HUDSON'S BAY AREA

58deg30'04.35"N-86deg47'18.48"W
3000205830086450

LIC. APP. Sept 17/74
PIX DEL. Sept 30/76

AQUITAINE COMPANY OF CANADA		FTD. 5170' Precamb	CO-ORD.	K.B. RT 77'
AQUIT ET AL POPLAR BEAR C-11		PBTD.	CORES Nil	GR. WD 560'
		I.P.		
SPUD. SEPT 21/74	30-710-585			
R/R OCT 20/74	20-1227-1750		PERFS.	
COMP.	13 3/8-3081-2225			
STATUS D&A		NET PAY		
		PROD. Z.		

FORMATION	TOP	SUBSEA	TOP
MID DEV	1250	-1173	
EKWAN RIVER	3070	-2993	
SEVERN RIVER	3490	-3413	
U ORDOV	4303	-4226	
CHURCHILL R	4591	-4514	
BAD CACHE	4906	-4829	
PRECAMB	5138	-5061	
TD	5170	-5093	

NO DRILLSTEM TESTS RUN.

*Vicinity: 264 miles east of Churchill, Manitoba.

Pentagone 82

LOGS CNLFDC, SLCGR, HDT, DILL

CONTRACTOR

WELL COMPLETED

EST. T.D.--

RIGHTS-- EMR #139

COMPANY Aquitaine Company of Canada Ltd.

CLASS New Field Wildcat

CONT. Pentagone #82 PROV. HB Offshore

LOGS DIL, FDC-CNL, SLC-GR, HDT

ISSUED September 22/76

LIC. EMR 139 | 300 | C | 11 | 58 40 | 086 45 0

GRID: 58°40' N. 86°45' W. UNIT C SEC 11

WELL Aquit et al Polar Bear C-11

CO-ORD. Lat 58°30'04.35" N Long 86°47'18.48" W.

FORMATIONS	LOG	S/S
Sea Floor/Quaternary	637 KB	
Middle Devonian	1250	-1173
Mid. Devon Upper		
Kenogami	2320	-2243
Silurian-Ekwan Rvr	3070	-2993
Silurian-Severn Rvr	3490	-3413
Upper Ordovician		
Red Head River	4303	-4226
Upper Churchill Rvr	4591	-4514
Bad Cache	4906	-4829
Pre-Cambrian	5138	-5061

WD 560' RT 77' COMP.

SPUD Sep 21/74 R.R. Oct 20/74 Oct 20/74

T.D. 5170'

IN Pre-Camb

P.B.

T.V.D.

30	x	710 c-585
20	x	1227 c-1750
13 3/8	x	3081 c-2225

STATUS ABANDONED ZONE

I.P.

CORES:

NO CORES CUT

STATUS HISTORY D M Y

PERFS:

Abandoned, not perforated

No oil or gas shows

DRILLSTEM TESTS:

NO DRILL STEM TESTS RUN

1. INTRODUCTION

1.1 Summary

The Polar Bear C-11 well was drilled in the Hudson Bay between September 21, 1974 and October 18, 1974. The Operator was Aquitaine Company of Canada Ltd., based in Calgary, acting on behalf of the "Hudson Bay Group", which was comprised of:

- Aquitaine Company of Canada Ltd.
- Atlantic Richfield Canada Ltd.
- Elf Oil Exploration and Production (Canada) Ltd.
- Petrofina Canada Ltd.
- Shell Canada Ltd.
- Sogepet Ltd.

The selected drilling unit was the semi-submersible "Pentagone 82" (P-82), owned and operated by Sea and Land Drilling Contractors Inc., a subsidiary of the Forex-Neptune group.

The P-82 was towed from the "Aquitaine et al Walrus A-71" location by the Tidewater tug supply vessel, "Supreme Tide", to this new location.

