOMITE** - white, mottled light gray in part, medium crystalline to coarse crystalline and some microcrystalline, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen ?, rare pyrite in small part;
2780 - 2790	**LIMESTONE** - medium - dark gray brown, light gray in part, microcrystalline to cryptocrystalline, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining in small part, trace dolomite streaks in part; **DOLOMITE** - white, mottled light gray in part, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen ?, rare pyrite in small part;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2790 - 2795	**LIMESTONE** - medium - dark gray brown, light gray in part, cryptocrystalline and some microcrystalline, scattered white dolomite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **DOLOMITE** - light gray - medium gray, microcrystalline to fine crystalline and some cryptocrystalline, trace fracture porosity, no visual show, trace iron stain, no visible porosity, becoming slightly argillaceous in part, scattered dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks, trace argillaceous laminae;
2795 - 2800	**LIMESTONE** - medium - dark gray brown, dark gray - black in part, cryptocrystalline and some microcrystalline, scattered white dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **DOLOMITE** - light gray - medium gray, microcrystalline to fine crystalline and some cryptocrystalline, trace fracture porosity, no visual show, trace iron stain, no visible porosity, becoming slightly argillaceous in part, scattered dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks, trace argillaceous laminae;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2800 - 2805	**LIMESTONE** - medium - dark gray brown, dark gray - black in part, cryptocrystalline and some microcrystalline, scattered white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - light gray - medium gray, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, trace iron stain, no visible porosity, becoming slightly argillaceous in part, scattered dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks, trace argillaceous laminae;
2805 - 2810	**LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part;
2810 - 2815	**LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **DOLOMITE** - medium gray - light gray in part, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, trace iron stain, no visible porosity, occasionally slightly argillaceous in part, scattered white dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2815 - 2820	**LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - light gray, medium gray in part, cryptocrystalline to fine crystalline and some microcrystalline, no visual show, trace iron stain, no visible porosity, scattered white dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks;
2820 - 2825	**DOLOMITE** - light gray, medium gray in part, cryptocrystalline to fine crystalline and some microcrystalline, no visual show, trace iron stain, no visible porosity, common white dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks; **DOLOMITE** - white, semitranslucent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part;
2825 - 2830	**DOLOMITE** - light gray, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, common iron stain, no visible porosity, common white dolomite fracture fill, scattered pyrite in part, disseminated;
2830 - 2835	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, trace dolomite fracture fill;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2835 - 2840	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks; **SHALE** - dark gray, black in part, blocky, slightly calcareous, slightly dolomitic, trace pyrite;
2840 - 2845	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks;
2845 - 2847	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks; **LIMESTONE** - light gray, cryptocrystalline and some microcrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic in small part;
2847 - 2860	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part; **DOLOMITE** - white, semitranslucent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, trace dolomite fracture fill; **LIMESTONE** - medium gray - dark gray in part, cryptocrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks;

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Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2860 - 2865	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, trace white dolomite fracture fill in part, slightly calcareous streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, trace dolomite fracture fill; **LIMESTONE** - medium gray - dark gray in part, occasionally light gray in part, cryptocrystalline and some microcrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks;
2865 - 2875	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, trace white dolomite fracture fill in part, slightly calcareous streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, fracture fill in part; **LIMESTONE** - medium gray - dark gray in part, occasionally light gray in part, cryptocrystalline and some microcrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks;
2875 - 2885	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, trace white dolomite fracture fill in part, slightly calcareous streaks in part; **DOLOMITE** - dark gray, black in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, trace white dolomite fracture fill in part, rare calcareous streaks;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2885 - 2895	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, no visible porosity, trace white dolomite fracture fill in part, trace calcareous streaks in part; **DOLOMITE** - dark gray, black in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, trace white dolomite fracture fill in part, rare calcareous streaks;
2895 - 2905	**DOLOMITE** - gray, brown, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, no visible porosity, trace white dolomite fracture fill in part;
2905 - 2920	**DOLOMITE** - gray, brown, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, common iron stain, no visible porosity, rare white dolomite fracture fill in part, trace pyrite disseminated;
2920 - 2925	**DOLOMITE** - light gray, brown, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, scattered iron stain, scattered stylolite, no visible porosity, rare white dolomite fracture fill in part, trace pyrite disseminated; **DOLOMITE** - dark gray, black in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity;

TD DRILLER 2925m @1800Hrs 98-02-14

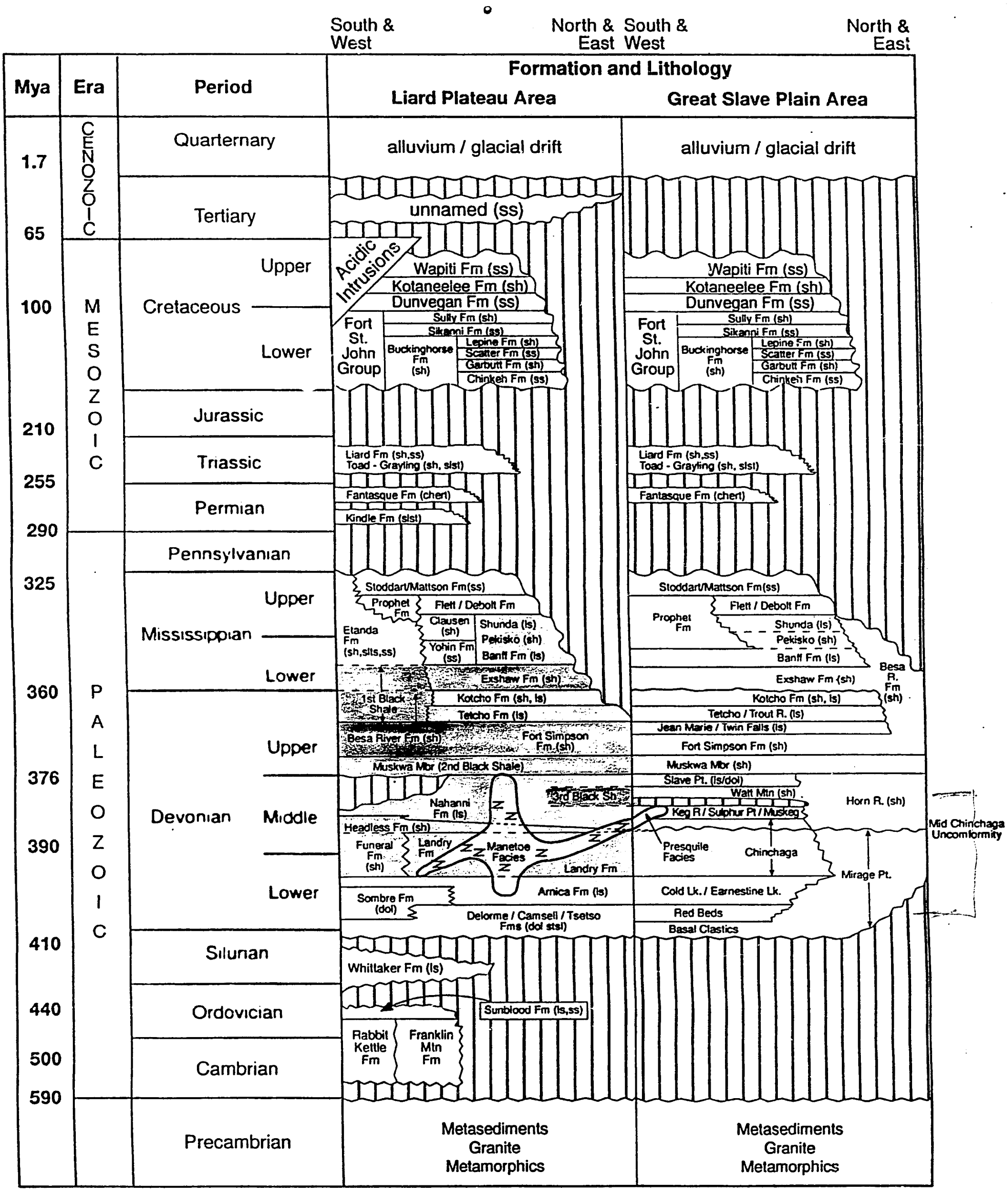
HYDROCARBON SHOW SUMMARY

FORMATION	INTERVAL	REMARKS
Sulphur Pt	2578	No samples - probable frac 20' flare for 3min
Sulphur Pt	2595	No samples - probable frac 3.1mmcf/d
"	2595-2635	avg 1.7mmcf/d
Sulphur Pt/ Nahanni	2636	28.65mmcf/d decr to 19mmcf/d decr to 8.5mmcf/d 2501/min 70,000 ppm
Nahanni	2640-2740	14mmcf/d decr steadily 10mmcf/d 1501/min 120,000ppm
Headless	2740-2768	10mmcf/d decr to 9mmcf/d 2501/min 98,000 ppm
Landry	2768-2812	9mmcf/d decr to 8mmcf/d
	2813	8mmcf/d incr to 10.5mmcf/d 1701/min 110,000 ppm
	2825	10mmcf/d 2001/min 130,000ppm
Arnica	2838-2847	12mmcf/d decr to 8mmcf/d 300 1/min 142,000ppm
	2847-2925	steady 8.5mmcf/d 300 - 600 1/min 130,000ppm

PARAMOUNT BERKLEY ARROWHEAD N-65

STRATIGRAPHIC COLUMN

Figure IV-1
Stratigraphic Chart



5. WELL EVALUATION

Downhole Logs (In Pocket, At The End)

TABLE 3 DOWNHOLE LOG SUMMARY OPEN HOLE LOGS

DATE RUN	TYPE	INTERVAL (m)
	WESTERN ATLAS	
Jan 30/98	High Definition Induction Gamma Ray	479 - 1884
	Compensated Z-Densilog, Compensated Neutron, Gamma Ray, XY Caliper	479 - 1871.1
	Digital Acoustilog, Gamma Ray, XY Caliper	0 – 1878
	Cement Volume	479 - 1878
	COMPUTALOG	
Feb 15/98	GRN	2503.4 – 2643
Feb 16/98	Temperature	1800 – 2543
Feb 17/98	Borehole Compensated Sonic (lost reading)	2524.8 – 2634.6
	SCHLUMBERGER	
Feb 19/98	Azimuthal Laterlolog	2529 – 2922.3
	Dipole Sonic Imager	1800 – 2918.7
	Platform Express compensated Neutron Lithodensity	1800 – 2926.4
	Platform Express Microlog	1800 – 2926.4

TABLE 4 DOWNHOLE LOG SUMMARY CASED HOLE LOGS

DATE RUN	TYPE	INTERVAL (m)
	COMPUTALOG	
Mar 11/98	Temperature	994 – 2822.7
	Sector Bond	2223 – 2822
Mar 12/98	Perforating	2568.8 – 2640
Mar 16/98	Sector Bond	2294 – 2660
Mar 21/98	Collar	2224 - 2774

Other Logs: N/A

Synthetic Seismograms: N/A

Formation Stimulation: See Attached Treatment Reports

Formation & Production Tests: No DST's were run, however, the Nahanni formation was drilled underbalanced (See attached underbalanced rates)

PARAMOUNT BERKLEY ARROWHEAD N-65

DETAILS OF FORMATION &

PRODUCTION TESTING

ENTEST CORP.

PARAMOUNT RESOURCES LTD.

et al Arrowhead N65
Underbalanced Drilling
02/07/98 – 02/23/98

DWIGHT DEVLIN

Report prepared by:
ENTEST Corp.
12-Mar-98

Today's: 22-Feb-98 Page: 1 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
					HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		Depth	Press	Hours	10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
		m	kPa													
02/09/98	15:00															
SAFETY AND PROCEDURE MEETING																
02/09/98	15:30															
CIRCULATE WELL OVER TO WATER																
02/09/98	17:00															
START TO DRILL OUT SHOE / RETURNS TO RIG TANK																
02/10/98	04:00															
PRESSURE TEST PRIMARY AND SECONDARY FLOW LINES TOO 21000 kPa																
02/10/98	04:45															
SAFETY MEETING																
02/10/98	05:34															
START TO RUN IN HOLE / START AIR INJECTION @ 35.00m³/min								0.00								
02/10/98	05:46	77.52	0.02													
FLUID TOO SURFACE								0.00								
02/10/98	05:50	86.13	0.02													
START FLUID INJECTION								0.00								
02/10/98	06:15	103.36	0.03													
SHUT DOWN AIR INJECTION								0.00								
02/10/98	06:45	137.81	0.04													
START AIR INJECTION @ 65.00m³/min								0.03								
02/10/98	07:18	835.50	0.11	187.77			187.77									
AIR TO SURFACE								0.76								
02/10/98	07:47	714.91	0.59	109.60	1.49		111.10									
LARGE SLUG OF FLUID AND AIR								6.08								
02/10/98	09:00	232.56	1.78	90.89	1.34		92.22									
CONTINUE INJECTING AIR TO DRY ANNULAR								10.14								
02/10/98	10:00	249.79	2.78	96.91			96.91									
CONTINUE INJECTING AIR, ANNULAR NOT DRY								14.14								
02/10/98	11:00	232.56	3.78	94.08			94.08									
CONTINUE INJECTING AIR, FLUID RETURNS STILL AT APPROX. 100 litres / 5 min.								16.08								
02/10/98	11:30	180.88	4.27	94.35			94.35									
CONTINUE PUMPING AIR TO DRY HOLE								18.93								
02/10/98	12:00	180.88	4.77	94.80			94.80									
CONTINUE INJECTING AIR, ANNULAR NOT DRY																

Today's: 22-Feb-98 Page: 2 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachem
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/10/98	13:00		155.04	5.77	92.81		92.81	22.85								
CONTINUE INJECTING AIR, ANNULAR NOT DRY																
02/10/98	14:00		146.43	6.76	91.27		91.27	26.61								
CONTINUE INJECTING AIR, ANNULAR NOT DRY																
02/10/98	15:35		155.04	8.33	94.59		94.59	32.86								
DRILL OUT 1 METER OF REMAINING SHOE TO CHECK FOR RETURNS																
02/10/98	16:00		120.59	8.75	67.37	28.70	96.07	34.50								
CONTINUE INJECTING AIR, ANNULAR NOT DRY																
02/10/98	17:00		111.97	9.74	68.15	26.01	94.16	38.38								
CONTINUE INJECTING AIR, ANNULAR NOT DRY																
02/10/98	18:00		120.59	10.72	68.70	26.86	95.56	42.26								
CONTINUE INJECTING AIR, ANNULAR NOT DRY																
02/10/98	18:05		120.59	10.80	69.35	26.51	95.85	42.59								
DRILL OUT 0.3 METERS TO CHECK RETURNS																
02/10/98	19:00		111.97	11.72	69.10	26.58	95.68	46.20								
CONTINUE BLOWING HOLE DRY																
02/10/98	20:00		111.97	12.71	69.12	27.01	96.13	50.14								
CONTINUE TO BLOW HOLE DRY																
02/10/98	20:08		94.75	12.84	63.83	28.78	92.61	50.67								
SHUT DOWN AIR INJECTION TO CHANGE WILLIAMS HEAD RUBBER																
02/10/98	23:20			13.03			0.00	50.89								
BEGIN TO CIRCULATE WITH N² AT 42m³/min																
02/10/98	23:22		146.43	13.05	63.65	31.16	94.81	50.96								
N² TOO SURFACE																
02/10/98	23:23		180.88	13.07		33.12	33.12	50.98								
DIRECT FLOW FROM HI STAGE TO LOW STAGE TO PURGE VESSELS																
02/11/98	00:53		146.43	13.54	92.06	51.14	143.20	54.30								
DRILL AHEAD / OPEN HI STAGE BACK PRESSURE																
02/11/98	01:00	2530.00	60.29	13.65	48.62	19.57	68.19	54.69								
02/11/98	01:30	2532.00	51.68	14.15	44.64	15.33	59.97	55.96								
02/11/98	02:00	2533.00	51.68	14.65	45.79	15.61	61.41	57.25								

Today's: 22-Feb-98 Page: 3 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth m	Inlet Press kPa	Prod Hours	GAS PRODUCTION HPSep_Flow 10^3 m³/d	LPGas_Flow 10^3 m³/d	Total_Flow 10^3 m³/d	Cumm_Gas 10^3 m³/d	OIL PRODUCTION Rate m³/d	Cumm. m³	WATER PRODUCTION Rate m³	Cumm. m³	INJECT Gas/N2 m³/min	RATE Date Liq. m³/min	OPTION A Net Gas 10^3 m³/d	OPTION B Gain/Loss m³
02/11/98	02:30	2534.00	51.68	15.14	45.08	17.15	62.23	58.54								
02/11/98	02:54		51.68	15.53	44.95	15.34	60.29	59.48								
2535m SAMPLE TAKEN - NO SAMPLE																
02/11/98	03:00	2535.00	77.52	15.63	57.42		57.42	59.72								
02/11/98	03:30	2536.00	94.75	16.12	60.43		60.43	60.98								
02/11/98	04:00	2537.00	94.75	16.62	59.82		59.82	62.24								
02/11/98	04:30	2539.80	103.36	17.12	61.38	1.41	62.78	63.52								
02/11/98	04:37		94.75	17.23	60.73		60.73	63.81								
2540m SAMPLE TAKEN - NO SAMPLE																
02/11/98	05:00	2540.00	94.75	17.62	61.47		61.47	64.79								
02/11/98	06:00	2543.00	43.07	18.61	36.10	4.10	40.20	67.34								
02/11/98	06:26		103.36	18.95	61.51		61.51	67.88								
NO SAMPLE FOR 2545m																
02/11/98	06:30	2545.00	94.75	19.02	61.81		61.81	68.05								
02/11/98	07:00	2547.00	103.36	19.52	59.73		59.73	69.31								
02/11/98	07:15		94.75	19.77	61.41		61.41	69.95								
NO SAMPLE FOR 2550m																
02/11/98	07:30	2553.00	111.97	20.02	66.16		66.16	70.58								
02/11/98	08:00	2553.00	94.75	20.51	59.17		59.17	71.82								
SWITCH N² TOO BY-PASS / START WIPER TRIP TOO INTERMEDIATE CASING.																
02/11/98	10:30	2553.00		20.77			0.00	72.10								
ON BOTTOM / START N² @ 42m³/min / CONTINUE DRILLING																
02/11/98	10:36		25.84	20.86	32.52		32.52	72.16								
N² TOO SURFACE.																

Today's: 22-Feb-98 Page: 4 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth m	Inlet Press kPa	Prod Hours	GAS PRODUCTION HPSep_Flow 10^3 m³/d	LPGas_Flow 10^3 m³/d	Total_Flow 10^3 m³/d	Cumm_Gas 10^3 m³/d	OIL PRODUCTION Rate m³/d	Cumm. m³	WATER PRODUCTION Rate m³	Cumm. m³	INJECT Gas/N2 m³/min	RATE Date Liq. m³/min	OPTION A Net Gas 10^3 m³/d	OPTION B Gain/Loss m³
02/11/98	11:00	2553.00	77.52	21.26	60.45		60.45	73.08								
02/11/98	11:20	2555.00	77.52	21.59	60.51		60.51	73.90								
NO SAMPLE FOR 2555m																
02/11/98	11:30	2556.00	68.91	21.76	57.39		57.39	74.32								
02/11/98	11:45		68.91	22.01	59.03		59.03	74.93								
NO SAMPLE FOR 2560m																
02/11/98	12:00	2560.00	68.91	22.26	60.36	1.79	62.15	75.55								
02/11/98	12:10		68.91	22.42	59.06		59.06	75.97								
PULL OF BOTTOM TO CIRCULATE																
02/11/98	12:30	2564.00	77.52	22.75	61.02		61.02	76.79								
CONTINUE DRILLING																
02/11/98	13:00	2564.00	86.13	23.25	68.25		68.25	78.19								
02/11/98	13:30	2565.00	94.75	23.75	63.65		63.65	79.60								
NO SAMPLE FOR 2565m																
02/11/98	14:00	2566.00	60.29	24.24	39.65	11.75	51.40	80.88								
02/11/98	14:30	2568.00	8.61	24.89	17.31		17.31	81.71								
02/11/98	14:39		8.61	24.89	17.31		17.31	81.74								
PULL UP TOO INTERMEDIATE CASING TOO CIRCULATE.																
02/11/98	16:13		17.23	25.46	25.55		25.55	81.98								
N² TOO SURFACE																
02/11/98	16:20	2568.00	60.29	25.58	54.28	1.44	55.72	82.20								
BACK ON BOTTOM DRILLING																
02/11/98	16:30	2570.00	86.13	25.73	61.51		61.51	82.63								
NO SAMPLE FOR 2570m																
02/11/98	17:00	2572.00	17.23	26.17	24.51		24.51	83.60								
PULL OFF BOTTOM TOO CIRCULATE.																
02/11/98	17:19		103.36	26.47	70.43		70.43	84.30								
STOPPED N² INJECTION / STARTED AIR INJECTION @ 68m³/min																

Today's: 22-Feb-98 Page: 5 of 28
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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/11/98	18:00		155.04	27.15	89.34		89.34	86.80					68.00			
CONTINUE PUMPING AIR @ 68m³/min																
02/11/98	18:35		163.65	27.73	90.03	1.51	91.55	89.00					45.00			
SHUT DOWN AIR INJECTION / BROUGHT N² BACK ON LINE AT 45m³/min TO PURGE ANNULAR AND VESSEL.																
02/11/98	19:00		86.13	28.14	62.05		62.05	90.19					45.00			
CONTINUE TO PURGE SYSTEM WITH N²																
02/11/98	19:25		103.36	28.40	67.66		67.66	91.21					45.00			
PURGE TEST VESSEL WITH N² / DRILL AHEAD																
02/11/98	19:30	2575.00	94.75	28.48	63.92		63.92	91.44					45.00			
SAMPLE AT 2575 METERS - NO SAMPLE																
02/11/98	19:39	2578.80	111.97	28.63	76.51		76.51	91.87					45.00			
BURNABLE GAS TO SURFACE																
02/11/98	19:41		103.36	28.67	69.77		69.77	91.92					45.00			
BURNABLE GAS STOPPED																
02/11/98	19:46		94.75	28.74	68.94		68.94	92.16					45.00			
SAMPLE AT 2580 METERS - NO SAMPLE																
02/11/98	20:00	2579.00	94.75	28.98	66.48		66.48	92.81					45.00			
02/11/98	20:03		94.75	29.03	66.10		66.10	92.95					45.00			
SAMPLE AT 2585 METERS - NO SAMPLE																
02/11/98	20:18		94.75	29.28	65.63		65.63	93.64					45.00			
SAMPLE AT 2590 METERS - NO SAMPLE																
02/11/98	20:30	2593.00	94.75	29.48	66.14		66.14	94.20					45.00			
02/11/98	20:35		275.63	29.56	137.51		137.51	94.52					45.00			
SAMPLE AT 2595 METERS																
02/11/98	20:36	2596.00	344.54	29.58	170.24		170.24	94.64					45.00		105.44	
BURNABLE GAS TO SURFACE / STOP DRILLING																
02/11/98	20:38		378.99	29.61	191.61		191.61	94.90					45.00			
02/11/98	21:00	2596.00	241.17	29.98	131.56	1.66	133.21	97.19					45.00		47.50	
NO H2S PRESENT																
02/11/98	21:10		232.56	30.14	127.22		127.22	98.09					45.00			
DRILL AHEAD																

Today's: 22-Feb-98 Page: 6 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/11/98	21:25		232.56	30.38	127.31		127.31	99.42					45.00			
SAMPLE AT 2600 METERS - NO SAMPLE																
02/11/98	21:30	2600.00	232.56	30.47	126.88	1.62	128.49	99.86					45.00		63.69	
02/11/98	21:34		232.56	30.53	127.58	12.01	139.59	100.22					45.00			
CONNECTION																
02/11/98	22:00	2600.00	206.72	30.97	118.47		118.47	101.99					45.00		53.67	
02/11/98	22:18		223.95	31.27	122.83		122.83	103.53								
SAMPLE AT 2605 METERS - NO SAMPLE																
02/11/98	22:30	2610.00	223.95	31.47	124.90		124.90	104.56					45.00		60.10	
2610m SAMPLE TAKEN - NO SAMPLE																
02/11/98	22:55	2615.00	223.95	31.88	124.69		124.69	106.72								
2615m SAMPLE TAKEN - NO SAMPLE																
02/11/98	23:00	2618.00	223.95	31.96	123.96		123.96	107.15					45.00		59.16	
02/11/98	23:07	2620.00	223.95	32.08	122.68		122.68	107.74								
2620m SAMPLE TAKEN - NO SAMPLE																
02/11/98	23:25	2625.00	223.95	32.33	122.74		122.74	109.02								
2625m SAMPLE TAKEN - VERY SMALL AMOUNT																
02/11/98	23:30	2627.00	223.95	32.34	122.65		122.65	109.11					45.00		57.85	
02/11/98	23:43		223.95	32.36	122.55		122.55	109.19								
RESET TIME ON COMPUTER 20 MINUTES AHEAD TO CORRISPOND WITH PASON TIME																
02/12/98	00:00	2629.00	241.17	32.64	128.35		128.35	110.69					45.00		63.55	
CONNECTION																
02/12/98	00:23		198.11	33.03	110.21		110.21	112.26								
2630m SAMPLE TAKEN - VERY SMALL AMOUNT																
02/12/98	00:30	2633.15	232.56	33.13	124.95		124.95	112.83					45.00		60.15	
02/12/98	00:37	2635.00	284.24	33.25	143.09		143.09	113.48								
2635m SAMPLE TAKEN - VERY SMALL AMOUNT																
02/12/98	00:43	2636.91	1447.05	33.35	609.21	4.06	613.27	114.64					45.00		544.41	
STOP DRILLING / PULL OFF BOTTOM / INCREASE IN GAS RATE																

Today's: 22-Feb-98 Page: 7 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/12/98	00:48		1894.94	33.43	865.06	6.19	871.25	117.46								
02/12/98	01:00	2636.91	1507.34	33.63	690.04		690.04	123.43					45.00		625.24	
H2S = 0 ppm																
02/12/98	01:30		826.88	34.12	359.09		359.09	133.30					45.00		294.29	
02/12/98	02:00	2636.91	680.46	34.61	318.02		318.02	140.70					45.00		253.22	
CONTINUE TO FLOW WELL / BLACK SLUDGE IN SAMPLE CATCHER																
02/12/98	02:04			34.68	2.28		2.28	141.26								
PRIMARY FLOW LINE PLUGGED OFF / SWITCH FLOW THROUGH SECONDARY LINE																
02/12/98	02:12		8.61	34.68			0.00	141.27					0.00			
SHUT DOWN N² PUMP																
02/12/98	02:21		34.45	34.79	43.41		43.41	142.99								
PLUGGED OFF AT CHOKE IN RIG'S MANIFOLD SHACK / SWITCH TO FULL 4" FLOW																
02/12/98	02:30	2636.91	1653.77	34.94	595.74		595.74	146.85					0.00		595.74	
FLUID TOO SURFACE / 70 000ppm / H²S = 25 ppm																
02/12/98	03:00	2636.91	801.04	35.44	311.84		311.84	154.84			7.83	7.83	0.00		311.84	
WORKING ON UNPLUGGING PRIMARY FLOW LINE																
02/12/98	03:30	2636.91	706.30	35.93	286.03		286.03	160.96					0.00		286.03	
02/12/98	04:00	2636.91	680.46	36.43	274.39		274.39	166.74			3.5	11.33	0.00		274.39	
02/12/98	04:30	2636.91	680.46	36.93	269.10		269.10	172.17					0.00		269.10	
02/12/98	04:38		783.82	37.07	307.22		307.22	173.82					45.00			
SWITCH FLOW THROUGH PRIMARY FLOW LINE / START N² DOWN HOLE @ 45.00m³/min																
02/12/98	04:48		826.88	37.23	311.76		311.76	175.93					45.00	0.12		
START PUMPING FOAM DOWN HOLE @ 0.12m³/min																
02/12/98	05:00	2636.91	861.34	37.43	335.64		335.64	178.66			1.2	12.53	45.00	0.12		
H²S READING = 0 ppm / NET GAS 270.84 10^3 m³/d																
02/12/98	05:01		861.34	37.44	335.87		335.87	178.89								
CUMM. BURNABLE GAS TO DATE = 68.00 10^3m³																
02/12/98	05:02		852.72	37.46	332.95		332.95	179.12								
CUMM. WATER PRODUCED TO DATE = 12.53 m³																

Today's: 22-Feb-98 Page: 8 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/12/98	05:30	2636.91	826.88	37.93	302.57	2.50	305.07	184.71			3.4	15.93	45.00	0.12		7.00
NET GAS 240.27 10^3 m³/d																
02/12/98	06:00	2636.91	844.11	38.44	309.95	3.05	313.00	191.20			6.16	22.09	45.00	0.12		
NET GAS 248.20 10^3 m³/d / SALINITY = 64 000ppm																
02/12/98	06:30	2636.91	818.27	38.92	305.85		305.85	197.41			3.77	25.86	45.00	0.12		
NET GAS 241.05 10^3 m³/d / GOOD SAMPLE IN SAMPLE CATCHER																
02/12/98	07:00	2636.91	818.27	39.42	303.86		303.86	203.78			3.77	29.63	45.00	0.12		
NET GAS 239.06 10^3 m³/d / SALINITY = 80 000ppm																
02/12/98	07:30	2636.91	869.95	39.92	287.68		287.68	210.20			2.01	31.64	45.00	0.12		
NET GAS 222.88 10^3 m³/d																
02/12/98	08:00	2636.91	801.04	40.41	316.10		316.10	216.52			5.92	37.56	45.00	0.12		
NET GAS 251.30 10^3m³/d																
02/12/98	08:20		844.11	40.74	321.66	3.51	325.17	220.70								
STARTED TRANSFERING FLUID TOO RIG TANK / 37.56m³ PRODUCED TOO PIT.																
02/12/98	08:30	2636.91	852.72	40.91	305.72		30[illegible] 72	222.97			4.5	49.36	45.00	0.12		
NET GAS 240.92 10^3m³/d																
02/12/98	09:00	2636.91	904.40	41.40	330.13		330.13	229.92			5.03	54.39	44.00	0.12		
NET GAS 266.77 10^3m³/d / DECREASE N² TO 44.00m³/min / SALINITY 50 000 ppm																
02/12/98	09:05		878.56	41.48	342.65	4.09	346.74	231.10					0.00	0.12		
BY-PASS N² TO REPAIR LEAK																
02/12/98	09:15		904.40	41.65	386.15		386.15	233.45								
02/12/98	09:30	2636.91	878.56	41.90	335.66		335.66	236.77			6.34	60.73	44.00	0.12		
NET GAS 272.30 10^3m³/d / WELL SLUGGING																
02/12/98	09:55		792.43	42.32	147.40		147.40	240.16								
HIGH PRESSURE GAS SAMPLE TAKEN # 21607 @ 451 kPa																
02/12/98	10:00	2636.90	775.20	42.40	172.11		172.11	240.70			3.05	63.78				
NET GAS 172.11 10^3m³/d / SALINITY 72 000 ppm																
02/12/98	10:05		826.88	42.47	169.42		169.42	241.13								
HIGH PRESSURE GAS SAMPLE #21842 @ 431 kPa / SALINITY 7.2 %																
02/12/98	10:11		766.59	42.57	166.72		166.72	241.81								
HIGH PRESSURE FLUID SAMPLE TAKEN # 21776 @ 350 kPa																
02/12/98	10:15		663.23	42.63	104.38	2.78	107.16	242.22								
HIGH PRESSURE FLUID SAMPLE TAKEN # 21751 @ 320 kPa																

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/12/98	10:30	2636.90	542.64	42.88	118.42		118.42	243.82			1.05	64.83				
NET GAS 118.42 10^3m³/d																
02/12/98	10:43		844.11	43.09	144.85	3.36	148.21	245.01								
N² TOO BY-PASS																
02/12/98	11:00	2636.90	602.94	43.38	124.63		124.63	246.73			1.36	66.19				
NET GAS 124.63 10^3m³/d / SALINITY 100 000 ppm																
02/12/98	11:15		568.48	43.63	119.20	2.35	121.56	247.95								
02/12/98	11:30	2636.90	577.10	43.87	123.81	2.21	126.02	249.24			2.56	68.75				
NET GAS 123.81 10^3m³/d																
02/12/98	11:35		577.10	43.95	122.87		122.87	249.67								
BROUGHT N² BACK ON LINE @ 45m³/min																
02/12/98	12:00	2636.90	869.95	44.37	152.13		152.13	252.11			3.85	72.60	44.00	0.12	88.77	
START DRILLING																
02/12/98	12:05		1360.91	44.45	294.84	2.86	297.70	252.78								
PULL OFF BOTTOM TO CIRCULATE HOLE.																
02/12/98	12:30	2636.90	2239.48	44.86	289.14	4.52	293.66	259.41			7.7	80.30	44.00	0.12	230.30	
FLOW TEMPERATURE 50 DEGREES CELCIUS																
02/12/98	12:33		2161.96	44.91	301.47	4.75	306.21	260.13					0.00			
N² TOO BY-PASS																
02/12/98	12:55		1886.33	45.28	356.15	9.94	366.09	265.09					40.00			
N² TOO BACK ON LINE @ 40m³/min																
02/12/98	13:00	2636.90	1731.29	45.36	278.41	3.69	282.11	266.04			3.18	83.48	40.00	0.10	224.51	
02/12/98	13:20		1472.89	45.68	237.72	14.36	252.08	269.91								
TEMPERATURE METER MALFUNCTION / SWITCH TO MANUAL TEMPERATURE																
02/12/98	13:21		1533.18	45.69	442.86	2.96	445.82	270.22								
02/12/98	13:30	2636.90	1490.11	45.84	440.00		440.00	273.15			4.12	87.60	40.00	0.10	382.40	
H²S = 50ppm																
02/12/98	14:00	2639.00	1481.50	46.34	497.36	2.94	500.30	282.15			2.2	89.80	40.00	0.10	442.70	
FLOW LINE TEMPERATURE = 71°C / CONTINUE DRILLING / H²S = 10ppm																
02/12/98	14:15		1352.30	46.58	338.17	8.90	347.07	286.55								

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/12/98	14:30	2645.00	1447.05	46.83	428.45	5.74	434.19	291.06			.85	90.65	40.00	0.10	376.59	
FLOW LINE TEMPERATURE = 77°C / SAMPLE 2645m TAKEN																
02/12/98	14:45		1395.37	47.08	430.00	8.16	438.16	295.70								
02/12/98	15:00	2649.00	1309.23	47.33	370.65	34.27	404.92	300.23			7.77	98.42	40.00	0.10	347.32	
02/12/98	15:20		1050.83	47.66	269.86	9.51	279.37	306.16								
SAMPLE 2650 m TAKEN																
02/12/98	15:30	2653.00	1248.94	47.83	295.55		295.55	308.89			8.63	107.05	40.00	0.10	237.93	
02/12/98	15:40		1283.39	47.99	394.38	4.94	399.32	311.73								
SAMPLE 2655m TAKEN																
02/12/98	16:00	2657.00	1274.78	48.33	406.11		406.11	317.30			2.14	109.19	40.00	0.10	348.51	
FLOW LINE TEMPERATURE = 74°C																
02/12/98	16:15		1283.39	48.57	381.25	5.01	386.26	321.17								
02/12/98	16:25		1257.55	48.73	395.04	2.52	397.56	323.95								
SAMPLE 2660m TAKEN																
02/12/98	16:30	2660.00	1240.32	48.82	388.54	2.47	391.00	325.30			2.85	112.04	40.00	0.10	333.40	
FLOW LINE TEMPERATURE = 76°C																
02/12/98	16:45		1223.10	49.07	365.11	66.25	431.36	329.50								
SAMPLE 2665m SAMPLE MISSED / BY-PASS N² TO MAKE CONNECTION																
02/12/98	17:00	2669.00	878.56	49.32	353.61	2.31	355.93	333.70			5.98	118.02	40.00	0.10	298.33	
FLOW LINE TEMPERATURE = 65°C																
02/12/98	17:06		1274.78	49.42	401.69		401.69	334.96								
SAMPLE 2670m TAKEN																
02/12/98	17:15		1214.48	49.57	391.72	2.55	394.26	337.52								
02/12/98	17:30	2675.00	1223.10	49.81	368.23	5.07	373.30	341.44			1.89	119.91	40.00	0.10	315.70	
SAMPLE 2675m TAKEN																
02/12/98	18:00	2683.00	1145.58	50.31	340.23	2.40	342.63	349.22			3.49	123.40	40.00	0.10	285.03	
02/12/98	18:20		1162.80	50.64	346.64	9.01	355.65	354.39								
MAKE CONNECTION																

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth m	Inlet Press kPa	Prod Hours	GAS PRODUCTION HPSep_Flow 10^3 m³/d	LPGas_Flow 10^3 m³/d	Total_Flow 10^3 m³/d	Cumm_Gas 10^3 m³/d	OIL PRODUCTION Rate m³/d	Cumm. m³	WATER PRODUCTION Rate m³	Cumm. m³	INJECT Gas/N2 m³/min	RATE Date Liq. m³/min	OPTION A Net Gas 10^3 m³/d	OPTION B Gain/Loss m³
02/12/98	18:30	2687.00	1076.67	50.81	376.67		376.67	357.07			2.4	125.80	40.00	0.10	319.07	
FLOW LINE TEMPERATURE = 76°C																
02/12/98	18:45		1188.64	51.05	383.43	12.51	395.95	360.58								
02/12/98	18:55		1154.19	51.22	383.54		383.54	363.17								
NO SAMPLE FOR 2690m / SAMPLE CATCHER OUT OF SERVICE																
02/12/98	19:00	2692.00	1093.90	51.30	396.89	2.42	399.31	364.47			6.88	132.68	40.00	0.10	341.71	
FLOW LINE TEMPERATURE = 76°C																
02/12/98	19:10		1111.12	51.47	380.28	2.37	382.65	367.07								
2695m SAMPLE TAKEN																
02/12/98	19:30	2698.00	1085.28	51.80	359.46	9.16	368.62	372.11			2.56	135.24	40.00	0.10	311.02	
02/12/98	19:37		1085.28	51.92	379.03	2.31	381.34	373.90								
2700m SAMPLE TAKEN																
02/12/98	20:00	2705.00	1059.44	52.29	340.50	2.34	342.84	379.49			4.34	1389.58	40.00	0.10	285.24	
2705m SAMPLE TAKEN																
02/12/98	20:12		1033.60	52.48	338.22	2.22	340.44	382.22								
MAKE CONNECTION																
02/12/98	20:30	2707.00	818.27	52.78	338.63	1.29	339.92	386.63			3.53	143.11	40.00	0.10	282.32	
02/12/98	20:48		956.08	53.08	384.61		384.61	391.10								
2710m SAMPLE TAKEN																
02/12/98	21:00	2713.00	895.79	53.27	311.03	2.14	313.17	393.86			4.5	147.61	40.00	0.10	255.57	
02/12/98	21:05	2715.00	534.03	53.35	216.09		216.09	394.61								
2715m SAMPLE TAKEN																
02/12/98	21:27	2720.00	1042.22	53.72	351.37	2.34	353.71	400.12								
2720m SAMPLE TAKEN																
02/12/98	21:30	2720.00	1024.99	53.77	373.70	6.82	380.52	400.85			-2.8	144.81	40.00	0.10	322.92	
02/12/98	21:49	2725.00	1042.22	54.08	305.47	4.75	310.22	405.36								
2725m SAMPLE TAKEN																
02/12/98	22:00	2725.00	1024.99	54.26	409.11	10.60	419.71	408.12			.16	144.97	40.00	0.10	362.11	

FLOW LINE TEMPERATURE = 74°C / SALINITY = 120 000ppm / H^2S = 150ppm

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth	Inlet Press	Prod Hours	GAS PRODUCTION HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	OIL PRODUCTION Rate	Cumm.	WATER PRODUCTION Rate	Cumm.	INJECT Gas/N2	RATE Date Liq.	OPTION A Net Gas	OPTION B Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/12/98	22:15		990.54	54.51	204.48		204.48	411.36								
02/12/98	22:28	2730.00	990.54	54.73	334.33	4.53	338.86	414.67								
2730m SAMPLE TAKEN																
02/12/98	22:30	2730.00	990.54	54.76	358.32	4.33	362.66	415.17			5.93	150.90	40.00	0.10	241.70	
02/12/98	22:49	2735.00	981.92	55.08	323.95		323.95	419.50								
2735m SAMPLE TAKEN																
02/12/98	23:00		990.54	55.26	306.10		306.10	421.99			11.81	162.71	40.00	0.10	185.14	
FLOW LINE TEMPERATURE = 74°C / SALINITY = 108 000ppm / H²S = 20ppm																
02/12/98	23:07		947.47	55.37	318.36	2.61	320.97	423.60								
SAMPLE AT 2740 METERS																
02/12/98	23:30	2745.00	990.54	55.75	316.32	1.88	318.20	428.86			.12	165.36	40.00	0.10	260.60	
FLOW LINE TEMPERATURE = 74°C / CONNECTION / SAMPLE AT 2745 METERS																
02/12/98	23:40		956.08	55.92	262.68		262.68	431.20								
02/13/98	00:00	2748.00	1068.06	56.25	329.85	2.11	331.96	435.48			17.52	182.88	40.00	0.10	274.36	
FLOW LINE TEMPERATURE = 68°C / SALINITY = 112,000ppm / H2S = 20 ppm																
02/13/98	00:13		973.31	56.46	332.72	2.34	335.05	438.70								
SAMPLE AT 2750 METERS																
02/13/98	00:24		930.24	56.64	328.50	2.18	330.68	441.20								
SAMPLE AT 2755 METERS																
02/13/98	00:30	2756.00	973.31	56.74	314.26	2.30	316.56	442.58			3.92	186.80	40.00	0.10	258.96	
FLOW LINE TEMPERATURE = 65°C																
02/13/98	00:44		956.08	56.98	339.12	2.21	341.33	445.73								
SAMPLE AT 2760 METERS																
02/13/98	01:00	2763.00	947.47	57.24	361.27	4.56	365.83	449.30			3.08	189.88	40.00	0.10	308.23	
FLOW LINE TEMPERATURE = 66°C / CONNECTION / SALINITY = 110,000ppm / H2S = 22ppm																
02/13/98	01:24		973.31	57.63	362.81	14.00	376.81	454.58								
SAMPLE AT 2765 METERS																
02/13/98	01:30	2767.00	930.24	57.73	260.07		260.07	455.85			5.15	195.03	40.00	0.10	202.47	
FLOW LINE TEMPERATURE = 61°C																
02/13/98	01:42		930.24	57.93	288.38	2.15	290.53	458.65								
SAMPLE AT 2770 METERS																

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/13/98	02:00	2775.00	921.63	58.23	290.32	8.43	298.75	462.64			6.71	201.74	40.00	0.10	241.45	
FLOW LINE TEMPERATURE = 63°C / SALINITY = 98,000ppm / H2S = 12ppm																
02/13/98	02:25		904.40	58.64	285.74	2.16	287.90	468.06								
SAMPLE AT 2780 METERS																
02/13/98	02:30	2781.00	887.18	58.73	305.02	4.18	309.20	469.13			4.94	206.68	40.00	0.10	251.60	
FLOW LINE TEMPERATURE = 64°C																
02/13/98	02:39		921.63	58.88	316.01	4.53	320.54	471.13								
CONNECTION																
02/13/98	03:00	2785.00	809.66	59.23	266.64		266.64	475.60			2.9	209.58	40.00	0.10	209.04	
FLOW LINE TEMPERATURE = 64°C / SAMPLE AT 2785 / SALINITY = 110,000ppm / H2S = 10ppm																
02/13/98	03:23		878.56	59.60	298.51	2.10	300.61	480.81								
SAMPLE AT 2790 METERS																
02/13/98	03:30	2791.00	878.56	59.72	311.65		311.65	482.33			7.47	217.05	40.00	0.10	254.05	
FLOW LINE TEMPERATURE = 64°C / SHIP 33m³ OFF LOCATION																
02/13/98	03:50		844.11	60.05	299.69	2.09	301.78	486.62								
SAMPLE AT 2795 METERS																
02/13/98	04:00	2798.00	878.56	60.22	276.67	1.98	278.64	488.70			1.89	218.94	40.00	0.10	218.94	
FLOW LINE TEMPERATURE = 64°C / SALINITY = 114,000ppm / H2S = 10ppm																
02/13/98	04:17		869.95	60.50	325.57	6.15	331.71	492.35								
CONNECTION																
02/13/98	04:30	2802.00	783.82	60.72	224.85	13.71	238.55	495.20			2.76	221.70	40.00	0.10	180.95	
FLOW LINE TEMPERATURE = 69°C																
02/13/98	04:50		671.84	61.04	208.71	13.67	222.38	499.08								
SAMPLE AT 2805 METERS																
02/13/98	05:00	2806.00	861.34	61.21	301.12	8.32	309.43	501.32			6.35	228.05	40.00	0.10	251.83	
FLOW LINE TEMPERATURE = 62°C / SALINITY = 98,000ppm / H2S = 10ppm																
02/13/98	05:01		835.50	61.23	293.26	10.53	303.79	501.53								
CUMM 24 HOUR BURNABLE GAS = 264.[illegible] 10^3m³																
02/13/98	05:02		869.95	61.24	278.76	4.17	282.94	501.73								
CUMM BURNABLE GAS TO DATE = 332.10 10^3m³																
02/13/98	05:03		878.56	61.26	283.70	2.17	285.87	501.93								
CUMM 24 HOUR WATER PRODUCTION = 215.52 m³																
02/13/98	05:04		869.95	61.28	323.46	2.20	325.66	502.15								
CUMM FLUID TO DATE = 228.05 m³																

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth m	Inlet Press kPa	Prod Hours	GAS PRODUCTION HPSep_Flow 10^3 m³/d	LPGas_Flow 10^3 m³/d	Total_Flow 10^3 m³/d	Cumm_Gas 10^3 m³/d	OIL PRODUCTION Rate m³/d	Cumm. m³	WATER PRODUCTION Rate m³	Cumm. m³	INJECT Gas/N2 m³/min	RATE Date Liq. m³/min	OPTION A Net Gas 10^3 m³/d	OPTION B Gain/Loss m³
02/13/98	05:18	2810.00	861.34	61.51	292.07	2.11	294.18	505.10								
2810m SAMPLE TAKEN																
02/13/98	05:30	2812.00	852.72	61.71	301.86	4.27	306.12	507.64			4.94	232.99	40.00	0.10	248.52	
02/13/98	05:45	2815.00	869.95	61.93	282.22	4.18	286.40	510.48								
2815m SAMPLE TAKEN																
02/13/98	06:00	2819.00	852.72	62.18	295.54	1.98	297.52	513.49			.76	233.75	40.00	0.10	239.92	
FLOW LINE TEMPERATURE = 63°C / SALINITY = 100 000ppm / H²S = 10ppm																
02/13/98	06:14		852.72	62.42	280.02	78.81	358.83	516.23								
CONNECTION																
02/13/98	06:30	2822.00	482.35	62.68	211.98		211.98	519.34			7.83	241.58	40.00	0.10	154.38	
FLOW LINE TEMPERATURE = 65°C																
02/13/98	06:43	2825.00	999.15	62.90	287.04		287.04	521.56								
2825m SAMPLE TAKEN																
02/13/98	07:00	2830.00	775.20	63.18	251.33	3.67	255.00	524.88			8.42	249.42	40.00	10.00	193.73	
SAMPLE 2830m TAKEN / SALINITY = 130 000ppm / FLOWLINE TEMPERATURE 65°C																
02/13/98	07:24		930.24	63.58	294.24		294.24	529.14								
SAMPLE AT 2835m																
02/13/98	07:30	2836.00	904.40	63.68	282.58		282.58	530.33			4	253.42	40.00	10.00	224.98	
FLOW LINE TEMPERATURE = 68°C																
02/13/98	07:45	2840.00	904.40	63.93	278.75	2.30	281.05	533.31								
SAMPLE 2840m TAKEN																
02/13/98	08:00	2840.00	930.24	64.18	284.16	39.39	323.56	536.32			.85	254.27	40.00	10.00	226.56	
FLOW LINE TEMPERATURE = 76°C / SALINITY = 110 000ppm / H2S @ 15ppm																
02/13/98	08:03		990.54	64.22	289.64	5.34	294.98	536.96								
MAKE CONNECTION																
02/13/98	08:30	2845.00	973.31	64.67	319.94	2.03	321.97	541.94			1.64	255.91	40.00	10.00	262.34	
FLOW LINE TEMPERATURE = 74°C																
02/13/98	08:35		904.40	64.75	275.79	1.89	277.68	542.87								
SAMPLE 2845m TAKEN																
02/13/98	08:43		792.43	64.88	247.52		247.52	544.37								
STALL BIT / PULL OFF BOTTOM AND CIRCULATE.																
02/13/98	08:50		801.04	65.00	227.45	1.70	229.15	545.51					40.00	0.00		
SHUT FOAM AND PUMP OFF.																

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/13/98	09:00	2847.00	861.34	65.17	260.88		260.88	547.23			4.13	260.04	40.00	0.00	203.28	
FLOW LINE TEMPERATURE = 80°C / SALINITY 130 000ppm / H2S @ 60ppm																
02/13/98	09:01		878.56	65.18	259.44		259.44	547.41								
SAMPLE @ 2847m																
02/13/98	09:02		878.56	65.20	266.95	5.40	272.35	547.60								
HIGH PRESSURE FLUID SAMPLE TAKEN # 21930 @ 342 kPa																
02/13/98	09:05		895.79	65.25	272.06	1.90	273.96	548.16								
HIGH PRESSURE FLUID SAMPLE TAKEN # 22100 @ 383 kPa																
02/13/98	09:10		999.15	65.33	344.58	2.01	346.59	549.24								
HIGH PRESSURE GAS SAMPLE TAKEN # 19554 @ 421 kPa																
02/13/98	09:14		964.70	65.39	374.15	2.40	376.55	550.25								
HIGH PRESSURE GAS SAMPLE TAKEN # 19948 @ 626 kPa																
02/13/98	09:18		809.66	65.46	268.08	12.69	280.76	551.07								
TWO STOCK FLUID SAMPLES TAKEN																
02/13/98	09:30	2847.00	835.50	65.66	225.14	19.87	245.01	553.44			7.57	267.61	40.00	0.10	187.41	
FLOW LINE TEMPERATURE = 82°C / SALINTY 140 000ppm / H2S @ 60ppm																
02/13/98	09:32		1068.06	65.69	219.35	17.46	236.81	553.82					0.00	0.00		
BYPASS N² / START PULLING UP TOO INTERMEDIATE CASING																
02/13/98	10:00		732.14	66.16	255.35		255.35	559.38			8.91	276.52	0.00	0.00	255.35	
FLOW LINE TEMPERATURE = 78°C / SALINITY = 142 000ppm / H2S @ 10ppm																
02/13/98	10:06		620.16	66.26	236.82		236.82	560.42								
HIGH PRESSURE GAS SAMPLE TAKEN #18438 @ 620 kPa																
02/13/98	10:08		577.10	66.29	227.22		227.22	560.75								
HIGH PRESSURE GAS SAMPLE TAKEN #11198 @ 577 kPa																
02/13/98	10:10		559.87	66.33	212.89	1.62	214.51	561.05								
HIGH PRESSURE FLUID SAMPLE TAKEN #17059 @ 285 kPa																
02/13/98	10:12		542.64	66.36	196.76		196.76	561.32								
HIGH PRESSURE FLUID SAMPLE TAKEN #19574 @ 273 kPa																
02/13/98	10:20		551.26	66.48	199.55		199.55	562.46								
TWO STOCK FLUID SAMPLES TAKEN / ALL SAMPLES DELIVERED TO AGAT IN FT. NELSON,BC																
02/13/98	10:29		525.42	66.63	192.41		192.41	563.65			4.74	281.26	0.00	0.00	192.41	
SHUT IN WELL AT CHOKE / RECORD BUILD-UPS																
02/13/98	10:30		1283.39	66.65	32.31		32.31	563.67								

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/13/98	10:31		1584.86	66.67	14.90		14.90	563.68								
02/13/98	10:32		1800.19	66.68	3.32		3.32	563.68								
02/13/98	10:33		1981.07	66.70	2.84		2.84	563.69								
02/13/98	10:34		2127.50	66.72			0.00	563.69								
02/13/98	10:36		2325.61	66.72			0.00	563.69								
02/13/98	10:38		2463.42	66.73			0.00	563.69								
02/13/98	10:40		2575.40	66.73			0.00	563.69								
02/13/98	10:42		2678.76	66.73			0.00	563.69								
02/13/98	10:44		2756.28	66.73			0.00	563.69								
02/13/98	10:46		2833.80	66.73			0.00	563.69								
02/13/98	10:48		2911.32	66.73	0.00		0.00	563.69								
02/13/98	10:50		2971.61	66.73	0.00	0.00	0.00	563.69								
02/13/98	10:52		3031.91	66.73			0.00	563.69								
02/13/98	10:54		3100.81	66.73			0.00	563.69								
02/13/98	10:56		3152.49	66.73			0.00	563.69								
02/13/98	10:58		3212.79	66.73			0.00	563.69								
02/13/98	11:00		3273.08	66.73			0.00	563.69								

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Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L. Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/13/98	11:10		3600.39	66.73			0.00	563.69								
02/13/98	11:20		3850.17	66.73			0.00	563.69								
02/13/98	11:30		4125.80	66.73			0.00	563.69								
02/13/98	11:40		4366.98	66.73	0.00		0.00	563.69								
02/13/98	11:50		4608.15	66.73			0.00	563.69								
02/13/98	12:00		4832.10	66.73			0.00	563.69								
02/13/98	12:10		5047.43	66.73			0.00	563.69								
02/13/98	12:20		5254.15	66.73			0.00	563.69								
02/13/98	12:30		5452.26	66.73			0.00	563.69								
02/13/98	12:40		5650.37	66.73			0.00	563.69								
02/13/98	12:50		5848.48	66.73			0.00	563.69								
02/13/98	13:00		6029.36	66.73			0.00	563.69								
02/13/98	13:10		6210.24	66.73			0.00	563.69								
02/13/98	13:20		6391.12	66.73	0.00		0.00	563.70								
02/13/98	13:30		6563.39	66.73	0.00		0.00	563.70								
02/13/98	13:32		6597.84	66.73			0.00	563.70								
02/13/98	13:37		25.84	66.74	46.04		46.04	563.73								

BLEED DOWN PRESSURE TO BEGIN KILLING WELL

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/13/98	14:10		671.84	66.93	183.32	22.92	206.24	565.09								
BLED OFF PRESSURE / KILLING WELL																
02/13/98	14:44			67.47			0.00	567.60								
WELL DEAD / PREPARE TO PULL PIPE																
02/13/98	19:00						0.00	567.60								
KICK FROM WELL WHILE TRIPPING																
02/13/98	20:00						0.00	567.60								
BLEED DOWN KICK PRESSURE / PUMP FLUID DOWN ANNULUS / CONTINUE TRIPPING PIPE																
02/14/98	01:45						0.00	567.60								
DRILL PIPE AT 1500m / START N² @ 23m³/min																
02/14/98	02:53						0.00	567.60								
NO RETURNS / INCREASE N² RATE TO 34.00m³/min																
02/14/98	03:09		801.04	68.34	22.45	2.66	25.11	567.61								
FLUID AND N² TOO SURFACE																
02/14/98	03:30		422.06	68.68	26.84		26.84	568.46								
02/14/98	03:40		835.50	68.85	45.06		45.06	568.66								
BURNABLE GAS TOO SURFACE																
02/14/98	04:00		155.04	69.18	13.31		13.31	569.38								46.78
DIVERT FLOW THROUGH SECONDARY																
02/14/98	04:17		792.43	69.34	83.21		83.21	569.50								
ESTABLISH FLOW THROUGH SECONDARY																
02/14/98	04:30		422.06	69.56	42.42		42.42	570.01								
BYPASS N² / CONTINUE TO RUN IN HOLE																
02/14/98	05:00			70.03	3.93		3.93	570.41				281.26				25.80
STOP TRIPPING / CHANGE OUT WILLIAMS HEAD RUBBER																
02/14/98	05:01			70.04	2.35		2.35	570.41								
DAILY BURNABLE GAS CUMM = 56.09 10^3m³																
02/14/98	05:02		8.61	70.06			0.00	570.41								
DAILY PRODUCED FLUID CUMM = 53.21 m³																
02/14/98	05:03		17.23	70.07	2.77		2.77	570.42								
CUMM GAS TO DATE = 388.19 10^3m³																
02/14/98	05:04		8.61	70.08			0.00	570.42								
CUMM FLUID TO DATE = 281.26 m³																

Today's: 22-Feb-98 Page: 19 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/14/98	05:30		77.52	70.46	8.48		8.48	570.55				281.26	0.00	0.00	8.48	7.30
TOTAL FLUID PUMPED DOWN HOLE TO KILL WELL = 102.00 m³																
02/14/98	06:00		163.65	70.95	5.01		5.01	571.04				281.26	0.00	0.00	5.01	3.38
FLOW LINE TEMPERATURE = 46°C																
02/14/98	06:30		241.17	71.41	19.02		19.02	571.31				281.26	0.00	0.00	19.02	7.21
FLOW LINE TEMPERATURE = 48°C																
02/14/98	07:00		542.64	71.91	81.30	2.52	83.82	572.18				281.26	0.00	0.00	83.82	7.62
FLOW LINE TEMPERATURE = 53°C																
02/14/98	07:30		869.95	72.41	76.45		76.45	573.93				281.26	0.00	0.00	76.45	9.65
TOTAL KILL FLUID RECOVERED																
02/14/98	08:00		844.11	72.88	226.24		226.24	578.98			19.12	300.38	0.00	0.00	226.24	
FLOW LINE TEMPERATURE = 71°C																
02/14/98	08:30		792.43	73.38	172.35		172.35	582.67			15.18	315.56	0.00	0.00	172.35	
FLOW LINE TEMPERATURE = 68°C																
02/14/98	09:00		904.40	73.88	232.00		232.00	586.75			13.56	329.12	0.00	0.00	232.00	
FLOW LINE TEMPERATURE = 65°C																
02/14/98	09:30		594.32	74.38	136.34		136.34	590.94			12.22	341.34	41.00	0.00	136.34	
START N² @ 41m³/min																
02/14/98	10:00		1050.83	74.88	249.66		249.66	594.80			9.64	350.98	41.00	0.00	190.62	
FLOW LINE TEMPERATURE = 64°C																
02/14/98	10:05		913.02	74.96	291.58		291.58	595.79					41.00	0.08		
FOAM ON LINE @ 80L/min																
02/14/98	10:30		818.27	75.37	201.03		201.03	600.18			15.9	366.88	41.00	0.08	141.99	
02/14/98	10:40		887.18	75.53	221.34	90.65	311.99	601.70								
CONNECTION																
02/14/98	11:00		594.32	75.87	179.36		179.36	605.05			6.42	373.30	41.00	0.08	120.32	
FLOW LINE TEMPERATURE = 62°C / SALINITY = 140 000ppm / H²S = 10ppm																
02/14/98	11:21		844.11	76.22	248.13		248.13	608.25								
GAS COMPOSITION CHANGE / NON-BURNABLE GAS TO SURFACE / TAKE TWO HIGH PRESSURE SAMPLES																
02/14/98	11:22		826.88	76.23	238.00	2.54	240.54	608.42								
GAS SAMPLES - #22057 + #12367																
02/14/98	11:23	2847.00	826.88	76.25	230.88		230.88	608.58								
START DRILLING																

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Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth m	Inlet Press kPa	Prod Hours	GAS PRODUCTION HPSep_Flow 10^3 m³/d	LPGas_Flow 10^3 m³/d	Total_Flow 10^3 m³/d	Cumm_Gas 10^3 m³/d	OIL PRODUCTION Rate m³/d	Cumm. m³	WATER PRODUCTION Rate m³	Cumm. m³	INJECT Gas/N2 m³/min	RATE Date Liq. m³/min	OPTION A Net Gas 10^3 m³/d	OPTION B Gain/Loss m³
02/14/98	11:30		835.50	76.36	235.11	2.64	237.75	609.73			9.2	382.50	41.00	0.08	178.71	
FLOW LINE TEMPERATURE = 64°C / SALINITY = 122 000ppm																
02/14/98	11:40	2855.00	835.50	76.53	239.86		239.86	611.38								
2855m SAMPLE TAKEN																
02/14/98	12:00	2857.00	835.50	76.86	214.21		214.21	614.64			15.12	397.62	41.00	0.08	155.17	
FLOW LINE TEMPERATURE = 64°C / SALINITY = 125 000ppm																
02/14/98	12:18		913.02	77.16	250.93	19.13	270.05	617.74								
CONNECTION																
02/14/98	12:30	2859.00	792.43	77.36	261.16		261.16	619.97			14.22	411.84	41.00	0.08	202.12	
FLOW LINE TEMPERATURE = 71°C / SALINITY = 118 000ppm																
02/14/98	12:40	2860.00	611.55	77.52	240.20	2.23	242.43	621.66								
2860m SAMPLE TAKEN																
02/14/98	13:00	2864.00	913.02	77.85	254.86		254.86	624.66			6	417.84	41.00	0.08	195.82	
FLOW LINE TEMPERATURE = 70°C																
02/14/98	13:04	2865.00	904.40	77.92	267.01		267.01	625.40								
2865m SAMPLE TAKEN																
02/14/98	13:25	2870.00	895.79	78.27	256.78	2.23	259.01	628.95								
2870m SAMPLE TAKEN																
02/14/98	13:30	2871.00	921.63	78.35	264.68		264.68	629.85			13.44	431.28	41.00	0.08	205.64	
FLOW LINE TEMPERATURE = 74°C / SALINITY = 130 000ppm																
02/14/98	13:50	2875.00	947.47	78.68	267.42		267.42	633.45								
2875m SAMPLE TAKEN																
02/14/98	14:00	2877.00	921.63	78.84	269.44	83.06	352.50	635.39			16.26	447.54	41.00	0.08	293.46	
FLOW LINE TEMPERATURE = 76°C / SALINITY = 130 000ppm / CONNECTION																
02/14/98	14:30	2877.00	456.51	79.34	169.21		169.21	640.69			9.6	457.14	41.00	0.08	110.17	
FLOW LINE TEMPERATURE = 76°C																
02/14/98	14:40	2880.00	1360.91	79.51	208.54	2.50	211.04	641.52								
2880m SAMPLE TAKEN																
02/14/98	15:00	2885.00	938.86	79.83	258.78		258.78	645.49			14.85	471.99	41.00	0.80	199.74	
FLOW LINE TEMPERATURE = 74°C / SALINITY = 134 000ppm																
02/14/98	15:25	2890.00	938.86	80.25	263.68		263.68	649.97								
2890m SAMPLE TAKEN																
02/14/98	15:30	2891.00	930.24	80.33	262.83	2.12	264.95	650.88			12.48	484.47	41.00	0.08	205.91	
FLOW LINE TEMPERATURE = 71°C / 132 000ppm																

Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
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Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/14/98	15:53	2895.00	938.86	80.72	269.42		269.42	655.07								
2895m SAMPLE TAKEN																
02/14/98	16:00	2896.00	947.47	80.83	268.36	37.86	306.22	656.49			10.74	495.21	41.00	0.08	247.18	
FLOW LINE TEMPERATURE = 72°C / SALINITY = 135 000ppm / CONNECTION																
02/14/98	16:24	2900.00	482.35	81.22	56.62	2.34	58.96	660.84								
2900m SAMPLE TAKEN																
02/14/98	16:30	2903.00	1093.90	81.33	318.29		318.29	661.81			15.19	510.40	41.00	0.08	259.25	
FLOW LINE TEMPERATURE = 74°C / SALINITY = 140 000ppm																
02/14/98	16:38		938.86	81.46	244.40		244.40	663.45								
2905m SAMPLE TAKEN																
02/14/98	17:00	2910.00	921.63	81.81	235.79		235.79	666.90			15.12	525.52	41.00	0.08	176.75	
FLOW LINE TEMPERATURE = 76°C / 2910m SAMPLE TAKEN / SALINITY = 140 000ppm																
02/14/98	17:14	2915.00	938.86	82.03	248.92		248.92	669.28								
2915m SAMPLE TAKEN																
02/14/98	17:26		878.56	82.23	223.06	48.32	271.38	671.47								
CONNECTION																
02/14/98	17:30	2915.00	938.86	82.30	262.62		262.62	672.18			12.12	537.64	41.00	0.08	203.58	
FLOW LINE TEMPERATURE = 75°C / SALINITY = 138 000ppm																
02/14/98	17:52	2920.00	361.76	82.67	35.73	2.11	37.85	675.60								
2920m SAMPLE TAKEN																
02/14/98	18:00	2921.00	1102.51	82.80	232.63		232.63	676.34			18.36	556.00	41.00	0.08	173.59	
FLOW LINE TEMPERATURE = 80°C / SALINITY = 130 000ppm																
02/14/98	18:13	2925.00	895.79	83.02	146.75		146.75	677.92								
2925m SAMPLE TAKEN / PULL OFF BOTTOM AND CIRCULATE																
02/14/98	18:30	2925.00	930.24	83.29	199.79		199.79	680.16			17.25	573.25	41.00	0.08	140.75	
FLOW LINE TEMPERATURE = 84°C / SALINITY = 142 000ppm / 2925m T.D. WELL																
02/14/98	18:45		1033.60	83.54	224.09		224.09	682.43					0.00	0.00		
SHUT DOWN N² AND FOAM INJECTION / PULL 16 STANDS																
02/14/98	19:00		1128.35	83.79	279.64		279.64	685.22			15.12	588.37	0.00	0.00	220.60	
FLOW LINE TEMPERATURE = 94°C / SALINITY = 140 000ppm																
02/14/98	19:30		895.79	84.29	277.40		277.40	689.88			8.7	597.07	0.00	0.00	277.40	
FLOW LINE TEMPERATURE = 71°C																
02/14/98	20:00		775.20	84.78	138.46	2.99	141.45	694.32			6.2	603.27	0.00	0.00	141.45	
FLOW LINE TEMPERATURE = 60°C / SALINITY = 138 000ppm / H²S = 0 ppm																

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Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/14/98	20:01		749.36	84.80	149.47		149.47	694.43								
TAKE TWO HIGH PRESSURE GAS SAMPLES #18114 + #12075 - 68°C - 780 kPa																
02/14/98	20:02		740.75	84.82	131.46		131.46	694.52								
TAKE TWO HIGH PRESSURE FLUID #21741 + #21692 - 68°C - 770 kPa																
02/14/98	20:03		766.59	84.83	141.17		141.17	694.62								
TAKE TWO STOCK FLUID SAMPLES / ALL SAMPLES TO BE DELIVERED TO AGAT LAB.'s																
02/14/98	20:24		413.44	85.18		3.01	3.01	695.45				603.27				
SHUT IN WELL @ B.O.P.s / RIG RECORD SHUT IN PRESSURE'S																
02/14/98	20:25		404.83	85.18		3.01	3.01	695.45								
DAILY CUMM BURNABLE GAS = 105.37 10^3m³																
02/14/98	20:26		396.22	85.18		3.02	3.02	695.45								
DAILY CUMM FLUID = 322.01 m³																
02/14/98	20:27		387.60	85.18		3.00	3.00	695.45								
CUMM BURNABLE GAS TO DATE = 437.47 10^3m³																
02/14/98	20:28		378.99	85.18		3.00	3.00	695.46								
CUMM FLUID PRODUCED TO DATE = 603.27m³																
02/15/98	18:16		499.58	87.86			0.00	695.49								
COMPUTALOG ON LOCATION TO LOG HOLE / BLEED WELL TO FLARE																
02/15/98	19:20			88.88	12.35		12.35	700.28								
HI PRESSURE GAS SAMPLES #17811, #17692 - 16°C, 4 kPa																
02/15/98	20:27			89.95	3.92		3.92	700.65								
02/15/98	22:50		103.36	91.83			0.00	701.00								
FLUID TOO SURFACE																
02/15/98	23:00		60.29	92.00	27.68		27.68	701.15								
FLOW OF FLUID STOPPED - 3.82m³ RECOVERED																
02/16/98	00:20		25.84	93.32	9.81		9.81	701.51								
PUMP FLUID DOWN HOLE TO PUT WELL ON VACUUM																
02/16/98	00:27			93.40	0.12		0.12	701.53								
WELL ON VACUUM																
02/16/98	03:00			93.44			0.00	701.53								
SAFETY MEETING PRIOR TO LOGGING THE HOLE																
02/16/98	05:00		206.00	93.52		1.34	1.34	701.53								
BLEED OFF WELL PRESSURE																

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FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill Depth m	Inlet Press kPa	Prod Hours	GAS PRODUCTION HPSep_Flow 10^3 m³/d	LPGas_Flow 10^3 m³/d	Total_Flow 10^3 m³/d	Cumm_Gas 10^3 m³/d	OIL PRODUCTION Rate m³/d	Cumm. m³	WATER PRODUCTION Rate m³	Cumm. m³	INJECT Gas/N2 m³/min	RATE Date Liq. m³/min	OPTION A Net Gas 10^3 m³/d	OPTION B Gain/Loss m³
02/16/98	08:30		17.23	94.08			0.00	701.53								
WAIT ON WIRE LINE																
02/16/98	19:00		8.61	94.08			0.00	701.53								
COMPUTALOG TAGGED BRIDGE IN OPEN HOLE / PREPARE TO RUN PIPE IN HOLE TO CLEAN OUT																
02/16/98	22:30		17.23	94.08			0.00	701.53					32.00			
PUMP N² DOWN HOLETO BLOW HOLE DRY																
02/16/98	23:15		163.65	94.08			0.00	701.53								
FLUID TOO SURFACE																
02/16/98	23:40		1403.98	94.12	4.82	2.85	7.67	701.54								
N² TOO SURFACE / TRUCK TOOK 16.6m³																
02/17/98	00:30		577.10	94.94	158.27		158.27	703.68								
TRUCK TOOK 16.6m³																
02/17/98	01:00		180.88	95.44	5.43		5.43	704.65								
TRUCK TOOK 11.3m³ / NO MORE RETURNS - SHUT DOWN N², RUN IN 15 STANDS																
02/17/98	01:20		163.65	95.46			0.00	704.66								
START N² @ 32m³/min																
02/17/98	02:10		275.63	95.64			0.00	704.73								
FLUID TOO SURFACE / TRUCK TOOK 16.6m³																
02/17/98	02:13		249.79	95.64			0.00	704.73								
TRACES OF BURNABLE GAS																
02/17/98	02:41		1024.99	95.68	29.84	3.23	33.08	704.78								
N² TOO SURFACE																
02/17/98	02:45		1774.35	95.75	239.36		239.36	705.18								
NO MORE BURNABLE GAS / TRUCK TOOK 16.6m³																
02/17/98	03:30		577.10	96.47	74.45		74.45	707.10								
TRUCK TOOK 16.6m³																
02/17/98	03:45		378.99	96.72			0.00	707.50								
START PUMPING FOAM																
02/17/98	04:00		809.66	96.95	37.36		37.36	708.35								
START SHIPPING TO PIT / FLUID RECOVERED AT THIS POINT = 94.3m³																
02/17/98	04:30		680.46	97.45	67.88		67.88	710.06								
FLUID RECOVERED = 123.1m³																
02/17/98	05:00		499.58	97.95	39.75	2.72	42.47	711.33								
SHUT DOWN N² / RUN IN HOLE / FLUID RECOVERED = 153.1m³																

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FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/17/98	05:05		465.12	98.03	40.43		40.43	711.47								
BURNABLE GAS TOO SURFACE																
02/17/98	05:30		258.40	98.44	11.05		11.05	711.90								
TOTAL FLUID RECOVERED = 163.9m³																
02/17/98	06:00		241.17	98.64		1.93	1.93	711.98								
TOTAL FLUID RECOVERED = 168.8m³																
02/17/98	06:30		465.12	98.74		2.03	2.03	712.04								
SWITCH FLOW THROUGH SECONDARY FLOW LINE, SHUT PIPE RAMS / WAIT ON LOGGERS																
02/17/98	07:00		172.27	99.11	4.12	2.19	6.32	712.24								
TOTAL FLUID RECOVERED FROM WELL = 212.85m³																
02/17/98	07:30		223.95	99.25	5.31		5.31	712.32								
WAIT ON ORDERS																
02/17/98	09:35		275.63	99.35	23.59		23.59	712.39								
BLEED OF ANNULUS																
02/17/98	09:43		275.63	99.48	38.58		38.58	712.57								
FLUID TOO SURFACE																
02/17/98	10:00		267.01	99.72			0.00	712.82			3	216.91				
02/17/98	10:30		301.47	99.86			0.00	712.88			10.35	227.26				
02/17/98	11:00		534.03	100.26	35.07		35.07	713.26			16.75	244.01				
START SHIPPING TO PIT																
02/17/98	11:16		310.08	100.46			0.00	713.62			10	254.01				
DECREASE OF FLUID AND GAS RETURNS																
02/17/98	11:30		284.24	100.46			0.00	713.62				254.01				
02/17/98	11:45		387.60	100.68	37.64		37.64	714.02			6	260.01				
02/17/98	12:00		327.31	100.78			0.00	714.07				260.01				
02/17/98	12:30		258.40	100.80			0.00	714.07				260.01				
02/17/98	13:00		327.31	100.80		1.88	1.88	714.07				260.01				

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Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
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FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/18/98	08:05		51.68	100.87			0.00	714.10								
STOP PUMPING FLUID																
02/18/98	09:10		60.29	100.87			0.00	714.10								
START PUMPING FLUID																
02/18/98	09:15		120.59	100.87			0.00	714.10								
FLUID TOO SURFACE																
02/18/98	09:20		146.43	100.87			0.00	714.10								
STOP PUMPING FLUID																
02/18/98	09:30		129.20	100.87			0.00	714.10								
N² ON-LINE TO INCREASE FLUID VOLUMES ON SURFACE																
02/18/98	10:00		103.36	100.87			0.00	714.10								
START PUMPING FLUID DOWN HOLE																
02/18/98	11:00		809.66	101.18	59.97		59.97	714.88								
132.83m³ OF FLUID ON SURFACE.																
02/18/98	12:00		508.19	102.14	48.70		48.70	716.49								
200.00 m³ OF FLUID ON SURFACE.																
02/18/98	12:10		551.26	102.31	55.02		55.02	716.80								
SHUT DOWN N² AND FLUID PUMPS / BEGIN ADDING WEIGHT TO MUD																
02/18/98	13:00		301.47	103.02	11.72		11.72	717.58								
PREPARE TO MUD UP																
02/18/98	19:35		387.60	103.25			0.00	717.59								
CIRCULATE HOLE WHILE RUNNING IN TO BOTTOM																
02/18/98	20:14		413.44	103.46			0.00	717.67								
FLUID TOO SURFACE																
02/18/98	20:43		422.06	103.61	10.41		10.41	717.68								
TRANSFER FLOW TO MUD TANKS VIA HI STAGE																
02/18/98	21:03		103.36	103.82	6.57		6.57	717.69								
BURNABLE GAS TOO SURFACE																
02/18/98	21:19		335.92	104.07	57.77	2.55	60.31	717.81								
NO MORE BURNABLE GAS - N² TO SURFACE																
02/18/98	21:40		430.67	104.38			0.00	718.21								
LOSS OF CIRCULATION																
02/18/98	23:00		86.13	104.48			0.00	718.26								
TRIP OUT INTO CASING																

Today's: 22-Feb-98 Page: 27 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/19/98	00:10		43.07	104.50		1.77	1.77	718.27								
CIRCULATE																
02/19/98	00:12		94.75	104.50			0.00	718.27								
FLUID TOO SURFACE																
02/19/98	01:00		163.65	104.50			0.00	718.27								
CONTINUE TO CIRCULATE TO MUD TANKS VIA HI STAGE																
02/19/98	04:00		25.84	104.57			0.00	718.29								
PUMPS DOWN - RUN IN TO BOTTOM																
02/19/98	05:10		17.23	104.57			0.00	718.30								
STOP RUNNING IN - PUMPS ON																
02/19/98	05:15		129.20	104.57			0.00	718.30								
FLUID TOO SURFACE																
02/19/98	05:16		111.97	104.57			0.00	718.30								
STOP PUMPING / FINISH RUNNING IN																
02/19/98	05:26		77.52	104.60			0.00	718.30								
CIRCULATE ON BOTTOM																
02/19/98	05:27		103.36	104.60			0.00	718.30								
FLUID TOO SURFACE																
02/19/98	06:00		34.45	104.61			0.00	718.31								
PUMPS DOWN - PULL UP INTO CASING																
02/19/98	08:00		180.88	104.62			0.00	718.32								
CONTINUE CIRCULATING																
02/19/98	09:00		51.68	104.62			0.00	718.33								
START PULLING OUT OF HOLE																
02/19/98	17:00		51.68	104.62			0.00	718.33								
OUT OF HOLE / RIG UP FOR OPEN HOLE LOGGER'S.																
02/20/98	22:20		8.61	104.93		1.67	1.67	718.33								
WIPER TRIP - DISPLACE FLUID THROUGH HI STAGE																
02/20/98	23:05		17.23	104.93			0.00	718.33								
CHANGE OUT WILLIAMS HEAD RUBBER / SLIP AND CUT																
02/21/98	02:10		25.84	104.97			0.00	718.34								
CONTINUE TO RUN IN HOLE																
02/21/98	05:26		17.23	105.00			0.00	718.35								
CIRCULATE HOLE AT 2530 METERS																

Today's: 25-Feb-98 Page: 28 of 28
Test Date(s): From: 02/07/98 To: 02/23/98
Company: Paramount Resources
Location: et al Arrowhead N65
Company Rep: Rod MacEachern
Formation: Nahanni

FOREMOST ENERGY SYSTEMS LTD.

UnderBalanced-Drilling Report

Job No.: 3611
Unit No: Gemini 3
Test Operator: L Turnbull / T Fox
Operation: Underbalanced Drilling
Gas Sent To: Flare

Date	Time	Drill	Inlet	Prod	GAS PRODUCTION				OIL PRODUCTION		WATER PRODUCTION		INJECT	RATE	OPTION A	OPTION B
		Depth	Press	Hours	HPSep_Flow	LPGas_Flow	Total_Flow	Cumm_Gas	Rate	Cumm.	Rate	Cumm.	Gas/N2	Date Liq.	Net Gas	Gain/Loss
		m	kPa		10^3 m³/d	10^3 m³/d	10^3 m³/d	10^3 m³/d	m³/d	m³	m³	m³	m³/min	m³/min	10^3 m³/d	m³
02/21/98	05:37		86.13	105.00			0.00	718.35								
FLUID TOO SURFACE																
02/21/98	05:44		17.23	105.00		1.71	1.71	718.35								
PUMPS DOWN - RUN IN TO BOTTOM																
02/21/98	06:25		94.75	105.00			0.00	718.36								
ON BOTTOM - PUMPS ON TO CIRCULATE TWICE HOLE VOLUME																
02/21/98	06:26		43.07	105.00			0.00	718.36								
FLUID TOO SURFACE																
02/22/98	09:20						0.00	718.36								
FINISHED LOGGING HOLE / PREPARE TO RUN IN																
02/22/98	12:15						0.00	718.36								
FLUID TOO SURFACE																
02/22/98	15:00						0.00	718.36								
ON BOTTOM / CIRCULATE HOLE																
02/24/98	10:00						0.00	718.36								
CEMENT IN 5.5" LINER / COMPLETE																
02/24/98	19:00						0.00	718.36								
BRIDGE PLUG SET / CIRCULATE OVER TO INHIBITED WATER																
02/24/98	21:30						0.00	718.36								
FINISHED CIRCULATING / START RIG OUT OF GEMINI 3																

6. ENVIRONMENTAL WELL REPORT

Was submitted with drilling application

PARAMOUNT BERKLEY ARROWHEAD N-65

OIL, GAS & WATER ANALYSES

JAT Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 1A

LABORATORY NUMBER: W23116A

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: H20 FOAMING AGENT/H2S INHIBITOR

SAMPLING POINT: PREMIX TANK

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 98-02-12

DATE RECEIVED (Y-M-D): 98-02-20

DATE REPORTED (Y-M-D): 98-03-04

ANALYST: LN NCO

OTHER INFORMATION: N-65

	mg/L	MASS FRACTION	mmol/L
Na	5050.0	0.182	220.0
K	5110.0	0.184	131.0
Ca	1370.0	0.049	34.2
Mg	220.0	0.008	9.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	18.4	0.001	0.3

ION	mg/L	MASS FRACTION	mmol/L
Cl	15500.0	0.559	437.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	393.0	0.014	6.4
SO_4	70.9	0.003	0.7
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 27700.0

RELATIVE DENSITY: 1.017 @ 25° C

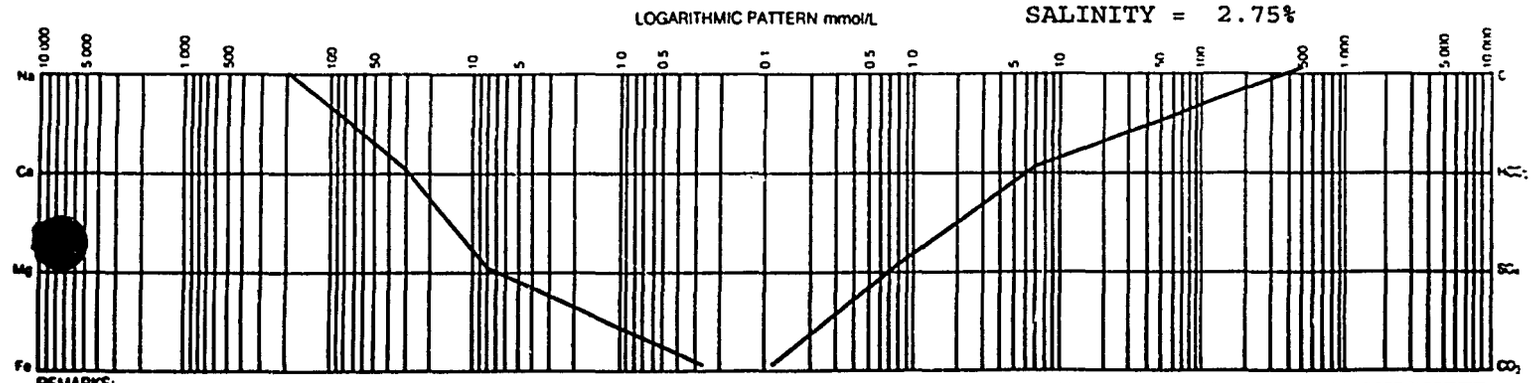
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 7.23 @ 25° C

RESISTIVITY/OHM m: 0.35 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 2.75%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

F. JAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 8D

LABORATORY NUMBER: M23116D

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: PRODUCED H20/SOAP/H2S INHIBITOR

SAMPLING POINT: VESSEL FLUID DUMP

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 98-02-12

DATE RECEIVED (Y-M-D): 98-02-20

DATE REPORTED (Y-M-D): 98-03-04

ANALYST: LN NCO

OTHER INFORMATION: N-65; DRILLING FLUID

	mg/L	MASS FRACTION	mmol/L
Na	30100.0	0.298	1310.0
K	1450.0	0.014	37.1
Ca	5410.0	0.054	135.0
Mg	1070.0	0.011	44.0
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	199.0	0.002	3.6

ION	mg/L	MASS FRACTION	mmol/L
Cl	62500.0	0.619	1760.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	220.0	0.002	3.6
SO_4	2.0	TRC*	TRC+
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

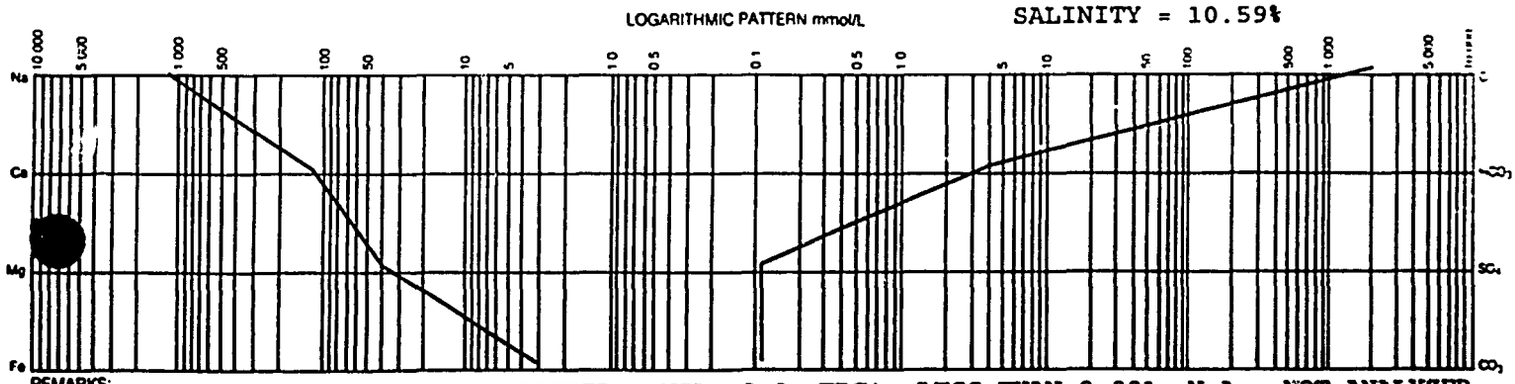
DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	CALCULATED
	101000.0

RELATIVE DENSITY	REFRACTIVE INDEX
1.065 @ 25° C	N.A. @ 25° C
OBSERVED pH	RESISTIVITY/OHM m
6.05 @ 25° C	0.08 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 10.59%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

**NOTE: RESISTIVITY IS 0.084 OHM.m

WATER ANALYSIS

CONTAINER IDENTIFICATION: 21776F

LABORATORY NUMBER: W23116F

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: PRESSURE: 350 KPA

SAMPLING POINT: PRESSURE VESSEL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 98-02-12

DATE RECEIVED (Y-M-D): 98-02-20

DATE REPORTED (Y-M-D): 98-03-04

ANALYST: LN NCO

OTHER INFORMATION: N-65

ION	mg/L	MASS FRACTION	mmol/L
Na	24300.0	0.300	1060.0
K	1450.0	0.018	37.1
Ca	4380.0	0.054	109.0
Mg	787.0	0.010	32.4
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	547.0	0.007	9.8

ION	mg/L	MASS FRACTION	mmol/L
Cl	48700.0	0.602	1370.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	759.0	0.009	12.4
SO_4	9.3	TRC*	0.1
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED

TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 80900.0

RELATIVE DENSITY: 1.051 @ 25° C

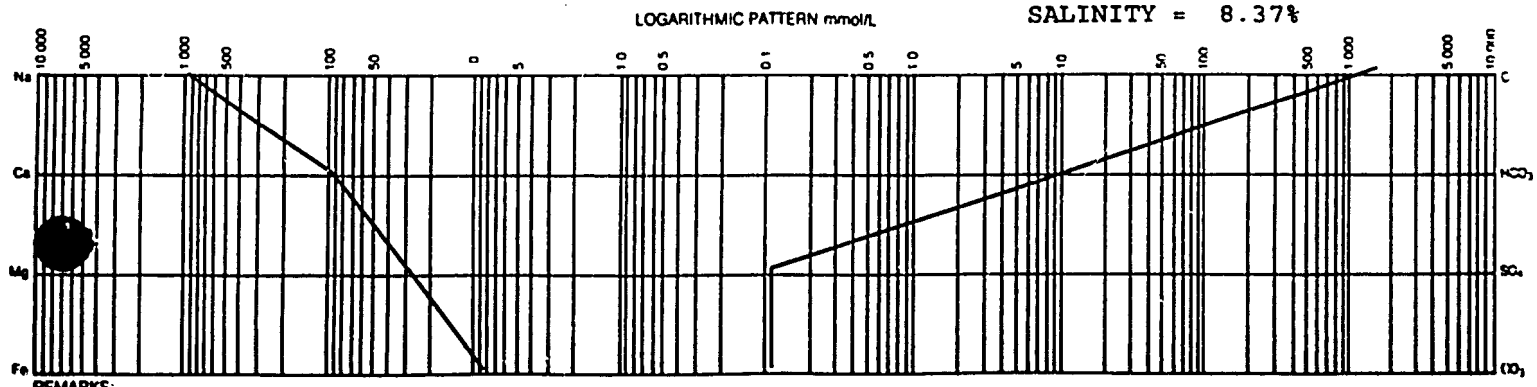
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 6.37 @ 25° C

RESISTIVITY OHM m: 0.10 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 8.37%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 3B

LABORATORY NUMBER: W23116B

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: STOCK FLUID @ 09:00 AM

SAMPLING POINT: FLUID DUMP

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 98-02-13

DATE RECEIVED (Y-M-D): 98-02-20

DATE REPORTED (Y-M-D): 98-03-04

ANALYST: LN NCO

OTHER INFORMATION: N-65

	mg/L	MASS FRACTION	mmol/L
Na	50800.0	0.295	2210.0
K	4370.0	0.025	112.0
Ca	10800.0	0.063	269.0
Mg	1120.0	0.006	46.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	248.0	0.001	4.4

ION	mg/L	MASS FRACTION	mmol/L
Cl	105000.0	0.609	2960.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	67.1	TRC*	1.1
SO_4	TRC+	TRC*	TRC+
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED

TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 172000.0

RELATIVE DENSITY: 1.109 @ 25° C

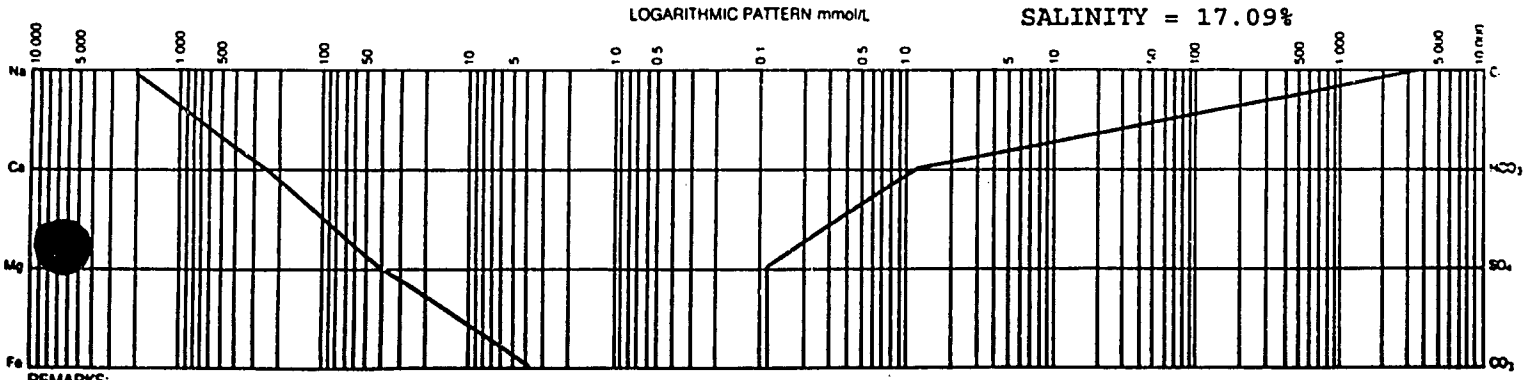
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 5.69 @ 25° C

RESISTIVITY/OHM •m: 0.06 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 17.09%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

**NOTE: RESISTIVITY IS 0.058 OHM.m

AGAT Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION	PB 5C
LABORATORY NUMBER	W23116C
OPERATOR NAME	PARAMOUNT RESOURCES LTD.
UNIQUE WELL IDENTIFIER	
WELL NAME	PARAMOUNT et al ARROWHEAD
ELEVATIONS KB m	574.60
ELEVATIONS GRD m	567.90
FIELD OR AREA	ARROWHEAD
POOL OR ZONE	NAHANNI
NAME OF SAMPLER	
COMPANY	ENTEST CORP.
TEST TYPE	
NO	
TEST RECOVERY	STOCK FLUID @ 10:00 AM
SAMPLING POINT	FLUID DUMP
AMT & TYPE OF CUSHION	
MUD RESISTIVITY/Ω m	@ 25° C
TEST INTERVAL OR PERFS	

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
98-02-13	98-02-20	98-03-04	LN NCO	N-65

	mg/L	MASS FRACTION	mmol/L
Na	48000.0	0.289	2090.0
K	3530.0	0.021	90.3
Ca	9960.0	0.060	249.0
Mg	1200.0	0.007	49.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	496.0	0.003	8.9

ION	mg/L	MASS FRACTION	mmol/L
Cl	103000.0	0.620	2900.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	36.6	TRC*	0.6
SO_4	TRC+	TRC*	TRC+
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

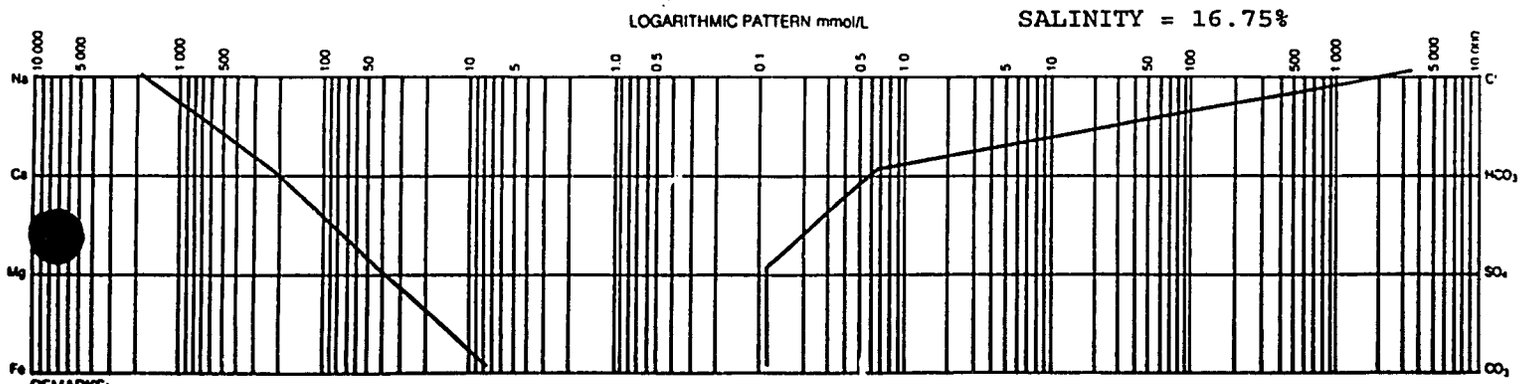
DISSOLVED

TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	
EVAPORATED AT 180° C	
AT IGNITION	
CALCULATED	166000.0
RELATIVE DENSITY	1.110 @ 25° C
REFRACTIVE INDEX	N.A. @ 25° C
OBSERVED pH	5.69 @ 25° C
RESISTIVITY/OHM •m	0.06 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 16.75%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

**NOTE: RESISTIVITY IS 0.058 OHM.m

AGAT Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: 22100E

LABORATORY NUMBER: K23116E

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: PRESSURE: 383 KPA

SAMPLING POINT: PRESSURE VESSEL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/c

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D): 98-02-13

DATE RECEIVED (Y-M-D): 98-02-20

DATE REPORTED (Y-M-D): 98-03-04

ANALYST: LN NCO

OTHER INFORMATION: N-65

	mg/L	MASS FRACTION	mmol/L
Na	46500.0	0.286	2020.0
K	3850.0	0.024	98.5
Ca	9600.0	0.059	240.0
Mg	1090.0	0.007	44.7
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	691.0	0.004	12.4

ION	mg/L	MASS FRACTION	mmol/L
Cl	101000.0	0.620	2850.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	97.6	0.001	1.6
SO_4	2.6	TRC*	TRC+
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED

TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 163000.0

RELATIVE DENSITY: 1.099 @ 25° C

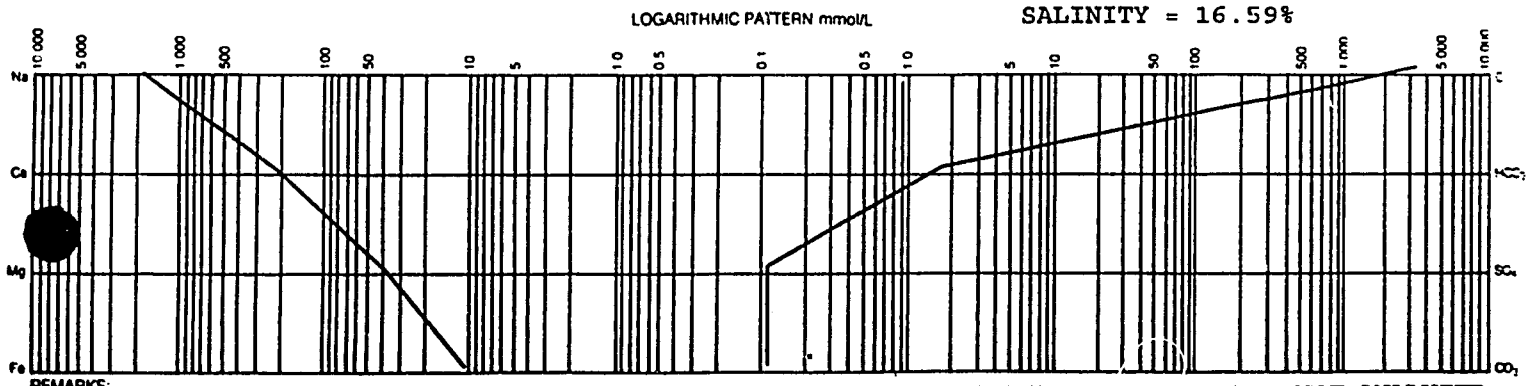
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 5.72 @ 25° C

RESISTIVITY OHM m: 0.06 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 16.59%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

**NOTE: RESISTIVITY IS 0.062 OHM.m

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 1A

LABORATORY NUMBER: WR24566A

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: SWABBING @ 0759 HRS. SWAB #30

SAMPLING POINT: FLOW LINE

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 98-03-20

DATE RECEIVED (Y-M-D): 98-03-25

DATE REPORTED (Y-M-D): 98-04-01

ANALYST: LN NCO

OTHER INFORMATION:

	mg/L	MASS FRACTION	mmol/L
Na	37000.0	0.201	1610.0
K	3810.0	0.021	97.3
Ca	25100.0	0.137	625.0
Mg	4480.0	0.024	184.0
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	738.0	0.004	13.2

ION	mg/L	MASS FRACTION	mmol/L
Cl	112000.0	0.610	3160.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	549.0	0.003	9.0
SO_4	1.5	TRC*	TRC+
CO_3	NIL	NIL	NIL
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	CALCULATED
	184000.0

RELATIVE DENSITY: 1.125 @ 25° C

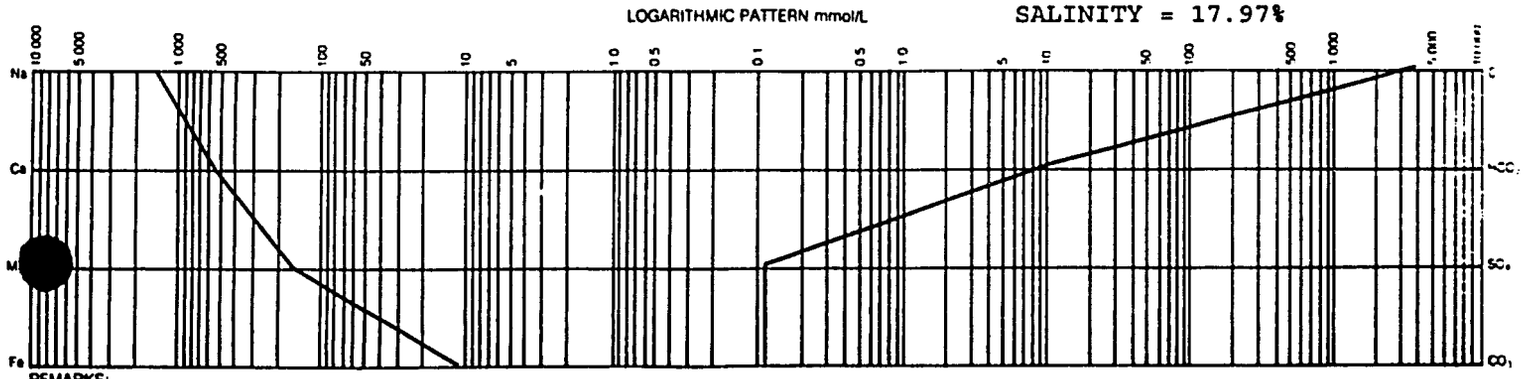
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 5.70 @ 25° C

RESISTIVITY OHM.m: 0.06 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 17.97%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

**NOTE: RESISTIVITY IS 0.062 OHM.m

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: AGAT 18438

LABORATORY NUMBER: G23116B

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY:

TEST INTERVAL OR PERFS:

SAMPLING POINT: PRESSURE VESSEL

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa				620	620	330
TEMPERATURE °C				79	79	21

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
98-02-12	98-02-20	98-03-02	BD NCO	N-65

COMP.	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m³
H_2	0.0002	0.0003	
He	0.0007	0.0009	
N_2	0.0320	0.0382	
CO_2	0.1628	0.0000	
H_2S	0.0001	0.0000	
C_1	0.7559	0.9030	
C_2	0.0339	0.0405	
C_3	0.0071	0.0084	26.0
iC_4	0.0015	0.0018	6.6
nC_4	0.0020	0.0024	8.5
iC_5	0.0009	0.0011	4.4
nC_5	0.0008	0.0009	3.8
C_6	0.0009	0.0011	5.1
C_7 +	0.0012	0.0014	7.3
C_8			
C_9			
C_{10}+			
TOTAL	1.0000	1.0000	61.7

GROSS HEATING VALUE MJ/m³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE	AIR FREE AS RECEIVED	VAPOUR PRESSURE PENTANES PLUS
38.91	32.59	67.1 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED MEASURED	MOISTURE FREE AS SAMPLED CALCULATED	MOISTURE AND ACID GAS FREE MEASURED	MOISTURE AND ACID GAS FREE CALCULATED
	0.761		0.614

PSEUDO CRITICAL PROPERTIES (CALCULATED):

AS SAMPLED pPc (abs)	AS SAMPLED pTc	ACID GAS FREE pPc (abs)	ACID GAS FREE pTc
5013 kPa	214.0 K	4552 kPa	196.4 K

RELATIVE MOLECULAR MASS

TOTAL GAS	C_7+
22.0	104.0

H_2S g/m³: 0.09

REMARKS

EXCEED NORMAL LIMITS : CO2
FIELD H2S = 60ppm/LAB = ND

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: AGAT 19948

LABORATORY NUMBER: G23116A

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: NAHANNI

NAME OF SAMPLER: LT

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY:

TEST INTERVAL OR PERFS:

SAMPLING POINT: PRESSURE VESSEL

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa				626	626	470
TEMPERATURE °C				74	74	21

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
98-02-13	98-02-20	98-03-02	BN NCO	N-65

COMP.	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m³
H_2	0.0004	0.0005	
He	0.0010	0.0012	
N_2	0.2489	0.3028	
CO_2	0.1780	0.0000	
H_2S	0.0001	0.0000	
C_1	0.5716	0.6955	
C_2	TRACE	TRACE	
C_3	0.0000	0.0000	0.0
iC_4	0.0000	0.0000	0.0
nC_4	0.0000	0.0000	0.0
iC_5	0.0000	0.0000	0.0
nC_5	0.0000	0.0000	0.0
C_6	0.0000	0.0000	0.0
C_7 +	0.0000	0.0000	0.0
C_8			
C_9			
C_{10}+			
TOTAL	1.0000	1.0000	0.0

GROSS HEATING VALUE MJ/m³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE: 26.26

AIR FREE AS RECEIVED: 21.60

VAPOUR PRESSURE PENTANES PLUS: 0.0 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED MEASURED	MOISTURE FREE AS SAMPLED CALCULATED	MOISTURE AND ACID GAS FREE MEASURED	MOISTURE AND ACID GAS FREE CALCULATED
	0.828		0.678

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED pPc (abs)	AS SAMPLED pTc	ACID GAS FREE pPc (abs)	ACID GAS FREE pTc
4794 kPa	194.5 K	4233 kPa	170.7 K

RELATIVE MOLECULAR MASS

TOTAL GAS: 24.0

C_7+: 0.0

H_2S g/m³: 0.09

REMARKS:

EXCEED NORMAL LIMITS : N2 ,CO2

FIELD H2S = 60ppm/LAB = ND

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: AGAT 19974

LABORATORY NUMBER: GR24566A

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al ARROWHEAD N65

ELEVATIONS KB m: 574.60 GRD m: 567.90

FIELD OR AREA: N.W.T

POOL OR ZONE: NAHANNI

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: N65-63-40-122-45 N.W.T. PAR

TEST INTERVAL OR PERFS:

SAMPLING POINT: METER RUN

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa				344	344	450
TEMPERATURE °C				5	5	21

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
98-03-20	98-03-25	98-04-02	BN NCO	

COMP.	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m³
H_2	0.0001	0.0002	
He	0.0014	0.0020	
N_2	0.0770	0.1114	
CO_2	0.3086	0.0000	
H_2S	0.0001	0.0000	
C_1	0.6128	0.8864	
C_2	TRACE	TRACE	
C_3	0.0000	0.0000	0.0
iC_4	0.0000	0.0000	0.0
NC_4	0.0000	0.0000	0.0
iC_5	0.0000	0.0000	0.0
NC_5	0.0000	0.0000	0.0
C_6	0.0000	0.0000	0.0
C_7 +	0.0000	0.0000	0.0
C_8			
C_{10} +			
TOTAL	1.0000	1.0000	0.0

GROSS HEATING VALUE MJ/m³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE: 33.48

AIR FREE AS RECEIVED: 23.17

VAPOUR PRESSURE PENTANES PLUS: 0.0 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED MEASURED	MOISTURE FREE AS SAMPLED CALCULATED	MOISTURE AND ACID GAS FREE MEASURED	MOISTURE AND ACID GAS FREE CALCULATED
	0.883		0.599

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED pPc (abs)	AS SAMPLED pTc	ACID GAS FREE pPc (abs)	ACID GAS FREE pTc
5363 kPa	220.4 K	4461 kPa	183.0 K

RELATIVE MOLECULAR MASS

TOTAL GAS	C_7+
25.6	0.0

H_2S g/m³: 0.14

REMARKS:

EXCEED NORMAL LIMITS : N2 ,CO2
FIELD H2S = 100ppm/LAB = ND

PARAMOUNT BERKLEY ARROWHEAD N-65

COMPLETION DATA

7. APPENDICES TO WELL HISTORY REPORT

Oil, Gas & Water Analyses: (see attached)

Completion Data: (see attached)
A cement squeeze was required to stop gas flow from the production liner which was successful. The lowest section of the Nahanni formation was perforated and acidized. The rig had to move off of the wellbore due to spring break – further completion activities are planned for winter 98/99 season.

Wellbore Diagram: (see attached)

PARAMOUNT BERKLEY ARROWHEAD N-65

DAILY COMPLETION SUMMARY
NOTE: Service Rig operating 24 Hours

March 6 – March 23, 1998

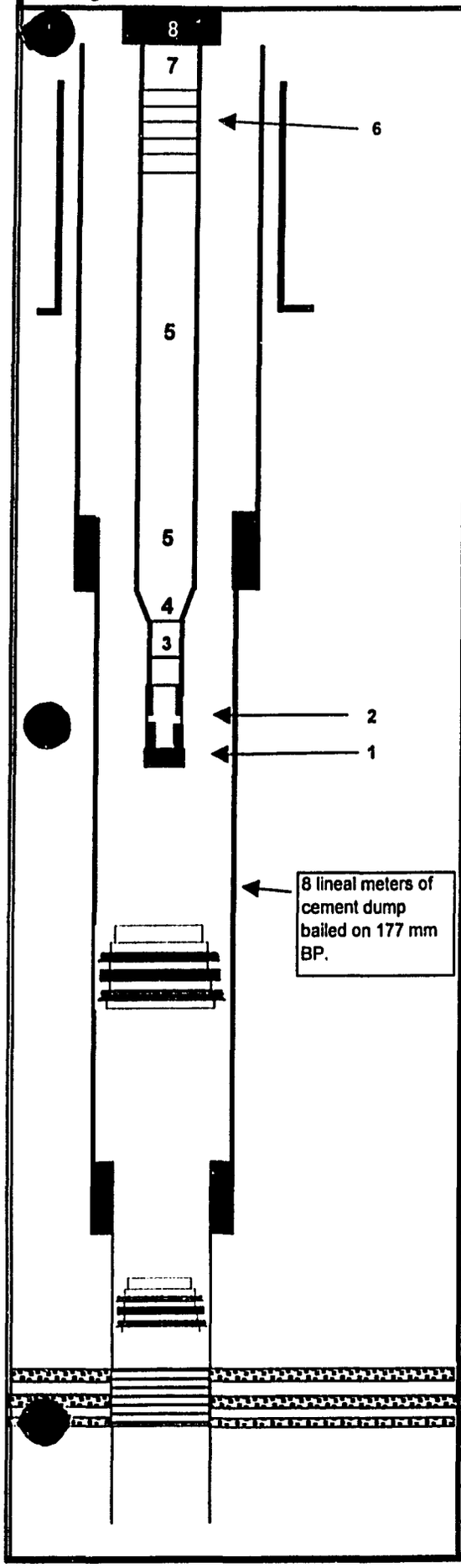
Date	Day	Remarks
March 6/98	1	Rig up Alberta Gold rig 30
March 7	2	NU Class III BOP
March 8	3	PT annulus to 21 MPa. RIH, tag top of 177 mm liner at 1723.93 m KB, tag bridge plug at 1952.9 m KB (set 2000 daN on BP – started moving down hole). Pushed BP to liner top at 2302.59 m KB. (NOTE: Bridge plug was to be drillable – instead it is retrievable)
March 9	4	Retrieve Baker Model "C" 47B bridge plug. RIH with bit.
March 10	5	RIH to 2304.47 m KB (cement top?) Tubing and casing flowing – lots of gas – lost 5.8 m3 during reverse circulation. Broke circulation, ran jt without rotating, circulated gas out – lost a total of 8.7 m3. RIH, tagged PBTD at 2812.6 m KB. Pull 2 jts, pumped 0.56 m3 to catch fluid. Established feed rate pumping 0.4 m3 /m at 7000 kPa (pumped a total of 5 m3 fresh water during test). Drilled to 2821.43 m KB.
March 11	6	RIH with scraper, tag PBTD 2821.43 m KB. Reverse circ – lost 9.82 m3.
March 12	7	Run GR-CCL-VDL-CBL – little cement above 2650 m KB. Run temperature log from 1000 m – PBTD – maximum temperature 130 degrees C – (wellbore was static for at lease 12 hours). RIH with packer and attempt to determine if top of liner is where leak is.
March 13	8	RIH and perforate with 101.4 mm ERHSC 39 gram HMX charges, 17 SPM, 60 degree phasing from 2618 – 2619 m KB. Set cement retainer – middle – at 2616 m KB.
March 14	9	Rig up Sanjel and squeeze with 3 m3 1885 kg/m3 slurry w/ 0.7 CFR, 0.7% CFL2 and FA1 foaming agent at 12 liters/m3 on the fly
March 15	10	Drill out cement from 2504.85 – 2531 m KB, broke through to 2598 m, drill to 2610 m KB – very slow drilling. POOH, drill collars twisted off.

March 16	11	Recover fish. Tag cement at 2808.5 m KB. Bit plugged off.
March 17	12	POOH with mud can – bit missing teeth. Run CBL-VDL-GR-CCL 2660 – 2304 m KB. Tagged fill at 2798.5 m KB. RIH with scraper
March 18	13	RIH with gauge ring. RIH with 101.4 mm ERHSC casing gun loaded w/ 39 gram HMX charges, 18 SPM 60 degree phasing and perforated 2788 – 2790, 2791 – 2792 m KB. (Difficulty getting guns to fire) Well went on vacuum. Run in with same gun assembly and perforate 2777 – 2782 m KB (all but 2 shots fired. RIH with 88.9 mm tubing and set packer assembly at 2757.99 m KB. Pull 14 swabs – recover 9.57 m3, no fluid inflow.
March 19	14	Pull a total of 17 swabs – last two dry. RU Schlumberger and acidize with 15% HCL containing 1.2% A270 inhibitor, 0.2% F75N surfactant, 1% U42 chelating agent, 0.1% friction reducer, 1% A201 inhibitor. Unload well with N2. Rig in frac equipment. Start acid frac pumping 15 m3 of 15% nitrified HCL acid as used earlier today. Start frac balls – maximum pressure obtained 42 MPa (equipment limitation). Flow back well.
March 20	15	Swab well dry
March 21	16	Reverse circulate well to inhibited fresh water. RIH with Cardium 139.7 mm PWPP permanent bridge plug – set at 2769.0 M KB. RIH with Cardium 177.8 mm PWPP permanent bridger plug – set at 2270.0 m KB. Dump bail 8 lineal meters of class G + L10 + D128 + D65 + Silica Flour. RIH w/ 88 mm tubing string.
March 22	17	Pumped 0.5 m3 diesel down tubing and annulus. Rig out rig for season.

PARAMOUNT RESOURCES LTD.

Existing

DOWNHOLE DIAGRAM



WELL NAME: Paramount et al Arrowhead

Prepared by: John Stroh / Randy Hemmingsen | Date 96/03/24

Elevations :

KB (m)	574.60	KB to CF [m]	6.90	TD [m]	2925.00
GL (m)	567.90	PBTD [m]	2821.43	KB to TF	6.30

Tubulars	Size [mm]	Wt - Kg/m	Grade	No Jts.	Landing Depth [m]
Surface Casing	339.70	81.10	J-55, ST&C		480.00
Intermed. Casing	244.50	64.74	L80, LT&C		1890.00
Product. Casing	177.80	38.69	MN80, LT&C		2529.00
Product. Liner	139.70	25.30	L80 FLUSH HYDRIL		2856.09
Production Tbg.	88.90	13.84	J-55	234.00	2190.00

Wellhead Description:

Make / Type: ABB Vetco Gray, Flowing style, 2 - Master valves, 1 - Wing valve (choke)

Size / Rating : 2 - 35 Mpa 79 mm ID gate valves. 2 - 35 Mpa 50.8 mm ID Csg valves

Tbg. String:

Date of Tubing Description:

ITEM	Description	Length (m)	KB Depth (m)
	KB-Tbg. Flg.	6.3	
1	73 mm collar	0.13	2222.56
2	73 mm XN nipple, C/W 58.75 mm profile, 56.01 mm NOG	0.31	2222.25
3	2 - 73 mm J-55 pup Jts. (3.07, 3.07)	6.14	2216.11
4	73 mm x 89 mm swage	0.14	2215.97
5	233 - 88.9 mm J-55, 13.84 kg/m Tbg.	2190.9	25.09
6	5 - 88.9 mm pup Jts. (.61, 1.21, 1.82, 2.43, 3.04 m)	9.11	15.98
7	1 - 88.9 mm J-55, 13.84 kg/m Tbg.	9.47	6.51
8	1 - 88.9 mm EUE Tbg hanger	0.21	6.30
			6.30
			6.30
			6.30
			6.30
			6.30
	Bottom of Tubing mKB	2222.69	

NOTES

Csg & Tbg inhibited with fresh water. Both sides topped off with diesel.

Cement in 139.7 mm Csg had been drilled to a depth of 2821.43 mKB.

Parts of 139 mm retainer sitting @ 2799.1 mKB.

139.7 mm BP set @ 2768.0 mKB

177.8 mm BP set @ 2270.0 mKB. Topped with 8 lineal meters of class G oilwell cement.

Perforations :

Zone	Nahanni	Interval : 2777 - 2782, 2788 - 2790, 2791 - 2792 mKB.
Zone		Interval :
Zone		Interval :

Stimulation : 15 m³ of Nitrified 15% HCL w/ balls.

Schlumberger Dowell

CCAT
Treatment Report

N-65

CCAT

Field
Arrowhead
Formation
Nahanni Headless
Location
N-65

Country
Canada
Province
Northwest Territories

Prepared for		*Service Point*	COIL TUBING GAB
Treatment No.	811-0350	*Business Phone*	(403) 539-4220
Date Prepared	03-18-1998	*FAX No.*	(403) 539-7532

Prepared by VIC LEMKE
Phone (403) 539-4220
E-Mail Address lemke@grande-prairie.dowell.slb.com

Comments Supply men, materials, and equipment to perform a 36.1mm coiled tubing conveyed 15% HCL wash and squeeze on above location as per above customers request.

Disclaimer Notice

This information is presented in good faith, but no warranty is given by and Dowell assumes no liability for advice or recommendations made concerning results to be obtained from the use of any product or service. The results given are estimates based on calculations produced by a computer model including various assumptions on the well, reservoir and treatment. The results depend on input data provided by the Operator and estimates as to unknown data and can be no more accurate than the model, the assumptions and such input data. The information presented is Dowell's best estimate of the actual results that may be achieved and should be used for comparison purposes rather than absolute values. The quality of input data, and hence results, may be improved through the use of certain tests and procedures which Dowell can assist in selecting.

The Operator has superior knowledge of the well, the reservoir, the field and conditions affecting them. If the Operator is aware of any conditions whereby a neighboring well or wells might be affected by the treatment proposed herein it is the Operator's responsibility to notify the owner or owners of the well or wells accordingly.

Prices quoted are estimates only and are good for 30 days from the date of issue. Actual charges may vary depending upon time, equipment, and material ultimately required to perform these services.

Freedom from infringement of patents of Dowell or others is not to be inferred.

Schlumberger
Dowell

Client :
Well :
Formation :
District :
Country :

Section 1: Job Messages

#	Time	Message	Corr Depth (m)	CT Weight (daN)	Circ Pres (kPa)	Tot Pump Rate (SM3/min)	Wellhead Pres (kPa)
1	7:00:00	Arrive on location	0.0	0.00	0	0.00	0
2	8:30:00	Start rigging up	0.0	0.00	0	0.00	0
3	9:42:52	Started Acquisition	0.0	0.00	0	0.00	0
4	10:22:14	Safety meeting	3.4	-695.20	-704	0.00	28
5	10:59:31	Reset Volume	3.4	-950.40	-701	0.00	51
6	11:01:06	Press test coil to 35 MPA.	3.4	-950.70	-699	0.24	45
7	11:24:22	Testers not reading press	3.4	-1469.60	2727	0.00	3501
8	11:48:56	ESD valve not working	3.4	-987.60	-563	0.00	139
9	12:34:04	Start to repressure test	3.4	-963.10	-597	0.00	98
10	12:44:41	Reset Volume	3.4	-1124.10	-638	0.00	207
11	12:45:33	Begin RIH CT	3.4	-945.60	-637	0.00	202
12	12:49:30	Repair level wind override	5.6	-1143.70	-619	0.00	174
13	13:06:48	Resume RIH	5.6	-1019.90	-619	0.00	123
14	13:35:14	Start pumping water to fill hole	381.0	-713.40	1785	0.07	102
15	13:53:52	PULL TEST AT METERS	796.7	2070.83	18112	0.20	62
16	14:02:06	PULL TEST AT METERS	923.2	709.90	17609	0.21	57
17	14:17:45	Fluid returns to surface	1296.7	1012.80	22900	0.20	127
18	14:18:36	Stop pumping fluid	1317.6	1240.00	-483	0.00	133
19	14:32:27	PULL TEST AT METERS	1650.0	2165.90	-664	0.00	147
20	15:03:14	PULL TEST AT METERS	2399.7	3268.70	-364	0.00	145
21	15:03:45	PULL TEST AT METERS	2399.0	3940.50	-530	0.00	143
22	15:04:54	Reset Volume	2394.0	3507.90	-410	0.00	144
23	15:06:22	Start Pumping Acid	2431.1	2819.20	6525	0.12	149
24	15:27:53	Stop pumping acid	2786.9	3891.30	-700	0.00	2130
25	15:38:11	Starting Acid	2792.9	1139.60	-685	0.00	1522
26	15:38:38	Stop Pumping	2792.9	2139.30	4682	0.11	1845
27	15:49:20	Starting Fluid	2792.9	2319.80	2393	0.05	2666
28	15:50:56	Stop Pumping	2792.9	1283.00	13306	0.00	14709
29	16:01:04	Starting Acid	2792.9	2577.60	-710	0.00	1374
30	16:02:28	Stop Pumping	2792.9	2188.90	5429	0.04	6280
31	16:12:31	Starting Acid	2792.9	2626.00	-524	0.00	1843
32	16:14:00	Stop Pumping	2792.9	2739.90	-602	0.00	1805
33	16:24:06	Starting Acid	2792.9	2761.90	-711	0.00	1617
34	16:25:31	Stop Pumping	2792.9	2851.30	85	0.05	1101
35	16:34:57	Starting Acid	2792.9	2809.20	-718	0.00	1305
36	16:36:40	Stop Pumping	2792.9	2873.50	-716	0.00	1364
37	16:47:23	Starting Acid	2792.9	2854.90	-713	0.00	1422
38	16:48:23	Starting Fluid	2792.9	2855.80	2356	0.09	1240
39	16:48:41	Stop Pumping	2792.9	2834.40	1552	0.05	1941
40	16:59:22	Start Pumping Water	2792.9	2896.60	-713	0.00	1479
41	17:00:59	Stop Pumping	2792.9	2849.10	600	0.05	2287
42	17:11:06	Start Water	2792.9	2928.00	-710	0.00	1424
43	17:12:35	Stop Pumping	2792.9	2896.90	1551	0.05	1965
44	17:24:08	Start Water	2792.9	2958.70	-496	0.00	1660
45	17:25:36	Stop Pumping	2792.9	2942.50	-179	0.00	1896
46	17:36:37	Start Water	2792.9	2938.10	-163	0.00	1956
47	17:38:14	Stop Pumping	2792.9	2866.60	1765	0.01	3510
48	17:49:13	Start Water	2792.9	3004.90	-287	0.00	1771
49	17:50:34	Stop Pumping	2792.9	3143.30	375	0.05	956
50	18:01:44	Start Water	2792.9	3142.00	-680	0.00	1166

Schlumberger
Dowell

Client : [illegible]
Well : [illegible]
Formation [illegible]
District [illegible]
Country : [illegible]

#	Time	Message	Corr Depth (m)	CT Weight (daN)	Circ Pres (kPa)	Tot Pump Rate (SM3/min)	Wellhead Pres (kPa)
51	18:03:05	Stop Pumping	2792.9	3139.00	898	0.05	1367
52	18:14:38	Start Water	2792.9	3166.80	-543	0.00	1416
53	18:15:59	Stop Pumping	2792.9	3043.90	1045	0.00	3133
54	18:26:10	Start Water	2792.9	3057.70	956	0.00	2925
55	18:27:33	Stop Pumping	2792.9	3014.50	3236	0.05	3388
56	18:37:05	Start Water	2792.9	3023.60	1191	0.00	3121
57	18:38:36	Stop Pumping	2792.9	3183.10	1689	0.05	1646
58	18:49:48	Start Water	2792.9	3153.40	326	0.00	2232
59	18:51:17	Stop Pumping	2792.9	3006.30	2120	0.00	3974
60	19:01:24	Start Water	2792.9	3217.40	-9	0.00	1876
61	19:02:47	Stop Pumping	2792.9	3095.90	1684	0.00	3536
62	19:12:34	Start Water	2792.9	3136.10	1284	0.00	3142
63	19:14:02	Stop Pumping	2792.9	3113.20	1538	0.01	3262
64	19:26:42	Start Water	2792.9	3111.50	1749	0.00	3485
65	19:31:45	Remark	2792.9	1093.10	29367	0.07	27692
66	19:36:35	Remark	2792.9	1462.90	33436	0.13	26005
67	19:45:37	Remark	2792.9	2006.60	32876	0.15	21571
68	19:47:15	Stop Pumping	2792.9	2251.90	20368	0.00	20464
69	19:51:22	Pres test N2 line to 30 MPA	2792.9	3628.40	3105	0.00	2614
70	19:53:52	Start pumping N2 at 20 scm/min	2792.9	3845.80	7813	0.00	526
71	20:12:25	Pull up hole to establish circulation	2787.8	4254.90	9849	0.00	431
72	20:39:44	Stop POH CT	2107.0	1472.40	19932	0.00	603
73	20:43:19	Run in hole to unload fluid	2107.0	1277.10	18992	0.00	791
74	21:31:59	Stop RIH for H2S alarm	2686.1	3790.70	8269	0.00	1368
75	21:50:13	Stop at 2792m and circulate for 15min	2792.0	3747.60	9149	0.00	1623
76	22:03:17	Begin POH CT	2792.0	3969.00	8550	0.00	1683
77	23:14:15	Stop pumping N2	448.7	-337.38	7408	0.00	1405
78	23:30:25	CT Back at Surface	1.9	-1446.40	515	0.00	840
79	23:31:08	Close master valve and bleed off press	1.9	-1199.60	434	0.00	797
80	23:31:41	Stopped Recording	1.9	-1180.60	375	0.00	763

Total returns where 17.7 M3.

Customer: Paramount Resources Ltd.
Representative:
Well: N-65

Schlumberger
Dowell

District: COIL TUBING GAB
DS Supervisor: VIC LEMKE
Date Prepared: 03-18-1998

Treatment Log

Time hh:mm:ss	WH PRESS kPa	CIRC PRESS kPa	CT CORR DEPTH m	TOT DOWN RUN LEN m	TOTAL N2 RATE scm/min	TOT FLUID m3
07:00:00	Arrive on location					
08:30:00	Start rigging up					
09:42:52	Started Acquisition					
10:07:40	0	0	0.0	0.0	0	0.000
10:16:24	28	-702	3.4	0.0	0	0.000
10:22:14	Safety meeting					
10:22:14	28	-705	3.4	0.0	0	0.000
10:26:24	28	-704	3.4	0.0	0	0.000
10:36:24	28	-704	3.4	0.0	0	0.000
10:46:24	39	-705	3.4	0.0	0	0.000
10:56:24	49	-698	3.4	0.0	0	0.000
10:59:31	Reset Volume □					
10:59:34	48	-702	3.4	0.0	0	0.396
11:01:06	Press test coil to 35 MPA					
11:01:09	49	-701	3.4	0.0	0	0.000
11:06:24	44	-697	3.4	0.0	0	0.055
11:16:24	47	17634	3.4	0.0	0	1.855
11:24:22	Testers not reading press					
11:24:24	874	805	3.4	0.0	0	3.252
11:26:24	3495	2698	3.4	0.0	0	3.515
11:36:24	3334	2556	3.4	0.0	0	3.515
11:46:24	180	-505	3.4	0.0	0	3.515
11:48:56	ESD valve not working					
11:48:59	148	-561	3.4	0.0	0	3.515
11:56:24	140	-563	3.4	0.0	0	3.515
12:06:24	131	-574	3.4	0.0	0	3.515
12:16:24	115	-585	3.4	0.0	0	3.515
12:26:24	112	-582	3.4	0.0	0	3.515
12:34:04	Start to repressure test					
12:34:04	103	-591	3.4	0.0	0	3.515
12:36:24	98	-597	3.4	0.0	0	3.515
12:44:41	Reset Volume □					
12:44:44	101	5637	3.4	0.0	0	3.682
12:45:33	Begin RIH CT					
12:45:34	207	-638	3.4	0.0	0	0.000
12:46:24	200	-635	3.4	0.0	0	0.000
12:49:30	Repair level wind override					
12:49:34	192	-635	5.1	1.7	0	0.000
12:56:24	174	-620	5.6	2.2	0	0.000
13:06:24	146	-614	5.6	2.2	0	0.000
13:06:48	Resume RIH					
13:06:49	121	-617	5.6	2.2	0	0.000
13:16:24	120	-620	5.6	2.2	0	0.000
13:26:24	112	-673	101.9	98.5	0	0.000
13:35:14	Start pumping water to fill hole					
13:35:14	107	-706	214.6	211.2	0	0.095

Well: N-65 Date Prepared: 03-18-1998

Time hh:mm:ss	WH PRESS kPa	CIRC PRESS kPa	CT CORR DEPTH m	TOT DOWN RUN LEN m	TOTAL N2 RATE scm/min	TOT FLUID m3
13:36:24	102	1785	381.0	377.6	0	0.100
13:46:24	101	18762	408.2	404.9	0	0.298
13:53:52	PULL TEST AT METERS					
13:53:54	74	18450	633.5	630.1	0	2.310
13:56:24	62	18059	795.7	794.1	0	3.847
14:02:06	PULL TEST AT METERS					
14:02:09	58	18054	799.9	811.4	0	4.365
14:06:24	58	17537	923.0	934.7	0	5.564
14:16:24	57	19083	1014.8	1029.0	0	6.436
14:17:45	Fluid returns to surface					
14:17:49	112	22927	1263.6	1277.7	0	8.440
14:18:36	Stop pumping fluid					
14:18:39	130	22964	1298.8	1313.0	0	8.727
14:26:24	134	-542	1319.7	1333.8	0	8.779
14:32:27	PULL TEST AT METERS					
14:32:29	145	-514	1515.5	1529.7	0	8.779
14:36:24	148	-671	1649.4	1664.3	0	8.779
14:46:24	142	-540	1717.0	1737.1	0	8.779
14:56:24	138	-529	1972.2	1992.3	0	8.779
15:03:14	PULL TEST AT METERS					
15:03:14	139	-451	2230.8	2250.8	0	8.779
15:03:45	PULL TEST AT METERS					
15:03:49	145	-364	2399.7	2419.8	0	8.779
15:04:54	Reset Volume □					
15:04:54	144	-514	2398.5	2419.8	0	8.779
15:06:22	Start Pumping Acid					
15:06:24	144	-410	2394.0	2420.4	0	8.779
15:16:24	148	7692	2433.7	2460.1	0	0.031
15:26:24	516	17548	2672.3	2698.8	0	2.079
15:27:53	Stop pumping acid					
15:27:54	3625	12548	2784.2	2810.7	0	4.106
15:36:24	1520	-725	2787.1	2813.6	0	4.364
15:38:11	Starting Acid					
15:38:14	1583	-701	2792.9	2819.4	0	4.364
15:38:38	Stop Pumping					
15:38:39	1515	738	2792.9	2819.4	0	4.372
15:46:24	2281	4553	2792.9	2819.4	0	4.416
15:49:20	Starting Fluid					
15:49:24	2750	342	2792.9	2819.4	0	4.422
15:50:56	Stop Pumping					
15:50:59	2786	2403	2792.9	2819.4	0	4.430
15:56:24	15104	12795	2792.9	2819.4	0	4.523
16:01:04	Starting Acid					
16:01:04	1541	-705	2792.9	2819.4	0	4.523
16:02:28	Stop Pumping					
16:02:29	1374	-710	2792.9	2819.4	0	4.523
16:06:24	6175	3882	2792.9	2819.4	0	4.624
16:12:31	Starting Acid					
16:12:34	1853	-503	2792.9	2819.4	0	4.624
16:14:00	Stop Pumping					
16:14:04	1841	-524	2792.9	2819.4	0	4.624

Well: N-65 Date Prepared: 03-18-1998

Time hh:mm:ss	WH PRESS kPa	CIRC PRESS kPa	CT CORR DEPTH m	TOT DOWN RUN LEN m	TOTAL N2 RATE scm/min	TOT FLUID m3
16:16:24	1908	-643	2792.9	2819.4	0	4.726
16:24:06	Starting Acid					
16:24:09	1646	-710	2792.9	2819.4	0	4.726
16:25:31	Stop Pumping					
16:25:34	1617	-710	2792.9	2819.4	0	4.726
16:26:24	1057	-554	2792.9	2819.4	0	4.826
16:34:57	Starting Acid					
16:34:59	1190	-738	2792.9	2819.4	0	4.826
16:36:24	1305	-720	2792.9	2819.4	0	4.826
16:36:40	Stop Pumping					
16:36:44	1103	-485	2792.9	2819.4	0	4.927
16:46:24	1384	-720	2792.9	2819.4	0	4.927
16:47:23	Starting Acid					
16:47:24	1423	-711	2792.9	2819.4	0	4.927
16:48:23	Starting Fluid					
16:48:24	1423	-703	2792.9	2819.4	0	4.927
16:48:41	Stop Pumping					
16:48:44	1219	2360	2792.9	2819.4	0	5.008
16:56:24	2222	351	2792.9	2819.4	0	5.032
16:59:22	Start Pumping Water					
16:59:24	1471	-707	2792.9	2819.4	0	5.032
17:00:59	Stop Pumping					
17:00:59	1479	-534	2792.9	2819.4	0	5.034
17:06:24	2287	600	2792.9	2819.4	0	5.139
17:11:06	Start Water					
17:11:09	1432	-703	2792.9	2819.4	0	5.139
17:12:35	Stop Pumping					
17:12:39	1424	-710	2792.9	2819.4	0	5.139
17:16:24	2366	122	2792.9	2819.4	0	5.237
17:24:08	Start Water					
17:24:09	1787	-378	2792.9	2819.4	0	5.237
17:25:36	Stop Pumping					
17:25:39	1657	47	2792.9	2819.4	0	5.238
17:26:24	2232	-8	2792.9	2819.4	0	5.336
17:36:24	2229	132	2792.9	2819.4	0	5.336
17:36:37	Start Water					
17:36:39	1956	-164	2792.9	2819.4	0	5.336
17:38:14	Stop Pumping					
17:38:14	1956	-163	2792.9	2819.4	0	5.336
17:46:24	3510	1765	2792.9	2819.4	0	5.437
17:49:13	Start Water					
17:49:14	1821	-235	2792.9	2819.4	0	5.437
17:50:34	Stop Pumping					
17:50:34	1771	-289	2792.9	2819.4	0	5.437
17:56:24	956	375	2792.9	2819.4	0	5.538
18:01:44	Start Water					
18:01:44	1180	-663	2792.9	2819.4	0	5.539
18:03:05	Stop Pumping					
18:03:09	1166	-680	2792.9	2819.4	0	5.539
18:06:24	1457	-263	2792.9	2819.4	0	5.639
18:14:38	Start Water					

Well: N-65 Date Prepared: 03-18-1998

Time hh.mm:ss	WH PRESS kPa	CIRC PRESS kPa	CT CORR DEPTH m	TOT DOWN RUN LEN m	TOTAL N2 RATE scm/min	TOT FLUID m3
18:14:39	1512	-427	2792.9	2819.4	0	5.639
18:15:59	Stop Pumping					
18:15:59	1415	-545	2792.9	2819.4	0	5.639
18:16:24	3133	1045	2792.9	2819.4	0	5.736
18:26:10	Start Water					
18:26:14	3464	1377	2792.9	2819.4	0	5.736
18:26:24	2858	3042	2792.9	2819.4	0	5.740
18:27:33	Stop Pumping					
18:27:34	1866	1820	2792.9	2819.4	0	5.748
18:36:24	3890	2024	2792.9	2819.4	0	5.834
18:37:05	Start Water					
18:37:09	3166	1239	2792.9	2819.4	0	5.834
18:38:36	Stop Pumping					
18:38:39	3114	3096	2792.9	2819.4	0	5.837
18:46:24	2037	-6	2792.9	2819.4	0	5.941
18:49:48	Start Water					
18:49:49	2311	425	2792.9	2819.4	0	5.941
18:51:17	Stop Pumping					
18:51:19	2231	324	2792.9	2819.4	0	5.941
18:56:24	4304	1986	2792.9	2819.4	0	6.036
19:01:24	Start Water					
19:01:24	2054	192	2792.9	2819.4	0	6.036
19:02:47	Stop Pumping					
19:02:49	1876	-9	2792.9	2819.4	0	6.036
19:06:24	3743	2000	2792.9	2819.4	0	6.137
19:12:34	Start Water					
19:12:34	3531	1693	2792.9	2819.4	0	6.137
19:14:02	Stop Pumping					
19:14:04	3142	1284	2792.9	2819.4	0	6.137
19:16:24	3686	2130	2792.9	2819.4	0	6.236
19:26:24	3628	1863	2792.9	2819.4	0	6.236
19:26:42	Start Water					
19:26:44	3488	1751	2792.9	2819.4	0	6.236
19:31:45	Remark					
19:31:49	3484	1746	2792.9	2819.4	0	6.236
19:36:24	27695	29375	2792.9	2819.4	0	6.558
19:36:35	Remark					
19:36:39	25998	33048	2792.9	2819.4	0	7.041
19:45:37	Remark					
19:45:39	26007	33366	2792.9	2819.4	0	7.076
19:46:24	21549	32837	2792.9	2819.4	0	8.292
19:47:15	Stop Pumping					
19:47:19	21518	26673	2792.9	2819.4	0	8.391
19:51:22	Pres test N2 line to 30 MPA					
19:51:24	20273	20167	2792.9	2819.4	0	8.428
19:53:52	Start pumping N2 at 20 scm/min					
19:53:54	2383	2813	2792.9	2819.4	0	8.428
19:56:24	528	7345	2792.9	2819.4	27	8.428
20:06:24	503	6001	2792.9	2819.4	0	8.428
20:12:25	Pull up hole to establish circulation					
20:12:29	412	2257	2792.9	2819.4	0	8.428

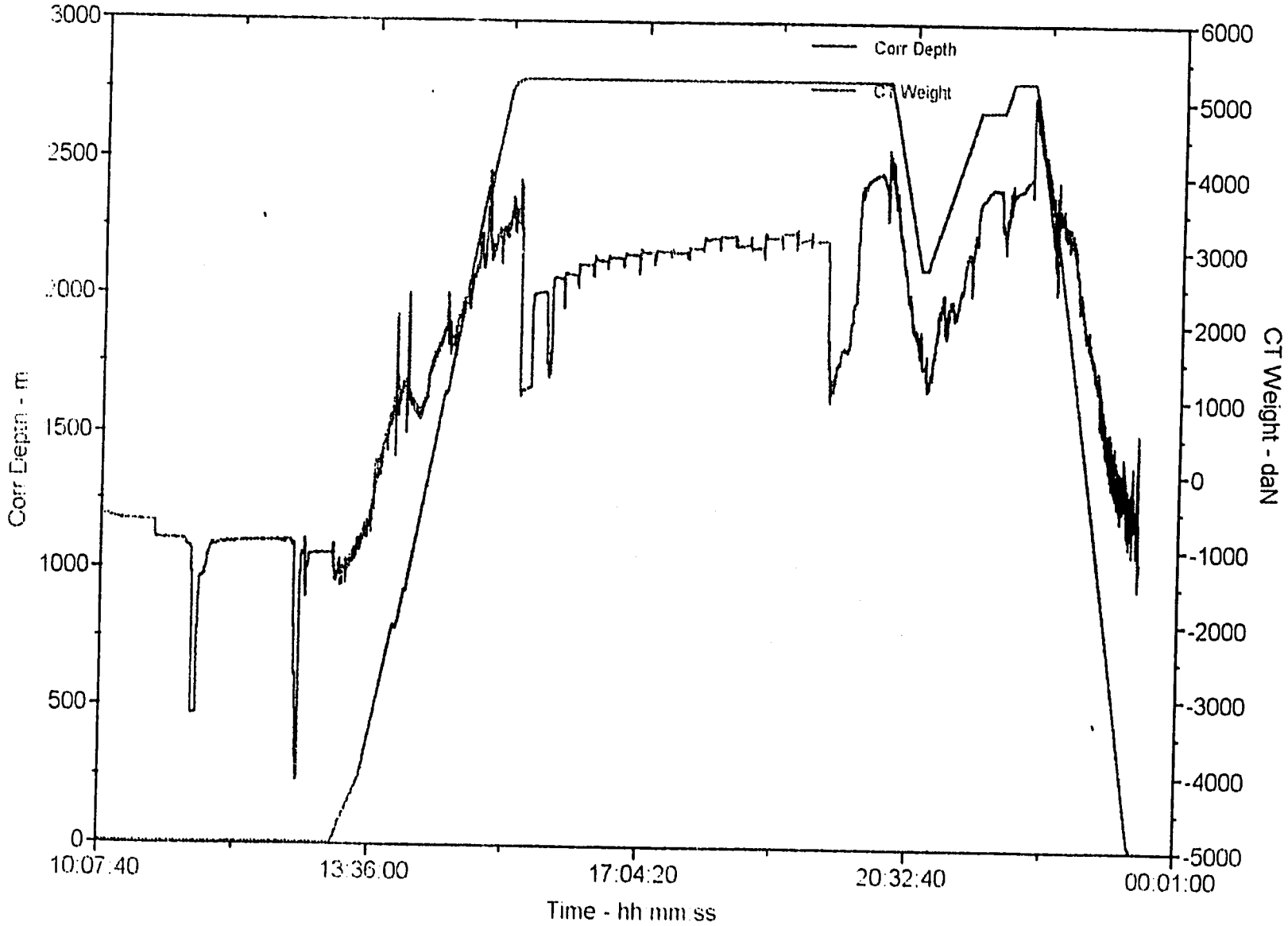
Well: N-65 Date Prepared: 03-18-1998

Time hh:mm:ss	WH PRESS kPa	CIRC PRESS kPa	CT CORR DEPTH m	TOT DOWN RUN LEN m	TOTAL N2 RATE scm/min	TOT FLUID m3
20:16:24	430	9929	2786.2	2819.4	31	8.428
20:26:24	438	12978	2692.6	2819.4	31	8.428
20:36:24	452	17690	2441.3	2819.4	30	8.428
20:39:44	Stop POH CT					
20:39:44	467	20464	2182.4	2819.4	31	8.428
20:43:19	Run in hole to unload fluid					
20:43:19	603	19932	2107.0	2819.4	31	8.428
20:46:24	791	18992	2107.0	2819.4	30	8.428
20:56:24	1371	18001	2152.2	2864.6	30	8.428
21:06:24	2940	13804	2298.8	3011.2	31	8.428
21:16:24	2129	11613	2444.4	3156.7	31	8.428
21:26:24	2532	10577	2593.1	3305.5	31	8.428
21:31:59	Stop RIH for H2S alarm					
21:31:59	1649	6286	2686.1	3398.5	0	8.428
21:36:24	1368	8269	2686.1	3398.5	49	8.428
21:46:24	1172	12101	2686.1	3398.5	49	8.428
21:50:13	Stop at 2792m and circulate for 15min					
21:50:14	1639	9443	2770.9	3483.2	30	8.428
21:56:24	1616	9147	2792.0	3504.4	30	8.428
22:03:17	Begin POH CT					
22:03:19	1103	8817	2792.0	3504.4	30	8.428
22:06.24	1681	8547	2792.0	3504.4	30	8.428
22:16:24	1607	8431	2728.0	3504.4	30	8.428
22:26:24	1415	8110	2378.3	3504.4	30	8.428
22:36:24	1377	7847	2161.6	3538.8	30	8.428
22:46:24	1406	7682	1810.8	3538.8	30	8.428
22:56:24	1402	7593	1457.6	3538.8	30	8.428
23:06:24	1361	7552	1099.6	3538.8	30	8.428
23:14:15	Stop pumping N2					
23:14:19	1372	7510	736.3	3538.8	30	8.428
23:16:24	1408	7402	445.7	3538.8	26	8.428
23:26:24	1423	4839	369.0	3538.8	0	8.428
23:30:25	CT Back at Surface					
23:30:29	1161	1104	20.4	3538.8	0	8.428
23:31:08	Close master valve and bleed off press					
23:31:09	835	507	1.9	3538.8	0	8.428

CCAT*

DEPTH/WIEGHT

Paramount Resources Ltd
N-65
811-0350
03-18-1998



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Depth Vs Time

Paramount Resources Ltd.
N-65
311-0350
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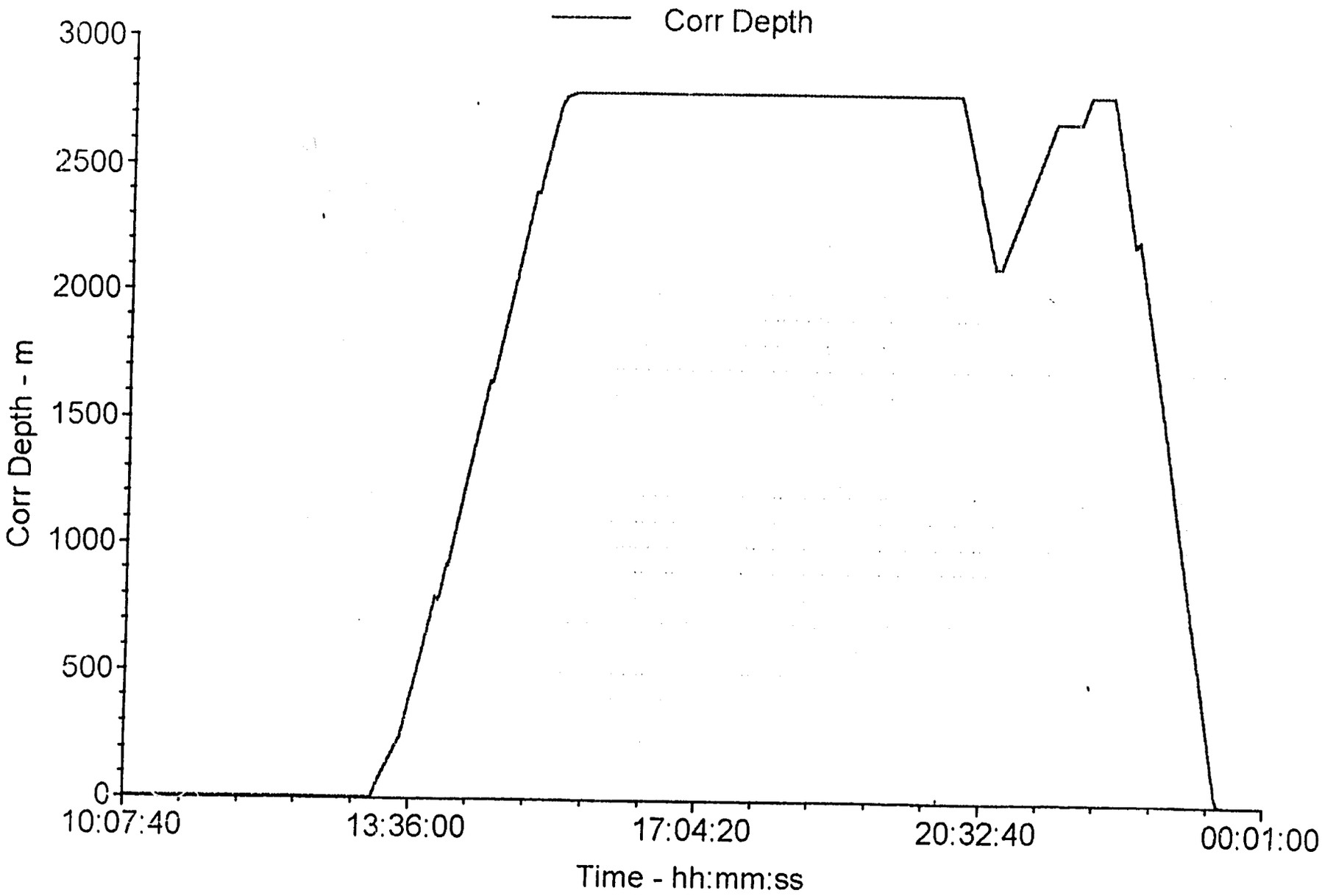

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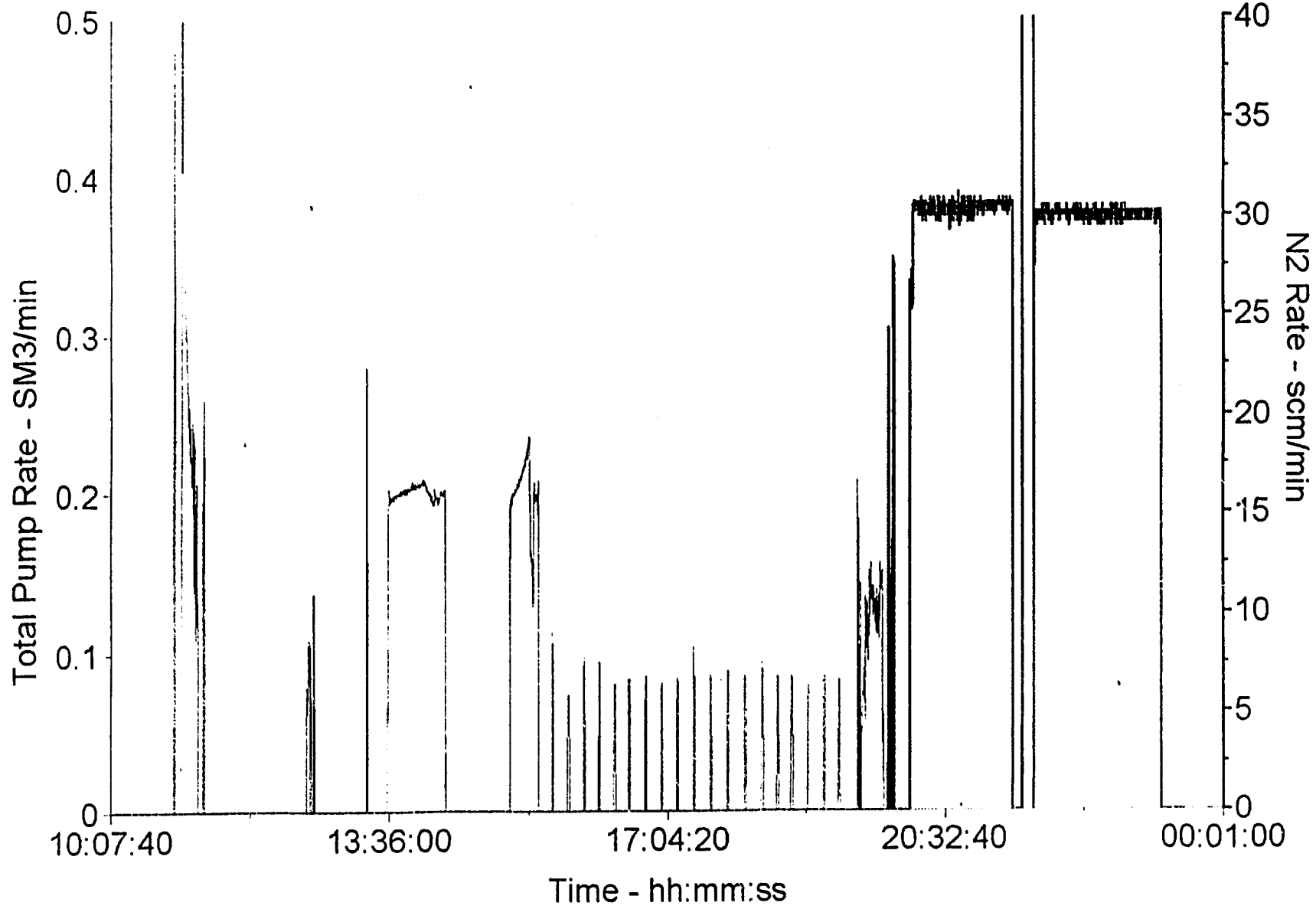
Foam Circulation

Paramount Resources Ltd.
N-65
811-0350
03-18-1998



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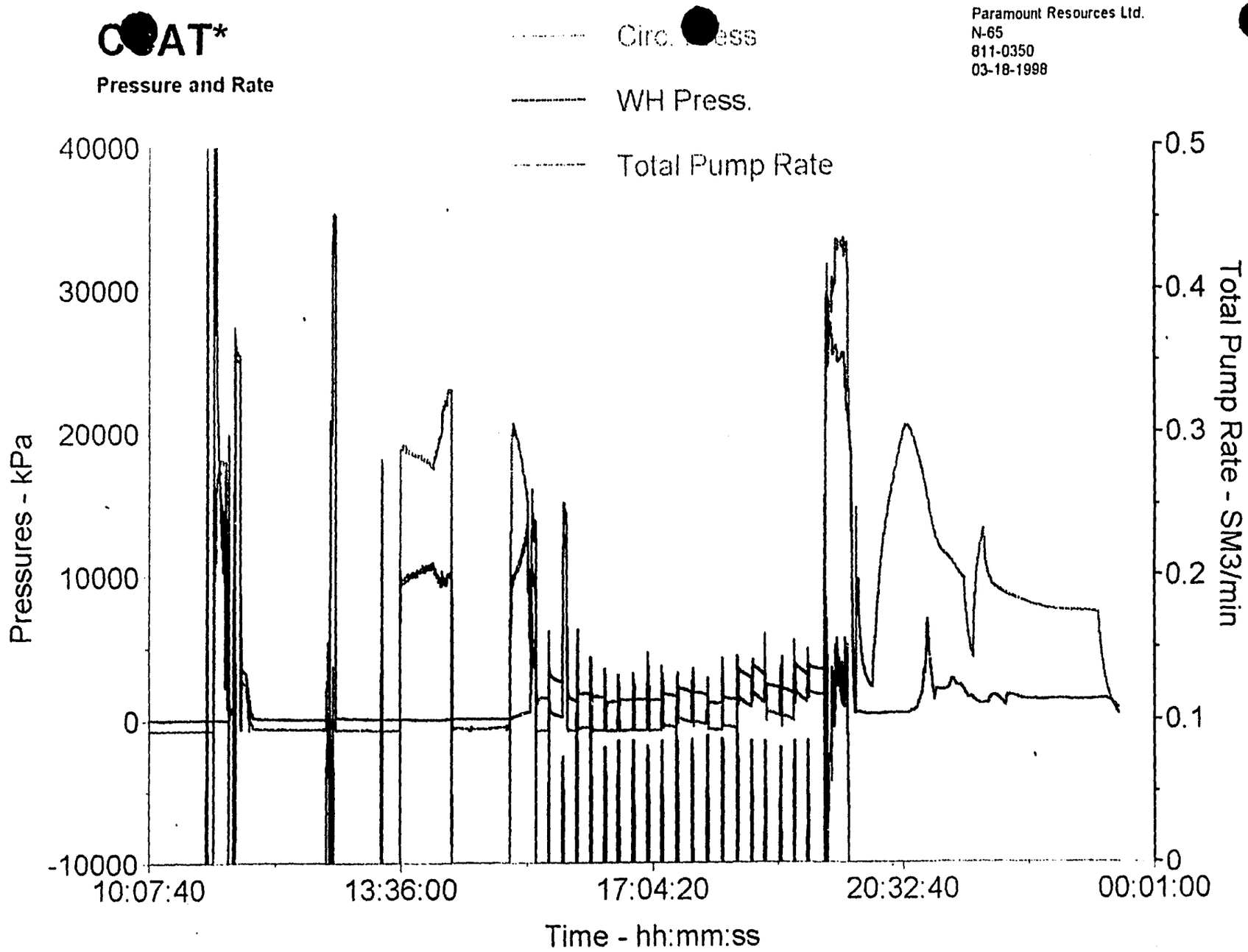
Pressure and Rate

Paramount Resources Ltd.
N-65
811-0350
03-18-1998



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Schlumberger Dowell

CCAT
Treatment Report

N-65

CCAT

Field
Arrowhead
Formation
Nahanni Headless
Location
N-65

Country
Canada
Province
Northwest Territories

Prepared for
Treatment No. **811-0350**
Date Prepared 03-19-1998

Service Point COIL TUBING GAB
Business Phone (403) 539-4220
FAX No. (403) 539-7532

Prepared by VIC LEMKE
Phone (403) 539-4220
E-Mail Address lemke@grande-prairie.dowell.slb.com

Comments Supply men, materials, and equipment to perform a high pressure acid ball job on above location as per above customers request.

[illegible]

This information is presented in good faith, but no warranty is given, and Dowell assumes no liability for advice or recommendations made concerning results to be obtained from the use of any product or service. The results given are estimates based on [illegible] model including assumptions on the well, reservoir and treatment. The results depend on input data provided by the Operator and estimates as to unknown data and can be no more accurate than the model, the assumptions and such input data. The information presented is Dowell's best [illegible] results which may be achieved and should be used for comparison purposes rather than absolute values. The quality of input data, and hence results, may be improved through the use of certain tests and procedures which Dowell can assist in selecting.

The Operator has superior knowledge of the well, the reservoir, the fluids and conditions affecting them, and the [illegible] of any conditions whereby a neighboring well or wells might be affected by the treatment proposed herein. It is the Operator's responsibility to notify the owner or operator of the well or wells accordingly.

Prices quoted are estimates only and are good for 30 days from the date of issue. Actual charges may vary depending upon time, equipment, and material ultimately required to perform these services.

Freedom from infringement of patents of Dowell or others is not to be inferred.

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Client : [illegible]
Well : [illegible]
Formation : [illegible]
District : [illegible]
Country : [illegible]

Section 1: Job Messages

#	Time	Message	Circ Pres (kPa)	Backup Pres 2 (kPa)	N2 Pump Rate (scm/min)	Flowmeter 1 Rate (SM3/min)	Tot Fluid Vol (m3)
1	1:58:37	Started Acquisition	0	0	0	0.00	0.000
2	2:11:11	Rig up equipment	0	0	0	0.00	0.000
3	3:42:52	Started Recording	0	0	0	0.00	0.000
4	3:43:30	Set pop valve	-13	-22	0	0.00	0.000
5	5:02:46	Reset Volume	-15	18	0	0.00	0.000
6	5:08:26	Press test lines to 60 MPA	52056	20292	0	0.00	0.000
7	5:09:52	Press up annulas to 21.5 MPA	51586	21309	0	0.00	0.000
8	5:22:35	Start Pumping Acid	3779	20362	0	0.78	0.000
9	5:24:36	Start dropping balls	1081	20231	0	1.16	0.000
10	5:27:02	Start pumping N2	5858	19646	95	0.97	0.000
11	5:38:16	Start Pumping Water	38329	13657	94	0.68	0.000
12	5:50:13	Stop Pumping	40418	19479	0	0.00	0.000
13	5:51:04	Monitor press	36467	19278	0	0.00	0.000
14	6:05:55	Bleed off and rig out	27521	19750	0	0.00	0.000
15	6:54:01	Stopped Recording	-25095	-26124	0	0.00	0.000
16	6:54:05	Stopped Acquisition	-25095	-26124	0	0.00	0.000

Final press was 42.6 MPA and 10 min shutin press was 27.5 MPA.

Customer: Paramount Resources Ltd.
Representative:
Well: N-65

Schlumberger
Dowell

District: COIL TUBING GAE
DS Supervisor: VIC LEMKE
Date Prepared: 03-19-1998

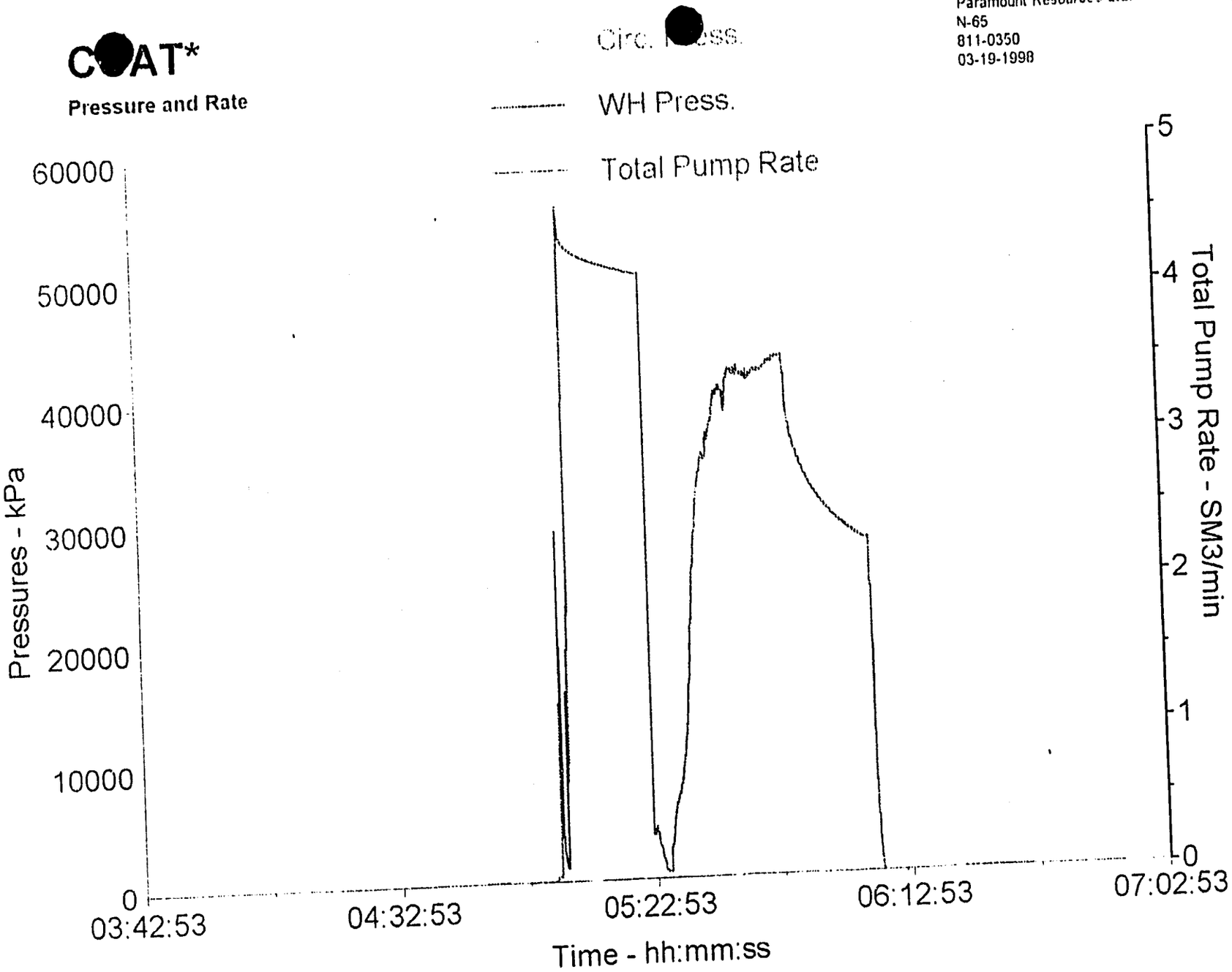
Treatment Log

Time hh:mm:ss	CIRC PRESS kPa	BACKUP PRESS2 kPa	N2 RATE scm/min	FLOWMETER1 RATE SM3/min
01:58:37	Started Acquisition			
02:11:11	Rig up equipment			
03:42:52	Started Recording			
03:42:53	0	0	0	0.00
03:43:30	Set pop valve			
03:43:30	-13	-16	0	0.00
03:51:45	-13	-22	0	0.00
04:01:45	-13	-36	0	0.00
04:11:45	-12	26720	0	0.00
04:21:45	-10	8	0	0.00
04:31:45	-14	22	0	0.00
04:41:45	-8	16	0	0.00
04:51:45	-6	20	0	0.00
05:01:45	0	22	0	0.00
05:02:46	Reset Volume □			
05:02:50	2	20	0	0.00
05:08:26	Press test lines to 60 MPA			
05:08:30	-8	18	0	0.00
05:09:52	Press up annulas to 21.5 MPA			
05:09:55	52023	20818	0	0.00
05:11:45	51563	21266	0	0.00
05:21:45	51130	21078	0	0.00
05:22:35	Start Pumping Acid			
05:22:35	49824	20399	0	0.00
05:24:36	Start dropping balls			
05:24:40	3779	20362	0	0.78
05:27:02	Start pumping N2			
05:27:05	771	20224	0	1.13
05:31:45	6037	19596	96	0.97
05:38:16	Start Pumping Water			
05:38:20	28117	17257	100	0.70
05:41:45	38509	14220	101	0.84
05:50:13	Stop Pumping			
05:50:15	41412	19566	100	0.81
05:51:04	Monitor press			
05:51:05	38903	19431	0	0.00
05:51:45	36299	19265	0	0.00
06:01:45	35164	19211	0	0.00
06:05:55	Bleed off and rig out			
06:05:55	28559	19572	0	0.00
06:11:45	27521	19750	0	0.00
06:21:45	-17	-34	0	0.00
06:31:45	-4	-17	0	0.00
06:41:45	6	2	0	0.00
06:51:45	-25095	-4	0	0.00

Paramount Resources Ltd.
N-65
811-0350
03-19-1998

COAT*

Pressure and Rate



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PARAMOUNT RESOURCES LTD

N-65-63-40-122-45NWT / NAHANNI

NEW COMPLETION

98-03-05 - 93-03-20

Report prepared by:

ENTEST CORP.

98-03-20

ENTESI CORP.

PRODUCTION SUMMARY

Customer Name:	PARAMOUNT RESOURCES LTD
LSD:	N-65-63-40-122-45NWT
Operation Description:	NEW COMPLETION
Test Dates:	98-03-05 - 93-03-20

Gas Parameters

Meter Run Size:	102.26 mm
Relative Gas Density:	0.65
Mole Fraction Nitrogen (N2):	
Mole Fraction Carbon Dioxide (CO2):	
Mole Fraction Hydrogen Sulfide (H2S):	

Production Totals

Total Production Time:	364.58
Total Amount of Gas Produced:	0.00
Total Amount of Oil/Cond Produced:	0
Total Amount of Water Produced:	69.95999

DAY SUMMARY

Date	Production Time hours	Gas Amount Prod 10^3m^3	Gas Avg Gas Rate 10^3m^3/day	OIL/Condensate Amount Prod m^3	OIL/Condensate Avg Prod Rate m^3/day	Water Amount Prod m^3	Water Avg Prod Rate m^3/day
98-03-05	15.00	0.00		0.00		0.00	
98-03-06	19.00	0.00		0.00		0.00	
98-03-07	14.00	0.00		0.00		0.00	
98-03-08	36.00	0.00		0.00		0.00	
98-03-10	29.00	0.00		0.00		0.00	
98-03-11	24.00	0.00		0.00		0.00	
98-03-12	31.00	0.00		0.00		0.00	
98-03-13	16.00	0.00		0.00		0.00	
98-03-14	24.00	0.00		0.00		0.00	
98-03-15	24.00	0.00		0.00		0.00	
98-03-16	39.50	0.00		0.00		0.00	
98-03-17	20.00	0.00		0.00		0.00	
98-03-18	36.00	0.00		0.00		36.35	48.16
98-03-19	23.54	0.00		0.00		30.73	87.52
98-03-20	13.54	0.00		0.00		2.88	

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
SD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20
Operation: NEW COMPLETION

Operations Summary

Date	Time	Comments
98-03-05	08:00	MOVE EQUIPMENT TO LOCATION
	23:00	SHUT DOWN TILL FOLLOWING A M .
98-03-06	08:00	SPOT EQUIPMENT & RUN FLARE LINE & STAND FLARE STACK & TIE IN
	18:00	SHUT DOWN TILL FOLLOWING AM.
98-03-07	08:00	EQUIPMENT & PERSONEL ON STAND BY
98-03-08	08:00	PERSONEL & EQUIPMENT ON STAND BY
	18:00	LINE HEATER ON LOCATION SPOT & RIG IN
	20:00	SHUT DOWN TILL FOLLOWING A M.
98-03-10	00:00	CONTINUE STAND BY
98-03-11	00:00	CONTINUE STAND BY
	23:30	CONTINUE STAND BY
	00:00	CONTINUE STAND BY
	01:00	CONTINUE STAND BY
98-03-12	00:00	CONTINUE STAND BY
	08:00	CONTINUE STAND BY
98-03-13	00:00	CONTINUE STANDBY
98-03-14	00:00	CONTINUE STANDBY
98-03-15	00:00	CONTINUE STANDBY
98-03-16	00:00	CONTINUE STANDBY
	15:30	CONTINUE STAND BY
98-03-17	00:00	CONTINUE STAND BY
	11:30	CONTINUE STAND BY
98-03-18	00:00	CONTINUE STAND BY
	02:30	RIG UP AND BEGIN TO SWAB
	08:04	RIG DOWN SWAB SWAB EQUIPMENT & RIG UP SCHLUMBERGER
	11:00	HOLD SAFETY MEETING & PRESSURE TEST SURFACE LINES
	13:06	START IN HOLE WITH COIL TUBING
	14:30	START RECOVERING DISPLACEMENT FLUID
	15:00	RECOVERING DISPLACEMENT FLUID
	15:30	TRANSFER 3 / M 3 TO RIG TANK

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-03-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20
Operation: NEW COMPLETION

Operations Summary

Date	Time	Comments
98-03-18	16:00	RECOVERED FLUID
	17:00	RECOVERED FLUID
	17:30	RECOVERED FLUID
	18:00	RECOVERED FLUID
	18:30	RECOVERED FLUID
	18:38	RECOVERED FLUID
	19:02	TRANSFER 4.83 / M 3 TO 400 STORAGE
	22:00	GAUGE 400 TANK @ 154 C M. =16.18 M3
	23:30	GAUGE 400 @ 159CM = 16.69M3 AND WAIT ON BULKER
98-03-19	02:55	BULKER ON LOCATION PREPARE TO FRAC
	05:50	COMPLETE ACID & PERF BALL FRAC
	06:35	OPEN TO FLOW BACK ACID ON 50.8 M. M. CHOKE
	09:30	BLEED CASING DOWN TO 0
	11:44	NO TAG ON SWAB # 2 @ 11:44 HRS
	16:05	TRANSFER TO 400 STORAGE 6.03 / M3
	19:27	SHUT DOWN SWABBING AND WAIT TWO HOURS
98-03-20	01:15	OBTAIN WATER SAMPLE @ 01:15 H . R. S. SWAB # 23
	07:59	OBTAIN WATER SAMPLE SWAB# 30
	08:15	TRANSFER T0 400 SORAGE 4.12 / M 3 SHUT DOWN SWABBING
	09:15	RECORD BUILD UPS
	09:30	BUILD UP
	09:45	BUILD UP
	10:00	BUILD UP
	10:15	BUILD UP
	10:30	BUILD UP
	10:45	BUILD UP
	11:00	BUILD UP
	11:15	BUILD UP
	11:30	BUILD UP
	11:45	BUILD UP

ENTES T CORP.

Company: PARAMOUNT RESOURCES LTD
SD: N-65-63-40-122-45NWT
Test Dates: 98-03-05-93-03-20
Operation: NEW COMPLETION
Zone: NAHANEY

Operations Summary

Date	Time	Comments
98-03-20	12:00	BUILD UP
	12:15	OBTAIN 2 GAS SAMPLES CYL # 00019974 &00019954 AGAT LAB
	12:30	KILL WELL & PROCEDE WITH EQUIPMENT RIG OUT
	12:35	TRANSFER BALANCE OF FLUID TO 400 =6.32 / M 3

ENTEST CORD

Company:	PARAMOUNT RESOURCES LTD	Job No:	R0004 Unit: CUB # 4
LSD:	N-65-63-40-122-45NWT	Company Rep:	RANDY HEMMINGSEN
Zone:	NAHANEY	Test Operator:	R. GALLANT
Test Dates:	98-03-05-93-03-20	Operation:	NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-05	08:00	MOVE EQUIPMENT TO LOCATION															
	23:00	SHUT DOWN TILL FOLLOWING A M .															
98-03-06	08:00	SPOT EQUIPMENT & RUN FLARE LINE & STAND FLARE STACK & TIE IN															
	18:00	SHUT DOWN TILL FOLLOWING AM.															
98-03-07	08:00	EQUIPMENT & PERSONEL ON STAND BY															
98-03-08	08:00	PERSONEL & EQUIPMENT ON STAND BY															
	18:00	LINE HEATER ON LOCATION SPOT & RIG IN															
	20:00	SHUT DOWN TILL FOLLOWING A M.															
98-03-10	00:00	CONTINUE STAND BY															
	01:00																
98-03-11	01:00																
	00:00	CONTINUE STAND BY															
	23:30	CONTINUE STAND BY															
	00:00	CONTINUE STAND BY															
	01:00	CONTINUE STAND BY															
98-03-12	00:00	CONTINUE STAND BY															
	08:00	CONTINUE STAND BY															
98-03-13	00:00	CONTINUE STANDBY															
98-03-14	00:00	CONTINUE STANDBY															
98-03-15	00:00	CONTINUE STANDBY															

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)		
Fluid Injected (m³)		
Cum Recovered (m³)		
Fluid To Recover (m³)	0	0

ENTEST CORP

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-16	00:00	CONTINUE STANDBY															
	15:30	CONTINUE STAND BY															
98-03-17	00:00	CONTINUE STAND BY															
	11:30	CONTINUE STAND BY															
98-03-18	00:00	CONTINUE STAND BY															
	02:30	RIG UP AND BEGIN TO SWAB		1			1	1									
	02:47	0	0	2			1	2									
	03:00	0	0	3	510	699	1	3									
	03:11	0	0	4	699	883	0.66	3.66									
	03:22	0	0	5	791	971	0	3.66									
	03:33	0	0	6	883	1062	0.33	3.99									
	03:51	0	0	7	883	1062	0.66	4.65									
	04:05	0	0	8	1062	1321	0.66	5.31									
	04:19	0	0	9	1279	1448	0	5.31									
	04:41	0	0	10	1321	1572	1.32	6.63									
	05:03	0	0	11	1572	1810	0.66	7.29									
	05:30	0	0	12	1732	1963	0.33	7.62									
	06:01	0	0	13	1887	2109	0.99	8.61									
	06:28	0	0	14	2145	2358	0.66	9.27									
	06:50	0	0	15	2217	2457	0.33	9.6									

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	9.60	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	9.6	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORE

Company:	PARAMOUNT RESOURCES LTD	Job No:	R0004 Unit: CUB # 4
LSD:	N-65-83-40-122-45NWT	Company Rep:	RANDY HEMMINGSEN
Zone:	NAHANEY	Test Operator:	R. GALLANT
Test Dates:	98-03-05-93-03-20	Operation:	NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-18	07:27	0	0	16	2322	2358	0	9.6									
	08:04	0	0	17	2322	2358	0	9.6									
		RIG DOWN SWAB SWAB EQUIPMENT & RIG UP SCHLUMBERGER															
	11:00	0	0														
		HOLD SAFETY MEETING & PRESSURE TEST SURFACE LINES															
	13:06	0	0														
		START IN HOLE WITH COIL TUBING															
	14:30	0	0				2.35	11.95									
		START RECOVERING DISPLACEMENT FLUID															
	15:00	0	0				0.68	12.63									
		RECOVERING DISPLACEMENT FLUID															
	15:30	0	0				4.18	16.81									
		TRANSFER 3 / M 3 TO RIG TANK															
	16:00	0	0				0.37	17.18									
		RECOVERED FLUID															
	17:00	0	0				0.25	17.43									
		RECOVERED FLUID															
	17:30	0	0				0.43	17.86									
		RECOVERED FLUID															
	18:00	0	0				0.35	18.21									
		RECOVERED FLUID															
	18:30	0	0				0	18.21									
		RECOVERED FLUID															
	18:38	0	0				0.18	18.39									
		RECOVERED FLUID															
	19:00	0	0				0.09	18.48									
	19:02	0	0				0.17	18.65									
		TRANSFER 4.83 / M 3 TO 400 STORAGE															
	22:00	0	0				11.35	30									
		GAUGE 400 TANK @ 154 C M. =16.18 M3															
	23:30	0	0				6.35	36.35									
		GAUGE 400 @ 159CM = 16.69M3 AND WAIT ON BULKER															
98-03-19	02:55																
		BULKER ON LOCATION PREPARE TO FRAC															
	05:50																
		COMPLETE ACID & PERF BALL FRAC															
	06:35	22000	0														
		OPEN TO FLOW BACK ACID ON 60.8 M. M. CHOKE															

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	26.75	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	36.35	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-19	06:40	22000															
	06:45	10000															
	06:50	5500	0														
	06:55	3500	0														
	07:10	2300	0														
	07:25	1800	0														
	08:00	2000					12.42	48.77									
	08:30	1900	7000				2.22	50.99									
	09:00	2000	8000				5.31	56.3									
	09:30	1400	8000				1.22	57.52									
		BLEED CASING DOWN TO 0															
	10:00	800	0				0.54	58.06001									
	10:30	300	0				0	58.06001									
	11:22					1191	0.76	58.84							5		
	11:44	0	0				0.61	59.45							5		
		NO TAG ON SWAB # 2 @ 11:44 HRS															
	12:07	0	0		1148	1321	0.62	60.07						232000	5		
	12:31	0	0	4	1148	1321	0.27	60.34						230000	5		
	12:49	0	0	5	1448	1652	0.53	60.87						240000	5		
	13:14	0	0	6	1448	1652	0.45	61.32						240000	5		
	13:46	0	0	7	1363	1612	0.44	61.76						225000	5		
	14:01	0	0	8	1407	1652	0.18	61.94						218000	5		600

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	25.59	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	61.94	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 Unit: CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-19	14:30	0	0	9		1887	0.53	62.47						220000	5		
	14:58	0	0	10	1652	1963	0.44	62.91						220000	5		
	15:23	0	0	11	1810	2037	0.34	63.25						220000	5		
	16:05	0	0	12	2457	2457	0.93	64.18						212000	5		
		TRANSFER TO 400 STORAGE 6.03 / M3															
	16:57	0	0	13	2252	2457	0.52	64.7						220000	5		
	17:26	0	0	14	2322	2587	0.26	64.96						200000	5		
	18:00	0	0	15		2587	0.61	65.57						208000	5		
	18:33	0	0	16		2587	0.18	65.75						212000	5		
	19:05	0	0	17		2587	0.26	66.01						210000	5		
	19:27	0	0	18		2587	0.09	66.1						190000	5		
		SHUT DOWN SWABBING AND WAIT TWO HOURS															
	21:26	0	0	19		2587	0.45	66.55						220000	5		50
	21:52	0	0	20		2587	0.18	66.73						206000	5		
	23:03	0	0	21		2587	0.35	67.07999						200000	5		
98-03-20	00:04	0	0	22		2587	0.27	67.34999						206000	5		
	01:15	0	0	23		2587	0.27	67.61999						206000	5		
		OBTAIN WATER SAMPLE @ 01:15 H . R. S. SWAB # 23															
	02:03	0	0	24		2587	0.44	68.05999						210000	5		
	03:03	0	0	25		2587	0.26	68.31999						222000	5		
	04:06	0	0	26		2587	0.18	68.49999						210000	5		
	05:09	0	0	27		2587	0.26	68.75999						216000	5		100
	05:57	0	0	28		2587	0.52	69.27999						214000	5		

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	7.34	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	69.27999	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-19	14:58	0	0	10	1652	1963	0.44	62.91						220000	5		
	15:23	0	0	11	1810	2037	0.34	63.25						220000	5		
	16:05	0	0	12	2457	2457	0.93	64.18						212000	5		
		TRANSFER TO 400 STORAGE 6.03 / M3															
	16:57	0	0	13	2252	2457	0.52	64.7						220000	5		
	17:26	0	0	14	2322	2587	0.26	64.96						200000	5		
	18:00	0	0	15		2587	0.61	65.57						208000	5		
	18:33	0	0	16		2587	0.18	65.75						212000	5		
	19:05	0	0	17		2587	0.26	66.01						210000	5		
	19:27	0	0	18		2587	0.09	66.1						190000	5		
		SHUT DOWN SWABBING AND WAIT TWO HOURS															
	21:26	0	0	19		2587	0.45	66.55						220000	5		50
	21:52	0	0	20		2587	0.18	66.73						206000	5		
	23:03	0	0	21		2587	0.35	67.07999						200000	5		
98-03-20	00:04	0	0	22		2587	0.27	67.34999						206000	5		
	01:15	0	0	23		2587	0.27	67.61999						206000	5		
		OBTAIN WATER SAMPLE @ 01:15 H. R. S. SWAB # 23															
	02:03	0	0	24		2587	0.44	68.05999						210000	5		
	03:03	0	0	25		2587	0.26	68.31999						222000	5		
	04:06	0	0	26		2587	0.18	68.49999						210000	5		
	05:09	0	0	27		2587	0.26	68.75999						216000	5		100
	05:57	0	0	28		2587	0.52	69.27999						214000	5		

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	69.27999	
Fluid Injected (m³)		
Cum Recovered (m³)	69.27999	
Fluid To Recover (m³)	0	0

PARAMOUNT BERKLEY ARROWHEAD N-65

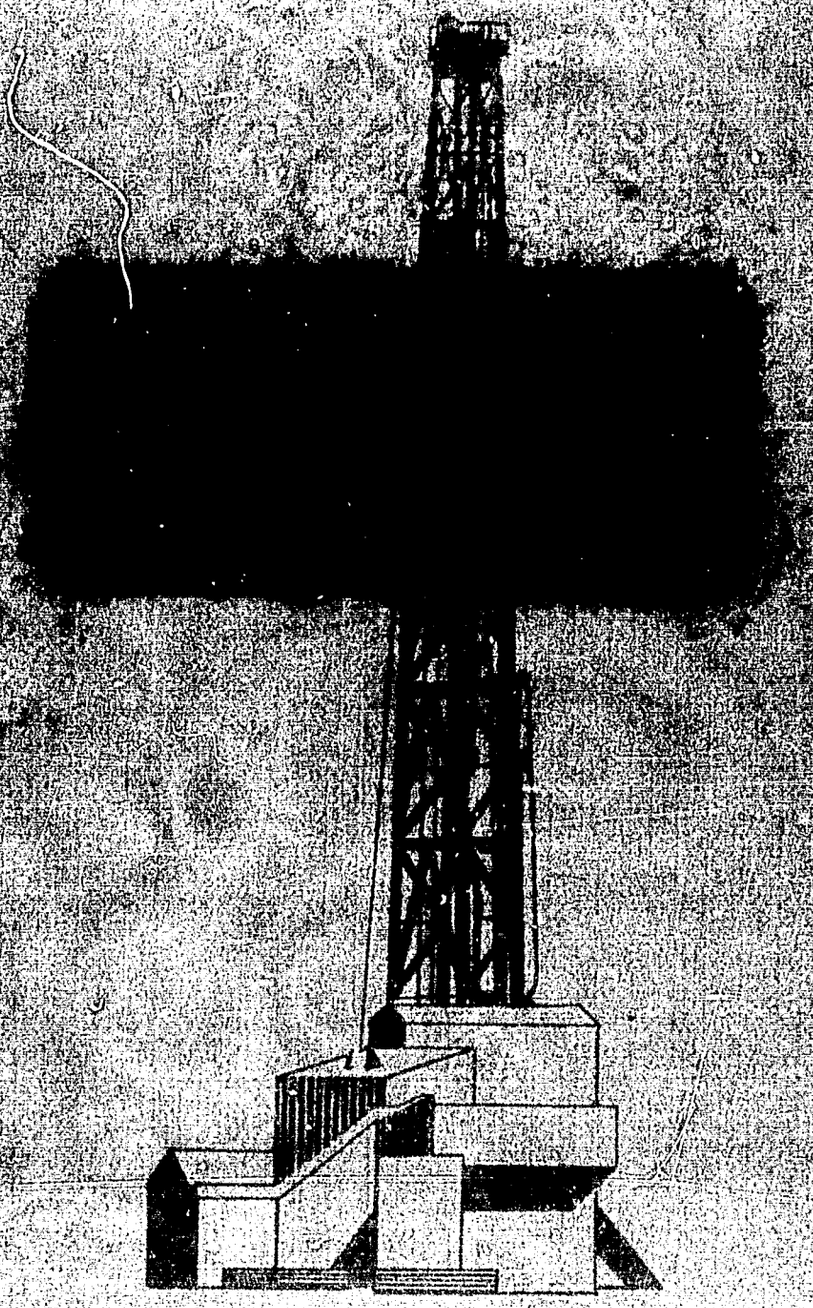
DOWNHOLE LOGS

GEOLOGICAL REPORT

N.E.B. COPY

18 33

Geological Report



C L Consultants Limited

CONTINENTAL LABORATORIES

CL CONSULTANTS LIMITED

1958 - 1998

"Logging the Past 40 Years"

PARAMOUNT et al
ARROWHEAD N65

LAT 60 34' LONG 122 57'

File No: 98N-2036

9211-P33-10-1

Prepared by:

D.G FERGUSON
Wellsite Geologist
CL Consultants Limited

Prepared for:

Paul Collins
PARAMOUNT RESOURCES LIMITED

PERMIT TO PRACTICE
CL CONSULTANTS LIMITED

Signature: _____

Date: February 20, 1998

PERMIT NUMBER: P 2911

The Association of Professional Engineers, Geologists and Geophysicists of Alberta

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
MAR 30 1998

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SYNOPSIS

OPERATOR:	PARAMOUNT RESOURCES LTD.	
WELL NAME:	PARAMOUNT ET AL ARROWHEAD	
LOCATION:	LAT 60 34' LONG 122 57'	
FIELD:	Undefined	
PROVINCE:	NWT	
ELEVATIONS:	G.L. - 567.9 m	K.B. - 574.6 m
SPUD DATE:	January 14, 1998	14:00 hrs
T.D. DATE:	February 14, 1998	18:00 hrs
CONTRACTOR:	Nabors Drilling	Rig: 16
HOLE SIZE:	156 mm	
COLLARS:	149 mm	
MUD TYPE:	air / Cutter D / Nitrogen	
WIRELINE LOGGING CO.:	Western Atlas wireline/Computalog	
LOG RECORD:	Run #1	

1) HDIL-GR	1890 m - 479 m	
2) DAL-GR-XY	1890 m - 479 m	
3) ZDL CN-GR-XY	1890 m - 0 m	

DRILLING SUPERVISION:	Rod MacEachern/Dave Garstad
GEOLOGICAL SUPERVISION:	D.G. FERGUSON
TOTAL DEPTH:	2925 meters

FORMATION TOPS (m)

FORMATION	PROGNOSIS	SAMPLE	LOGS	SUBSEA
Cret Scatter	311m	276m ?	490m	+ 84.6
Cret Garbutt	349m	328m ?	545m	+ 29.6
Miss Chinkeh	--		633m	- 58.4
Miss Flett	451m	628m	682m	- 107.4
Miss Banff	829m	810m	812m	- 237.4
Miss Exshaw	1329m	1318m	1316m	- 741.4
Dev Kotcho	1343m	1329m	1330m	- 755.4
Dev Tetcho	1720m	1725m	1728m	-1153.4
Kakisa	--	1845m	1844m	-1269.4
Ft Simpson	1892m	1870m	1870m	-1295.4
TD Intermediate hole		1890m		
Dev Muskwa	2542m	2498m		
Slave Pt	--	2524m	2524	-1949.4
Watt Mtn	--	2565m		
Sulphur Pt	--	2573m		
Nahanni	2564m	2689m	2689	-2114.4
Headless SH	--	2788m	2788	-2213.4
Landry (Manetoe)		2811m	2811	-2236.4
Arnica	--	2865m	2865	-2290.4
TD		2925m		

PARAMOUNT et al ARROWHEAD N65
LAT 60 34' LONG 122 57'

DEVIATION SURVEY RECORD

Depth (m)	Deviation	Azimuth	Depth (m)	Deviation	Azimuth
46m	1		2155m	4	
64m	3/4		2241m	2 1/4	
83m	0		2270m	4 1/8	
100m	0		2300m	5	
127m	1/4		2308m	5	
145m	1/2		2385m	3	
173m	1		2414m	2 3/4	
183m	0		2443m	2 7/8	
199m	1/4		2471m	2	
227m	1/4		2503m	1	
242m	3/4		2529m	1	
266m	1/2				
284m	1/2				
303	1/2				
323	1/2				
342m	3/4				
361	1/2				
380m	1/2				
404m	1				
424m	1				
443m	1/2				
462m	2				
471m	2				
480m	1 3/4				
522m	2				
627m	3				
650	2 1/4				
737m	1				
824m	3/4				
920m	3/4				
1014m	1				
1106m	1				
1220m	1				
1330m	3/4				
1445m	1				
153m	1 1/2				
1618m	1 3/4				
1700m	2				
1806m	2				
1884m	2 1/4				
1890m	2 3/4				
1956m	3				
1984m	3				
2012m	2				
2099m	2				