Purpose

The purpose of this wildcat was to evaluate the entire Paleozoic section of a structure discovered by seismic reflection. The structure consists of a huge monoclinal block, tilted to the S.W. and limited by a fault on its northeastern flank. The areal closure was estimated to be 122 sq. miles with vertical closure of approximately 400'. The main objective was the Attawapiskat, a reefal facies developing in the upper part of the Silurian section. Other reservoirs were expected deeper.

Summary of Drilling Operations

Two joints of 30" conductor pipe were set after drilling a 36" hole, to cover the upper part of the glacial drift.

A 20" conductor casing was then set at 1,227'. A 17-1/2" hole was drilled to 3,105' and a 13-3/8" casing was set at 3,081', before entering the expected Attawapiskat formation.

Drilling of a 12-1/4" hole was resumed to T.D. (5,170') with no further casing set, due to the lack of reservoir.

Results

The Attawapiskat is either eroded or partly present under a tight facies. No other significant reservoirs were encountered. No gas or oil shows were observed.

The well was plugged and abandoned, the P-82 was then towed to Cape Chidley ($64^{o}W$ - $61^{o}N$), by two Tidewater tug supply vessels, between October 20th and October 31, 1974. On October 31, 1974, the tow was resumed with the "Oceanic" tug, to the North Sea.

Details of the first leg of the tow are given in a separate report, namely, "Towing of the P-82 Out of the Hudson Bay in the Fall of 1974".

2. GENERAL DATA

2.1 Well Name and Number: Aquit et al Polar Bear C-11

2.2 Drilling Unit: Pentagone 82 (P-82) Semi-submersible type.
Marathon - Letourneau shipyard, Brownsville, Texas
(Summer 1971 to Fall 1973)
Lloyd's Class + 100 A1 (The unit is ice reinforced but no ice classification is available for this type of vessel.)

2.3 Operator: Aquitaine Company of Canada Ltd.
540 - 5th Avenue S.W.
CALGARY, Alberta
T2P 0M4

2.4 Permittees: Aquitaine Company of Canada Ltd.
Atlantic Richfield Canada Ltd.
Elf Oil Exploration and Production Canada Ltd.
Petrofina Canada Ltd.
Sogepet Limited

2.5 Drilling Contractor: Sea and Land Drilling Contractors, Inc.
(Incorporated in Panama)
8, Aquilino de la Guardia, PANAMA, R.P.

Sea and Land Drilling Contractors
Forex Neptune
Caledon Road, Eastern Wharf
DUNDEE DD1 3LW, Scotland
Telephone: (0382) 453910
Telex: 76455 - PETROBASE

2.6 Permit Number: 1426

2.7 Drilling Authority: EMR Number: 139
Date Issued: September 17, 1974

2.8 Well Location: Hudson Bay
Latitude: 58°30'04.352"N
Longitude: 86°47'18.489"W

Location determined by means of a Decca Lambda "Cesium" system.

2.9 Elevations: R.T./K.B. to Sea Level: 77'
Water Depth: 553'

2.10 Total Depth: 5,170'

2.11 Spudded: September 21, 1974, at 8:30 p.m.

2.12 Drilling Completed: October 14, 1974, at 10:30 a.m.

2.13 Well Abandoned: October 18, 1974, at 10:00 a.m.

2.14 Rig Released: P-82 under tow back to the North Sea on October 20, 1974, at 9:00 p.m. P-82 released on October 30, 1974, at 6:00 a.m.

2.15 Well Status: Plugged and Abandoned

2.16 Well Classification: New Field - Wildcat

2.17 Support Equipment:

Two Tug Supply Vessels:

Names: M/V Supreme Tide and M/V Giant Tide
Owner: Tidewater Marine Service, Inc.
Built: Hatco Verksted A/S shipyard - Ulsteinvick, Norway
(Delivered in May 1974)
Classification: Navigation: ABS A1(E) + AMS Towing unrestricted
Ice: ABS Class "C" (1971 rules)

One Supply Vessel:

Name: M/V Federal 6
Owner: Federal Offshore Services Ltd.
Built: Star Shipyard
New Westminster, B.C., Canada (1972)
Classification: Navigation: ABS Ocean going A1(E)
Ice: ABS Class "A"

One Helicopter:

Type: Bell 212 IFR Model
Owner: Dominion Pegasus Helicopters Ltd.
Classification: Licensed for commercial night and instrument flying.