BIT RECORD

#	Type	Size (mm)	In	Out	Total (m)	Hrs drilled	FOB (daN)	RPM	Cond. T B G
1a	ReedY11	444	0	185m	185m	28.25	3 /10	100/160	3-2-I
2a	S 13	444	185	395m	210m	28.25	3 /11	100/161	8-1-I
3a	SS 81	444	395	480m	85m	34.00	4 /6	160	2-2-I
1	HP51	311	480	490M	10M	1.50	4 / 5	45/50	3-3-I
2	HP43A	311	490	634M	144M	12.75	1/2	45/50	3-3-I
3	H425ZR3	311	634	1890M	1256M	57.25	1	AIR HAMMER	
1	FDT	216	1890	1893M	3M	1.75	3/4	40	1-1-I
2	H42R8R3	216	1893M	2515M	622M	28.75	0/1	AIR HAMMER	
3	HP 53A	216	2515M	2530M	15M	7.00	10/12	70/80	2-1-I
1	HZS84F	156	2530M	2847M	317M	33.25	10/12	50	6-8-I
2	HZS84F	156	2847M	2925M	78M	77.75	10	50	

BIT CONDITION		SCALE
Tooth Wear	(T)	0 - 8
Bearing Wear	(B)	0 - 8
Gauge	(G)	in or (mm) under
New Bit	T=0	B=0 G=in

DAILY DRILLING CHRONOLOGY

Date	Depth 08:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 08:00 - 08:00
98-01-14	0	0	0000	RIG UP NABORS 16
98-01-15	90	90	13	Dill ahead 444mm sfc hole
98-01-16	185m	95	15.25	Drill ahead with bit #2a
98-01-17	332m	147m	21.2	Drill ahead with bit 2a
98-01-18	395m	63m	17	RIH with bit 3a
98-01-19	460m	63	19	Drill 444mm sfc hole
98-01-20	480m	20	15	hoist to run 339.7mm sfc csg
98-01-21	to 01-25			csg/change drill string/cmt
98-01-26	634m	144m	7.5	make up air hammer /bit
98-01-27	1110m	476m	19.2	drill ahead 311mm hole w/ air
98-01-28	1705m	595m	21	drill ahead 311mm hole w/ air
98-01-29	1890m	185m	6.4	displace hole for logs
98-01-30	1890m	0	0	lay down rotating head and pick up flow nipple
98-01-31-	to 02-02			intermediate casing
98-02-02	1893m	3m	1.75	displace hole with air
98-02-03	2187m	294m	10.7	air dirll 216mm hole
98-02-04	2480m	293m	15.75	air drill 216mm hole
98-02-05	2520m	40m	3.2	drill 216mm hole
98-02-06	2520m	10m	6.2	runn 177.8mmm liner
98-02-06	98-02-09			running liner for open hole
98-02-09	2530	10		RIH w/ 89mm drillstring
98-02-10	2530	0		
98-02-11	2550	20		drill 156mm hole with N2
98-02-12	2636	86		foam underbalance drill 156mm hole
98-02-13	2847	211	18.2	" "" " "
98-02-14	2847	0	0	foam underbalance drill 156mm hole
98-02-15	2925	78	7	WO Loggers

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
55 - 80	No sample - NO SAMPLE - predominant lost circulation material;
80 - 100	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, fair to poor intergranular porosity, no visual show, slightly calcareous, trace carbonaceous laminae in part; **SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part;
100 - 120	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, fair to poor intergranular porosity, no visual show, slightly calcareous, trace carbonaceous laminae in part; **SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part;
120 - 125	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part;
125 - 145	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, slightly silty in part;
145 - 175	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, slightly silty in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
175 - 195	**SANDSTONE** - light gray, white, predominant quartzose, salt and pepper in part, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly calcareous, trace carbonaceous laminae in part, scattered argillaceous laminae; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, slightly silty in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite;
195 - 205	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite;
205 - 215	**SANDSTONE** - gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, slightly silty, occasionally calcareous in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
215 - 220	**SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
220 - 225	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, slightly silty, moderately siliceous in part, trace calcareous streaks in part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
225 - 230	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, slightly silty, moderately calcareous in part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part; **LIMESTONE** - white, translucent, cryptocrystalline, no visual show, no visible porosity, trace sandy streaks in part;
230 - 235	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, moderately calcareous in part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
235 - 255	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, moderately calcareous in part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
255 - 275	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
275 - 295	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
295 - 315	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
315 - 335	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, moderately silty in part, grading **SILTSTONE** in part;
335 - 355	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained to fine grained, subangular to subrounded, well sorted, no visual show, no visible porosity, trace Iron, stained in part, slightly argillaceous, slightly silty, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, trace pyrite, trace micromicaceous, trace silty streaks;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
355 - 385	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, with scattered argillaceous laminae, slightly silty, grading to **SILTSTONE** in part, trace kaolinitic in part, trace calcareous streaks in small part; **SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks;
385 - 415	**SANDSTONE** - light gray, brown in small part, quartz, trace chert, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, with scattered argillaceous laminae, slightly silty, grading to **SILTSTONE** in part, trace kaolinitic in part, trace calcareous streaks in small part; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks; **LIMESTONE** - white, translucent, cryptocrystalline, no visual show, no visible porosity, trace sandy streaks in part;
415 - 430	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks;
430 - 445	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous, trace silty streaks;
445 - 455	**SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous in part, trace silty streaks in small part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
455 - 470	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous in part, trace silty streaks in small part;
470 - 480	**SILTSTONE** - medium gray, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SHALE** - medium gray, subfissile to blocky, scattered **SILTSTONE** streaks, rare pyrite, trace micromicaceous in part, trace silty streaks in small part;
TD SFC HOLE: 480M	
480 - 490	**SHALE** - medium gray, subfissile, rare pyrite, trace silty streaks in small part;
490 - 505	**SHALE** - medium gray, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SILTSTONE** - medium gray, salt and pepper, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite;
505 - 515	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SILTSTONE** - medium gray, salt and pepper, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SANDSTONE** - light gray, salt and pepper, quartz, trace chert, predominant siliceous cement, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, with scattered argillaceous laminae, slightly silty, grading to **SILTSTONE** in part, trace dolomitic streaks in small part, trace pyrite in small part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
515 - 525	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SILTSTONE** - medium gray, salt and pepper, grading to silty **SHALE**, no visual show, no visible porosity, moderately argillaceous, trace calcareous streaks, trace pyrite; **SANDSTONE** - light gray, salt and pepper, quartz, trace chert, predominant siliceous cement, very fine grained, subangular, well sorted, no visual show, no visible porosity, scattered argillaceous laminae, slightly silty, rare dolomitic streaks in small part, trace pyrite;
525 - 535	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SANDSTONE** - light gray, brown, quartz, trace chert, predominant siliceous cement, fine grained to very fine grained and some medium grained, subangular to subrounded, well sorted, light brown oil stain, milky white cut, no visible porosity, secondary dolomite cement in part, slightly argillaceous, slightly silty, trace pyrite;
535 - 540	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SANDSTONE** - light gray, brown, quartz, trace chert, predominant siliceous cement, fine grained to very fine grained and some medium grained, subangular to subrounded, well sorted, light brown oil stain, milky white cut, no visible porosity, secondary dolomite cement in part, slightly argillaceous, slightly silty, trace pyrite;
540 - 560	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;
560 - 580	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
580 - 600	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;
600 - 620	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite;
620 - 630	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite; **SHALE** - Kaolin, white , fissile;
Miss Flett	628m Sample
630 - 640	**SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite; **LIMESTONE** - brown, medium gray in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, slightly argillaceous in part, trace pyrite;
640 - 650	**SHALE** - medium gray, becoming dark gray in part, subfissile, becoming blocky in part, trace pyrite, rare calcareous streaks in part, trace silty streaks; **SHALE** - dark gray, fissile to subfissile, trace pyrite veining, soft, grading to mudstone in part, trace micromicaceous, rare silty streaks, trace pyrite; **LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite;
650 - 660	**SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks; **LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
660 - 670	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks;
670 - 685	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, scattered argillaceous laminae in part, rare pyrite; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks;
685 - 690	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, slightly argillaceous in part, slightly fossiliferous; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, trace calcareous streaks;
690 - 695	**LIMESTONE** - brown, medium gray in part, indistinct fossil fragments in part, trace coral fragments, microcrystalline to cryptocrystalline, no visual show, no visible porosity, slightly argillaceous in part, slightly fossiliferous; **SHALE** - medium gray, becoming dark gray in part, subfissile, trace pyrite, trace micromicaceous, moderately calcareous, grading to Marlstone in part;
695 - 700	**SHALE** - medium gray, subfissile - fissile, soft, trace pyrite, trace micromicaceous, moderately calcareous, grading to Marlstone in part;
700 - 710	**SHALE** - medium gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous, grading to Marlstone in part;
710 - 730	**SHALE** - medium gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous, grading to Marlstone in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
730 - 750	**SHALE** - medium gray, becoming dark gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous, grading to Marlstone in part;
750 - 760	**SHALE** - medium gray, becoming dark gray, subfissile - fissile, soft, rare pyrite, rare micromicaceous, moderately calcareous;
760 - 770	**SHALE** - dark gray, black, fissile, soft, slightly carbonaceous, trace pyrite;
770 - 780	**LIMESTONE** - mottled buff - light brown, fragmental in part, trace indistinct fossil fragments in part, microcrystalline to medium crystalline, dull yellow fluorescence, weak milky cut, no visible porosity, clean, slightly dolomitic with dolomite micro fracture fill (?), slightly fossiliferous;
780 - 785	**LIMESTONE** - medium gray, massive, trace indistinct fossil fragments in part, microcrystalline, no visual show, no visible porosity, moderately argillaceous, grading to calcareous SHALE in part, slightly fossiliferous;
785 - 790	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous;
790 - 800	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous; **SANDSTONE** - light gray - brown, predominantly quartzose, predominant siliceous cement, very fine grained, subangular, well sorted, no visual show, no visible porosity, slightly silty, trace dolomitic cement, trace pyrite; **LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline, no visual show, no visible porosity, clean, slightly fossiliferous;
800 - 805	**SHALE** - dark gray, black, fissile, soft, slightly carbonaceous, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
805 - 810	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous; **SANDSTONE** - medium gray, predominantly quartzose, predominant siliceous cement, very fine grained to silt grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, trace dolomitic cement, trace pyrite; **SHALE** - gray - green, soft, fissile, moderately calcareous, grading to calcareous Marlstone in part, scattered quartz grains floating;
Miss Banff	810m Sample
810 - 815	**SHALE** - medium gray, dark gray in part, fissile, soft, trace pyrite, moderately calcareous; **SANDSTONE** - medium gray, predominantly quartzose, predominant siliceous cement, very fine grained to silt grained, subangular, well sorted, no visual show, no visible porosity, slightly argillaceous, trace dolomitic cement, trace pyrite;
815 - 830	**SHALE** - medium gray, dark gray in part, fissile, soft, moderately calcareous; **LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline, no visual show, no visible porosity, clean, slightly fossiliferous; **SHALE** - gray - green, soft, fissile, moderately calcareous, grading to calcareous Marlstone in part, scattered quartz grains floating;
830 - 840	**LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline to fine crystalline, no visual show, no visible porosity, clean, slightly fossiliferous;
840 - 850	**LIMESTONE** - mottled buff - light brown, massive, trace indistinct fossil fragments in part, microcrystalline to fine crystalline, no visual show, no visible [illegible]ty, clean, slightly fossiliferous; **LIMESTONE** - m[illegible] buff - light brown, trace indistinct fossil [illegible]nts [illegible] part, microcrystalline to medium crystalline, [illegible]nt yellow fluorescence, streaming milky cut, no vi[illegible]e porosity, clean, slightly oolitic, slightly fossiliferous;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
850 - 860	SHALE - medium gray, light gray in part, subfissile, moderately calcareous; LIMESTONE - mottled buff - light brown, trace indistinct fossil fragments in part, microcrystalline to medium crystalline, bright yellow fluorescence, streaming milky cut, no visible porosity, slightly oolitic, slightly fossiliferous, slightly argillaceous in part;
860 - 880	SHALE - medium gray, light gray in part, subfissile, moderately calcareous;
880 - 895	SHALE - medium gray, light gray in part, subfissile, moderately calcareous;
895 - 905	SHALE - medium gray, subfissile - fissile, soft, slightly calcareous in part, trace pyrite;
905 - 930	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite;
930 - 955	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite;
955 - 985	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
985 - 1015	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1015 - 1045	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1045 - 1050	SHALE - dark gray, medium gray in part, fissile, soft, slightly carbonaceous, trace pyrite in small part, slightly calcareous;
1050 - 1080	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1080 - 1100	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1100 - 1130	SHALE - medium gray, becoming light gray in part, subfissile, soft, moderately calcareous, trace pyrite in part;
1130 - 1160	SHALE - medium gray, becoming dark gray in part, subfissile, soft, slightly calcareous, trace pyrite in small part;
1160 - 1190	SHALE - medium gray, becoming dark gray in part, subfissile, trace calcareous in small part, scattered pyrite disseminated throughout;
1190 - 1220	SHALE - medium gray, becoming dark gray in part, subfissile, scattered pyrite disseminated throughout;
1220 - 1250	SHALE - medium gray, becoming dark gray in part, subfissile, scattered pyrite disseminated throughout;
1250 - 1280	SHALE - dark gray, medium gray in part, fissile, soft, slightly carbonaceous in small part, trace pyrite disseminated throughout;
1280 - 1300	SHALE - dark gray, medium gray in part, fissile, soft, slightly carbonaceous in small part, trace pyrite disseminated throughout;
1300 - 1305	SHALE - dark gray, brown in part, fissile, soft, slightly carbonaceous in small part, trace pyrite disseminated throughout;
1305 - 1315	SHALE - dark gray, brown in part, fissile, slightly carbonaceous, scattered pyrite crystals;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1315 - 1330	SHALE - medium gray in part, subfissile - fissile, moderately calcareous, marly in part, scattered pyrite disseminated throughout; SHALE - dark gray, brown in part, fissile, slightly carbonaceous, scattered pyrite crystals; SHALE - dark gray to black, brown in part, fissile, possible micro fractures in part, slightly carbonaceous, scattered pyrite crystals, trace calcareous streaks;
Miss Exshaw	1318m Sample
Dev Kotcho	1329m Sample
1330 - 1360	SHALE - medium gray in part, subfissile - fissile, moderately calcareous, marly in part, scattered pyrite disseminated throughout;
1360 - 1390	SHALE - medium gray in part, light gray in part, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1390 - 1420	SHALE - medium - light gray, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1420 - 1450	SHALE - medium - light gray, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1450 - 1480	SHALE - medium - light gray, subfissile - fissile, moderately calcareous, marly in part, trace pyrite;
1480 - 1510	SHALE - medium - light gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite;
1510 - 1540	SHALE - medium - light gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite;
1540 - 1570	SHALE - medium - light gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite; SHALE - medium gray, subfissile - fissile, scattered pyrite disseminated throughout;
1570 - 1600	SHALE - medium gray, subfissile - fissile, scattered pyrite disseminated throughout;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1600 - 1630	**SHALE** - medium gray, subfissile - fissile, waxy in part, moderately calcareous, marly in part, trace pyrite;
1630 - 1660	**SHALE** - medium gray, subfissile - fissile, becoming medium -dark gray brown in part, moderately calcareous, marly in part, trace pyrite;
1660 - 1690	**SHALE** - medium gray, subfissile - fissile, becoming medium - dark gray brown in part, moderately calcareous, marly in part, trace pyrite;
1690 - 1720	**SHALE** - medium gray, subfissile - fissile, becoming medium - dark gray brown in part, moderately calcareous, marly in part, trace pyrite;
1720 - 1725	**SHALE** - medium gray, dark gray brown, subfissile - fissile, moderately calcareous, trace pyrite in part;
Dev Tetcho	1725m Sample
1725 - 1735	**LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, trace pyrite;
1735 - 1750	**SHALE** - medium gray, dark gray brown, blocky, moderately calcareous, trace pyrite in part; **LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, grading to moderately argillaceous in part, trace pyrite;
1750 - 1755	**SHALE** - medium gray, dark gray in part, blocky, moderately calcareous, trace pyrite; **LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, grading to moderately argillaceous in part, trace pyrite;
1755 - 1760	**SHALE** - medium gray, dark gray brown, blocky, moderately calcareous, trace pyrite in part; **LIMESTONE** - light gray brown, medium gray in part, cryptocrystalline, no visual show, no visible porosity, slightly argillaceous, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1760 - 1770	**SHALE** - medium gray, blocky, moderately calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, grading to very fine grained **SANDSTONE** in part, no visual show, no visible porosity, slightly argillaceous in part, slightly calcareous;
1770 - 1775	**SHALE** - medium gray, blocky, moderately calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, slightly calcareous;
1775 - 1780	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, trace calcareous streaks in part, becoming dolomitic in part, trace siliceous cement;
1780 - 1785	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, trace calcareous streaks in part, becoming dolomitic in part, trace siliceous cement;
1785 - 1790	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks;
1790 - 1800	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks;
1800 - 1815	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, trace calcareous streaks in part, becoming dolomitic in part, trace siliceous cement;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1815 - 1845	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks;
Kakisa	1845m Sample
1845 - 1850	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, grading to very fine grained **SANDSTONE** in part, no visual show, no visible porosity, slightly argillaceous in part, trace calcareous, becoming slightly dolomitic in part, trace siliceous cement;
1850 - 1860	**SHALE** - medium gray, blocky, slightly calcareous, trace pyrite in part, scattered **SILTSTONE** streaks; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, moderately calcareous, grading to silty **LIMESTONE** in part, trace siliceous cement;
1860 - 1865	**SHALE** - medium gray, subfissile, blocky in part, slightly calcareous, trace pyrite in small part;
1865 - 1870	**SHALE** - medium gray, subfissile, blocky in part, slightly calcareous, trace pyrite in small part; **LIMESTONE** - medium gray brown, cryptocrystalline to microcrystalline, no visual show, no visible porosity, moderately argillaceous, trace pyrite, scattered silty streaks, grading in part to calcareous **SILTSTONE**; **SILTSTONE** - light gray, occasionally medium gray in part, predominant quartz, no visual show, no visible porosity, moderately argillaceous in part, grading to silty calcareous **SHALE** in part, moderately calcareous, grading to silty **LIMESTONE** in part, trace siliceous cement;
Ft Simpson	1870m Sample
1870 - 1890	**SHALE** - medium gray, blocky in part, moderately calcareous, trace pyrite disseminated throughout, scattered **SILTSTONE** streaks;

TD Intermediate Hole 1890m

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
1890 - 1905	SHALE - medium gray, subfissile - blocky, becoming light gray in part, moderately calcareous streaks, trace pyrite disseminated throughout, scattered SILTSTONE streaks in small part;
1905 - 1935	SHALE - medium gray, subfissile - blocky, becoming light gray in part, moderately calcareous streaks, trace pyrite disseminated throughout, scattered SILTSTONE streaks in small part;
1935 - 1965	SHALE - medium gray, subfissile - blocky, moderately calcareous streaks, trace pyrite disseminated throughout, trace SILTSTONE streaks in small part;
1965 - 1995	SHALE - medium gray, subfissile - blocky, slightly calcareous in part, trace pyrite disseminated throughout, trace SILTSTONE streaks;
1995 - 2025	SHALE - medium gray, subfissile - blocky, slightly calcareous in part, trace pyrite disseminated throughout, trace SILTSTONE streaks;
2025 - 2055	SHALE - medium gray, subfissile - blocky, scattered calcareous streaks, trace pyrite disseminated, trace SILTSTONE streaks in small part;
2055 - 2080	SHALE - medium gray, subfissile - blocky, scattered calcareous streaks, trace pyrite disseminated, trace SILTSTONE streaks in small part;
2080 - 2105	SHALE - medium gray, subfissile - blocky, slightly calcareous streaks, trace pyrite, trace SILTSTONE streaks in small part;
2105 - 2130	SHALE - medium gray, subfissile - blocky, slightly calcareous streaks, trace pyrite, trace SILTSTONE streaks in small part;
2130 - 2155	SHALE - medium gray, subfissile - blocky, slightly calcareous streaks, trace pyrite, rare SILTSTONE streaks in small part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2155 - 2185	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2185 - 2215	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2215 - 2245	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2245 - 2275	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2275 - 2305	SHALE - medium gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2305 - 2320	SHALE - medium gray, becoming dark gray, subfissile - blocky, rare clear dolomite (micro fracture fill ?), trace calcareous streaks in small part, trace pyrite;
2320 - 2335	SHALE - medium gray - dark gray, subfissile - blocky, rare clear dolomite (micro fracture fill ?), trace calcareous streaks in small part, trace pyrite;
2335 - 2350	SHALE - medium gray - dark gray, subfissile - blocky, rare clear dolomite (micro fracture fill ?), trace calcareous streaks in small part, trace pyrite;
2350 - 2380	SHALE - medium gray - dark gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite;
2380 - 2400	SHALE - dark gray to medium gray, slightly brown in part, subfissile, slightly micromicaceous, trace pyrite, rare calcareous streaks in small part;
2400 - 2410	No sample - Blooey line problems;
2410 - 2430	SHALE - dark gray, subfissile, slightly micromicaceous, trace pyrite, rare calcareous streaks in small part;
2430 - 2435	SHALE - medium gray - dark gray, subfissile - blocky, trace calcareous streaks in small part, trace pyrite; SHALE - dark gray, subfissile, slightly micromicaceous, trace pyrite, rare calcareous streaks in small part;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2435 - 2445	**SHALE** - dark gray - black, brown in part, fissile - subfissile, slightly carbonaceous in part, scattered pyrite throughout, moderately calcareous;
2445 - 2455	**SHALE** - dark gray brown, fissile - subfissile, slightly carbonaceous in part, scattered pyrite throughout, slightly calcareous in part, becoming dolomitic in small part;
2455 - 2470	**SHALE** - medium gray - dark gray brown, subfissile - blocky, rare calcareous streaks, trace pyrite;
2470 - 2475	**SHALE** - medium gray - dark gray brown, subfissile - blocky, scattered calcareous and trace quartz veining, scattered calcareous fracture fill in part, trace calcareous streaks, trace pyrite;
2475 - 2490	**SHALE** - medium gray - dark gray brown, subfissile - blocky, scattered calcareous and trace quartz veining, scattered calcareous fracture fill in part, trace calcareous streaks, trace pyrite; **SHALE** - dark gray brown, subfissile, becoming black, fissile, slightly carbonaceous in part, trace pyrite throughout;
2490 - 2500	**SHALE** - black, fissile, slightly carbonaceous in part, scattered pyrite throughout;
Dev Muskwa	2498m Sample
2500 - 2505	**SHALE** - black, brown in part, fissile - subfissile, slightly calcareous, scattered pyrite throughout;
2505 - 2515	**SHALE** - black, brown in part, fissile - subfissile, moderately calcareous, scattered pyrite throughout;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2515 - 2520	**SHALE** - black, brown in part,, moderately calcareous streaks, grading to argillaceous **LIMESTONE** in part, scattered pyrite; **LIMESTONE** - light gray, brown, dark gray in part, mottled in part, microcrystalline to cryptocrystalline and some medium crystalline, fragmental in part with rare clear and translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace slickensides in part, rare oolitic streaks, scattered argillaceous laminae, scattered dolomitic streaks, occasional silty;
Slave Point	2520m Sample
2520 - 2525	**SHALE** - black, brown in part, moderately calcareous streaks, grading to argillaceous **LIMESTONE** in part, scattered pyrite; **LIMESTONE** - dark gray, brown, light gray in part, mottled in part, microcrystalline to cryptocrystalline and some medium crystalline, scattered clear calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace slickensides in part, trace argillaceous laminae;
2525 - 2530	**LIMESTONE** - medium - dark gray, brown, light gray in part, mottled in part, microcrystalline to cryptocrystalline and some medium crystalline, scattered clear calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity;
TD Mainhole section	2530m
2530 - 2640	No sample - No sample returns while drilling with N2;
Watt Mtn	2565m Logs
Sulphur Point	2573m Logs

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2640 - 2655	**LIMESTONE** - light gray, medium gray brown, occasionally mottled in part, microcrystalline and some medium crystalline, trace fracture porosity, scattered clear and white calcite fracture fill - trace euhedral crystals in part, no visual show, no visible porosity, scattered pyrite in part; **LIMESTONE** - light gray, medium gray brown, occasionally mottled in part, microcrystalline and some medium crystalline, scattered clear and white calcite fracture fill - trace euhedral crystals in part, no visual show, no visible porosity, scattered pyrite in part;
2655 - 2660	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline and some medium crystalline, scattered clear calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated;
2660 - 2665	No sample - No sample returns while drilling with N2;
2665 - 2680	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline and some medium crystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated;
2680 - 2695	No sample - No sample returns while drilling with N2;
Nahanni	2689m Sample
2695 - 2700	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2700 - 2720	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite veining in part, rare dolomite fracture fill in small part, trace pyrite disseminated; **LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline, trace fracture porosity in part, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining;
2720 - 2740	**LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline, trace clear, translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite veining in part, rare dolomite fracture fill in small part, trace pyrite disseminated; **LIMESTONE** - medium - dark gray brown, microcrystalline to cryptocrystalline, trace fracture porosity in part, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining;
2740 - 2745	**LIMESTONE** - medium - dark gray brown, occasionally light brown in part, microcrystalline to cryptocrystalline, trace white - translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, rare dolomitic fracture fill in small part, trace pyrite veining;
2745 - 2765	**LIMESTONE** - medium - dark gray brown, occasionally light brown in part, microcrystalline to cryptocrystalline, trace white - translucent calcite fracture fill - euhedral crystals in part, no visual show, no visible porosity, rare dolomitic fracture fill in small part, trace pyrite veining;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2765 - 2770	**LIMESTONE** - medium - dark gray brown, light gray in part, microcrystalline to cryptocrystalline, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining in small part, trace dolomite streaks in part;
2770 - 2780	**LIMESTONE** - medium - dark gray brown, light gray in part, microcrystalline to cryptocrystalline, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining in small part, trace dolomite streaks in part; **DOLOMITE** - white, mottled light gray in part, medium crystalline to coarse crystalline and some microcrystalline, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen ?, rare pyrite in small part;
2780 - 2790	**LIMESTONE** - medium - dark gray brown, light gray in part, microcrystalline to cryptocrystalline, scattered white calcite fracture fill - euhedral crystals in part, rare dolomite fracture fill in part, no visual show, no visible porosity, scattered pyrite veining in small part, trace dolomite streaks in part; **DOLOMITE** - white, mottled light gray in part, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen ?, rare pyrite in small part;
Headless SS	2788m Sample

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2790 - 2795	**LIMESTONE** - medium - dark gray brown, light gray in part, cryptocrystalline and some microcrystalline, scattered white dolomite fracture fill - euhedral crystals in part, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **DOLOMITE** - light gray - medium gray, microcrystalline to fine crystalline and some cryptocrystalline, trace fracture porosity, no visual show, trace iron stain, no visible porosity, becoming slightly argillaceous in part, scattered dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks, trace argillaceous laminae;
2795 - 2800	**LIMESTONE** - medium - dark gray brown, dark gray - black in part, cryptocrystalline and some microcrystalline, scattered white dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **DOLOMITE** - light gray - medium gray, microcrystalline to fine crystalline and some cryptocrystalline, trace fracture porosity, no visual show, trace iron stain, no visible porosity, becoming slightly argillaceous in part, scattered dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks, trace argillaceous laminae;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2800 - 2805	**LIMESTONE** - medium - dark gray brown, dark gray - black in part, cryptocrystalline and some microcrystalline, scattered white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - light gray - medium gray, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, trace iron stain, no visible porosity, becoming slightly argillaceous in part, scattered dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks, trace argillaceous laminae;
2805 - 2810	**LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part;
2810 - 2815	**LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **DOLOMITE** - medium gray - light gray in part, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, trace iron stain, no visible porosity, occasionally slightly argillaceous in part, scattered white dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks;
Landry	2811m Sample

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2815 - 2820	**LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part; **DOLOMITE** - light gray, medium gray in part, cryptocrystalline to fine crystalline and some microcrystalline, no visual show, trace iron stain, no visible porosity, scattered white dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks;
2820 - 2825	**DOLOMITE** - light gray, medium gray in part, cryptocrystalline to fine crystalline and some microcrystalline, no visual show, trace iron stain, no visible porosity, common white dolomite fracture fill, scattered pyrite, disseminated, trace calcareous streaks; **DOLOMITE** - white, semitranslucent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, no visible porosity, trace dolomite fracture fill, trace pyrobitumen interstitial, rare pyrite in small part; **LIMESTONE** - medium - dark gray brown, cryptocrystalline and some microcrystalline, trace white calcite and dolomite fracture fill - euhedral crystals in part, scattered iron stain, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks in part;
2825 - 2830	**DOLOMITE** - light gray, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, common iron stain, no visible porosity, common white dolomite fracture fill, scattered pyrite in part, disseminated;
2830 - 2835	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, trace dolomite fracture fill;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2835 - 2840	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks; **SHALE** - dark gray, black in part, blocky, slightly calcareous, slightly dolomitic, trace pyrite;
2840 - 2845	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks;
2845 - 2847	**DOLOMITE** - light gray, white, microcrystalline to fine crystalline, no visual show, abundant iron stain, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part, rare calcareous streaks; **LIMESTONE** - light gray, cryptocrystalline and some microcrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic in small part;
2847 - 2860	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline to fine crystalline and some cryptocrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, scattered white dolomite fracture fill, trace white calcite fracture fill in part; **DOLOMITE** - white, semitranslucent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, trace dolomite fracture fill; **LIMESTONE** - medium gray - dark gray in part, cryptocrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2860 - 2865	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, trace white dolomite fracture fill in part, slightly calcareous streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, trace dolomite fracture fill; **LIMESTONE** - medium gray - dark gray in part, occasionally light gray in part, cryptocrystalline and some microcrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks;
Arnica 2865 - 2875	2865m Sample **DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, trace white dolomite fracture fill in part, slightly calcareous streaks in part; **DOLOMITE** - white, semitransluent, medium crystalline to coarse crystalline and some microcrystalline, trace fracture porosity, no visual show, common iron stain, no visible porosity, fracture fill in part; **LIMESTONE** - medium gray - dark gray in part, occasionally light gray in part, cryptocrystalline and some microcrystalline, no visual show, no visible porosity, trace pyrite disseminated in part, trace dolomitic streaks;
2875 - 2885	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, scattered thinly interbedded **LIMESTONE**, no visible porosity, trace white dolomite fracture fill in part, slightly calcareous streaks in part; **DOLOMITE** - dark gray, black in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, trace white dolomite fracture fill in part, rare calcareous streaks;

LITHOLOGY

Formation tops Sample interval (in meters)	SAMPLE DESCRIPTION
2885 - 2895	**DOLOMITE** - light gray, white, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, no visible porosity, trace white dolomite fracture fill in part, trace calcareous streaks in part; **DOLOMITE** - dark gray, black in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity, trace white dolomite fracture fill in part, rare calcareous streaks;
2895 - 2905	**DOLOMITE** - gray, brown, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, abundant iron stain, no visible porosity, trace white dolomite fracture fill in part;
2905 - 2920	**DOLOMITE** - gray, brown, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, common iron stain, no visible porosity, rare white dolomite fracture fill in part, trace pyrite disseminated;
2920 - 2925	**DOLOMITE** - light gray, brown, occasionally medium gray in part, microcrystalline and some cryptocrystalline, no visual show, scattered iron stain, scattered stylolite, no visible porosity, rare white dolomite fracture fill in part, trace pyrite disseminated; **DOLOMITE** - dark gray, black in part, microcrystalline to cryptocrystalline, no visual show, no visible porosity;

TD DRILLER 2925m @1800Hrs 98-02-14

HYDROCARBON SHOW SUMMARY

FORMATION	INTERVAL	REMARKS
Sulphur Pt	2578	No samples - probable frac 20' flare for 3min
Sulphur Pt	2595	No samples - probable frac 3.1mmcf/d
"	2595-2635	avg 1.7mmcf/d
Sulphur Pt/ Nahanni	2636	28.65mmcf/d decr to 19mmcf/d decr to 8.5mmcf/d 2501/min 70,000 ppm
Nahanni	2640-2740	14mmcf/d decr steadily 10mmcf/d 1501/min 120,000ppm
Headless	2740-2768	10mmcf/d decr to 9mmcf/d 2501/min 98,000 ppm
Landry	2768-2812	9mmcf/d decr to 8mmcf/d
	2813	8mmcf/d incr to 10.5mmcf/d 1701/min 110,000 ppm
	2825	10mmcf/d 2001/min 130,000ppm
Arnica	2838-2847	12mmcf/d decr to 8mmcf/d 300 1/min 142,000ppm
	2847-2925	steady 8.5mmcf/d 300 - 600 1/min 130,000ppm

C L Consultants Limited

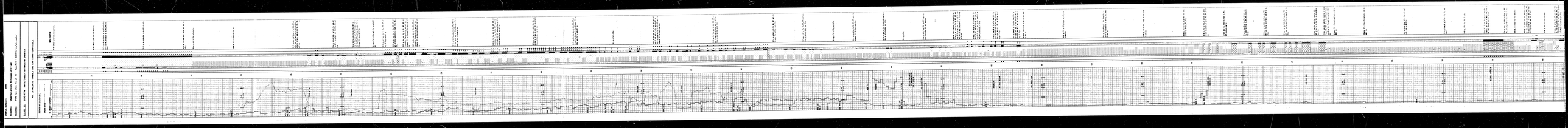
N.E.B. COPY

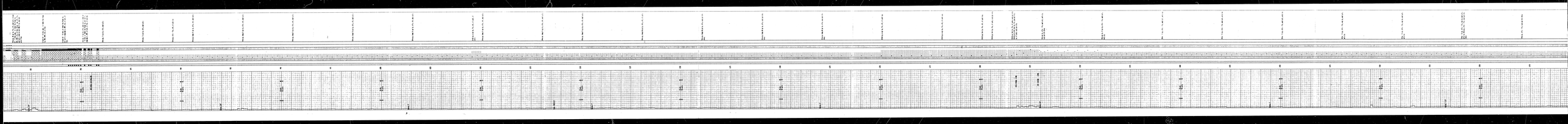
SAMPLE LOG

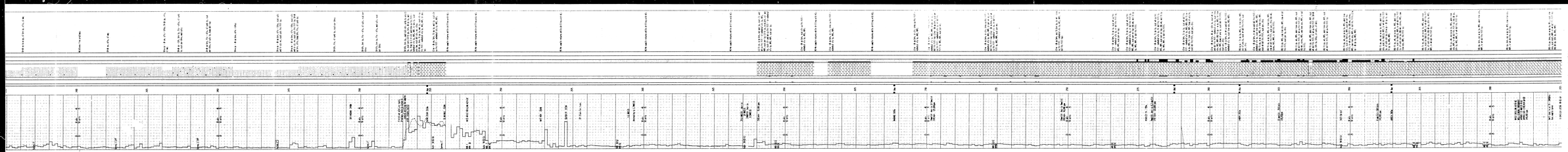
FILE: 98N-2036

COMPANY:	PARAMOUNT RESOURCES LTD.		
WELL:	PARAMOUNT ET AL ARROWHEAD		
LOCATION:	N65		
FIELD:	Undefined		
PROVINCE:	NWT		
GEOLOGIST:	D G Ferguson		
SPUD DATE:	Jan 14, 1998	DATA FROM:	55 m
FINISH DATE:	Feb 14, 1998		
ELEVATION K.B.:	574.6 m	T.D. DRILLER:	2925 m
ELEVATION G.L.:	567.9 m	T.D. LOGGER:	2924 m
K.B. - CSG BOWL:	6.7 m	HOLE SIZE:	156 mm

PRODUCING FORMATION:	SULPHUR POINT/NAHANNI
BOTTOM FORMATION:	ARNICA
STATUS:	Exploratory - TIGHT HOLE
CASING:	177mm landed at 2524m
RIG RELEASED:	
CONTRACTOR:	Nabors rig 16
MUD SYSTEM:	air / cutter d / nitrogen







ENTEST REPORTS (5)

ENTEST CORP.

" A Plains Energy Services Company"

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PARAMOUNT RESOURCES LTD.

N-65

MULTI POINT TEST

98/12/30 – 99/01/11

Prepare by:
Entest Corp.
February 02, 1999

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

30/12/98	06:30		ARRIVED ON LOCATION.																	
	07:00			17250																
	07:30		OPENED TO BLEED DOWN TO RIG TANK.																	
	08:00			1000																
	08:10			TSTM																
			SHUT IN / RIGGED UP FLOWLINE TO TEST UNIT.																	
	08:30		NOWSCO ON LOCATION FOR ACID FRAC.																	
	09:45			6800																
			OPENED UP TO BLEED OFF / CHOKE SIZE: 48/64"(19.05mm)																	
	09:50			3300																
	09:55			1700																
	10:00			1000																
			SHUT IN PREPARE TO SWAB.																	
	10:15		RUN IN TO TAG FLUID.																	
	10:33		FLUID RECOVERED TSTM.																7	40000
	10:40		RIGGED OFF LUBRICATOR / H2S = 1050 ppm																	
	10:45		OPENED TO VENT THROUGH SEPARATOR.																	
	11:00			40																
	11:30			TSTM																

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

30/12/98	11:35		SHUT IN WELL FOR NOWSCO TO PUT ON HAMER VALVE.																	
	11:45		OPENED TO VENT THROUGH SEPARATOR.																	
	12:00			TSTM																
	13:20		HOLD SAFETY MEETING / CEILING FRAC PRESSURE: 48MPa.																	
	14:30		FINISHED FRAC / RIGGED OFF NOWSCO / FLUID TO RECOVER:1.5M3 KCL,18M3 ACID,12M3 H2O.																	
	14:35		PRESSURE TEST FLOWLINE TO 14MPa.																	
	14:45		19.05	9000																
			OPENED TO FLOW BACK FRAC ON A 48/64"(19.05mm) CHOKE.																	
	14:46		FLUID TO SURFACE.																	
	14:50			3425																
			OPENED CHOKE TO 2 x 3/4"																	
	14:55			3400																
	15:00			1250												7.67			4	
	15:10			1400																
			REDUCE CHOKE TO 24/64"(9.53mm)																	
	15:15			1400																
	15:25		OPENED CHOKE TO 36/64"(14.29mm)																	
	15:30			5600																
	15:40		OPENED CHOKE TO ~ 2 x 3/4"																	

ENTESTcorp.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

30/12/98	15:45			7200																	
			OPENED TO 2"(50.80mm). SIGHT GLASSES FREEZING.																		
	16:00			7400																7	CID/H2
			FLUID RATE= 14.96M3/HR.																		
	16:15		50.80	3000																	
	16:30			2600																	
	17:00			2300																5	CID/H2
			FLUID RATE= 16.37M3/HR.																		
	17:30			2100																	
	18:00			2100																	
			FLUID RATE= 15.38M3/MIN																		
	18:30			2100																5	140,000
	18:45		REDUCE CHOKE TO 16/64"(6.35mm) / N2 CONTENT LOW ENOUGH TO KEEP FLARE.																		
	19:00		6.35	9800		20	103	35.90	19	31.75	16.31							100	7	198,000
	19:30			10800		20	172	46.60	18	31.75	21.58							100	7	196,000
			SHUT IN AT WELLHEAD / RECORDED BUILD-UPS.																		
	19:35			12000																	
	19:40			12175																	
	19:45			12300																	

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

31/12/98	20:00			12700																
	20:15			13000																
	20:30	4.75		14000																
			TOTAL FLUID RECOVERED= 67.78 M3 / TOTAL FORM / H2O PRODUCED= 36.																	
			SECURED WELLHEAD / DRAIN ALL LINES AND VESSEL.																	
	22:00		RETURN TO CAMP.																	
	07:00			17400	11500															
			BLEED OFF CASING TO RIG TANK.																	
	09:00	4.75	6.35	17600	100															
			OPENED TO FLOW ON 16/64"(6.35mm) CHOKE.																	
	09:05			17600	110	4														
	09:10			17550	120	4														
	09:15			17550	120	4														
	09:30			17500	145	4	70	65.70	-30	31.75	20.61									
	09:35		INCREASED BACKPRESSURE.																	
	09:45			17450	160	4	105	49.80	-30	31.75	20.71									
			BEGIN INJECTING METHANOL @ CHOKE / INCREASED BACKPRESSURE.																	
	10:00	5.75		17300	180	4	138	81.70	-28	31.75	27.49	5.11						50	5	16000
			SMALL AMOUNT OF FLUID RETURNS.(TSTM)																	

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

31/12/98	10:30		8.73	17300	200	4	683	87.20	-27	31.75	56.19									
			OPENED CHOKE TO 22/64"(8.73mm)																	
	11:00	6.75		16400	220	6	2379	47.30	-37	31.75	81.79	9.83						65	5	18000
			ORIFICE PLATE CHANGED TO 2.50"(63.50mm)																	
	11:30			15400	235	7	538	34.90	-46	63.50	138.85									
	12:00	7.75		15000	280	9	517	34.10	-39	63.50	132.62	18.52						75	5	22000
	12:30			14450	290	10	538	37.40	-19	63.50	135.00									
			FLUID ENTERING VESSEL IN SLUSH OR HYDRATE FORM.																	
	13:00	8.75	8.73	14300	315	11	517	36.40	-18	63.50	130.63	25.91						70	5	22000
	13:30			14100	325	10	517	36.10	-18	63.50	130.11									
	14:00	9.75		13900	340	10	517	35.60	-18	63.50	129.24	32.54						75	5	23000
			LOW SAL.BECAUSE OF METHANOL. INJECTION NOW STOPPED DURING SAMPLE.																	
	14:30			13650	355	12	510	35.40	-17	63.50	127.85									
	15:00	10.75		13500	370	11	496	32.90	-17	63.50	121.96	38.55						90	5	138000
			H2S=2000 ppm																	
	15:30			12800	390	11	448	30.90	-15	63.50	112.69									
	16:00	11.75		12600	415	12	414	29.60	-13	63.50	106.28	43.48								
			FLUID INCREASING AND WARMER.																	
	16:30			12600	430	12	414	28.90	-13	63.50	105.06									

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
J. NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

31/12/98	17:00	12.75		12550	445	12	414	28.90	-13	63.50	105.06	48.09					4.49	99	6	134000
	17:30			12400	470	13	407	28.40	-11	63.50	103.02									
	18:00	13.75		12300	490	13	400	27.90	-8	63.50	100.80	52.49	1.77	0.00	0.00	1.77	42.54	100	6	136000
			SHUT IN AT WELLHEAD / RECORDED BUILD-UPS / TODAYS TTL. FLUID= 6.26M3																	
	18:05			12700																
	18:10			13000																
	18:15			13400																
	18:30			13600																
	18:45			13850																
	19:00			14000																
			TTL. CUM.. FLUID= 74.04 M3 / TTL. PRODUCED H2O= 42.54 M3																	
	20:00		RETURN TO CAMP / RUN RECORDERS TOMORROW.																	
01/01/99	06:30		ARRIVED ON LOCATION.																	
	07:30		SLICK LINE ON LOCATION TO RUN RECORDERS.																	
	12:55		SLICKLINE FINISHED.																	
	13:20		PRESSURE UP TO MANIFOLD.																	
	13:30	13.75	8.73	17200	510												42.54			
			OPENED TO FLOW ON A 22/64"(8.73mm) BEAN CHOKE.																	
	13:35			16600	500															

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

01/01/99	13:40			16500	500															
	13:45			16250	510	5	400	67.70	-42	63.50	164.42									
	14:00	14.25		16000	550	4	379	65.20	-46	63.50	159.31	58.02				TSTM	42.54	46	7	106,000
	14:15			15520	570	3	345	59.80	-48	63.50	147.71									
			CHANGE FROM ADJUSTABLE CHOKE TO NEW 22/64"(8.73mm) BEAN CHOKE.																	
	14:30	14.75		15150	590	4	400	63.50	-46	63.50	161.21	62.85								
	15:00	15.25		14270	640	4	345	57.80	-29	63.50	139.29	65.88				TSTM	42.54	58	7	108,000
	15:30	15.75		14000	660	5	379	48.10	-23	63.50	131.54	68.72								
	16:00	16.25		13820	680	5	400	48.30	-22	63.50	134.61	71.62				TSTM	42.54	95	7	110,000
			ALL TUBING PRESSURES DEADWEIGHT.																	
			BLOW DOWN AND ZERO METER.																	
	16:30	16.75		13220	300	6	393	42.30	-22	63.50	125.52	74.30				TSTM	42.54	98	7	110,000
			HYDRATED FLUID RETURNS.																	
	17:00	17.25	8.73	12700	310	4	345	40.60	-21	63.50	116.28	76.76				TSTM	42.54	99	7	120,000
			SHUT IN WELL FOR 4 HOURS.																	
	21:25		OPENED WELL TO MANIFOLD / LEAK IN LINE / BLEED OFF AND TIGHTEN.																	
	21:30		12.70	14650	310															
			OPENED TO FLOW ON 32/64"(12.70mm) CHOKE.																	
	21:35			12000	320															

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
.L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

01/01/99	21:40		SHUT IN TO REPAIR LEAK IN MANIFOLD DUE TO DRASTIC																	
	21:40		CHANGE IN TEMPERATURE																	
	21:42	17.25		15500	320															
			REOPEN ON 32/64" CHOKE.																	
	21:45			13500	320															
	21:48		STILL RETURNING POCKETS OF NITROGEN /UNABLE TO KEEP FL																	
	21:50			12500	320															
	21:52		VESSEL @ MAX. BACKPRESSURE TO KEEP FLARE LIT.																	
	21:55			12500	320															
			THROTTLE CHOKE TO GET FLARE LIT.																	
	22:00	17.55		13400	320	8	3310	42.90	-11	63.50	353.64	83.91								
	22:05		REDUCE CHOKE / INCREASED BACKPRESSURE TO IGNITE FLARE.																	
	22:06		OPENED TO 28/64"(11.11mm) / INCREASING SLOWLY TO KEEP FLARE LIT.																	
	22:09		REDUCE TO 22/64"(8.73mm) FLARE OUT.																	
	22:10			13150	330	10														
	22:15	17.80	8.73	13300	330	10	2896	104.60	-11	63.50	508.87	94.24								
	22:20		SHUT IN AT MANIFOLD / POCKETS OF NITROGEN SNUFFING OUT FLARE. H2S= 2600 PPM																	
			RIGGING UP DUAL 2" PILOTS ON FLARE STACK.																	
02/01/99	00:25			15100																

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTI POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

02/01/99	00:30		11.11	15100																
			OPENED WELL ON 28/64 (11.11 mm) CHOKE.																	
	00:35			13000																
	00:40			13000																
			DECREASED BACK PRESSURE.																	
	00:45	18.05		13500	270	10	2413	30.88	-17	88.90	528.38	104.71								
	01:00	18.30		12400	280	12	2517	31.37	-13	88.90	539.00	115.13				1.88	45.94	100	7	120000
	01:15			12200	315	12														
			SHIP FLUID TO 400 bbL TANK.																	
	01:30	18.80		11000	295	12														
	02:00	19.30		10000	360	12	1379	7.97	-1	88.90	194.70	122.42				4.73	50.67	100	7	126000
	02:05			8700																
			INCREASED CHOKE TO 32/64 (12.7 mm)																	
	02:30	19.80		8700	595	18	1551	9.96	6	88.90	227.15	127.31								
	03:00	20.30		8200	635	20	1448	8.96	10	88.90	206.62	131.72				7.96	58.63	100	7	138000
			STARTED SHIPPING FLUID TO 400 bbL TANK.																	
	03:11		STOP SHIPPING FLUID TO 400 bbL TANK.																	
	03:30	20.80		7700		22	1296	7.97	12	88.90	183.93	135.61								
	04:00	21.30		7700		22	1227	7.97	14	88.90	178.44	139.37				8.11	66.74	100	7	136000

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
.L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

02/01/99	04:15		STARTED SHIPPING FLUID TO 400 bbL TANK.																	
	04:29		STOP SHIPPING FLUID TO 400 bbL TANK.																	
	04:30	21.80		7500		24	1089	6.97	12	88.90	158.29	142.67				3.75	70.49	100	7	138000
			SHUT WELL IN FOR 4 HOURS.																	
			TOTAL H2O PROD.PAST 4 HOURS= 26.07M3																	
			TOTAL H2O PROD. TO DATE= 70.49M3																	
			TOTAL GAS FLARED PAST 4 HOURS= 48.43																	
	08:30		WAITING ON INSTRUCTIONS FROM CALGARY.																	
	10:30	21.80	19.05	13000	80												70.49			
			OPENED TO FLOW ON 48/64"(19.05mm) CHOKE.																	
	10:35			9500	80															
	10:40			7000	80															
	10:41		FLUID TO SURFACE / INCREASED BACKPRESSURE.																	
	10:45	22.05		10000	90	16	2413	19.92	-4	88.90	411.10	150.00								
	11:00	22.30		9200	95	12	2069	16.93	-3	88.90	349.00	155.81								
	11:15	22.55		8600	115	19	1779	15.69	1	88.90	308.24	160.63								
	11:30	22.80		7650	140	20	1482	13.94	4	88.90	263.55	164.41	5.12	0.00	0.00	5.12	75.61	100	7	126,000
	12:00	23.30		6500	190	24	965	9.71	11	88.90	176.61	168.09								
	12:30	23.80		5900	240	24	827	7.47	13	88.90	143.80	171.06	8.17	0.00	0.00	8.17	83.78	100	7	125,000

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

02/01/99	13:00	24.30	19.05	5600	325	27	752	6.97	17	88.90	132.06	173.79								
	13:30	24.80		5500	455	32	690	6.47	22	88.90	121.34	176.28	7.39	0.00	0.00	7.39	91.17	100	7	130,000
	14:00	25.30		5350	475	32	690	6.47	22	88.90	121.34	178.77								
	14:30	25.80		5200	535	26	690	6.47	23	88.90	121.12	181.26	7.54	0.00	0.00	7.54	98.71	100	7	130,000
			TOTAL H2O PROD. PAST 4HRS.= 28.22M3																	
			TOTAL H2O PROD. TO DATE= 98.71M3																	
			TOTAL GAS FLARED PAST 4HRS.= 38.59																	
			TOTAL GAS FLARED TO DATE= 181.26																	

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

03/01/99																				
	12:30	25.80	13.49	15450																
			OPENED UP TO BLEED TBG TO 9000 kPa TO KILL THE WELL.																	
	12:35	25.88		14200																
	12:40	25.96	19.05	11500																
	12:45	26.04		11000																
			TRACES OF FLUID TO SURFACE.(HYDRATED)																	
	13:00	26.30		9800			2069	30.38	-9	88.90										
			OPEN ED TO 25.40 mm CHOKE / GAS SAMPLE TAKEN.# 12373																	
	13:15	26.55		9300																
			OPENED TO 48/64"(19.05mm)																	
	13:30	26.80		9000																
			SHUT IN WELL.																	

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

04/01/99																				
	09:15				3000															
			OPENED TO BLEED DOWN WELL FOR WIRELINERS .WHO ARE STUCK AT LEASE ENTRANCE.																	
	09:30				1000															
			FLUID TO SURFACE / SHUT IN.																	
	13:30		BLEED DOWN FOR WIRELINE TO RUN BRIDGE PLUG.																	
	14:00		WIRELINE RUNNING IN HOLE.																	
	17:00				3750															
			BOTTOM PERFS. ISOLATED. 2632.5-2637.5 MKb.																	
			ATTEMPT TO BLEED OFF GAS.																	
	17:05		FLUID TO SURFACE.																	
			FLUID SLUGGING IN WAVES AS PRESSURE DECREASES.																	
	17:30				1000															
	18:00				175															
			WIDE OPEN ON 2" GUTLINE.																	
	18:15				40															
	18:30				110															
			WELL NOT BRINGING BACK ANY FLUID.																	
	19:00				30															

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

04/01/99	19:30				5															
	20:00				5															
	20:30				5															
	21:00		SHUT IN FOR THE NIGHT.										2.66							
			TOTAL LOAD TO RECOVER= 86.5 M3(31.5 FRAC + 55 kill)																	
			TOTAL LOAD RECOVERED= 34.16																	
			LOAD LEFT TO RECOVER=52.34 m3																	
			TOTAL PRODUCED WATER= 98.71 M3																	
			TOTAL GAS FLARED = 181.26 10/3 M/3																	
05/01/99	07:15				1100															
			OPENED TO BLEED OFF THROUGH 2" GUTLINE.																	
	07:20				100															
	07:25				20															
	07:30				10															
			LEAVE OPEN TO VENT UNTIL RIG IS READY TO PUMP DOWN FLUID.																	
	16:15		TBG. IN HOLE / RIGGED UP TO SWAB.																	
	16:00		LIGHT TOWER BROKE DOWN / UNABLE TO SWAB UNTIL MORNING.																	
06/01/99	08:00			600	500															
			WAITING FOR DAYLIGHT TO SWAB TO RIG TANK.																	

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

06/01/99	09:30		RIG BEGINS SWABBING.																		
07/01/99	07:55			14300																	
			OPENED TO 48/64"(19.05mm)																		
	08:00			8400																	
	08:05			1400																	
			H2S=1400 ppm																		
	08:10			250																	
			OPENED TO 1"(25.40mm) NO FLUID TO SURFACE.																		
	08:15			35																	
	08:25			5																	
			SHUT IN / RIGGED UP TO SWAB.																		
	08:45		RUN IN TO TAG FLUID.																		
	09:10		OUT OF HOLE / NO FLUID TAGGED.																		
			RIG PULLING HOURLY SWABS TO RIG TANK.																		
	18:00			1700																	
			OPENED ON 48/64"(19.05mm) CHOKE.																		

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

						Flow Temp C	Static Pressure	Diff Press.	Meter Temp C	Orifice Size mm	Gas Rate 10^3M^3/d	Gas Gr.	Fluid volume							
07/01/99	18:05			700																
	18:10			500																
	18:15			100																
	18:30			20																
	18:45			TSTM																
			NO FLUID TO SURFACE / SHUT IN AT WELLHEAD FOR THE NIGHT																	
			OPENING GAUGE																	
08/01/99	07:00			13800	300															
	07:15			13800	300															
			OPENED TO FLOW ON 48/64"(19.05mm)																	
	07:20			6500																
			OPENED TO 2"(50.80mm) GUTLINE.																	
	07:25			480																
	07:30			65																
	07:35			30																
	07:40			10																
	07:45			TSTM																
08/01/99			SHUT IN / RIGGED UP TO KILL WELL.																	
	11:00		ADDING PUP AND TENSION TO PACKER.																	

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

08/01/99			SWABBING BACK FLUID TO RIG TANK / SHUT DOWN FOR THE NIGHT																		
09/01/99			OPENING GAUGE																		
	07:00			11800	TSTM																
	07:30		OPENED TO BLEED OFF.																		
	07:35			3400																	
	07:40			2300																	
	07:45			250																	
	08:00			5																	
			RIGGING UP TO SWAB / ACID PUMPER ON LOCATION.																		
			PREPARING TO ACIDIZE PERFS. 2625.5-2630, 2614-2615 mKB												0.00		0.00				
	12:00		HOLD SAFETY MEETING.																		
	13:30		FINISHED ACID SQUEEZE.																		
			LOAD TO RECOVER = 21.00 M3																		
	13:45	0.00	19.05	7000																	
			OPENED UP TO FLOW ON 48/64"(19.05mm) CHOKE.																		
	13:50	0.08		2800																	
			FLUID AT SURFACE.																		

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
WELL NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

09/01/99	13:55	0.16		2650																
	14:00	0.25	26.93	2650												5.54	5.54			
			OPENED CHOKES TO 1.06"(26.93mm)																	
	14:15	0.50		6600												4.99	10.53	100	6	ACID
			N2 AT SURFACE.																	
	14:30	0.75		5900																
	14:45	1.00		4550	14800															
			BLEEDING DOWN CASING TO RIG TANK.																	
	15:00	1.25		4050	4600	15										8.15	18.68	100	6	ACID
	15:15	1.50	BURNABLE GAS AT SURFACE.																	
	15:30	1.75		3750	8400	17	876	49.30	15	63.50	180.62	12.31								
	16:00	2.25		3600	12250	21	814	45.82	17	63.50	167.77	15.83				10.14	28.82	100	6	85,700
			BLEEDING OFF CASING TO RIG TANK.																	
	16:30	2.75	26.93	3500	500	24	745	43.33	20	63.50	155.82	19.32								
	17:00	3.26		3500	4000	27	690	38.84	24	63.50	141.64	22.80				11.95	40.77	100	6	85,700
	17:30	3.75		3500	5400	30	758	42.08	26	63.50	153.22	26.22								
	18:00	4.25		3400	7200	33	758	41.33	29	63.50	151.10	29.66				10.43	51.20	100	6	91,000
			BLEED DOWN CASING TO RIG TANK.																	
	18:30	4.75		3400	1500	33	724	39.84	30	63.50	145.07	33.08								

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

09/01/99	19:00	5.25		3400	2000	33	758	42.08	33	63.50	151.37	36.50				10.54	61.74	100	6	89,300
	19:30	5.75		3400	2600	35	758	42.83	38	63.50	151.37	39.91								
	20:00	6.25		3400	2800	35	758	42.83	40	63.50	150.87	43.31				10.68	72.42	100	6	94,600
	20:30	6.75		3350	2900	37	758	42.83	40	63.50	150.87	46.71								
	21:00	7.25		3350	2900	37	758	43.33	43	63.50	150.96	50.09				10.81	83.23	100	6	92,800
	21:30	7.75		3350	2700	38	758	43.58	44	63.50	151.13	53.47								
	22:00	8.25		3330	2500	38	758	43.33	44	63.50	150.71	56.84				10.51	93.74	100	6	92,800
	22:30	8.75		3330	2500	38	758	43.58	44	63.50	151.13	60.21				6.02	99.76	100	6	91,000
			SHUT WELL IN AS DIRECTED.																	
	22:35		OPENED WELL AS DIRECTED.																	
	23:00	9.25		3350	1500	39	827	45.82	46	63.50	160.72	63.62				5.00	104.76	100	6	92,800
	23:30	9.75		3450	12000	40	779	44.07	46	63.50	153.38	66.99								
	23:45	10.00	SHUT WELL IN AS DIRECTED.													6.33	111.09	100	6	91,000
			FLUID PRODUCED SINCE WELL OPENED = 111.09 M^3.																	
			TOTAL GAS PRODUCED SINCE WELL OPENED = 66.75 10^3M^3.																	
10/01/99	07:00		WAITING FOR TANK TRUCKS AND ANOTHER 400 BBL. TO FLOW.																	
	15:00	10.00	19.05	15550	840															
	15:05	10.08		10000	840															
	15:10	10.16		9600	840															

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
WELL NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

10/01/99	15:30	10.50		8400	840															
			METER IN SERVICE. 2.50"(63.50mm) ORIFICE PLATE.																	
	15:45	10.75		8250	900	18										TSTM	111.09			
	16:00	11.00		7650	900	18	1724	81.67	0	63.50	332.49	76.71				1.09	112.18	100	7	120,000
	16:30	11.50		6850	900	20	1517	71.71	2	63.50	291.09	81.06								
	17:00	12.00		5800	950	22	1069	51.79	7	63.50	206.72	84.85				2.44	114.62	100	7	120,000
			NOW MAKING SUBSTANTIAL H2O / FLARE STAYING LIT.																	
	17:30	12.50		5600	950	24	896	44.82	13	63.50	174.99	88.42								
	18:00	13.00		5400	950	25	786	39.34	19	63.50	152.73	91.83				5.91	120.53	100	7	130,000
	18:30	13.50		5200	950	28	745	36.85	21	63.50	143.81	95.17								
	19:00	14.00		5200	950	30	703	35.86	24	63.50	137.44	98.44				6.64	127.17	100	7	130,000
	19:30	14.50		5000	950	32	690	35.36	24	63.50	135.30	101.69								
	20:00	15.00		5000	950	33	690	34.86	25	63.50	134.18	104.91				7.15	134.32	100	7	126,000
	20:30	15.50		5000	950	35	690	34.36	26	63.50	133.00	108.12								
	21:00	16.00		4950	900	36	690	34.11	27	63.50	132.30	111.30				6.93	141.25	100	7	128,000
	21:30	16.50		4950	900	37	669	33.86	28	63.50	129.76	114.46								
	22:00	17.00		4950	900	34	661	33.86	28	63.50	129.05	117.60				6.70	147.95	100	7	128,000
	22:30	17.50	19.05	4750	900	35	655	33.86	29	63.50	128.30	120.72								
	23:00	18.00		4750	800	36	655	33.37	30	63.50	127.17	123.81				6.75	154.70	100	7	127,000

ENTEST CORP.

CUSTOMER: PARAMOUNT RESOURCES LTD.
L NAME / No. PARAMOUNT BERKLEY ARROWHEAD N-65
TYPE TEST: MULTY POINT TEST
COMPANY REP: BERT BLAKELY
FIELD OR AREA: ARROWHEAD
ZONE: SULFUR POINT

METER RUN: 154.05 mm
GAS DENSITY: 0.65 Air = 1
UNIT NUMBER: 14
SUPERVISOR: R.LUTZ

Date	Time	Choke Size mm	Tbg Press kPa	Csg Press kPa	Flow Temp C	Static Press kPa	Diff Press kPa	Meter Temp C	Orifice Size mm	Gas Rate 10^3/day	Cum Gas 10^3	Fluid Volume M^3	Calc Inc HC/M^3	Cum HC M^3	Calc Inc H2O/M^3	Cum H2O M^3	BS&W %	pH	SAL ppm
11/01/99	23:30	18.50		4750	800	36	648	33.37	31	63.50	126.34	126.89							
	00:00	19.00		4750	800	37	641	33.62	31	63.50	126.18	129.96				6.62	161.32	100	7	130,000
	00:30	19.50		4700	800	37	634	32.87	32	63.50	123.97	133.00							
	01:00	20.00		4650	700	37	634	32.87	32	63.50	123.97	136.02				6.04	167.36	100	7	126,000
	01:30	20.50		4600	700	37	627	32.37	31	63.50	122.65	139.02							
	02:00	21.00		4600	700	37	627	32.37	31	63.50	122.65	142.02				6.58	173.94	100	7	126,000
	02:30	21.50		4550	650	37	621	32.37	31	63.50	122.12	144.99							
	03:00	22.00		4500	650	38	621	32.12	32	63.50	121.46	147.95				6.27	180.21	100	7	128,000
	03:30	22.50		4500	650	39	621	31.87	33	63.50	120.79	150.90							
	04:00	23.00		4400	650	39	621	31.87	32	63.50	121.00	153.83				6.30	186.51	100	7	128,000
	04:30	23.50		4400	650	39	621	31.87	32	63.50	121.00	156.76							
	05:00	24.00		4400	650	39	621	31.63	32	63.50	120.55	159.68				6.15	192.66	100	7	130,000
	05:30	24.50		4350	650	38	621	31.63	32	63.50	120.55	162.58							
	06:00	25.00		4250	600	38	621	31.63	32	63.50	120.55	165.48				6.22	198.88	100	7	128,000

H2O PRODUCED SINCE 15:00 hrs = 87.79 M^3.

GAS PRODUCED SINCE 15:00 hrs = 98.73 10^3M^3.

FLUID PRODUCED SINCE ACID SQUEEZE= 198.88 M3

CUM.. GAS SINCE SQUEEZE= 165.48 10^3 M^3

ENTEST CORP.

" A Plains Energy Services Company"

N.E.B. COPY

Paramount Resources Ltd.

N-65 Sulfur Point

99/01/11 – 99/01/20

Prepare by
Entest Corp.
March 12, 1999

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

FieldNotes
Field Measurements

Paramount Et Al Arrowhead N-65

Pool: Sulfur Point
Job Number: G0160 b

	Date yyyy/mm/dd	Clock Time hh:mm:ss	.	Choke	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	Measured Wat1 Vol m^3	Cum. Water1 m^3	Ph	BSW1 %	Salinity ppm
1	1999/01/11	06:00:00	NOTE: CONTINUING FROM 98/12/30 - 99/01/11 AT 0600 SENT ON FEB 3/99																
2			FLUID PRODUCED SINCE ACID SQUEEZE = 198.88 M3																
3			CUM GAS SINCE SQUEEZE = 165.48 $10_{3M}3$																
4		06:30:00		19.050	4250	600	38.0	614	30.9	32.0	63.500	121.096	168.003	198.880	198.88	198.88			
5		07:00:00			4250	600	38.0	614	30.9	32.0	63.500	121.096	170.526	5.750	5.75	204.63	7	100.00	126000
6		07:30:00			4300	600	38.0	593	30.4	33.0	63.500	118.096	173.017						
7		08:00:00			4300	600	38.0	607	30.4	33.0	63.500	119.295	175.490	5.750	5.75	210.38	7	100.00	129000
8		08:30:00			4300	600	38.0	607	30.9	33.0	63.500	120.288	177.986						
9		09:00:00			4200	600	38.0	593	30.4	33.0	63.500	118.096	180.469	5.410	5.41	215.79	7	100.00	126000
10		09:30:00			4100	550	38.0	593	30.4	33.0	63.500	118.096	182.929						
11		10:00:00			4000	550	38.0	565	29.9	33.0	63.500	114.692	185.354	5.610	5.61	221.60	7	100.00	122000
12		10:30:00			3900	550	39.0	565	29.9	32.0	63.500	114.839	187.746						
13		11:00:00			4000	550	39.0	579	29.4	32.0	63.500	115.113	190.141	5.050	5.05	226.65	7	100.00	122000
14		11:30:00			3800	550	39.0	572	29.4	32.0	63.500	114.512	192.533						
15		12:00:00			4300	550	39.0	565	29.4	33.0	63.500	113.713	194.911	5.610	5.61	232.26	7	100.00	123000
16		12:30:00			4400	550	39.0	565	28.9	34.0	63.500	112.534	197.267						
17	1999/01/11	13:00:00			4050	550	39.0	565	29.4	34.0	63.500	113.519	199.622	5.180	5.18	237.44	7	100.00	122000
18		13:30:00			3950	500	41.0	565	28.9	33.0	63.500	112.726	201.979						
19		14:00:00			3900	500	41.0	565	29.4	33.0	63.500	113.713	204.336	4.870	4.87	242.31	7	100.00	122000
20		14:30:00			3700	500	41.0	565	28.9	32.0	63.500	112.920	206.698						
21		15:00:00			3550	500	41.0	565	29.6	33.0	63.500	114.203	209.064	4.950	4.95	247.26	7	100.00	121000
22			GAS SAMPLE TAKEN: # C&G 2396																
23		15:30:00			3800	450	41.0	552	28.9	34.0	63.500	111.418	211.414						
24		16:00:00			3600	450	41.0	552	28.9	35.0	63.500	111.229	213.734	5.110	5.11	252.37	7	100.00	122000
25			SHUT IN. RECORD BUILD-UPS.																
26			TOTAL FLUID SINCE ACID SQUEEZE= 252.37 M3																
27	1999/01/11	16:05:00			3450														
28		16:10:00			3700														
29		16:15:00			4800														
30		16:30:00			5600														
31		16:45:00			6450														
32		17:00:00			7200														
33		17:30:00			7450														
34		18:00:00			7600														
35		19:00:00			8000														
36		20:00:00			8500														

1999/01/11 06:00:00 To 1999/01/12 07:00:00

Gas	213.734	Cum.	213.734	10^3m^3
Oil	198.880	Cum.	198.880	m^3
Water	305.860	Cum.	305.860	m^3

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

FieldNotes
Field Measurements

Paramount Et Al Arrowhead N-65

Pool: Sulfur Point
Job Number: G0160 b

	Date yyyy/mm/dd	Clock Time hh:mm:ss	Choke	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	Measured Wat1 Vol m^3	Cum. Water1 m^3	Ph	BSW1 %	Salinity ppm
37	1999/01/12	07:00:00		10750	500													
38		08:00:00	SLICKLINE ON LOCATION TO RUN RECORDERS AND GRADIENT.															
39		13:30:00	SLICKLINE FINISHED.															
40		14:30:00	12.700	12050	400													
41			OPENED TO FLOW WELL ON 32/64"(12.70mm) CHOKE.															
42		14:35:00		9900	400													
43		14:37:00	SLUG OF FLUID TO SURFACE.															
44		14:40:00		10550	400													
45	1999/01/12	14:45:00		10400	400													
46		15:00:00		10050	400	22.0	917	81.7	10.0	63.500	247.630	385.687	0.250	0.25	252.62	7	100.00	62000
47		15:15:00		9600	400	23.0												
48		15:30:00		9300	250	21.0	827	76.2	7.0	63.500	229.371	390.655						
49			USING SMALLER GAUGE IN CASING.															
50		16:00:00		8800	250	22.0	772	71.2	8.0	63.500	214.403	395.278	0.370	0.37	252.99	7	100.00	74000
51		16:30:00		8400	250	23.0	724	66.2	6.0	63.500	201.536	399.611						
52		17:00:00		8050	250	23.0	690	63.3	4.0	63.500	193.446	403.725	0.390	0.39	253.38	7	100.00	78000
53		17:30:00		7750	250	24.0	655	59.8	5.0	63.500	183.297	407.649						
54		18:00:00		7450	250	24.0	607	56.8	6.0	63.500	172.402	411.355	0.510	0.51	253.89	7	100.00	84000
55			H2S BY GASTECH= 2000 PPM															
56		18:30:00		7250		25.0	593	55.8	7.0	63.500	168.822	414.909						
57		19:00:00	12.700	7050		25.0	607	52.3	7.0	63.500	164.956	418.386	0.980	0.98	254.87	7	100.00	88000
58		19:30:00		6900		26.0	579	50.3	8.0	63.500	158.154	421.752						
59		20:00:00		6750		26.0	552	48.3	9.0	63.500	151.502	424.977	0.900	0.90	255.77	7	100.00	104000
60		20:30:00		6520		26.0	538	45.8	10.0	63.500	145.574	428.072						
61		21:00:00		6350		27.0	517	43.8	12.0	63.500	139.391	431.040	0.950	0.95	256.72	7	100.00	110000
62		21:30:00		6120		27.0	489	40.8	14.0	63.500	128.623	433.832						
63		22:00:00		5950		27.0	414	36.9	17.0	63.500	115.331	436.373	1.550	1.55	258.27	7	100.00	120000
64		22:30:00		5850		28.0	400	34.9	19.0	63.500	110.160	438.722						
65		23:00:00		5750		29.0	379	33.9	18.0	63.500	106.412	440.978	2.290	2.29	260.56	7	100.00	118000
66		23:30:00		5700		29.0	365	32.9	18.0	63.500	103.260	443.162						
67	1999/01/13	00:00:00		5700		29.0	359	32.4	19.0	63.500	101.606	445.296	2.580	2.58	263.14	7	100.00	118000
68		00:30:00	12.700	5650		30.0	359	32.4	20.0	63.500	101.426	447.411						
69		01:00:00		5650		30.0	345	31.9	22.0	63.500	98.724	449.496	2.340	2.34	265.48	7	100.00	118000
70		01:30:00		5650		31.0	345	31.6	22.0	63.500	98.326	451.548						
71		02:00:00		5650		32.0	345	31.1	23.0	63.500	97.371	453.587	2.750	2.75	268.23	7	100.00	119000
72		02:30:00		5650		32.0	345	30.9	23.0	63.500	96.969	455.611						
73		03:00:00		5600		32.0	345	30.9	23.0	63.500	96.969	457.632	3.070	3.07	271.30	7	100.00	120000
74		03:30:00	12.700	5600		33.0	345	30.4	24.0	63.500	95.994	459.642						
75		04:00:00		5600		35.0	345	30.4	25.0	63.500	95.827	461.640	2.700	2.70	274.00	7	100.00	118000
76		04:30:00		5550		35.0	345	29.9	25.0	63.500	95.016	463.628						
77		05:00:00		5550		33.0	345	29.9	26.0	63.500	94.852	465.605	2.600	2.60	276.60	7	100.00	116000
78		05:30:00		5550		35.0	345	29.9	26.0	63.500	94.852	467.582						

1999/01/12 07:00:00 To 1999/01/13 06:00:00

Gas	255.806	Cum.	469.540	10^3m^3
Oil	0.000	Cum.	198.880	m^3
Water	54.220	Cum.	360.080	m^3

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

FieldNotes
Field Measurements

Paramount Et Al Arrowhead N-65

Pool: Sulfur Point
Job Number: G0160 b

	Date yyyy/mm/dd	Clock Time hh:mm:ss	Choke	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	Measured Wat1 Vol m^3	Cum. Water1 m^3	Ph	BSW1 %	Salinity ppm
79	1999/01/13	06:00:00		5500		34.0	338	28.4	27.0	63.500	93.131	469.540	2.880	2.88	279.48	7	100.00	118000
80		06:30:00		5500		34.0	331	28.9	27.0	63.500	91.574	471.464						
81		07:00:00		5500		35.0	324	28.4	26.0	63.500	90.157	473.357	2.700	2.70	282.18	7	100.00	120000
82		07:30:00		5450	15	36.0	331	28.4	27.0	63.500	90.776	475.241						
83			NOW USING 30PSI GAUGE IN CSG.															
84		08:00:00		5400	15	36.0	331	27.9	28.0	63.500	89.800	477.122	2.470	2.47	284.65	7	100.00	120000
85		08:30:00		5400	10	37.0	331	29.4	29.0	63.500	92.067	479.017						
86		09:00:00		5350	10	38.0	331	28.9	29.0	63.500	91.261	480.927	2.950	2.95	287.60	7	100.00	122000
87		09:30:00		5300	10	38.0	345	28.4	29.0	63.500	91.926	482.835						
88		10:00:00		5300	10	38.0	331	27.9	30.0	63.500	89.494	484.725	2.830	2.83	290.43	7	100.00	120000
89		10:30:00		5300	10	38.0	310	25.9	30.0	63.500	84.037	486.532						
90		11:00:00		5250	10	38.0	331	27.4	29.0	63.500	88.621	488.333	2.830	2.83	293.26	7	100.00	120000
91		11:30:00		5250	5	39.0	331	26.9	30.0	63.500	87.838	490.173						
92		12:00:00		5200	5	39.0	331	26.4	30.0	63.500	86.999	491.994	2.410	2.41	295.67	7	100.00	120000
93		12:30:00		5150	5	39.0	310	25.9	31.0	63.500	83.895	493.774						
94		13:00:00		5050	5	41.0	310	25.9	32.0	63.500	83.753	495.521	2.860	2.86	298.53	7	100.00	118000
95		13:30:00	12.700	5000		41.0	310	25.9	32.0	63.500	83.753	497.265						
96			WELL STARTING TO SLUG.															
97		14:00:00		5000		41.0	310	25.9	31.0	63.500	83.895	499.012	2.730	2.73	301.26	7	100.00	118000
98	1999/01/13	14:30:00		5000		41.0	317	26.4	31.0	63.500	85.425	500.776	1.270	1.27	302.53	7	100.00	
113	1999/01/14		SETTING BRIDGE PLUG AND MOVING TO TOP PERFS. 2614-2615 mKB./ END OF SULPHUR POINT															
114	1999/01/17		SWABBING TO RIG TANK. ON STANDBY.															
115	1999/01/19		RUNNING TBG. PLUG TO FIND TBG.,CSG., OR PACKER LEAK.															

1999/01/13 06:00:00 To 1999/01/20 14:00:00

Gas	31.236	Cum.	500.776 10^3m^3
Oil	0.000	Cum.	198.880 m^3
Water	46.100	Cum.	406.180 m^3

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

FieldNotes
Field Measurements

Paramount Et Al Arrowhead N-65

Pool: Sulfur Point
Job Number: G0160 b

	Date yyyy/mm/dd	Clock Time hh:mm:ss	.	Choke	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	Measured Wat1 Vol m^3	Cum. Water1 m^3	Ph	BSW1 %	Salinity ppm
116	1999/01/20	14:00:00	TRIPPING OUT OF HOLE.																
117	1999/01/20	14:00:00	WAITING ON WIRELINE TO RUN BRIDGE PLUG.																
118																			
119																			
120																			
121																			
122																			
123																			
124																			
125																			
126																			
127																			
128																			
129																			
130																			

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

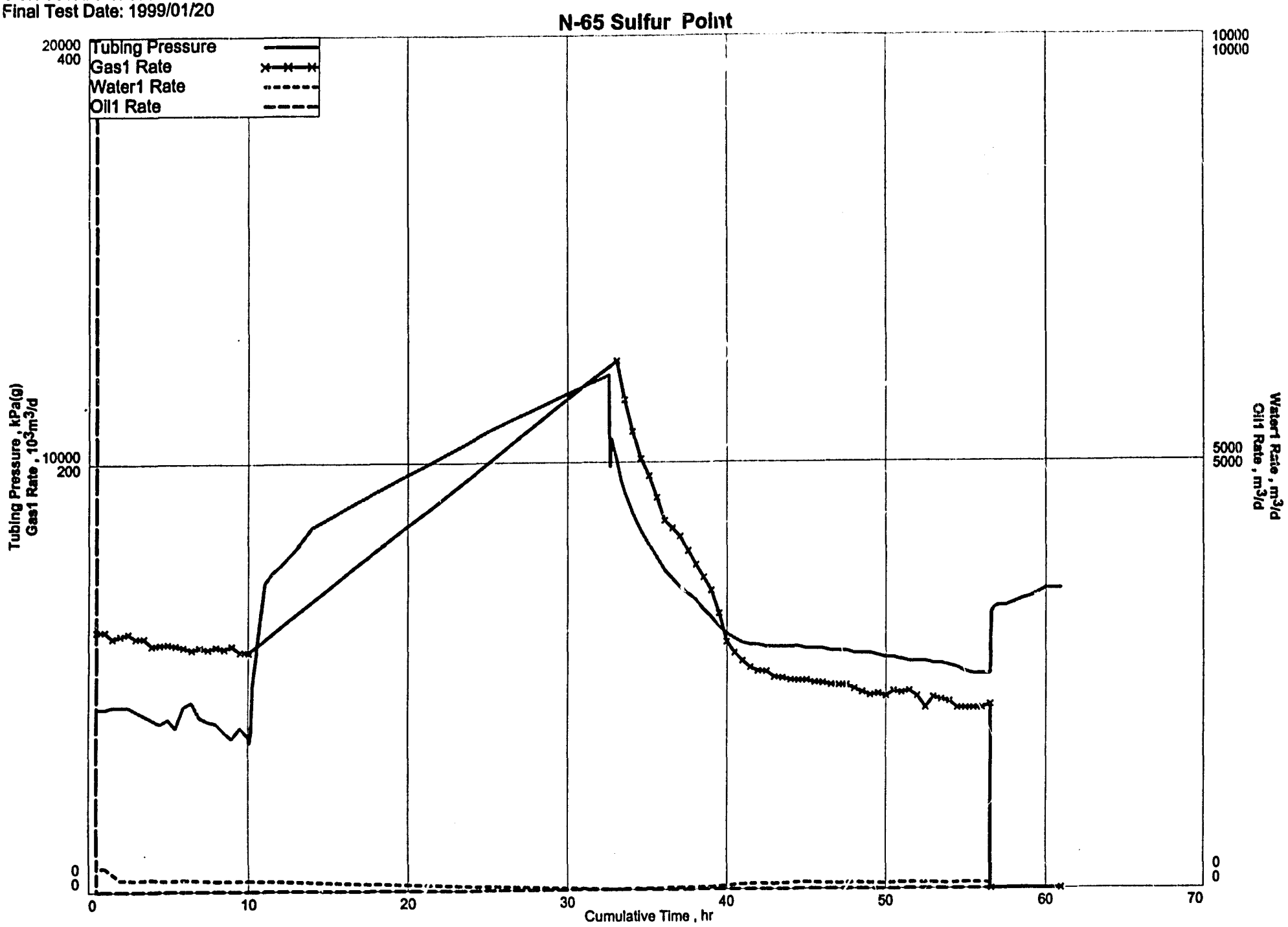
Paramount Et Al Arrowhead N-65
Pool: Sulfur Point
Job Number: G0160 b

	From Date yyyy/mm/dd	Clock Time hh:mm:ss	To Date yyyy/mm/dd	Clock Time hh:mm:ss	Daily Cum. Gas 10^3m^3	Daily Cum. Oil m^3	Daily Cum. Water m^3	Daily Cum. Cond. m^3	Cum. Gas To Date 10^3m^3	Cum. Oil To Date m^3	Cum. Water To Date m^3	Cum. Cond To Date m^3
1	1999/01/11	06:00:00	1999/01/12	07:00:00	213.734	198.880	305.860		213.734	198.880	305.860	
2	1999/01/12	07:00:00	1999/01/13	06:00:00	255.806	0.000	54.220		469.540	198.880	360.080	
3	1999/01/19	06:00:00	1999/01/20	14:00:00	31.236	0.000	46.100		500.776	198.880	406.180	

Print Filter Off

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

Paramount Et Al Arrowhead N-65
Pool: Sulfur Point
Job Number: G0160 b



Fast C:\FAST\Examples\Paramount b.FLD 10-Mar-99 Ver 1.595

Entest Corp.

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/11
Final Test Date: 1999/01/20

Paramount Et Al Arrowhead N-65

Pool: Sulfur Point
Job Number: G0160 b

	Date yyyy/mm/dd	Clock hh:mm:ss	Comment
1	[illegible]	[illegible]	NOTE: CONTINUING FROM 98/12/30 - 99/01/11 AT 0600 SENT ON FEB 3/99
2	1999/01/11	06:00:00	FLUID PRODUCED SINCE ACID SQUEEZE = 198.88 M_3
3	[illegible]	[illegible]	SUM GAS SINCE SQUEEZE = 166487.103 M3
4	1999/01/11	15:00:00	GAS SAMPLE TAKEN: # C&G 2396
5	[illegible]	[illegible]	SHUT IN RECORD BUILD-UPS
6	1999/01/11	16:00:00	TOTAL FLUID SINCE ACID SQUEEZE= 252.37 M3
7	[illegible]	[illegible]	SLICKLINE EXCAVATION TO RUN RECORDERS AND GRADIENT
8	1999/01/12	13:30:00	SLICKLINE FINISHED.
9	[illegible]	[illegible]	OPEN WELL ON 32/64 (12.70mm) CHOKE
10	1999/01/12	14:37:00	SLUG OF FLUID TO SURFACE.
11	[illegible]	[illegible]	PRESSURE CAUSE IN CASING
12	1999/01/12	18:00:00	H2S BY GASTECH= 2000 PPM
13	[illegible]	[illegible]	PRESSURE CAUSE IN CSG
14	1999/01/13	13:30:00	WELL STARTING TO SLUG.
15	[illegible]	[illegible]	RECORDED BUILD-UPS
16	1999/01/14	19:00:00	SETTING BRIDGE PLUG AND MOVING TO TOP PERFS. 2614-2615 mKB./ END OF SULPHUR POINT
17	[illegible]	[illegible]	TANK ON STANDBY
18	1999/01/19	19:00:00	RUNNING TBG. PLUG TO FIND TBG.,CSG., OR PACKER LEAK.
19	[illegible]	[illegible]	TRIPPING OUT OF HOLE
20	1999/01/20	14:00:00	WAITING ON WIRELINE TO RUN BRIDGE PLUG.

Print Filter Off

FieldNotes

Gas Meter 1

Meter Type:	Orifice Meter
Meter Size:	154.05 mm
Previous Gas Production:	165.480 $10^3 m^3$
Tap Type:	Flange
Tap Location:	Downstream
Gas Gravity (G):	0.650
CO_2:	0.19 %
H_2S:	0.00 %
N_2:	0.06 %
Critical Temperature (T_c):	207.58 K
Critical Pressure (P_c):	4630.61 kPa

Oil Meter1

Meter Type:	Produced Volume
Measurement Type:	Incremental
Previous Oil Production:	0.000 m^3
Previous Water Production:	0.000 m^3

Water Meter1

Meter Type:	Produced Volume
Measurement type:	Incremental
Previous Water Production:	0.000 m^3

N.E.B. COPY

ENTEST CORP.

" A Plains Energy Services Company"

Paramount Resources Ltd.