M E M O R A N D U M

TO: M.E. Hriskevich DATE: November 6, 1974

FROM: A.J. Brinker FILE: N.F.

RE: Aquitaine et al Polar Bear C-11 Log Evaluation

Well Data:

Kelly Bushing:	77'
Kelly Bushing to Sea Floor:	630'
Casing:	30" to 710'
	20" to 1,227'
	13 3/8" to 3,081'
Open Hole:	12¼" to 5,170'
Logs Run:	Run 1 at 3,105'
	DLL, CNL-FDC, BHC-GR, HDT
	Run 2 at 5,170'
	DLL, CNL-FDC, BHC-GR, HDT, FIT, SRS

An evaluation of the logs showing porosity, water saturation and lithology in the AQUITAINE ET AL POLAR BEAR C-11 well is included herein.

1,227' - 1,384'	- hole is too large for logging tools to indicate lithology.
1,384' - 1,446'	primarily shale possibly with some sand.
1,446' - 1,470'	sand grading into limestone and becoming shaley near the bottom of the interval some porosity, approximately 3% is indicated in the interval 1,450' - 58' water saturation 100%
1,470' - 1,480'	shale

1,480' - 1,486' - dolomite with 7% porosity and 100% water saturation

1,485' - 1,495' - limestone

1,495' - 1,506' - shale

1,506' - 1,520' - limestone, shale, gypsum

1,520' - 1,550' - limestone and shale

1,550' - 1,590' - limestone and shale

1,590' - 1,690' - limestone shale dolomite with gypsum indicated at 1,661' and 1,668' and 1,684'

1,690' - 1,695' - dense dolomite

1,695' - 1,730' - porous limestone averaging 10% with 100% water saturation

1,730' - 1,782' - limestone with shale

1,782' - 1,808' - porous limestone averaging 8% with 100% water saturation

1,808' - 1,875' - shaley limestone

1,875' - 1,970' - shaley dolomite

1,970' - 2,323' - primarily shale

2,323' - 2,337' - dolomite

2,337' - 2,380' - shale

2,380' - 2,466' - salt

2,466' - 2,528' - primarily dolomite with some 5% porosity Sw = 100%

2,528' - 2,660' - gypsum

2,660' - 2,674' - dolomite with some shale

2,694' - 2,726' - shale

2,726' - 2 840' - salt

2,840' - 2,900' - salt with radioactive material

2,900' - 3,034' - salt

3,034' - 3,046' - limestone

3,046' - 3,076' - salt

3,076' - 3,110' - large hole

3,110' - 3,140' - dolomite with gypsum

3,140' - 3,190' - dense dolomite

3,190' - 3,204' - gypsum

- 3,250' - dolomite

3,250' - 3,274' - dolomtie with an average of 3% porosity Sw = 100

3,274' - 3,281' - gypsum

3,281' - 3,446' - dolomite

3,446' - 3,464' - dolomite with up to 5% porosity Sw = 100%

3,464' - 3,468' - gypsum

3,468' - 3,500' - dolomite with increasing amount of shale

3,500' - 3,804' - dense dolomite

- on indication of porosity, 3,540' may be due to gypsum

3,804' - 3,809' - gypsum

3,809' - 3,820' - dolomite with some shale and possibly some gypsum

3,820' - 3,853' - dolomite averaging 3% porosity with a minimum water saturation of 50%.

3,853' - 3,880' - dense dolomite

3,880 - 3,906' - dense limestone

3,906' - 3,912' - anhydrite

3,912' - 3,915' - porous dolomite (5%) or gypsum

3,915' - 3,920' - anhydrite

3,920' - 3,927' - dense dolomite

3,927' - 3,938' - anhydrite

3,938' - 3,948' - dense limestone grading into dense dolomite

3,948' - 3,966' - anhydrite grading into dolomite and gypsum

3,966' - 3,982' - dense dolomite

3,982' - 4,006' - dolomite with porosity averaging 3% Sw = 100%

4,006' - 4,050' - limey dolomite, dense

4,050' - 4,070' - dolomite

4,070' - 4,116' - limestone, dense

4,116' - 4,128' - anhydrite

4,128' - 4,155' - dolomite with some gypsum

4,155' - 4,164' - dolomite with 4% porosity Sw = 100%

4,164' - 4,170' - limestone dense

4,170' - 4,176' - dolomite with 3% porosity Sw = 100%

4,176' - 4,186' - dense limestone

4,186' - 4,230' - gypsum

4,230' - 4,296' - limestone, dense

4,296' - 4,306' - gypsum

4,306' - 4,356' - salt

4,356' - 4,378' - gypsum

4,378' - 4,382' - dolomite

4,382' - 4,386' - gypsum

4,386' - 4,425' - dolomite with 2-3% porosity Sw = 100%

4,425' - 4,235' - anhydrite

4,435' - 4,439' - dolomite dense

4,439' - 4,458' - gypsum

4,458' - 4,470' - dolomite 1% porosity Sw = 100%

4,470' - 4,492' - dolomite with gypsum and anhydrite

4,492' - 4,514' - dolomite, dense

4,514' - 4,548' - anhydrite

4,548' - 4,558' - gypsum

4,558' - 4,580' - dolomite dense

4,580' - 4,592' - shale

4,592' - 4,604' - limestone grading to dolomite

4,604' - 4,608'	- anhydrite
4,608' - 68'	- dolomite, dense
4,668' - 4,868'	- limestone, dolomite, dense
4,868' - 4,910'	- gypsum
4,910' - 5,124'	- limestone, dense
5,124' - 5,138'	- shale
5,138' - 5,150'	- sand with 1-2% porosity and Sw = 40%

VBMcKeown/sgb

AQUITAINE — DRILLING TICKET

WELL NAME: POLAR BEAR C-11

RIG	COORDINATES	TIMING	CASING	LOGS
P - 82	X = 58°30' 08.37"	Commenced - Sept. 21/74	ø 30" at 710'	DLL 1245 - 5156
GEOLOGIST	Y = 86°47' 13.15"	Temporary Halt	ø 20" at 1227'	Sonic-GR 1100 - 5166
B. Tillement	Z	Resumption of Drilling -	ø 13 3/8" at 3081'	FDC CNI 500 - 5167
A. Pochitaloff	Z KB - 77 A.M.S.L	Temporary Halt -	ø at	HDT 1245 - 5165
	Hudson Bay	Resumption of Drilling	ø at	
Brought up to date on	PROVINCE	Completed - Oct. 14/74		
November 1974	Federal waters			