N-65 Slave Point

99/01/17 – 99/02/02

Prepare by
Entest Corp.
March 12, 1999

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
[redacted]																				

1999/01/17 07:00:00 To 1999/01/26 18:00:00

Gas		Cum.		10^3m^3
Oil	0.000	Cum.	0.000	m^3
Water		Cum.		m^3

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16		18:30:00	OPENED TO FLOW ON 48/64" (19.05 mm) CHOKE																		
17		18:35:00			7600																
18		18:40:00			6900																
19		18:45:00			7500																
20		19:00:00			4000									11.09	100.0	0.00	0.00	11.09	11.09		
21		19:15:00			3850																
22		19:30:00			4000																
23		20:00:00	CASING VAC																		
24		20:00:00			4200		4.0	414	29.9	3.0	63.500	98.46	6.15	10.22	100.0	0.00	0.00	10.22	21.31	5	0
25		20:00:00	METER IN SERVICE WITH 2.50" (63.50 mm) ORIFICE PLATE																		
26		20:30:00			3800		4.0	345	23.9	4.0	63.500	81.51	8.03								
27		21:00:00			3150		4.0	241	17.9	6.0	63.500	61.28	9.52	6.99	100.0	0.00	0.00	6.99	28.30	5	0
[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1999/01/28 18:00:00 To 1999/01/29 07:00:00

Gas	9.516	Cum.	9.516	10^3m^3
Oil	0.000	Cum.	0.000	m^3
Water	28.300	Cum.	28.300	m^3

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
[redacted]																					
51		21:50:00	BURNABLE GAS TO SURFACE / LIGHT FLARE																		
52		22:00:00			9150	7900	7.0	345	63.7	8.0	38.100	47.43	10.01	7.54	100.0	0.00	0.00	7.54	35.84	7	0
53		22:00:00	METER IN SERVICE WITH 1.50" (38.10 mm) ORIFICE PLATE / BLEEDING DOWN CSG.																		
54		22:30:00			8350		7.0	345	67.7	7.0	38.100	49.06	11.02								
55		23:00:00			9050		15.0	345	79.7					6.40	100.0	0.00	0.00	6.40	42.24	7	0
56		23:00:00	INCREASED BACK PRESSURE																		
57		23:30:00			9250	3800	18.0	676	99.6	10.0	38.100	78.54	13.67								
58	30/01/1999	00:00:00			8010	3800	16.0	758	59.8	8.0	38.100	63.66	15.15	3.00	100.0	0.00	0.00	3.00	45.24	7	0
59		00:30:00			7200	3500	18.0	621	49.5	10.0	38.100	52.73	16.37								
60		01:00:00			7000	3600	18.0	552	42.8	13.0	38.100	46.24	17.40	2.96	100.0	0.00	0.00	2.96	48.20	7	0
[redacted]																					
71			OPENED TO FLOW ON 2ND POINT 32/64" (12.70 mm) CHOKE																		
72		05:05:00			7500	7400															
73		05:10:00			6810	7400															
74			FLUID TO SURFACE																		
75		05:15:00			9700	7400															
76		05:30:00			7600	7400															

1999/01/29 07:00:00 To 1999/01/30 06:30:00

Gas	12.971	Cum.	22.486	10^3m^3
Oil	0.000	Cum.	0.000	m^3
Water	24.410	Cum.	52.710	m^3

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
77	30/01/1999	05:35:00	METER IN SERVICE																		
78		05:45:00			6500	7400	12.0	379	59.8	10.0	50.800	84.82	20.05								
79		06:00:00			5850	7400	12.0	280	53.8	11.0	50.800	71.49	20.86	4.51	100.0	0.00	0.00	4.51	52.71	7	0

1999/01/30 06:30:00 To 1999/01/31 06:30:00

Gas	32.945	Cum.	55.433 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	19.200	Cum.	71.910 m^3

FieldNotes
Field Measurements

	Date dd/mm/yyyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
80	30/01/1999	06:30:00			5850	7400	14.0	345	63.7	11.0	50.800	84.47	22.49								
81		07:00:00			4200	6900	16.0	207	40.3	12.0	50.800	55.25	23.94	4.21	100.0	0.00	0.00	4.21	56.92	7	0
82		07:30:00			3900	5100	18.0	124	28.9	14.0	50.800	39.55	24.93								
83			BLEED DOWN CASING TO RIG TANK																		
84		08:00:00			5150	3400	21.0	207	50.8	19.0	50.800	61.62	25.98	4.41	100.0	0.00	0.00	4.41	61.33	7	1925
85		08:30:00			5500	2600	22.0	310	59.8	19.0	50.800	77.30	27.43								
86		09:00:00			4800	1800	22.0	331	54.5	15.0	50.800	76.05	29.03	2.87	100.0	0.00	0.00	2.87	64.20	7	1925
[redacted]																					
90			OPENED TO FLOW ON A 40/64"(15.88mm) CHOKE / 3RD POINT																		
91		13:05:00			4050	3000															
92		13:10:00			4205	3000															
93		13:15:00			3910	3000															
94		13:30:00			3520	3000	10.0	448	65.7	13.0	50.800	94.75	31.00								
95			METER IN SERVICE WITH 2"(50.80mm) ORIFICE PLATE.																		
96		13:45:00			2770	2400	10.0														
97			CASING OPEN TO RIG TANK SINCE 07:30.																		
98		14:00:00			2620	2100	11.0	290	44.8	15.0	50.800	65.34	32.67	1.11	100.0	0.00	0.00	1.11	65.31	7	0
99		14:30:00			2370	1600	13.0	241	37.9	16.0	50.800	55.88	33.93								
100		15:00:00			2240	1200	14.0	241	37.9	18.0	50.800	55.69	35.10	1.51	100.0	0.00	0.00	1.51	66.82	7	0
101		15:30:00			2070	1000	18.0	221	35.4	19.0	50.800	52.07	36.22								
102		16:00:00			1850	1000	19.0	193	29.9	19.0	50.800	45.59	37.24	1.59	100.0	0.00	0.00	1.59	68.41	7	0
103		16:30:00			1720	700	19.0	103	19.9	24.0	50.800	30.49	38.03								
104		17:00:00			1680	450	20.0	221	35.6	23.0	50.800	51.89	38.89	1.59	100.0	0.00	0.00	1.59	70.00	7	0
[redacted]																					
114			OPENED WELL ON 4th & EXTENDED ON 32/64 OR 12.70 MM CHOKE																		
115			STARTED TO BLEED OFF CASING																		
116		21:05:00		12.70	5000	5000															
117		21:10:00			4700	5000															
118		21:15:00			4720	4600															
119		21:30:00	METER IN SERVICE WITH A 2" OR 50.8 MM PLATE.																		
120		21:30:00																			
121		21:45:00			3850	3700															
122		22:00:00			3600	3000	8.0	283	47.3	6.0	50.800	67.73	41.71	0.71	100.0	0.00	0.00	0.71	70.71	7	0

1999/01/30 06:30:00 To 1999/01/31 06:30:00

Gas	32.945	Cum.	55.433 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	19.200	Cum.	71.910 m^3

FieldNotes
Field Measurements

	Date dd/mm/yyy	Clock Time hh:mm:ss		Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
123	30/01/1999	22:30:00			2000	2000	8.0	241	39.8	5.0	50.800	58.57	43.02								
124		23:00:00			1900	1400	9.0	172	29.9	6.0	50.800	44.98	44.10	0.43	100.0	0.00	0.00	0.43	71.14	7	0
125		23:30:00			2700	800	9.0	200	32.9	8.0	50.800	49.45	45.09								
126	31/01/1999	00:00:00			2200	600	10.0	186	37.4	7.0	50.800	51.72	46.14	0.50	100.0	0.00	0.00	0.50	71.64	7	0
127		00:30:00			1900	600	9.0	138	25.9	6.0	50.800	39.07	47.09								
128		01:00:00			1720	600	8.0	138	23.9	5.0	50.800	37.54	47.88	0.17	100.0	0.00	0.00	0.17	71.81	7	0
129		01:30:00			1600	600	8.0	138	21.9	6.0	50.800	35.82	48.65								
130		02:00:00			1520	400	6.0	131	20.9	6.0	50.800	34.46	49.38	0.00		0.00	0.00	0.00	71.81		
131		02:30:00			1430	400	6.0	103	19.9	8.0	50.800	31.37	50.07								
132	31/01/1999	03:00:00			1400	400	5.0	103	18.9	8.0	50.800	30.54	50.71	0.00		0.00	0.00	0.00	71.81		
133		03:30:00			1370	400	5.0	103	17.9	7.0	50.800	29.76	51.34								
134		04:00:00			1350	400	5.0	103	17.9	10.0	50.800	29.60	51.96	0.00		0.00	0.00	0.00	71.81		
135		04:30:00		12.70	1300	400	4.0	103	17.9	11.0	50.800	29.54	52.57								
136		05:00:00			1300	400	4.0	103	17.4	11.0	50.800	29.11	53.18	0.10		0.00	0.00	0.10	71.91	7	0
137			CHANGED PLATE TO 1.50 OR 38.1 mm / INCREASED BACK PRESSURE.																		
138		05:30:00			1300	400	4.0	117	78.4	11.0	38.100	37.61	53.88								
139		06:00:00			1300	400	4.0	117	77.7	10.0	38.100	37.47	54.66	0.00		0.00	0.00	0.00	71.91		
140			H2S= 2200 PPM																		

1999/01/30 06:30:00 To 1999/01/31 06:30:00

Gas	32.945	Cum.	55.433	10^3m^3
Oil	0.000	Cum.	0.000	m^3
Water	19.200	Cum.	71.910	m^3

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date dd/mm/yyyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
141	31/01/1999	06:30:00		12.70	1300	400	4.0	117	74.7	10.0	38.100	36.65	55.43								
142		07:00:00			1300	400	5.0	117	74.7	10.0	38.100	36.65	56.20								
143		07:30:00			1300	350	4.0	117	75.2	11.0	38.100	36.72	56.96								
144		08:00:00			1300	350	4.0	117	75.7	11.0	38.100	36.86	57.73								
145		08:30:00			1330	350	4.0	117	76.2	12.0	38.100	36.93	58.50								
146		09:00:00			1330	350	4.0	117	76.7	12.0	38.100	37.06	59.27								
147		09:30:00			1330	450	3.0	117	76.2	12.0	38.100	36.93	60.04								
148		10:00:00			1330	500	3.0	117	76.2	12.0	38.100	36.93	60.81	0.08	100.0	0.00	0.00	0.08	71.99	7	0
149		10:30:00			1330	600	2.0	117	76.2	11.0	38.100	36.99	61.58								
150			CASING IS CONTINUOUSLY VENTING TO RIG TANK.																		
151		11:00:00			1330	600	2.0	117	76.2	11.0	38.100	36.99	62.35	0.07	100.0	0.00	0.00	0.07	72.06	6	0
152		11:30:00			1330	600	3.0	117	75.7	11.0	38.100	36.86	63.12								
153		12:00:00			1310	600	3.0	117	75.7	10.0	38.100	36.93	63.89	0.05	100.0	0.00	0.00	0.05	72.11	7	0
154		12:30:00			1310	700	3.0	103	75.7	10.0	38.100	35.83	64.64								
155		13:00:00			1310	700	4.0	103	75.7	10.0	38.100	35.83	65.39	0.13	100.0	0.00	0.00	0.13	72.24	7	0
156		13:30:00			1310	700	4.0	103	75.7	10.0	38.100	35.83	66.14								
157	.	14:00:00			1310	600	5.0	103	76.2	12.0	38.100	35.83	66.88	0.13	100.0	0.00	0.00	0.13	72.37	6	0
158			INCREASED BACKPRESSURE.																		
159		14:30:00			1320	600	5.0	234	43.8	12.0	38.100	33.58	67.61								
160	31/01/1999	15:00:00			1320	600	5.0	234	43.8	11.0	38.100	33.65	68.31	0.15	100.0	0.00	0.00	0.15	72.52	7	0
161		15:30:00			1320	600	4.0	234	43.8	11.0	38.100	33.65	69.01								
162		16:00:00		12.70	1320	650	3.0	234	44.1	10.0	38.100	33.81	69.71	0.04	100.0	0.00	0.00	0.04	72.56	6	0
163		16:30:00			1320	600	3.0	221	44.3	10.0	38.100	33.25	70.41								
164		17:00:00			1320	600	3.0	221	44.1	10.0	38.100	33.16	71.10	0.08	100.0	0.00	0.00	0.08	72.64	6	0
165		17:30:00			1320	600	2.0	228	43.8	10.0	38.100	33.41	71.79								
166		18:00:00			1320	600	2.0	228	44.3	10.0	38.100	33.61	72.49	0.00		0.00	0.00	0.00	72.64		
167			BLOW DOWN AND ZERO METER.																		
168		18:30:00			1320	600	2.0	228	35.9	10.0	38.100	30.08	73.15								
169		19:00:00	INCREASED BACK PRESSURE / FREEZING IN FLARE LINE.																		
170					1370	600	2.0	345	51.8	10.0	38.100	42.38	73.91	0.09	100.0	0.00	0.00	0.09	72.73	7	0
171		19:30:00			1350	600	3.0	310	25.8	10.0	38.100	28.44	74.65								
172		20:00:00			1320	600	0.0	393	29.9	10.0	38.100	33.59	75.29	0.21	100.0	0.00	0.00	0.21	72.94	7	0
173		20:30:00			1260	600	0.0	379	29.9	10.0	38.100	33.10	75.99								
174		21:00:00			1280	600	0.0	379	29.9	10.0	38.100	33.10	76.68	0.04	100.0	0.00	0.00	0.04	72.98	6	0
175		21:30:00			1280	600	0.0	379	29.9	10.0	38.100	33.10	77.37								
176		22:00:00			1280	600	0.0	379	29.9	9.0	38.100	33.16	78.06	0.10	100.0	0.00	0.00	0.10	73.08	7	0
177		22:30:00			1280	600	0.0	379	29.9	9.0	38.100	33.16	78.75								
178		23:00:00			1250	600	2.0	379	29.9	10.0	38.100	33.10	79.44	0.05	100.0	0.00	0.00	0.05	73.13	7	0
179	31/01/1999	23:30:00			1250	600	4.0	379	29.9	10.0	38.100	33.10	80.13								
180		23:50:00	FREEZING IN FLARE LINE / PUMP METHONAL DOWN FLARE LINE.																		
181	01/02/1999	00:00:00			1250	600	4.0	414	31.9	10.0	38.100	35.45	80.84	0.06	100.0	0.00	0.00	0.06	73.19	7	0
182		00:30:00			1250	600	4.0	379	29.9	10.0	38.100	33.10	81.56								
183		01:00:00		12.70	1250	600	2.0	379	29.9	7.0	38.100	33.29	82.25	0.09	100.0	0.00	0.00	0.09	73.28	6	0

1999/01/31 06:30:00 To 1999/02/01 06:30:00

Gas	34.714	Cum.	90.146 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	1.770	Cum.	73.680 m^3

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
184	01/02/1999	01:30:00			1230	600	2.0	379	29.9	6.0	38.100	33.35	82.94								
185		02:00:00			1230	600	2.0	379	29.9	6.0	38.100	33.35	83.64	0.06	100.0	0.00	0.00	0.06	73.34	6	0
186		02:30:00			1230	600	2.0	379	29.9	4.0	38.100	33.48	84.33								
187		03:00:00			1230	600	2.0	379	29.9	4.0	38.100	33.48	85.03	0.06	100.0	0.00	0.00	0.06	73.40	7	0
188		03:30:00			1200	600	2.0	379	29.9	4.0	38.100	33.48	85.73								
189		04:00:00			1220	600	4.0	407	31.9	5.0	38.100	35.54	86.45	0.18	100.0	0.00	0.00	0.18	73.58	7	0
190		04:30:00			1200	600	4.0	407	31.9	7.0	38.100	35.41	87.19								
191		05:00:00			1200	600	4.0	414	31.9	8.0	38.100	35.59	87.93	0.07	100.0	0.00	0.00	0.07	73.65	6	0
192		05:30:00			1260	600	4.0	414	31.9	9.0	38.100	35.52	88.67								
193		06:00:00			1300	600	4.0	414	31.9	9.0	38.100	35.52	89.41	0.03	100.0	0.00	0.00	0.03	73.68	7	0
194			H2S = 2200 PPM																		

1999/02/01 06:30:00 To 1999/02/02 06:30:00

Gas	33.512	Cum.	123.658 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	2.670	Cum.	76.350 m^3

FieldNotes
Field Measurements

	Date	Clock Time	.	Chok	Pt	Pc	WHT	Static1 Pres	Diff1 Pres	Meter1 Temp	Orifice1	Gas1 Rate	Cum. Gas1	Measure Fld1 Vol	BSW1	Calc Inc Oil1 Gain	Cum. Oil1	Calc Inc BSW1 G	BSW1 Water	Ph	Salinity
	dd/mm/yyy	hh:mm:ss			kPa(g)	kPa(g)	°C	kPa(g)	kPa	°C	mm	$10^3m^3/d$	10^3m^3	m^3	%	m^3	m^3	m^3	m^3		ppm
195	01/02/1999	06:30:00		12.70	1350	600	4.0	414	31.9	9.0	38.100	35.52	90.15								
196		07:00:00			1350	600	2.0	414	33.9	9.0	38.100	36.64	90.90	0.03	100.0	0.00	0.00	0.03	73.71	7	0
197		07:30:00			1370	650	3.0	427	33.9	9.0	38.100	37.10	91.67								
198		08:00:00			1370	650	3.0	427	33.9	9.0	38.100	37.10	92.44								
199		08:30:00			1500	700	3.0	427	33.9	9.0	38.100	37.10	93.21								
200			RIG CREW SHUT IN CASING.																		
201		09:00:00			1520	700	2.0	427	33.4	9.0	38.100	36.83	93.98	0.08	100.0	0.00	0.00	0.08	73.79	6	0
202		09:30:00			1520	700	2.0	427	32.6	9.0	38.100	36.54	94.75								
203		10:00:00			1520	800	2.0	469	35.9	9.0	38.100	39.72	95.54	0.13	100.0	0.00	0.00	0.13	73.92	6	0
204		10:30:00			1310	900	1.0	345	27.9	9.0	38.100	30.85	96.28								
205		11:00:00			850	1200	3.0	172	11.9	9.0	38.100	15.60	96.76	0.12	100.0	0.00	0.00	0.12	74.04	7	0
206			WELL LIQUID LOADING / CASING BACK OPEN TO RIG TANK / INCREASED BACKPRESSURE.																		
207		11:30:00			2200	1100	9.0	469	25.4	11.0	38.100	33.19	97.27								
208			WELL UNLOADING FLUID.																		
209		12:00:00			2020	1100	9.0	621	37.4	10.0	38.100	45.64	98.09	1.00	100.0	0.00	0.00	1.00	75.04	7	0
210	01/02/1999	12:30:00			1850	1000	8.0	676	36.4	9.0	38.100	46.83	99.05								
211	.	13:00:00			1700	1000	8.0	607	33.9	9.0	38.100	43.07	99.99	0.46	100.0	0.00	0.00	0.46	75.50	7	0
212		13:30:00			1570	900	7.0	565	31.4	9.0	38.100	40.15	100.86								
213		14:00:00			1470	800	6.0	538	29.9	11.0	38.100	38.21	101.67	0.09	100.0	0.00	0.00	0.09	75.59	7	0
214		14:30:00			1430	700	5.0	517	28.9	11.0	38.100	36.92	102.45								
215		15:00:00			1380	600	5.0	503	27.9	12.0	38.100	35.78	103.21								
216		15:30:00		12.70	1350	600	5.0	483	27.4	12.0	38.100	34.85	103.95								
217		16:00:00			1320	600	6.0	483	26.6	12.0	38.100	34.36	104.67								
218		16:30:00			1285	600	5.0	469	26.4	12.0	38.100	33.77	105.38								
219		17:00:00			1270	600	5.0	462	25.9	10.0	38.100	33.37	106.08								
220		17:30:00			1250	600	4.0	455	25.4	9.0	38.100	32.89	106.77								
221		18:00:00			1250	600	3.0	448	25.1	9.0	38.100	32.52	107.45								
222		18:30:00			1230	600	2.0	441	24.6	8.0	38.100	32.04	108.12								
223		19:00:00			1230	600	2.0	441	24.4	8.0	38.100	31.87	108.79	0.05	100.0	0.00	0.00	0.05	75.64	7	0
224		19:30:00			1230	600	0.0	427	23.9	8.0	38.100	31.12	109.44								
225		20:00:00			1220	600	2.0	427	23.9	7.0	38.100	31.18	110.09	0.14	100.0	0.00	0.00	0.14	75.78	7	0
226		20:30:00			1220	600	2.0	427	23.9	7.0	38.100	31.18	110.74								
227		21:00:00			1220	600	2.0	427	23.9	6.0	38.100	31.24	111.39	0.10	100.0	0.00	0.00	0.10	75.88	7	0
228		21:30:00			1220	600	2.0	427	23.9	7.0	38.100	31.18	112.04								
229	01/02/1999	22:00:00			1200	600	2.0	427	23.9	8.0	38.100	31.12	112.69	0.07	100.0	0.00	0.00	0.07	75.95	6	0
230		22:30:00			1200	600	3.0	427	23.9	8.0	38.100	31.12	113.34								
231		23:00:00			1200	600	3.0	427	23.9	8.0	38.100	31.12	113.99	0.06	100.0	0.00	0.00	0.06	76.01	7	0
232		23:30:00			1200	600	3.0	427	23.9	8.0	38.100	31.12	114.64								
233	02/02/1999	00:00:00			1200	600	3.0	427	23.9	9.0	38.100	31.06	115.28	0.00		0.00	0.00	0.00	76.01		
234		00:30:00			1200	600	3.0	427	23.9	9.0	38.100	31.06	115.93								
235		01:00:00			1200	600	3.0	427	23.9	11.0	38.100	30.95	116.58	0.03	100.0	0.00	0.00	0.03	76.04	6	0
236		01:30:00			1200	600	3.0	427	23.9	12.0	38.100	30.89	117.22								
237		02:00:00		12.70	1200	600	3.0	427	23.9	11.0	38.100	30.95	117.86	0.00		0.00	0.00	0.00	76.04		

1999/02/01 06:30:00 To 1999/02/02 06:30:00

Gas	33.512	Cum.	123.658 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	2.670	Cum.	76.350 m^3

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0100C

	Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
238	02/02/1999	02:30:00			1200	600	3.0	427	23.9	11.0	38.100	30.95	118.51								
239		03:00:00			1210	600	2.0	427	23.9	11.0	38.100	30.95	119.15	0.12	100.0	0.00	0.00	0.12	76.16	7	0
240		03:30:00			1210	600	4.0	427	23.9	13.0	38.100	30.83	119.80								
241		04:00:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	120.44	0.08	100.0	0.00	0.00	0.08	76.24	7	0
242		04:30:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	121.08								
243		05:00:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	121.73	0.09	100.0	0.00	0.00	0.09	76.33	6	0
244		05:30:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	122.37								
245		06:00:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	123.01	0.02	100.0	0.00	0.00	0.02	76.35	6	0
246			H2S = 2200 PPM.																		

1999/02/02 06:30:00 To 1999/02/02

Gas	16.536	Cum.	140.194 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	0.540	Cum.	76.890 m^3

Paramount Resources Ltd.
/—W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

FieldNotes
Field Measurements

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date dd/mm/yyy	Clock Time hh:mm:ss	.	Chok	Pt kPa(g)	Pc kPa(g)	WHT °C	Static1 Pres kPa(g)	Diff1 Pres kPa	Meter1 Temp °C	Orifice1 mm	Gas1 Rate $10^3m^3/d$	Cum. Gas1 10^3m^3	Measure Fld1 Vol m^3	BSW1 %	Calc Inc Oil1 Gain m^3	Cum. Oil1 m^3	Calc Inc BSW1 G m^3	BSW1 Water m^3	Ph	Salinity ppm
247	02/02/1999	06:30:00		12.70	1210	600	4.0	427	23.9	12.0	38.100	30.89	123.66								
248		07:00:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	124.30	0.04	100.0	0.00	0.00	0.04	76.39	6	0
249		07:30:00			1210	600	4.0	427	23.9	12.0	38.100	30.89	124.94								
250		08:00:00			1210	600	3.0	427	23.9	12.0	38.100	30.89	125.59								
251		08:30:00			1210	600	1.0	427	23.9	12.0	38.100	30.89	126.23								
252		09:00:00			1210	600	2.0	427	23.9	12.0	38.100	30.89	126.88								
253		09:30:00			1210	600	2.0	427	23.9	12.0	38.100	30.89	127.52								
254		10:00:00			1210	600	2.0	427	23.9	12.0	38.100	30.89	128.16								
255			HYDRATE IN FLARELINE / INCREASED METHANOL INJECTION.																		
256		10:30:00			1200	600	1.0	427	23.9	12.0	38.100	30.89	128.81								
257		11:00:00			1200	600	2.0	427	23.9	11.0	38.100	30.95	129.45	0.07	100.0	0.00	0.00	0.07	76.46	7	0
258		11:30:00			1250	600	2.0	441	24.6	12.0	38.100	31.80	130.10								
259		12:00:00			1250	600	2.0	441	24.6	13.0	38.100	31.74	130.77	0.06	100.0	0.00	0.00	0.06	76.52	7	0
260	02/02/1999	12:30:00			1260	600	2.0	441	24.9	14.0	38.100	31.84	131.43								
261		13:00:00			1270	600	2.0	448	25.1	15.0	38.100	32.15	132.09	0.08	100.0	0.00	0.00	0.08	76.60	7	0
262		13:30:00			1270	600	2.0	448	25.1	15.0	38.100	32.15	132.76								
263	.		ZERO METER.																		
264		14:00:00			1270	600	2.0	448	24.9	13.0	38.100	32.11	133.43	0.06	100.0	0.00	0.00	0.06	76.66	6	0
265			GAS SAMPLES TAKEN: #18856, #19229																		
266		14:30:00			1280	600	2.0	448	25.1	14.0	38.100	32.21	134.10								
267		15:00:00			1280	600	2.0	448	25.1	14.0	38.100	32.21	134.77	0.06	100.0	0.00	0.00	0.06	76.72	7	0
268		15:30:00			1280	600	2.0	455	25.1	13.0	38.100	32.48	135.45								
269		16:00:00		12.70	1280	600	2.0	455	25.1	13.0	38.100	32.48	136.13	0.04	100.0	0.00	0.00	0.04	76.76	6	0
270		16:30:00			1280	600	2.0	455	25.1	12.0	38.100	32.54	136.80								
271		17:00:00			1280	600	2.0	455	25.1	11.0	38.100	32.60	137.48	0.06	100.0	0.00	0.00	0.06	76.82	7	0
272		17:30:00			1280	600	2.0	455	25.1	12.0	38.100	32.54	138.16								
273		18:00:00			1280	600	2.0	455	25.1	12.0	38.100	32.54	138.84	0.04	100.0	0.00	0.00	0.04	76.86	6	0
274			ZERO METER.																		
275		18:30:00			1280	550	2.0	455	25.1	12.0	38.100	32.54	139.52								
276		19:00:00			1280	550	2.0	455	25.1	12.0	38.100	32.54	140.19	0.03	100.0	0.00	0.00	0.03	76.89	6	0
277			SHUT WELL IN / WIRE LINE HERE TO CHANGE RECORDERS OUT AND PULL PLUG.																		

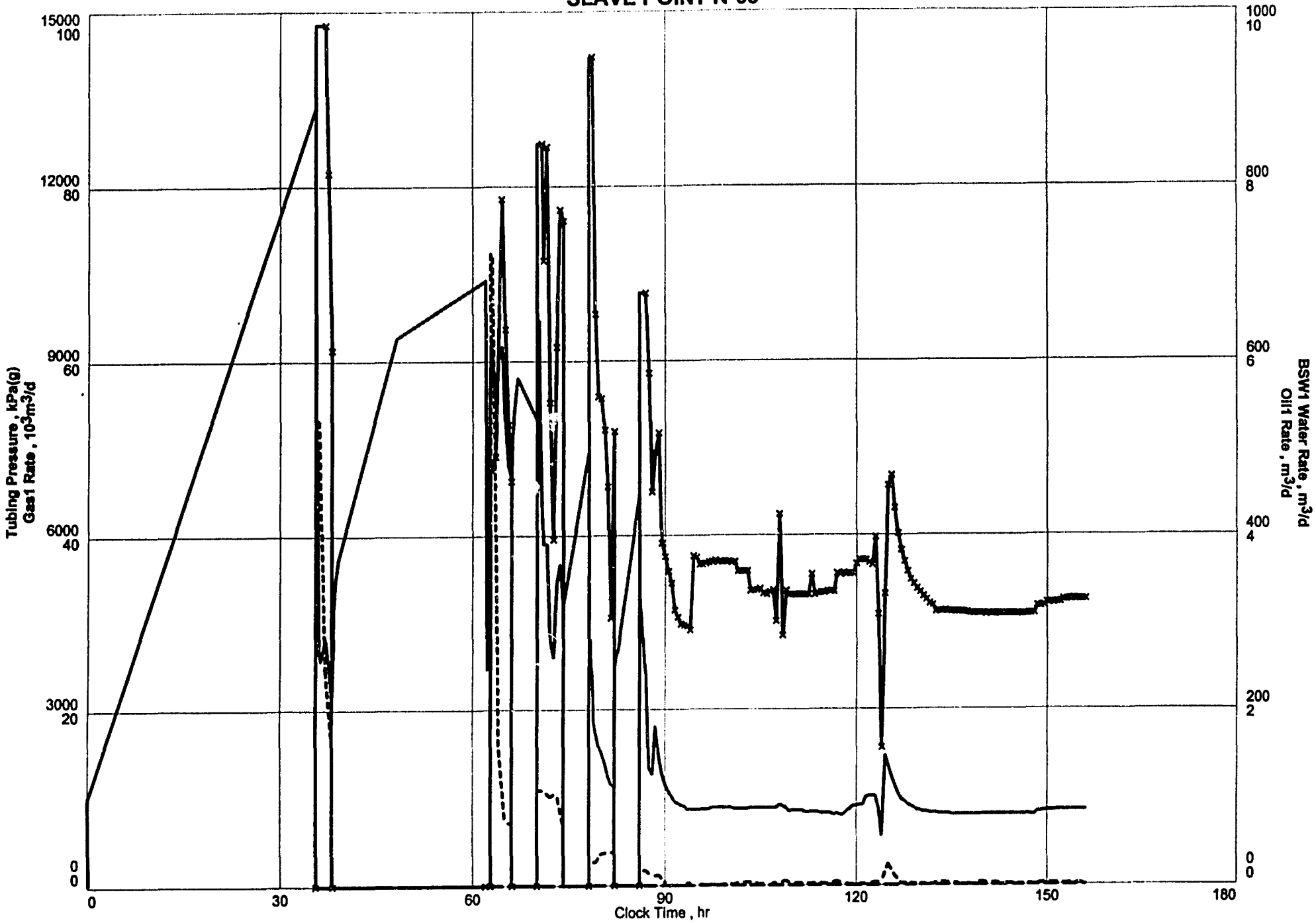
1999/02/02 06:30:00 To 1999/02/02

Gas	16.536	Cum.	140.194 10^3m^3
Oil	0.000	Cum.	0.000 m^3
Water	0.540	Cum.	76.890 m^3

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

SLAVE POINT N-65



Fast C:\FAST\Examples\Paramount c.FLD 11-Mar-99 Ver 1.595

Entest Corp.

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

Paramount Et Al Arrowhead
Pool: Slave Point
Job Number: G0160C

	Date yyyy/mm/dd	Clock hh:mm:ss	Comment
1	1999/01/17	07:00:00	SWABBING TO RIG TANK ON STANDBY
2	1999/01/19	07:00:00	RUNNING TBG. PLUG TO FIND TBG. CSG. OR PACKER LEAK
3	1999/01/20	07:00:00	TRIPPING OUT OF HOLE
4	1999/01/20	07:00:00	WAITING ON WIRELINE TO RUN BRIDGE PLUG
5	1999/01/24	07:00:00	TUBING NOT PRESSURE TESTING
6	1999/01/24	07:00:00	TRIPPING OUT TO REDOPE AND TORQUE COLLARS
7	1999/01/26	07:00:00	TRIPPING IN WITH PLUG IN PLACE / PRESSURE TESTING EVERY 5 STANDS
8	1999/01/26	07:00:00	SWABBING TO RIG TANK
9	1999/01/27	07:00:00	PERFORATE 2,679-2681 / 2,681-2,683 MKB IN SLAVE POINT
10	1999/01/27	07:00:00	SWAB TO RIG TANK
11	1999/01/28	18:00:00	SWAB OFF TO RIG TANK / SWAB PREPARE FOR ACID JOB
12	1999/01/28	18:00:00	FINISHED ACID JOB / 22.30 M3 TO RECOVER
13	1999/01/28	20:00:00	OPENED TO FLOW ON 48/64" (19.05 mm) CHOKE
14	1999/01/28	20:00:00	CASING VAC
15	1999/01/28	20:00:00	METER IN SERVICE WITH 2.50" (63.50 mm) ORIFICE PLATE
16	1999/01/28	21:00:00	SHUT IN / RUN RECORDERS IN MORNING
17	1999/01/29	12:00:00	BLEED OFF CASING TO RIG TANK
18	1999/01/29	12:00:00	WIRELINE ON LOCATION TO RUN GRADIENT AND RECORDERS
19	1999/01/29	16:30:00	SHUT DOWN CASING
20	1999/01/29	16:30:00	WIRELINE OUT OF HOLE / RECORDERS SET
21	1999/01/29	16:30:00	OPENED WELL ON 24/64 OR 9.53 mm CHOKE / START OF 4 POINT TEST
22	1999/01/29	21:20:00	FLUID TO SURFACE
23	1999/01/29	21:20:00	FLARE WENT OUT / GAS HEAD GONE / STARTED DISPLACING TUBING
24	1999/01/29	21:30:00	START SHIPPING TO 400 BBL
25	1999/01/29	21:30:00	STOP SHIPPING
26	1999/01/29	21:50:00	BURNABLE GAS TO SURFACE / LIGHT FLARE
27	1999/01/29	22:00:00	METER IN SERVICE WITH 1.50" (38.10 mm) ORIFICE PLATE / BLEEDING DOWN CSG
28	1999/01/29	23:00:00	INCREASED BACK PRESSURE
29	1999/01/30	01:00:00	H_2S = 1650 ppm / SHUT IN / RECORDED BUILD-UPS
30	1999/01/30	02:00:00	TOTAL FLUID PROD. ON FIRST POINT =19.90 m3
31	1999/01/30	02:00:00	TOTAL GAS FLARED ON FIRST POINT = 9.34 $10_3 m^3$
32	1999/01/30	05:00:00	OPENED TO FLOW ON 2ND POINT 32/64" (12.70 mm) CHOKE
33	1999/01/30	05:00:00	FLUID TO SURFACE
34	1999/01/30	05:35:00	METER IN SERVICE

Print Filter Off

Paramount Resources Ltd.
/---W/
Start Test Date: 1999/01/17
Final Test Date: 1999/02/02

Paramount Et Al Arrowhead

Pool: Slave Point
Job Number: G0160C

	Date yyyy/mm/dd	Clock hh:mm:ss	Comment
[illegible]	1999/01/30	07:30:00	BLEED DOWN CASING TO RIG TANK
36	1999/01/30	09:00:00	SHUT IN WELL / RECORD BUILD-UPS (NO BUILD-UPS)
[illegible]	[illegible]	[illegible]	FLUID PROD ON 2ND RATE = 16.00 m3 GAS PROD = 11.76 $10^3 m^3$
38	1999/01/30	13:00:00	OPENED TO FLOW ON A 40/64"(15.88mm) CHOKE / 3RD POINT
[illegible]	[illegible]	[illegible]	METER IN SERVICE WITH 2"(50.80mm) ORIFICE PLATE.
40	1999/01/30	13:45:00	CASING OPEN TO RIG TANK SINCE 07:30.
[illegible]	[illegible]	[illegible]	SHUT IN / RECORDED BUILD-UPS / SHUT IN CASING.
42	1999/01/30	18:00:00	NO ENOUGH BUILD-UPS
[illegible]	[illegible]	[illegible]	OPENED WELL ON 4H & EXTENDED ON 32/64 OR 12.70 MM CHOKE
44	1999/01/30	21:00:00	STARTED TO BLEED OFF CASING
[illegible]	[illegible]	[illegible]	METER IN SERVICE WITH A 2" OR 50.9 MM PLATE
46	1999/01/31	05:00:00	CHANGED PLATE TO 1.50 OR 38.1 mm / INCREASED BACK PRESSURE.
[illegible]	[illegible]	[illegible]	GAS 2200 PPM
48	1999/01/31	10:30:00	CASING IS CONTINUOUSLY VENTING TO RIG TANK.
[illegible]	[illegible]	[illegible]	INCREASED BACKPRESSURE
50	1999/01/31	18:00:00	BLOW DOWN AND ZERO METER.
[illegible]	[illegible]	[illegible]	INCREASED BACK PRESSURE / FREEZING IN FLARE LINE
52	1999/01/31	23:50:00	FREEZING IN FLARE LINE / PUMP METHONAL DOWN FLARE LINE.
[illegible]	[illegible]	[illegible]	GAS 2200 PPM
54	1999/02/01	08:30:00	RIG CREW SHUT IN CASING.
[illegible]	[illegible]	[illegible]	WELL LIQUID LOADING / CASING BACK OPEN TO RIG TANK / INCREASED BACKPRESSURE
56	1999/02/01	11:30:00	WELL UNLOADING FLUID.
[illegible]	[illegible]	[illegible]	GAS 2200 PPM
58	1999/02/02	10:00:00	HYDRATE IN FLARELINE / INCREASED METHANOL INJECTION.
[illegible]	[illegible]	[illegible]	ZERO METER
60	1999/02/02	14:00:00	GAS SAMPLES TAKEN: #18856, #19229
[illegible]	[illegible]	[illegible]	ZERO METER
62	1999/02/02	19:00:00	SHUT WELL IN / WIRE LINE HERE TO CHANGE RECORDERS OUT AND PULL PLUG.

Print Filter Off

FieldNotes

Gas Meter 1

Meter Type:	Orifice Meter
Meter Size:	154.05 mm
Previous Gas Production:	0.000 $10^3 m^3$
Tap Type:	Flange
Tap Location:	Downstream
Gas Gravity (G):	0.762
CO_2:	0.19 %
H_2S:	0.00 %
N_2:	0.06 %
Critical Temperature (T_c):	226.70 K
Critical Pressure (P_c):	4601.40 kPa

Oil Meter1

Meter Type:	Produced Volume
Measurement Type:	Incremental
Previous Oil Production:	0.000 m^3
Previous Water Production:	0.000 m^3

AGAT Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: AGAT 19229

LABORATORY NUMBER: GG35506A

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT BERKLEY ARROWHEAD N-65

ELEVATIONS KB m: 574.60 GRD m: 567.30

FIELD OR AREA: ARROWHEAD

POOL OR ZONE: SLAVE POINT

NAME OF SAMPLER:

COMPANY: ENTEST CORP.

TEST TYPE:

NO:

TEST RECOVERY: 60 DEG. 34' 45"latitude 122 DEG. 57' 18"longitude

TEST INTERVAL OR PERFS: 2579.0-2581.0 2594.0-2601.0 mKB

SAMPLING POINT: METER RUN

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa				448	448	500
TEMPERATURE °C				13	13	21

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
99-02-02	99-02-08	99-02-17	BN/PL NCO	

COMP	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL/m³
H_2	0.0004	0.0005	
He	0.0013	0.0016	
N_2	0.0615	0.0757	
CO_2	0.1885	0.0000	
H_2S	0.0000	0.0000	
C_1	0.7476	0.9212	
C_2	0.0001	0.0001	
C_3	0.0001	0.0001	0.4
iC_4	TRACE	TRACE	0.1
nC_4	0.0001	0.0002	0.5
iC_5	TRACE	TRACE	0.2
nC_5	0.0001	0.0001	0.4
C_6	0.0001	0.0002	0.8
C_7 +	0.0002	0.0003	1.5
C_8			
C_9			
C_{10}+			
TOTAL	1.0000	1.0000	3.9

GROSS HEATING VALUE MJ/m³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE	AIR FREE AS RECEIVED	VAPOUR PRESSURE PENTANES PLUS
34.96	28.38	43.9 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED MEASURED	MOISTURE FREE AS SAMPLED CALCULATED	MOISTURE AND ACID GAS FREE MEASURED	MOISTURE AND ACID GAS FREE CALCULATED
	0.762		0.586

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED pPc (abs)	AS SAMPLED pTc	ACID GAS FREE pPc (abs)	ACID GAS FREE pTc
5046 kPa	207.9 K	4503 kPa	185.6 K

RELATIVE MOLECULAR MASS

TOTAL GAS	C_{7+}
22.1	103.1

H_2S g/m³: 0.00

REMARKS:

EXCEED NORMAL LIMITS : N2 ,CO2

N.E.B. COPY

1833

PARAMOUNT RESOURCES LTD

N-65-63-40-122-45NWT / NAHANNI

NEW COMPLETION

98-03-05 - 93-03-20

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
APR - 8 1998

Report prepared by:

ENTEST CORP.

98-03-20

ENTEST CORP.

PRODUCTION SUMMARY

Customer Name:	PARAMOUNT RESOURCES LTD
LSD:	N-65-63-40-122-45NWT
Operation Description:	NEW COMPLETION
Test Dates:	98-03-05 - 93-03-20

Gas Parameters

Meter Run Size:	102.26 mm
Relative Gas Density:	0.65
Mole Fraction Nitrogen (N2):	
Mole Fraction Carbon Dioxide (CO2):	
Mole Fraction Hydrogen Sulfide (H2S):	

Production Totals

Total Production Time:	364.58
Total Amount of Gas Produced:	0.00
Total Amount of Oil/Cond Produced:	0
Total Amount of Water Produced:	69.95999

DAY SUMMARY

Date	Production Time	Gas		OIL/Condensate		Water	
		Amount Prod	Avg Gas Rate	Amount Prod	Avg Prod Rate	Amount Prod	Avg Prod Rate
	hours	10^3m^3	10^3m^3/day	m^3	m^3/day	m^3	m^3/day
98-03-05	15.00	0.00		0.00		0.00	
98-03-06	19.00	0.00		0.00		0.00	
98-03-07	14.00	0.00		0.00		0.00	
98-03-08	36.00	0.00		0.00		0.00	
98-03-10	29.00	0.00		0.00		0.00	
98-03-11	24.00	0.00		0.00		0.00	
98-03-12	31.00	0.00		0.00		0.00	
98-03-13	16.00	0.00		0.00		0.00	
98-03-14	24.00	0.00		0.00		0.00	
98-03-15	24.00	0.00		0.00		0.00	
98-03-16	39.50	0.00		0.00		0.00	
98-03-17	20.00	0.00		0.00		0.00	
98-03-18	36.00	0.00		0.00		36.35	48.16
98-03-19	23.54	0.00		0.00		30.73	87.52
98-03-20	13.54	0.00		0.00		2.88	

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT **Zone:** NAHANEY
Test Dates: 98-03-05-93-03-20
Operation: NEW COMPLETION

Operations Summary

Date	Time	Comments
98-03-05	08:00	MOVE EQUIPMENT TO LOCATION
	23:00	SHUT DOWN TILL FOLLOWING A M .
98-03-06	08:00	SPOT EQUIPMENT & RUN FLARE LINE & STAND FLARE STACK & TIE IN
	18:00	SHUT DOWN TILL FOLLOWING AM.
98-03-07	08:00	EQUIPMENT & PERSONEL ON STAND BY
98-03-08	08:00	PERSONEL & EQUIPMENT ON STAND BY
	18:00	LINE HEATER ON LOCATION SPOT & RIG IN
	20:00	SHUT DOWN TILL FOLLOWING A M.
98-03-10	00:00	CONTINUE STAND BY
98-03-11	00:00	CONTINUE STAND BY
	23:30	CONTINUE STAND BY
	00:00	CONTINUE STAND BY
	01:00	CONTINUE STAND BY
98-03-12	00:00	CONTINUE STAND BY
	08:00	CONTINUE STAND BY
98-03-13	00:00	CONTINUE STANDBY
98-03-14	00:00	CONTINUE STANDBY
98-03-15	00:00	CONTINUE STANDBY
98-03-16	00:00	CONTINUE STANDBY
	15:30	CONTINUE STAND BY
98-03-17	00:00	CONTINUE STAND BY
	11:30	CONTINUE STAND BY
98-03-18	00:00	CONTINUE STAND BY
	02:30	RIG UP AND BEGIN TO SWAB
	08:04	RIG DOWN SWAB SWAB EQUIPMENT & RIG UP SCHLUMBERGER
	11:00	HOLD SAFETY MEETING & PRESSURE TEST SURFACE LINES
	13:06	START IN HOLE WITH COIL TUBING
	14:30	START RECOVERING DISPLACEMENT FLUID
	15:00	RECOVERING DISPLACEMENT FLUID
	15:30	TRANSFER 3 / M 3 TO RIG TANK

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT **Zone:** NAHANEY
Test Dates: 98-03-05-93-03-20
Operation: NEW COMPLETION

Operations Summary

Date	Time	Comments
98-03-18	16:00	RECOVERED FLUID
	17:00	RECOVERED FLUID
	17:30	RECOVERED FLUID
	18:00	RECOVERED FLUID
	18:30	RECOVERED FLUID
	18:38	RECOVERED FLUID
	19:02	TRANSFER 4.83 / M 3 TO 400 STORAGE
	22:00	GAUGE 400 TANK @ 154 C M. =16.18 M3
	23:30	GAUGE 400 @ 159CM = 16.69M3 AND WAIT ON BULKER
98-03-19	02:55	BULKER ON LOCATION PREPARE TO FRAC
	05:50	COMPLETE ACID & PERF BALL FRAC
	06:35	OPEN TO FLOW BACK ACID ON 50.8 M. M. CHOKE
	09:30	BLEED CASING DOWN TO 0
	11:44	NO TAG ON SWAB # 2 @ 11:44 HRS
	16:05	TRANSFER TO 400 STORAGE 6.03 / M3
	19:27	SHUT DOWN SWABBING AND WAIT TWO HOURS
98-03-20	01:15	OBTAIN WATER SAMPLE @ 01:15 H . R. S. SWAB # 23
	07:59	OBTAIN WATER SAMPLE SWAB# 30
	08:15	TRANSFER T0 400 SORAGE 4.12 / M 3 SHUT DOWN SWABBING
	09:15	RECORD BUILD UPS
	09:30	BUILD UP
	09:45	BUILD UP
	10:00	BUILD UP
	10:15	BUILD UP
	10:30	BUILD UP
	10:45	BUILD UP
	11:00	BUILD UP
	11:15	BUILD UP
	11:30	BUILD UP
	11:45	BUILD UP

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT **Zone:** NAHANEY
Test Dates: 98-03-05-93-03-20
Operation: NEW COMPLETION

Operations Summary

Date	Time	Comments
98-03-20	12:00	BUILD UP
	12:15	OBTAIN 2 GAS SAMPLES CYL # 00019974 &00019954 AGAT LAB
	12:30	KILL WELL & PROCEDE WITH EQUIPMENT RIG OUT
	12:35	TRANSFER BALANCE OF FLUID TO 400 =6.32 / M 3

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-05	08:00	MOVE EQUIPMENT TO LOCATION															
	23:00	SHUT DOWN TILL FOLLOWING A M .															
98-03-06	08:00	SPOT EQUIPMENT & RUN FLARE LINE & STAND FLARE STACK & TIE IN															
	18:00	SHUT DOWN TILL FOLLOWING AM.															
98-03-07	08:00	EQUIPMENT & PERSONEL ON STAND BY															
98-03-08	08:00	PERSONEL & EQUIPMENT ON STAND BY															
	18:00	LINE HEATER ON LOCATION SPOT & RIG IN															
	20:00	SHUT DOWN TILL FOLLOWING A M.															
98-03-10	00:00	CONTINUE STAND BY															
	01:00																
98-03-11	01:00																
	00:00	CONTINUE STAND BY															
	23:30	CONTINUE STAND BY															
	00:00	CONTINUE STAND BY															
	01:00	CONTINUE STAND BY															
98-03-12	00:00	CONTINUE STAND BY															
	08:00	CONTINUE STAND BY															
98-03-13	00:00	CONTINUE STANDBY															
98-03-14	00:00	CONTINUE STANDBY															
98-03-15	00:00	CONTINUE STANDBY															

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)		
Fluid Injected (m³)		
Cum Recovered (m³)		
Fluid To Recover (m³)	0	0

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-16	00:00																
		CONTINUE STANDBY															
	15:30																
		CONTINUE STAND BY															
98-03-17	00:00																
		CONTINUE STAND BY															
	11:30																
		CONTINUE STAND BY															
98-03-18	00:00																
		CONTINUE STAND BY															
	02:30			1			1	1									
		RIG UP AND BEGIN TO SWAB															
	02:47	0	0	2			1	2									
	03:00	0	0	3	510	699	1	3									
	03:11	0	0	4	699	883	0.66	3.66									
	03:22	0	0	5	791	971	0	3.66									
	03:33	0	0	6	883	1062	0.33	3.99									
	03:51	0	0	7	883	1062	0.66	4.65									
	04:05	0	0	8	1062	1321	0.66	5.31									
	04:19	0	0	9	1279	1448	0	5.31									
	04:41	0	0	10	1321	1572	1.32	6.63									
	05:03	0	0	11	1572	1810	0.66	7.29									
	05:30	0	0	12	1732	1963	0.33	7.62									
	06:01	0	0	13	1887	2109	0.99	8.61									
	06:28	0	0	14	2145	2358	0.66	9.27									
	06:50	0	0	15	2217	2457	0.33	9.6									

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	9.60	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	9.6	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-18	07:27	0	0	16	2322	2358	0	9.6									
	08:04	0	0	17	2322	2358	0	9.6									
		RIG DOWN SWAB SWAB EQUIPMENT & RIG UP SCHLUMBERGER															
	11:00	0	0														
		HOLD SAFETY MEETING & PRESSURE TEST SURFACE LINES															
	13:06	0	0														
		START IN HOLE WITH COIL TUBING															
	14:30	0	0				2.35	11.95									
		START RECOVERING DISPLACEMENT FLUID															
	15:00	0	0				0.68	12.63									
		RECOVERING DISPLACEMENT FLUID															
	15:30	0	0				4.18	16.81									
		TRANSFER 3 / M 3 TO RIG TANK															
	16:00	0	0				0.37	17.18									
		RECOVERED FLUID															
	17:00	0	0				0.25	17.43									
		RECOVERED FLUID															
	17:30	0	0				0.43	17.86									
		RECOVERED FLUID															
	18:00	0	0				0.35	18.21									
		RECOVERED FLUID															
	18:30	0	0				0	18.21									
		RECOVERED FLUID															
	18:38	0	0				0.18	18.39									
		RECOVERED FLUID															
	19:00	0	0				0.09	18.48									
	19:02	0	0				0.17	18.65									
		TRANSFER 4.83 / M 3 TO 400 STORAGE															
	22:00	0	0				11.35	30									
		GAUGE 400 TANK @ 154 C M. =16.18 M3															
	23:30	0	0				6.35	36.35									
		GAUGE 400 @ 159CM = 16.69M3 AND WAIT ON BULKER															
98-03-19	02:55																
		BULKER ON LOCATION PREPARE TO FRAC															
	05:50																
		COMPLETE ACID & PERF BALL FRAC															
	06:35	22000	0														
		OPEN TO FLOW BACK ACID ON 60.8 M. M. CHOKE															

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	26.75	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	36.35	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-19	06:40	22000															
	06:45	10000															
	06:50	5500	0														
	06:55	3500	0														
	07:10	2300	0														
	07:25	1800	0														
	08:00	2000					12.42	48.77									
	08:30	1900	7000				2.22	50.99									
	09:00	2000	8000				5.31	56.3									
	09:30	1400	8000				1.22	57.52									
		BLEED CASING DOWN TO 0															
	10:00	800	0				0.54	58.06001									
	10:30	300	0				0	58.06001									
	11:22					1191	0.78	58.84							5		
	11:44	0	0				0.61	59.45							5		
		NO TAG ON SWAB # 2 @ 11:44 HRS															
	12:07	0	0		1148	1321	0.62	60.07						232000	5		
	12:31	0	0	4	1148	1321	0.27	60.34						230000	5		
	12:49	0	0	5	1448	1652	0.53	60.87						240000	5		
	13:14	0	0	6	1448	1652	0.45	61.32						240000	5		
	13:46	0	0	7	1363	1612	0.44	61.76						225000	5		
	14:01	0	0	8	1407	1652	0.18	61.94						218000	5		600

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	25.59	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	61.94	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-19	14:30	0	0	9		1887	0.53	62.47						220000	5		
	14:58	0	0	10	1652	1963	0.44	62.91						220000	5		
	15:23	0	0	11	1810	2037	0.34	63.25						220000	5		
	16:05	0	0	12	2457	2457	0.93	64.18						212000	5		
		TRANSFER TO 400 STORAGE 6.03 / M3															
	16:57	0	0	13	2252	2457	0.52	64.7						220000	5		
	17:26	0	0	14	2322	2587	0.26	64.96						200000	5		
	18:00	0	0	15		2587	0.61	65.57						208000	5		
	18:33	0	0	16		2587	0.18	65.75						212000	5		
	19:05	0	0	17		2587	0.26	66.01						210000	5		
	19:27	0	0	18		2587	0.09	66.1						190000	5		
		SHUT DOWN SWABBING AND WAIT TWO HOURS															
	21:26	0	0	19		2587	0.45	66.55						220000	5		50
	21:52	0	0	20		2587	0.18	66.73						206000	5		
	23:03	0	0	21		2587	0.35	67.07999						200000	5		
98-03-20	00:04	0	0	22		2587	0.27	67.34999						206000	5		
	01:15	0	0	23		2587	0.27	67.61999						206000	5		
		OBTAIN WATER SAMPLE @ 01:15 H. R. S. SWAB # 23															
	02:03	0	0	24		2587	0.44	68.05999						210000	5		
	03:03	0	0	25		2587	0.26	68.31999						222000	5		
	04:06	0	0	26		2587	0.18	68.49999						210000	5		
	05:09	0	0	27		2587	0.26	68.75999						216000	5		100
	05:57	0	0	28		2587	0.52	69.27999						214000	5		

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	7.34	0.00
Fluid Injected (m³)		
Cum Recovered (m³)	69.27999	
Fluid To Recover (m³)	0.00	0.00

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD
LSD: N-65-63-40-122-45NWT
Zone: NAHANEY
Test Dates: 98-03-05-93-03-20

Job No: R0004 **Unit:** CUB # 4
Company Rep: RANDY HEMMINGSEN
Test Operator: R. GALLANT
Operation: NEW COMPLETION

Date	Time	Tubing Press (kPa)	Casing Press (kPa)	Swab #	Fluid Level (m)	Swab Depth (m)	Amt Water (m³)	Cum Water (m³)	Amt Oil (m³)	Cum Oil (m³)	Grindout Water %	Grindout Sand %	Grindout Wax %	Salinity (ppm)	PH	API (°)	H2S (ppm)
98-03-19	14:58	0	0	10	1652	1963	0.44	62.91						220000	5		
	15:23	0	0	11	1810	2037	0.34	63.25						220000	5		
	16:05	0	0	12	2457	2457	0.93	64.18						212000	5		
		TRANSFER TO 400 STORAGE 6.03 / M3															
	16:57	0	0	13	2252	2457	0.52	64.7						220000	5		
	17:26	0	0	14	2322	2587	0.26	64.96						200000	5		
	18:00	0	0	15		2587	0.61	65.57						208000	5		
	18:33	0	0	16		2587	0.18	65.75						212000	5		
	19:05	0	0	17		2587	0.26	66.01						210000	5		
	19:27	0	0	18		2587	0.09	66.1						190000	5		
		SHUT DOWN SWABBING AND WAIT TWO HOURS															
	21:26	0	0	19		2587	0.45	66.55						220000	5		50
	21:52	0	0	20		2587	0.18	66.73						206000	5		
	23:03	0	0	21		2587	0.35	67.07999						200000	5		
98-03-20	00:04	0	0	22		2587	0.27	67.34999						206000	5		
	01:15	0	0	23		2587	0.27	67.61999						206000	5		
		OBTAIN WATER SAMPLE @ 01:15 H . R. S. SWAB # 23															
	02:03	0	0	24		2587	0.44	68.05999						210000	5		
	03:03	0	0	25		2587	0.26	68.31999						222000	5		
	04:06	0	0	26		2587	0.18	68.49999						210000	5		
	05:09	0	0	27		2587	0.26	68.75999						216000	5		100
	05:57	0	0	28		2587	0.52	69.27999						214000	5		

SWAB Summary	Acid/H2O (m³)	Oil/Cond (m³)
Page Recovery (m³)	69.27999	
Fluid Injected (m³)		
Cum Recovered (m³)	69.27999	
Fluid To Recover (m³)	0	0

ENTEST CORP.

Company:	PARAMOUNT RESOURCES LTD			Job No	R0004	Unit: CUB # 4	Gas Sent To: FLARE
LSD:	N-65-63-40-122-45NWT	Company Rep:	RANDY HEMMINGSEN			H2S:	Diff. Range: 0-100 KPA kPa
Zone:	NAHANEY	Test Operator:	R. GALLANT			N2:	Specific Gravity 0.65
Test Dates:	98-03-05 - 93-03-20	Operation:	FLOW TEST			CO2	Meter Run Size 102.26 mm

Date	Time	Elapsed Time (Hrs)	Tubing Press (kPa)	Casing Press (kPa)	Flow Temp (°C)	Static Press (kPa)	Diff Press (kPa)	Meter Temp (°C)	Gas Flow $10^3m^3/d$	Cum Gas 10^3m^3	Amt Water (m^3)	Cum Water (m^3)	Amt Oil (m^3)	Cum Oil (m^3)	Cond/Gas Ratio $m^3/10^3m^3$	WGR $m^3/10^3m^3$	Salinity (ppm)	API (°)	PH	H2S (ppm)	
98-03-05	08:00																				MOVE EQUIPMENT TO LOCATION
	23:00	15.00																			SHUT DOWN TILL FOLLOWING A M .
98-03-06	08:00	24.00																			SPOT EQUIPMENT & RUN FLARE LINE & STAND FLARE STACK & TIE IN
	18:00	34.00																			SHUT DOWN TILL FOLLOWING AM.
98-03-07	08:00	48.00																			EQUIPMENT & PERSONEL ON STAND BY
98-03-08	08:00	72.00																			PERSONEL & EQUIPMENT ON STAND BY
	18:00	82.00																			LINE HEATER ON LOCATION SPOT & RIG IN
	20:00	84.00																			SHUT DOWN TILL FOLLOWING A M.
98-03-10	00:00	112.00																			CONTINUE STAND BY
	01:00	113.00																			
98-03-11	01:00	137.00																			
	00:00	136.00																			CONTINUE STAND BY
	23:30	159.50																			CONTINUE STAND BY
	00:00	136.00																			CONTINUE STAND BY
	01:00	137.00																			CONTINUE STAND BY
98-03-12	00:00	160.00																			CONTINUE STAND BY
	08:00	168.00																			CONTINUE STAND BY
98-03-13	00:00	184.00																			CONTINUE STANDBY
98-03-14	00:00	208.00																			CONTINUE STANDBY
98-03-15	00:00	232.00																			CONTINUE STANDBY

Production Summary	Time (hours)	Gas (10^3m^3)	Water (m^3)	Oil/Cond (m^3)
Total for this page	232.00	0.00	0.00	0.00
Total from previous page				
Total Cum. Production	232.00			

ENTEST CORP.

Company:	PARAMOUNT RESOURCES LTD		**Job No**	R0004	**Unit:**	CUB # 4	**Gas Sent To:** FLARE
LSD:	N-65-63-40-122-45NWT	**Company Rep:**	RANDY HEMMINGSEN		**H2S:**		**Diff. Range:** 0-100 KPA kPa
Zone:	NAHANEY	**Test Operator:**	R. GALLANT		**N2:**		**Specific Gravity** 0.65
Test Dates:	98-03-05 - 93-03-20	**Operation:**	FLOW TEST		**CO2**		**Meter Run Size** 102.26 mm

Date	Time	Elapsed Time (Hrs)	Tubing Press (kPa)	Casing Press (kPa)	Flow Temp (°C)	Static Press (kPa)	Diff Press (kPa)	Meter Temp (°C)	Gas Flow $10^3m^3/d$	Cum Gas 10^3m^3	Amt Water (m^3)	Cum Water (m^3)	Amt Oil (m^3)	Cum Oil (m^3)	Cond/Gas Ratio $m^3/10^3m^3$	WGR $m^3/10^3m^3$	Salinity (ppm)	API (°)	PH	H2S (ppm)
98-03-16	00:00	256.00																		
						CONTINUE STANDBY														
	15:30	271.50																		
						CONTINUE STAND BY														
98-03-17	00:00	280.00																		
						CONTINUE STAND BY														
	11:30	291.50																		
						CONTINUE STAND BY														
98-03-18	00:00	304.00																		
						CONTINUE STAND BY														
	02:30	306.50									1	1								
						RIG UP AND BEGIN TO SWAB														
	02:47	306.78	0	0							1	2								
	03:00	307.00	0	0							1	3								
	03:11	307.18	0	0							0.66	3.66								
	03:22	307.36	0	0							0	3.66								
	03:33	307.54	0	0							0.33	3.99								
	03:51	307.84	0	0							0.66	4.65								
	04:05	308.07	0	0							0.66	5.31								
	04:19	308.30	0	0							0	5.31								
	04:41	308.67	0	0							1.32	6.63								
	05:03	309.04	0	0							0.66	7.29								
	05:30	309.49	0	0							0.33	7.62								
	06:01	310.01	0	0							0.99	8.61								
	06:28	310.46	0	0							0.66	9.27								
	06:50	310.83	0	0							0.33	9.6								

Production Summary	Time (hours)	Gas (10^3m^3)	Water (m^3)	Oil/Cond (m^3)
Total for this page	78.83	0.00	9.60	0.00
Total from previous page	232.00			
Total Cum. Production	310.83		9.60	

ENTEST CORP.

Company:	PARAMOUNT RESOURCES LTD		Job No R0004	Unit: CUB # 4		Gas Sent To:	FLARE
LSD:	N-65-63-40-122-45NWT	Company Rep:	RANDY HEMMINGSEN	H2S:		Diff. Range:	0-100 KPA kPa
Zone:	NAHANEY	Test Operator:	R. GALLANT	N2:		Specific Gravity	0.65
Test Dates:	98-03-05 - 93-03-20	Operation:	FLOW TEST	CO2		Meter Run Size	102.26 mm

Date	Time	Elapsed Time (Hrs)	Tubing Press (kPa)	Casing Press (kPa)	Flow Temp (°C)	Static Press (kPa)	Diff Press (kPa)	Meter Temp (°C)	Gas Flow $10^3m^3/d$	Cum Gas 10^3m^3	Amt Water (m^3)	Cum Water (m^3)	Amt Oil (m^3)	Cum Oil (m^3)	Cond/Gas Ratio $m^3/10^3m^3$	WGR $m^3/10^3m^3$	Salinity (ppm)	API (°)	PH	H2S (ppm)
98-03-18	07:27	311.45	0	0							0	9.6								
	08:04	312.07	0	0							0	9.6								
	11:00	315.00	0	0																
	13:06	317.10	0	0																
	14:30	318.50	0	0							2.35	11.95								
	15:00	319.00	0	0							0.68	12.63								
	15:30	319.50	0	0							4.18	16.81								
	16:00	320.00	0	0							0.37	17.18								
	17:00	321.00	0	0							0.25	17.43								
	17:30	321.50	0	0							0.43	17.86								
	18:00	322.00	0	0							0.35	18.21								
	18:30	322.50	0	0							0	18.21								
	18:38	322.63	0	0							0.18	18.39								
	19:00	323.00	0	0							0.09	18.48								
	19:02	323.03	0	0							0.17	18.65								
	22:00	326.00	0	0							11.35	30								
	23:30	327.50	0	0							6.35	36.35								
98-03-19	02:55	330.92																		
	05:50	333.84																		
			Choke 50.8 mm																	
	06:35	334.59	22000	0																

RIG DOWN SWAB SWAB EQUIPMENT & RIG UP SCHLUMBERGER

HOLD SAFETY MEETING & PRESSURE TEST SURFACE LINES

START IN HOLE WITH COIL TUBING

START RECOVERING DISPLACEMENT FLUID

RECOVERING DISPLACEMENT FLUID

TRANSFER 3 / M 3 TO RIG TANK

RECOVERED FLUID

RECOVERED FLUID

RECOVERED FLUID

RECOVERED FLUID

RECOVERED FLUID

TRANSFER 4.83 / M 3 TO 400 STORAGE

GAUGE 400 TANK @ 154 C M. =16.18 M3

GAUGE 400 @ 159CM = 16.69M3 AND WAIT ON BULKER

BULKER ON LOCATION PREPARE TO FRAC

COMPLETE ACID & PERF BALL FRAC

OPEN TO FLOW BACK ACID ON 50.8 M. M. CHOKE

Production Summary	Time (hours)	Gas (10^3m^3)	Water (m^3)	Oil/Cond (m^3)
Total for this page	23.76	0.00	26.75	0.00
Total from previous page	310.83		9.60	
Total Cum. Production	334.59		36.35	

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD **Job No** R0004 **Unit:** CUB # 4 **Gas Sent To:** FLARE
LSD: N-65-63-40-122-45NWT **Company Rep:** RANDY HEMMINGSEN **H2S:** **Diff. Range:** 0-100 KPA kPa
Zone: NAHANEY **Test Operator:** R. GALLANT **N2:** **Specific Gravity** 0.65
Test Dates: 98-03-05 - 93-03-20 **Operation:** FLOW TEST **CO2** **Meter Run Size** 102.26 mm

Date	Time	Elapsed Time (Hrs)	Tubing Press (kPa)	Casing Press (kPa)	Flow Temp (°C)	Static Press (kPa)	Diff Press (kPa)	Meter Temp (°C)	Gas Flow $10^3m^3/d$	Cum Gas 10^3m^3	Amt Water (m^3)	Cum Water (m^3)	Amt Oil (m^3)	Cum Oil (m^3)	Cond/Gas Ratio $m^3/10^3m^3$	WGR $m^3/10^3m^3$	Salinity (ppm)	API (°)	PH	H2S (ppm)
98-03-19	06:40	334.67	22000																	
			Choke 50.8 mm																	
	06:45	334.75	10000																	
	06:50	334.83	5500	0																
	06:55	334.91	3500	0																
	07:10	335.16	2300	0																
	07:25	335.41	1800	0																
	08:00	335.99	2000								12.42	48.77								
	08:30	336.49	1900	7000							2.22	50.99								
	09:00	336.99	2000	8000							5.31	56.3								
	09:30	337.49	1400	8000							1.22	57.52								
					BLEED CASING DOWN TO 0															
	10:00	337.99	800	0							0.54	58.06001								
	10:30	338.49	300	0							0	58.06001								
	11:22	339.36									0.78	58.84						5		
	11:44	339.73	0	0							0.61	59.45						5		
					NO TAG ON SWAB # 2 @ 11:44 HRS															
	12:07	340.11	0	0							0.62	60.07					232000	5		
	12:31	340.51	0	0							0.27	60.34					230000	5		
	12:49	340.81	0	0							0.53	60.87					240000	5		
	13:14	341.23	0	0							0.45	61.32					240000	5		
	13:46	341.76	0	0							0.44	61.76					225000	5		
	14:01	342.01	0	0							0.18	61.94					218000	5		600

Production Summary	Time (hours)	Gas (10^3m^3)	Water (m^3)	Oil/Cond (m^3)
Total for this page	7.42	0.00	25.59	0.00
Total from previous page	334.59		36.35	
Total Cum. Production	342.01		61.94	

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD | Job No R0004 | Unit: CUB # 4 | Gas Sent To: FLARE
LSD: N-65-63-40-122-45NWT | Company Rep: RANDY HEMMINGSEN | H2S: | Diff. Range: 0-100 KPA kPa
Zone: NAHANEY | Test Operator: R. GALLANT | N2: | Specific Gravity 0.65
Test Dates: 98-03-05 - 93-03-20 | Operation: FLOW TEST | CO2 | Meter Run Size 102.26 mm

Date	Time	Elapsed Time (Hrs)	Tubing Press (kPa)	Casing Press (kPa)	Flow Temp (°C)	Static Press (kPa)	Diff Press (kPa)	Meter Temp (°C)	Gas Flow $10^3m^3/d$	Cum Gas 10^3m^3	Amt Water (m^3)	Cum Water (m^3)	Amt Oil (m^3)	Cum Oil (m^3)	Cond/Gas Ratio $m^3/10^3m^3$	WGR $m^3/10^3m^3$	Salinity (ppm)	API (°)	PH	H2S (ppm)
98-03-19	14:30	342.49	0	0							0.53	62.47					220000		5	
	14:58	342.96	0	0							0.44	62.91					220000		5	
	15:23	343.38	0	0							0.34	63.25					220000		5	
	16:05	344.08	0	0							0.93	64.18					212000		5	
	16:57	344.95	0	0	TRANSFER TO 400 STORAGE 6.03 / M3						0.52	64.7					220000		5	
	17:26	345.43	0	0							0.26	64.96					200000		5	
	18:00	346.00	0	0							0.61	65.57					208000		5	
	18:33	346.55	0	0							0.18	65.75					212000		5	
	19:05	347.08	0	0							0.26	66.01					210000		5	
	19:27	347.45	0	0							0.09	66.1					190000		5	
	21:26	349.43	0	0	SHUT DOWN SWABBING AND WAIT TWO HOURS						0.45	66.55					220000		5	50
	21:52	349.86	0	0							0.18	66.73					206000		5	
	23:03	351.04	0	0							0.35	67.07999					200000		5	
98-03-20	00:04	352.06	0	0							0.27	67.34999					206000		5	
	01:15	353.24	0	0							0.27	67.61999					206000		5	
	02:03	354.04	0	0	OBTAIN WATER SAMPLE @ 01:15 H . R. S. SWAB # 23						0.44	68.05999					210000		5	
	03:03	355.04	0	0							0.26	68.31999					222000		5	
	04:06	356.09	0	0							0.18	68.49999					210000		5	
	05:09	357.14	0	0							0.26	68.75999					216000		5	100
	05:57	357.94	0	0							0.52	69.27999					214000		5	

Production Summary	Time (hours)	Gas (10^3m^3)	Water (m^3)	Oil/Cond (m^3)
Total for this page	15.93	0.00	7.34	0.00
Total from previous page	342.01		61.94	
Total Cum. Production	357.94		69.28	

ENTEST CORP.

Company: PARAMOUNT RESOURCES LTD | Job No R0004 | Unit: CUB # 4 | Gas Sent To: FLARE
LSD: N-65-63-40-122-45NWT | Company Rep: RANDY HEMMINGSEN | H2S: | Diff. Range: 0-100 KPA kPa
Zone: NAHANEY | Test Operator: R. GALLANT | N2: | Specific Gravity 0.65
Test Dates: 98-03-05 - 93-03-20 | Operation: FLOW TEST | CO2 | Meter Run Size 102.26 mm

Date	Time	Elapsed Time (Hrs)	Tubing Press (kPa)	Casing Press (kPa)	Flow Temp (°C)	Static Press (kPa)	Diff Press (kPa)	Meter Temp (°C)	Gas Flow $10^3m^3/d$	Cum Gas 10^3m^3	Amt Water (m^3)	Cum Water (m^3)	Amt Oil (m^3)	Cum Oil (m^3)	Cond/Gas Ratio $m^3/10^3m^3$	WGR $m^3/10^3m^3$	Salinity (ppm)	API (°)	PH	H2S (ppm)
98-03-20	06:52	358.86	0	0							0.26	69.53999					210000		5	
	07:59	359.98	0	0							0.42	69.95999					202000		5	
	08:15	360.25	0	0																
	09:15	361.25	900																	
	09:30	361.50	1000																	
	09:45	361.75	1000	0																
	10:00	362.00	1025	0																
	10:15	362.25	1025	0																
	10:30	362.50	1400	0																
	10:45	362.75	1400	0																
	11:00	363.00	1500	0																
	11:15	363.25	1750	0																
	11:30	363.50	2000	0																
	11:45	363.75	2000	0																
	12:00	364.00	2250	0																
	12:15	364.25																		
	12:30	364.50																		
	12:35	364.58																		

OBTAIN WATER SAMPLE SWAB# 30

TRANSFER T0 400 SORAGE 4.12 / M 3 SHUT DOWN SWABBING

RECORD BUILD UPS

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

BUILD UP

OBTAIN 2 GAS SAMPLES CYL # 00019974 &00019954 AGAT LAB

KILL WELL & PROCEDE WITH EQUIPMENT RIG OUT

TRANSFER BALANCE OF FLUID TO 400 =6.32 / M 3

Production Summary	Time (Hours)	Gas (10^3m^3)	Water (m^3)	Oil/Cond (m^3)
Total for this page	6.64	0.00	0.68	0.00
Total from previous page	357.94		69.28	
Total Cum. Production	364.58		69.96	

TRI-ALTA BEWS REPORTS (4)

Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 12 - 01 15
Test by TRI-ALTA BEWS SERVICES
Interp. by Cal-Scan Services Ltd.

TRI-ALTA BEWS SERVICES

Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Address: CALGARY, ALBERTA
Field & Pool: BERKLEY/SULPHUR POINT
Type of test: STATIC GRADIENT
Prod. Int CF: 2607.68 to 2623.72
Elev. (CF) (KB)
Pool datum:

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Status: GAS
Date of test: 1999 01 12
Prod. through: 73.03MM TUBING
Mid-point prod.int. CF: 2615.7
Datum depth of well CF:

Tubing pres: 11420 KPAG
Casing pres: 0 KPAG
Temperature at run depth: 132.0 C

Shut in time:
On bottom/off bottom: 10:30 - 10:36
Surface temperature:

Note: All units in metric, depth in meters cf; pressure in KPAG

TOP RECORDER

Element serial#: 22437
Pressure Range: 0 to 37577
Cal. equation: 738.6 * DEFL -3.2
Latest calibration: 10-22-98
Clock range: 3 HOUR

Run depth (CF): 2613.9
Grad. at run depth: 2.706
Pres. at run depth: 15834.3
Pres. at mid point perf.: 15839.1
Pres. at datum depth:

Depth m	Defl mm	Pressure KPAG	Gradient KPAG/m
-1.8	15.485	11432.0	
-1.8	15.480	11428.3	
498.2	16.420	12120.0	1.383
998.2	17.295	12763.8	1.288
1498.2	18.090	13348.8	1.170
1998.2	18.855	13912.1	1.127
2498.2	20.525	15144.4	2.465
2553.9	21.020	15509.6	6.558
2583.9	21.350	15753.1	8.117
2613.9	21.460	15834.3	2.706

Fluid level at 2375 mcf
Final surface flex:11612.3 KPAG

BOTTOM RECORDER

Element serial#: 22436
Pressure range: 0 to 37750
Cal. equation: 741.5 * DEFL +15.5
Latest calibration: 10-22-98
Clock range: 3 HOUR

Run depth (CF): 2615.7
Grad. at run depth: 2.713
Pres. at run depth: 15864.4
Pres. at mid point perf.: 15864.4
Pres. at datum depth:

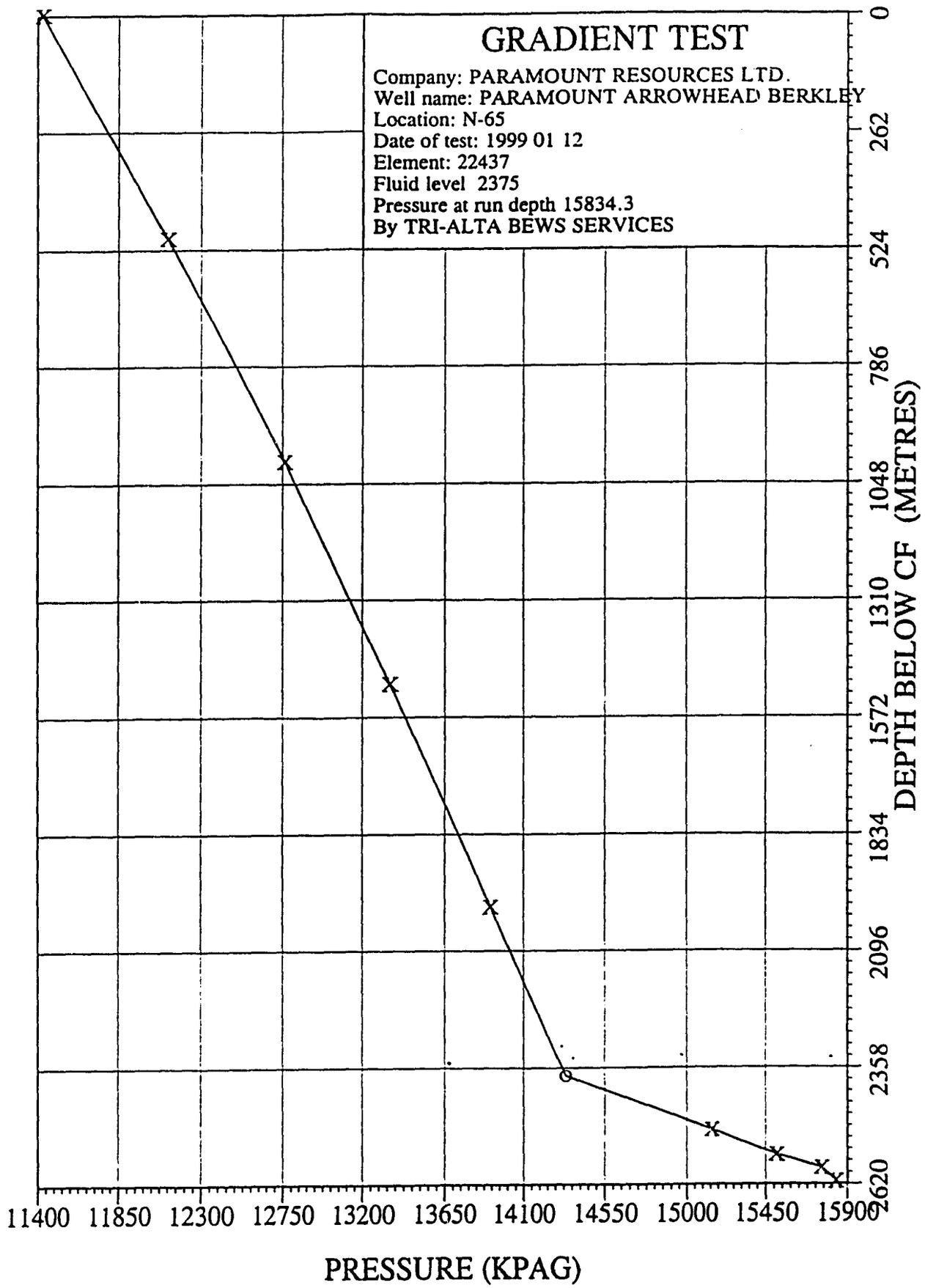
Depth m	Defl mm	Pressure KPAG	Gradient KPAG/m
0.0	15.400	11446.4	
0.0	15.400	11446.4	
500.0	16.320	12127.3	1.362
1000.0	17.180	12763.8	1.273
1500.0	17.970	13348.5	1.169
2000.0	18.735	13914.7	1.132
2500.0	20.430	15168.9	2.508
2555.7	20.920	15531.4	6.509
2585.7	21.260	15783.0	8.386
2615.7	21.370	15864.4	2.713

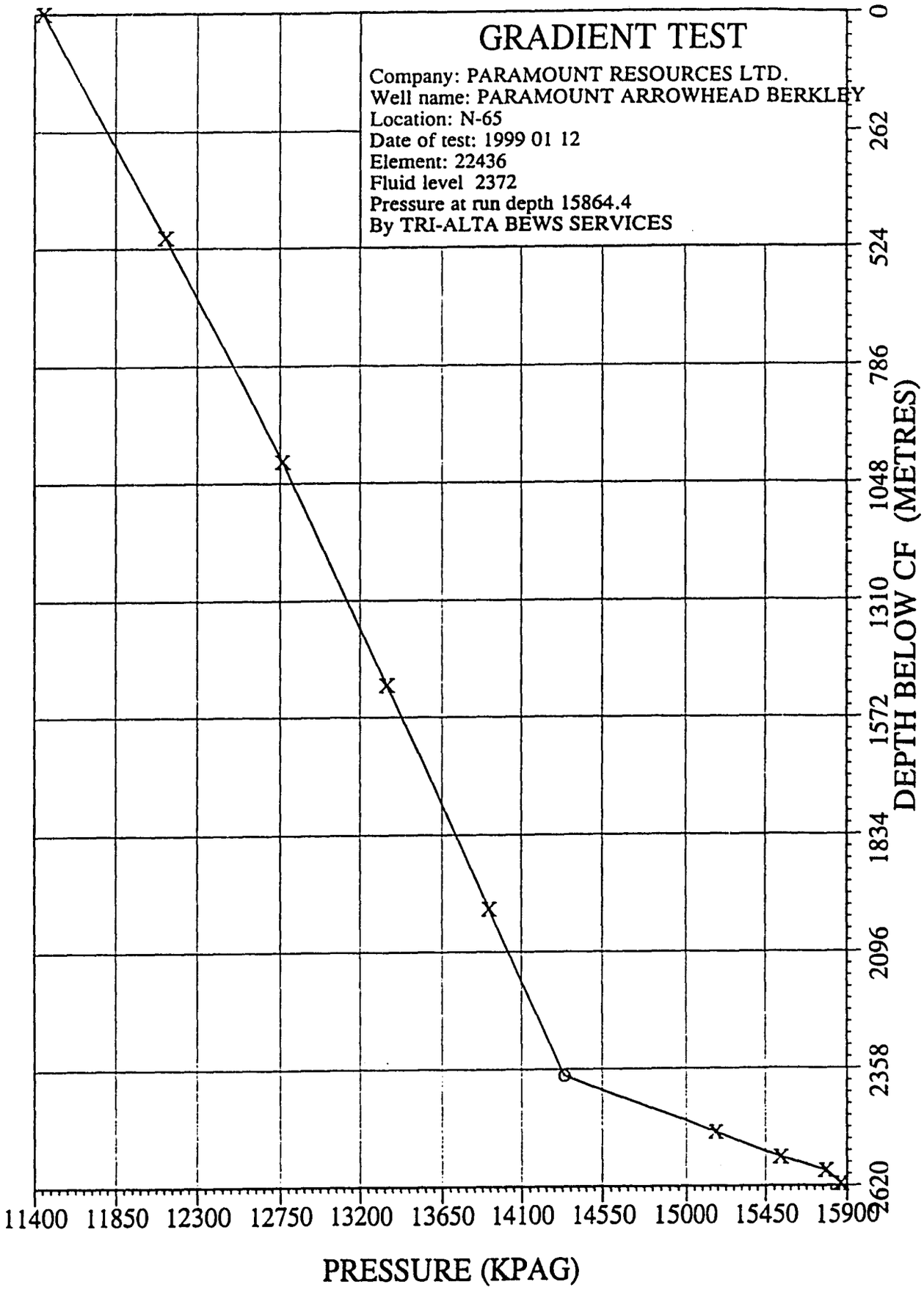
Fluid level at 2372 mcf
Final surface flex:11616.7 KPAG

Remarks:

Test by: MILT

Interpretation by CAL-SCAN SERVICES LTD.


GRADIENT TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 12
Element: 22437
Fluid level 2375
Pressure at run depth 15834.3
By TRI-ALTA BEWS SERVICES
DEPTH BELOW CF (METRES)
0
262
524
786
1048
1310
1572
1834
2096
2358
2620
PRESSURE (KPAG)
11400
11850
12300
12750
13200
13650
14100
14550
15000
15450
15900


GRADIENT TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 12
Element: 22436
Fluid level 2372
Pressure at run depth 15864.4
By TRI-ALTA BEWS SERVICES
0
262
524
786
1048
1310
1572
1834
2096
2358
2620
DEPTH BELOW CF (METRES)
11400
11850
12300
12750
13200
13650
14100
14550
15000
15450
15900
PRESSURE (KPAG)

TRI-ALTA BEWS SERVICES

SUMMARY

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 12 - 01 15

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

JAN 12-12:56	ON BOTTOM
JAN 12-15:00	OPEN WELL
JAN 13-15:00	SHUT IN
JAN 15-07:30	OFF BOTTOM

Remarks:
Tubing when pulled = 11800 kpag casing = 0 kpag.

Interpretation by CAL-SCAN SERVICES LTD.

TRI-ALTA BEWS SERVICES

Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Address: CALGARY, ALBERTA
Field & Pool: BERKLEY/SULPHUR POINT
Type of test: SINGLE POINT
Prod. Int CF: 2607.68 to 2623.72
Elev. (CF) (KB)
Pool datum:

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Status: GAS
Date of test: 1999 01 12 - 01 15
Prod. through: 73.03MM TUBING
Mid-point prod.int. CF: 2615.7
Datum depth of well CF:

Tubing pres: 11480 KPAG
Casing pres: 0 KPAG
Temperature at run depth: 122.0 C

Shut in time: 1999 01 13 1500
On/off btm: 01 12-1256:00-01 15-0730:0
Surface temperature:

Note: All units in metric, depth in meters cf; pressure in KPAG

TOP RECORDER

Element serial#: 22437
Pressure Range: 0 to 37577
Cal. equation: 738.6 * DEFL -3.2
Latest calibration: 10-22-98
Clock range: 180 HOUR
Run depth (CF): 2594.2

BOTTOM RECORDER

Element serial#: 22436
Pressure range: 0 to 37750
Cal. equation: 741.5 * DEFL +15.5
Latest calibration: 10-22-98
Clock range: 180 HOUR
Run depth (CF): 2596

		TOP RECORDER			BOTTOM RECORDER		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
JAN 12-12:56	0.00	21.580	15922.8		21.500	15960.6	
ON BOTTOM	0.25	21.605	15941.3		21.530	15982.3	
13:26	0.50	21.635	15963.4		21.560	16005.0	
13:41	0.75	21.650	15974.5		21.595	16030.9	
13:56	1.00	21.685	16000.3		21.610	16042.0	
14:11	1.25	21.690	16004.0		21.625	16053.1	
14:26	1.50	21.710	16018.8		21.640	16064.2	
14:41	1.75	21.730	16033.5		21.665	16082.7	
15:00	2.07	21.760	16055.6		21.675	16090.1	
JAN 12-15:00	0.00	21.760	16055.6		21.675	16090.1	
OPEN WELL	0.25	20.570	15177.6		20.300	15072.7	
15:30	0.50	20.000	14757.0		19.570	14532.5	
15:45	0.75	19.115	14103.9		19.095	14181.0	
16:00	1.00	18.635	13749.9		18.455	13707.4	
16:15	1.25	18.065	13330.4		17.930	13318.9	
16:30	1.50	17.620	13003.0		17.560	13045.1	
16:45	1.75	17.220	12708.7		17.220	12793.4	
17:00	2.00	16.835	12425.4		16.815	12493.7	
17:15	2.25	16.470	12156.8		16.570	12312.4	
17:30	2.50	16.225	11976.5		16.250	12075.5	
17:45	2.75	15.790	11656.4		16.025	11909.0	
18:00	3.00	15.590	11509.2		15.765	11716.6	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 12 - 01 15

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2594.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2596		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
18:15	3.25	15.370	11347.4		15.480	11505.6	
18:30	3.50	15.185	11211.2		15.240	11328.0	
18:45	3.75	14.960	11045.7		15.010	11157.8	
19:00	4.00	14.710	10861.7		14.805	11006.1	
19:15	4.25	14.545	10740.3		14.625	10872.9	
19:30	4.50	14.395	10629.9		14.445	10739.6	
19:45	4.75	14.245	10519.5		14.330	10654.5	
20:00	5.00	14.070	10390.8		14.140	10513.9	
20:15	5.25	13.970	10317.2		14.050	10447.3	
20:30	5.50	13.845	10225.2		13.885	10325.2	
20:45	5.75	13.735	10144.3		13.790	10254.9	
21:00	6.00	13.640	10074.4		13.675	10169.8	
21:15	6.25	13.550	10008.1		13.560	10084.6	
21:30	6.50	13.505	9975.0		13.510	10047.6	
21:45	6.75	13.400	9897.8		13.410	9973.6	
22:00	7.00	13.430	9919.8		13.410	9973.6	
22:15	7.25	13.430	9919.8		13.425	9984.7	
22:30	7.50	13.445	9930.9		13.435	9992.1	
22:45	7.75	13.450	9934.5		13.445	9999.5	
23:00	8.00	13.460	9941.9		13.455	10006.9	
23:30	8.50	13.470	9949.3		13.475	10021.7	
00:00	9.00	13.470	9949.3		13.475	10021.7	
00:30	9.50	13.485	9960.3		13.485	10029.1	
01:00	10.00	13.490	9964.0		13.495	10036.5	
01:30	10.50	13.490	9964.0		13.495	10036.5	
02:00	11.00	13.500	9971.3		13.495	10036.5	
02:30	11.50	13.510	9978.7		13.500	10040.2	
03:00	12.00	13.520	9986.1		13.500	10040.2	
03:30	12.50	13.520	9986.1		13.515	10051.3	
04:00	13.00	13.505	9975.0		13.515	10051.3	
04:30	13.50	13.510	9978.7		13.515	10051.3	
05:00	14.00	13.480	9956.6		13.490	10032.8	
05:30	14.50	13.480	9956.6		13.485	10029.1	
06:00	15.00	13.475	9952.9		13.465	10014.3	
06:30	15.50	13.460	9941.9		13.455	10006.9	
07:00	16.00	13.430	9919.8		13.455	10006.9	
07:30	16.50	13.405	9901.4		13.425	9984.7	
08:00	17.00	13.395	9894.1		13.380	9951.4	
08:30	17.50	13.365	9872.0		13.340	9921.8	
09:00	18.00	13.345	9857.3		13.290	9884.8	
09:30	18.50	13.310	9831.5		13.270	9870.0	
10:00	19.00	13.300	9824.2		13.250	9855.2	
10:30	19.50	13.280	9809.5		13.210	9825.6	
11:00	20.00	13.280	9809.5		13.210	9825.6	
11:30	20.50	13.250	9787.4		13.200	9818.2	
12:00	21.00	13.230	9772.7		13.190	9810.8	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 12 - 01 15

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2594.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2596		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
12:30	21.50	13.210	9757.9		13.190	9810.8	
13:00	22.00	13.200	9750.6		13.165	9792.3	
13:30	22.50	13.190	9743.2		13.140	9773.8	
14:00	23.00	13.185	9739.5		13.130	9766.4	
14:30	23.50	13.175	9732.2		13.120	9759.0	
15:00	24.00	13.150	9713.8		13.100	9744.2	
JAN 13-15:00	0.00	13.150	9713.8		13.100	9744.2	
SHUT IN	0.25	13.940	10295.1		13.935	10362.2	
15:30	0.50	14.240	10515.9		14.210	10565.7	
15:45	0.75	14.520	10721.9		14.500	10780.3	
16:00	1.00	14.775	10909.5		14.760	10972.8	
16:15	1.25	14.950	11038.3		14.980	11135.6	
16:30	1.50	15.185	11211.2		15.195	11294.7	
16:45	1.75	15.390	11362.1		15.390	11439.0	
17:00	2.00	15.580	11501.9		15.555	11561.1	
17:15	2.25	15.800	11663.8		15.720	11683.3	
17:30	2.50	15.945	11770.5		15.905	11820.2	
17:45	2.75	16.090	11877.2		16.070	11942.3	
18:00	3.00	16.245	11991.2		16.210	12045.9	
18:15	3.25	16.390	12097.9		16.340	12142.1	
18:30	3.50	16.520	12193.6		16.485	12249.4	
18:45	3.75	16.625	12270.8		16.600	12334.6	
19:00	4.00	16.745	12359.1		16.705	12412.3	
19:15	4.25	16.865	12447.4		16.800	12482.6	
19:30	4.50	16.970	12524.7		16.910	12564.0	
19:45	4.75	17.065	12594.6		17.020	12645.4	
20:00	5.00	17.155	12660.8		17.105	12708.3	
20:15	5.25	17.235	12719.7		17.205	12782.3	
20:30	5.50	17.320	12782.2		17.290	12845.2	
20:45	5.75	17.410	12848.5		17.395	12922.9	
21:00	6.00	17.485	12903.7		17.455	12967.3	
21:15	6.25	17.555	12955.2		17.525	13019.2	
21:30	6.50	17.610	12995.6		17.580	13059.9	
21:45	6.75	17.685	13050.8		17.640	13104.3	
22:00	7.00	17.730	13083.9		17.710	13156.1	
22:15	7.25	17.800	13135.4		17.770	13200.5	
22:30	7.50	17.860	13179.6		17.825	13241.2	
22:45	7.75	17.915	13220.1		17.885	13285.6	
23:00	8.00	17.960	13253.2		17.940	13326.3	
23:30	8.50	18.055	13323.1		18.050	13407.7	
00:00	9.00	18.160	13400.3		18.140	13474.3	
00:30	9.50	18.240	13459.2		18.210	13526.1	
01:00	10.00	18.310	13510.7		18.295	13589.0	
01:30	10.50	18.390	13569.6		18.385	13655.6	
02:00	11.00	18.485	13639.5		18.450	13703.7	
02:30	11.50	18.565	13698.4		18.520	13755.6	

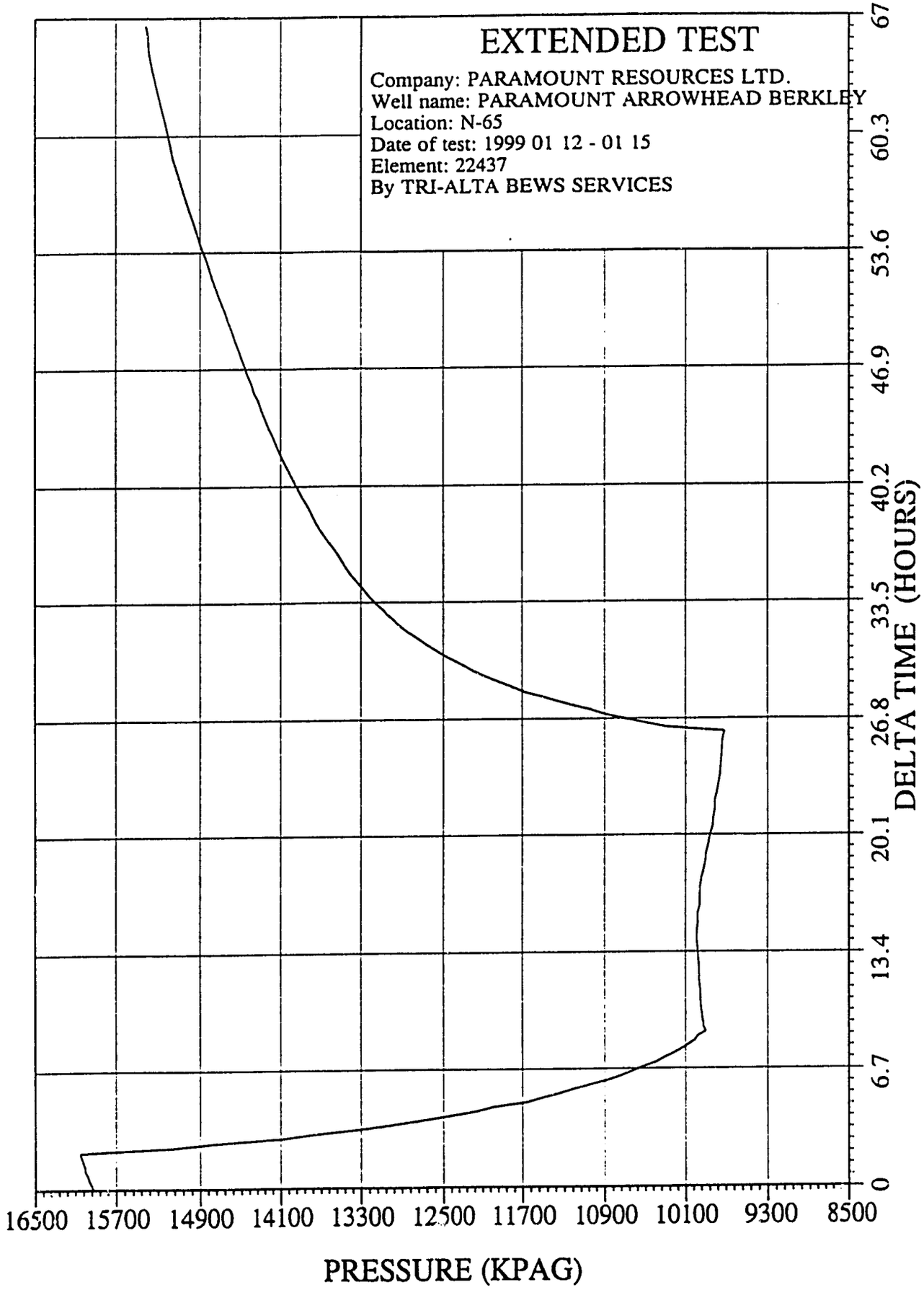
TRI-ALTA BEWS SERVICES

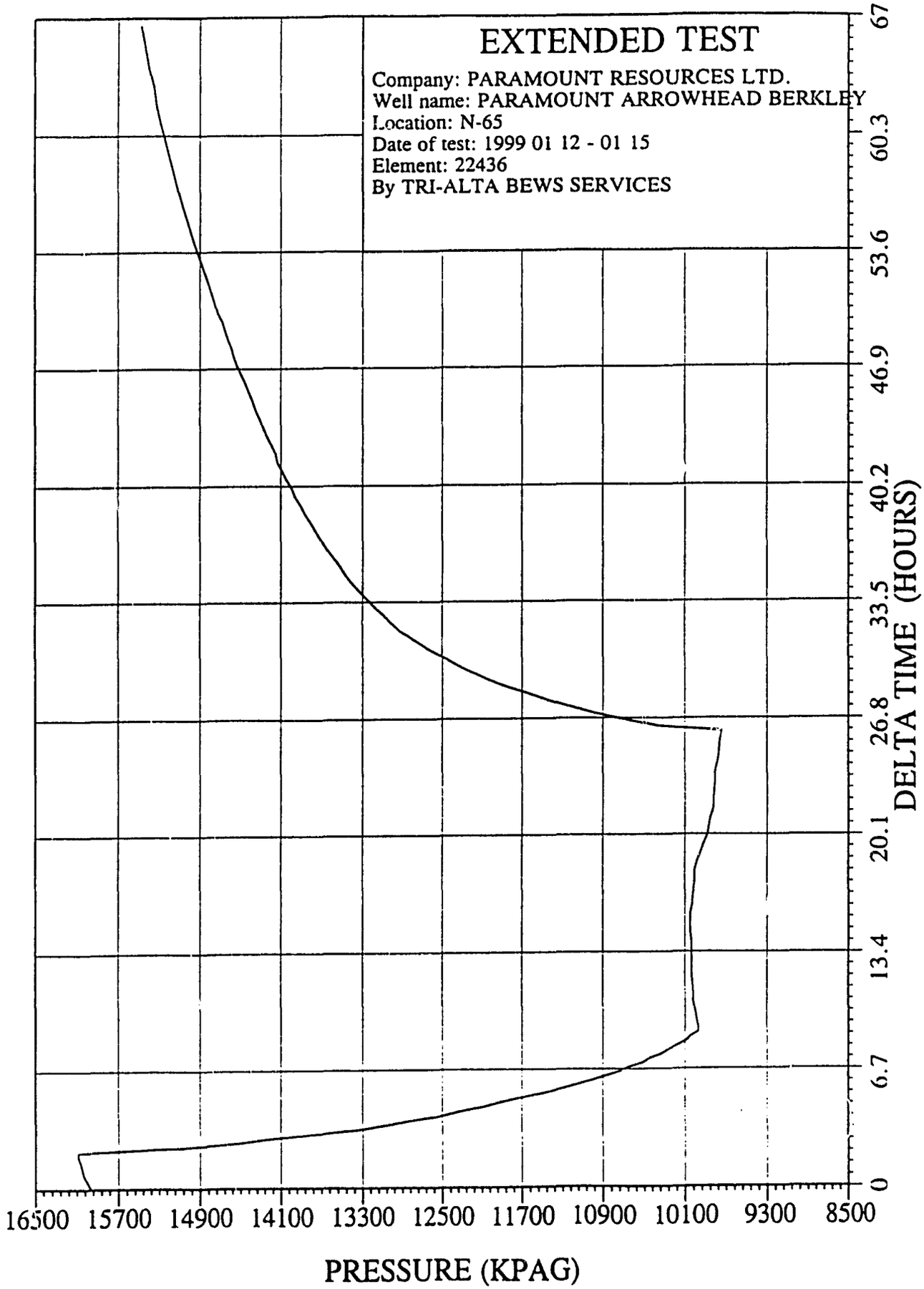
Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 12 - 01 15

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2594.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2596		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
03:00	12.00	18.635	13749.9		18.585	13803.7	
03:30	12.50	18.690	13790.3		18.660	13859.2	
04:00	13.00	18.750	13834.6		18.720	13903.6	
04:30	13.50	18.820	13886.3		18.795	13959.0	
05:00	14.00	18.880	13930.5		18.840	13992.3	
05:30	14.50	18.940	13974.8		18.910	14044.1	
06:00	15.00	19.000	14019.1		18.970	14088.5	
06:30	15.50	19.060	14063.4		19.035	14136.6	
07:00	16.00	19.120	14107.6		19.060	14155.1	
07:30	16.50	19.170	14144.5		19.120	14199.5	
08:00	17.00	19.220	14181.4		19.180	14243.9	
08:30	17.50	19.280	14225.7		19.230	14280.9	
09:00	18.00	19.330	14262.6		19.275	14314.2	
09:30	18.50	19.380	14299.5		19.330	14354.9	
10:00	19.00	19.420	14329.0		19.370	14384.5	
10:30	19.50	19.485	14377.0		19.420	14421.5	
11:00	20.00	19.520	14402.8		19.465	14454.8	
11:30	20.50	19.575	14443.4		19.520	14495.5	
12:00	21.00	19.615	14472.9		19.575	14536.2	
12:30	21.50	19.660	14506.1		19.620	14569.5	
13:00	22.00	19.700	14535.6		19.650	14591.7	
13:30	22.50	19.745	14568.8		19.700	14628.7	
14:00	23.00	19.780	14594.6		19.740	14658.3	
14:30	23.50	19.825	14627.8		19.775	14684.2	
15:00	24.00	19.860	14653.7		19.835	14728.6	
16:00	25.00	19.950	14720.1		19.905	14780.4	
17:00	26.00	20.035	14782.8		19.980	14835.9	
18:00	27.00	20.105	14834.4		20.060	14895.1	
19:00	28.00	20.195	14900.9		20.140	14954.3	
20:00	29.00	20.265	14952.5		20.210	15006.1	
21:00	30.00	20.340	15007.8		20.280	15057.9	
22:00	31.00	20.410	15059.5		20.345	15106.0	
23:00	32.00	20.475	15107.5		20.400	15146.7	
00:00	33.00	20.545	15159.1		20.460	15191.1	
01:00	34.00	20.590	15192.3		20.520	15235.5	
02:00	35.00	20.640	15229.2		20.585	15283.5	
03:00	36.00	20.700	15273.5		20.640	15324.2	
04:00	37.00	20.755	15314.1		20.670	15346.4	
05:00	38.00	20.810	15354.7		20.730	15390.8	
06:00	39.00	20.855	15387.9		20.775	15424.1	
07:00	40.00	20.870	15398.9		20.820	15457.4	
JAN 15-07:30	40.50	20.895	15417.4		20.845	15475.9	
OFF BOTTOM	0.00	20.895	15417.4		20.845	15475.9	

Remarks:
Tubing when pulled = 11800 kpag casing = 0 kpag.