AGE	Formation	SCALE 1" = 500' or 1/6,000 DEPTH	LOG	CORE	DIP	Porosity TYPE	Porosity GRADE	SHOW-TEST	GAIN AND LOSS	LITHOLOGY
	WATER	500								
?	?	630								Mud Line
		1000								No samples
MIDDLE DEVONIAN	UN. C	1250								Halite, calcareous clay, gypsum and anhydrite, limestone
		1440								1440
	UNIT B	1500								Intercalations of: - limestone, pink, white buff, red brown, tight - gypsum, anhydrite - red claystone
		1730								Limestone, buff - pink, bioclastic, tight, rarely slight porous
	UNIT A	1970								1970
		2000								Red-brown claystone
	UPPER KENOG	2320								2320
		2500								Red-brown dolomite and halite
										2465 Limestone, dolo. limestone, cream, buff, microx, cryptox, slightly bituminous, tight
										2728 Halite
		3000								
	EKWAN	3070								3070
						micro vugs				Dolomite, white, pink, beige, microx to cryptox, local sucrosic, hard, tight
SILURIAN		3490		NONE					gain	3490
		3500						Very slight gas background	Cl_2Ca water 20 bb/h	Limestone, grey, brown, microx or cryptox, tight, hard
	SEVERN							3900 Small gas kick $C_1/C_2 = 30$		
		4000						AT 4200 I FIT : NO FLOW NO PRESSURE		Layer of anhydrite
		4303				inter cryst.	significant interval			4303
ORDOVIC.	RED HEAD	4500						Very slight gas background	Steady gain 15 - 30 bb / hour	Halite, anhydrite, Dolomitic limestone, tan to brown microx
		4591								4591 Limestone, buff, brown, microx, tight
	CHURCHILL									
		4906								4906
UPPER	Bad Cache	5000				no				Limestone, beige, brown, whitish, microx, cryptox, tight
		5122								5122 Shale and sand
		5138								5138
		T.D. 5170'								Granite
PRECAMBRIAN	Basal Clastics	5500								

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 1

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
						70% Brick red brown, silty to sandy, plastic, slightly calcareous clay traces of gypsiferous silica (chert) 30% cement
1250	1260					60% red brown clay, traces of gypsum - chert 40% cement
1260	1270					50% clay as above, brick red brown orange, locally yellow 50% cement
1270	1280					80% clay, brick red brown; gypsiferous chert 20% cement
1280	1295					85% clay as above; traces gypsum 15% cement
1295	1310					85% clay, brick red traces of gypsum 15% cement
1310	1325					85% clay as above (locally yellow) 15% cement, concretion chert (rare)
1325	1340					100% clay as above gypsum (trace) concretion chert (rare)
1340	1355					80% clay, sandy or silty, brick red 20% gypsum or anhydrite and chert
1355	1370					80% clay, calcareous or micrite, argillaceous, red brown sandy or silty, hard, occasionally soft 20% gypsum
1370	1385					70% micrite, argillaceous, red brown, silty, hard 30% gypsum or anhydrite
1385	1400					90% micrite, argillaceous as above 10% gypsum
1400	1410					90% micrite, argillaceous as above 10% fibrous gypsum
1410	1420					90% micrite, argillaceous as above 10% gypsum
1420	1430					100% micrite, argillaceous as above gypsum (traces)
1430	1440					50% limestone, white, buff, micrite, hard, slightly porous 50% micrite, argillaceous as above traces gypsum
1440	1450					80% limestone, white, buff as above 20% micrite, argillaceous, red
1450	1460					

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 2

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1460	1470					90% limestone (4 types) 10% micrite, argillaceous, red 1. Limestone: white, buff, micrite, hard, slightly porous 2. Limestone: rose, purple, argillaceous, hard, silty 3. Limestone: yellow (traces) 4. Limestone: very argillaceous, red brown, silty or sandy, slightly porous
1470	1480					20% anhydrite (white) microcrystalline 80% limestone as above (4 types)
1480	1490					Limestone, white, buff, predominantly micrite
1490	1500					Limestone as above, predominantly white
1500	1510					80% predominantly limestone, argillaceous, rose purple, hard, silty, white 20% gypsum or anhydrite
1510	1520					Limestone as above, predominantly rose, purple
1520	1530					80% limestone, argillaceous, dominantly purple 20% anhydrite
1530	1540.					as above
1540	1550					90% limestone, dominantly white, buff, (micrite) compact; abundant purple limestone 10% gypsum
1550	1560					90% limestone, white and purple 10% gypsum
1560	1570					Limestone as above traces of gypsum
1570	1580					90% limestone, argillaceous, purple, locally breccia (dominant) 10% clay, brick red, silty
1580	1590					Limestone, white, dominantly purple 10% clay, brick red (sandy or silty) traces anhydrite
1590	1600					Dominantly limestone as above traces anhydrite
1600	1610					70% limestone 20% anhydrite 10% brick red clay
1610	1620					Limestone white, dominantly purple 30% anhydrite
1620	1630					as above, white often purple 20% anhydrite - gypsum

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 3

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C. Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1630	1640					Limestone, dominantly purple salt casts
1640	1650					40% anhydrite 60% limestone, white or purple, dominantly argillaceous concretion brick red, porous (salt?)
1650	1660					80% limestone, as above, white or purple, argillaceous 20% anhydrite
1660	1670					Limestone, white, buff, dominantly dolomitic traces of brick red clay 20% anhydrite
1670	1680					10% anhydrite, as above abundant aggregates (porous)
1680	1690					as above - brick red clay (traces) 10% anhydrite
1690	1700					50% white anhydrite limestone, white, cream, red brown plus dolomitic; limestone m. brown, micritic, tight
1700	1705					50% anhydrite 50% limestone as above
1705	1710					20% anhydrite 80% limestone, white-rose or red brown, dolomitic, micrite, compact
1710	1715					10% anhydrite 90% limestone as above, white and red brown
1715	1720					20% anhydrite 80% limestone, dominantly red brown, occasionally calcite veining
1720	1725					10% anhydrite 90% limestone
1725	1730					100% limestone, white rose or red brown fossils
1730	1740					Limestone, argillaceous, red brown, soft
1740	1745					Limestone, white rose, red brown, compact, occasionally silty 10% anhydrite
1745	1750					Limestone as above fossils
1750	1760					100% limestone, white rose or red brown, micrite, compact slightly argillaceous or silty, fossils traces anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 4

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1760	1770					as above, fossils vuggy dolomite, abundant
1770	1780					100% limestone as above traces of brick red clay gastropods, fossils
1780	1790					limestone, white, buff, micrite, locally porous vuggy dolomite (rare) traces of brick red clay, partly plastic
1790	1800					Limestone, white, buff, micrite, locally slightly porous (partly plastic) fossils traces of limestone, rose or red brown aggregates (rare) traces of brick red clay
1800	1810					Limestone, dominantly white, buff Limestone, rose, yellow or red brown aggregates (rare) traces of red clay (partly plastic 10%) crinoids
1810	1815					as above (limestone, dominantly white plus limestone, color varicolored) fossils
1815	1820					as above 80% Limestone dominantly white limestone color-different traces of brick red clay (20%) partly plastic Change bit
1820	1830					80% limestone, white, buff as above fossils - crinoids abundant concretions of brick red clay (20%)
1830	1840					80% limestone, white - rose, micrite, compact (partly plastic)
1840	1845					Limestone, white-rose as above traces brick red clay fossils
1845	1850					as above
1850	1855					limestone, white-rose, micritic, bioclastic, hard, tight bioclastic - abundant fossils concretion (claystone) traces porosity, silty, calcareous, soft traces of brick red clay

SAMPLES NOT LAGGED

SAMPLES LAGGED AT .... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 5

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Shawings O.G.W.	
1855	1860					as above
1860	1870					80% limestone as above 20% concretions, brick red clay and gypsum
1870	1875					as above
1875	1880					70% limestone 30% concretions and claystone - brick red, slightly silty, calcareous, soft (gypsum)
1880	1890					70% limestone 30% concretions, claystone
1890	1895					as above
1895	1900					80% limestone, rose 20% concretions, claystone (brick red)
1900	1910					as above
1910	1915					as above traces anhydrite fossils
1915	1920					as above
1920	1925					as above
1925	1930					80% limestone 20% claystone, slightly silty, calcareous, brown or red, bioclastic, micritic, white-rose, hard, tight
1930	1960					as above
1960	1970					70% limestone 20% claystone 10% grey yellow, siliceous; limestone friable, micritic yellow, argillaceous content
1970	1980					40% limestone, rose 40% siliceous limestone 20% claystone
1980	1990					50% partly plastic, red brown, slightly calcareous, silty 10% limestone as above 40% limestone, siliceous
1990	2320					Claystone, brown red, occasionally mauve, very soft, slightly calcareous, very silty, plastic; crinoids
2320	2330					40% claystone as above 60% dolomite, red brown, occasionally purple, buff, cream grey, brown, micritic, medium hard, tight; traces of dolomite cryptoxln, cream