EXTENDED TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 12 - 01 15
Element: 22437
By TRI-ALTA BEWS SERVICES
0
6.7
13.4
20.1
26.8
33.5
40.2
46.9
53.6
60.3
67
DELTA TIME (HOURS)
16500
15700
14900
14100
13300
12500
11700
10900
10100
9300
8500
PRESSURE (KPAG)


EXTENDED TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 12 - 01 15
Element: 22436
By TRI-ALTA BEWS SERVICES
16500 15700 14900 14100 13300 12500 11700 10900 10100 9300 8500
PRESSURE (KPAG)
0 6.7 13.4 20.1 26.8 33.5 40.2 46.9 53.6 60.3 67
DELTA TIME (HOURS)

N.E.B. COPY

Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 29
Test by TRI-ALTA BEWS SERVICES
Interp. by Cal-Scan Services Ltd.

TRI-ALTA BEWS SERVICES

Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Address: CALGARY, ALBERTA
Field & Pool: BERKLY/SLAVE POINT
Type of test: STATIC GRADIENT
Prod. Int CF: 2572.7 to 2594.7
Elev. (CF) 568.3 (KB) 574.6
Pool datum:

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Status: GAS
Date of test: 1999 01 29
Prod. through: 88.9 MM TUBING
Mid-point prod.int. CF: 2583.7
Datum depth of well CF:

Tubing pres: 10090.0
Casing pres: 7000.0
Temperature at run depth: 112.0 C

Shut in time:
On bottom/off bottom: 1357:00-1403:00
Surface temperature:

Note: All units in metric, depth in meters cf; pressure in KPAG

TOP RECORDER

Element serial#: 22437
Pressure Range: 0 to 37577
Cal. equation: 738.6 * DEFL -3.2
Latest calibration: 10-22-98
Clock range: 3 HOUR

Run depth (CF): 2553.2
Grad. at run depth: 9.866
Pres. at run depth: 22783.6
Pres. at mid point perf.: 23084.5
Pres. at datum depth:

Depth m	Defl mm	Pressure KPAG	Gradient KPAG/m
-1.8	13.700	10118.5	
-1.8	13.650	10081.7	
498.2	14.570	10758.7	1.354
998.2	15.400	11369.4	1.221
1498.2	18.350	13540.2	4.341
1998.2	23.800	17560.9	8.042
2493.2	30.070	22191.7	9.355
2523.2	30.470	22487.6	9.866
2553.2	30.870	22783.6	9.866

Fluid level at 1269.5 mcf
Final surface flex:10067.0 KPAG

BOTTOM RECORDER

Element serial#: 22436
Pressure range: 0 to 37750
Cal. equation: 741.5 * DEFL +15.5
Latest calibration: 10-22-98
Clock range: 3 HOUR

Run depth (CF): 2555
Grad. at run depth: 9.884
Pres. at run depth: 22809.0
Pres. at mid point perf.: 23092.6
Pres. at datum depth:

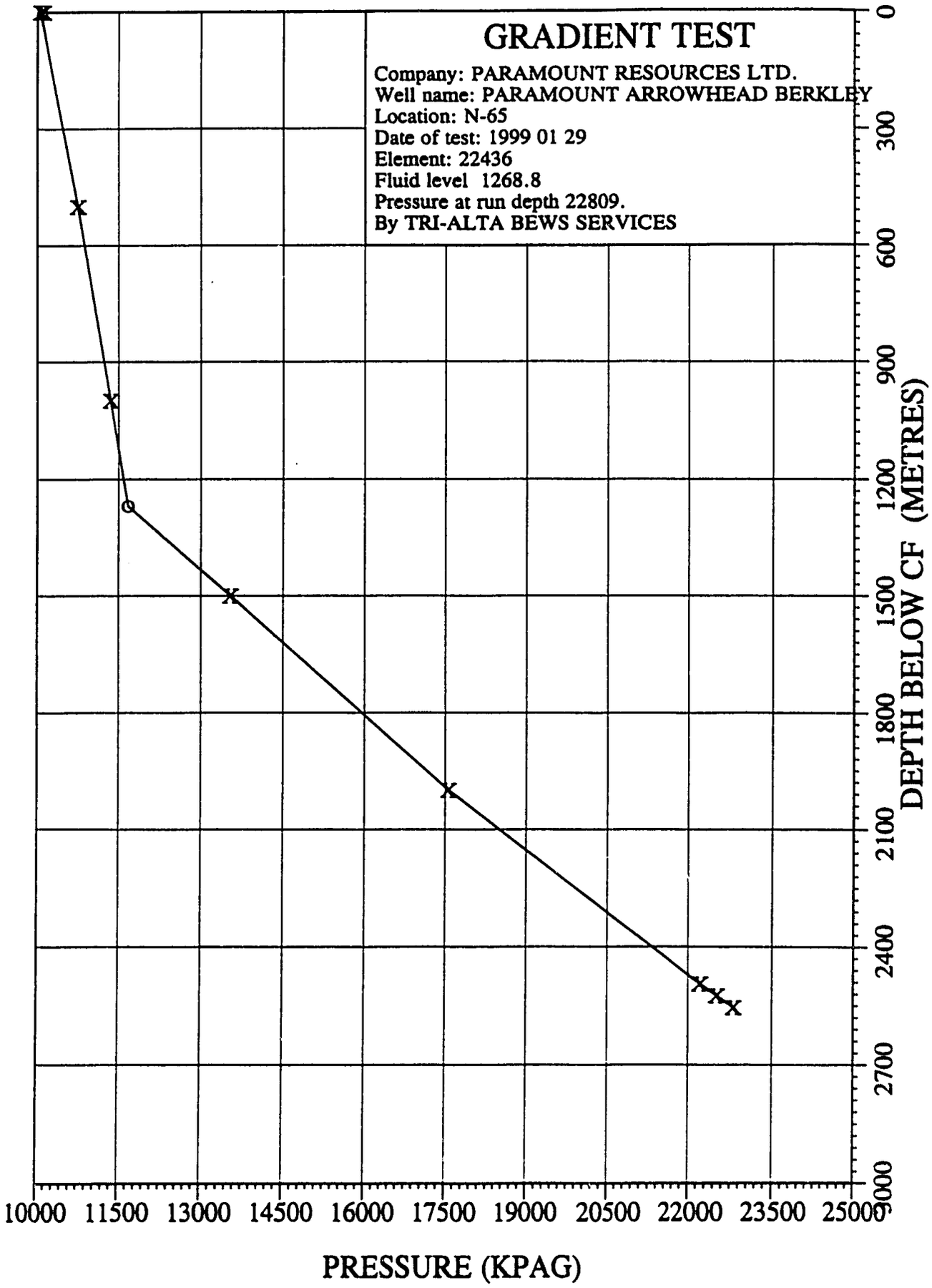
Depth m	Defl mm	Pressure KPAG	Gradient KPAG/m
0.0	13.600	10114.2	
0.0	13.530	10062.4	
500.0	14.460	10750.7	1.377
1000.0	15.270	11350.2	1.199
1500.0	18.220	13533.5	4.367
2000.0	23.660	17558.9	8.051
2495.0	29.950	22215.9	9.408
2525.0	30.350	22512.4	9.884
2555.0	30.750	22809.0	9.884

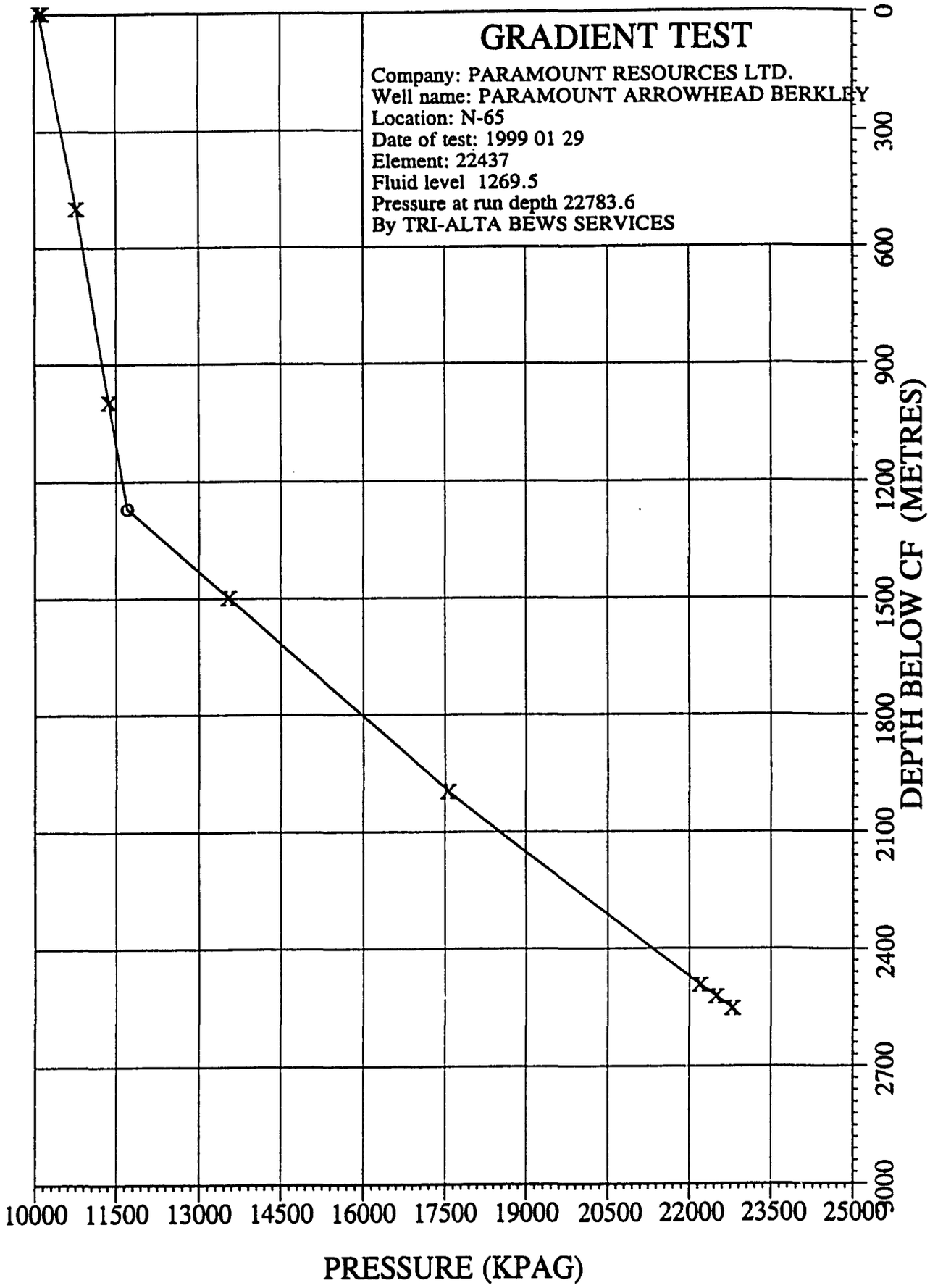
Fluid level at 1268.8 mcf
Final surface flex:10047.6 KPAG

Remarks:

Test by: MILT

Interpretation by CAL-SCAN SERVICES LTD.


GRADIENT TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 29
Element: 22436
Fluid level 1268.8
Pressure at run depth 22809.
By TRI-ALTA BEWS SERVICES
DEPTH BELOW CF (METRES)
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
PRESSURE (KPAG)
10000
11500
13000
14500
16000
17500
19000
20500
22000
23500
25000


GRADIENT TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 29
Element: 22437
Fluid level 1269.5
Pressure at run depth 22783.6
By TRI-ALTA BEWS SERVICES
DEPTH BELOW CF (METRES)
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
10000
11500
13000
14500
16000
17500
19000
20500
22000
23500
25000
PRESSURE (KPAG)

N.E.B. COPY

Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 29 - 02 02
Test by TRI-ALTA BEWS SERVICES
Interp. by Cal-Scan Services Ltd.

TRI-ALTA BEWS SERVICES

SUMMARY

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 29 - 02 02

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

JAN 29-16:22	ON BOTTOM
JAN 29-21:00	OPEN WELL
FEB 02-19:00	SHUT IN
FEB 02-19:38	OFF BOTTOM

Remarks:

Interpretation by CAL-SCAN SERVICES LTD.

TRI-ALTA BEWS SERVICES

Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Address: CALGARY, ALBERTA
Field & Pool: BERKLEY/SULPHUR POINT
Type of test: SINGLE POINT
Prod. Int CF: 2572.7 to 2594.7
Elev. (CF) 568.3 (KB) 574.6
Pool datum:

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Status: GAS
Date of test: 1999 01 29 - 02 02
Prod. through: 88.9MM
Mid-point prod.int. CF: 2583.7
Datum depth of well CF:

Tubing pres: 10090
Casing pres: 7000
Temperature at run depth:

Shut in time: 1999 02 02 1900
On/off btm: 01 29-1622:00-02 02-1938:0
Surface temperature:

Note: All units in metric, depth in meters cf; pressure in KPAG

TOP RECORDER

Element serial#: 22437
Pressure Range: 0 to 37577
Cal. equation: 738.6 * DEFL -3.2
Latest calibration: 10-22-98
Clock range: 180 HOUR
Run depth (CF): 2553.2

BOTTOM RECORDER

Element serial#: 22436
Pressure range: 0 to 37750
Cal. equation: 741.5 * DEFL +15.5
Latest calibration: 10-22-98
Clock range: 180 HOUR
Run depth (CF): 2555

		TOP RECORDER			BOTTOM RECORDER		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
JAN 29-16:22	0.00	27.155	20036.5		27.000	20030.3	
ON BOTTOM	0.25	27.425	20235.8		27.315	20263.4	
16:52	0.50	27.745	20471.9		27.640	20503.9	
17:07	0.75	28.120	20748.8		27.990	20763.0	
17:22	1.00	28.440	20985.6		28.355	21033.6	
17:37	1.25	28.780	21237.1		28.740	21318.9	
17:52	1.50	29.090	21466.5		29.055	21552.5	
18:07	1.75	29.355	21662.6		29.305	21737.8	
18:22	2.00	29.610	21851.3		29.485	21871.2	
18:37	2.25	29.825	22010.4		29.730	22052.8	
18:52	2.50	30.035	22165.8		29.910	22186.3	
19:07	2.75	30.185	22276.8		30.100	22327.1	
19:22	3.00	30.380	22421.0		30.250	22438.3	
19:37	3.25	30.510	22517.2		30.400	22549.5	
19:52	3.50	30.665	22631.9		30.545	22657.0	
20:07	3.75	30.780	22717.0		30.670	22749.7	
20:22	4.00	30.890	22798.4		30.790	22838.6	
20:37	4.25	31.000	22879.8		30.870	22897.9	
20:52	4.50	31.070	22931.6		30.925	22938.7	
20:60	4.63	31.090	22946.4		30.945	22953.5	
JAN 29-21:00	0.00	31.090	22946.4		30.945	22953.5	
OPEN WELL	0.25	28.310	20889.4		28.090	20837.1	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 29 - 02 02

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
21:30	0.50	27.155	20036.5		27.140	20133.9	
21:45	0.75	26.190	19324.5		26.275	19493.8	
22:00	1.00	25.590	18881.7		25.410	18853.8	
22:15	1.25	24.980	18431.6		24.820	18417.2	
22:30	1.50	24.445	18036.9		24.380	18091.6	
22:45	1.75	23.745	17520.3		23.615	17525.6	
23:00	2.00	22.715	16760.3		22.675	16830.0	
23:15	2.25	21.565	15911.8		21.600	16034.6	
23:30	2.50	20.435	15077.9		20.560	15265.0	
23:45	2.75	19.930	14705.3		19.745	14662.0	
00:00	3.00	19.535	14413.9		19.460	14451.1	
00:15	3.25	19.285	14229.4		19.255	14299.4	
00:30	3.50	19.040	14048.6		18.990	14103.3	
00:45	3.75	18.895	13941.6		18.840	13992.3	
01:00	4.00	19.980	14742.2		20.160	14969.1	
01:15	4.25	20.810	15354.7		20.880	15501.8	
01:30	4.50	21.470	15841.7		21.460	15931.0	
01:45	4.75	21.615	15948.7		21.540	15990.2	
02:00	5.00	21.620	15952.3		21.460	15931.0	
02:15	5.25	21.525	15882.2		21.395	15882.9	
02:30	5.50	21.470	15841.7		21.400	15886.6	
02:45	5.75	21.510	15871.2		21.475	15942.1	
03:00	6.00	21.600	15937.6		21.575	16016.1	
03:15	6.25	21.760	16055.6		21.765	16156.7	
03:30	6.50	21.970	16210.6		21.970	16308.4	
03:45	6.75	22.215	16391.4		22.215	16489.7	
04:00	7.00	22.460	16572.2		22.575	16756.0	
04:15	7.25	22.865	16871.0		22.950	17033.5	
04:30	7.50	23.240	17147.7		23.350	17329.5	
04:45	7.75	23.830	17583.1		23.760	17632.9	
05:00	8.00	20.980	15480.1		20.825	15461.1	
05:15	8.25	17.925	13227.4		17.720	13163.5	
05:30	8.50	17.220	12708.7		16.905	12560.3	
05:45	8.75	16.505	12182.5		16.210	12045.9	
06:00	9.00	15.580	11501.9		15.685	11657.4	
06:15	9.25	14.995	11071.4		14.865	11050.5	
06:30	9.50	14.660	10824.9		14.620	10869.2	
06:45	9.75	14.760	10898.5		14.835	11028.3	
07:00	10.00	14.925	11019.9		15.000	11150.4	
07:15	10.25	15.090	11141.3		15.105	11228.1	
07:30	10.50	15.120	11163.4		15.110	11231.8	
07:45	10.75	14.435	10659.3		14.510	10787.7	
08:00	11.00	13.660	10089.1		13.560	10084.6	
08:15	11.25	12.440	9191.3		12.585	9363.0	
08:30	11.50	11.640	8602.7		11.750	8745.1	
08:45	11.75	11.225	8297.3		11.230	8360.2	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 29 - 02 02

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
09:00	12.00	12.450	9198.7		12.455	9266.8	
09:15	12.25	12.615	9320.1		12.600	9374.1	
09:30	12.50	12.705	9386.3		12.710	9455.6	
09:45	12.75	12.810	9463.6		12.805	9525.9	
10:00	13.00	12.895	9526.2		12.890	9588.8	
10:15	13.25	12.980	9588.7		12.975	9651.7	
10:30	13.50	13.085	9666.0		13.070	9722.0	
10:45	13.75	13.150	9713.8		13.160	9788.6	
11:00	14.00	13.235	9776.3		13.240	9847.8	
11:15	14.25	13.330	9846.2		13.325	9910.7	
11:30	14.50	13.410	9905.1		13.390	9958.8	
11:45	14.75	13.490	9964.0		13.485	10029.1	
12:00	15.00	13.570	10022.8		13.575	10095.7	
12:15	15.25	13.660	10089.1		13.650	10151.3	
12:30	15.50	13.710	10125.9		13.715	10199.4	
12:45	15.75	13.760	10162.7		13.760	10232.7	
13:00	16.00	9.190	6799.4		9.285	6920.7	
13:15	16.25	8.240	6096.5		8.360	6231.4	
13:30	16.50	7.945	5878.2		7.955	5929.5	
13:45	16.75	7.720	5711.8		7.755	5780.5	
14:00	17.00	7.670	5674.8		7.705	5743.2	
14:15	17.25	7.405	5478.7		7.415	5527.0	
14:30	17.50	7.160	5297.4		7.125	5310.9	
14:45	17.75	6.890	5097.7		6.905	5146.9	
15:00	18.00	6.720	4971.9		6.740	5023.9	
15:15	18.25	6.615	4894.2		6.670	4971.7	
15:30	18.50	6.560	4853.5		6.615	4930.7	
15:45	18.75	6.720	4971.9		6.845	5102.2	
16:00	19.00	6.980	5164.3		7.175	5348.1	
16:15	19.25	7.230	5349.2		7.285	5430.1	
16:30	19.50	7.050	5216.0		7.270	5418.9	
16:45	19.75	7.640	5652.6		7.855	5855.0	
17:00	20.00	7.970	5896.7		8.215	6123.3	
17:15	20.25	8.445	6248.2		8.550	6373.0	
17:30	20.50	8.825	6529.3		8.830	6581.7	
17:45	20.75	9.125	6751.3		9.180	6842.6	
18:00	21.00	9.425	6972.8		9.485	7068.7	
18:15	21.25	9.740	7204.6		9.825	7320.4	
18:30	21.50	10.045	7429.0		10.115	7535.0	
18:45	21.75	10.425	7708.6		10.410	7753.3	
19:00	22.00	10.750	7947.8		10.775	8023.5	
19:15	22.25	11.090	8198.0		11.125	8282.5	
19:30	22.50	11.445	8459.2		11.480	8545.2	
19:45	22.75	11.860	8764.6		11.920	8870.9	
20:00	23.00	12.255	9055.2		12.260	9122.5	
20:15	23.25	12.615	9320.1		12.540	9329.7	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 29 - 02 02

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
20:30	23.50	12.905	9533.5		12.885	9585.1	
20:45	23.75	13.040	9632.9		13.065	9718.3	
21:00	24.00	10.310	7624.0		10.650	7930.9	
21:15	24.25	9.300	6880.7		9.480	7065.0	
21:30	24.50	8.710	6444.2		8.580	6395.4	
21:45	24.75	8.150	6029.9		8.060	6007.8	
22:00	25.00	7.550	5586.0		7.565	5638.8	
22:15	25.25	7.200	5327.0		7.340	5471.1	
22:30	25.50	7.135	5278.9		7.160	5336.9	
22:45	25.75	7.135	5278.9		7.160	5336.9	
23:00	26.00	6.965	5153.2		7.000	5217.7	
23:15	26.25	6.680	4942.3		6.515	4856.2	
23:30	26.50	5.910	4372.6		5.980	4457.4	
23:45	26.75	5.370	3973.1		5.405	4028.8	
00:00	27.00	5.085	3762.2		5.155	3842.5	
00:15	27.25	4.915	3636.4		4.940	3682.2	
00:30	27.50	4.785	3540.3		4.810	3585.3	
00:45	27.75	4.685	3466.3		4.710	3510.8	
01:00	28.00	4.590	3396.0		4.645	3462.3	
01:15	28.25	4.515	3340.5		4.595	3425.0	
01:30	28.50	4.450	3292.4		4.535	3380.3	
01:45	28.75	4.435	3281.3		4.475	3335.6	
02:00	29.00	4.400	3255.4		4.475	3335.6	
02:15	29.25	4.410	3262.8		4.475	3335.6	
02:30	29.50	4.425	3273.9		4.480	3339.3	
02:45	29.75	4.430	3277.6		4.500	3354.2	
03:00	30.00	4.450	3292.4		4.510	3361.7	
03:30	30.50	4.495	3325.7		4.550	3391.5	
04:00	31.00	4.520	3344.2		4.600	3428.8	
04:30	31.50	4.580	3388.6		4.655	3469.8	
05:00	32.00	4.635	3429.3		4.715	3514.5	
05:30	32.50	4.670	3455.2		4.730	3525.7	
06:00	33.00	4.725	3495.9		4.780	3562.9	
06:30	33.50	4.760	3521.8		4.810	3585.3	
07:00	34.00	4.790	3544.0		4.830	3600.2	
07:30	34.50	4.815	3562.4		4.870	3630.0	
08:00	35.00	4.840	3580.9		4.870	3630.0	
08:30	35.50	4.840	3580.9		4.870	3630.0	
09:00	36.00	4.840	3580.9		4.870	3630.0	
09:30	36.50	4.840	3580.9		4.870	3630.0	
10:00	37.00	4.840	3580.9		4.885	3641.2	
10:30	37.50	4.840	3580.9		4.885	3641.2	
11:00	38.00	4.820	3566.1		4.885	3641.2	
11:30	38.50	4.820	3566.1		4.870	3630.0	
12:00	39.00	4.815	3562.4		4.865	3626.3	
12:30	39.50	4.825	3569.8		4.855	3618.8	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 29 - 02 02

Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
13:00	40.00	4.825	3569.8		4.855	3618.8	
13:30	40.50	4.825	3569.8		4.860	3622.6	
14:00	41.00	4.835	3577.2		4.870	3630.0	
14:30	41.50	4.835	3577.2		4.870	3630.0	
15:00	42.00	4.835	3577.2		4.880	3637.5	
15:30	42.50	4.835	3577.2		4.875	3633.7	
16:00	43.00	4.835	3577.2		4.860	3622.6	
16:30	43.50	4.815	3562.4		4.845	3611.4	
17:00	44.00	4.795	3547.7		4.820	3592.7	
17:30	44.50	4.795	3547.7		4.820	3592.7	
18:00	45.00	4.795	3547.7		4.820	3592.7	
18:30	45.50	4.805	3555.1		4.830	3600.2	
19:00	46.00	4.805	3555.1		4.830	3600.2	
19:30	46.50	4.805	3555.1		4.830	3600.2	
20:00	47.00	4.805	3555.1		4.830	3600.2	
20:30	47.50	4.790	3544.0		4.820	3592.7	
21:00	48.00	4.780	3536.6		4.820	3592.7	
21:30	48.50	4.775	3532.9		4.805	3581.6	
22:00	49.00	4.740	3507.0		4.765	3551.8	
22:30	49.50	4.715	3488.5		4.730	3525.7	
23:00	50.00	4.685	3466.3		4.715	3514.5	
23:30	50.50	4.670	3455.2		4.705	3507.0	
00:00	51.00	4.670	3455.2		4.705	3507.0	
00:30	51.50	4.670	3455.2		4.705	3507.0	
01:00	52.00	4.670	3455.2		4.710	3510.8	
01:30	52.50	4.670	3455.2		4.710	3510.8	
02:00	53.00	4.670	3455.2		4.710	3510.8	
02:30	53.50	4.670	3455.2		4.710	[illegible]10.8	
03:00	54.00	4.680	3462.6		[illegible]71[illegible]	[illegible]0.8	
03:30	54.50	4.680	3462.6		[illegible]	[illegible]10.8	
04:00	55.00	4.690	3470.0		4[illegible]	3518.2	
04:30	55.50	4.690	3470.0		4.[illegible]	3518.2	
05:00	56.00	4.690	3470.0		4.720	3518.2	
05:30	56.50	4.690	3470.0		4.720	3518.2	
06:00	57.00	4.690	3470.0		4.730	3525.7	
06:30	57.50	4.690	3470.0		4.730	3525.7	
07:00	58.00	4.690	3470.0		4.730	3525.7	
07:30	58.50	4.675	3458.9		4.695	3499.6	
08:00	59.00	4.630	3425.6		4.660	3473.5	
08:30	59.50	4.570	3381.2		4.610	3436.2	
09:00	60.00	4.530	3351.6		4.565	3402.7	
09:30	60.50	4.635	3429.3		4.620	3443.7	
10:00	61.00	4.920	3640.1		4.870	3630.0	
10:30	61.50	5.910	4372.6		5.550	4136.9	
11:00	62.00	6.910	5112.5		6.750	5031.3	
11:19	62.32	7.100	5253.0		7.125	5310.9	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 01 29 - 02 02

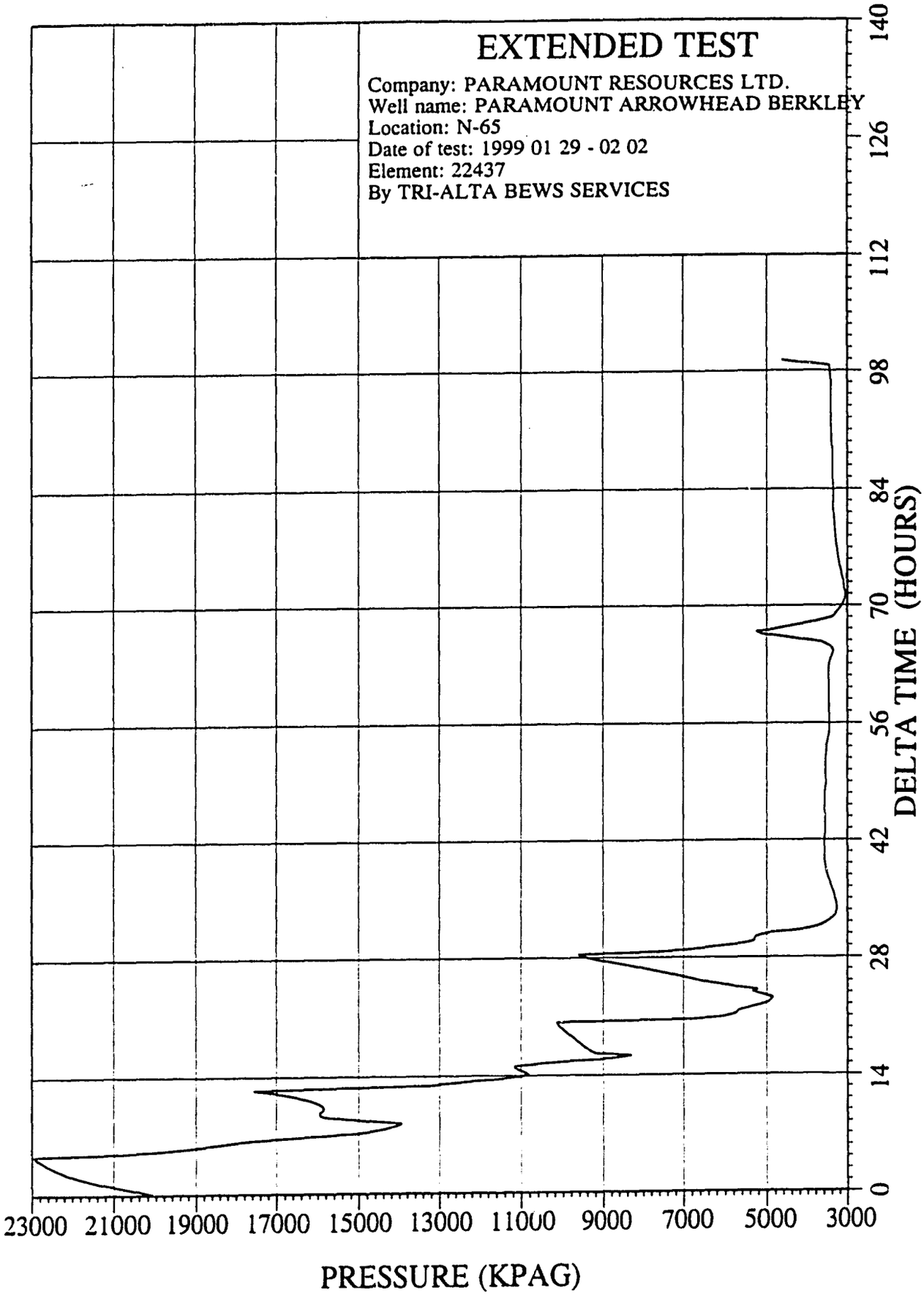
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65

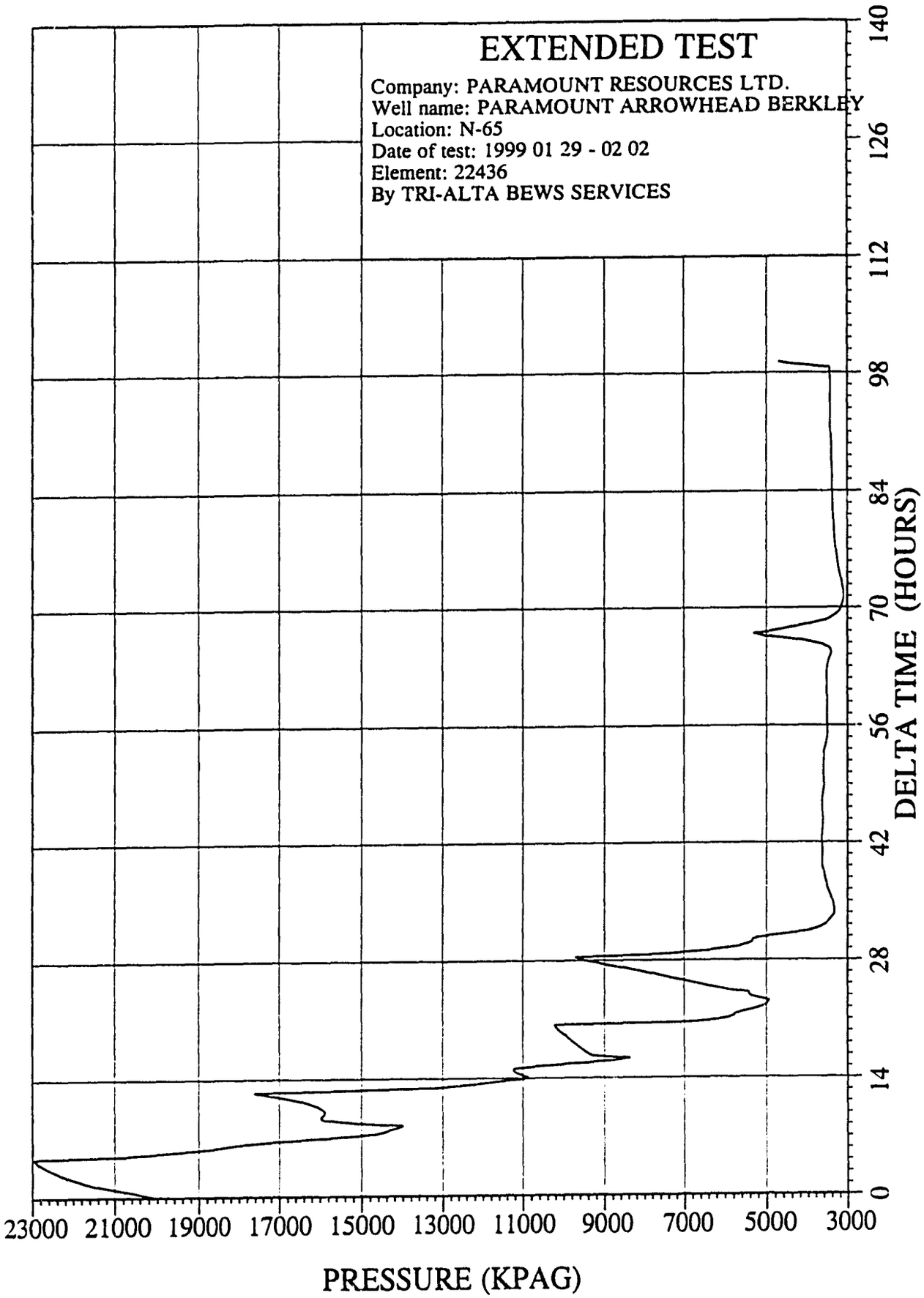
		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
11:30	62.50	6.595	4879.4		6.675	4975.4	
12:00	63.00	5.900	4365.2		6.005	4476.0	
12:30	63.50	5.105	3777.0		5.230	3898.4	
13:00	64.00	4.575	3384.9		4.670	3480.9	
13:30	64.50	4.430	3277.6		4.440	3309.5	
14:00	65.00	4.305	3185.1		4.290	3197.7	
14:30	65.50	4.215	3118.5		4.230	3153.0	
15:00	66.00	4.150	3070.4		4.175	3112.0	
15:30	66.50	4.130	3055.6		4.150	3093.3	
16:00	67.00	4.130	3055.6		4.150	3093.3	
16:30	67.50	4.175	3088.9		4.165	3104.5	
17:00	68.00	4.185	3096.3		4.200	3130.6	
17:30	68.50	4.200	3107.4		4.220	3145.5	
18:00	69.00	4.240	3137.0		4.250	3167.9	
18:30	69.50	4.260	3151.8		4.280	3190.2	
19:00	70.00	4.300	3181.4		4.315	3216.3	
19:30	70.50	4.330	3203.6		4.340	3235.0	
20:00	71.00	4.360	3225.8		4.360	3249.9	
20:30	71.50	4.380	3240.6		4.380	3264.8	
21:00	72.00	4.400	3255.4		4.400	3279.7	
22:00	73.00	4.430	3277.6		4.435	3305.8	
23:00	74.00	4.460	3299.8		4.460	3324.4	
00:00	75.00	4.485	3318.3		4.480	3339.3	
01:00	76.00	4.505	3333.1		4.490	3346.8	
02:00	77.00	4.525	3347.9		4.515	3365.4	
03:00	78.00	4.530	3351.6		4.525	3372.9	
04:00	79.00	4.530	3351.6		4.530	3376.6	
05:00	80.00	4.540	3359.0		4.530	3376.6	
06:00	81.00	4.550	3366.4		4.530	3376.6	
07:00	82.00	4.550	3366.4		4.545	3387.8	
08:00	83.00	4.550	3366.4		4.555	3395.2	
09:00	84.00	4.560	3373.8		4.555	3395.2	
10:00	85.00	4.585	3392.3		4.560	3398.9	
11:00	86.00	4.595	3399.7		4.585	3417.6	
12:00	87.00	4.610	3410.8		4.600	3428.8	
13:00	88.00	4.610	3410.8		4.600	3428.8	
14:00	89.00	4.610	3410.8		4.600	3428.8	
15:00	90.00	4.610	3410.8		4.600	3428.8	
16:00	91.00	4.610	3410.8		4.600	3428.8	
17:00	92.00	4.610	3410.8		4.600	3428.8	
18:00	93.00	4.630	3425.6		4.615	3439.9	
19:00	94.00	4.665	3451.5		4.620	3443.7	
FEB 02-19:00	0.00	4.665	3451.5		4.620	3443.7	
SHUT IN	0.25	5.420	4010.1		5.500	4099.6	
19:30	0.50	6.050	4476.2		6.130	4569.2	
FEB 02-19:38	0.63	6.270	4639.0		6.345	4729.5	
OFF BOTTOM	0.00	6.270	4639.0		6.345	4729.5	

Remarks:

Test by: MILT

Interpretation by CAL-SCAN SERVICES LTD.


EXTENDED TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 29 - 02 02
Element: 22437
By TRI-ALTA BEWS SERVICES
DELTA TIME (HOURS)
0
14
28
42
56
70
84
98
112
126
140
PRESSURE (KPAG)
23000
21000
19000
17000
15000
13000
11000
9000
7000
5000
3000


EXTENDED TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ARROWHEAD BERKLEY
Location: N-65
Date of test: 1999 01 29 - 02 02
Element: 22436
By TRI-ALTA BEWS SERVICES
PRESSURE (KPAG)
23000 21000 19000 17000 15000 13000 11000 9000 7000 5000 3000
DELTA TIME (HOURS)
0 14 28 42 56 70 84 98 112 126 140

N.E.B. COPY

Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Date of test: 1999 02 02 - 02 14
Test by TRI-ALTA BEWS SERVICES
Interp. by Cal-Scan Services Ltd.

TRI-ALTA BEWS SERVICES

SUMMARY

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

FEB 02-21:20	ON BOTTOM
FEB 14-14:52	OFF BOTTOM

Remarks:
Top recorder stopped early.
Top recorder was stair stepping during test.

Interpretation by CAL-SCAN SERVICES LTD.

TRI-ALTA BEWS SERVICES

Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Address: CALGARY, ALBERTA
Field & Pool: ARROWHEAD
Type of test: BUILD UP
Prod. Int CF: 2572.7 to 2594.7
Elev. (CF) 568.3 (KB) 574.6
Pool datum:

Tubing pres:
Casing pres:
Temperature at run depth: 158.0 C

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Status: GAS
Date of test: 1999 02 02 - 02 14
Prod. through: 88.9MM
Mid-point prod.int. CF: 2583.7
Datum depth of well CF:

Shut in time:
On/off btm: 02 02-2120:00-02 14-1452:0
Surface temperature:

Note: All units in metric, depth in meters cf; pressure in KPAG

TOP RECORDER

Element serial#: 22437
Pressure Range: 0 to 37577
Cal. equation: 738.6 * DEFL -3.2
Latest calibration: 10-22-98
Clock range: 360 HOUR
Run depth (CF): 2553.2

BOTTOM RECORDER

Element serial#: 22436
Pressure range: 0 to 37750
Cal. equation: 741.5 * DEFL +15.5
Latest calibration: 10-22-98
Clock range: 360 HOUR
Run depth (CF): 2555

		TOP RECORDER			BOTTOM RECORDER		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
FEB 02-21:20	0.00	8.690	6429.4		8.600	6410.3	
ON BOTTOM	0.25	9.120	6747.6		9.215	6868.7	
21:50	0.50	9.390	6947.0		9.490	7072.4	
22:05	0.75	9.640	7131.0		9.705	7231.5	
22:20	1.00	9.900	7322.3		9.840	7331.5	
22:35	1.25	10.125	7487.9		10.085	7512.8	
22:50	1.50	10.400	7690.2		10.315	7683.0	
23:05	1.75	10.700	7911.0		10.600	7893.9	
23:20	2.00	11.000	8131.7		10.885	8104.9	
23:35	2.25	11.300	8352.5		11.150	8301.0	
23:50	2.50	11.575	8554.8		11.400	8486.0	
00:05	2.75	11.845	8753.5		11.740	8737.7	
00:20	3.00	12.125	8959.6		12.020	8944.9	
00:35	3.25	12.410	9169.3		12.305	9155.8	
00:50	3.50	12.715	9393.7		12.590	9366.7	
01:05	3.75	13.000	9603.4		12.885	9585.1	
01:20	4.00	13.330	9846.2		13.215	9829.3	
01:35	4.25	13.565	10019.2		13.445	9999.5	
01:50	4.50	13.850	10228.9		13.700	10188.3	
02:05	4.75	14.135	10438.6		13.960	10380.7	
02:20	5.00	14.425	10652.0		14.260	10602.7	
02:35	5.25	14.655	10821.2		14.470	10758.1	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
02:50	5.50	14.900	11001.5		14.770	10980.2	
03:05	5.75	15.220	11237.0		15.020	11165.2	
03:20	6.00	15.405	11373.1		15.230	11320.6	
03:35	6.25	15.660	11560.7		15.510	11527.8	
03:50	6.50	15.950	11774.1		15.820	11757.3	
04:05	6.75	16.235	11983.9		16.080	11949.7	
04:20	7.00	16.500	12178.9		16.305	12116.2	
04:35	7.25	16.700	12326.0		16.520	12275.3	
04:50	7.50	17.000	12546.8		16.820	12497.4	
05:05	7.75	17.160	12664.5		17.010	12638.0	
05:20	8.00	17.400	12841.1		17.235	12804.5	
05:35	8.25	17.585	12977.2		17.460	12971.0	
05:50	8.50	17.850	13172.2		17.670	13126.5	
06:05	8.75	18.055	13323.1		17.870	13274.5	
06:20	9.00	18.265	13477.6		18.120	13459.5	
06:35	9.25	18.480	13635.8		18.300	13592.7	
06:50	9.50	18.705	13801.4		18.540	13770.4	
07:05	9.75	18.900	13945.3		18.715	13899.9	
07:20	10.00	19.070	14070.7		18.915	14047.8	
07:35	10.25	19.325	14258.9		19.120	14199.5	
07:50	10.50	19.500	14388.0		19.370	14384.5	
08:05	10.75	19.705	14539.3		19.500	14480.7	
08:20	11.00	19.740	14565.1		19.695	14625.0	
08:35	11.25	20.025	14775.4		19.905	14780.4	
08:50	11.50	20.220	14919.3		20.100	14924.7	
09:05	11.75	20.415	15063.2		20.275	15054.2	
09:20	12.00	20.520	15140.7		20.460	15191.1	
09:35	12.25	20.800	15347.3		20.650	15331.6	
09:50	12.50	21.200	15642.4		21.010	15598.0	
10:05	12.75	21.400	15790.0		21.300	15812.6	
10:20	13.00	21.650	15974.5		21.510	15968.0	
10:35	13.25	21.885	16147.9		21.780	16167.8	
10:50	13.50	22.100	16306.5		21.960	16301.0	
11:05	13.75	22.300	16454.1		22.205	16482.3	
11:20	14.00	22.450	16564.9		22.365	16600.6	
11:35	14.25	22.700	16749.3		22.530	16722.7	
11:50	14.50	22.730	16771.4		22.595	16770.8	
12:05	14.75	22.415	16539.0		22.340	16582.1	
12:20	15.00	22.405	16531.6		22.300	16552.6	
12:35	15.25	22.335	16479.9		22.175	16460.1	
12:50	15.50	22.410	16535.3		22.300	16552.6	
13:05	15.75	22.600	16675.5		22.450	16663.5	
13:20	16.00	22.700	16749.3		22.585	16763.4	
13:35	16.25	22.900	16896.8		22.745	16881.8	
13:50	16.50	23.100	17044.4		22.925	17015.0	
14:05	16.75	23.280	17177.2		23.130	17166.7	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT / REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
14:20	17.00	23.420	17280.5		23.240	17248.1	
14:35	17.25	23.600	17413.4		23.445	17399.8	
14:50	17.50	23.755	17527.7		23.570	17492.3	
15:05	17.75	23.885	17623.7		23.710	17595.9	
15:20	18.00	24.005	17712.2		23.810	17669.9	
15:35	18.25	24.090	17774.9		23.870	17714.3	
15:50	18.50	24.130	17804.4		23.925	17755.0	
16:05	18.75	24.175	17837.6		23.985	17799.4	
16:20	19.00	24.200	17856.1		23.990	17803.1	
16:35	19.25	24.230	17878.2		23.990	17803.1	
16:50	19.50	24.255	17896.7		24.050	17847.5	
17:05	19.75	24.300	17929.9		24.170	17936.2	
17:20	20.00	24.360	17974.1		24.260	18002.8	
17:35	20.25	24.420	18018.4		24.320	18047.2	
17:50	20.50	24.460	18047.9		24.380	18091.6	
18:05	20.75	24.520	18092.2		24.465	18154.5	
18:20	21.00	24.630	18173.4		24.580	18239.6	
18:35	21.25	24.680	18210.3		24.690	18321.0	
18:50	21.50	24.795	18295.1		24.795	18398.7	
19:05	21.75	24.850	18335.7		24.885	18465.3	
19:20	22.00	24.910	18380.0		24.965	18524.5	
19:35	22.25	25.020	18461.2		25.050	18587.4	
19:50	22.50	25.085	18509.1		25.125	18642.9	
20:05	22.75	25.240	18623.5		25.210	18705.8	
20:20	23.00	25.340	18697.3		25.305	18776.1	
20:35	23.25	25.405	18745.2		25.375	18827.9	
20:50	23.50	25.405	18745.2		25.385	18835.3	
21:05	23.75	25.405	18745.2		25.385	18835.3	
21:20	24.00	25.380	18726.8		25.200	18698.4	
21:35	24.25	25.380	18726.8		25.200	18698.4	
21:50	24.50	25.390	18734.2		25.260	18742.8	
22:05	24.75	25.390	18734.2		25.325	18790.9	
22:20	25.00	25.390	18734.2		25.400	18846.4	
22:35	25.25	25.390	18734.2		25.505	18924.1	
22:50	25.50	25.530	18837.5		25.580	18979.6	
23:05	25.75	25.600	18889.1		25.640	19024.0	
23:20	26.00	25.650	18926.0		25.755	19109.1	
23:35	26.25	25.760	19007.2		25.815	19153.5	
23:50	26.50	25.825	19055.2		25.865	19190.5	
00:05	26.75	25.900	19110.5		25.920	19231.2	
00:20	27.00	25.955	19151.1		25.975	19271.8	
00:35	27.25	25.965	19158.5		26.015	19301.4	
00:50	27.50	25.965	19158.5		26.050	19327.3	
01:05	27.75	26.115	19269.1		26.080	19349.5	
01:20	28.00	26.180	19317.1		26.120	19379.1	
01:35	28.25	26.180	19317.1		26.150	19401.3	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
01:50	28.50	26.190	19324.5		26.180	19423.5	
02:05	28.75	26.190	19324.5		26.115	19375.4	
02:20	29.00	26.190	19324.5		26.115	19375.4	
02:35	29.25	26.190	19324.5		26.115	19375.4	
02:50	29.50	26.190	19324.5		26.115	19375.4	
03:05	29.75	26.200	19331.9		26.140	19393.9	
03:20	30.00	26.200	19331.9		26.165	19412.4	
03:35	30.25	26.200	19331.9		26.205	19442.0	
03:50	30.50	26.260	19376.1		26.280	19497.5	
04:05	30.75	26.320	19420.4		26.340	19541.9	
04:20	31.00	26.415	19490.5		26.405	19590.0	
04:35	31.25	26.470	19531.1		26.470	19638.1	
04:50	31.50	26.535	19579.0		26.525	19678.8	
05:05	31.75	26.580	19612.3		26.595	19730.6	
05:20	32.00	26.600	19627.0		26.660	19778.7	
05:35	32.25	26.665	19675.0		26.710	19815.7	
05:50	32.50	26.710	19708.2		26.735	19834.2	
06:05	32.75	26.760	19745.1		26.750	19845.3	
06:20	33.00	26.760	19745.1		26.780	19867.5	
06:35	33.25	26.775	19756.1		26.815	19893.4	
06:50	33.50	26.775	19756.1		26.840	19911.9	
07:05	33.75	26.840	19804.1		26.850	19919.3	
07:20	34.00	26.870	19826.2		26.870	19934.1	
07:35	34.25	26.880	19833.6		26.895	19952.6	
07:50	34.50	26.890	19841.0		26.855	19923.0	
08:05	34.75	26.890	19841.0		26.815	19893.4	
08:20	35.00	26.890	19841.0		26.830	19904.5	
08:35	35.25	26.905	19852.1		26.850	19919.3	
08:50	35.50	26.910	19855.8		26.870	19934.1	
09:05	35.75	26.920	19863.1		26.930	19978.5	
09:20	36.00	26.930	19870.5		26.995	20026.6	
09:50	36.50	27.025	19940.6		27.105	20108.0	
10:20	37.00	27.095	19992.3		27.170	20156.1	
10:50	37.50	27.135	20021.8		27.245	20211.6	
11:20	38.00	27.155	20036.5		27.315	20263.4	
11:50	38.50	27.225	20088.2		27.340	20281.9	
12:20	39.00	27.310	20150.9		27.350	20289.3	
12:50	39.50	27.335	20169.4		27.310	20259.7	
13:20	40.00	27.345	20176.7		27.360	20296.7	
13:50	40.50	27.355	20184.1		27.465	20374.4	
14:20	41.00	27.355	20184.1		27.540	20429.9	
14:50	41.50	27.560	20335.4		27.620	20489.1	
15:20	42.00	27.620	20379.7		27.705	20551.9	
15:50	42.50	27.635	20390.7		27.720	20563.0	
16:20	43.00	27.645	20398.1		27.730	20570.4	
16:50	43.50	27.655	20405.5		27.745	20581.5	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
17:20	44.00	27.655	20405.5		27.750	20585.2	
17:50	44.50	27.655	20405.5		27.775	20603.7	
18:20	45.00	27.660	20409.2		27.825	20640.7	
18:50	45.50	27.860	20556.7		27.885	20685.1	
19:20	46.00	27.885	20575.2		27.920	20711.1	
19:50	46.50	27.890	20578.9		27.960	20740.7	
20:20	47.00	27.890	20578.9		27.990	20763.0	
20:50	47.50	27.900	20586.3		28.015	20781.5	
21:20	48.00	27.900	20586.3		28.020	20785.2	
21:50	48.50	27.900	20586.3		28.060	20814.9	
22:20	49.00	28.045	20693.3		28.100	20844.5	
22:50	49.50	28.195	20804.3		28.155	20885.3	
23:20	50.00	28.200	20808.0		28.190	20911.2	
23:50	50.50	28.200	20808.0		28.210	20926.1	
00:20	51.00	28.215	20819.1		28.235	20944.6	
00:50	51.50	28.215	20819.1		28.235	20944.6	
01:20	52.00	28.215	20819.1		28.260	20963.1	
01:50	52.50	28.215	20819.1		28.315	21003.9	
02:20	53.00	28.375	20937.5		28.345	21026.1	
02:50	53.50	28.390	20948.6		28.390	21059.5	
03:20	54.00	28.400	20956.0		28.415	21078.0	
03:50	54.50	28.400	20956.0		28.420	21081.7	
04:20	55.00	28.410	20963.4		28.430	21089.1	
04:50	55.50	28.410	20963.4		28.460	21111.4	
05:20	56.00	28.420	20970.8		28.510	21148.5	
05:50	56.50	28.555	21070.7		28.555	21181.8	
06:20	57.00	28.560	21074.3		28.580	21200.3	
06:50	57.50	28.585	21092.8		28.590	21207.8	
07:20	58.00	28.585	21092.8		28.600	21215.2	
07:50	58.50	28.595	21100.2		28.600	21215.2	
08:20	59.00	28.595	21100.2		28.635	21241.1	
08:50	59.50	28.695	21174.2		28.675	21270.8	
09:20	60.00	28.785	21240.8		28.715	21300.4	
09:50	60.50	28.785	21240.8		28.750	21326.4	
10:20	61.00	28.795	21248.2		28.780	21348.6	
10:50	61.50	28.795	21248.2		28.810	21370.8	
11:20	62.00	28.795	21248.2		28.835	21389.4	
11:50	62.50	28.805	21255.6		28.860	21407.9	
12:20	63.00	28.805	21255.6		28.890	21430.1	
12:50	63.50	28.870	21303.7		28.915	21448.7	
13:20	64.00	28.950	21362.9		28.935	21463.5	
13:50	64.50	28.975	21381.4		28.950	21474.6	
14:20	65.00	28.975	21381.4		28.980	21496.9	
14:50	65.50	28.980	21385.1		29.010	21519.1	
15:20	66.00	28.980	21385.1		29.035	21537.6	
15:50	66.50	28.980	21385.1		29.050	21548.8	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
16:20	67.00	28.980	21385.1		29.070	21563.6	
16:50	67.50	28.990	21392.5		29.090	21578.4	
17:20	68.00	28.990	21392.5		29.110	21593.2	
17:50	68.50	28.990	21392.5		29.120	21600.6	
18:20	69.00	28.990	21392.5		29.165	21634.0	
18:50	69.50	29.140	21503.5		29.180	21645.1	
19:20	70.00	29.200	21547.9		29.215	21671.1	
19:50	70.50	29.220	21562.7		29.235	21685.9	
20:20	71.00	29.230	21570.1		29.250	21697.0	
20:50	71.50	29.230	21570.1		29.275	21715.5	
21:20	72.00	29.240	21577.5		29.280	21719.3	
22:20	73.00	29.250	21584.9		29.345	21767.4	
23:20	74.00	29.250	21584.9		29.360	21778.6	
00:20	75.00	29.460	21740.3		29.380	21793.4	
01:20	76.00	29.470	21747.7		29.410	21815.6	
02:20	77.00	29.485	21758.8		29.455	21849.0	
03:20	78.00	29.485	21758.8		29.490	21874.9	
04:20	79.00	29.485	21758.8		29.520	21897.2	
05:20	80.00	29.490	21762.5		29.570	21934.2	
06:20	81.00	29.580	21829.1		29.595	21952.8	
07:20	82.00	29.700	21917.9		29.620	21971.3	
08:20	83.00	29.700	21917.9		29.650	21993.5	
09:20	84.00	29.720	21932.7		29.690	22023.2	
10:20	85.00	29.720	21932.7		29.720	22045.4	
11:20	86.00	29.730	21940.1		29.760	22075.1	
12:20	87.00	29.765	21966.0		29.805	22108.4	
13:20	88.00	29.860	22036.3		29.835	22130.7	
14:20	89.00	29.875	22047.4		29.865	22152.9	
15:20	90.00	29.880	22051.1		29.895	22175.1	
16:20	91.00	29.880	22051.1		29.925	22197.4	
17:20	92.00	29.880	22051.1		29.945	22212.2	
18:20	93.00	29.890	22058.5		29.985	22241.9	
19:20	94.00	29.915	22077.0		30.010	22260.4	
20:20	95.00	30.100	22213.9		30.030	22275.2	
21:20	96.00	30.135	22239.8		30.065	22301.2	
22:20	97.00	30.135	22239.8		30.080	22312.3	
23:20	98.00	30.135	22239.8		30.095	22323.4	
00:20	99.00	30.155	22254.6		30.120	22341.9	
01:20	100.00	30.155	22254.6		30.165	22375.3	
02:20	101.00	30.155	22254.6		30.190	22393.8	
03:20	102.00	30.155	22254.6		30.220	22416.1	
04:20	103.00	30.165	22262.0		30.245	22434.6	
05:20	104.00	30.175	22269.4		30.260	22445.7	
06:20	105.00	30.345	22395.2		30.290	22468.0	
07:20	106.00	30.370	22413.7		30.320	22490.2	
08:20	107.00	30.380	22421.0		30.340	22505.0	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
09:20	108.00	30.380	22421.0		30.350	22512.4	
10:20	109.00	30.380	22421.0		30.380	22534.7	
11:20	110.00	30.380	22421.0		30.415	22560.6	
12:20	111.00	30.380	22421.0		30.430	22571.7	
13:20	112.00	30.380	22421.0		30.450	22586.6	
14:20	113.00	30.380	22421.0		30.475	22605.1	
15:20	114.00	30.395	22432.1		30.490	22616.2	
16:20	115.00	30.395	22432.1		30.510	22631.0	
17:20	116.00	30.395	22432.1		30.525	22642.2	
18:20	117.00	30.560	22554.2		30.540	22653.3	
19:20	118.00	30.640	22613.4		30.560	22668.1	
20:20	119.00	30.640	22613.4		30.570	22675.5	
21:20	120.00	30.640	22613.4		30.590	22690.3	
23:20	122.00	30.640	22613.4		30.620	22712.6	
01:20	124.00	30.640	22613.4		30.650	22734.8	
03:20	126.00	30.655	22624.5		30.680	22757.1	
05:20	128.00	30.655	22624.5		30.700	22771.9	
07:20	130.00	30.665	22631.9		30.730	22794.1	
09:20	132.00	30.665	22631.9		30.760	22816.4	
11:20	134.00	30.995	22876.1		30.790	22838.6	
13:20	136.00	31.000	22879.8		30.810	22853.4	
15:20	138.00	31.010	22887.2		30.830	22868.3	
17:20	140.00	31.010	22887.2		30.850	22883.1	
19:20	142.00	31.010	22887.2		30.870	22897.9	
21:20	144.00	31.030	22902.0		30.900	22920.2	
23:20	146.00	31.050	22916.8		30.930	22942.4	
01:20	148.00	31.050	22916.8		30.960	22964.6	
03:20	150.00	31.095	22950.1		30.985	22983.2	
05:20	152.00	31.095	22950.1		31.000	22994.3	
07:20	154.00	31.095	22950.1		31.020	23009.1	
09:20	156.00	31.110	22961.2		31.040	23023.9	
11:20	158.00	31.135	22979.7		31.060	23038.8	
13:20	160.00	31.160	22998.2		31.080	23053.6	
15:20	162.00	31.160	22998.2		31.100	23068.4	
17:20	164.00	31.160	22998.2		31.130	23090.6	
19:20	166.00	31.190	23020.4		31.140	23098.1	
21:20	168.00	31.200	23027.8		31.160	23112.9	
23:20	170.00	31.210	23035.2		31.170	23120.3	
01:20	172.00	31.255	23068.5		31.180	23127.7	
05:20	176.00	31.265	23075.9		31.215	23153.7	
09:20	180.00	31.265	23075.9		31.230	23164.8	
13:20	184.00	31.275	23083.3		31.250	23179.6	
17:20	188.00	31.275	23083.3		31.280	23201.8	
21:20	192.00	31.280	23087.0		31.300	23216.7	
01:20	196.00	31.280	23087.0		31.320	23231.5	
05:20	200.00	31.280	23087.0		31.340	23246.3	

TRI-ALTA BEWS SERVICES

Company: PARAMOUNT RESOURCES LTD.
Date of test: 1999 02 02 - 02 14

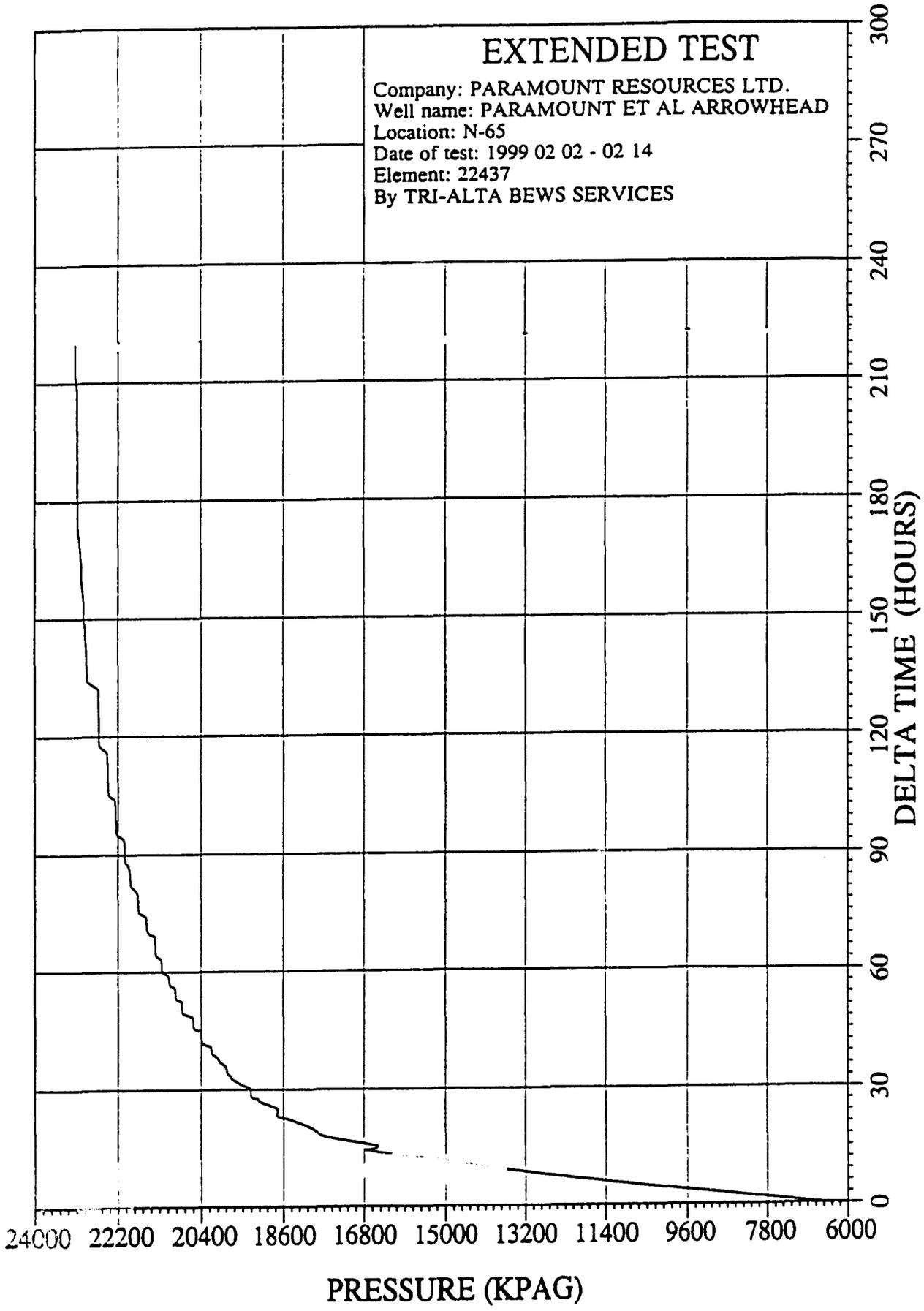
Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65

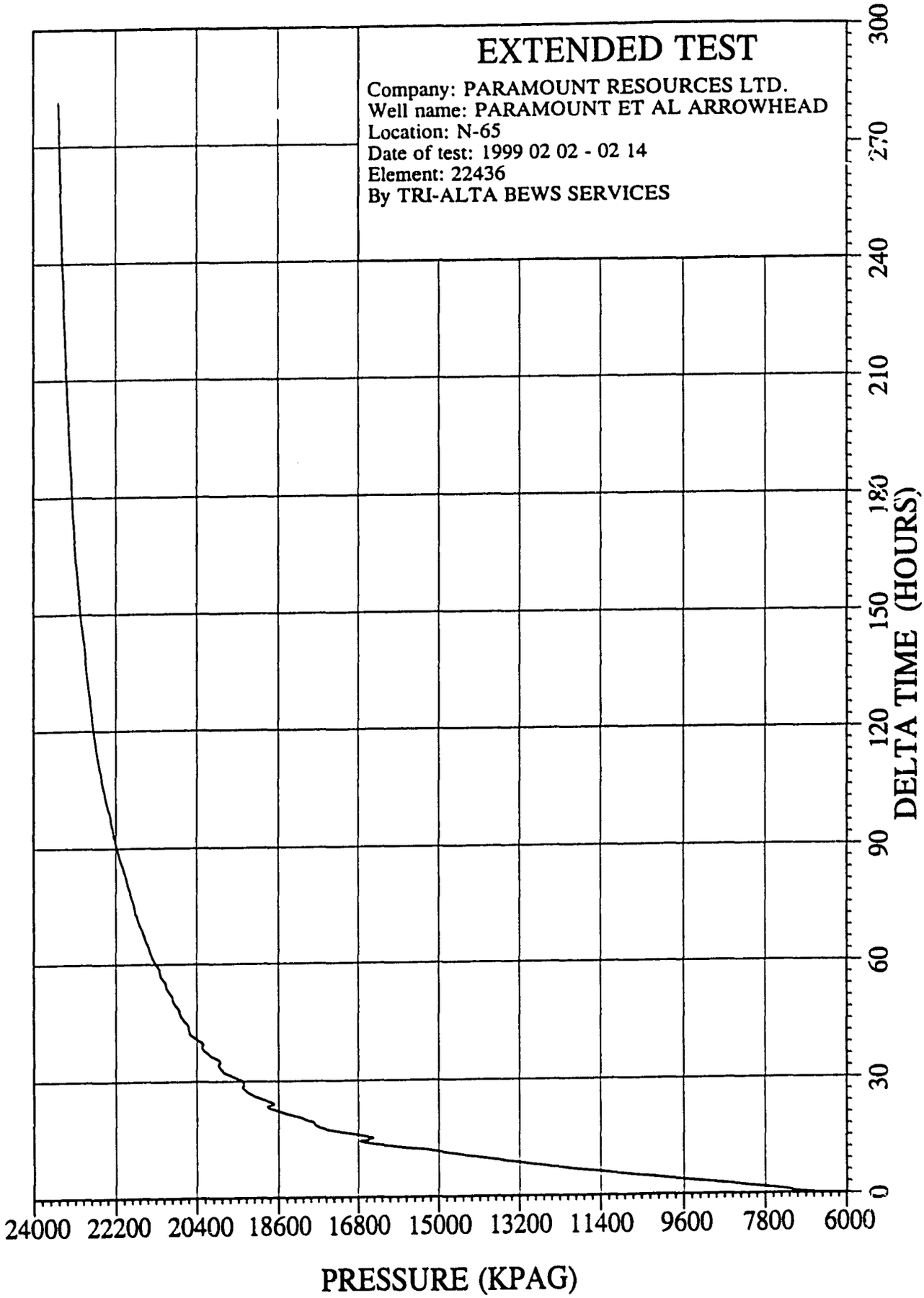
		TOP RECORDER Element serial#: 22437 Run Depth (CF): 2553.2			BOTTOM RECORDER Element serial#: 22436 Run depth (CF): 2555		
COMMENT REAL TIME	DELTA TIME HOURS	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT	DEFL mm	PRESSURE RUNDEPTH	PRESSURE MIDPNT
09:20	204.00	31.280	23087.0		31.365	23264.9	
13:20	208.00	31.280	23087.0		31.380	23276.0	
17:20	212.00	31.335	23127.7		31.405	23294.5	
21:20	216.00	31.335	23127.7		31.420	23305.6	
01:20	220.00	31.340	23131.4		31.435	23316.7	
05:20	224.00	0.000	0.0		31.450	23327.9	
09:20	228.00	0.000	0.0		31.470	23342.7	
13:20	232.00	0.000	0.0		31.480	23350.1	
17:20	236.00	0.000	0.0		31.490	23357.5	
21:20	240.00	0.000	0.0		31.510	23372.3	
01:20	244.00	0.000	0.0		31.530	23387.2	
05:20	248.00	0.000	0.0		31.540	23394.6	
09:20	252.00	0.000	0.0		31.550	23402.0	
13:20	256.00	0.000	0.0		31.560	23409.4	
17:20	260.00	0.000	0.0		31.570	23416.8	
21:20	264.00	0.000	0.0		31.580	23424.2	
01:20	268.00	0.000	0.0		31.590	23431.6	
05:20	272.00	0.000	0.0		31.600	23439.1	
09:20	276.00	0.000	0.0		31.610	23446.5	
13:20	280.00	0.000	0.0		31.620	23453.9	
FEB 14-14:52	281.54	0.000	0.0		31.630	23461.3	
OFF BOTTOM	0.00	0.000	0.0		31.630	23461.3	

Remarks:
Top recorder stopped early.
Top recorder was stair stepping during test.

Test by:

Interpretation by CAL-SCAN SERVICES LTD.


EXTENDED TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Date of test: 1999 02 02 - 02 14
Element: 22437
By TRI-ALTA BEWS SERVICES
PRESSURE (KPAG)
24000
22200
20400
18600
16800
15000
13200
11400
9600
7800
6000
DELTA TIME (HOURS)
0
30
60
90
120
150
180
210
240
270
300


EXTENDED TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Date of test: 1999 02 02 - 02 14
Element: 22436
By TRI-ALTA BEWS SERVICES
DELTA TIME (HOURS)
0
30
60
90
120
150
180
210
240
270
300
PRESSURE (KPAG)
24000
22200
20400
18600
16800
15000
13200
11400
9600
7800
6000

TRI-ALTA BEWS SERVICES

Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Address: CALGARY, ALBERTA
Field & Pool: ARROWHEAD
Type of test: STATIC GRADIENT
Prod. Int CF: 2572.7 to 2594.7
Elev. (CF) 568.3 (KB) 574.6
Pool datum:

Tubing pres: 17630
Casing pres: 15620
Temperature at run depth: 158.0 C

Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Status: GAS
Date of test: 1999 02 14
Prod. through: 88.9MM
Mid-point prod.int. CF: 2583.7
Datum depth of well CF:

Shut in time:
On bottom/off bottom: 1835:00-1841:00
Surface temperature:

Note: All units in metric, depth in meters cf; pressure in KPAG

TOP RECORDER

Element serial#: 22437
Pressure Range: 0 to 37577
Cal. equation: 738.6 * DEFL -3.2
Latest calibration: 10-22-98
Clock range: 3 HOUR

Run depth (CF): 2553.2
Grad. at run depth: 8.139
Pres. at run depth: 23442.2
Pres. at mid point perf.: 23690.4
Pres. at datum depth:

Depth m	Defl mm	Pressure KPAG	Gradient KPAG/m
-1.8	23.635	17439.2	
-1.8	23.320	17206.7	
498.2	25.150	18557.1	2.701
998.2	26.580	19612.3	2.110
1498.2	27.840	20542.0	1.859
1998.2	29.040	21429.5	1.775
2493.2	31.090	22946.4	3.064
2523.2	31.430	23198.0	8.386
2553.2	31.760	23442.2	8.139

Fluid level at 2396.7 mcf

BOTTOM RECORDER

Element serial#: 22436
Pressure range: 0 to 37750
Cal. equation: 741.5 * DEFL +15.5
Latest calibration: 10-22-98
Clock range: 3 HOUR

Run depth (CF): 2555
Grad. at run depth: 8.772
Pres. at run depth: 23513.2
Pres. at mid point perf.: 23764.9
Pres. at datum depth:

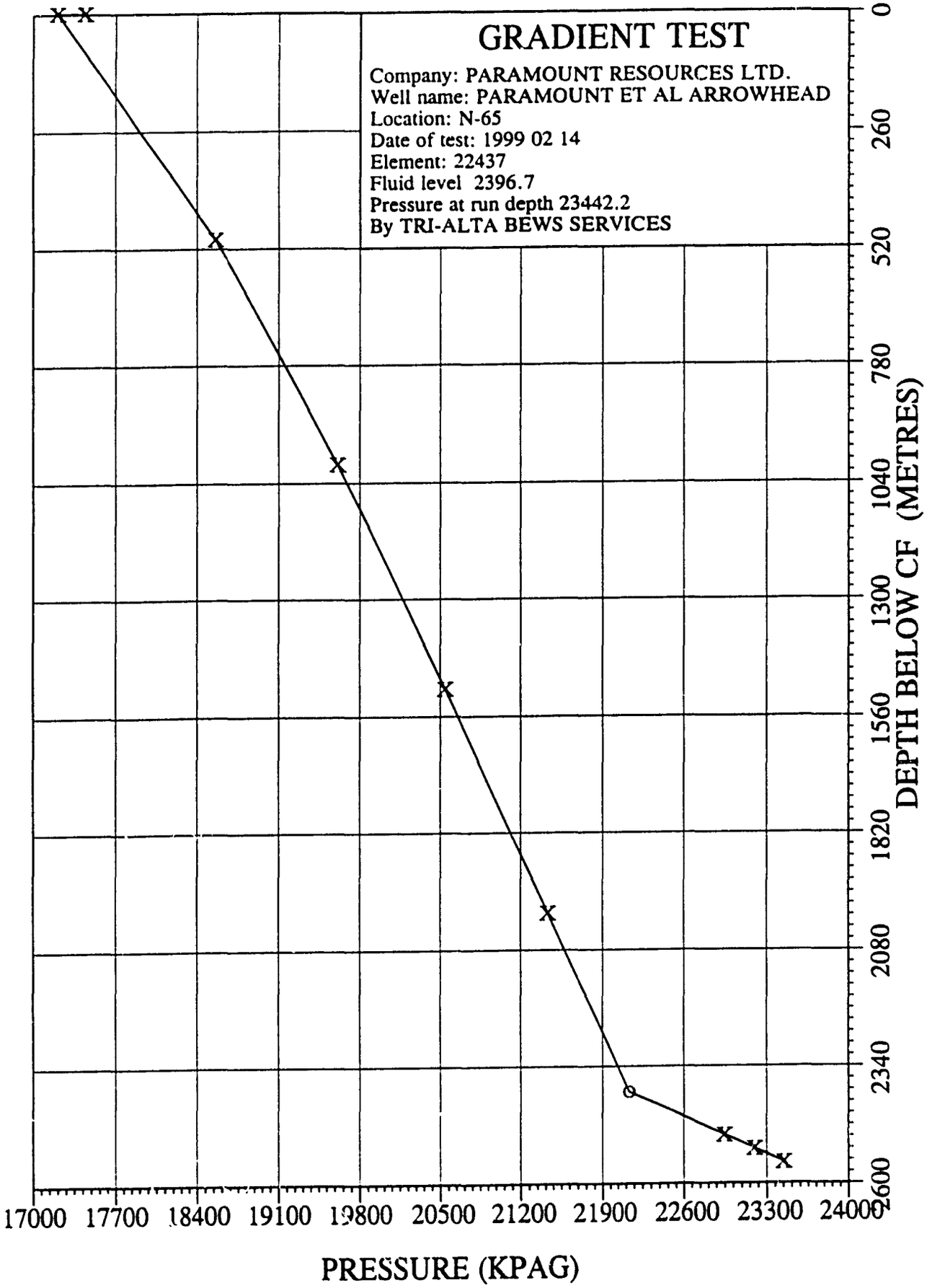
Depth m	Defl mm	Pressure KPAG	Gradient KPAG/m
0.0	23.510	17447.9	
0.0	23.340	17322.1	
500.0	25.000	18550.4	2.457
1000.0	26.430	19608.5	2.116
1500.0	27.690	20540.9	1.865
2000.0	28.895	21433.9	1.786
2495.0	30.990	22986.9	3.137
2525.0	31.345	23250.0	8.772
2555.0	31.700	23513.2	8.772

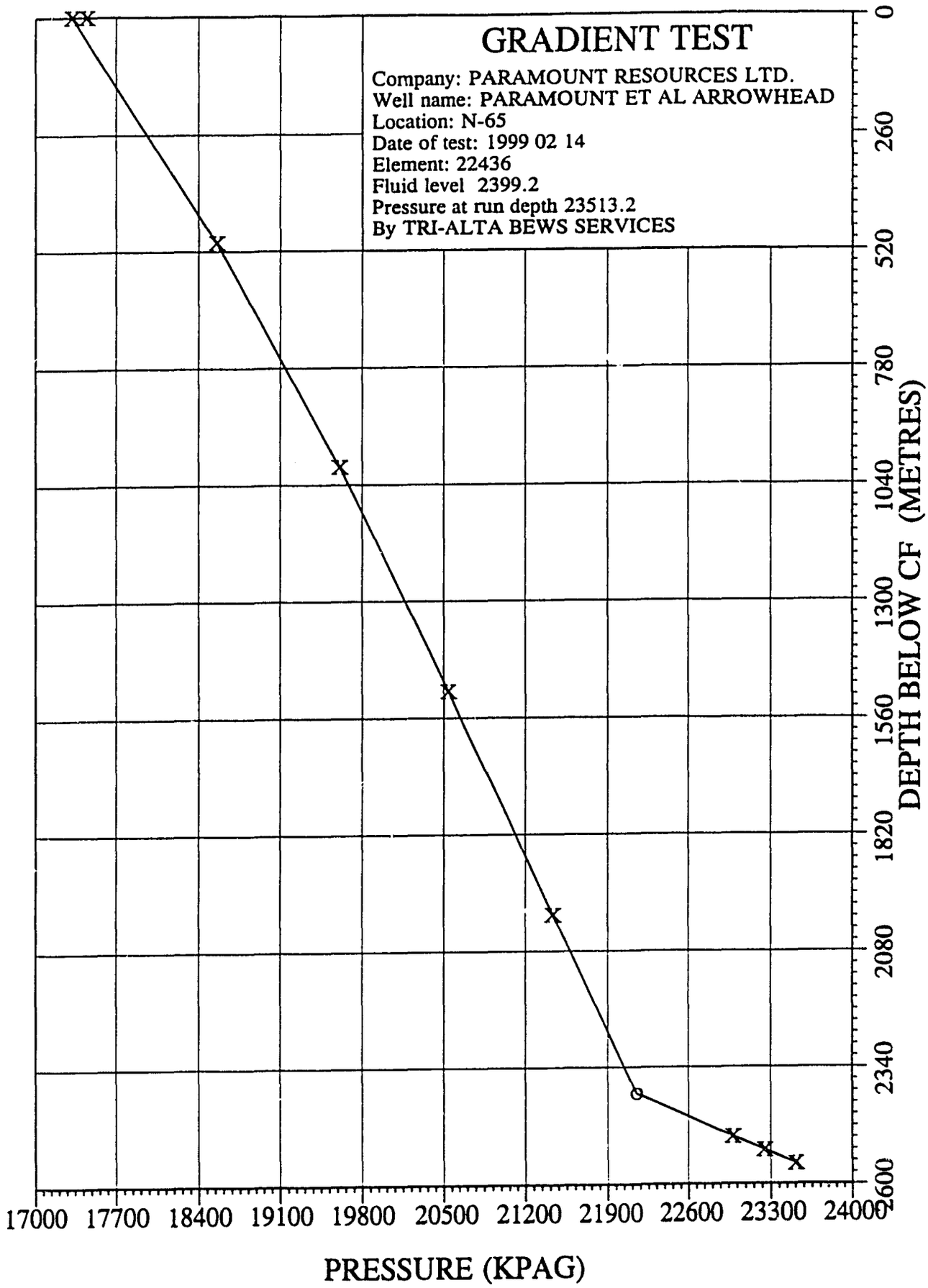
Fluid level at 2399.2 mcf

Remarks:

Test by:

Interpretation by CAL-SCAN SERVICES LTD.


GRADIENT TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Date of test: 1999 02 14
Element: 22437
Fluid level 2396.7
Pressure at run depth 23442.2
By TRI-ALTA BEWS SERVICES
0
260
520
780
1040
1300
1560
1820
2080
2340
2600
DEPTH BELOW CF (METRES)
17000
17700
18400
19100
19800
20500
21200
21900
22600
23300
24000
PRESSURE (KPAG)


GRADIENT TEST
Company: PARAMOUNT RESOURCES LTD.
Well name: PARAMOUNT ET AL ARROWHEAD
Location: N-65
Date of test: 1999 02 14
Element: 22436
Fluid level 2399.2
Pressure at run depth 23513.2
By TRI-ALTA BEWS SERVICES
DEPTH BELOW CF (METRES)
0
260
520
780
1040
1300
1560
1820
2080
2340
2600
17000
17700
18400
19100
19800
20500
21200
21900
22600
23300
24000
PRESSURE (KPAG)

SURVEY PLAN

OVERSIZED

DOCUMENT

FILMED

ON

35mm

RESISTIVITY/ CONDUCTIVITY

N.E.B. COPY 7133

WESTERN ATLAS

HIGH DEFINITION INDUCTION LOG
GAMMA RAY LOG

Gas-Fire-Lake

FILE NO:	COMPANY: PANCANADIAN PETROLEUM LIMITED
LOC NO:	WELL: TURNERVILLE N-14 HORNBURG N-14
	FIELD: WEST-NWT
	COUNTY: PEACE RIVER
	LOCATION: W4 / 19/2

OTHER SERVICES: DIL-SP/GR/BHC-GR/CALI-GR/CNL-GR/CDL-GR/CAL-GR/DIPMETER

PERMANENT DATUM: G.L. ELEVATION 285.8 m — ELEVATIONS: KB 1.0 m, DF N/A, GL 285.8 m
LOG MEASURED FROM K.B. 1.0 m ABOVE PERM. DATUM

DATE	1992-Jan-14		
RUN NO.	ONE		
DEPTH DRILLER	1980.0 m		
DEPTH LOGGER	1980.0 m		
BOTTOM LOGGED INTERVAL	1979.0 m		
TOP LOGGED INTERVAL	175.0 m		
CASING DRILLER SIZE AT DEPTH	244.5 mm @ 175.0 m		
CASING LOGGER	175.0 m		
BIT SIZE	311.1 mm		
TYPE OF FLUID IN HOLE	GEL CHEM		
DENSITY / VISCOSITY	1080 kg/m³ / 0.0 s		
PH / FLUID LOSS	10.0 / 0.0 cm³		
SOURCE OF SAMPLE	FLOWLINE		
RM @ MEASURED TEMP	0.0 ohm-m @ 0.0 degC		
RMF @ MEASURED TEMP	0.0 ohm-m @ 0.0 degC		
RMC @ MEASURED TEMP	0.0 ohm-m @ 0.0 degC		
SOURCE OF RMF / RMC	N/A / N/A		
RM @ BHT	0.0 ohm-m @ 0.0 degC		
TIME SINCE CIRCULATION	0.0 hrs		
MAX. REC. TEMP. (BHT)	0.0 degC		
EQUIP. LOCATION / NO.	0.0 / 0.0		
RECORDED BY	D. MCGILLIVRAY		
WITNESSED BY	J. CHAMBERS		

BOREHOLE RECORD			
BIT NO.	TYPE	SIZE	TO
1	FDT	311.1 mm	1980.0 m

CASING RECORD			
NO.	SIZE	WEIGHT	TO
1	244.5 mm	0.0 kg/m	175.0 m

TOOL STRING (TOP TO BOTTOM)	
HDIL-A	1.0 m
HDIL-B	1.0 m
HDIL-C	1.0 m
HDIL-D	1.0 m
HDIL-E	1.0 m
HDIL-F	1.0 m
HDIL-G	1.0 m
HDIL-H	1.0 m
HDIL-I	1.0 m
HDIL-J	1.0 m
HDIL-K	1.0 m
HDIL-L	1.0 m
HDIL-M	1.0 m
HDIL-N	1.0 m
HDIL-O	1.0 m
HDIL-P	1.0 m
HDIL-Q	1.0 m
HDIL-R	1.0 m
HDIL-S	1.0 m
HDIL-T	1.0 m
HDIL-U	1.0 m
HDIL-V	1.0 m
HDIL-W	1.0 m
HDIL-X	1.0 m
HDIL-Y	1.0 m
HDIL-Z	1.0 m
HDIL-AA	1.0 m
HDIL-AB	1.0 m
HDIL-AC	1.0 m
HDIL-AD	1.0 m
HDIL-AE	1.0 m
HDIL-AF	1.0 m
HDIL-AG	1.0 m
HDIL-AH	1.0 m
HDIL-AI	1.0 m
HDIL-AJ	1.0 m
HDIL-AK	1.0 m
HDIL-AL	1.0 m
HDIL-AM	1.0 m
HDIL-AN	1.0 m
HDIL-AO	1.0 m
HDIL-AP	1.0 m
HDIL-AQ	1.0 m
HDIL-AR	1.0 m
HDIL-AS	1.0 m
HDIL-AT	1.0 m
HDIL-AU	1.0 m
HDIL-AV	1.0 m
HDIL-AW	1.0 m
HDIL-AX	1.0 m
HDIL-AY	1.0 m
HDIL-AZ	1.0 m
HDIL-BA	1.0 m
HDIL-BB	1.0 m
HDIL-BC	1.0 m
HDIL-BD	1.0 m
HDIL-BE	1.0 m
HDIL-BF	1.0 m
HDIL-BG	1.0 m
HDIL-BH	1.0 m
HDIL-BI	1.0 m
HDIL-BJ	1.0 m
HDIL-BK	1.0 m
HDIL-BL	1.0 m
HDIL-BM	1.0 m
HDIL-BN	1.0 m
HDIL-BO	1.0 m
HDIL-BP	1.0 m
HDIL-BQ	1.0 m
HDIL-BR	1.0 m
HDIL-BS	1.0 m
HDIL-BT	1.0 m
HDIL-BU	1.0 m
HDIL-BV	1.0 m
HDIL-BW	1.0 m
HDIL-BX	1.0 m
HDIL-BY	1.0 m
HDIL-BZ	1.0 m
HDIL-CA	1.0 m
HDIL-CB	1.0 m
HDIL-CC	1.0 m
HDIL-CD	1.0 m
HDIL-CE	1.0 m
HDIL-CF	1.0 m
HDIL-CG	1.0 m
HDIL-CH	1.0 m
HDIL-CI	1.0 m
HDIL-CJ	1.0 m
HDIL-CK	1.0 m
HDIL-CL	1.0 m
HDIL-CM	1.0 m
HDIL-CN	1.0 m
HDIL-CO	1.0 m
HDIL-CP	1.0 m
HDIL-CQ	1.0 m
HDIL-CR	1.0 m
HDIL-CS	1.0 m
HDIL-CT	1.0 m
HDIL-CU	1.0 m
HDIL-CV	1.0 m
HDIL-CW	1.0 m
HDIL-CX	1.0 m
HDIL-CY	1.0 m
HDIL-CZ	1.0 m
HDIL-DA	1.0 m
HDIL-DB	1.0 m
HDIL-DC	1.0 m
HDIL-DD	1.0 m
HDIL-DE	1.0 m
HDIL-DF	1.0 m
HDIL-DG	1.0 m
HDIL-DH	1.0 m
HDIL-DI	1.0 m
HDIL-DJ	1.0 m
HDIL-DK	1.0 m
HDIL-DL	1.0 m
HDIL-DM	1.0 m
HDIL-DN	1.0 m
HDIL-DO	1.0 m
HDIL-DP	1.0 m
HDIL-DQ	1.0 m
HDIL-DR	1.0 m
HDIL-DS	1.0 m
HDIL-DT	1.0 m
HDIL-DU	1.0 m
HDIL-DV	1.0 m
HDIL-DW	1.0 m
HDIL-DX	1.0 m
HDIL-DY	1.0 m
HDIL-DZ	1.0 m
HDIL-EA	1.0 m
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HDIL-EZ	1.0 m
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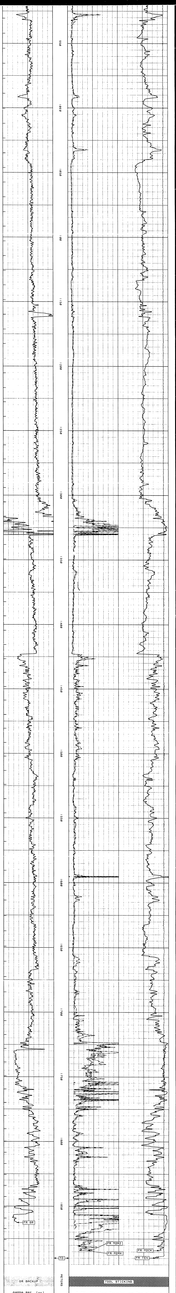
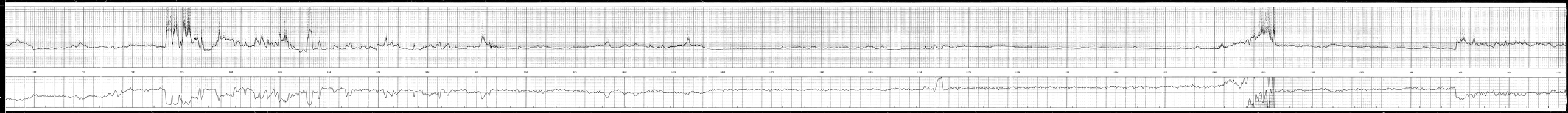
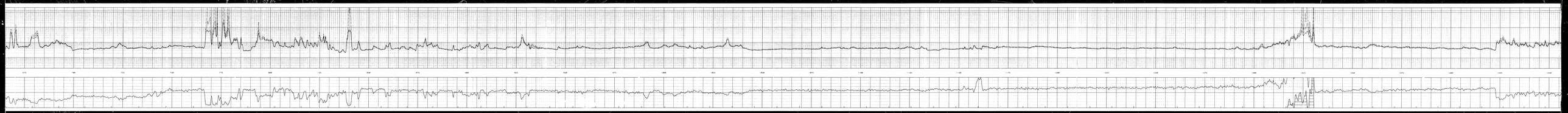
HDIL-FX	1.0 m
HDIL-FY	1.0 m
HDIL-FZ	1.0 m
HDIL-GA	1.0 m
HDIL-GB	1.0 m
HDIL-GC	1.0 m
HDIL-GD	1.0 m
HDIL-GE	1.0 m
HDIL-G


SP BASLINE
GAMMA RAY (gr)
DEPTH
DATA MISSING
DATA MISSING
DATA MISSING





REPEAT PASS - 3 CURVE S B M MATCHED
3 DB Matched Resistivity
DB - 40 (OHM)
DB - 20 (OHM)
DB - 10 (OHM)
(OHM - METER CUM)
METERS
-1675
-1680
-1685
-1690
-1695
-1700
-1705
-1710
-1715
-1720
-1725
-1730
-1735
-1740
-1745
-1750
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-1760
-1765
-1770
-1775
-1780
-1785
-1790
-1795
-1800
-1805
-1810
-1815
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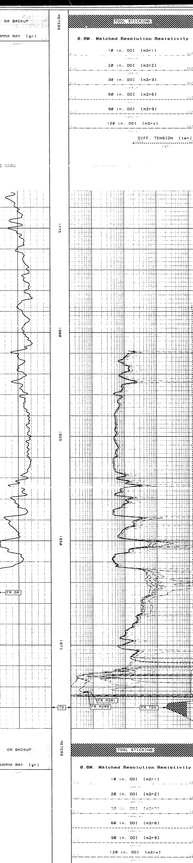
-1865
-1870



CALIBRATION / VERIFICATION SUMMARY

GR PRIMARY CALIBRATION SUMMARY

TOOL # [SDGRM 1002A] (PRESETTING PERFORMED: Thu Nov 05 12:05:07 1998)

UNIT # [PRIMARY CALBOX] CHAN LOG # [CHGRM 001 GR]

	BROADCAST CALIBR'ON		ALT	BROADCAST CALIBR'ON		DIFF.	
	[CALBOX]	[CHAN]	[CALBOX]	[CALBOX]	[CHAN]	[CALBOX]	[CHAN]
GR	185.198	1114.000	0.000	0.000	25.700	185.198	1114.000

GR PRIMARY VERIFICATION SUMMARY

TOOL # [SDGRM 1002A] (PRESETTING PERFORMED: Thu Nov 05 12:12:15 1998)

UNIT # [PRIMARY CALBOX] CHAN LOG # [CHGRM 001 GR]

	BROADCAST CALIBR'ON		ALT	BROADCAST CALIBR'ON		DIFF.	
	[CALBOX]	[CHAN]	[CALBOX]	[CALBOX]	[CHAN]	[CALBOX]	[CHAN]
GR	185.198	1114.000	0.000	0.000	25.700	185.198	1114.000

GR BEFORE LOG VERIFICATION SUMMARY

TOOL # [SDGRM 1002A] (PRESETTING PERFORMED: Fri Jan 16 11:18:41 1998)

UNIT # [PRIMARY CALBOX] CHAN LOG # [CHGRM 001 GR]

	BROADCAST CALIBR'ON		ALT	BROADCAST CALIBR'ON		DIFF.	
	[CALBOX]	[CHAN]	[CALBOX]	[CALBOX]	[CHAN]	[CALBOX]	[CHAN]
GR	185.198	1114.000	0.000	0.000	25.700	185.198	1114.000

GR AFTER LOG VERIFICATION SUMMARY

TOOL # [SDGRM 1002A] (PRESETTING PERFORMED: Fri Jan 16 11:23:38 1998)

UNIT # [PRIMARY CALBOX] CHAN LOG # [CHGRM 001 GR]

	BROADCAST CALIBR'ON		ALT	BROADCAST CALIBR'ON		DIFF.	
	[CALBOX]	[CHAN]	[CALBOX]	[CALBOX]	[CHAN]	[CALBOX]	[CHAN]
GR	185.198	1114.000	0.000	0.000	25.700	185.198	1114.000

HDIL PRIMARY CALIBRATION SUMMARY

TOOL # [SDDIM 1164]* (PRESETTING PERFORMED: Thu Nov 24 18:31:21 1998)

UNIT # [SDDIM 1164]*

ZONE (MMHOs)	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ELEC. OFFSET	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RM Factor	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

TC PRMRS TC20 @ TC20 1 Dol Tower T Factor

TC 20 1.000 @ 0.000 20 @ 1.000

HDIL BEFORE LOG VERIFICATION SUMMARY

TOOL # [SDDIM 1164]* (PRESETTING PERFORMED: Fri Jan 16 12:13:32 1998)

UNIT # [PRIMARY CALBOX]

ZONE (MMHOs)	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ELEC. OFFSET	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

HDIL AFTER LOG VERIFICATION SUMMARY

TOOL # [SDDIM 1164]* (PRESETTING PERFORMED: Fri Jan 16 12:15:18 1998)

UNIT # [PRIMARY CALBOX]

ZONE (MMHOs)	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ELEC. OFFSET	10 Khz	20 Khz	30 Khz	40 Khz	50 Khz	60 Khz	110 Khz	130 Khz	150 Khz
Cell 0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cell 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

COMPANY :	PARAMOUNT RESOURCES LTD.	FILE NO:	
WELL :	PARAMOUNT ET AL AFORMAID N-03		
FIELD :	UNDESIGNATED	API NO:	
COUNTY :	ALBERTA		
LOCATION:		ELEVATIONS	
		KB : 0.00	
		DF : 0.00	
		GL:307.0 m	
		DATE : 20-JAN-98	

WESTERN ATLAS

N.E.B. COPY 1833

COMPANY: PARAMOUNT RESOURCES LTD.

WELL: PARAMOUNT ET AL ARROWHEAD N65

FIELD ARROWHEAD

PROVINCE: NORTHWEST TERRITORIES

AZIMUTHAL LATEROLOG

Schlumberger

9211-P3310-1

PROVINCE: NORTHWEST TERRITORIES
Field: ARROWHEAD
Location: UWI: 1833
Well: PARAMOUNT ET AL ARROWHE
Company: PARAMOUNT RESOURCES LTD

UWI: 1833
SUR LOC: 60 *40' N 122*45' W

Elev.: K.B. 574.6 M
G.L. 567.9 M
D.F. 574.3 M

LOCATION
Permanent Datum: GROUND LEVEL
Log Measured From: KELLY BUSHING
Drilling Measured From: KELLY BUSHING

Elev.: 567.9 M
6.7 M above Perm. Datum

API Serial No.
EL.383

Lat: 60*40'
Long: -122*45'

	Run 1	Run 2	Run 3	Run 4
Logging Date	19-FEB-1998			
Run Number	ONE			
Depth Driller	2926 M			
Schlumberger Depth	2927.2 M			
Bottom Log Interval	2922.3 M			
Top Log Interval	2529 M			
Casing Driller Size @ Depth	177.800 MM @ 2529 M		@	
Casing Schlumberger	2529 M			
Bit Size	154.000 MM			
Type Fluid In Hole	SALT WATER			
MUD Density / Viscosity	1090 K/M3 / 52 S			
MUD Fluid Loss / PH	/ 9			
MUD Source Of Sample	FLOWLINE			
RM @ Measured Temperature	0.150 OHMM @ 24 DEGC	@	@	@
RMF @ Measured Temperature	0.180 OHMM @ 21 DEGC	@	@	@
RMC @ Measured Temperature	0.130 OHMM @ 22 DEGC	@	@	@
Source RMF / RMC	MEASURED / MEASURED			
RM @ MRT / RMF @ MRT	0.041 @ 145 / 0.046 @ 145	@ / @	@ / @	@ / @
Maximum Recorded Temperatures	145 DEGC			
Circulation Stopped / Time	19-FEB-1998 / 8:00			
Logger On Bottom / Time	20-FEB-1998 / 4:50			
Unit Number / Location	2016 / GRANDE PRAIRIE			
Recorded By	SHAWN CARROLL			
Witnessed By	ROD MacEACHERN			

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1	OTHER SERVICES2
OS1: MICROLOG	OS1:
OS2: COMPENSATED NEUTRON	OS2:
OS3: LITHODENSITY	OS3:
OS4: AZIMUTHAL LATEROLOG	OS4:
OS5: FORMATION MICROIMAGE	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
ALL SCALES AND INTERVALS AS PER CLIENT REQUEST.	
HALS RAN ECCENTERED WITH TWO 13MM STANDOFFS.	
THESE LOGS ARE DEPTH CORRELATED TO COMPUTALOG NEUTRON LOG DATED 02/16/98.	
TWO DESCENTS WERE REQUIRED TO ALLOW THE TOOL TO COOL DOWN.	
EXTENDED REPEAT TO VERIFY RESPONSE OF HALS BETWEEN 2800M AND CSG.	
CAL1 FAILED TO OPEN DOWNHOLE.	
RIG: NABORS #16	
PRINTS: 4 FIELD AND 9 FINAL.	
OPERATOR: ERNEST DE'CRUZ	

RUN 1		RUN 2	
SERVICE ORDER #:	1084113	SERVICE ORDER #:	
PROGRAM VERSION:	7C0-712	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

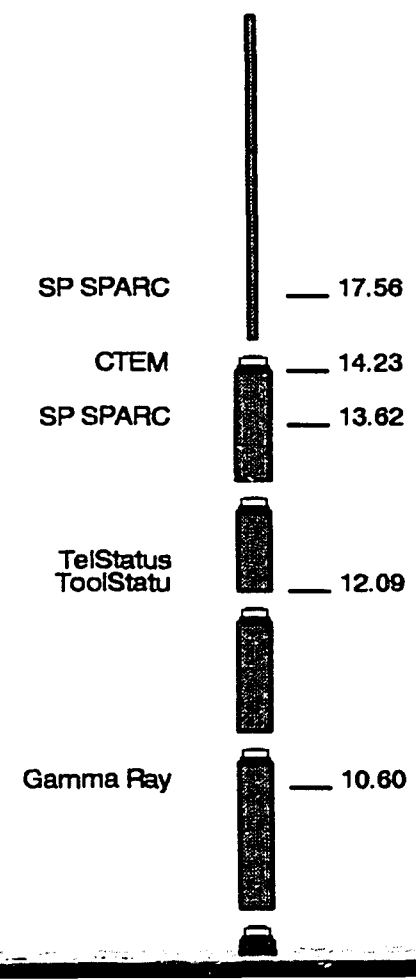
EQUIPMENT DESCRIPTION

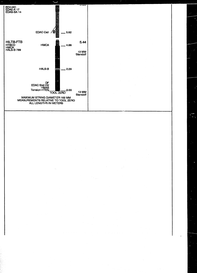
RUN 1 | RUN 2

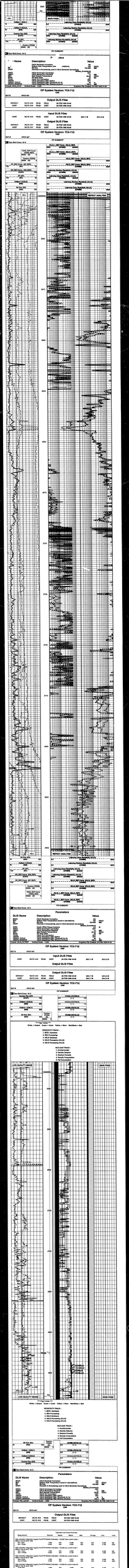
SURFACE EQUIPMENT

LCM-AA
GSR-U/Y
DTM-B

DOWNHOLE EQUIPMENT




Section 1
Section 2
Section 3
GR 0 API 150
CALI 6 IN 16
ILD 0.2 OHMM 2000
ILM 0.2 OHMM 2000
SFLU 0.2 OHMM 2000
DT 140 US/F 40
DRHO -0.15 G/C3 0.15
NPHI 45 PU -15
RHOB 1.95 G/C3 2.95
Depth Scale 1:240 (5"/100')
Measured Depth
MERIDIAN DRILLING
MERIDIAN DRILLING
Well: 7C5-712 (Sec 5 T11 N R5 W)
Field: CARDIUM
County: Grande Prairie
State: Alberta
Date: 2011/12/18
Time: 10:00
Depth Reference: KB 0.0 m above Perm. Datum
Logged Interval: 2000.0 m to 3100.0 m
Total Depth: 3100.0 m
Drilling Fluid Type: Water Based Mud
Max Temp: 90 degC at 3100.0 m
Max Deviation: 0.5 deg at 2000.0 m
Bottom Hole Location: 100/07-08-011-05W5/00
Surface Location: 100/07-08-011-05W5/00
Licence: 0
Operator: Meridian Drilling Ltd.
Rig: 7
Equipment: Schlumberger Platform Express
Recorded by: Schlumberger
Witnessed by: Mr. Dan Ferguson
Output DLIS Files
DEFAULT 0207 HLTD #15 PRIM PRIM FIELD 2011/12/18 2011/12/18
DEFAULT 0208 HLTD #16 PRIM PRIM FIELD 2011/12/18 2011/12/18
Off System Vacation 7C5-712
Data Mark Every: 25 ft
Depth Scale: 1:240
Gamma Ray (GR) 0 API 150
Caliper (CALI) 6 IN 16
Deep Resistivity (ILD) 0.2 OHMM 2000
Medium Resistivity (ILM) 0.2 OHMM 2000
Shallow Resistivity (SFLU) 0.2 OHMM 2000
Sonic (DT) 140 US/F 40
Density (RHOB) 1.95 G/C3 2.95
Neutron Porosity (NPHI) 45 PU -15
Density Correction (DRHO) -0.15 G/C3 0.15
Lithology Density Neutrons (DLN)
Lithology Density Neutrons (DLN)
Lithology Density Neutrons (DLN)



Sea Mark Extra, M.S.

Name	Description	Value
DBTM	Bottom Depth (Calculated)	
DCAL	Delta Caliper (Calculated)	
DCOR	Density Correction (Calculated)	
DEPTH	Depth Channel	
DPHI	Density Porosity (Calculated)	
DRHO	Density Correction (Calculated)	
DTM	Delta Time Mud (Calculated)	
DTMA	Delta Time Mud Average (Calculated)	
DTMC	Delta Time Mud Corrected (Calculated)	
DTMF	Delta Time Mud Filtered (Calculated)	
DTMFC	Delta Time Mud Filtered Corrected (Calculated)	
DTMFCA	Delta Time Mud Filtered Corrected Average (Calculated)	
DTMFA	Delta Time Mud Filtered Average (Calculated)	
DTMFD	Delta Time Mud Filtered Difference (Calculated)	
DTMFDA	Delta Time Mud Filtered Difference Average (Calculated)	
DTMFDC	Delta Time Mud Filtered Difference Corrected (Calculated)	
DTMFDCA	Delta Time Mud Filtered Difference Corrected Average (Calculated)	
DTMFR	Delta Time Mud Filtered Ratio (Calculated)	
DTMFRA	Delta Time Mud Filtered Ratio Average (Calculated)	
DTMFRC	Delta Time Mud Filtered Ratio Corrected (Calculated)	
DTMFRCA	Delta Time Mud Filtered Ratio Corrected Average (Calculated)	
DTMR	Delta Time Mud Ratio (Calculated)	
DTMRA	Delta Time Mud Ratio Average (Calculated)	
DTMRC	Delta Time Mud Ratio Corrected (Calculated)	
DTMRCA	Delta Time Mud Ratio Corrected Average (Calculated)	
DTS	Delta Time Shear	
DTSA	Delta Time Shear Average	
DTSC	Delta Time Shear Corrected	
DTSCA	Delta Time Shear Corrected Average	
DTSF	Delta Time Shear Filtered	
DTSFA	Delta Time Shear Filtered Average	
DTSFC	Delta Time Shear Filtered Corrected	
DTSFCA	Delta Time Shear Filtered Corrected Average	
DTSFD	Delta Time Shear Filtered Difference	
DTSFDA	Delta Time Shear Filtered Difference Average	
DTSFDC	Delta Time Shear Filtered Difference Corrected	
DTSFDCA	Delta Time Shear Filtered Difference Corrected Average	
DTSFR	Delta Time Shear Filtered Ratio	
DTSFRA	Delta Time Shear Filtered Ratio Average	
DTSFRC	Delta Time Shear Filtered Ratio Corrected	
DTSFRCA	Delta Time Shear Filtered Ratio Corrected Average	
DTSR	Delta Time Shear Ratio	
DTSRA	Delta Time Shear Ratio Average	
DTSRC	Delta Time Shear Ratio Corrected	
DTSRCA	Delta Time Shear Ratio Corrected Average	
DTSTORE	Delta Time Shear Storage	
DTSTORE	Delta Time Shear Storage	
DTSTORE	Delta Time Shear Storage

Zvt 2 Phase	0.000	N/A	0.219	N/A	N/A	0.800	DEG
Zvt 3 Phase	0.000	N/A	0.171	N/A	N/A	0.500	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Upper Bridle Voltage mode 1
Before: Feb 20 03:57 1998

Zvb 1 Gain	1.000	N/A	0.994	N/A	N/A	0.025	MV
Zvb 1 Phase	0.000	N/A	0.217	N/A	N/A	2.300	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB M1-M2 Voltage gains
Before: Feb 20 03:57 1998

ZVM 1 Gain	1.000	N/A	0.999	N/A	N/A	0.039	UV
ZVM 2 Gain	1.000	N/A	0.995	N/A	N/A	0.019	UV
ZVM 3 Gain	1.000	N/A	0.994	N/A	N/A	0.019	UV

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB M1-M2 Voltage Phases
Before: Feb 20 03:57 1998

ZVM 1 Phase	0.000	N/A	0.315	N/A	N/A	3.800	DEG
ZVM 2 Phase	0.000	N/A	1.576	N/A	N/A	1.300	DEG
ZVM 3 Phase	0.000	N/A	1.001	N/A	N/A	1.000	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB M1-A0* Voltage gains
Before: Feb 20 03:57 1998

ZVH 1 Gain	1.000	N/A	0.998	N/A	N/A	0.013	UV
ZVH 2 Gain	1.000	N/A	0.994	N/A	N/A	0.046	UV
ZVH 3 Gain	1.000	N/A	0.994	N/A	N/A	0.046	UV

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB M1-A0* Voltage Phases
Before: Feb 20 03:57 1998

ZVH 1 Phase	0.000	N/A	0.581	N/A	N/A	3.800	DEG
ZVH 2 Phase	0.000	N/A	1.966	N/A	N/A	1.300	DEG
ZVH 3 Phase	0.000	N/A	1.236	N/A	N/A	1.000	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Aux Voltage gains
Before: Feb 20 03:57 1998

ZVA 1 Gain	1.000	N/A	1.085	N/A	N/A	0.032	MV
ZVA 2 Gain	1.000	N/A	1.074	N/A	N/A	0.045	MV
ZVA 3 Gain	1.000	N/A	1.011	N/A	N/A	0.045	MV

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Aux Voltage Phases
Before: Feb 20 03:57 1998

ZVA 1 Phase	0.000	N/A	0.876	N/A	N/A	2.300	DEG
ZVA 2 Phase	0.000	N/A	-0.556	N/A	N/A	0.800	DEG
ZVA 3 Phase	0.000	N/A	0.467	N/A	N/A	0.500	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB A0*-A0*' Diff. Voltage mode 1
Before: Feb 20 03:57 1998

ZVD 1 Gain	1.000	N/A	0.998	N/A	N/A	0.047	UV
ZVD 1 Phase	0.000	N/A	0.272	N/A	N/A	3.800	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB A0*-A0*' Diff. Voltage mode 2
Before: Feb 20 03:57 1998

ZVD 2 Gain	1.000	N/A	0.983	N/A	N/A	0.056	UV
ZVD 2 Phase	0.000	N/A	1.036	N/A	N/A	1.300	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB A0*-A0*' Diff. Voltage mode 3A
Before: Feb 20 03:57 1998

ZVD 3A Gain	1.000	N/A	0.989	N/A	N/A	0.056	UV
ZVD 3A Phase	0.000	N/A	0.584	N/A	N/A	1.000	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB A0*-A0*' Diff. Voltage mode 3B
Before: Feb 20 03:57 1998

ZVD 3B Gain	1.000	N/A	1.000	N/A	N/A	0.054	UV
ZVD 3B Phase	0.000	N/A	0.102	N/A	N/A	1.000	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB vertical Voltage mode 1
Before: Feb 20 03:57 1998

ZVV 1 Gain	1.000	N/A	0.997	N/A	N/A	0.022	UV
ZVV 1 Phase	0.000	N/A	0.405	N/A	N/A	2.800	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB vertical Voltage mode 2
Before: Feb 20 03:57 1998

ZVV 2 Gain	1.000	N/A	0.985	N/A	N/A	0.036	UV
ZVV 2 Phase	0.000	N/A	2.316	N/A	N/A	1.300	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Azimuthal Voltages mode 1
Before: Feb 20 03:57 1998

Az 1 Gain - 0	1.000	N/A	0.997	N/A	N/A	0.047	UV
Az 1 Gain - 1	1.000	N/A	1.000	N/A	N/A	0.047	UV
Az 1 Gain - 2	1.000	N/A	0.997	N/A	N/A	0.047	UV
Az 1 Gain - 3	1.000	N/A	0.998	N/A	N/A	0.047	UV
Az 1 Gain - 4	1.000	N/A	0.998	N/A	N/A	0.047	UV
Az 1 Gain - 5	1.000	N/A	0.996	N/A	N/A	0.047	UV
Az 1 Gain - 6	1.000	N/A	0.997	N/A	N/A	0.047	UV
Az 1 Gain - 7	1.000	N/A	1.000	N/A	N/A	0.047	UV
Az 1 Gain - 8	1.000	N/A	0.996	N/A	N/A	0.047	UV
Az 1 Gain - 9	1.000	N/A	0.998	N/A	N/A	0.047	UV
Az 1 Gain - 10	1.000	N/A	0.996	N/A	N/A	0.047	UV
Az 1 Gain - 11	1.000	N/A	0.998	N/A	N/A	0.047	UV
AZ 1 Phase - 0	0.000	N/A	0.245	N/A	N/A	3.800	DEG
AZ 1 Phase - 1	0.000	N/A	0.340	N/A	N/A	3.800	DEG
AZ 1 Phase - 2	0.000	N/A	0.335	N/A	N/A	3.800	DEG
AZ 1 Phase - 3	0.000	N/A	0.315	N/A	N/A	3.800	DEG
AZ 1 Phase - 4	0.000	N/A	0.177	N/A	N/A	3.800	DEG
AZ 1 Phase - 5	0.000	N/A	0.369	N/A	N/A	3.800	DEG
AZ 1 Phase - 6	0.000	N/A	0.331	N/A	N/A	3.800	DEG
AZ 1 Phase - 7	0.000	N/A	0.247	N/A	N/A	3.800	DEG
AZ 1 Phase - 8	0.000	N/A	0.149	N/A	N/A	3.800	DEG
AZ 1 Phase - 9	0.000	N/A	0.369	N/A	N/A	3.800	DEG
AZ 1 Phase - 10	0.000	N/A	0.114	N/A	N/A	3.800	DEG
AZ 1 Phase - 11	0.000	N/A	0.353	N/A	N/A	3.800	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Azimuthal Voltages mode 2
Before: Feb 20 03:57 1998

Az 2 Gain - 0	1.000	N/A	0.982	N/A	N/A	0.056	UV
Az 2 Gain - 1	1.000	N/A	0.985	N/A	N/A	0.056	UV
Az 2 Gain - 2	1.000	N/A	0.983	N/A	N/A	0.056	UV
Az 2 Gain - 3	1.000	N/A	0.983	N/A	N/A	0.056	UV
Az 2 Gain - 4	1.000	N/A	0.983	N/A	N/A	0.056	UV
Az 2 Gain - 5	1.000	N/A	0.982	N/A	N/A	0.056	UV
Az 2 Gain - 6	1.000	N/A	0.982	N/A	N/A	0.056	UV
Az 2 Gain - 7	1.000	N/A	0.985	N/A	N/A	0.056	UV
Az 2 Gain - 8	1.000	N/A	0.981	N/A	N/A	0.056	UV
Az 2 Gain - 9	1.000	N/A	0.983	N/A	N/A	0.056	UV
Az 2 Gain - 10	1.000	N/A	0.980	N/A	N/A	0.056	UV
Az 2 Gain - 11	1.000	N/A	0.984	N/A	N/A	0.056	UV
Az 2 Phase - 0	0.000	N/A	1.049	N/A	N/A	1.300	DEG
Az 2 Phase - 1	0.000	N/A	1.089	N/A	N/A	1.300	DEG
Az 2 Phase - 2	0.000	N/A	1.051	N/A	N/A	1.300	DEG
Az 2 Phase - 3	0.000	N/A	1.058	N/A	N/A	1.300	DEG
Az 2 Phase - 4	0.000	N/A	1.040	N/A	N/A	1.300	DEG
Az 2 Phase - 5	0.000	N/A	1.119	N/A	N/A	1.300	DEG
Az 2 Phase - 6	0.000	N/A	1.018	N/A	N/A	1.300	DEG
Az 2 Phase - 7	0.000	N/A	1.091	N/A	N/A	1.300	DEG
Az 2 Phase - 8	0.000	N/A	1.072	N/A	N/A	1.300	DEG
Az 2 Phase - 9	0.000	N/A	1.004	N/A	N/A	1.300	DEG
Az 2 Phase - 10	0.000	N/A	0.932	N/A	N/A	1.300	DEG
Az 2 Phase - 11	0.000	N/A	0.989	N/A	N/A	1.300	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Azimuthal Voltages mode 3A
Before: Feb 20 03:57 1998

Az 3A Gain - 0	1.000	N/A	0.988	N/A	N/A	0.056	UV
Az 3A Gain - 1	1.000	N/A	0.991	N/A	N/A	0.056	UV
Az 3A Gain - 2	1.000	N/A	0.988	N/A	N/A	0.056	UV
Az 3A Gain - 3	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Gain - 4	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Gain - 5	1.000	N/A	0.988	N/A	N/A	0.056	UV
Az 3A Gain - 6	1.000	N/A	0.988	N/A	N/A	0.056	UV
Az 3A Gain - 7	1.000	N/A	0.991	N/A	N/A	0.056	UV
Az 3A Gain - 8	1.000	N/A	0.987	N/A	N/A	0.056	UV
Az 3A Gain - 9	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Gain - 10	1.000	N/A	0.986	N/A	N/A	0.056	UV
Az 3A Gain - 11	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Phase - 0	0.000	N/A	0.598	N/A	N/A	1.000	DEG
Az 3A Phase - 1	0.000	N/A	0.634	N/A	N/A	1.000	DEG
Az 3A Phase - 2	0.000	N/A	0.614	N/A	N/A	1.000	DEG
Az 3A Phase - 3	0.000	N/A	0.611	N/A	N/A	1.000	DEG
Az 3A Phase - 4	0.000	N/A	0.580	N/A	N/A	1.000	DEG
Az 3A Phase - 5	0.000	N/A	0.639	N/A	N/A	1.000	DEG
Az 3A Phase - 6	0.000	N/A	0.577	N/A	N/A	1.000	DEG
Az 3A Phase - 7	0.000	N/A	0.597	N/A	N/A	1.000	DEG
Az 3A Phase - 8	0.000	N/A	0.579	N/A	N/A	1.000	DEG
Az 3A Phase - 9	0.000	N/A	0.579	N/A	N/A	1.000	DEG
Az 3A Phase - 10	0.000	N/A	0.499	N/A	N/A	1.000	DEG
Az 3A Phase - 11	0.000	N/A	0.567	N/A	N/A	1.000	DEG

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HALSB Azimuthal Voltages mode 3B
Before: Feb 20 03:57 1998

Az 3B Gain - 0	1.000	N/A	1.000	N/A	N/A	0.054	UV
Az 3B Gain - 1	1.000	N/A	1.005	N/A	N/A	0.054	UV
Az 3B Gain - 2	1.000	N/A	1.000	N/A	N/A	0.054	UV
Az 3B Gain - 3	1.000	N/A	1.001	N/A	N/A	0.054	UV
Az 3B Gain - 4	1.000	N/A	1.001	N/A	N/A	0.054	UV
Az 3B Gain - 5	1.000	N/A	1.003	N/A	N/A	0.054	UV
Az 3B Gain - 6	1.000	N/A	0.998	N/A	N/A	0.054	UV
Az 3B Gain - 7	1.000	N/A	1.005	N/A	N/A	0.054	UV
Az 3B Gain - 8	1.000	N/A	1.002	N/A	N/A	0.054	UV
Az 3B Gain - 9	1.000	N/A	0.998	N/A	N/A	0.054	UV
Az 3B Gain - 10	1.000	N/A	0.993	N/A	N/A	0.054	UV
Az 3B Gain - 11	1.000	N/A	0.997	N/A	N/A	0.054	UV
Az 3B Phase - 0	0.000	N/A	0.111	N/A	N/A	1.000	DEG
Az 3B Phase - 1	0.000	N/A	0.262	N/A	N/A	1.000	DEG
Az 3B Phase - 2	0.000	N/A	0.072	N/A	N/A	1.000	DEG
Az 3B Phase - 3	0.000	N/A	0.201	N/A	N/A	1.000	DEG
Az 3B Phase - 4	0.000	N/A	0.129	N/A	N/A	1.000	DEG
Az 3B Phase - 5	0.000	N/A	0.335	N/A	N/A	1.000	DEG
Az 3B Phase - 6	0.000	N/A	0.020	N/A	N/A	1.000	DEG
Az 3B Phase - 7	0.000	N/A	0.296	N/A	N/A	1.000	DEG
Az 3B Phase - 8	0.000	N/A	0.151	N/A	N/A	1.000	DEG
Az 3B Phase - 9	0.000	N/A	0.041	N/A	N/A	1.000	DEG
Az 3B Phase - 10	0.000	N/A	-0.160	N/A	N/A	1.000	DEG
Az 3B Phase - 11	0.000	N/A	0.000	N/A	N/A	1.000	DEG

Eccentralized Dual Axis Caliper Wellsite Calibration - Caliper 1 Calibration
Before: Feb 20 04:04 1998

Caliper 1 Small Ring	203.2	N/A	67.75	N/A	N/A	N/A	MM
Caliper 1 Large Ring	304.8	N/A	109.5	N/A	N/A	N/A	MM

Eccentralized Dual Axis Caliper Wellsite Calibration - Caliper 2 Calibration
Before: Feb 20 04:04 1998

Caliper 2 Small Ring	203.2	N/A	38.03	N/A	N/A	N/A	MM
Caliper 2 Large Ring	304.8	N/A	57.98	N/A	N/A	N/A	MM

Scintillation Gamma-Ray - N Wellsite Calibration - Detector Calibration
Before: Feb 19 17:58 1998

Gamma Ray (Jig - Bkg)	145.9	N/A	145.9	N/A	N/A	13.27	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-DTS / Equipment Identification

Primary Equipment:

HILT Azimuthal Laterolog Sonde B	HALS - B	789
HILT HTBC DTS mode	HTBC -	
HTBC Communication Assembly DTS Mode	HMCA -	

Auxiliary Equipment:

Laterolog Control Module	LCM - AA

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Total current mode 1

	Value	Minimum	Nominal	Maximum
Itot 1 Gain MA	0.998	0.926	1.000	1.081
Itot 1 Phase DEG	0.000	-0.100	0.000	0.100

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Aux current mode 1

	Value	Minimum	Nominal	Maximum
Iaux 1 Gain MA	0.992	0.854	1.000	1.180
Iaux 1 Phase DEG	0.158	-4.600	0.000	4.600

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Aux current mode 2

	Value	Minimum	Nominal	Maximum
Iaux 2 Gain MA	0.977	0.816	1.000	1.232
Iaux 2 Phase DEG	-0.000	-1.000	0.000	0.100

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB A0 current mode 3A

	Value	Minimum	Nominal	Maximum
I0 3A Gain UA	0.985	0.893	1.000	1.114
I0 3A Phase DEG	-0.000	-1.000	0.000	0.100

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB A0 current mode 3B

	Value	Minimum	Nominal	Maximum
I0 3B Gain UA	0.975	0.893	1.000	1.114
I0 3B Phase DEG	0.000	-1.000	0.000	0.100

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Torpedo Voltage gains

	Value	Minimum	Nominal	Maximum
Zvt 1 Gain MV	0.994	0.925	1.000	1.078
Zvt 2 Gain MV	0.965	0.865	1.000	1.153
Zvt 3 Gain MV	0.989	0.865	1.000	1.153

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Torpedo Voltage Phases

	Value	Minimum	Nominal	Maximum
Zvt 1 Phase DEG	0.245	-4.400	0.000	4.400
Zvt 2 Phase DEG	0.219	-2.800	0.000	2.800
Zvt 3 Phase DEG	0.171	-1.400	0.000	1.400

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Upper Bridle Voltage mode 1

	Value	Minimum	Nominal	Maximum
Zvb 1 Gain MV	0.994	0.925	1.000	1.078
Zvb 1 Phase DEG	0.217	-4.400	0.000	4.400

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB M1-M2 Voltage gains

	Value	Minimum	Nominal	Maximum
ZVM 1 Gain UV	0.999	0.895	1.000	1.117
ZVM 2 Gain UV	0.995	0.943	1.000	1.056
ZVM 3 Gain UV	0.994	0.943	1.000	1.056

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB M1-M2 Voltage Phases

	Value	Minimum	Nominal	Maximum
ZVM 1 Phase DEG	0.315	-6.500	0.000	6.500
ZVM 2 Phase DEG	1.576	-3.300	0.000	3.300
ZVM 3 Phase DEG	1.001	-2.000	0.000	2.000

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB M1-A0* Voltage gains

	Value	Minimum	Nominal	Maximum
ZVH 1 Gain UV	0.998	0.962	1.000	1.039
ZVH 2 Gain UV	0.994	0.864	1.000	1.154
ZVH 3 Gain UV	0.994	0.864	1.000	1.154

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB M1-A0* Voltage Phases

	Value	Minimum	Nominal	Maximum
ZVH 1 Phase DEG	0.581	-6.500	0.000	6.500
ZVH 2 Phase DEG	1.966	-3.300	0.000	3.300
ZVH 3 Phase DEG	1.236	-2.000	0.000	2.000

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Aux Voltage gains

	Value	Minimum	Nominal	Maximum
ZVA 1 Gain MV	1.085	0.905	1.000	1.103
ZVA 2 Gain MV	1.074	0.866	1.000	1.151
ZVA 3 Gain MV	1.011	0.866	1.000	1.151

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Aux Voltage Phases

	Value	Minimum	Nominal	Maximum
ZVA 1 Phase DEG	0.876	-4.100	0.000	4.100
ZVA 2 Phase DEG	-0.556	-2.300	0.000	2.300
ZVA 3 Phase DEG	0.467	-1.000	0.000	1.000

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB A0*-A0*' Diff. Voltage mode 1

	Value	Minimum	Nominal	Maximum
ZVD 1 Gain UV	0.998	0.874	1.000	1.147
ZVD 1 Phase DEG	0.272	-6.300	0.000	6.300

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB A0*-A0*' Diff. Voltage mode 2

	Value	Minimum	Nominal	Maximum
ZVD 2 Gain UV	0.983	0.842	1.000	1.187
ZVD 2 Phase DEG	1.036	-3.300	0.000	3.300

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB A0*-A0*' Diff. Voltage mode 3A

	Value	Minimum	Nominal	Maximum
ZVD 3A Gain UV	0.989	0.842	1.000	1.187
ZVD 3A Phase DEG	0.534	-2.000	0.000	2.000

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB A0*-A0*' Diff. Voltage mode 3B

	Value	Minimum	Nominal	Maximum
ZVD 3B Gain UV	1.000	0.845	1.000	1.183
ZVD 3B Phase DEG	0.102	-2.000	0.000	2.000

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB vertical Voltage mode 1

	Value	Minimum	Nominal	Maximum
ZVV 1 Gain UV	0.997	0.936	1.000	1.065
ZVV 1 Phase DEG	0.405	-4.600	0.000	4.600

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB vertical Voltage mode 2

	Value	Minimum	Nominal	Maximum
ZVV 2 Gain UV	0.985	0.895	1.000	1.112
ZVV 2 Phase DEG	2.316	-2.800	0.000	2.800

Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Azimuthal Voltages mode 1

Idx	Az 1 Gain UV Value	Idx	AZ 1 Phase DEG Value
0	0.997	0	0.245
1	1.000	1	0.340
2	0.997	2	0.335
3	0.998	3	0.315
4	0.998	4	0.177
5	0.996	5	0.369
6	0.997	6	0.331
7	1.000	7	0.247
8	0.996	8	0.149
9	0.998	9	0.369
10	0.996	10	0.114
11	0.998	11	0.353

Gain: 0.874 (Minimum) 1.000 (Nominal) 1.147 (Maximum); Phase: -6.300 (Minimum) 0.000 (Nominal) 6.300 (Maximum)
Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Azimuthal Voltages mode 2

Idx	Az 2 Gain UV Value	Idx	Az 2 Phase DEG Value
0	0.982	0	1.049
1	0.985	1	1.089
2	0.983	2	1.051
3	0.983	3	1.058
4	0.983	4	1.040
5	0.982	5	1.119
6	0.982	6	1.018
7	0.985	7	1.091
8	0.981	8	1.072
9	0.983	9	1.004
10	0.980	10	0.932
11	0.984	11	0.989

Gain: 0.842 (Minimum) 1.000 (Nominal) 1.187 (Maximum); Phase: -3.300 (Minimum) 0.000 (Nominal) 3.300 (Maximum)
Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Azimuthal Voltages mode 3A

Idx	Az 3A Gain UV Value	Idx	Az 3A Phase DEG Value
0	0.988	0	0.598
1	0.991	1	0.634
2	0.988	2	0.614
3	0.989	3	0.611
4	0.989	4	0.580
5	0.988	5	0.639
6	0.988	6	0.577
7	0.991	7	0.597
8	0.987	8	0.579
9	0.989	9	0.579
10	0.986	10	0.499
11	0.989	11	0.567

Gain: 0.842 (Minimum) 1.000 (Nominal) 1.187 (Maximum); Phase: -2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)
Before: Feb 20 03:57 1998

High resolution Integrated Logging Tool-DTS Wellsite Calibration
HALSB Azimuthal Voltages mode 3B

Idx	Az 3B Gain UV Value	Idx	Az 3B Phase DEG Value
0	1.000	0	0.111
1	1.005	1	0.262
2	1.000	2	0.072
3	1.001	3	0.201
4	1.001	4	0.129
5	1.003	5	0.335
6	0.998	6	0.020
7	1.005	7	0.296
8	1.002	8	0.151
9	0.998	9	0.041
10	0.993	10	-0.160
11	0.997	11	0.000

Gain: 0.845 (Minimum) 1.000 (Nominal) 1.183 (Maximum); Phase: -2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)
Before: Feb 20 03:57 1998

Eccentralized Dual Axis Caliper / Equipment Identification

Primary Equipment:

Eccentralized Dual Axis Sonde - BA	EDAS - BA	14
Eccentralized Dual Axis Electronics (car	EDAE - A	17

Auxiliary Equipment:

Electronics Cartridge Housing	ECH - KC

Eccentralized Dual Axis Caliper Wellsite Calibration
Caliper 1 Calibration

Phase		Value	Minimum	Nominal	Maximum
Before	Caliper 1 Small Ring MM		172.7	203.2	233.7
Before	Caliper 1 Large Ring MM		259.1	304.8	350.5

Before: Feb 20 04:04 1998

Eccentralized Dual Axis Caliper Wellsite Calibration
Caliper 2 Calibration

Phase		Value	Minimum	Nominal	Maximum
Before	Caliper 2 Small Ring MM		172.7	203.2	233.7
Before	Caliper 2 Large Ring MM		259.1	304.8	350.5

Before: Feb 20 04:04 1998

Scintillation Gamma-Ray - N / Equipment Identification

Primary Equipment:

Scintillation Gamma Cartridge	SGC - TB	3588
Scintillation Gamma Detector	SGD - TAA	

Auxiliary Equipment:

Scintillation Gamma Housing	SGH - K
Gamma Source Radioactive	GSR - U/Y

Scintillation Gamma-Ray - N Wellsite Calibration
Detector Calibration

Phase		Value	Minimum	Nominal	Maximum
Before	Gamma Ray Background GAPI	26.57	0	30.00	120.0
Before	Gamma Ray (Jig - Bkg) GAPI	145.9	132.7	145.9	159.2
Before	Gamma Ray (Calibrated) GAPI	165.0	150.0	165.0	180.0

Before: Feb 19 17:58 1998

NATIONAL ENERGY BOARD
ENG... BRANCH
MAR 3 0 1998

COMPANY	PARAMOUNT RESOURCES LTD.	BOTTOM LOG INTERVAL	2922.3 M
		SCHLUMBERGER DEPTH	2927.2 M
WELL	PARAMOUNT ET AL ARROWHEAD N65	DEPTH DRILLER	2926 M
FIELD	ARROWHEAD	KELLY BUSHING	574.6 M
PROVINCE	NORTHWEST TERRITORIES	DRILL FLOOR	574.3 M
		GROUND LEVEL	567.9 M

AZIMUTHAL LATEROLOG

Schlumberger

SONIC

N.E.B. COPY 1833

WESTERN ATLAS

DIGITAL ACOUSTILOG
GAMMA RAY LOG
X-Y CALIPER LOG

FILE NO:	COMPANY	PARAMOUNT RESOURCES LTD.
	WELL	PARAMOUNT E.E AL ARROWHEAD N-65
API NO:	FIELD	UNDEFINED
	PROVINCE	N.W.T

LOCATION:

WID : 1833

9211-933-10-1

OTHER SERVICES
HDIL-GR
ZDL-CN-GR-XY
CVL
LOGSTAR

PERMANENT DATUM G.L. ELEVATION 567.9 M
LOG MEASURED FROM K.B. 6.7 M ABOVE P.D.
DRILL. MEAS. FROM KELLY BUSHING

ELEVATIONS
KB 574.6 M
DF
GL 567.9 M

DATE	30-JAN-98			
RUN	ONE			
SERVICE ORDER	968637			
DEPTH DRILLER	1890.0 M			
DEPTH LOGGER	1890.0 M			
BOTTOM LOGGED INTERVAL	1878.0 M			
TOP LOGGED INTERVAL	0.0 M			
CASING - DRILLER	339.7 MM	@ 480.0 M	@	
CASING LOGGER	479.0 M			
BIT SIZE	311.0 MM			
TYPE OF FLUID IN HOLE	CUTTER D			
DENSITY / VISCOSITY	980 G/L	57 S		
PH / FLUID LOSS	0	0 C3		
SOURCE OF SAMPLE	NOT TAKEN			
RM AT MEAS. TEMP.	6.4 OHMM	@ 70 DEGC	@	
RMF AT MEAS. TEMP.	0 OHMM	@ 0 DEGC	@	
RMC AT MEAS. TEMP.	0 OHMM	@ 0 DEGC	@	
SOURCE OF RMF / RMC	N/A	N/A		
RM AT BHT	6.4 OHMM	@ 70 DEGC	@	
TIME SINCE CIRCULATION	12.5 HRS.			
MAX. RECORDED TEMP.	70 DEGC			
EQUIP. NO. / LOCATION	HL 6517	G.P.		
RECORDED BY	K.VALOUISKI/W.LOWTHER			
WITNESSED BY	D.FERGUSON			

F213 1E32

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. HOWEVER, WE WILL NOT BE RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

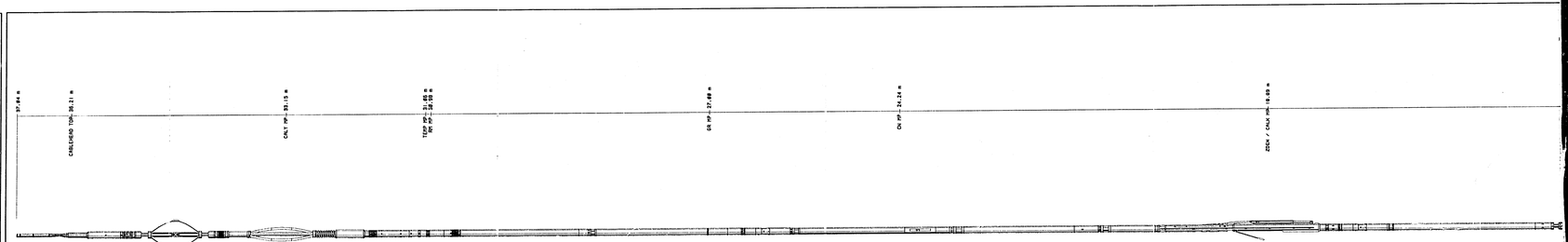
RUN 1: TIME STOPPED CIRCULATION : 0000 30-JAN-98.
HDIL,DAL & ZDL-CN RECORDED IN COMBINATION.
DELTA-T SCALES : 100 - 500 US/M
REPEAT PASS PRESENTED TWICE WITH 100 - 500 US/M AND 100 - 300 US/M SCALES.
GR REPEAT PASS PRESENTED TWICE WITH 0 - 150 GAPI.
ALL SCALES AND PRESENTATIONS AS PER CUSTOMER'S REQUEST.
CREW : S.RATTRAY * E.BARRETT

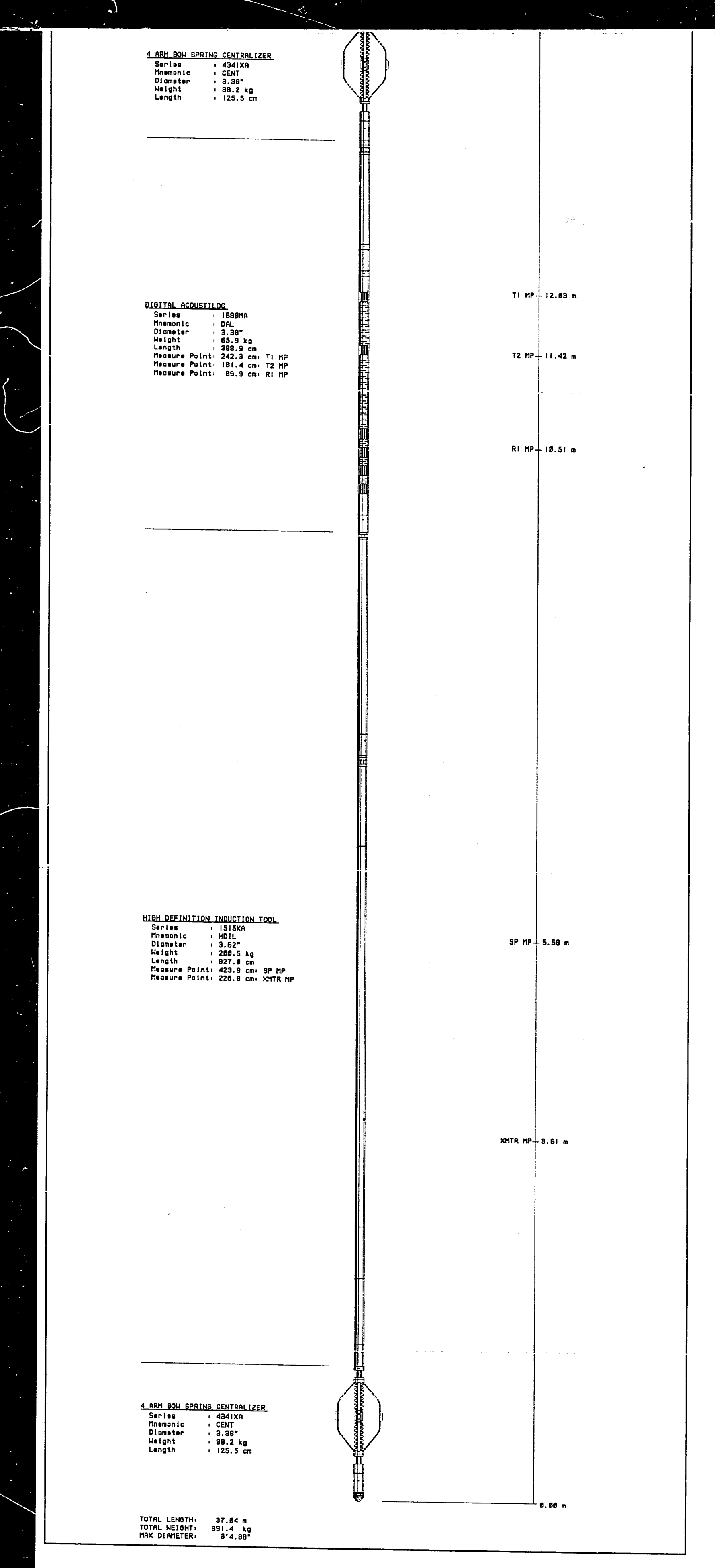
EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	CST	43042C	072843	3-4BW CENTRALIZER
1	1	VSL	42035A	172345	4-ARM CALIPER
1	1	TTRM	39815A	173338	FREE
1	1	CGMB	35105A	173*****	FREE
1	1	SDS	13281A	153116	FREE
1	1	HNGC	13281A	153116	HINGE JOINT
1	1	CN	24465A	152411	BOWSPRING/LTD
1	1	ZDL	2228SA/2228NA	155372/15535	PAD DEVICE
1	1	KNGC	39324A	158389	KNUCKLE JOINT
1	1	DAL(L)	18615A	155982	FREE
1	1	CVL	43042A	153128	3-4BW CENTRALIZER
1	1	DAL(M)	18809A	154419	CENTRALIZER
1	1	HDIL	15195A/15384A	17789/178874	CENTRALIZED
1	1	CENT	43419A	173211	4-4BW CENTRALIZER

INSTRUMENT CONFIGURATION

Source File /2011/pdata/ps93d11.log





MAIN PASS – UPPER PRESENTATION

Release:3.0 May 05, 1997 Fileview 1.83ulb Cplot /main/27 Fri Jan 30 15:45:16 1998
Updates:1 Pcrplt /main/35 Pdf_Cpp /main/12

PARAMETER AND FILTER SUMMARY REPORT

FILE: /datla/pass/par65/c874A03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 459.715 m BOTTOM DEPTH: 1890.065 m

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
GR	FILTER ()	medium (1)		TOP	BOTTOM
Y AXIS CALIPER	FILTER ()	light (2)		"	"
	FILTER (.h)	light (2)		"	"
	FILTER (.I)	light (2)		"	"
X AXIS CALIPER	FILTER ()	light (2)		"	"
	FILTER (.h)	light (2)		"	"
	FILTER (.I)	light (2)		"	"
DT24	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	244.500	mm	TOP	BOTTOM
X-Y CALIPER	X-Y Caliper	Average		"	"
BIT SIZE	BIT SIZE	311.000	mm	"	"

ACOUSTIC POROSITY

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
DELTA T CURVE SELECTION	CURVE SELECTION	first arrival		TOP	BOTTOM

ACOUSTIC PICK CONTROL

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
DELTA-T REJECTION RANGE	REJECTION DTmin	131	us/m	TOP	BOTTOM
	REJECTION DTmax	591	us/m	"	"
FIRST ARRIVAL PICK (5 FT)	SEARCH START OFFSET (sfa11*)	0	us	"	"
	SEARCH START OFFSET (sfa12*)	0	us	"	"
	SEARCH START OFFSET (sfa13*)	0	us	"	"
	SEARCH START OFFSET (sfa14*)	0	us	"	"
	SEARCH WINDOW LENGTH	1200	us	"	"
	THRESHOLD FACTOR	0.40		TOP	898.703
		0.30		898.703	BOTTOM
	THRESHOLD MINIMUM (sfa11*)	41		TOP	896.341
		46		896.341	896.645
		47		896.645	896.950
		60		896.950	897.788
		35		897.788	BOTTOM
	THRESHOLD MINIMUM (sfa12*)	41		TOP	896.493
		46		896.493	896.798
		47		896.798	897.103
		60		897.103	897.941
		35		897.941	BOTTOM
	THRESHOLD MINIMUM (sfa13*)	41		TOP	896.645
		46		896.645	896.950
		47		896.950	897.255
		60		897.255	898.093
		35		898.093	BOTTOM
	THRESHOLD MINIMUM (sfa14*)	41		TOP	896.798
		46		896.798	897.103
		47		897.103	897.407
		60		897.407	898.246
		35		898.246	BOTTOM
	E3 THRESHOLD	OFF		TOP	BOTTOM

ACOUSTIC QUALITY CONTROL

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
CYCLE SKIP LIMIT	CYCLE SKIP LIMIT	100	us	TOP	BOTTOM

ACOUSTIC WAVEFORM FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
ACOUSTIC WAVEFORM FILTER	SURFACE WAVE FILTER	ON		TOP	BOTTOM
	LOW FREQ CUTOFF	5000	Hz	"	"
	HIGH FREQ CUTOFF	20000	Hz	"	"

ACOUSTIC X CORRELATION

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
XCORR WINDOW POSITION (5 FT)	USE CALIPER	CALIPER		TOP	BOTTOM
	WINPOS	691	us	"	"
XCORR DELTA-T (5 FT)	Xcorr CWlength	150	us	"	"
	Xcorr DTmin	98	us/m	"	"
	Xcorr DTmax	591	us/m	"	"

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
bit	0.00	caly	33.15	gr	26.97		
calx	18.82	dt24qs	11.28	ten	0.00		

Presentation : /datla/pass/par65/dal_up.pdf
Data File : FI : cpu1:/datla/pass/par65/c874A03.xtf
Company : paramount resources ltd.
Well : paramount et al arrowhead n-65
Field : undefined
Interval : 426.95 - 1890.06 Meters
Oct : c874A

DRILLING PROCESS
DRILL RATE
DRILL RATE
DRILL RATE

CONTINUED
DT - DELTA-T COMPRESSIONAL (USEC/F)
METERS
1775
1800
1825
1850
1875
METERS
CONTINUED
DT - DELTA-T COMPRESSIONAL (USEC/F)
METERS
1775
1800
1825
1850
1875
METERS
CONTINUED
DT - DELTA-T COMPRESSIONAL (USEC/F)
METERS
1775
1800
1825
1850
1875
METERS
CONTINUED
DT - DELTA-T COMPRESSIONAL (USEC/F)
METERS
1775
1800
1825
1850
1875
METERS

GR TO SURFACE

Release-3.0 May 05, 1997 Filename /dbin
Updates: Path: /home/ss

Cplot /home/ss/27 Fri Jan 30 15:46:45 1998
Ref.Cpo /home/ss/2

PARAMETER AND FILTER SUMMARY REPORT

File: /home/ss/ss/GR/GR0005.par
Cplot: /home/ss/ss/GR/GR0005.cpo
TOP/BOTTOM: 96.00M / BOTTOM DEPTH: 497.52M

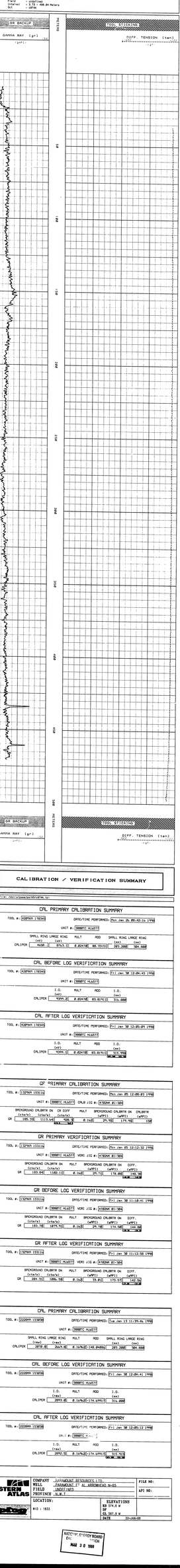
SYMMETRIC FILTER

REPLACEMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
GR	FILTER [1]	median [1]		TOP	BOTTOM
TENSION	FILTER [1]	median [1]		"	"

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
GF	28.97	ten	0.00				

Presentation: /home/ss/ss/GR/dual.prf
Data File: /home/ss/ss/GR/GR0005/GR0005.lst
Company: = paramount resources ltd.
Well: = paramount et al arrowhead h-65
Field: = undefined
Interval: = 0.75 - 498.00 Meters
Dir: = cartes



CALIBRATION / VERIFICATION SUMMARY

Source File: /home/ss/ss/GR/cal.lp

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 42GPWA 1183HS — DATE/TIME PERFORMED: Mon Jan 26 08:42:16 1998

UNIT #: 3988TIC HLASTO

	SMALL RING (cm)	LARGE RING (cm)	MULT	MOD	SMALL RING (cm)	LARGE RING (cm)
CALIPER	4420.	8763.0	0.024768	88.70153	287.2080	384.6080

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 42GPWA 1183HS — DATE/TIME PERFORMED: Fri Jan 30 12:04:45 1998

UNIT #: 3988TIC HLASTO

	I.D. (mm)	MULT	MOD	I.D. (cm)
CALIPER	4299.2	0.024768	85.8141	315.0080

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 42GPWA 1183HS — DATE/TIME PERFORMED: Fri Jan 30 12:05:09 1998

UNIT #: 3988TIC HLASTO

	I.D. (mm)	MULT	MOD	I.D. (cm)
CALIPER	4299.2	0.024768	85.8141	315.0080

GF PRIMARY CALIBRATION SUMMARY

TOOL #: 132MGN 1331Ia — DATE/TIME PERFORMED: Mon Jan 05 12:00:03 1998

UNIT #: 3988TIC HLASTO — CMLR JIG #: 4782KNX 81-384

	BACKGROUND (counts)	CMLR ON (counts)	CR OFF (counts)	MULT	BACKGROUND (uWP1)	CMLR ON (uWP1)	CMLR OFF (uWP1)
GR	185.39	1113.64	928.25	0.1562	29.962	174.126	150
			0.0				0.0

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 132MGN 1331Ia — DATE/TIME PERFORMED: Mon Jan 05 12:12:32 1998

UNIT #: 3988TIC HLASTO — VERI JIG #: 4782KNX 81-384

	BACKGROUND (counts)	CMLR ON (counts)	MULT	BACKGROUND (uWP1)	CMLR ON (uWP1)	DIFF. (uWP1)
GR	183.04	1182.13	0.1562	29.962	178.08	148.12
						148.00
						0.12

GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 132MGN 1331Ia — DATE/TIME PERFORMED: Fri Jan 30 11:18:41 1998

UNIT #: 3988TIC HLASTO — VERI JIG #: 4782KNX 81-384

	BACKGROUND (counts)	CMLR ON (counts)	MULT	BACKGROUND (uWP1)	CMLR ON (uWP1)	DIFF. (uWP1)
GR	183.39	1074.50	0.1562	29.78	174.58	144.80
						144.80
						0.00

GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 132MGN 1331Ia — DATE/TIME PERFORMED: Fri Jan 30 11:12:50 1998

UNIT #: 3988TIC HLASTO — VERI JIG #: 4782KNX 81-384

	BACKGROUND (counts)	CMLR ON (counts)	MULT	BACKGROUND (uWP1)	CMLR ON (uWP1)	DIFF. (uWP1)
GR	184.50	1086.58	0.1562	30.03	175.50	145.46
						145.46
						0.00

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2220PMN 1530EB — DATE/TIME PERFORMED: Tue Jan 13 11:39:46 1998

UNIT #: 3988TIC HLASTO

	SMALL RING (mm)	LARGE RING (mm)	MULT	MOD	SMALL RING (cm)	LARGE RING (cm)
CALIPER	2878.0	2669.0	0.147620	-140.04860	287.2080	384.6080

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2220PMN 1530EB — DATE/TIME PERFORMED: Fri Jan 30 12:04:41 1998

UNIT #: 3988TIC HLASTO

	I.D. (mm)	MULT	MOD	I.D. (cm)
CALIPER	2993.0	0.147620	-174.14993	315.0080

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2220PMN 1530EB — DATE/TIME PERFORMED: Fri Jan 30 12:05:12 1998

UNIT #: 3988TIC HLASTO

	I.D. (mm)	MULT	MOD	I.D. (cm)
CALIPER	2992.0	0.147620	-174.14993	315.0080

WESTERN ATLAS	COMPANY: PARAMOUNT RESOURCES LTD.		FILE NO:
	WELL: PARAMOUNT ET AL ARROWHEAD H-65		
	FIELD: UNDEFINED		API NO:
	PROVINCE: N.W.T.		
	LOCATION:	ELEVATIONS: KB 574.0 M	
	WID : 1833	DF 569.0 M	
		GL 561.0 M	
		DATE: 30-JAN-98	

NATIONAL ENERGY BOARD
MAR 3 0 1999
RECEIVED

N.E.B. COPY 1833

COMPUTALOG

CS-400

BOREHOLE COMPENSATED SONIC LOG

PROVINCE	NORTHWEST TERRITORIES
FIELD	ARROWHEAD
WELL	PARMOUNT ET AL
COMPANY	PARAMOUNT RESOURCES LTD.

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARMOUNT ET AL ARROWHEAD N65
FIELD	ARROWHEAD
PROVINCE	NORTHWEST TERRITORIES

A21-P73-10-1

LOCATION
60° 40' 122° 45'

Perm. Datum Ground Level Elev. 567.9
Log measured from K.B. , 6.7 m above Permanent Datum.

Other Services:

ELEV. K.B. 574.60
G.L. 574.60
CBF -----

Date	FEBRUARY 17,1988		
Run No.	ONE		
First Reading	2634.6		
Last Reading	2524.8		
Meters Meas.	109.8		
Depth Reached	2630.0		
Bot. Driller	2625.0		
Csg. Logger	2524.8		
Csg. Driller	2530.0		
Fluid Type	SALT WATER		
Dens. & Visc.	1050.00 | 49.00		
Mud pH	10.50		
Mud Water Loss	N/A		
Mud Res.	0.03 @ 10 °C	@ °C	@ °C
Mud Res. @ BHT	0.01 @ 101 °C	@ °C	@ °C
Rmc	N/A @ °C	@ °C	@ °C
Rmf	N/A @ °C	@ °C	@ °C
Rmf @ BHT	N/A @ °C	@ °C	@ °C
Bit Size	154mm		
Spacing	0.61M		
Operating Time	3.0 hrs.		
Unit #	252		
Location	EDMONTON		
Recorded By	RUSSILL		
Witnessed By	MAC EACHERN		

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT AND DO NOT GUARANTEE THEIR ACCURACY OR CORRECTNESS. ANY OPINION EXPRESSED REPRESENTS THE BEST JUDGEMENT OF SCHLUMBERGER ENTERPRISES LIMITED (SEL) AND ITS DULY AUTHORIZED REPRESENTATIVES. SEL AND ITS OFFICERS, AGENTS OR EMPLOYEES, ASSUME NO RESPONSIBILITY FOR ANY LOSS OR DAMAGE SUFFERED BY THE CLIENT OR ANY OTHER PERSON OR ORGANIZATION ON ANY ACCOUNT WHATSOEVER, OR FOR ANY LOSS, COST, DAMAGE OR EXPENSE IMPOSED ON THE CLIENT BY THIRD PARTIES OR RESULTING FROM THE USE OF THE INTERPRETATIONS PROVIDED. ALL INTERPRETATIONS ARE MADE AT THE SOLE RISK OF THE CLIENT. ERRORS AND OMISSIONS EXCEPTED. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR RATES, POLICIES AND PROVISIONS AS PUBLISHED FROM TIME TO TIME.

REMARKS: Bit Diameter 154mm
Drilling Stopped 1830 hrs.
CORRELATED TO RUN ONE
RECORDED AT 2624 METERS. LOGGED FROM BRIDGE.

Service Order # 16976
Tool on Bottom 2230/17 BHT 101 °C
Primer: 4

Number	Type	Serial No.	Depth
Disk	Type	Serial No.	Depth
Tools in Hole			
Tools in Drillpipe			
Hole Fluid			
Drill Pipe	Size	Wt.	
Drill Water Loss			
Rm @ Meas. Temp.			
Rmf @ Meas. Temp.			
Rmc @ Meas. Temp.			
Source Rmf Rmc			
Rm @ BHT			
Rmf @ BHT			
Rmc @ BHT			

Type Log: SONIC
SCALE CHANGES
INTERVAL

Run No.	Tool Type	Serial No.
ONE	BCT-A	19251
ONE	SONIC-A	9125
ONE	CAL-CB	8113

EQUIPMENT DATA

REMARKS

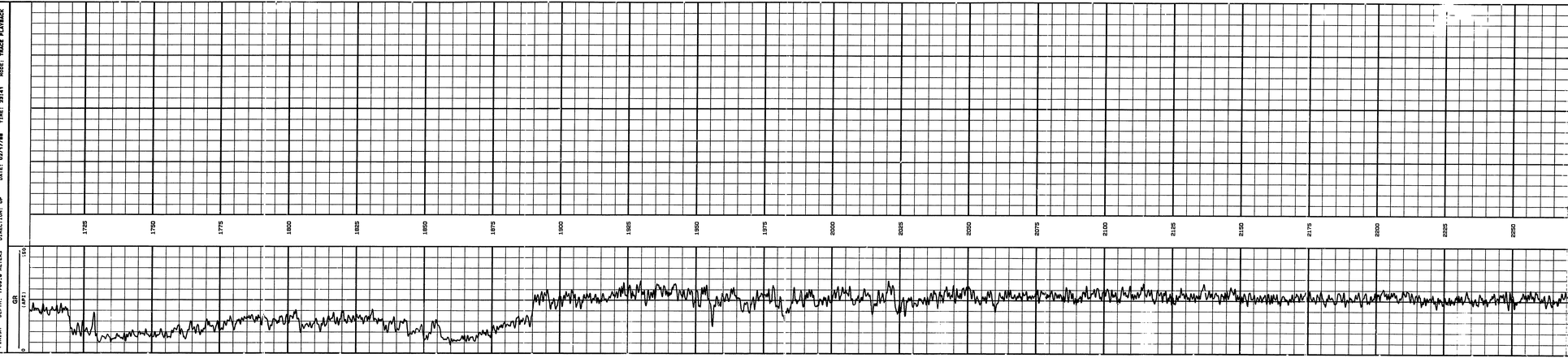
MAIN PASS
1:200 SCALE

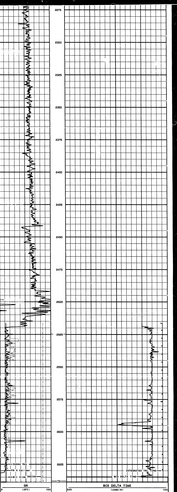
V.07.31.97

VERSION: 1.64

16976BCS1

FINISH DEPTH: 1705.8 METERS DIRECTION: UP DATE: 02/17/88 TIME: 23:41 MODE: TRACE PLAYBACK




MUD DENSITY TRACE
CONTINUED
CALIPER
TRACE
CONTINUED
DATE
DIRECTION OF MOTION
DIRECTION OF
DATE
RECORDED
TIME
DELAY
MODEL TRACE PLOTTED
CONTINUED
DIRECTION OF MOTION
DIRECTION OF
DATE
RECORDED
TIME
DELAY
MODEL TRACE PLOTTED

GR	BCS DELTA TIME
0 (API) 150	300 (usec/m) 100
X CALIPER	
125 (mm) 375	
TENSION	
20000 LBS 0	

START DEPTH: 2839.4 METERS DIRECTION: UP DATE: 02/17/98 TIME: 23:07 MODE: TRACE PLAYBACK

14976BCS1

v.07.31.97 VERSION: 1.64

01/24/98	19:44	0.0 m	Ver 1.64-1.64	Job 15138

Caliper Before Survey Calibration

Tool Type: XCA-CB Serial No: 9312

	Measured Small	Measured Large	Units	Calibrated Small	Calibrated Large	Units
CALX	3387.9	5829.0	MV	178	356	MM

02/17/98	17:41	0.0 m	Ver 1.64-1.64	Job 14976

Gamma Ray Before Survey Calibration

Tool Type: GRT-HA Serial No: 8293
Calibrator No: 20S296

Background	Calibrator	Standard	Units
193.3	706.1	140.0	GAPI

Delta Counts Per Sec: 512.8 CPS/API = 3.663

O.H. Adaptor Head

Weight 18.0 kg
Length .7 m
Max. Diameter 8.9 cm

Total Stack Weight 163.1 kg in air
Total Stack Length 10.95 m

2-Arm Caliper

Weight 79.4 kg
Length 2.7 m
Max. Diameter 10.2 cm

Universal GR

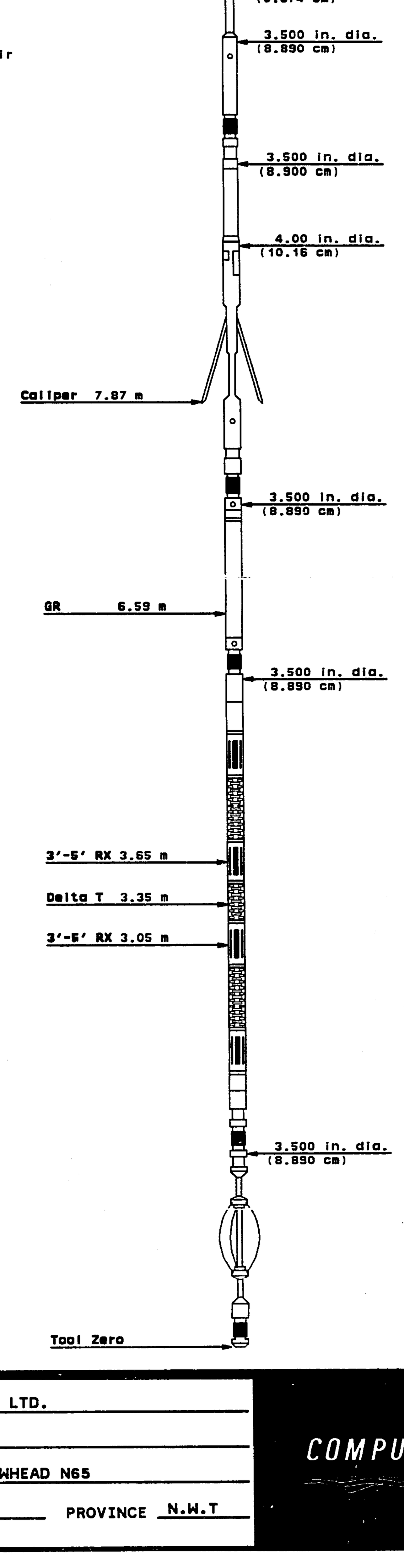
Weight 36.4 kg
Length 1.4 m
Max. Diameter 8.9 cm

Borehole Compensated Sonic

Weight 115.7 kg
Length 4.7 m
Max. Diameter 8.9 cm

Centralizer

Weight 13.6 kg
Length 1.45 m
Max. Diameter 8.9 cm



COMPANY PARAMOUNT RESOURCES LTD.

WELL PARMOUNT ET AL ARROWHEAD N65

FIELD ARROWHEAD PROVINCE N.W.T

COMPUTALOG

DENSITY

WESTERN ATLAS

COMPENSATED Z-DENSILOG
COMPENSATED NEUTRON LOG
GAMMA RAY LOG
X-Y CALIPER LOG

9211-233 N.E.B. COPY

FILE NO:	
API NO:	
COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT ET AL ARROWHEAD N-65
FIELD	UNDEFINED
PROVINCE	N.W.T
LOCATION:	
WID : 1833	

OTHER SERVICES: HDIL-GR, DAL-GR-XY, CVL, LOGSTAR

ELEVATIONS: KB 574.6 M, DF, GL 569.9 M

PERMANENT DATUM G.L. ELEVATION 569.9 M
LOG MEASURED FROM K.B. 4.7 M ABOVE P.D.
DRILL. MEAS. FROM KELLY BUSHING

DATE		30-JAN-98
RUN NUMBER		ONE
SERVICE ORDER		958637
DEPTH DRILLER		1890.0 M
DEPTH LOGGER		1890.0 M
BOTTOM LOGGED INTERVAL		1871.1 M
TOP LOGGED INTERVAL		479.0 M
CASING - DRILLER		339.7 MM @ 480.0 M
CASING LOGGER		479.0 M
BIT SIZE		311.0 MM
TYPE OF FLUID IN HOLE		GOLTER D
DENSITY / VISCOSITY		980 G/L 52 S
PH / FLUID LOSS		0 C3 0 C3
SOURCE OF SAMPLE		NOT TAKEN
RM AT MEAS. TEMP.		6.4 OHMM @ 70 DEGC
RMF AT MEAS. TEMP.		@ OHMM @ DEGC
RMC AT MEAS. TEMP.		0 OHMM @ 0 DEGC
SOURCE OF RMF / RMC		N/A N/A
RM AT BHT		6.4 OHMM @ 70 DEGC
TIME SINCE CIRCULATION		12.5 HRS.
MAX. RECORDED TEMP.		70 DEGC
RECORDED BY		G.P.
EQUIP. NO. / LOCATION		3HL 5? /
WITNESSED BY		K.KAY / 41/M1 LOWER
		D.FEL

- FOLD HERE

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

RUN 1: TIME STOPPED CIRCULATION : 0000 30-JAN-98.
HDIL,DAL & ZDL-CN RECORDED IN COMBINATION.
CNC AND PORZ RECORDED AND PRESENTED IN LIMESTONE MATRIX : TD - 650.
SANDSTONE PLAYBACK : 650 - SC.
CNC IS AVERAGE CALIPER CORRECTED.
CREW : S.RATTRAY * E.BARRETT

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	CENT	4304ZZ	070803	2-ARM CENTRALIZER
1	1	YCAL	4209XA	178345	Y-AXIS CALIPER
1	1	TTRM	3981XA	179328	FREE
1	1	COWR	3510XA	173206	FREE
1	1	DGR	1329XA	153116	FREE
1	1	KNUC	3923XA	180332	KNUCKLE JOINT
1	1	CN	2446XA	154211	DECENTRALIZED
1	1	ZDL	2228EA/2228WA	155337/153038	PAD DEVICE
1	1	KNUC	3923XA	168289	KNUCKLE JOINT
1	1	DAL(E)	1667EA	153562	FREE
1	1	CENT	4341XA	178358	4-ARM CENTRALIZER
1	1	DAL(W)	1680WA	154419	CENTRALIZER
1	1	HDIL	1515EA/1515WA	177896/178674	CENTRALIZED
1	1	CENT	4341XA	113211	4-ARM CENTRALIZER

INSTRUMENT CONFIGURATION

Source File: /data/pass/par95/zdl-tdg

CABLEHEAD
Series : CABL338
Mnemonic :
Diameter : 3.38"
Weight : 18.9 kg
Length : 157.5 cm

2-ARM BOW-SPRING CENTRALIZER
Series : 4304ZZ
Mnemonic : CENT
Diameter : 3.63"
Weight : 38.6 kg
Length : 133.9 cm

Y-CALIPER
Series : 4209XA
Mnemonic : YCAL
Diameter : 4.25"
Weight : 62.7 kg
Length : 222.2 cm
Measure Point: 134.1 cm: CALY MP

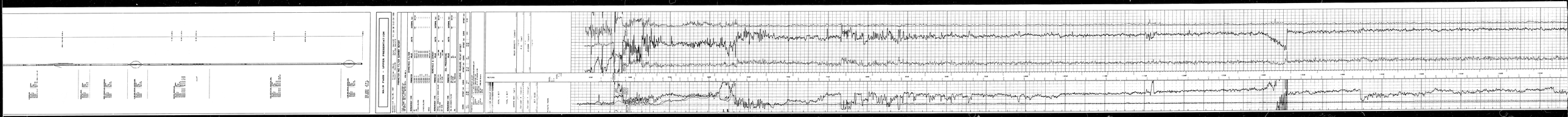
TTRM SUB
Series : 3981XA
Mnemonic : TTRM
Diameter : 3.63"
Weight : 35.4 kg
Length : 116.8 cm
Measure Point: 42.2 cm: TEMP MP
Measure Point: 34.5 cm: RM MP

WTS COMMON REMOTE
Series : 3510XA
Mnemonic : WTS
Diameter : 3.63"
Weight : 45.5 kg
Length : 189.5 cm

DIGITAL SPECTRALOG
Series : 1329XA
Mnemonic : DGR
Diameter : 3.63"
Weight : 64.5 kg
Length : 222.8 cm
Measure Point: 48.8 cm: GR MP

KNUCKLE JOINT
Series : 3923XA
Mnemonic : KNUJT
Diameter : 3.38"
Weight : 68.2 kg
Length : 231.4 cm

COMPENSATED NEUTRON
Series : 2446XA
Mnemonic : CN
Diameter : 3.63"
Weight : 68.2 kg
Length : 231.4 cm
Measure Point: 74.9 cm: CN MP


RELAY CHART - OPTION TRANSMITTER LOSS
CONTROL DATA CORPORATION
DATE
DRAWN BY
CHECKED BY
APPROVED BY
DATE
DRAWING NO.
SCALE
SHEET
OF
SHEETS
DRAWING NO.
REVISION
DATE
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REVISION
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REVISION
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REVISION
DATE

MILE FORD - SANDSTONE MATRIX - 2.65 - C

Date: 1-Feb-94
Time: 15:16:17
Version: 1.0
Software: 1.0

RAW DATA

Depth Scale: 1:200
Depth Mode: Measured
Depth Offset: 0.0 m
Time Scale: 1:1000
Time Offset: 0.0 s

Tool Name: Dual Spaced Neutron
Serial Number: 1
Tool Length: 1.00 m
Tool Weight: 0.0 kg
Tool Diameter: 0.0 mm
Tool Position: Eccentered
Measure Point Offset: 0.0 m
Logging Speed: 10.0 m/min
Sensitivity: 1.00 cps/pu
Sensitivity Method: Manual
Sensitivity Date: 1-Feb-94
Sensitivity Time: 15:16:17
Sensitivity Operator: Unknown
Sensitivity Comment: Unknown
Calibration Method: Unknown
Calibration Date: 1-Jan-1900
Calibration Time: 0:00:00
Calibration Operator: Unknown
Calibration Comment: Unknown
Calibration Reference: Unknown
Calibration Type

	CPS	CPS	SSN/LSN	SSN/LSN	FACTOR	(pu)
LSN	697.69	784.53				
SSN	1795.67	1862.56				
RATIO			2.62503	2.75100	1.04798	
					1.01888	1.07708
CN						21.358

CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 154211 DATE/TIME PERFORMED: Tue Jan 13 12:10:43 1998

UNIT #: 3880TC HL6577 ICE BLOCK #: 4717ND 000403

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	1940.67	2035.52				
SSN	4599.17	5065.16				
RATIO			2.48838	1.04798	2.60913	
CN						19.354

CN BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2446XA 154211 DATE/TIME PERFORMED: Fri Jan 30 11:15:14 1998

UNIT #: 3880TC HL6577 ICE BLOCK #: 4717ND 000403

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	1938.52	2033.16				
SSN	4575.52	5036.52				
RATIO			2.47719	1.04798	2.59724	
CN						19.189
						17.924 21.32

CN AFTER LOG VERIFICATION SUMMARY

TOOL #: 2446XA 154211 DATE/TIME PERFORMED: Fri Jan 30 11:18:00 1998

UNIT #: 3880TC HL6577 ICE BLOCK #: 4717ND 000403

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	1939.77	2034.54				
SSN	4580.07	5042.00				
RATIO			2.47021	1.04798	2.59865	
CN						19.210
						17.964 21.37

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Tue Jan 13 11:39:46 1998

UNIT #: 3880TC HL6577

	SMALL RING (raw)	LARGE RING (raw)	MULT	ADD	SMALL RING (mm)	LARGE RING (mm)
CALIPER	2070.8	2669.8	0.16962	-148.04084	203.200	304.800

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Fri Jan 30 12:04:41 1998

UNIT #: 3880TC HL6577

	I.D. (raw)	MULT	ADD	I.D. (mm)
CALIPER	2093.0	0.16962	-174.69917	316.000

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Fri Jan 30 12:05:12 1998

UNIT #: 3880TC HL6577

	I.D. (raw)	MULT	ADD	I.D. (mm)
CALIPER	2092.5	0.16962	-174.69917	315.915
				313.180 320.76

ZDL PRIMARY CALIBRATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Tue Jan 13 11:22:13 1998

UNIT #: 3880TC HL6577 CALB. BLOCK SET: 2225XA 150415 CS SOURCE #: 4703NT 001012

	SSD-NDTC (cts/s)	HRD1-NDTC (cts/s)	HRD2-NDTC (cts/s)	SHR	DEN (kg/m3)	CORR (kg/m3)	PE (b/e)
MG BLOCK (LO PE)	1231.9.2	5228.0	6369.0	0.173	1687.000	7.000	2.293
				0.170	0.72		
AL BLOCK	6132.2	533.3	685.0		2685.000	-13.000	
AL+SHIM (CORR)	8560.1	923.9	1150.0		2601.000	166.000	
MG+SHIM (HI PE)		2514.1	3247.5	0.276			10.580
				0.270	0.282		
RATIO MG/AL	2.01	4.80	4.36				
	1.91	2.01 5.38	18.48	3.75	4.75		

BACKGROUND (cts/s)	CS PEAK CHANNEL #	AM PEAK CHANNEL #
1125.6	230.2	23.3
	228.8 231.6	21.8 24.8

ZDL PRIMARY VERIFICATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Tue Jan 13 22:07:14 1998

UNIT #: 3880TC HL6577 VERI. JIG #: 4704NA 941142

	SSD-NDTC (cts/s)	HRD1-NDTC (cts/s)	HRD2-NDTC (cts/s)	SHR	DEN (kg/m3)	CORR (kg/m3)	PE (b/e)
FIELD BLOCK	10545.5	1086.5	3209.6	0.183	2301.920	159.224	15.812

ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Fri Jan 30 11:22:37 1998

UNIT #: 3880TC HL6577 VERI. JIG #: 4704NA 941142

	SSD-NDTC (cts/s)	HRD1-NDTC (cts/s)	HRD2-NDTC (cts/s)	SHR	DEN (kg/m3)	CORR (kg/m3)	PE (b/e)
FIELD BLOCK	10646.0	1084.1	3227.3	0.182	2309.831	167.724	15.834
				0.181	0.187	225.58 226.58	163.224 167.224

ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153038 DATE/TIME PERFORMED: Fri Jan 30 11:24:42 1998

UNIT #: 3880TC HL6577 VERI. JIG #: 4704NA 941142

	SSD-NDTC (cts/s)	HRD1-NDTC (cts/s)	HRD2-NDTC (cts/s)	SHR	DEN (kg/m3)	CORR (kg/m3)	PE (b/e)
FIELD BLOCK	10659.4	1094.9	3238.2	0.183	2306.374	167.514	15.796
				0.182	0.187	223.87 225.87	163.724 167.74

WESTERN ATLAS

COMPANY PARAMOUNT RESOURCES LTD.		FILE NO:
WELL PARAMOUNT ET AL ARROWHEAD N-65		
FIELD UNDEFINED		API NO:
PROVINCE N.W.T		
LOCATION:	ELEVATIONS	
	KB 574.6 M	
WID : 1833	DF	
	GL 567.9 M	
	DATE 30-JAN-98	

COMPANY PARAMOUNT RESOURCES LTD.

WELL ARROWHEAD

FIELD PARAMOUNT ET AL ARROWHEAD INS.

PROVINCE NORTHWEST TERRITORIES

Schlumberger

COMPUTED NEUTRON
DENSITY LOG
CASING

Province	NORTHWEST TERRITORIES
Field	ARROWHEAD
Location	UWI: 1833
Well	PARAMOUNT ET AL ARROWHEAD
Company	PARAMOUNT RESOURCES LTD

LOCATION

Latitude	60 Deg 54 Min 0.000 Sec N
Longitude	123 Deg 29 Min 0.000 Sec W
Elevation	
Log Measured From	KB 5.00 m Above Perm. Datum
Drilling Measured From	KB

Permanent Datum	MSL	Elev.	0.00 m
Log Measured From	KB	5.00 m Above Perm. Datum	
Drilling Measured From	KB		

Date	20-FEB-1998		
Run Number	ONE		
Depth Driller	1764.0 m		
Depth Logger	1763.2 m		
Bottom Log Interval	1762.8 m		
Top Log Interval	2930.0 m		
Casing Driller	13.375 @ 0.0 m		
Casing Logger	13.375 @ 0.0 m		
Bit Size	12.250 in		
Type Fluid in Hole	DRILL WATER		
Density	1.0 g/cm3	Viscosity	0.0 mPa.s
Fluid Loss	0.0 cm3	Source of Sample	CIRCULATED
Rm @ Meas. Temp.	0.000 @ 0.0 C	Rmf @ Meas. Temp.	0.000 @ 0.0 C
Rmc @ Meas. Temp.	0.000 @ 0.0 C	Rm @ BHT	0.000 @ 0.0 C
Max Rec. Temp.	0.0 C	Equip. Location	
Recorded By		Witnessed By	

	Run 1	Run 2	Run 3	Run 4
Bit Size	12.250 in			
Casing Driller	13.375 @ 0.0 m			
Casing Logger	13.375 @ 0.0 m			
Depth Driller	1764.0 m			
Depth Logger	1763.2 m			
Bottom Log Interval	1762.8 m			
Top Log Interval	2930.0 m			
Type Fluid in Hole	DRILL WATER			
Density	1.0 g/cm3			
Viscosity	0.0 mPa.s			
Fluid Loss	0.0 cm3			
Source of Sample	CIRCULATED			
Rm @ Meas. Temp.	0.000 @ 0.0 C			
Rmf @ Meas. Temp.	0.000 @ 0.0 C			
Rmc @ Meas. Temp.	0.000 @ 0.0 C			
Rm @ BHT	0.000 @ 0.0 C			
Max Rec. Temp.	0.0 C			
Equip. Location				
Recorded By				
Witnessed By				

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OTHER SERVICES	OTHER EQUIPMENT
OS1: MICROLOG	OE1:
OS2: DIPOLE SONIC IMAGER	OE2:
OS3:	OE3:
OS4: AZIMUTHAL LATEROLOG	OE4:
OS5: ACTIVE GAMMA RAY CHAINS	OE5:

REMARKS TO CUSTOMER
ALL SCALES AND INTERVALS AS PER CLIENT REQUEST
NO RAN BOTTOM SHOT
TOOL WAS STUCK AT 1762.8 DUE TO HOLE CONDITION
THIS LOG IS DEPTH CORRELATED TO COMPUTALOG NEUTRON LOG DATED 09/14/66

REMARKS - RUN NUMBER 2

RIG: NABORS #19
PRINTS: 4 FIELD AND 2 FINAL
CREWS: CH DRISKIT DE DOLLE

	RUN 1	RUN 2
SERVICE ORDER #	1084113	
PROGRAM VERSION	TCG-712	
PLANS LOGGED		

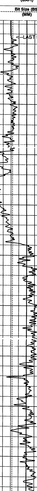
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1 | RUN 2

SURFACE EQUIPMENT
DSR-2 S/ 91507 2774-B
CSU-B
CGS-HS
NCS-KS

DOWNHOLE EQUIPMENT



MAXIMUM STRING DIAMETER 1.11 MM
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Input DLIS Files

CUST	HILTD .006	FN:66	CUST	20-FEB-1998 20:24	2930.0 M	1764.5 M

Output DLIS Files

DEFAULT	HILTD .007	FN:114	CUST	20-FEB-1998 07:04	2930.0 M	1763.2 M

OP System Version: 7C0-712

CSU s/n 91

FIP SUMMARY

- 1> Integrated Hole Volume Minor Flp Every: 0.1 M3
- 2> Integrated Hole Volume Major Flp Every: 1 M3
- 3> Integrated Cement Volume Minor Flp Every: 0.1 M3
- 4> Integrated Cement Volume Major Flp Every: 1 M3

Time Mark Every 60 S

Tension (TENS)
50000 (lb) 0

Caliper (HCAL)
6 (in) 16

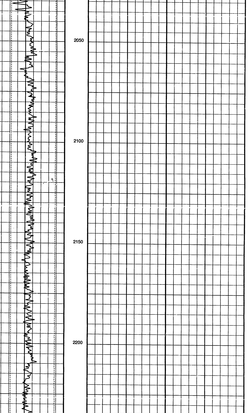
Gamma Ray (GR)
0 (GAPI) 150

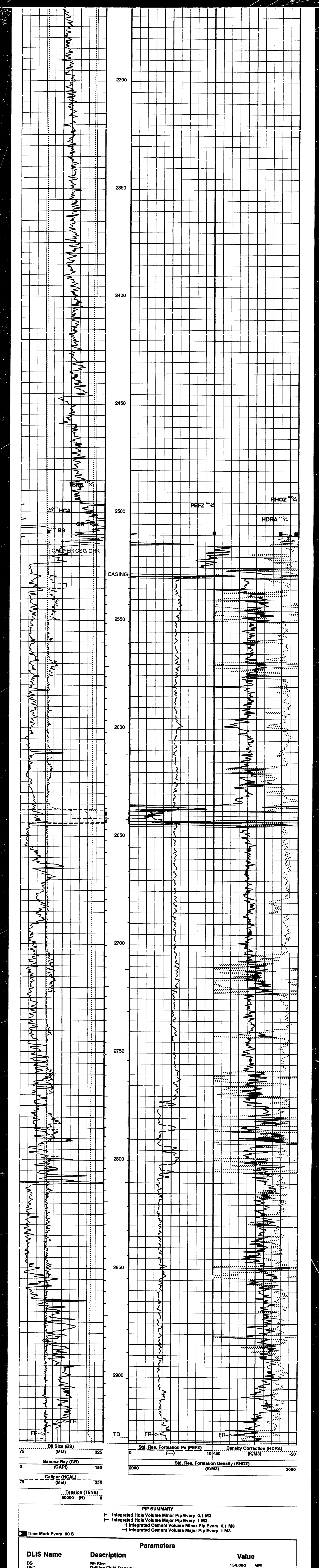
Bit Size (BS)
16 (in) 6

Rel. Rev. Formation Density (RHOZ)
2000 (K/M3) 3000

Rel. Rev. Formation Pe (PEFZ)
0 (E-1) 100.000

Density Correction (HDRA)
(K/M3) -50





Bit Size (BS) 75 (MM) 325
Gamma Ray (GR) 0 (GAPI) 150
Caliper (HCAL) 75 (MM) 325
Tension (TENS) 50000 (N) 0

Std. Res. Formation Pe (PEFZ) 0 (----) 10
Density Correction (HDRA) 450 (K/M3) -50
Std. Res. Formation Density (RHOZ) 2000 (K/M3) 3000

PIP SUMMARY
Integrated Hole Volume Minor Pip Every 0.1 M3
Integrated Hole Volume Major Pip Every 1 M3
Integrated Cement Volume Minor Pip Every 0.1 M3
Integrated Cement Volume Major Pip Every 1 M3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BS	Bit Size	154.000	MM
DFD	Drilling Fluid Density	1090.00	K/M3
DHC	Density Hole Correction	BS	
DO	Depth Offset	-1.2	M
HMPCO	HILT RTSC Measure points correction	NO	
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect	
HSTI	STI Uses HILT Acceleration	YES	
NIAV	HRDD Density/Pe Algorithm Version	1	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	25.4	MM
PP	Playback Processing	OFF	

Format: PORO_2 Vertical Scale: 1:600 Graphics File Created: 22-FEB-1998 07:08

OP System Version: 7C0-712
DBM with AP

Input DLIS Files

CUST	HILTD .036	FN:65	CUST	21-FEB-1998 20:24	2932.0 M	1784.5 M

Output DLIS Files

DEFAULT	HILTD .057	FN:114	CUST	22-FEB-1998 07:08		

Input DLIS Files

CUST	HILTD .036	FN:65	CUST	21-FEB-1998 20:24	2932.0 M	1784.5 M

Output DLIS Files

DEFAULT	HILTD .057	FN:114	CUST	22-FEB-1998 07:08	2930.8 M	1783.2 M

OP System Version: 7C0-712
DBM with AP

PIP SUMMARY
Integrated Hole Volume Minor Pip Every 0.1 M3
Integrated Hole Volume Major Pip Every 1 M3
Integrated Cement Volume Minor Pip Every 0.1 M3
Integrated Cement Volume Major Pip Every 1 M3

Time Mark Every 60 S

Tension (TENS) 50000 (N) 0
Caliper (HCAL) 75 (MM) 325
Gamma Ray (GR) 0 (GAPI) 150
Bit Size (BS) 75 (MM) 325

Std. Res. Formation Pe (PEFZ) 0 (----) 10
Density Correction (HDRA) 450 (K/M3) -50
Alpha Processed Neutron Porosity (NPOR) 0.45 (V/V) -0.15
Std. Res. Density Porosity (DPHZ) 0.45 (V/V) -0.15

Bit Size (BS) (MM)	75 – 325
Gamma Ray (GR) (GAPI)	0 – 150
Caliper (HCAL) (MM)	75 – 325
Tension (TENS) (N)	50000 – 0
Std. Res. Density Porosity (DPHZ) (V/V)	0.45 – -0.15
Alpha Processed Neutron Porosity (NPOR) (V/V)	0.45 – -0.15
Std. Res. Formation Pe (PEFZ) (----)	0 – 10
Density Correction (HDRA) (K/M3)	450 – -50

PIP SUMMARY

- ⊢ Integrated Hole Volume Minor Pip Every 0.1 M3
- ⊢ Integrated Hole Volume Major Pip Every 1 M3
- ⊣ Integrated Cement Volume Minor Pip Every 0.1 M3
- ⊣ Integrated Cement Volume Major Pip Every 1 M3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BHFL	Borehole Fluid Type	WATER	
BHS	Bore Hole Status	OPEN	
BS	Bit Size	154.000	MM
BSAL	Borehole Salinity	-50000.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CWEI	Casing Weight	38.70	KG/M
DFD	Drilling Fluid Density	1090.00	K/M3
DHC	Density Hole Correction	BS	
DO	Depth Offset	-1.2	M
FD	Fluid Density	1000	K/M3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.822700e-02	DC/M
HMPCO	HILT RTSC Measure points correction	NO	
HSCM	HILT Speed Correction Mode	TSCD_SpeedCorrect	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	SALT	
MDEN	Matrix Density	2710	K/M3
MST	Mud Sample Temperature	24.00	DEGC
MWCO	Mud Weight Correction Option	NO	
NIAV	HRDD Density/Pe Algorithm Version	1	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	25.4	MM
PP	Playback Processing	OFF	
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	0.1800	OHMM
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	15	DEGC
SOCN	Standoff Distance	12.7	MM
SOCO	Standoff Correction Option	NO	

Format: PORO_5 Vertical Scale: 1:240 Graphics File Created: 22-FEB-1998 07:08

OP System Version: 7C0-712
DBM with AP

Input DLIS Files

CUST	HILTD .036	FN:65	CUST	21-FEB-1998 20:24	2932.0 M	1784.5 M

Output DLIS Files

DEFAULT	HILTD .057	FN:114	CUST	22-FEB-1998 07:08

Input DLIS Files

DEFAULT	HILTD .036	FN:64	FIELD	21-FEB-1998 20:24	2932.0 M	1784.5 M

Output DLIS Files

DEFAULT	HILTD .065	FN:123	CUST	22-FEB-1998 08:57	2930.8 M	2519.2 M

Integrated Hole/Cement Volume Summary

Hole Volume = 8.96 M3

Cement Volume = 2.87 M3 (assuming 139.70 MM casing O.D.)