SAMPLES NOT LAGGED

SAMPLES LAGGED AT .... FT. PER MIN.

(Delete as Appropriate)

Sheet No. 6

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION
2330	2335					40% Claystone 60% dolomite
2335	2340					20% claystone 80% dolomite
2340	2350					40% claystone 60% dolomite
2350	2360					70% claystone 30% dolomite
2360	2370					60% claystone 40% dolomite
2370	2375					20% claystone 10% dolomite (red brown, cream, buff) 70% anhydrite, white, light grey
2375	2380					40% claystone 10% dolomite 50% anhydrite
2380	2390					30% claystone 30% dolomite 40% anhydrite
2390	2400					50% claystone 10% dolomite 40% anhydrite SALT FROM 2380' - 2465'
2400	2410					40% claystone 20% dolomite 40% anhydrite
2410	2420					as above
2420	2430					30% claystone 30% dolomite 40% anhydrite
2430	2440					30% claystone 30% dolomite 30% anhydrite 10% traces limestone, white, cream, fiable
2440	2450					30% claystone 30% dolomite traces shale, green-grey, soft, no. cal. 40% anhydrite
2450	2460					20% claystone 10% shale 40% dolomite, predominantly buff, beige 30% anhydrite crinoids, coral

SAMPLES NOT LAGGED

SAMPLES LAGGED AT .... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 7

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2460	2470					10% claystone 10% shale 20% dolomite, buff, light, brown, occasionally grey/white, translucid, hard, voids, cryptoxln 60% anhydrite
2470	2475					10% claystone and shale 20% limestone, buff, very hard, blocky, cryptoxln, tight 20% dolomite 50% anhydrite
2475	2480					10% claystone 10% shale 20% dolomite 30% anhydrite 30% limestone, buff, cryptoxln....
2480	2485					20% dolomite 10% claystone 20% anhydrite 50% limestone, cream, light brown, microxln, cryptoxln, plus limestone as above, very hard, voids
2485	2490					10% claystone 10% dolomite 10% anhydrite 70% limestone (voids dominant)
2490	2495					traces claystone 10% dolomite 10% anhydrite 80% limestone (voids dominant)
2495	2500					10% dolomite anhydrite (traces) 90% limestone, oolitic, buff, cream, micritic, tight, med. hard
2500	2505					10% claystone 20% dolomite, white, grey, microxln, hard 70% limestone (3 types)
2505	2510					20% claystone 20% dolomite, white grey 60% limestone, cryptoxln, oolitic
2510	2515					20% claystone 20% dolomite 60% limestone, dominantly cryptoxln
2515	2520					20% claystone 20% dolomite 60% limestone (3 types)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 8