Computed from 2925.9 M to 2529.1 M using data channel(s) HCAL

OP System Version: 7C0-712
DBM with AP

PIP SUMMARY

⊢ Integrated Hole Volume Minor Pip Every 0.1 M3

Time Mark Every 10 S

Gamma Ray (API) 0 — 100

Caliper (Inch) 6.5 — 16.5

Delta Caliper (Inch) -2 — 2

Sonic Travel Time (US/F) 140 — 40

Bit Size (Inch) 6 — 16

Density (G/C3) 1.95 — 2.95

Neutron Porosity (Percent) 30 — -10

Bit Size Compacted Density (G/C3) 1.95 — 2.95

Bit Size Compacted Neutron Porosity (Percent) 30 — -10

Delta Caliper (Inch) -2 — 2

Gamma Ray (API) 0 — 100

Time Mark Every 10 S

Integrated Time Volume Minus Pip Zero 1 X 60
Integrated Time Volume Minus Pip Zero 1 X 360
Integrated Cement Volume Minus Pip Zero 1 X 60

Bit Size (Inch) 6 — 16

Density (G/C3) 1.95 — 2.95

Neutron Porosity (Percent) 30 — -10

Bit Size Compacted Density (G/C3) 1.95 — 2.95

Bit Size Compacted Neutron Porosity (Percent) 30 — -10

Delta Caliper (Inch) -2 — 2

Gamma Ray (API) 0 — 100

Time Mark Every 10 S

Integrated Time Volume Minus Pip Zero 1 X 60
Integrated Time Volume Minus Pip Zero 1 X 360
Integrated Cement Volume Minus Pip Zero 1 X 60

Time Mark Every 10 S

Gamma Ray (API) 0 — 100

Caliper (Inch) 6.5 — 16.5

Delta Caliper (Inch) -2 — 2

Sonic Travel Time (US/F) 140 — 40

Bit Size (Inch) 6 — 16

Density (G/C3) 1.95 — 2.95

Neutron Porosity (Percent) 30 — -10

Bit Size Compacted Density (G/C3) 1.95 — 2.95

Bit Size Compacted Neutron Porosity (Percent) 30 — -10

Delta Caliper (Inch) -2 — 2

Gamma Ray (API) 0 — 100

Time Mark Every 10 S

Integrated Time Volume Minus Pip Zero 1 X 60
Integrated Time Volume Minus Pip Zero 1 X 360
Integrated Cement Volume Minus Pip Zero 1 X 60

Time Mark Every 10 S

Gamma Ray (API) 0 — 100

Caliper (Inch) 6.5 — 16.5

Delta Caliper (Inch) -2 — 2

Sonic Travel Time (US/F) 140 — 40

Bit Size (Inch) 6 — 16

Density (G/C3) 1.95 — 2.95

Neutron Porosity (Percent) 30 — -10

Bit Size Compacted Density (G/C3) 1.95 — 2.95

Bit Size Compacted Neutron Porosity (Percent) 30 — -10

Delta Caliper (Inch) -2 — 2

Gamma Ray (API) 0 — 100

Time Mark Every 10 S

Integrated Time Volume Minus Pip Zero 1 X 60
Integrated Time Volume Minus Pip Zero 1 X 360
Integrated Cement Volume Minus Pip Zero 1 X 60

Parameters

DLIS Name	Description	Value
BHCS	Borehole Fluid Type	WATER
BHCS	Borehole Salinity	10000 PPM
BHCS	Mud Density	1.00 G/C3
BHCS	Mud Viscosity	1.00 CP
BHCS	Borehole Diameter Correction Option	0
BHCS	Borehole Diameter Correction Option	0
BHCS	Depth Shift	0.00
CNL	Depth Shift Selection	0
CNL	Sandstone Matrix Selected	SS
CNL	Limestone Matrix Selected	LS
CNL	Dolomite Matrix Selected	DOLO
CNL	Borehole Diameter Correction Option	0
CNL	Borehole Fluid Density Correction Option	0
CNL	Borehole Fluid Density Selected from Nominal	1
CNL	Fluid Density Selected	1.00G/C3
CNL	Neutron Porosity Selected	TRUE
CNL	Neutron Porosity Selected for Environmental Correction	TRUE
CNL	CNL Neutron Porosity Option	0
CNL	CNL Density Porosity Option	DOLO
CNL	Depth Shift Selection	0
CNL	Depth Shift Selection	0
CNL	Sand Density	2.65
CNL	Sand Neutron Porosity	0.03
CNL	Sand Density Compacted	2.65
CNL	Sand Neutron Porosity Compacted	0.03
CNL	CNL Compacted Density	NOT USED
CNL	CNL Compacted Neutron	NOT USED
CNL	Density Of Shale Matrix	2.65
CNL	Neutron Of Shale Matrix	0.03
CNL	Density Of Shale Compacted	2.65
CNL	Neutron Of Shale Compacted	0.03
CNL	Density Of Fluid Matrix	1.00
CNL	Neutron Of Fluid Matrix	1.00
CNL	Density Of Fluid Compacted	1.00
CNL	Neutron Of Fluid Compacted	1.00
CNL	Density Porosity Correction Option	0
CNL	Neutron Porosity Correction Option	0
CNL	Density Of Mud Cake Matrix	2.65
CNL	Neutron Of Mud Cake Matrix	0.03
CNL	Density Of Mud Cake Compacted	2.65
CNL	Neutron Of Mud Cake Compacted	0.03
CNL	Density Of Mud Cake Density	2.65
CNL	Density Of Mud Cake Neutron	0.03
CNL	Density Of Mud Cake Density Compacted	2.65
CNL	Density Of Mud Cake Neutron Compacted	0.03
CNL	Density Of Mud Cake Density Correction Option	0
CNL	Density Of Mud Cake Neutron Correction Option	0

MICRO

N.E.B. COPY 1833

COMPANY: PARAMOUNT RESOURCES LTD.

WELL: PARAMOUNT ET AL ARROWHEAD N65

FIELD: ARROWHEAD

PROVINCE: NORTHWEST TERRITORIES

Province: NORTHWEST TERRITORIES
Field: ARROWHEAD
Location: UWI: 1833
Well: PARAMOUNT ET AL ARROWHEAD N65
Company: PARAMOUNT RESOURCES LTD

Schlumberger

PLATFORM EXPRESS MICROLOG

LOCATION			
UWI: ~~1833~~ 300N656040122450	Elev.:	K.B.	574.6 M
SUR LOC: 60 *40' N 122*45' W		G.L.	567.9 M
		D.F.	574.3 M
Permanent Datum: GROUND LEVEL	Elev.: 567.9 M		
Log Measured From: KELLY BUSHING	6.7 M above Perm. Datum		
Drilling Measured From: KELLY BUSHING			
API Serial No. EL383	Lat: 60*40'	Long: -122*45'	

Logging Date	21-FEB-1998			
Run Number	ONE			
Depth Driller	2926 M			
Schlumberger Depth	2927.2 M			
Bottom Log Interval	2926.4 M			
Top Log Interval	1800 M			
Casing Driller Size @ Depth	177.800 MM	@ 2529 M	@	
Casing Schlumberger	2529 M			
Bit Size	154.000 MM			
Type Fluid In Hole	SALT WATER / LCM			
MUD Density / Viscosity	1090 K/M3	91 S		
Fluid Loss / PH		9		
Source Of Sample	FLOWLINE			
RM @ Measured Temperature	0.125 OHMM	@ 16 DEGC	@	
RMF @ Measured Temperature	0.130 OHMM	@ 18 DEGC	@	
RMC @ Measured Temperature	0.195 OHMM	@ 18 DEGC	@	
Source RMF / RMC	MEASURED	ESTIMATED		
RM @ MRT / RMF @ MRT	0.034 @ 115	0.038 @ 115	@	@
Maximum Recorded Temperatures	115 DEGC	115	← NOT STATIC	
Circulation Stopped / Time	21-FEB-1998	11:30	EST BHT 150 °C	
Logger On Bottom / Time	21-FEB-1998	20:25		
Unit Number / Location	2016	GRANDE PRAIRIE		
Recorded By	SHAWN CARROLL			
Witnessed By	ROD MacEACHERN			

	Run 1	Run 2	Run 3	Run 4
Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth	@		@	
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
MUD Density / Viscosity				
Fluid Loss / PH				
Source Of Sample				
RM @ Measured Temperature	@		@	
RMF @ Measured Temperature	@		@	
RMC @ Measured Temperature	@		@	
Source RMF / RMC				
RM @ MRT / RMF @ MRT	@	@	@	@
Maximum Recorded Temperatures				
Circulation Stopped / Time				
Logger On Bottom / Time				
Unit Number / Location				
Recorded By				
Witnessed By				

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1
OS1: MICROLOG
OS2: DIPOLE SONIC IMAGER
OS3:
OS4: AZIMUTHAL LATEROLOG
OS5: FORMATION MICROIMAGE

OTHER SERVICES2
OS1:
OS2:
OS3:
OS4:
OS5:

REMARKS: RUN NUMBER 1
ALL SCALES AND INTERVALS AS PER CLIENT REQUEST.
PEX RAN SLICK DUE TO SLIM HOLE.
NO REPEAT ANALYSIS DUE TO HOT HOLE CONDITION.
THIS LOG IS DEPTH CORRELATED TO COMPUTALOG NEUTRON LOG DATED 02/16/98.
PULLED TIGHT AT 2640 M.

REMARKS: RUN NUMBER 2

RIG: NABORS #16
PRINTS: 4 FIELD AND 9 FINAL.
OPERATOR: ERNEST DE'CRUZ

RUN 1		RUN 2	
SERVICE ORDER #:	1084113	SERVICE ORDER #:	
PROGRAM VERSION:	7C0-712	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	
LOGGED INTERVAL START	STOP	LOGGED INTERVAL START	STOP

EQUIPMENT DESCRIPTION

RUN 1

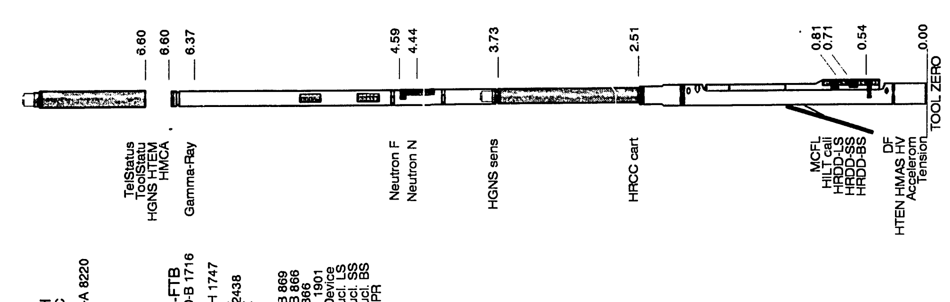
SURFACE EQUIPMENT

GSR-U 91537 DTM-B
NCT-B
CNB-AB
NCS-VB

DOWNHOLE EQUIPMENT

DTC-H
ECH-KC
DTC-A
DTCH1-A 8220

HILTB-FTB
HGNSD-B 1716
HMCA
HGNS-H 1747
NLS-KL
NSR-F 2438
HACCZ
HCNT
HGR
HRCC-B 869
HRMS-B 866
HRGD 866
GLS-VJ 1901
MCFL Device
HILT Nucl. LS
HILT Nucl. SS
HILT Nucl. BS
BOW-SPR
NPV-N



MAXIMUM STRING DIAMETER 117 MM
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

RUN 2

Input DLIS Files

CUST	HILTD .036	FN:65	CUST	21-FEB-1998 20:24	2932.0 M	1784.5 M

Output DLIS Files

DEFAULT	HILTD .057	FN:114	CUST	22-FEB-1998 07:08

OP System Version: 7C0-712

DBM with AP

PIP SUMMARY

Integrated Hole Volume Minor Pip Every 0.1 M3
Integrated Hole Volume Major Pip Every 1 M3
Integrated Cement Volume Minor Pip Every 0.1 M3
Integrated Cement Volume Major Pip Every 1 M3

Time Mark Every 60 S

Tension (TENS) (N) 50000 — 0
Caliper (HCAL) (MM) 75 — 325
Gamma Ray (GR) (GAPI) 0 — 150
Bit Size (BS) (MM) 75 — 325
Std. Res. Density Standoff (DSOZ) (MM) 25 — 0
Positive Separation From HMIN to HMNO
Computed Micro Normal (HMNO) (OHMM) 0 — 5
Computed Micro Inverse (HMIN) (OHMM) 0 — 5

MAIN PASS

COMPUTED

N.E.B. COPY

1833

NATIO[...]RGY BOARD
EN[...]ANCH
MAR 30 1998

9211-P33-10-1

Schlumberger

Tadpole Plot
Stereonet View

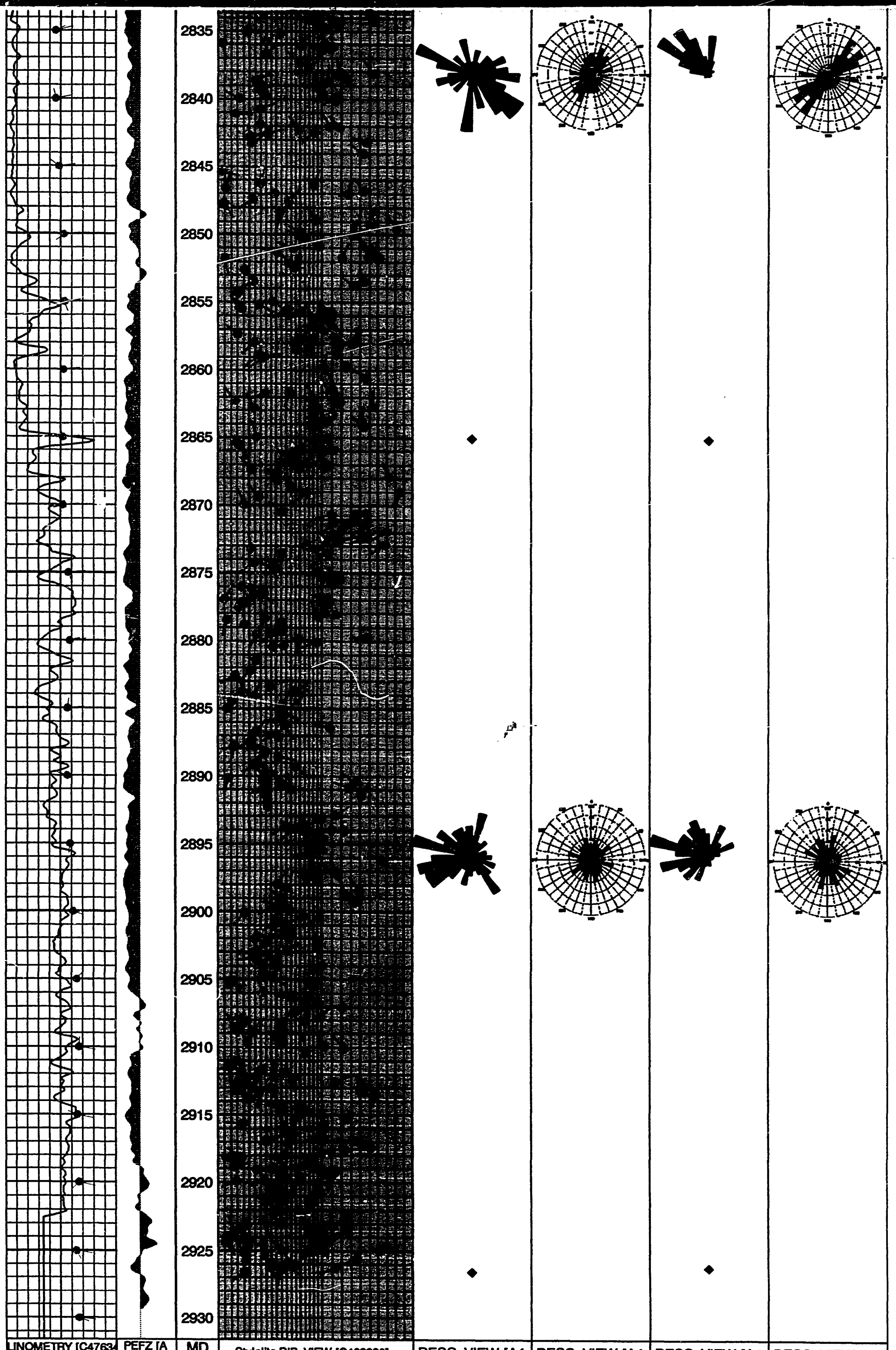
COMPANY:	PARAMOUNT RESOURCES LTD.
WELL:	PARAMOUNT ET AL ARROWHEAD N65
FIELD:	ARROWHEAD
	NORTHWEST TERRITORIES
COUNTRY:	CANADA

Date Processed:	23-FEB-1998	Date Logged:	19-FEB-1998
Job Number:	4645	Processed at:	CALGARY
Well Location:	60*40' N 122*45* W		
Latitude:		Longitude:	
Elevations:	KB:	DF:	GL:

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretations made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.


2835
2840
2845
2850
2855
2860
2865
2870
2875
2880
2885
2890
2895
2900
2905
2910
2915
2920
2925
2930
LINOMETRY [C4763
Borehole Drift
0 Deg 10
LINOMETRY [C4762
Borehole Drift
0 Deg 10
GR [A475995]
0 150
(gAPI)
GR [A476258]
0 150
(gAPI)
GR [A476354]
0 150
(gAPI)
LINOMETRY [C4759
Borehole Drift
0 Deg 20
PEFZ [A
3 6
( )
gp_Are
gp_Are
MD
1 : 240
m
Stylolite DIP_VIEW [C482328]
True Dip
0 Deg 90
nductive Fracture DIP_VIEW [C48213
True Dip
0 Deg 90
Bed Boundary DIP_VIEW [C482250]
True Dip
0 Deg 90
DESC .VIEW [A4
N
W E
S
True Dip
DIP .VIEW [C482328]
DESC .VIEW [A4
Core Image
DESC .VIEW [A4
N
W E
S
True Dip
DIP .VIEW [C482328]
DESC .VIEW [A4
Core Image

MISCELLANEOUS

N.E.B. COPY

1933

WESTERN ATLAS

CEMENT VOLUME LOG
FOR 311 MM BIT
AND 244.5 MM CASING

FILE NO:	COMPANY	PARAMOUNT RESOURCES LTD.
	WELL	PARAMOUNT ET AL ARROWHEAD N-65
API NO:	FIELD	UNDESIGNED
	PROVINCE N.W.T.	

LOCATION:

OTHER SERVICES
DIL-LSS
CNL-LDL-CAL-GR
DIL-SP-GR
LDS/TAB

ELEVATIONS
KB 394.0 M
DF
GL 367.9 M

PERMANENT DATUM G.L. ELEVATION 367.9 M
LOG MEASURED FROM K.B. 26.1 M ABOVE P.D.
DRILL MEAS. FROM KELLY BUSHING

DATE	20-JAN-85
RUN NO.	ONE
DEPTH DRILLER	1080.0 M
DEPTH LOGGER	1080.0 M
BOTTOM LOGGED INTERVAL	1075.0 M
TOP LOGGED INTERVAL	470.0 M
CASING - DRILLER	244.5 MM @350.0 M
CASING LOGGER	470.0 M
BIT SIZE	311 MM
TYPE OF FLUID IN HOLE	CATION K
DENSITY / VISCOSITY	985 KG/ 54 S
PH / FLUID LOSS	9.0 / 6.0
SOURCE OF SAMPLE	MUD SHOCK
RM @ MEAS. TEMP.	0.5 OHMM @20.0DEGC
RMF @ MEAS. TEMP.	0.2 OHMM @20.0DEGC
RMC @ MEAS. TEMP.	0.7 OHMM @20.0DEGC
SOURCE OF RMF / RMC	MEAS / CALC
RM @ BHT	0.3 OHMM @70.0DEGC
TIME SINCE CIRCULATION	12.5 HRS
MAX. REC. TEMP.	70.0DEGC
EQUIP. NO. / LOCATION	1D 1933 / C.P.
RECORDED BY	R. GUIDO/M.CARTER
WITNESSED BY	J.LEACON

REMARKS:

THE CEMENT VOLUME LOG WAS RUN IN CONJUNCTION WITH A PULSE ECHO SONIC LOG (PEL) AND A DIPLOGGER TOOL (DL) CONDUCTED FOR PARAMOUNT RESOURCES LTD. (PRL). THE PEL WAS RUN WITH A 3 SECOND SPACING (SHORT FRAME MODE) AND A 10 SECOND SPACING (LONG FRAME MODE).

THE CEMENT VOLUME LOG WAS RUN WITH A 3 SECOND SPACING.

THE CEMENT VOLUME LOG WAS RUN WITH THE BENEFIT OF WELL SITE DATA PROVIDED BY PARAMOUNT RESOURCES LTD. THE INTERPRETATION OF THE DATA PRESENTED IN THIS REPORT IS BASED ON THE INFORMATION PROVIDED BY PARAMOUNT RESOURCES LTD. WESTERN ATLAS INTERNATIONAL, INC. DOES NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF THE INTERPRETATIONS, AND WILL NOT BE LIABLE FOR ANY LOSS OR DAMAGE SUFFERED IN CONNECTION THEREWITH.

RUN NO.	TIME	FLUID LEVEL	OPERATING RIG TIME	FLUID LEVEL	OPERATING RIG TIME
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

RUN NO.	TIME	FLUID LEVEL	OPERATING RIG TIME	FLUID LEVEL	OPERATING RIG TIME
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

CEMENT VOLUME LOG

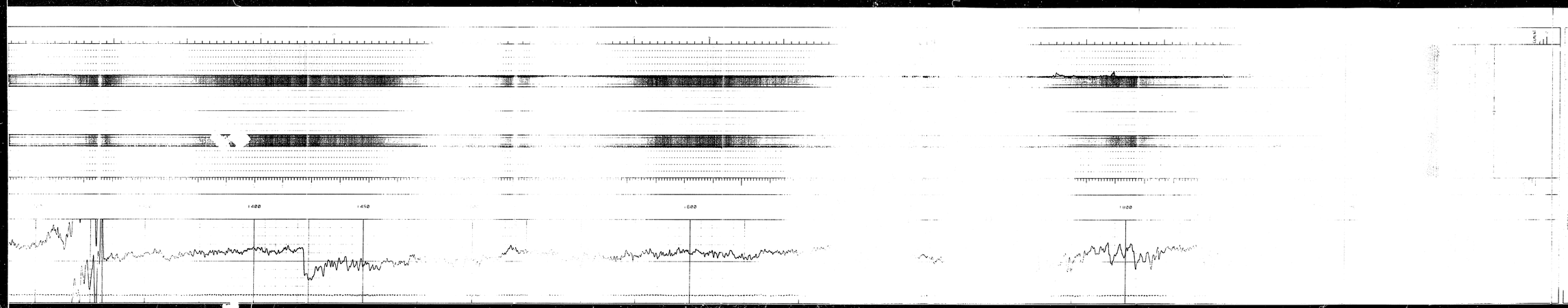
Western Atlas
Wireline Services

DATA SHEET FOR THE PRESSURE DEPENDENT REPORT

PARAMOUNT RESOURCES LTD.
WELL: ARROWHEAD N-65

SYNTHETIC FILTER	VALUE	UNITS	INTERVAL (M)
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0
	1.0		1.0

TEMPERATURE			
TYPE	UNITS	INTERVAL (M)	


1400
1450
1600
1800

BEST
COPY
ON FILE

9211-P33-10-1 N.E.B. COPY 1833

COMPUTALOG

CS400

GAMMA RAY NEUTRON

PROVINCE	NORTHWEST TERRITORIES
FIELD	ARROWHEAD
WELL	PARAMOUNT et al ARROWHEAD N-05
COMPANY	PARAMOUNT RESOURCES LTD.

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N-05
FIELD	ARROWHEAD
PROVINCE	NORTHWEST TERRITORIES

LSD ___ Sec ___ Twp ___ Rge ___

Perm. Datum GROUND LEVEL Elev. 587.9

Log measured from KB 5.7 m above Permanent Datum.

Other Services: TEMP LOG

ELEV. K.B. 593.6 G.L. 587.9 GP

Date	FEB-15-98				
Run No.	ONE				
Type Log	GR/N/CCL				
Depth-Driller	2935				
Depth-Logger	2943				
Btm.Log Inter	2943				
Top Log Inter	2500.4				
Fluid in Hole	GAS				
Fluid Level	SURFACE				
Jt Size	N/A				
Unit #	406				
Location	FORT ST. JOHN				
Recorded By	D.DEI				
Witnessed By	FERGUSON				

Shot Density	No. of Shots	Perf. Interval From	To

Gun Type

Gun Size

Tubing/Casing Record

	Size mm	Wt. kg/m	From	To
Tubing	177.8		1793	2529
Casing	244		SURFACE	2850
OPEN			2529	2935

Other Services

Service	Type	Size	Depth
Bridge Plug			
Produn. Packer			
Cement Retainer			
Cement			

Color Code

Casing	Tubing

Tubing Bottom: Junk Basket Size

Swaging Nipple: Gauge Ring Number

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REMARKS: NO LOG TO CORRELATE TO. DISPLACEMENT PRECEDES GR/N/LOG BY 4TH DEPTH.

LOG AS PER CUSTOMER REQUEST.

SERVICE CODES #28502

REMARKS: NO LOG TO CORRELATE TO.

CASING SHOE

V-07.31.97

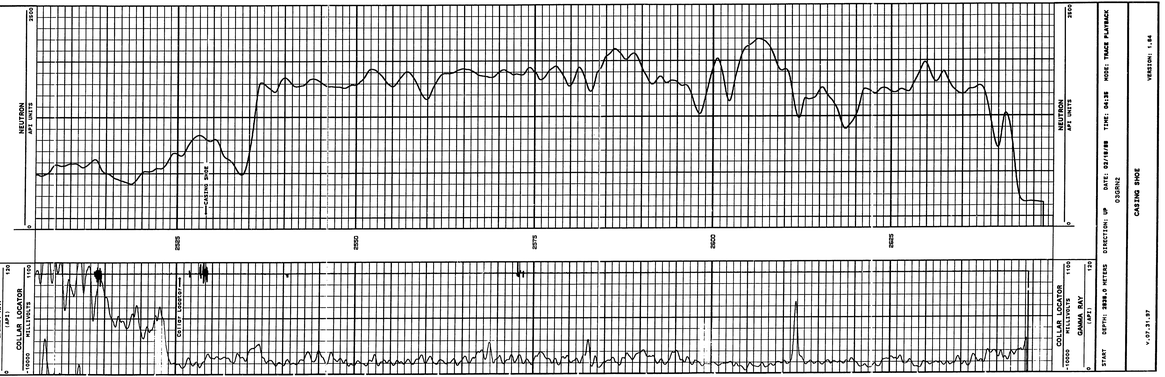
VERSION: 1.44

CS3042

DATE: 02/16/98 TIME: 04:00 MODE: TRACE PLAYBACK

DIRECTION: UP

FINISH DEPTH: 2483.4 METERS



START DEPTH: 2500.0 METERS

DIRECTION: UP DATE: 02/16/98 TIME: 04:20 MODE: TRACE PLAYBACK

CS3042

CASING SHOE

V-07.31.97

VERSION: 1.44

COMPUTALOG

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N-05
FIELD	ARROWHEAD
PROVINCE	NWT

9211-P33-10-1 N.E.B. COPY 1833

CS400

COMPUTALOG

TEMPERATURE LOG

PROVINCE	NORTHWEST TERRITORIES
FIELD	ARROWHEAD
WELL	PARAMOUNT et al ARROWHEAD N65
COMPANY	PARAMOUNT RESOURCES LTD.

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT et al ARROWHEAD N-65

FIELD ARROWHEAD

PROVINCE NORTHWEST TERRITORIES

LSD ____ Sec. ____ Twp. ____ Rge. ____
Perm. Datum GROUND LEVEL Elev. 567.9
Log measured from KB , 6.7 m above Permanent Datum.

UWI ____
Licence ____

Other Services:

ELEV.K.B. 574.6
G.L. 567.9
CBF ____

		Shot Density	No. of Shots	Perf. Interval From	Perf. Interval To
Date	FEB-16-98				
Run No.	ONE				
Type Log	TEMP/CCL				
Depth-Driller	2925				
Depth-Logger	2543				
Btm. Log Inter.	2543				
Top Log Inter.	1800				
Fluid in Hole	GAS	Gun Type			
Fluid Level	SURFACE	Gun Size			

		Tubing/Casing Record Size mm	Wt. Kg/m	From	To
Bit Size	N/A				
Unit #	406				
Location	FORT ST. JOHN	177.8		1723	2529
Recorded By	D.DEI	244		SURFACE	1890
Witnessed By	D.FERGUSON	OPEN		2529	2925

Collar Location Casing	Collar Location Tubing	Other Services Service	Type	Size	Depth
		Bri[illegible]			
		Pro[illegible]			
		Cem[illegible]			
		Cem[illegible]			
		Ju[illegible] ...ize			
		Gau[illegible] Number			

FOLD

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFULL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

REMARKS:
NO LOG TO CORRELATE TO.
LOG AS PER CUSTOMER REQUEST.
SERVICE ORDER #58503

REMARKS

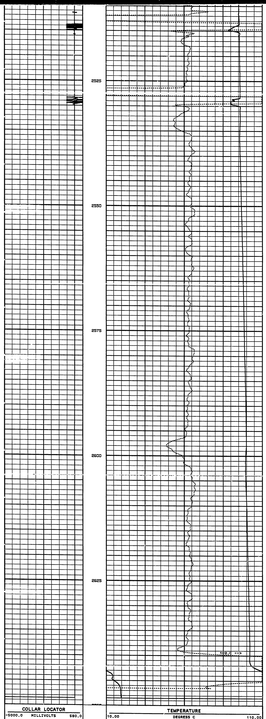
1:240

V.07.31.97 VERSION: 1.64

TEMP

03TEM1

START DEPTH: 1790.0 METERS DIRECTION: DOWN DATE: 02/16/98 TIME: 15:28 MODE: TRACE PLAYBACK



REMARKS

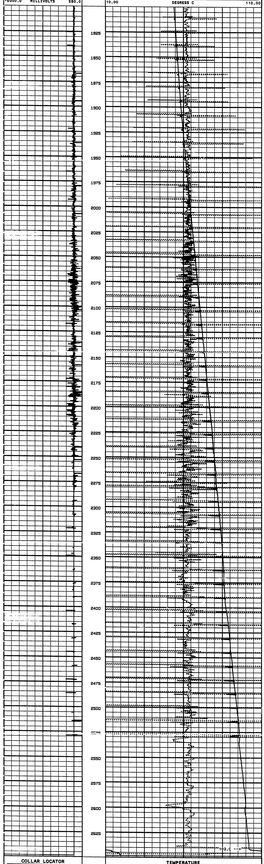
1:1200

V.07.01.07 VERSION: 1.64

TEMP

03TEW1

START DEPTH: 1700.0 METERS DIRECTION: DOWN DATE: 02/10/98 TIME: 10:03 MODE: TRACE PLAYBACK



COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N65
FIELD	ARROWHEAD PROVINCE NWT

COMPUTALOG

MAY - 5 1998

N.E.B. COPY

COMPANY: PARAMOUNT RESOURCES LTD.

WELL: PARAMOUNT ET AL ARROWHEAD N65

FIELD: ARROWHEAD

PROVINCE: NORTHWEST TERRITORIES

Province: NORTHWEST TERRITORIES
Field: ARROWHEAD
Location: UWI: 1933
Well: PARAMOUNT ET AL ARROWHE
Company: PARAMOUNT RESOURCES LTD

Schlumberger

DIPOLE SONIC IMAGER LOG
*** FIELD PRINT ***

UWI: 300N165604012245 6
SUR LOC: 60 °40' N 122°45' W

Elev.: K.B. 574.6 M
G.L. 567.9 M
D.F. 574.3 M

Permanent Datum: GROUND LEVEL Elev.: 567.9 M
Log Measured From: KELLY BUSHING 6.7 M above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Lat:	Long:
EL383	60°40'	-122°45'

		Run 1	Run 2	Run 3	Run 4
Logging Date		19-FEB-1998			
Run Number		ONE			
Depth Driller		2926 M			
Schlumberger Depth		2927.2 M			
Bottom Log Interval		2918.7 M			
Top Log Interval		1800 M			
Casing Driller Size @ Depth		177.800 MM @ 2529 M		@	
Casing Schlumberger		2529 M			
Bit Size		154.000 MM			
Type Fluid In Hole		SALT WATER / LCM			
MUD Density	Viscosity	1090 K/M3 52 S			
Fluid Loss	PH	9			
Source Of Sample		FLOWLINE			
RM @ Measured Temperature		0.150 OHMM @ 24 DEGC		@	
RMF @ Measured Temperature		0.150 OHMM @ 21 DEGC		@	
RMC @ Measured Temperature		0.130 OHMM @ 22 DEGC		@	
Source RMF	RMC	MEASURED MEASURED			
RM @ MRT	RMF @ MRT	0.041 @ 145 0.046 @ 145		@ @	
Maximum Recorded Temperatures		145 DEGC		Cartridge temp est. 150°C BHT	
Circulation Stopped	Time	19-FEB-1998 8:00			
Logger On Bottom	Time	19-FEB-1998 19:30			
Unit Number	Location	2016 GRANDE PRAIRIE			
Recorded By		SHAWN CARROLL			
Witnessed By		ROD MacEACHERN			

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR PROPOSAL AND TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1: CST-HST SERVICES2
CS1:
CS2:
CS3:
CS4:
CS5:

REMARKS: RUN NUMBER 2

FIG: NABORS #16
PRINTS 4 FIELD AND 8 FINAL
OPERATOR: ERNEST DEORUZ

THESE LOGS ARE DEPTH CORRELATED TO COMPUTALOG NEUTRON LOG DATED 02/18/98

CLIENT REQUESTED SUBSEQUENT DESCENT TO LOG DIB FROM 2735 TO 1800 M

DESCENT: DSST GR1 DTA DTC

	Run 1	Run 2	Run 3	Run 4
Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth	@		@	
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
MUD Density	Viscosity			
Fluid Loss	PH			
Source Of Sample				
RM @ Measured Temperature	@		@	
RMF @ Measured Temperature	@		@	
RMC @ Measured Temperature	@		@	
Source RMF	RMC			
RM @ MRT	RMF @ MRT	@ @	@ @	
Maximum Recorded Temperatures				
Circulation Stopped	Time			
Logger On Bottom	Time			
Unit Number	Location			
Recorded By				
Witnessed By				

	Run 1	Run 2
MCNL-G	1094113	RUN 2
MCD-G	70D-72	
SERVICE ORDER #:		
PROGRAM VERSION:		
FLUID LEVEL:		
LOGGED INTERVAL:	START	STOP

EQUIPMENT DESCRIPTION

RUN 1 RUN 2

SURFACE EQUIPMENT

GSR-UY
DTM-B

DOWNHOLE EQUIPMENT 22.89

CTEM

DTC-H
EBHC-C
DTC-A

DTA-A
DTX-A
DTX-KB3 16

SGT-N
SGT-A-E
SGC-TB 5588
SGD-TAA

MCD-G
MCD-G 28

DSST-B
SDAC-B 6079
SDDA-A 24
SWDA-A 24
SWDX-A 24
SMDX-A 24

21.64
20.73
19.51
17.83
15.54
13 MM Standoff
13 MM Standoff

TelStatus
ToolStatu

20.73
19.23
18.46

Gamma Ray

HD

HV DF
Tension FWF

0.00
TOOL ZERO

MAXIMUM STRING DIAMETER 118 MM
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Field: Gold Hill Field
Date: 2006-06-06 Time: 14:00:00
Operator: Chevron Texaco
Well: Gold Hill Field Well 1
Wellbore: Gold Hill Field Well 1 Wellbore
Wellbore API: 42-161-00000-00-00

Integrated Standard Summary

Client: Chevron Texaco
Project: Gulf Coast
Rig: Rig 1
Date: 2006-06-06
Time: 14:00:00

Overlayed Parameter Summary

Gold Hill Field Well 1 Wellbore
Gold Hill Field Well 1 Wellbore
Gold Hill Field Well 1 Wellbore
Gold Hill Field Well 1 Wellbore

Output DLIS Files

DEFAULT	ORIGIN (or)	PRIMARY	
ORIGIN	ORIGIN (or)	PRIMARY	24-FEB-1998 10:00
			24-FEB-1998 10:00

Integrated Hole/Cement Interval Summary

Hole Volume: 4 - 6.5 IN
Cement Volume: 1 - 6.25 IN (assuming 11.5ppg IPS mixing 6.25)
Pressure Test Data: 0.00 to 0.00, 0.00 to 0.00 (psig Data) Gradient 0.00

OP System Version: TCS-7112

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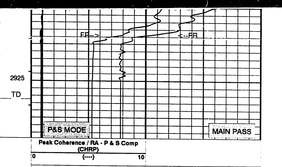


Gamma Ray (GR) (GAPI) 0 150
Hole Diameter (HD) (MM) 75 325
Bit Size (BS) (MM) 75 325
Tension (TENS) (N) 50000 0

Peak Coherence / RA - P & S Comp (CHRP) (---) 0 10
Delta-T Comp - P & S (DT4P) (US/M) 300 100
Delta-T Shear - P & S (DT4S) (US/M) 500 100

PIP SUMMARY
Integrated Hole Volume Minor Pip Every 0.1 M3
Integrated Hole Volume Major Pip Every 1 M3
Integrated Transit Time Minor Pip Every 1 MS
Integrated Transit Time Major Pip Every 10 MS

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
BHS	Bore Hole Status	OPEN
BS	Bit Size	154.000 MM
COUL	Label Slowness Lower Limit - P & S Comp	100 US/M
COUU	Label Slowness Upper Limit - P & S Comp	700 US/M
DORL	Depth Offset Repeat Analysis	0.0 M
DTF	Delta-T Fluid	620.079 US/M
LFC	Label Formation Character - P & S	COMP_FIRST
RSMN	Playback Processing	OFF
RSMX	Label Shear/Comp Minimum Ratio - P & S	1.4
SHUL	Label Shear/Comp Maximum Ratio - P & S	2.12
SHLL	Label Slowness Lower Limit - P & S Shear	250 US/M
SHUL	Label Slowness Upper Limit - P & S Shear	700 US/M
STLL	Label Slowness Lower Limit - Stoneley	200 US/M
STUL	Label Slowness Upper Limit - Stoneley	2500 US/M
TWIN	STC Integration Time Window - P & S	500 US

Format: DSI_5 Vertical Scale: 1:240 Graphics File Created: 20-FEB-1998 16:33

OP System Version: 7C0-712
DBM

SGT-N HPCV-667

Input DLIS Files

DEFAULT	DSSTB .008	FN:13	FIELD	19-FEB-1998 20:00	2932.8 M	2509.9 M

Output DLIS Files

DEFAULT	DSSTB .029	FN:52	FIELD	20-FEB-1998 16:33		
CUST	DSSTB .029	FN:53	CUST	20-FEB-1998 16:33		
FMI_CALIPERS	DSSTB .029	FN:54	FIELD	20-FEB-1998 16:33		

Input DLIS Files

DEFAULT	DSSTB .007	FN:11	FIELD	19-FEB-1998 19:03	2932.8 M	2852.9 M

Output DLIS Files

DEFAULT	DSSTB .008	FN:13	FIELD	19-FEB-1998 20:00		
CUST	DSSTB .008	FN:14	CUST	19-FEB-1998 20:01		

Integrated Hole/Cement Volume Summary

Hole Volume = 1.37 M3
Cement Volume = 0.65 M3 (assuming 114.00 MM casing O.D.)
Computed from 2925.9 M to 2855.7 M using data channel(s) HD

OP System Version: 7C0-712
DBM

SGT-N HPCV-667

Changed Parameter Summary

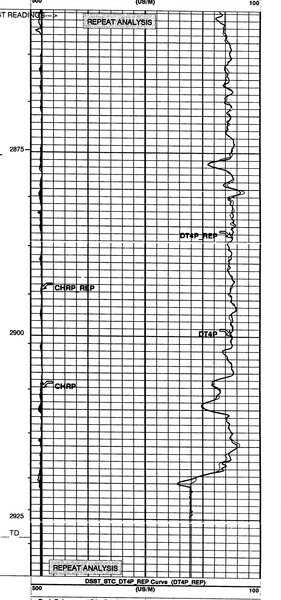
DLIS Name	New Value	Previous Value	Depth & Time
LFC	COMP_FIRST	DYNAMIC	2928.8 20:06:19

PIP SUMMARY
Integrated Hole Volume Minor Pip Every 0.1 M3
Integrated Hole Volume Major Pip Every 1 M3
Integrated Transit Time Minor Pip Every 1 MS
Integrated Transit Time Major Pip Every 10 MS

Time Mark Every 60 S

TENS_REP Curve (TENS_REP) (---) 50000 (N) 0
Tension (TENS) 50000 (N) 0
HD_REP Curve (HD_REP) 75 (MM) 325
GR_REP Curve (GR_REP) 0 (GAPI) 150
BS_REP Curve (BS_REP) 75 (MM) 325
Hole Diameter (HD) 75 (MM) 325
Gamma Ray (GR) 0 (GAPI) 150

DSST_STC_CHRP_REP Curve (CHRP_REP) 0 (---) 10
Delta-T Comp - P & S (DT4P) 500 (US/M) 100
Peak Coherence / RA - P & S Comp (CHRP) 0 (---) 10
DSST_STC_DT4P_REP Curve (DT4P_REP) 500 (US/M) 100



Gamma Ray (GR) 0 (GAPI) 150
Hole Diameter (HD) 75 (MM) 325
BS_REP Curve (BS_REP) 75 (MM) 325
GR_REP Curve (GR_REP) 0 (GAPI) 150
HD_REP Curve (HD_REP) 75 (MM) 325
Tension (TENS) 50000 (N) 0
TENS_REP Curve (TENS_REP) 50000 (N) 0

DSST_STC_DT4P_REP Curve (DT4P_REP) 500 (US/M) 100
Peak Coherence / RA - P & S Comp (CHRP) 0 (---) 10
Delta-T Comp - P & S (DT4P) 500 (US/M) 100
DSST_STC_CHRP_REP Curve (CHRP_REP) 0 (---) 10

PIP SUMMARY
Integrated Hole Volume Minor Pip Every 0.1 M3
Integrated Hole Volume Major Pip Every 1 M3
Integrated Transit Time Minor Pip Every 1 MS
Integrated Transit Time Major Pip Every 10 MS

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
BHS	Bore Hole Status	OPEN
BS	Bit Size	154.000 MM
COUL	Label Slowness Lower Limit - P & S Comp	100 US/M
COUU	Label Slowness Upper Limit - P & S Comp	700 US/M
DORL	Depth Offset Repeat Analysis	0.0 M
DTF	Delta-T Fluid	620.079 US/M
LFC	Label Formation Character - P & S	DYNAMIC
RSMN	Label Shear/Comp Minimum Ratio - P & S	1.4
RSMX	Label Shear/Comp Maximum Ratio - P & S	1.4
SHUL	Label Slowness Lower Limit - P & S Shear	250 US/M
SHUL	Label Slowness Upper Limit - P & S Shear	700 US/M
STLL	Label Slowness Lower Limit - Stoneley	200 US/M
STUL	Label Slowness Upper Limit - Stoneley	2500 US/M
TWIN	STC Integration Time Window - P & S	500 US

Format: DSI_REP Vertical Scale: 1:240 Graphics File Created: 19-FEB-1998 20:09

OP System Version: 7C0-712
DBM

SGT-N HPCV-667

Input DLIS Files

DEFAULT	DSSTB .007	FN:11	FIELD	19-FEB-1998 19:03	2932.8 M	2852.9 M

Output DLIS Files

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Mechanical Caliper - G Wellsite Calibration - Electronics Calibration							
Before: Feb 19 17:57:1998							
MCOD Counts Plus	377.0	N/A	378.9	N/A	N/A	N/A	
MCOD Counts Zero	103.0	N/A	104.0	N/A	N/A	N/A	
Mechanical Caliper - G Wellsite Calibration - Caliper Calibration							
Before: Feb 19 17:58:1998							
Diameter Large Ring	304.8	N/A	311.7	N/A	N/A	N/A	MM
Diameter Small Ring	203.2	N/A	215.4	N/A	N/A	N/A	MM
Scintillation Gamma-Ray - N Wellsite Calibration - Detector Calibration							
Before: Feb 19 17:58:1998							
Gamma Ray (clg - Big)	145.9	N/A	145.9	N/A	N/A	13.27	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

Mechanical Caliper - G / Equipment Identification

Primary Equipment:
Mechanical Caliper Device - G MCD - G 28
Secondary Equipment:

Mechanical Caliper - G Wellsite Calibration
Electronics Calibration

Phase	MCOD Counts Plus		Value	Phase	MCOD Counts Zero		Value
Before			378.9	Before			104.0
320.5 (Minimum)	377.0 (Nominal)	433.0 (Maximum)		87.58 (Minimum)	103.0 (Nominal)	118.4 (Maximum)	

Before: Feb 19 17:57:1998

Mechanical Caliper - G Wellsite Calibration
Caliper Calibration

Phase	Diameter Large Ring			MM	Value	Phase	Diameter Small Ring			MM	Value
Before						Before					
177.1 (Minimum)	304.8 (Nominal)		350.5 (Maximum)			172.7 (Minimum)	203.2 (Nominal)		233.7 (Maximum)		215.4

Before: Feb 19 17:58:1998

Scintillation Gamma-Ray - N / Equipment Identification

Primary Equipment:
Scintillation Gamma Cartridge SGC - TB 9588
Scintillation Gamma Detector SGD - TAA
Auxiliary Equipment:
Scintillation Gamma Housing SGH - K
Radioactive Source SGR - UV

Scintillation Gamma-Ray - N Wellsite Calibration
Detector Calibration

Phase	Gamma Ray (Background) (GAPI)			Value	Phase	Gamma Ray (clg - Big) (GAPI)			Value	Phase	Gamma Ray (Calibrated) (GAPI)			Value
Before				28.97	Before			145.9		Before				165.0
0 (Minimum)	30.00 (Nominal)		120.0 (Maximum)		132.7 (Minimum)	145.9 (Nominal)		158.2 (Maximum)		150.0 (Minimum)	165.0 (Nominal)		180.0 (Maximum)	

Before: Feb 19 17:58:1998

COMPANY	PARAMOUNT RESOURCES LTD.	BOTTOM LOG INTERVAL	2910.7 M
WELL	PARAMOUNT ET AL ARROWHEAD N65	SCHLUMBERGER DEPTH	2927.2 M
FIELD	ARROWHEAD	DEPTH DRILLER	2928 M
PROVINCE	NORTHWEST TERRITORIES	KELLY BUSHING	574.6 M
		DRILL FLOOR	574.3 M
		GROUND LEVEL	557.9 M

Schlumberger

DIPOLE SONIC IMAGER LOG

N.E.B. COPY

93H-P23-D-1

Schlumberger

GEOFRAME
PROCESSED
INTERPRETATION

DIPOLE SHEAR IMAGER

MD 2065

™& Mark of Schlumberger

Using the following logs: MICROLOG
COMPENSATED NEUTRON
LITHODENSITY

COMPANY:	PARAMOUNT RESOURCES LTD.
WELL:	PARAMOUNT ET AL ARROWHEAD N65
FIELD:	ARROWHEAD
Province:	NORTHWEST TERRITORIES
COUNTRY:	
Date Logged:	19-FEB-1998 Date Processed: 23-FEB-1998
Well Location:	UWI: 1833
	SUR LOC: 60 °40' N 122°45' W
Elevations:	KB: 574.6m DF: 574.3m GL: 567.9m
API Number:	EL383 Job Number: 1084113

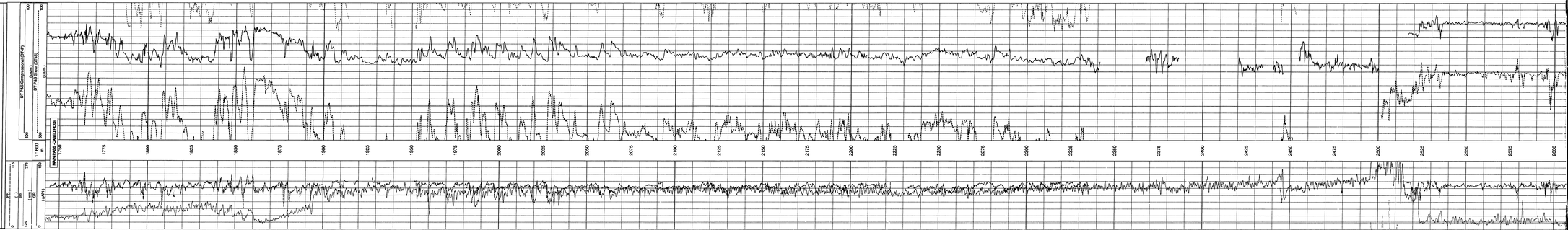
FOLD HERE

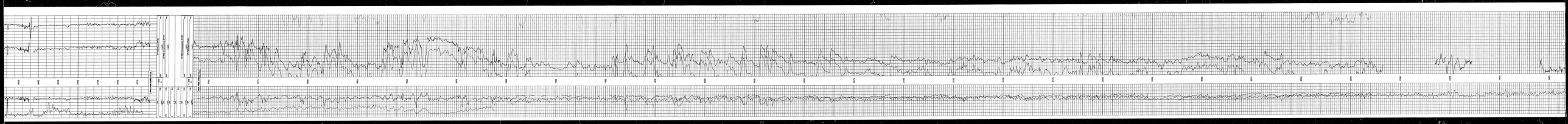
This well name, location and elevation information has been provided by the customer.

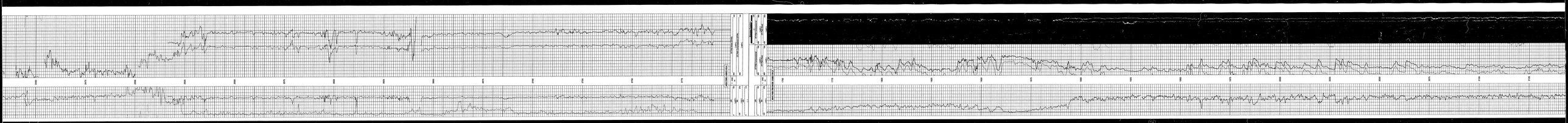
All interpretations, or opinions contained in this document, are based on inferences from electrical or other measurements, and we cannot, and do not, warrant the accuracy, or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our standard terms and conditions as set forth in our current price schedule.

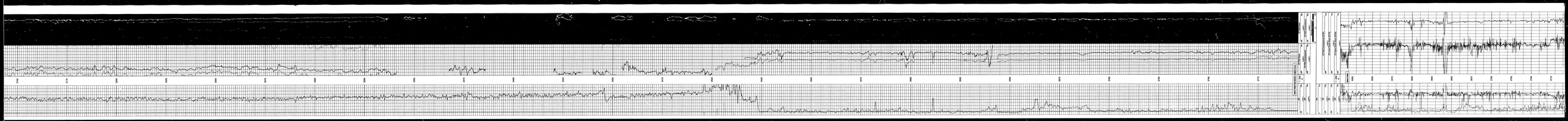
Field Recording: Logging Company: Schlumberger Log Interval: 1775m
Office Recording: CO Owner: CS CALGARY Baseline: GF 2.5.2 Log Interval: 2065m
Mud and Operator Measurements:
Rm @ Measured Temperature: 0.180m.o.m. @ 24degC BHT: 1000degC Bitsize: 154mm
Rmf @ Measured Temperature: 0.180m.o.m. @ 24degC Rmc @ Measured Temperature: Source: MUD SAMPLE
Rmb @ Measured Temperature: 0.180m.o.m. @ 20degC Mud Density: 1.08kg/m3

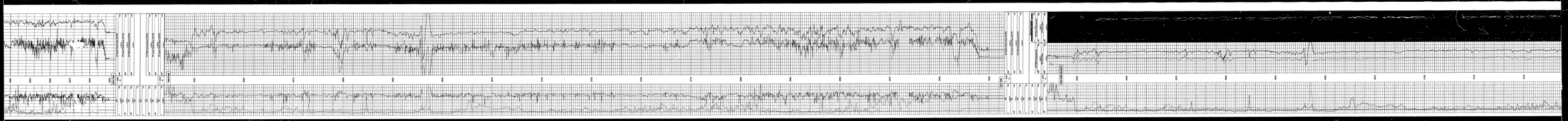
Remarks:
ALL SCALES AND INTERVALS AS PER CLIENT REQUEST
THE DIPOLE SHEAR IMAGER IS PLOTTED WITH OPEN STANDOFFS.
THESE LOGS ARE DEPTH CORRELATED TO COMPENSATED NEUTRON LOG DATED 02/14/98.

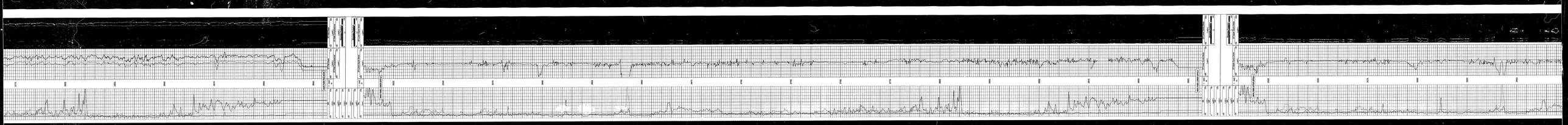


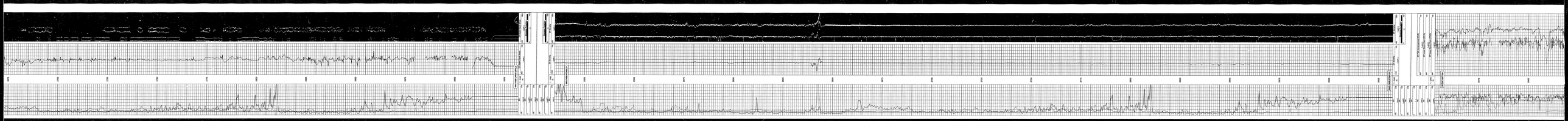

SPONTANEOUS POTENTIAL
RESISTIVITY SHALLOW
RESISTIVITY MEDIUM
RESISTIVITY DEEP
CALIPER
GAMMA RAY
DEPTH

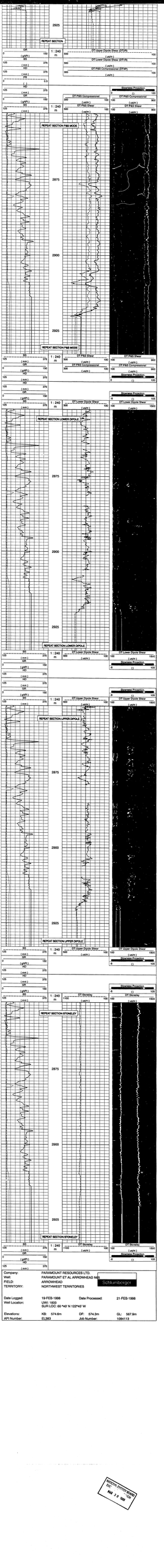












Company:	PARAMOUNT RESOURCES LTD.
Well:	PARAMOUNT ET AL ARROWHEAD N/B
FIELD:	ARROWHEAD
TERRITORY:	NORTHWEST TERRITORIES

Schlumberger

Date Logged:	19-FEB-1998	Date Processed:	21-FEB-1998
Well Location:	UWI: 1632 SUR LOC: 60 °40' N 122°45' W		
Elevations:	KB: 574.8m	DF: 574.3m	GL: 567.8m
API Number:	EL383	Job Number:	1084113

MAGNETIC DECLINATION REPORT
MAR 3 0 1998

LEGIBILITY
OF LOG
COULD VARY
DUE TO
COLOR
CONTENT

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9211-833-10-1

Schlumberger

FMI Image PLot

COMPANY: PARAMOUNT RESOURCES LTD.

WELL: PARAMOUNT ET AL ARROWHEAD N65

FIELD: ARROWHEAD

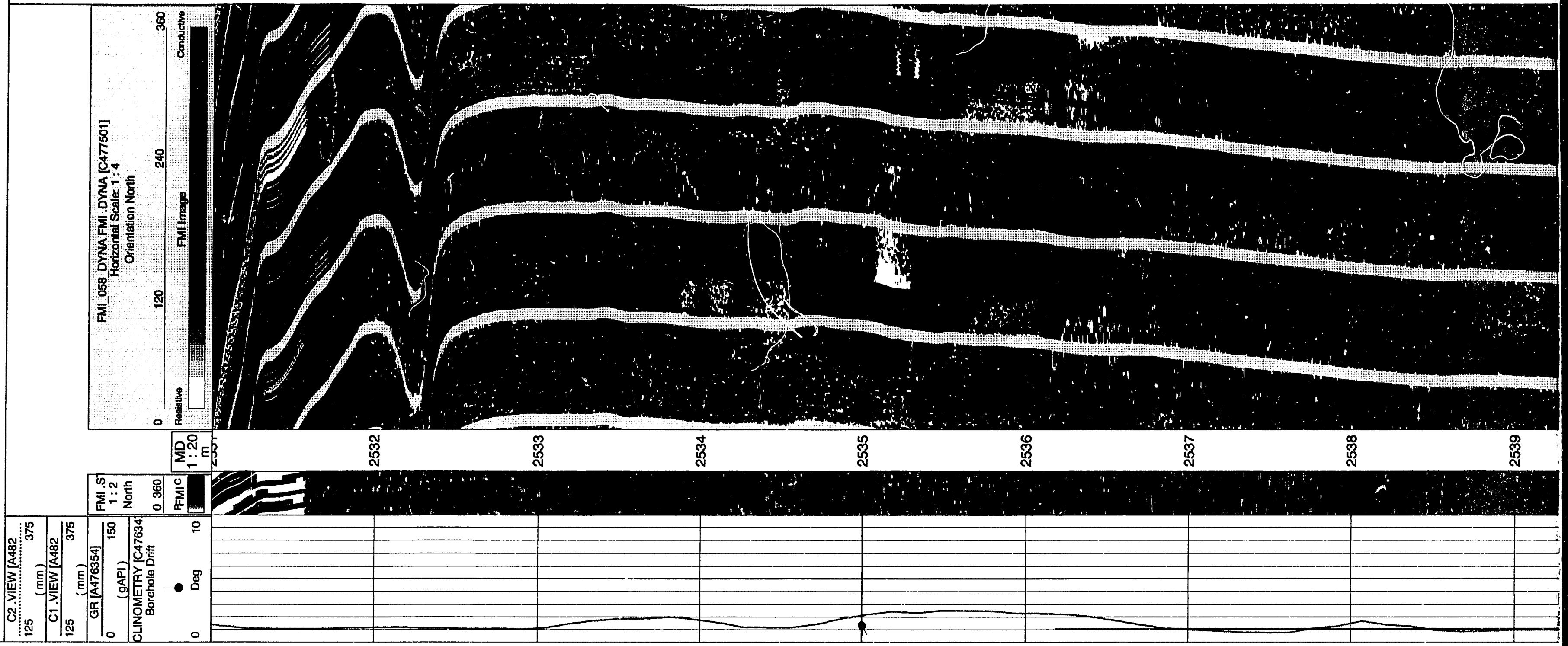
COUNTRY: CANADA

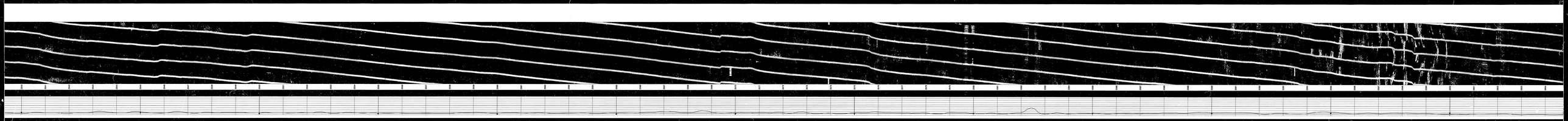
Date Processed:	26-FEB-1998	Date Logged:	23-FEB-1998
Job Number:	4645	Processed at:	CALGARY
Well Location:	60*40'N 122*45*W		
Latitude:		Longitude:	
Elevations:	KB:	DF:	GL:

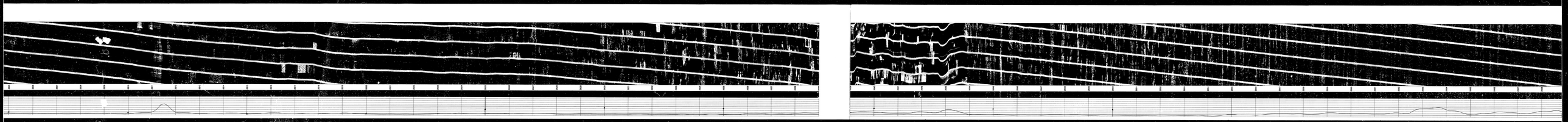
FOLD HERE

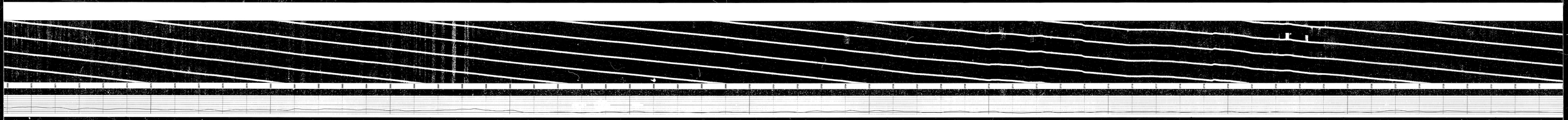
The well name, location and borehole reference data were furnished by the customer.

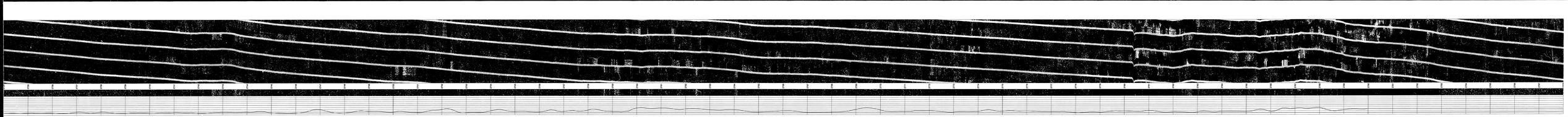
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretations made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

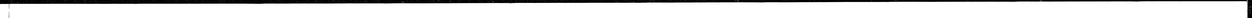


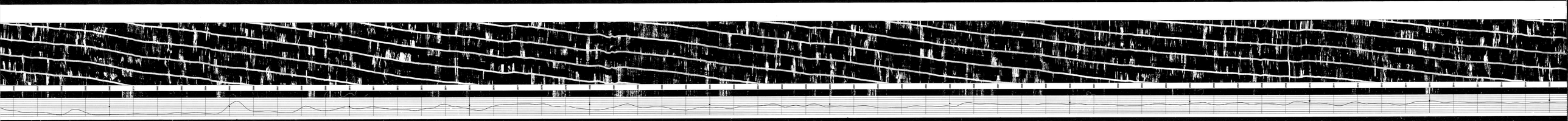


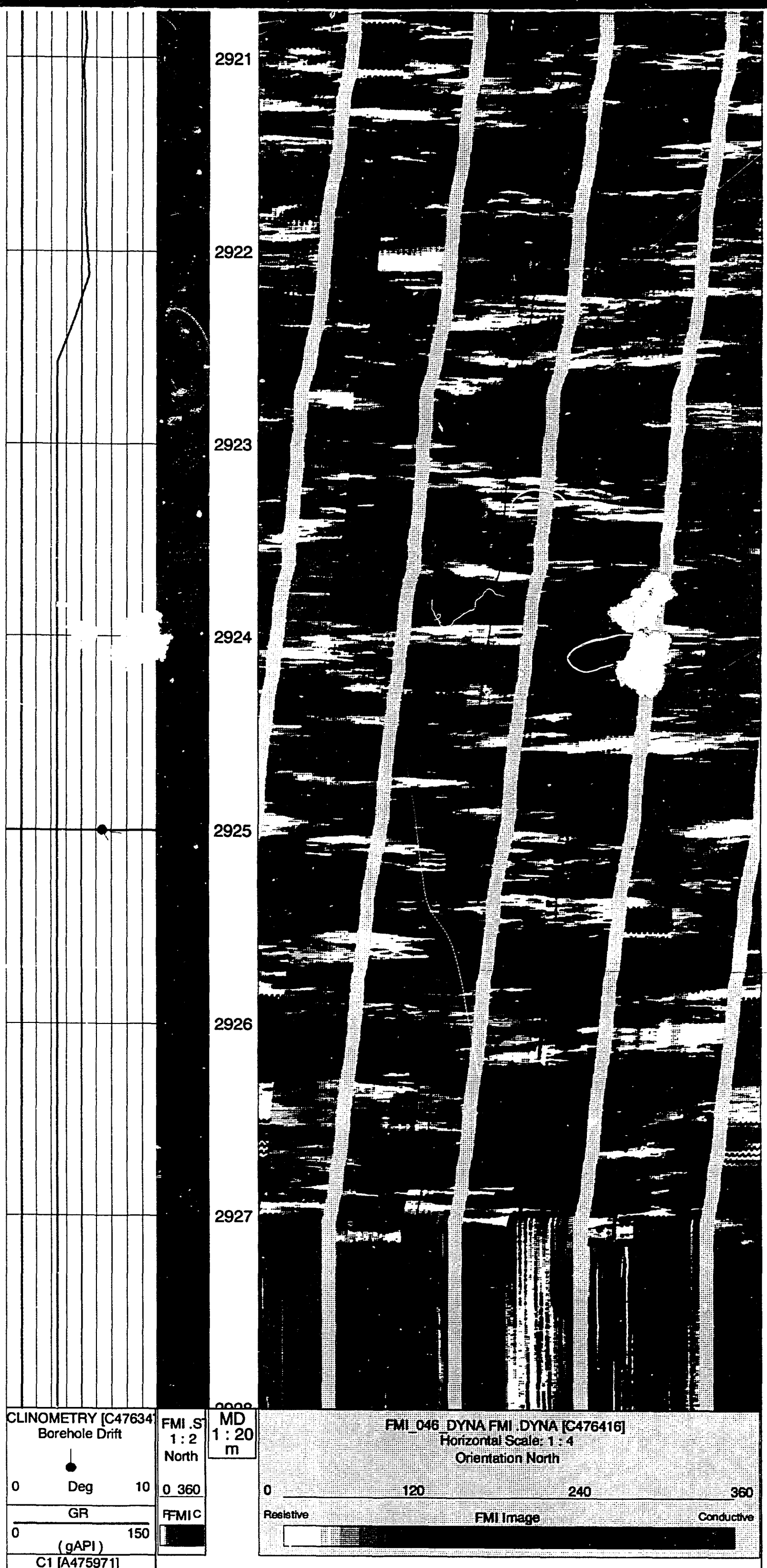











2921
2922
2923
2924
2925
2926
2927
CLINOMETRY [C47634]
Borehole Drift
0 Deg 10
GR
0 150
(gAPI)
C1 [A475971]
125 375
(mm)
C2 [A475976]
125 375
(mm)
CLINOMETRY [C47610]
Borehole Drift
0 Deg 10
CLINOMETRY [C47598]
Borehole Drift
0 Deg 20
CLINOMETRY [C47625]
Borehole Drift
0 Deg 10
CLINOMETRY [C47634]
Borehole Drift
0 Deg 10
FMI .ST
1 : 2
North
0 360
FFMI C
MD
1 : 20
m
FMI_046_DYNA FMI .DYNA [C476416]
Horizontal Scale: 1 : 4
Orientation North
0 120 240 360
Resistive
FMI Image
Conductive

LEGIBILITY
OF LOG
COULD VARY
DUE TO
COLOR
CONTENT

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NATIONAL ENERGY BOARD
MAR 30 1998

9211-P33-10-1

Schlumberger

GEOFRAME PROCESSED INTERPRETATION

STONELEY FRACTURE IDENTIFICATION

*A Mark of Schlumberger

Using the following logs: DSI, FMI

COMPANY:	PARAMOUNT RESOURCES LTD.
WELL:	PARAMOUNT ET AL ARROWHEAD N65
FIELD:	ARROWHEAD
PROVINCE:	NORTHWEST TERRITORIES
COUNTRY:	
Date Logged:	19-FEB-1998 Date Processed: 27-FEB-1998
Well Location:	UWI: 1833
	SUR LOC: 60 *40' N 122*45' W
Elevations:	KB: 574.6m DF: 574.3m GL:
API Number:	EL383 Job Number:

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretations made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

Field Recording: Location: GRANDE PRAIRIE	Software Version: 7C0-712	Engineer: SHAWN CARROLL	
Office Recording: ICS Center: CALGARY	Baseline: GF 2.5.2	Log Analyst: MACFARLANE	

Mud and Borehole Measurements:

Rm @ Measured Temperature: 0.15ohm.m @ 24degC	BHT: 150degC	Bitsize: 0mm	
Rmf @ Measured Temperature: 0.18ohm.m @ 21degC	Type Fluid in Hole:	SALT WATER	
Rmc @ Measured Temperature: 0.13ohm.m @ 22degC	Mud Density: 1.09g/cm3		

Remarks:

STRFRAC computed from 2530(casing) to 2920 meters.
High reflections/energy loss at 2580 and 2612 meters are due to porosity/lithology changes.
High reflections/energy loss will be caused by borehole washouts.
Stoneley fracture detection is evident at: 2597-2602, 2630-2634 and below 2810 meters.

Schlumberger

Company:	PARAMOUNT RESOURCES LTD.
Well:	PARAMOUNT ET AL ARROWHEAD N65
Field:	ARROWHEAD
Province:	NORTHWEST TERRITORIES
Date Logged:	19-FEB-1998 Date Processed: 27-FEB-1998
Well Location:	UWI: 1833
	SUR LOC: 60 *40' N 122*45' W
Elevations:	KB: 574.6m DF: 574.3m GL:
API Number:	EL383 Job Number:

LEGIBILITY
OF LOG
COULD VARY
DUE TO
COLOR
CONTENT

COMPUTALOG

SECTOR BOND LOG

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT ET AL ARMBRUSTER NEB.

FIELD WILDCAT

COUNTY/STATE NORTHWEST TERRITORIES

LOCATION: 1 MILE NORTH OF ARMBRUSTER LAKE

PERMANENT DATUM:	GROUND LEVEL	ELEV.	0 FT.
LOG MEASURED FROM:	KELLY BUSHING		0 FT.
DRILLING MEASURED FROM:	KELLY BUSHING		0 FT.

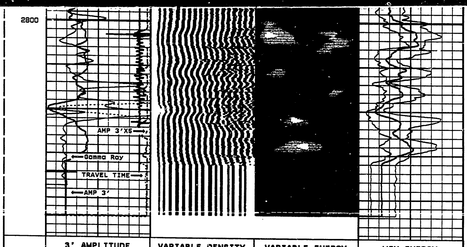
DATE	1-12-87		
RUN NO.	ONE		
DEPTH-DRILLER	1200		
DEPTH-LOGGER	1200		
BTM. LOG INTERVAL	1200		
TOP LOG INTERVAL	0		
CASING-DRILLER	8 5/8 @ 0		
CASING-LOGGER			
BIT SIZE	7 7/8		
TYPE FLUID IN HOLE	WATER		
DENSITY			
VISCOSITY			
PH			
FLUID LOSS			
SOURCE OF SAMPLE			
RM @ MEAS. TEMP.			
RMF @ MEAS. TEMP.			
RMC @ MEAS. TEMP.			
SOURCE RMF / RMC			
RM @ BHT			
TIME SINCE CIRC.			
MAX. REC. TEMP.			
EQUIP. LOCATION			
RECORDED BY			
WITNESSED BY			

BOREHOLE RECORD			
BIT NO.		FROM	TO
SIZE			
TYPE			
WEIGHT			
ROTATION			
PUMP			
SPM			
PRESSURE			
STROKE			
JETS			
HOURS			
DEPTH IN			
DEPTH OUT			

CASING RECORD			
SIZE	WEIGHT	GRADE	FROM
8 5/8			0

TOOL TYPE	SONIC		
SERIAL NO.			
TOOL POSITION			
DIST. FROM BIT			
RUN NO.	ONE		
TIME STARTED			
TIME STOPPED			
TOTAL TIME			
TOTAL FEET			
TOOL STATUS			

REMARKS: TOOL STOP @ 0 FT. CONTROL: 1000 FT. 1000 FT. 1000 FT.



START DEPTH: 2922.0 METERS DIRECTION: UP DATE: 03/11/88 TIME: 11:27 MODE: RECOMPUTE
RECOMPUTED DATE: 03/11/88 TIME: 21:21

259SBT4

MAIN PASS

v.07.31.97 VERSION: 1.64

REMARKS

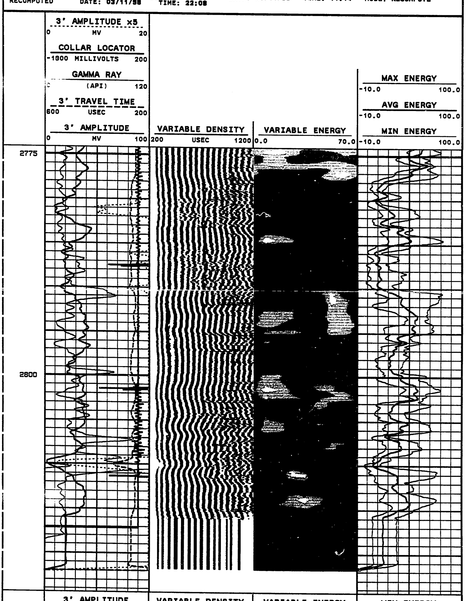
REPEAT PASS 0 kPa

v.07.31.97 VERSION: 1.64

REPEAT PASS

259SBT2

FINISH DEPTH: 2771.0 METERS DIRECTION: UP DATE: 03/11/88 TIME: 11:14 MODE: RECOMPUTE
RECOMPUTED DATE: 03/11/88 TIME: 22:08



START DEPTH: 2822.1 METERS DIRECTION: UP DATE: 03/11/88 TIME: 11:10 MODE: RECOMPUTE
RECOMPUTED DATE: 03/11/88 TIME: 22:08

259SBT2

REPEAT PASS

v.07.31.97 VERSION: 1.64

REMARKS

177.8 LINER TOP

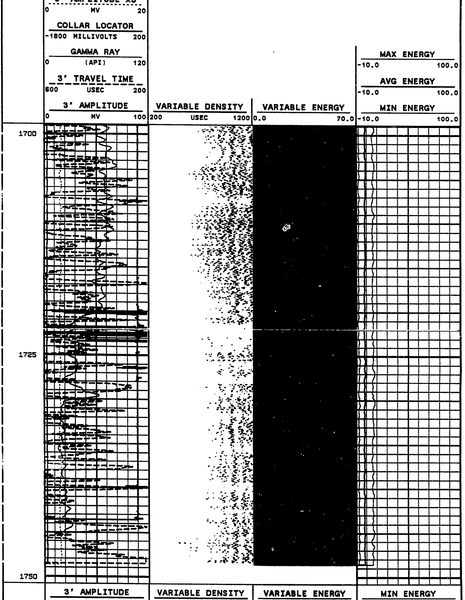
SBT TOOL NOT CENTRALIZED TO 177.8 CASING

v.07.31.97 VERSION: 1.64

177.8

259SBT6

FINISH DEPTH: 1888.0 METERS DIRECTION: UP DATE: 03/11/88 TIME: 13:01 MODE: RECOMPUTE
RECOMPUTED DATE: 03/11/88 TIME: 23:16



START DEPTH: 1750.0 METERS DIRECTION: UP DATE: 03/11/88 TIME: 12:58 MODE: RECOMPUTE
RECOMPUTED DATE: 03/11/88 TIME: 23:13

259SBT6

177.8

v.07.31.97 VERSION: 1.64

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT et al ARROWHEAD N65

FIELD ARROWHEAD PROVINCE N.W.T.

COMPUTALOG

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
MAR 2 4 1998

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COMPUTALOG CS400

TEMPERATURE LOG

9211-P33-10-1

PROVINCE	NORTHWEST TERRITORIES
FIELD	ARROWHEAD
WELL	PARAMOUNT et al ARROWHEAD N65
COMPANY	PARAMOUNT RESOURCES LTD.

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N65
FIELD	ARROWHEAD
PROVINCE	NORTHWEST TERRITORIES

LSD ___ Sec. ___ Twp. ___ Rge. ___ Other Services:
Perm. Datum GROUND LEVEL Elev. 567.9
Log measured from KB , 6.7 m above Permanent Datum.
ELEV. K.B. 574.6
G.L. 567.9
CBF
UWI WID 1833/ WATER LIC.N3L1-1706
Licence N97-A807

Date	MARCH 11,1998	Shot Density	No. of Shots	Perf. Interval From / To
Run No.	ONE			
Type Log	TEMP/CCL			
Depth-Driller	2926			
Depth-Logger	2819.7			
Btm.Log Inter	2822.7			
Top Log Inter	994.0			
Fluid in Hole	WATER	Gun Type		
Fluid Level	/	Gun Size		
Bit Size	154 mm	Tubing/Casing Record		
Unit #	406	Size mm / Wt. Kg/m	From	To
Location	FORT ST JOHN	244.5 / 64.74	SURFACE	1890
Recorded By	D.DEI	177.8 / 38.69	1733	2529
Witnessed By	J.STROH	139.7 / 25.3	2297.21	2856.09

Collar Location		Other Services			
Casing	Tubing	Service	Type	Size	Depth
		Bridge Plug			
		Produc. Packer			
		Cement Retainer			
		Cement			

Tubing Bottom — Junk Basket Size
Seating Nipple — Gauge Ring Number

FOLD

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REMARKS Rig: ALBERTA GOLD #30 Service Order # 58259
CORRELATE TO COMPUTALOG SBT LOG DATED: MARCH 11,1998 BHT 129 °C
LOG AS CUSTOMER REQUEST.
RAN TEMP TOOL IMMEDIATELY AFTER 2 GUAGE RING AND AN SBT RUN, WELL PRESSURE BUILD UP AS TOOL WAS LOGGING, ANTICIPATE HIGHER TEMP IF WELL WAS COMPLETELY STATIC FOR LONGER PERIOD OF TIME. Prints: 13

Bit Size	154 mm	Run No.	Tool Type	Tool No.	Other
Well Status	NEW	ONE	HI-TEMP/CCL		
Surface Pressure					
Shut In	Flowing				

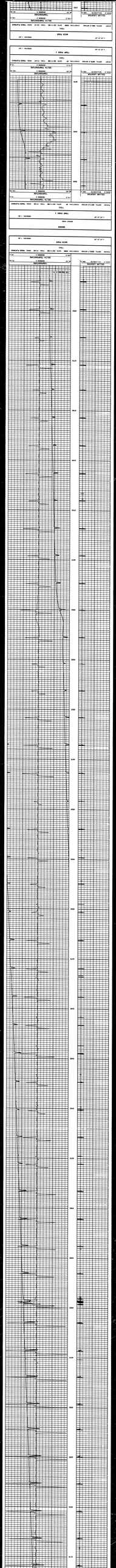
EQUIPMENT DATA

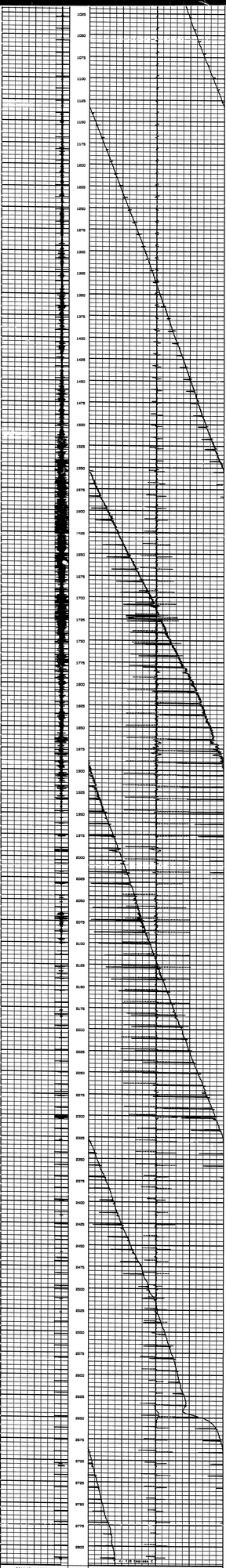
REMARKS
MAIN PASS
2 Deg.Per Division

MAIN PASS
V.07.31.97 VERSION: 1.64

TEM1
START DEPTH: 994.0 METERS DIRECTION: DOWN DATE: 03/11/98 TIME: 15:10 MODE: TRACE PLAYBACK

DELTA TEMPERATURE -50.0 DEGRESS C 50.0
TEMPERATURE 35.00 DEGRESS C 75.00
COLLAR LOCATOR -5000.0 MILLIVOLTS 580.0





FINISH: DEPTH: 2823.7 METERS DIRECTION: DOWN DATE: 03/11/98 TIME: 17:43 MODE: TRACK PLAYBACK

TEM1

MAIN PASS

V.07.31.97 VERSION: 1.84

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT et al Of ARROWHEAD N&B

FIELD ARROWHEAD PROVINCE N.W.T.

COMPUTALOG

NATIONAL ENERGY BOARD
ENERGY
MAR 2 4 1998

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COMPUTALOG

CS400

PERFORATING LOG

9211-P33-10-1

PROVINCE	NORTHWEST TERRITORIES
FIELD	ARROWHEAD
WELL	PARAMOUNT et al ARROWHEAD N65
COMPANY	PARAMOUNT RESOURCES LTD.

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT et al ARROWHEAD N65

FIELD ARROWHEAD

PROVINCE NORTHWEST TERRITORIES

LSD ____ Sec. ____ Twp. ____ Rge. ____
Perm. Datum GROUND LEVEL Elev. 567.9
Log measured from KB, 6.7 m above Permanent Datum.

UWI HID 1833/ WATER LIC.N3L1-1706
Licence N97-AB07

Other Services: CEMENT RETAINER
ELEV.K.B. 574.6
G.L. 567.9
CBF ____

Date	MARCH 12,1998
Run No.	ONE
Type Log	[illegible]
Depth-Driller	[illegible]
Depth-Logger	2640.0
Btm.Log Inter.	2640.0
Top Log Inter.	2568.8
Fluid in Hole	WATER
Fluid Level	/
Bit Size	154 mm
Unit #	406
Location	FORT ST JOHN
Recorded By	D.DEI
Witnessed By	J.STROH

Shot Density	No. of Shots	Perf. Interval From	To
17	17	2618.0	2619.0

Gun Type ERHSC
Gun Size 101.6

Tubing/Casing Record

Size mm	Wt. Kg/m	From	To
244.5	64.74	SURFACE	1890
177.8	38.69	1723	2529
139.7	25.3	2297.21	2856.09

Collar Location Casing	Tubing

Other Services

Service	Type	Size	Depth
Bridge Plug			
Production Packer			
Cement Retainer	HI-TEMP	139.7	2616.0
Cement			

Tubing Bottom
Seating Nipple
Junk Basket Size
Gauge Ring Number

FOLD

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REMARKS Rig: ALBERTA GOLD #30 Service Order # 58512

CORRECTE TO COMPUTALOG SBT LOG DATED: MARCH 11,1998. BHT 130 °C

Prints: 13

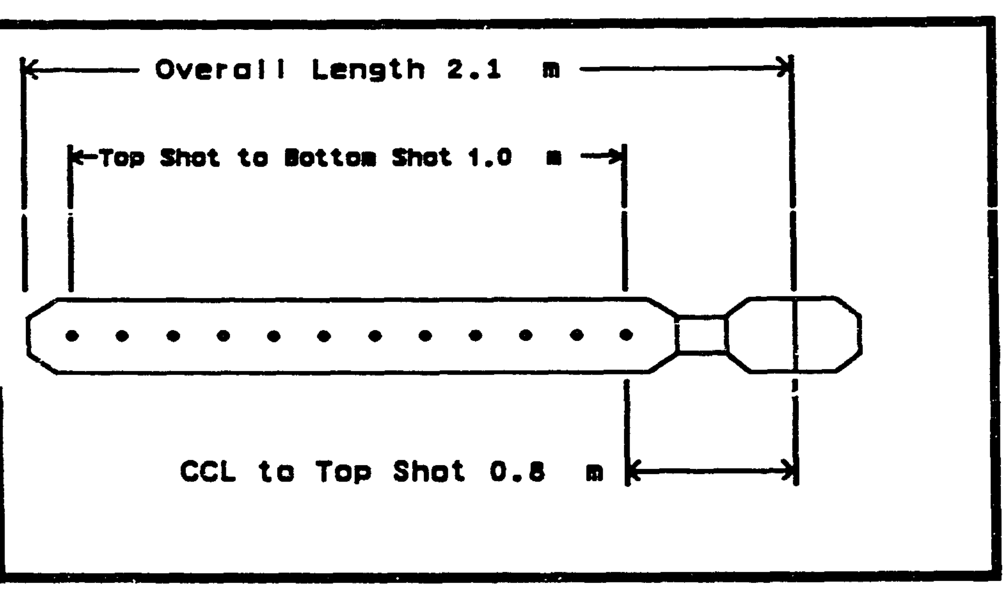
Bit Size	154 mm
Well Status	NEW
Surface Pressure	
Shut In	Flowing
NIL	NIL

EQUIPMENT DATA

Run No.	Tool Type	Tool No.	Other
ONE	ERHSC		2618.0-2619.0
TWO	CEMENT RETAINER		2616.0

Date 03/12/98
Gun O.D. 101.6 mm
Charge Type OWEN
Gram Weight 39 DP
Phasing 60 Degrees
Decentralized NO

Shot Density	No. of Shots	Perforated Interval From	To
17	17	2618.0	2619.0

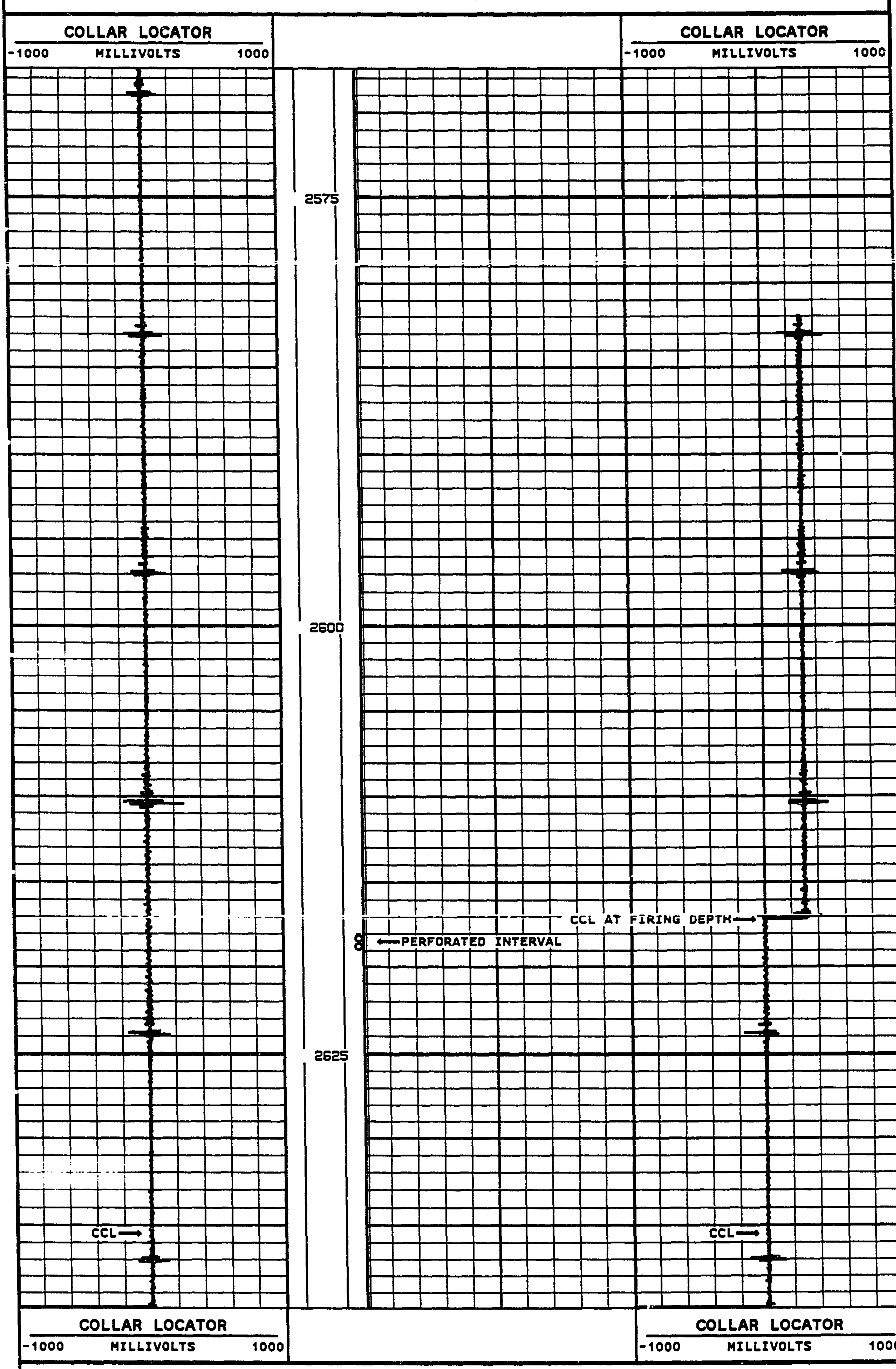


REMARKS

POSITION CCL AT 2617.2 mKB TO PERFORATE 2618.0 mKB TO 2619.0 mKB

VERSION: 1.64

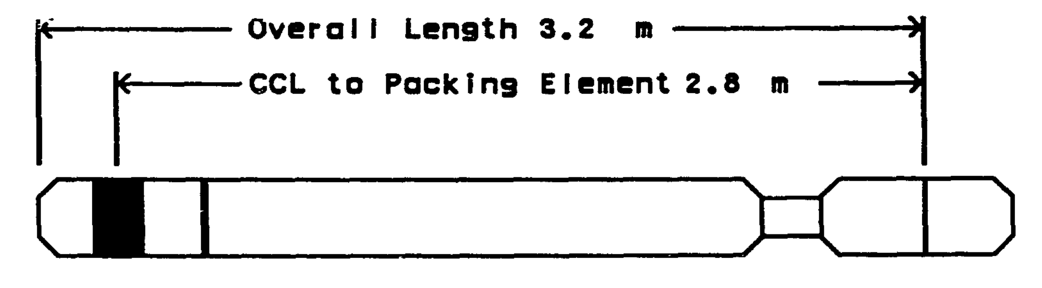
FINISH DEPTH: 2568.8 METERS DIRECTION: UP DATE: 03/12/98 TIME: 22:07 MODE: TRACE PLAYBACK



START DEPTH: 2639.9 METERS DIRECTION: UP DATE: 03/12/98 TIME: 22:08 MODE: TRACE PLAYBACK

VERSION: 1.64

Date 03/12/98
Type HI-TEMP
Model PWSR
Size 139.7
Depth 2616.0
Make CARDIUM

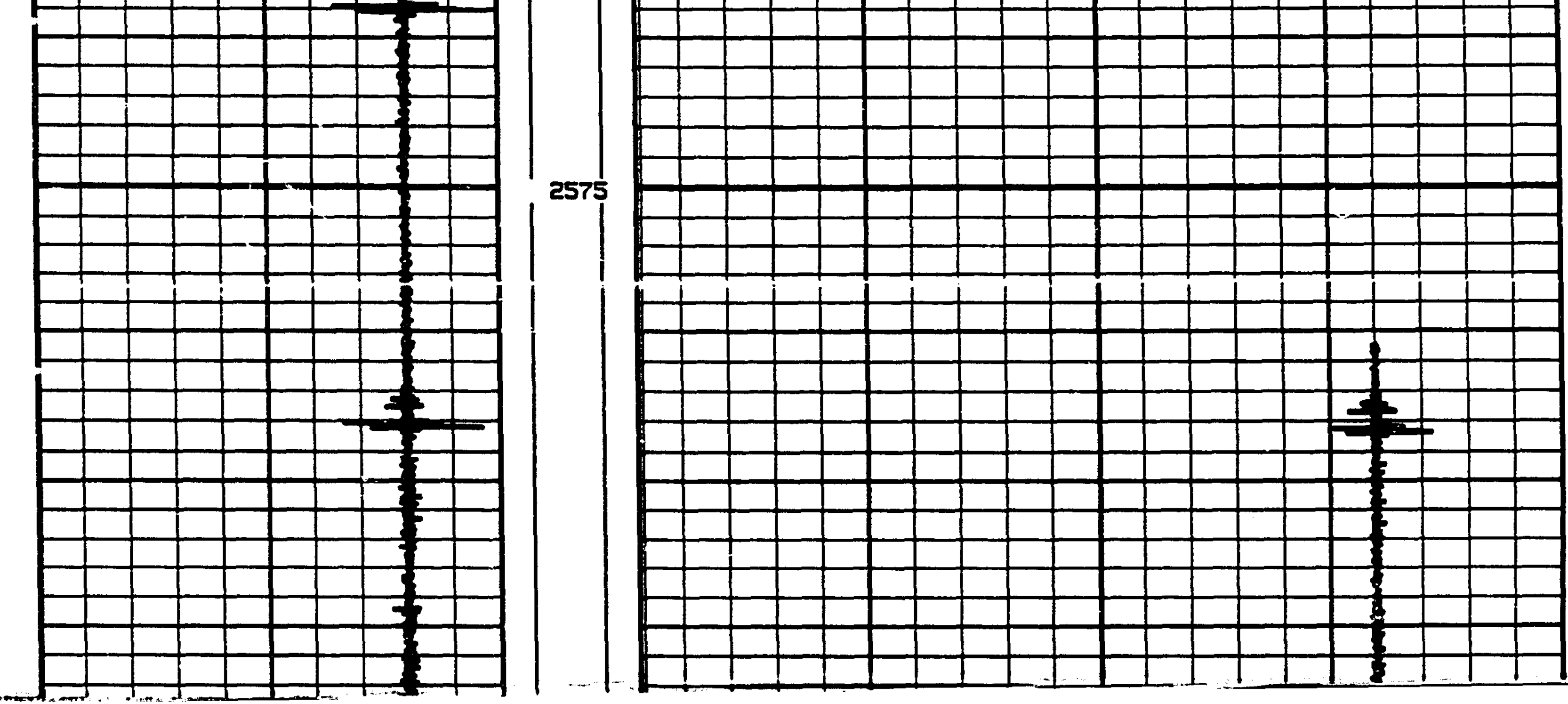


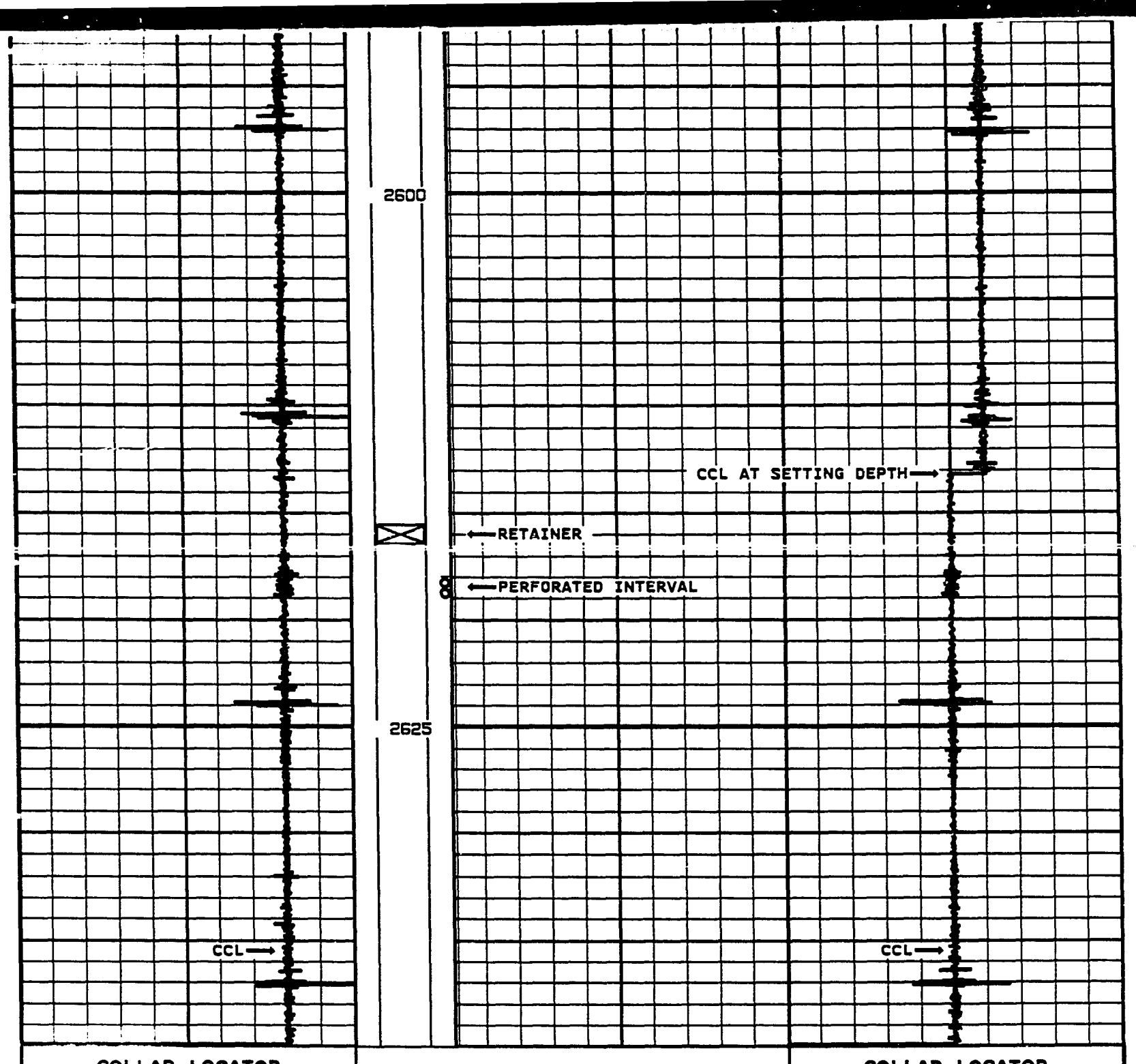
REMARKS

POSITION CCL AT 2613.2 mKB TO SET CEMENT RETAINER AT 2616.0

VERSION: 1.64

FINISH DEPTH: 2569.5 METERS DIRECTION: UP DATE: 03/13/98 TIME: 00:04 MODE: TRACE PLAYBACK





COLLAR LOCATOR		COLLAR LOCATOR
-500 MILLIVOLTS 500		-500 MILLIVOLTS 500

START DEPTH: 2640.0 METERS DIRECTION: UP DATE: 03/13/88 TIME: 00:03 MODE: TRACE PLAYBACK
VERSION: 1.64

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT et al ARROWHEAD N65

FIELD ARROWHEAD PROVINCE N.W.T.

COMPUTALOG

MAR 24 1988

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1833

COMPUTALOG

CS400

SECTOR BOND LOG

9211-P33-10-1

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N65
FIELD	ARROWHEAD
PROVINCE	NORTHWEST TERRITORIES

PROVINCE NORTHWEST TERRITORIES
FIELD ARROWHEAD
WELL PARAMOUNT et al ARROWHEAD N65
COMPANY PARAMOUNT RESOURCES LTD.

LSD ____ Sec. ____ Twp. ____ Rge. ____
Perm. Datum GROUND LEVEL Elev. 567.9
Log measured from KB , 6.7 m above Permanent Datum.
UWI NID 1833/ WATER LIC.N3L1-1706
Licence N97-A807

Other Services: NONE
ELEV.K.B. 574.6
G.L. 567.9
CBF

Date	MARCH 16,1998
Run No.	ONE
Type Log	GR/SBT/CCL
Depth-Driller	2926
Depth-Logger	2660.0
Btm.Log Inter.	2660.0
Top Log Inter.	2294.0
Fluid in Hole	WATER
Fluid Level	SURFACE
Bit Size	154 mm
Unit #	406
Location	FORT ST JOHN
Recorded By	D.DEI
Witnessed By	J.STROH

Shot Density	No. of Shots	Perf. Interval From	Perf. Interval To

Gun Type
Gun Size

Tubing/Casing Record

Size mm	Wt. Kg/m	From	To
244.5	64.74	SURFACE	1890
177.8	38.69	1723	2529
139.7	25.3	2297.21	2856.09

Collar Location Casing	Collar Location Tubing	Other Services Service	Type	Size	Depth
		Bridge Plug			
		Produc. Packer			
		Cement Retainer			
		Cement			

Tubing Bottom
Seating Nipple
Junk Basket Size
Gauge Ring Number

FOLD

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REMARKS

Rig: ALBERTA GOLD #30 Service Order # 58518

CORRELATE TO COMPUTALOG SBT LOG DATED: MARCH 11,1998. BHT 130 °C

CEMENT DATA: PUMP 2 m3 OF WATER FOR PREFLUSH,1945: BATCH MIX 3 m3 OF 1885 Kg/m3 SLURRY W/.7% CFR & .7% CFL-2, ADDED FA1 FOAMING AGENT @ 12 LITERS PER/m3 ON THE FLY.PUMPED 3 m3 OF SLURRY FOLLOWED BY 7.9 m3 OF WATER. STUNG INTO RETAINER. PUMP ED 2.5 m3 OF WATER CUT FLUSH BY .3 m3. ANNULUS STILL HOLDING FLUID COLUMN. POOH. LAID DOWN 7 JTS. FIRST 3 DRY, NEXT 14 JTS. WET. TRACE OF CEMENT ON OUTSIDE TBG. Prints: 13

EQUIPMENT DATA

Run No.	Tool Type	Tool No.	Other
ONE	SBT	195	

Bit Size	154 mm
Well Status	NEW
Surface Pressure Shut In	NIL
Surface Pressure Flowing	NIL

REMARKS

MAIN PASS 0 Kpa

MAIN PASS

VERSION: 1.54

v.07.31.97

REMARKS

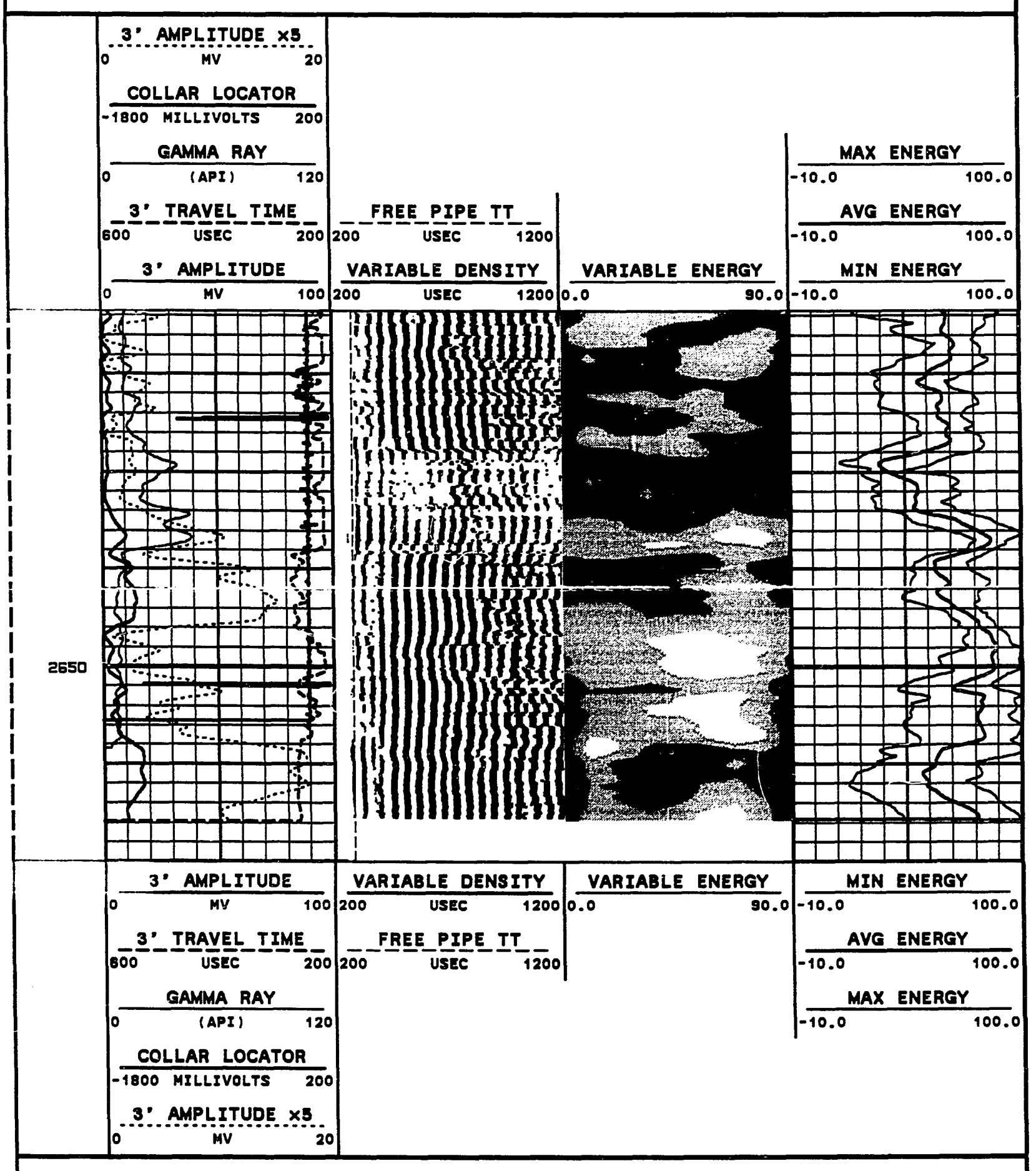
REPEAT PASS 0 Kpa

v.07.31.97 VERSION: 1.64

REPEAT PASS

516SBT2

FINISH DEPTH: 2831.0 METERS DIRECTION: UP DATE: 03/18/98 TIME: 18:00 MODE: TRACE PLAYBACK



START DEPTH: 2880.0 METERS DIRECTION: UP DATE: 03/18/98 TIME: 17:57 MODE: TRACE PLAYBACK

516SBT2

REPEAT PASS

v.07.31.97 VERSION: 1.64

COMPANY PARAMOUNT RESOURCES LTD.

WELL PARAMOUNT et al ARROWHEAD N65

FIELD ARROWHEAD PROVINCE N.W.T.

COMPUTALOG

NATIONAL ENERGY BOARD
MAR 25 1998

N.E.B. COPY 1833

COMPUTALOG CS400

PERFORATING LOG

9211-P33-10-1

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N65
FIELD	ARROWHEAD
PROVINCE	NORTHWEST TERRITORIES

PROVINCE NORTHWEST TERRITORIES
FIELD ARROWHEAD
WELL PARAMOUNT et al ARROWHEAD N65
COMPANY PARAMOUNT RESOURCES LTD.

LSD ____ Sec. ____ Twp. ____ Rge. ____
Perm. Datum GROUND LEVEL Elev. 567.9
Log measured from KB, 6.7 m above Permanent Datum.
UWI WID 1833/ WATER LIC.N3L1-1706
Licence N97-A807

Other Services: NONE

ELEV.K.B. 574.6
G.L. 567.9
CBF ____

Date	MARCH 17,1998
Run No.	ONE
Type Log	CCL
Depth-Driller	2926
Depth-Logger	2799.1
Btm.Log Inter.	2796.0
Top Log Inter.	2717.5
Fluid in Hole	WATER
Fluid Level	SURFACE
Bit Size	154 mm
Unit #	406
Location	FORT ST JOHN
Recorded By	D.DEI
Witnessed By	R.HEMMINGSEN

Shot Density	No. of Shots	Perf. Interval From	To
17	34	2788.0	2790.0
	17	2791.0	2792.0
17	86	2777.0	2782.0

Gun Type ERHSC
Gun Size 101.6

Tubing/Casing Record

Size mm	Wt. Kg/m	From	To
244.5	64.74	SURFACE	1890
177.8	38.69	1723	2529
139.7	25.3	2297.21	2856.09

Collar Location Casing	Tubing	Other Services: Service	Type	Size	Depth
		Bridge Plug			
		Produc[illegible] Packer			
		Cement [illegible]tainer			
		Cement			

Tubing Bottom ____ Junk [illegible]ket Size ____
Seating Nipple ____ Gauge [illegible]ng Number ____

FOLD

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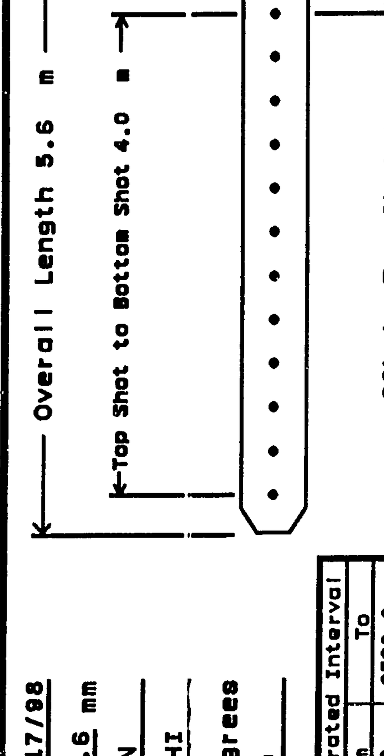
REMARKS Rig: ALBERTA GOLD #30 Service Order # 58517
CORRELATE TO COMPUTALOG SBT LOG DATED: MARCH 11,1998. BHT 130 °C
Prints: 13

Bit Size	154 mm
Well Status	NEW
Surface Pressure	
Shut In	Flowing
NIL	NIL

EQUIPMENT DATA

Run No.	Tool Type	Tool No.	Other
ONE	CCL		
TWO	CCL		



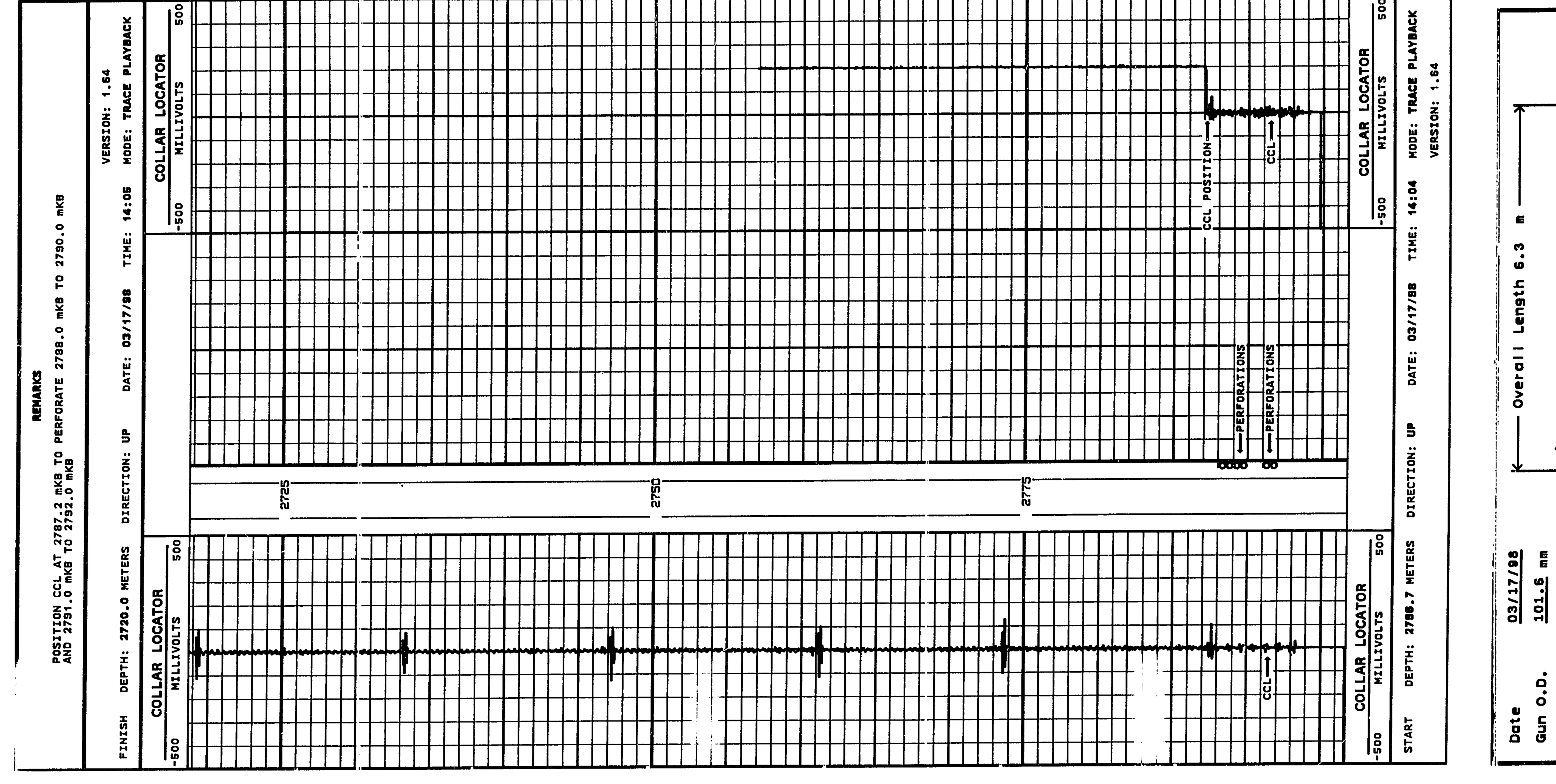
Date 03/17/98
Gun O.D. 101.6 mm
Charge Type OWEN
Gram Weight 39 HI
Phasing 60 Degrees
Decentralized NO

Shot Density	No. of Shots	Perforated Interval From	To
17	34	2788.0	2790.0
17	17	2791.0	2792.0

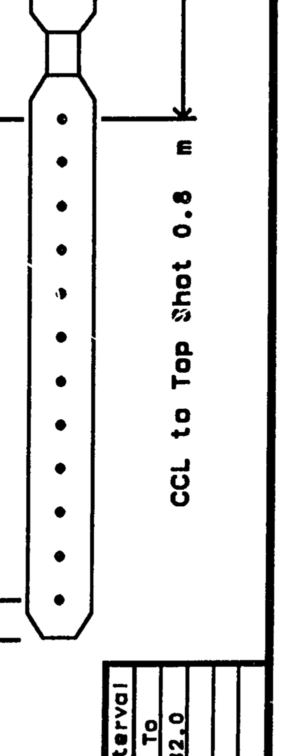
REMARKS

POSITION CCL AT 2787.2 mKB TO PERFORATE 2788.0 mKB TO 2790.0 mKB AND 2791.0 mKB TO 2792.0 mKB

FINISH DEPTH: 2720.0 METERS DIRECTION: UP DATE: 03/17/98 TIME: 14:05 MODE: TRACE PLAYBACK VERSION: 1.64



START DEPTH: 2798.7 METERS DIRECTION: UP DATE: 03/17/98 TIME: 14:04 MODE: TRACE PLAYBACK VERSION: 1.64



Date 03/17/98
Gun O.D. 101.6 mm
Charge Type OWEN
Gram Weight 39 HI
Phasing 60 Degrees
Decentralized NO

Shot Density	No. of Shots	Perforated Interval From	To
17	86	2777.0	2782.0

REMARKS

POSITION CCL AT 2776.0 mKB TO PERFORATE 2777.0 mKB TO 2782.0 mKB

FINISH DEPTH: 2719.3 METERS DIRECTION: UP DATE: 03/17/98 TIME: 15:02 MODE: TRACE PLAYBACK VERSION: 1.64

START DEPTH: 2788.0 METERS DIRECTION: UP DATE: 03/17/98 TIME: 15:01 MODE: TRACE PLAYBACK VERSION: 1.64

COMPUTALOG

COMPANY PARAMOUNT RESOURCES LTD.
WELL PARAMOUNT et al ARROWHEAD N65
ARROWHEAD PROVINCE N.W.T.

N.E.B COPY 9211-P33-10-1 1833

COMPUTALOG CS400

COLLAR LOG

COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARAMOUNT et al ARROWHEAD N65
FIELD	ARROWHEAD
PROVINCE	NORTHWEST TERRITORIES

Log Date: 03/21/89 Run No.: ONE Time: 0400 Depth: 2800.0	Other Services: D. BAIT CEMENT
Elev. Datum: GROUND LEVEL Elev. 567.3 Log measured from KB Ele. + above Permanent Datum.	ELEV.K.B.572.6 G.L.567.3 CBF
Met RIG 1822/ WATER LIC-NWL-1708. License NEW-4807.	

Date	MARCH 31/1989				
Run No.	ONE	Shot Density	No. of Shots	Perf. Interval From	To
Type Log	CCL				
Depth-Driller	2935				
Depth-Logger	2799.1				
Btm.Log Inter	2774.0				
Top Log Inter	2224.0				
Fluid in Hole	WATER	Gun Type EWHC			
Fluid Level	SURFACE	Gun Size 101.6			
Bit Size	154 MM	Tubing/Casing Record			
Bits #	406	Size MM	Wt/M	From	To
Location	FORT ST JOHN	244.5	34.74	SURFACE	1890
Recorded By	B. WEBB	177.8	34.53	1722	2539
Witnessed By	J. STEDH	139.7	25.3	2397.31	2850.09

Collar Location		Other Services			
Casing	Tubing	Service	Type	Size	Depth
		Bridge Plug	PERMANENT	139.8 177.	2720. 2788.
		Packer	Packer		
		Cement	Holsinger		
		Cement	"G"		2282.0
Tubing Bottom		Jars	Set Size		
Sealing Nipple		Gauge	Serial Number		

LOG COMPILATED TO COMPUTALOG SPC LOG DATED 03/17/89.
CAMCO MFGED WITH LVS, S-12B, S-8B, SILLIES FLOW.

REMARKS:

SIG. J. STEDH

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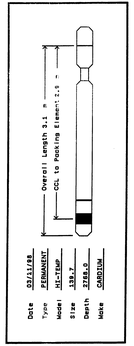

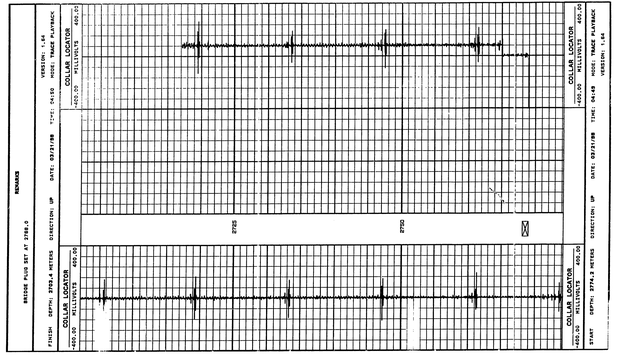

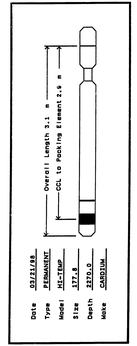

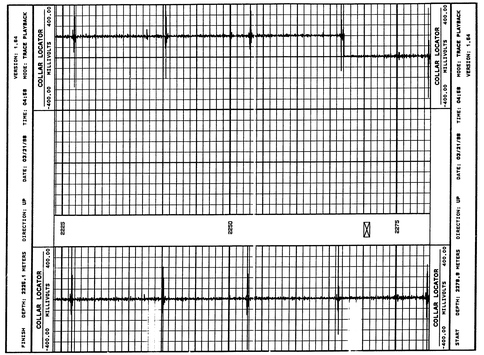

COMPUTALOG

COMPANY PARAMOUNT RESOURCES LTD.
WELL PARAMOUNT et al ARROWHEAD N65
FIELD ARROWHEAD PROVINCE N.W.T.

NATIONAL ENERGY BOARD
ENERGY RESEARCH
APR - 1 1989

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BAKER HUGHES — Digital Magnetic Induction Logging

Baker Atlas

File No:	Company	PARAMOUNT RESOURCES LTD.	
API No:	Well	PARAMOUNT ET AL ARROWHEAD N65	
	Field	ARROWHEAD	
	Province	NWT	
FIELD COPY	Location		Other Services
	UWI: 300N860040122450		TCD
	SURFACE LOCATION: 60°40' N 122°45' W		
	SEC TWP RGE		
Permanent Datum	G.L.	Elevation 567.9 m	Elevations
Log Measured From	K.B. 6.7 m	Above P.D.	KB 574.6 m
Drill Measured From	NELLY BUSHING		DF 574.3 m
			GL 567.9 m

Date	15-DEC-98
Run	1
Service Order	972696
Depth Driller	2326 m
Depth Logger	2303 m
Bottom Logged Interval	2303.5 m
Top Logged Interval	1720 m
Type Fluid in Hole	CRUDE
Max Recorded Temp	90 deg. C
Estimated Surface Temp	15 deg. C
Time Since Circulation	1.50
Time Since Last Log	1.50
Max Rec Temp	90 deg. C
Equipment Number	3-1
Location	ARROWHEAD
Recorded By	D. SOMERVILLE/R. MORGAN
Witnessed By	R. BEARDY

Disclaimer

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Bit Size	Sonde Type	To
0 m	0 m	0 m
0 m	0 m	0 m
0 m	0 m	0 m
0 m	0 m	0 m

Casing Record			From	To
Size	Weight	Grade		
244.5 mm	64.76 kg/m	J-40	0 m	180.9 m
177.8 mm	34.23 kg/m	J-55	0 m	1720 m
139.7 mm	25.3 kg/m	J-55	0 m	2303 m
139.7 mm	25.3 kg/m	J-55	2273.5 m	2326.0 m

Remarks

CORRELATED TO CHEMVIEW BECKER BOND LOG DATED 11-MAR-98.
RUN 1 LOGGED FROM 2303 M WITH 1 BOW SPRING DECENTRALIZER.
NEBP TURNED OFF @ 1890 M WHILE LOGGING DOWNHOLE.
NEBP ALSO ACTIVATED @ 1861 M WHILE LOGGING UPHOLE
CREW: D.SOMERVILLE/R.MORGAN
CALIBRATIONS: DAILY, POST, SONDE, LS

Run	Type	Tool	Serial Number	Equipment Code
1	PCM	2576A	116GGG	FREE
1	PCM	2576A	116GGG	FREE

TOOL DIAGRAM

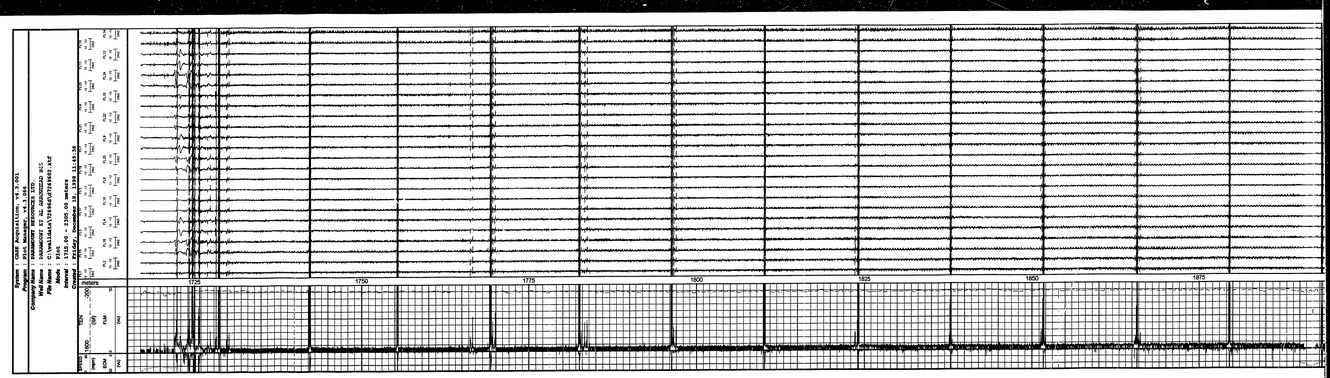
TOOL STRING FULL O.D. 114.0 mm

TOOL STRING FULL LENGTH 9.11 m

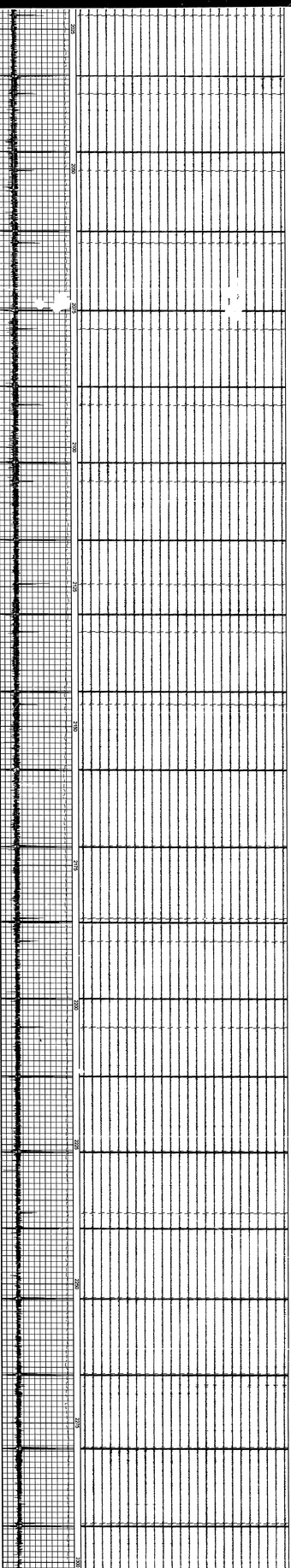
EVALUATION INTERVAL
1720 M TO 2301.5 M
LOGGED DOWN

DVSET PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	TOP	BOTTOM
FLAG:CTEN:TEN	FL Curve Not Used	None		1715.000	2301.463
FLAG:CTEN:CAL	FL Curve Not Used	None		1715.000	2301.463
FL Curve	NEBP: Bell-ringing Gain	On	%	1715.000	1886.587
FL Curve	NEBP: Bell-ringing Gain	OFF		1886.587	2301.463



BUFFALO SECTION
LOGGED UP
TEST CONTROL
TEST CONDITIONS
TEST CONDITIONS
TEST CONDITIONS



DIGITAL VERTILOG

C:\CASE\CALWEB\DATA\70grey05.cal

DATE/TIME PERFORMED: Sun Dec 13 14:50:29 1998 TOOL SERIES: 2940MA ASSET: 70grey SEQ: 05

PIPE OD :	Low Value [mm]	High Value [mm]	Additive	Multiplicative	Low Value [%V]	High Value [%V]
FL1	-103.8	858.1	1.079	0.0104	-0.000	10.000
FL2	-78.4	1000.0	0.000	0.0000	-0.000	10.000
FL3	-78.4	823.8	0.789	0.0101	-0.000	10.000
FL4	-78.4	937.1	0.790	0.0099	0.000	10.000
FL5	-78.4	1041.1	0.648	0.0088	-0.000	10.000
FL6	-78.4	950.4	0.763	0.0097	-0.000	10.000
FL7	-78.4	784.3	0.869	0.0116	-0.000	10.000
FL8	-78.4	921.0	0.881	0.0102	-0.000	10.000
FL9	-78.4	867.4	0.853	0.0108	-0.000	10.000
FL10	-78.4	939.9	0.827	0.0099	0.000	10.000
FL11	-78.4	978.1	0.743	0.0095	-0.000	10.000
FL12	-78.4	918.1	0.787	0.0101	-0.000	10.000
FL13	-78.4	-875.4	-0.883	-0.0105	0.000	10.000
FL14	-78.4	-880.7	-1.000	-0.0095	0.000	10.000
FL15	-78.4	-1091.1	-0.774	-0.0076	0.000	10.000
FL16	-78.4	-1000.0	-0.000	-0.0000	0.000	10.000
FL17	-78.4	-1008.5	-0.844	-0.0078	-0.000	10.000
FL18	-78.4	-1100.0	-0.767	-0.0069	-0.000	10.000
FL19	-78.4	-1081.8	-0.780	-0.0070	-0.000	10.000
FL20	-78.4	-1088.8	-0.775	-0.0069	0.000	10.000
FL21	-78.4	-1000.0	-0.000	-0.0000	0.000	10.000
FL22	-78.4	-933.6	-0.911	-0.0104	-0.000	10.000
FL23	-78.4	-936.4	-0.910	-0.0101	-0.000	10.000
FL24	-78.4	-886.7	-1.000	-0.0109	0.000	10.000
EC1	-78.4	-2134.1	-1.342	-0.0141	-0.000	26.000
EC2	-39.2	-4847.5	-0.574	-0.0148	0.000	26.000

BAKER HUGHES INTEQ	Company	PARAMOUNT RESOURCES LTD.	File No:
	Well	PARAMOUNT ET AL ARROWHEAD N65	API No:
	Field	ARROWHEAD	
Baker Atlas	Province	MNT	
CASE	Location	Elevations: KB 574.4 m, DF 574.3 m, GL 567.9 m	FIELD COPY
	UWI: 300N656040122450		
	SURFACE LOCATION: 60°40' N 122°45'W		
	SEC TWP RGE		

N.E.B. COPY

BAKER HUGHES

Baker Atlas

Gamma Ray-SCE

File No:	Company	PARAMOUNT RESOURCES LTD.
	Well	PARAMOUNT ET AL ARROWHEAD N65
API No:	Field	ARROWHEAD
	Province	NWT

FIELD COPY

Location	Other Services
UWI: 300N660W0122450 SURFACE LOCATION: 60°40' N 122°45'W SEC TWP RGE	DVRT

Permanent Datum	G.L.	Elevation	547.9 m	Elevation	
Log Measured From	K.B.	6.7 m	Above P. D.	KB	554.6 m
Drill Measured From	NEILY BUSHING			DF	554.3 m
				GL	547.9 m

Date	20-DEC-98	
Run	1	
Service Order	972496	
Depth Driller	2926 m	
Depth Logger	2924 m	
Bottom Logged Interval	2631 m	
Top Logged Interval	2500 m	
Type Fluid	2930	
Time Started	1200	
Operator Rig Time	24	
Type of Fluid in Hole	SALT WTR WATER	
Fluid Density	N/A	
Salinity	N/A	
Fluid Level	N/A	
Logged Cement Top	N/A	
Wellhead Pressure	0 kPa	
Maximum Hole Deviation	0 deg	
Nominal Logging Speed	12 mpm	
Maximum Recorded Temperature	N/A	
Reference Log	SONIC CN/LITH LOG	
Reference Log Date	21-FEB-98	
Equipment No. / Location	GLA58	G.P.
Recorded By	D.WOHLE/B.MANEAGE	
Witnessed By	M. HAMMY	

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Bit Size	From	To
311.1 mm	0.00 m	2926.00 m
177.8 mm	2926.00 m	2930.00 m

Casing Record				
Size	Weight	Grade	From	To
244.5 mm	64.73 kg/m	K-55	0.0 m	1990.0 m
177.8 mm	34.53 kg/m	K-55	1970.0 m	2929.0 m
101.6 mm	15.19 kg/m	K-55	2929.0 m	2946.05 m

Perforation Record			
Perforation Type	Perforation	Density	Phase
0.0 mm		0.0 spm	

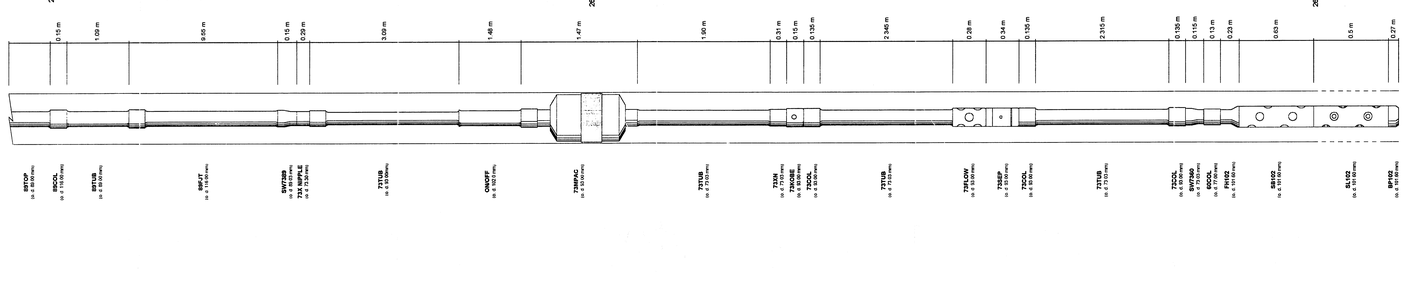
Remarks

CORRELATED TO SCHLUMBERGER PLATFORM EXPRESS COMPENSATED NEUTRON
LITHO DENSITY DIP DATED 21-FEB-98
LOG MEASURED FROM KB 6.7 ABOVE GROUND LEVEL, 17 STM
RECORDED DURING PERFORATING GUN -2.8 M AFTER CORRELATION PASS.
RECORDED DURING PERFORATING GUN 0.5 M AFTER CORRELATION PASS.
GREEN R. TRACE:4/4 HAS BLUE: GEMULTA 42

Run	Tog	Tool	Serial Number	Equipment Status	Serial Number	Position
1	1	CCL	2242XA		593982	FREE
	1	GR	1331XA		1331177	FREE

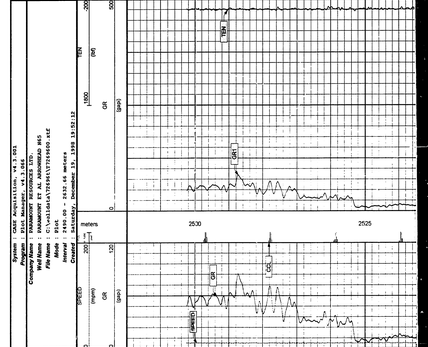
TOOL DIAGRAM

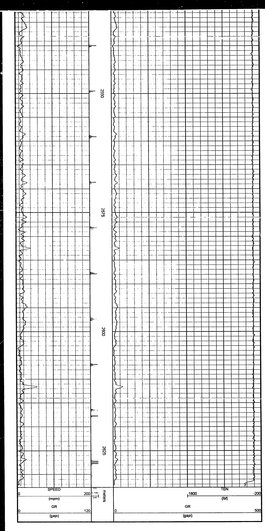
TOOL LENGTH: 27.5 m
TOOL WEIGHT: 1.0 kg
TOOL DIAMETER: 101.6 mm



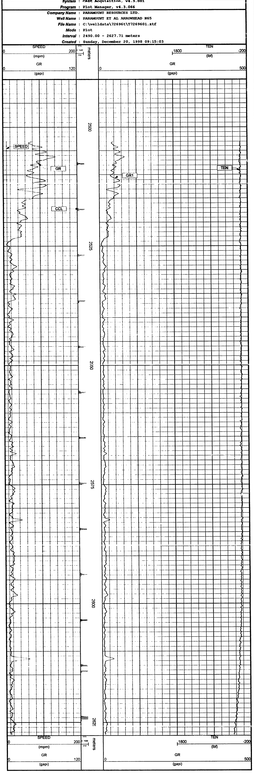
CORRELATION PASS

System	CASE Acquisition, v4.5 601
Operator	Baker Atlas, Version 4.0
Company Name	PARAMOUNT RESOURCES LTD.
Well Name	PARAMOUNT ET AL ARROWHEAD N65
File Name	C:\wireline\Y98601TP0000.pif
Mode	Pick
Interval	2500 - 2432.46 meters
Created	Saturday, December 19, 1998 19:52:12

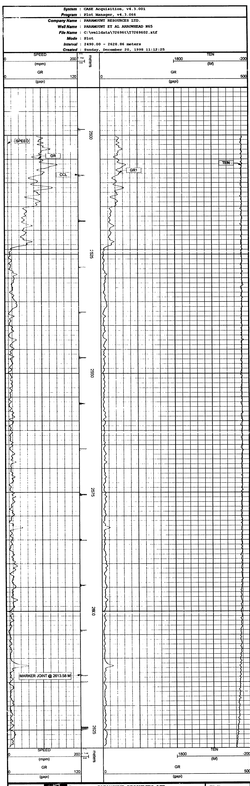




CONFIRMATION PASS 1



CONFIRMATION PASS 2



Baker Atlas	Company	PARAMOUNT RESOURCES LTD.	File No.
	Well	TIMEOUT ET AL ARROWHEAD 8K5	
	Field	ARROWHEAD	API No.
	Province	BC	
	Location	Elevation KB 376.8 m GL 373.3 m DL 367.9 m	FIELD COPY
	DLS: 3D0B0B4A0S2U0E		
	SURFACE LOCATION: 60°40' N 122°45'W		
	DATE 28/ 12/ 98		

Baker Atlas — BAKER HUGHES

File No:
API No:

Company	PARAMOUNT RESOURCES LTD.
Well	PARAMOUNT ET AL ARROWHEAD N65
Field	ARROWHEAD
Province	NWT

N.E.B. COPY

CEMENT RETAINER

FIELD COPY

Location

UWI: 300N686014012245W
SURFACE LOCATION: 60°40' N 122°45' W
SEC TWP RGE

Other Services: DVRE, TCP

Permanent Datum	G.L.	Elevation	567.9 m
Log Measured From	K.B.	Above P. D.	6.7 m
Drill Measured From	KELLY BUSHING		

Elevations: KB 574.6 m, DF 574.3 m, GL 567.9 m

Date	21-DEC-98
Run	1
Service Order	9726597
Depth Driller	2640.0 m
Depth Logger	2640.5 m
Bottom Logged Interval	2637 m
Top Logged Interval	2550 m
Time Started	1830
Time Finished	2030
Operator Rig Time	2 hr.
Operator Rig Number	NCL BAKER
Fluid Density	N/A
Salinity	N/A
Fluid Level	N/A
Logged Cement Top	N/A
Wellhead Pressure	0 kPa
Maximum Hole Deviation	10 deg
Maximum Recorded Temperature	N/A
Reference Log	COMPUTALOG SBL.
Reference Log Date	11-MAR-98
Equipment No.	6.P2
Equipment Location	HK6558
Recorded By	D.BIRKES/R.MACKAY
Witnessed By	R. TRUDEL

FOLD HERE

In making interpretations of logs, our employees will give the customer the benefit of their best judgement. But since all interpretations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages, or expenses whatsoever incurred or sustained by the customer resulting from any interpretation made by any of our employees.

Borehole Record

Bit Size	From	To
0 mm	0 m	0 m
0 mm	0 m	0 m
0 mm	0 m	0 m

Casing Record

Size	Weight	Grade	From	To
244.5 mm	64.74 kg/m	L-80	0 m	1890 m
177.8 mm	38.69 kg/m	L-80	1723 m	2529 m
139.7 mm	25.3 kg/m	L-80	2297.21 m	2656.09 m

Remarks

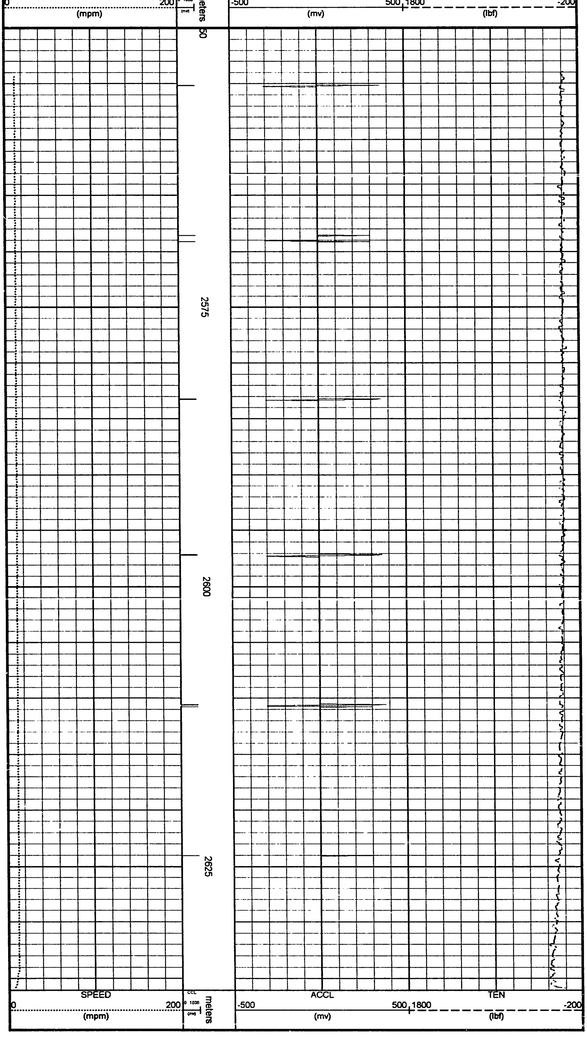
CORRELATED TO COMPUTALOG SECTOR BOND LOG DATED 11-MAR-98
BAKER 20 SLOW SET CHARGE USED
CCL TO CENTER ELEMENTS = 2.80M
CCL STOP DEPTH @ 2636.2M
CEMENT RETAINER CENTER OF ELEMENTS @ 2639.0M
CCL TO BOTTOM OF CEMENT RETAINER = 3.10M
CREW:R.TRUDEL*S.KULLMAN RIG: CENALTA 42

Equipment Data

Run	Trip	Tool	Series Number	Serial Number	Position
1	1	CCL	2310NA	309626	FREE

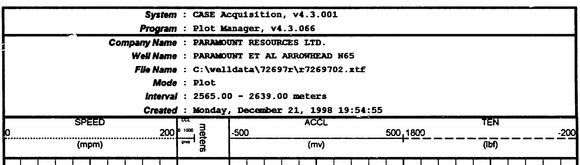
CONFIRMATION PASS

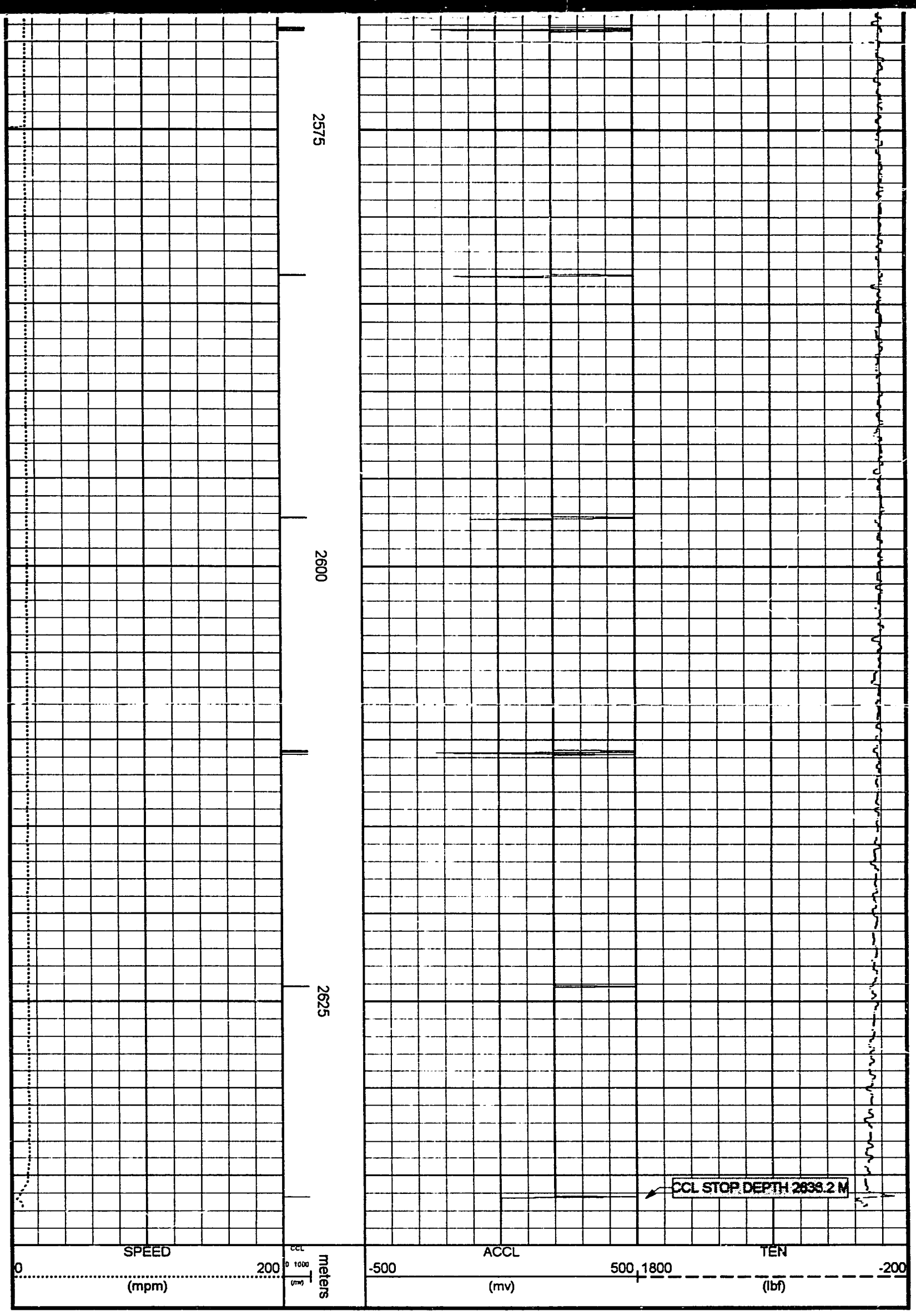
System : CASE Acquisition, v4.3.001
Program : Plot Manager, v4.3.066
Company Name : PARAMOUNT RESOURCES LTD.
Well Name : PARAMOUNT ET AL ARROWHEAD N65
File Name : C:\welldata\72697r\r7269701.xtf
Mode : Plot
Interval : 2550.00 - 2636.01 meters
Created : Monday, December 21, 1998 19:44:45



CEMENT RETAINER SET @ 2639.0 M

System : CASE Acquisition, v4.3.001
Program : Plot Manager, v4.3.066
Company Name : PARAMOUNT RESOURCES LTD.
Well Name : PARAMOUNT ET AL ARROWHEAD N65
File Name : C:\welldata\72697r\r7269702.xtf
Mode : Plot
Interval : 2565.00 - 2639.00 meters
Created : Monday, December 21, 1998 19:54:55





BAKER HUGHES Baker Atlas CASE	Company: PARAMOUNT RESOURCES LTD. Well: PARAMOUNT ET AL ARROWHEAD N65 Field: ARROWHEAD Province: NWT		File No: API No:
	Location UWI: 300N6S6040122450 SURFACE LOCATION: 60*40' N 122*45'W SEC TWP RGE	Elevations KB 574.6 m DF 574.3 m GL 567.9 m	FIELD COPY

N.E.B. COPY

CASING COLLAR LOG
BRIDGE PLUG SETTING RECORD

BAKER HUGHES
Baker Atlas

Version # 1.1

File No:	
LSD.	
SEC.	
TWP.	
RGE. N	
WEST 65	

Company	PARAMOUNT RESOURCES LIMITED
Well	PARAMOUNT ET AL ARROWHEAD N65
Field	ARROWHEAD
Province	NORTHWEST TERRITORIES CANADA

Location: UWI # WID 1833/WATER LIC#N3L1-1706
Well Licence # N97-A807
LSD. SEC. TWP. RGE. N W. 65

Other Services
BRIDGE PLUG

Permanent Datum GROUND LEVEL Elevation 567.9
Log Measured from K.B. 6.7 M. Above Datum
Drilling Meas. from KELLY BUSHING

Elev.: K.B. 574.6
D.F.
G.L. 567.9

Date	JANUARY 16-1999
Run No.	SIX
Type Log	COLLAR
First Reading	2621.4
Last Reading	2497.8
Depth Reached	2624.5
Bottom Driller	2821.4
Well Head Pressure	STATIC
Fluid Type	WATER
Fluid Level	VACUUM
Truck No	10117
Service Order No.	1004107
Recorded By	KEITH DAUNCEY
Witnessed By	BURT BLAKELY

Shot Density	No. of Shots	Perf. From	Interval To

Gun Type :
and Size :

CASING RECORD

Size M.	Weight	From	To
339.7	81.1	SURFACE	480
244.5	64.75	SURFACE	1890
177.8	38.69	1723	2529
139.7	25.3	2302.9	2856.09

COLLAR LOCATION

Casing	Tubing
2513.9	
2527.1	

OTHER SERVICES

Service	Type	Size	Depth
BRIDGE PLUG	CARDIUM P-WPR	139.7	2622.0 CENTER

Tubing Bottom:	Seating Nipple:
Junk Basket Size:	Gauge Ring Number:

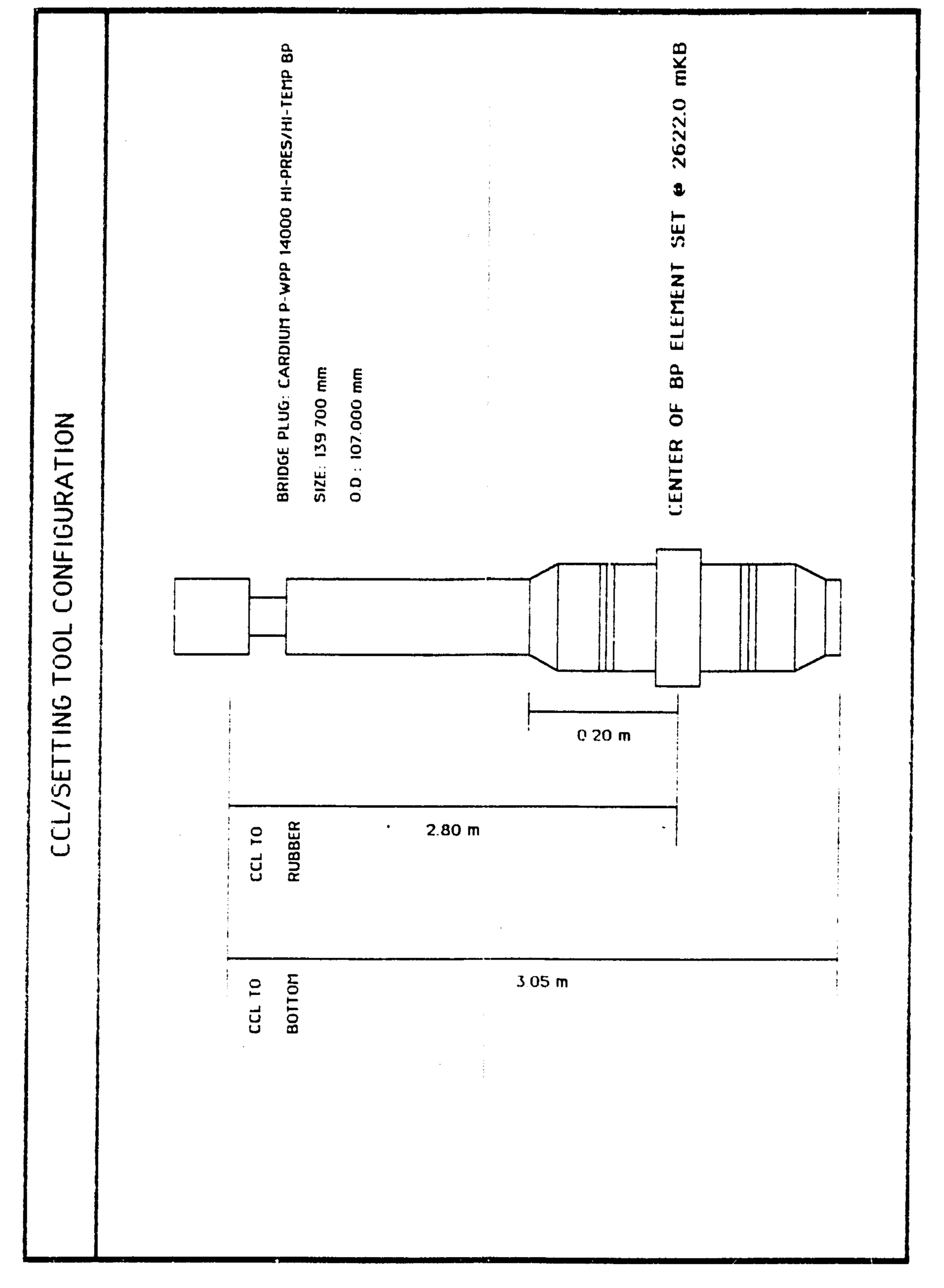
REMARKS:

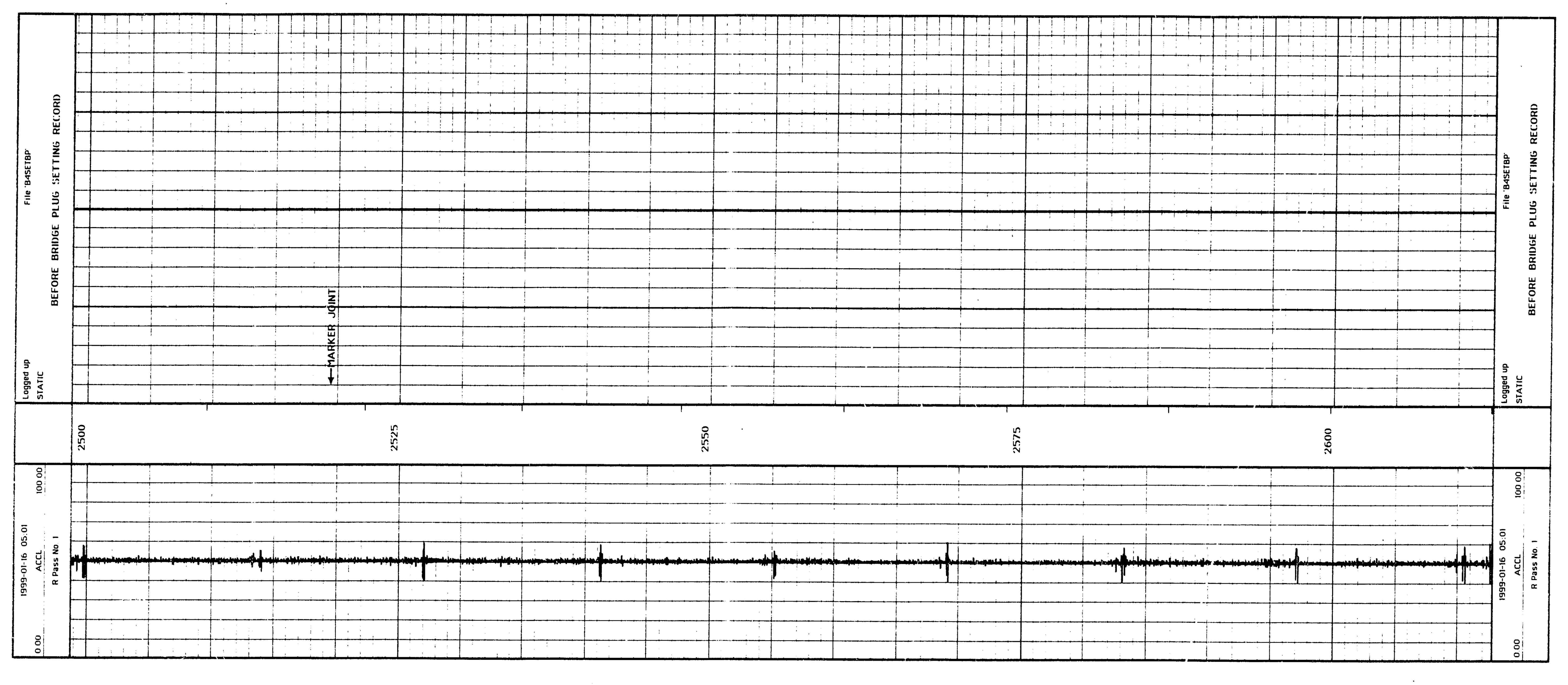
PREVIOUS PERFORATIONS

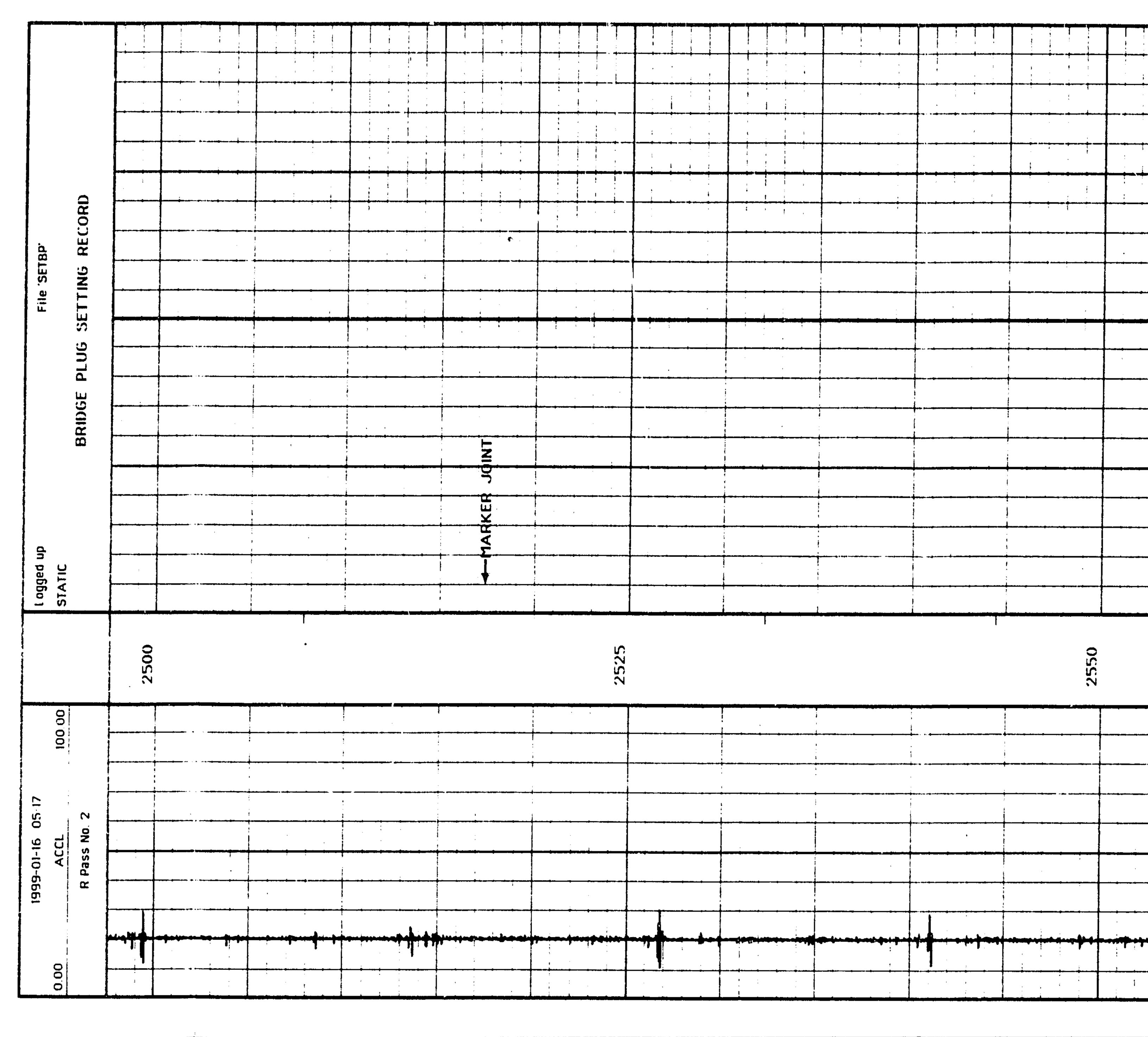
From:	To:
2614.0	2615.0
2625.5	2630.0
2632.5	2637.5
2640.0	2640.5

PREVIOUS COMPLETION INFORMATION

Depth Control Log Y COMPUTALOG SECTOR MARCH 11-1998
Log Correlated to:
Bridge Plug Set at
Cement Retainer Set at
Production Packer Set at







BAKER HUGHES
Baker Atlas

COMPANY: PARAMOUNT RESOURCES LIMITED
WELL: PARAMOUNT ET AL ARROWHEAD N65
FIELD: ARROWHEAD
PROVINCE: NORTHWEST TERRITORIES

N.E.B. COPY

BAKER HUGHES
Baker Atlas

CASING COLLAR LOG
BRIDGE PLUG SETTING RECORD

File No:	
LSD.	
SEC.	
TWP.	
RGE. N	
WEST 65	

Company PARAMOUNT RESOURCES LIMITED
Well PARAMOUNT ET AL ARROWHEAD N65
Field ARROWHEAD
Province NORTHWEST TERRITORIES CANADA

Location: UWI # WID 1833/WATER LIC#N3L1-1706
Well Licence # N97-A807
LSD. SEC. TWP. RGE. N W. 65

Other Services
BRIDGE PLUG

Permanent Datum GROUND LEVEL Elevation 567.9
Log Measured from K.B. 6.7 M. Above Datum
Drilling Meas. from KELLY BUSHING

Elev.: K.B. 574.6
D.F.
G.L. 567.9

Date	JANUARY 22-1999
Run No.	SEVEN
Type Log	COLLAR
First Reading	2615.2
Last Reading	2496.8
Depth Reached	2618.2
Bottom Driller	2821.4
Well Head Pressure	STATIC
Fluid Type	WATER
Fluid Level	520
Truck No	10117
Service Order No.	1004114
Recorded By	KEITH DAUNCEY
Witnessed By	AL IRONSIDE

Shot Density	No. of Shots	Perf. From	Interval To

Gun Type :
and Size :

CASING RECORD

Size M.	Weight	From	To
339.7	81.1	SURFACE	480
244.5	64.75	SURFACE	1890
177.8	38.69	1723	2529
139.7	25.3	2302.9	2856.09

COLLAR LOCATION

Casing	Tubing
2499.8	
2513.9	
2527.1	

OTHER SERVICES

Service	Type	Size	Depth
BRIDGE PLUG	CARDIUM P-WPP	139.7	2612.5 CENTER

Tubing Bottom:
Junk Basket Size
Seating Nipple:
Gauge Ring Number

REMARKS

Version # 1.1

PREVIOUS PERFORATIONS

From:	To:	From:	To:
2614.0	2615.0		
2625.5	2630.0		
2632.5	2637.5		
2640.0	2640.5		

PREVIOUS COMPLETION INFORMATION

Depth Control Log	Y
Log Correlated to	COMPUTALOG SECTOR MARCH 11-1998
Bridge Plug Set at	2622.0
Cement Retainer Set at	
Production Packer Set at	

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TRACE SETUP TABLE

ID	TOOL NAME	CURVE TYPE	TRACK	CHN	CHART LEFT	CHART RIGHT	GAIN	SHIFT	DEPTH OFFSET (m)	DEPTH FILTER	TIME FILTER
1	ACCL	1	1	2A	0.00	100.00	1	-14	0.00	15.00	0.04

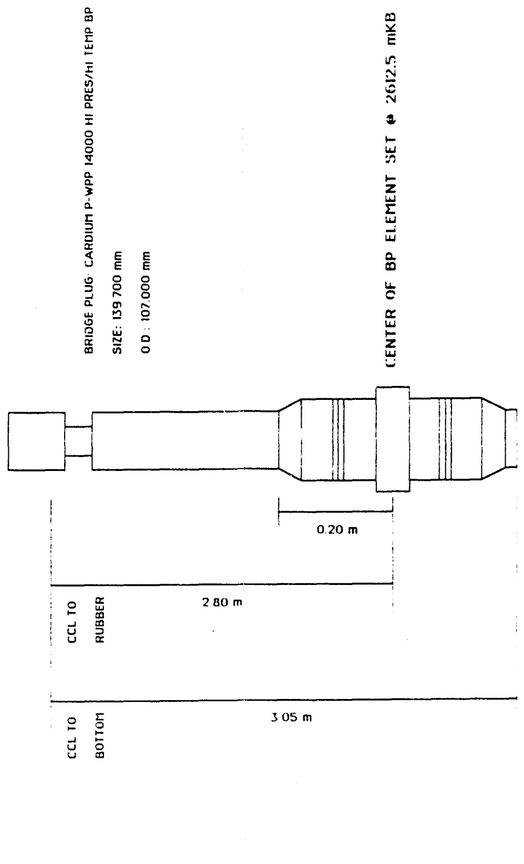
TOOL INFORMATION

Size (mm)	Type	Manufacturer	Serial Number
83	PERF CCL	TITAN	8318

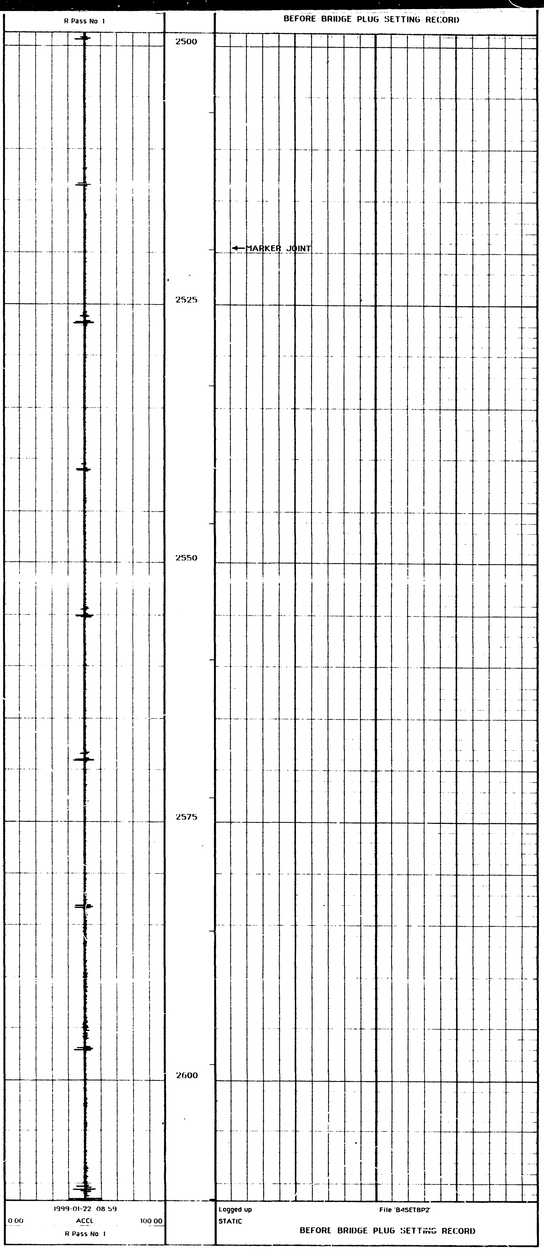
Additional Information:

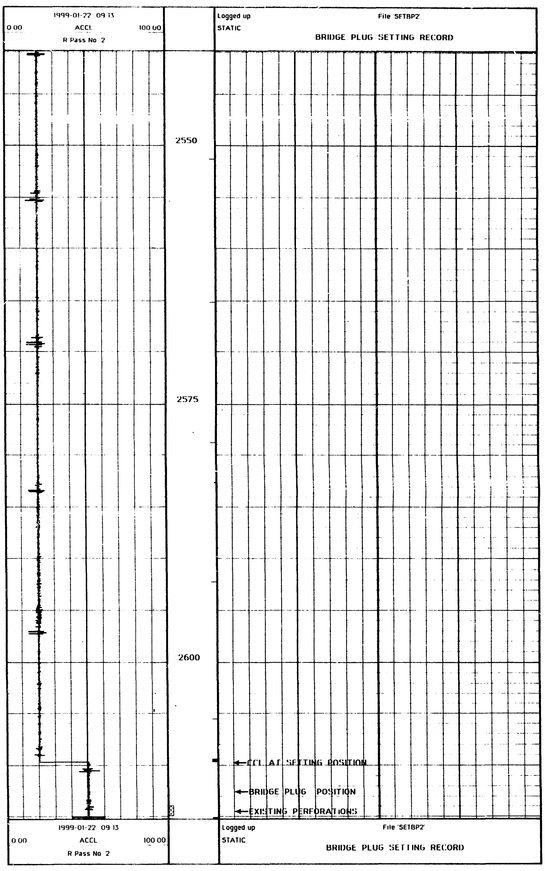
Version # 1.1

CCL/SETTING TOOL CONFIGURATION



File 'B4SFTBP2'
Logged up
STATIC
1999-01-22 08:59
0.00 ACCL 100.00





BAKER TOOL INFORMATION

PRIMARY			
Type:	437-44-2200	Manufacturer:	BAKER
Lot Number:	04930131		
SECONDARY			
Type:	SECONDARY	Manufacturer:	BAKER
Lot Number:	02980359	Date of Manufacture:	020998
POWER CHARGE			
Type:	#20 SLOW SET	Manufacturer:	BAKER
Lot Number:	04980449		
OIL			
Type:	10/30	Level:	275-350F
OTHER			
Serial Number:		Serviced By:	KEITH DAUNCEY
	10117-1-20	Prepared By:	JOHN SIEMENS

Version # 1.0

BAKER HUGHES
Baker Atlas

COMPANY-	PARAMOUNT RESOURCES LIMITED	FR	2615.2
WELL-	PARAMOUNT ET AL ARROWHEAD N65	LR	2496.8
FIELD-	ARROWHEAD	Elev: KB	574.6
PROVINCE-	NORTHWEST TERRITORIES	GL	567.9

N.E.B. COPY

BAKER HUGHES
Baker Atlas

GR-CCL-GR
TCP CORRELATION LOG

FINAL

Version # 1.1

File No:	Company	PARAMOUNT RESOURCES LIMITED	
LSD.	Well	PARAMOUNT ET AL ARROWHEAD N65	
SEC.	Field	ARROWHEAD	
TWP.	Province	NORTHWEST TERRITORIES	CANADA
RGE. N			
WEST 65			

Location: UWI # WID 1833/WATER LIC#N3L1-1706
Well Licence # N97-A807
LSD. SEC. TWP. RGE. N W. 65

Other Services

Permanent Datum GROUND LEVEL Elevation 567.9
Log Measured from K.B. 6.7 M. Above Datum
Drilling Meas. from KELLY BUSHING

Elev.: K.B. 574.6
D.F.
G.L. 567.9

Date	JANUARY 23-1999
Run No.	EIGHT
Type Log	GR-CCL-GR
First Reading	2574.8
Last Reading	2440.3
Depth Reached	2575.0
Bottom Driller	2821.4
Well Head Pressure	STATIC
Fluid Type	ANNULUS/WATER/FULL
Fluid Level	TUBING/DRY
Truck No	10117
Service Order No.	1004115/4116
Recorded By	KEITH DAUNCEY
Witnessed By	AL IRONSIDE

Shot Density	No. of Shots	Perf. From	Interval To
18	37	2579.0	2581.0
18	118	2594.0	2601.0

Gun Type : 101MM ERHSC X 60 DEGREE
and Size : 38.5 GRAM PREDATOR

CASING RECORD

Size M.	Weight	From	To
339.7	81.1	SURFACE	480
244.5	64.75	SURFACE	1890
177.8	38.69	1723	2529
139.7	25.3	2302.9	2856.09

COLLAR LOCATION

Casing	Tubing

OTHER SERVICES

Service	Type	Size	Depth

Tubing Bottom:
Junk Basket Size:
Seating Nipple: XN 58.67mm @ 2571.19mKB W/57.4mm NOGO
Gauge Ring Number:

REMARKS:

PREVIOUS PERFORATIONS

From:	To:	From:	To:
2614.0	2615.0		
2625.5	2630.0		
2632.5	2637.5		
2640.0	2640.5		

PREVIOUS COMPLETION INFORMATION

Depth Control Log Y
Log Correlated to: SCHLUMBERGER P-EX-CNLD FEB 21-1998
Bridge Plug Set at : 2612.5
Cement Retainer Set at :
Production Packer Set at :

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TRACE SETUP TABLE

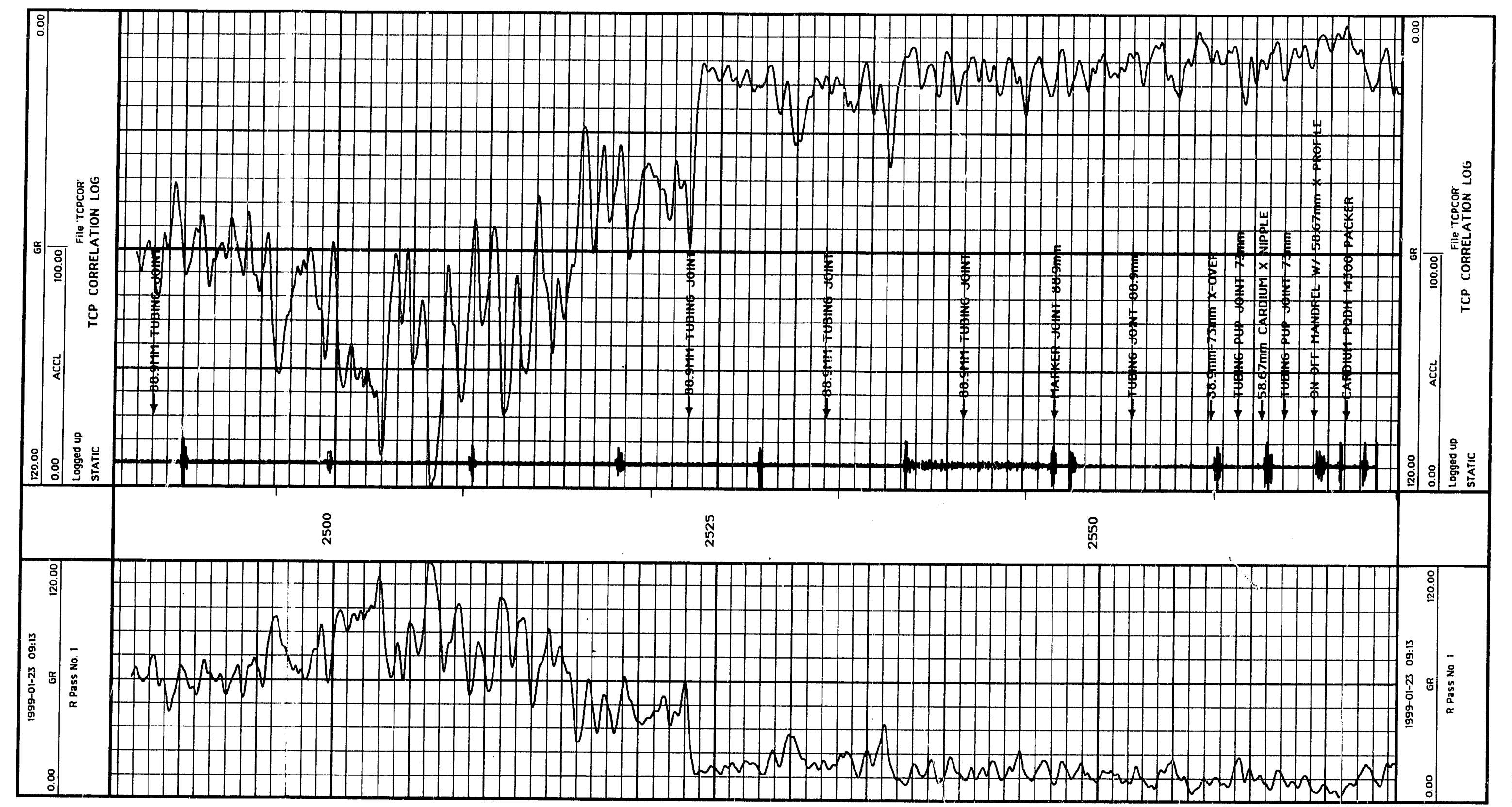
ID	TOOL NAME	CURVE TYPE	TRACK	CHN	CHART LEFT	CHART RIGHT	GAIN	SHIFT	DEPTH OFFSET (m)	DEPTH FILTER	TIME FILTER
1	GR	1	1	1U	0.00	120.00	3.3	0	1.08	1.00	1.00
2	ACCL	1	2	1A	0.00	100.00	0.8	-40.6	0.00	15.00	0.04
3	GR	1	4	1U	120.00	0.00	3.3	0	1.08	1.00	1.00

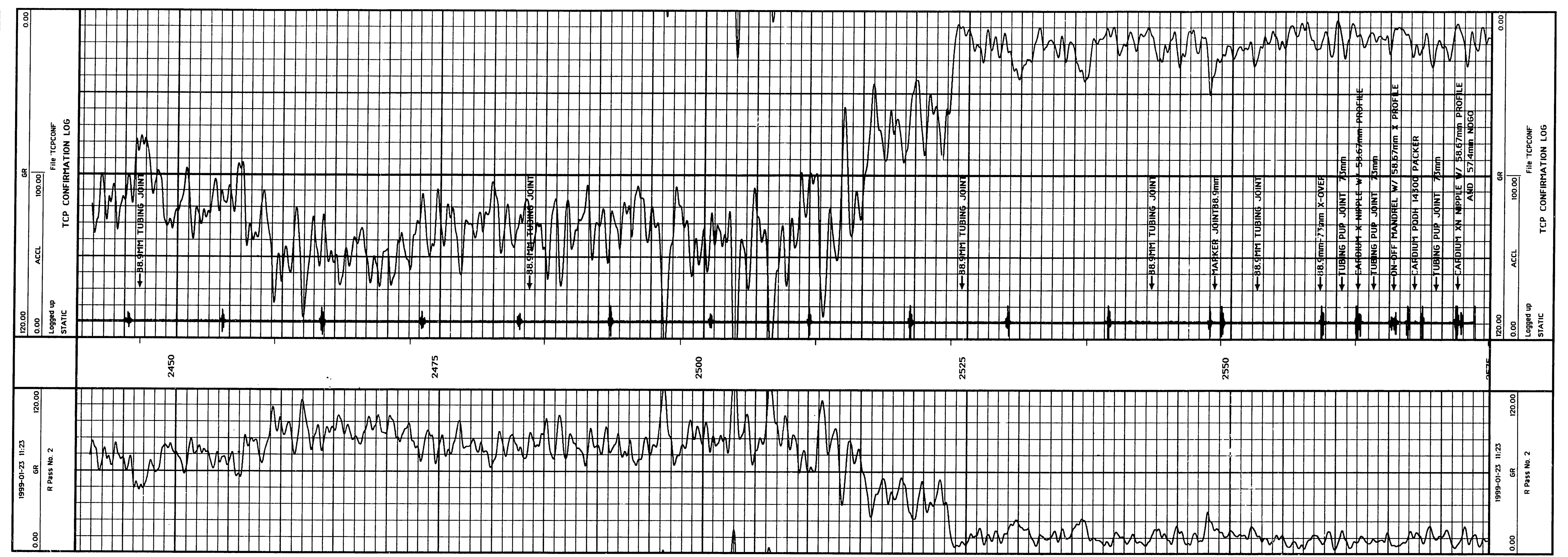
TOOL INFORMATION

Size (mm)	Type	Manufacturer	Serial Number
43	SINKER BAR	APPLIED	10-02
41	CCL	COMPROBE	C 4142
41	GAMMA RAY	COMPROBE	G 4142

Additional Information:

Version # 1.1





BAKER HUGHES
Baker Atlas

TUBING CONVEYED PERFORATING INSTALLATION

PARAMOUNT RESOURCES LIMITED
PARAMOUNT ET AL ARROWHEAD N65

Top Shot @	2579.0
Distance Marker Pup to Top Shot	31.01
Marker Pup needed @	2547.99
Marker Pup located @	2547.10
Required Pipe Adjustment	+0.89
Required Compression	0.36
Tubing Pulled	0.0
Total Pipe Required	1.25

Tubing Pulled	Tubing Added
	0.62
	0.64

Total 0.0 1.26

Perforation Interval 2579.0-2581.0 37 SHOTS
2594.0-2601.0 118 SHOTS

Gun Size 101.6MM Phase 60 Number of Shots 155
Charge Size 38.5 GRAM PREDATOR SPM 18

Well Bore Fluid
Casing WATER Level FULL
Tubing DRY Level DRY

Detonating Bar
Drop Time Fluid Level N/A seconds
Perforators seconds
Length 1.54
Fish Neck (25.4mm) located @ 2576.97

Dognut Landed for Correlation Y
If no, list stick up

Correlation made to open hole log Y
If no, list log type SCHLUMBERGER P-EX-CNLD FEB 21-98

Final Depth Marker @2547.99
PBTD 2612.1

Comments

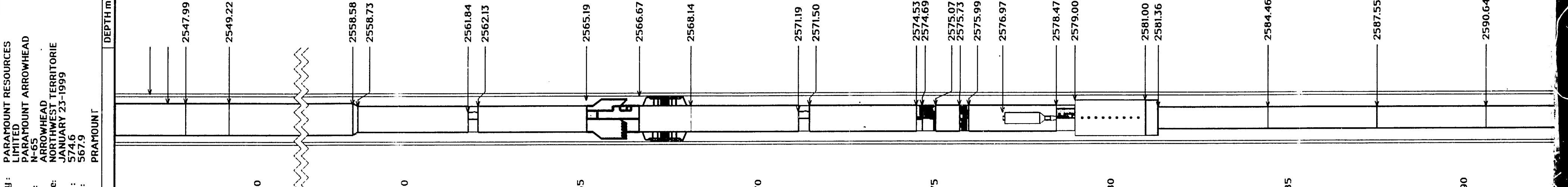
BOTTOM HOLE TEMPERATURE ESTIMATED @ 150°C
GUN ASSEMBLY WAS BUILT WITH HI-TEMPERATURE RATED EXPLOSIVES

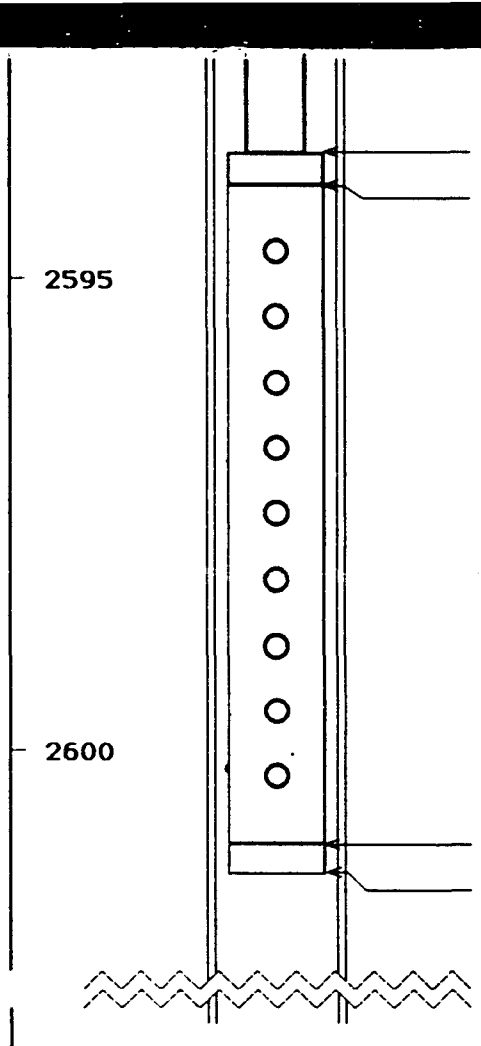
Version # 1.0

Company : PARAMOUNT RESOURCES LIMITED
Well : PARAMOUNT ARROWHEAD
Well # : N-65
Field : ARROWHEAD
Province: NORTHWEST TERRITORIE
Date : JANUARY 23-1999
KB elev : 574.6
GL elev : 567.9
File : PRAMOUNT

	SIZE	WEIGHT	GRADE	THREAD
CASING	339.7	81.1	J-55	ST+C
LINER	244.5	64.75	L-80	LT+C
LONG STRING	177.8	38.69	L-80	LT+C
SHORT STRING	139.7	25.3	L-80	HYDRIL

DEPTH m	LGTH m	OD mm	ID mm	DESCRIPTION
		139.70	124.26	CASING OD 139.7mm 25.30 kg/m
		88.90	76.00	TUBING OD 88.9 ID 76.00 TUBING TO SURFACE
2547.99	1.23	88.90	76.00	TUBING OD 88.9 ID 76.00 MARKER PUP JOINT
2549.22	9.36	88.90	76.00	TUBING OD 88.9 ID 76.00
2558.58	0.15	88.90	62.00	88.9mm X 73.0mm Crossover
2558.73	3.11	73.03	62.00	TUBING OD 73.03 ID 62.00
2561.84	0.29	73.03	58.67	73.0mm X Nipple 58.67 profile
2562.13	3.06	73.03	62.00	TUBING OD 73.03 ID 62.00
2565.19	1.48	115.02	58.67	73.0mm On-Off Mandrel W/ 58.7MM X PROFILE
2566.67	1.47	117.8	62.00	139.7mm x 73.0mm Packer CARDIUM PQDH 14300
2568.14	3.05	73.03	62.00	TUBING OD 73.03 ID 62.00
2571.19	0.31	73.03	57.40	73.0mm XN Nipple 58.67 profile W/ 57.40MM NOGO
2571.50	3.03	73.03	62.00	TUBING OD 73.03 ID 62.00
2574.53	0.16	93.70	62.00	73.03mm Pressure Test Sub
2574.69	0.38	93.70	59.70	GRIS #40-003-2875-00 UP SHIFT W/ OTIS B POSITIVE KEYS TO SEPERATE
2575.07	0.66	73.03	62.00	TUBING OD 73.03 ID 62.00
2575.73	0.26	73.00	62.00	GRIS FILL/FLOW SURGE TOOL COMBO SUB
2575.99	2.48	73.03	62.00	TUBING OD 73.03 ID 62.00
2576.97	1.50	31.70	0.00	Drop Bar with 25.4mm Fishneck
2578.47	0.53	86.40	0.00	GRIS PERCUSSION FIRING HEAD
2579.00	2.00	101.60	0.00	TOP SHOT 37-38.5 GRAM PREDATOR CHARGES
2581.00	0.36	101.60	0.00	BOTTOM SHOT
2581.36	3.10	60.33	50.67	TUBING OD 60.33 ID 50.67 DEBRUYN SPACER SUB ADAPTER USING 60.3MM L-80 PUPS
2584.46	3.09	60.33	50.67	TUBING OD 60.33 ID 50.67
2587.55	3.09	60.33	50.67	TUBING OD 60.33 ID 50.67
2590.64	3.03	60.33	50.67	TUBING OD 60.33 ID 50.67





2593.67	0.36	101.60	0.00	DEBRUYN SPACER SUB ADAPTER FROM 60.3MM TUBING TO GUN
2594.03	6.95	101.60	0.00	TOP SHOT 118-38.5 GRAM PREDATOR CHARGES
2601.00		101.60	0.00	BOTTOM SHOT
2601.30	0.33	101.6	0.00	BOTTOM OF TCP ASSEMBLY

EXPLOSIVE DATA

DATE: JANUARY 23-1999 COMPANY: PARAMOUNT RESOURCES LIMITED
LOCATION: WID 1833/WATER LIC#N3L1-1 COMPANY REP: AL IRONSIDE

PRIMA-CORD
MANUFACTURER: ACCURATE ARMS CO. INC. DATE OF MANUFACTURE: 97168
TYPE: LEAD COAT #58087 SPOOL NUMBER: 97168-006

CHARGE DATA
MANUFACTURER: WALS DATE OF MANUFACTURE: N/A
PART NUMBER: 190680-504-500F WORK ORDER #: N/A
GRAM WEIGHT: 38.5 GRAM PREDATOR

CARRIER DATA
MANUFACTURER: GRIS DENSITY: 18
PHASING: 60 GUN SIZE: 101.6
GUN TYPE: ERHSC SERIAL #: CM 209, CK 975, CM 305

DETONATORS
PART NUMBER: DATE OF MANUFACTURE:
DESCRIPTION: LOT #:

TCP INITIATOR
PART NUMBER: 821437-2 FIRING HEAD TYPE: GRIS PERCUSSION
DESCRIPTION: TELEDYNE PERCUSSION DATE OF MANUFACTURE: 06/97
LOT #: M 900-3

BOOSTERS
MANUFACTURER: OWEN LOT #: N/A
PART NUMBER: N/A DATE OF MANUFACTURE: N/A
DESCRIPTION: PYX HI-TEMP BOOSTER

OTHER CHARGES:
MANUFACTURER: DATE OF MANUFACTURE:
PART NUMBER: WORK ORDER #:
GRAM WEIGHT:

COMMENTS

Version # 1.1

BAKER HUGHES
Baker Atlas

COMPANY-	PARAMOUNT RESOURCES LIMITED	FR	2574.8
WELL-	PARAMOUNT ET AL ARROWHEAD N65	LR	2440.3
FIELD-	ARROWHEAD	Elev: KB	574.6
PROVINCE-	NORTHWEST TERRITORIES	GL	567.9