POLAR BEAR 0-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2520	2525					20% claystone 20% dolomite 60% limestone (voids dominant)
2525	2530					20% claystone 10% dolomite 70% limestone (dominantly oolitic)
2530	2540					10% claystone 10% dolomite 80% limestone (3 types) becoming dolomitic
2540	2550					10% claystone dolomite traces 90% limestone (3 types) as above
2550	2560					10% claystone traces dolomite 90% limestone (3 types) corals
2560	2570					10% claystone traces dolomite 90% limestone (dominantly cryptoxln, tight) corals
2570	2580					10% claystone 10% dolomite 80% limestone (cryptoxln dominant)
2580	2590					100% limestone, porous traces claystone and dolomite traces of asphalt
2590	2600					100% limestone, porous traces as above
2600	2610					100% limestone, cream, light brown, microxln - cryptoxln voids, buff, tight, hard, porous)
2610	2620					100% limestone as above, light brown - dark brown, microxln cryptoxln voids, very hard Change bit
2620	2630					Dolomitic limestone, microxln, medium brown, tight, locally voids, very hard.
2630	2640					as above
2640	2650					Dolomitic limestone, med. brown, microxln, tight, locally porous, very hard.
2650	2655					as above
2655	2660					dolomitic limestone, med. brown, microxln, tight 10% limestone, dark brown, bituminous, microxln, soft

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 9

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2660	2665					as above - traces por.
2665	2670					as above
2670	2675					Dol. limestone, light - medium brown, microxln, tight and limestone, dark brown, bituminous as above
2675	2680					limestone, light-med. brown, microxln, tight - locally porous traces limestone, dark brown, bituminous, soft corals
2680	2685					as above - trace bituminous limestone
2685	2690					as above
2690	2695					as above - no bituminous limestone
2695	2700					as above
2700	2705					as above
2705	2710					as above
2710	2715					90% limestone 10% shale cream, med. hard or soft, calcareous
2715	2720					50% limestone, light - med. brown, microxln, tight, locally porous, hard (20% + 30% = 50%) claystone, red brown, very soft, calcareous occasionally silty, plastic
2720	2725					30% limestone 10% dolomite 10% anhydrite 50% claystone
2725	2730					as above
2730	2740					80% claystone 20% limestone
2740	2750					80% claystone 20% limestone
2750	2760					as above
2760	2770					60% claystone 40% limestone, brown, cream, med. brown, grey, hard, micrite-argillaceous, tight
2770	2780					40% claystone 60% limestone
2780	2790					Fishing.. SALT ON THE BIT 50% claystone 50% limestone

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . . FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

POLAR BEAR O-20

Sheet No. 10

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2790	2800					70% claystone 30% limestone
2800	2810					SALT

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 11

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2810	2820					Salt - white, clear, xln traces of claystone, red brown
2820	2830					as above
2830	2840					as above
2840	2850					as above
2850	2860					as above
2860	2870					as above
2870	2880					as above
2880	2890					as above
2890	2900					as above
2900	2910					as above
2910	2920					as above
2920	2930					as above
2930	2940					90% salt 10% claystone
2940	2950					70% salt 30% claystone
2950	2960					60% salt 40% claystone
2960	2970					60% salt 40% claystone
2970	2980					60% salt 40% claystone
2980	2990					60% salt 40% claystone
2990	3000					60% salt 40% claystone
3000	3010					70% salt 30% claystone

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . . . . FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 12

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core & Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Shows O.G.W.	
3010	3020					60% salt 30% claystone 10% dolomitic shale, red, light brown, hard, blocky
3020	3030					as above
3030	3040					40% salt 40% claystone 10% shale 10% limestone light grey, hard, micritic, argillaceous, bituminous traces
3040	3050					as above
3050	3060					as above
3060	3070					as above
3070	3080					10% salt 30% claystone 10% shale 10% limestone 40% dolomite, white, pure, hard, massive, brittle, cryptoxln, tight, locally porous
3080	3090					traces of salt 30% claystone 10% shale 10% limestone 50% dolomite white as above and dolomite buff, cream, hard, massive, microxln, occas. quite porous
3090	3095					10% shale 30% claystone 60% dolomite, porous
3095	3100					20% claystone 80% dolomite, porous
3100	3105					as above
						13 5/8" casing
3105	3110					10% cement 90% dolomite as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . . . . FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 13

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core ○ Ditch ○	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3110	3115					20% cement 80% dolomite as above
3115	3120					90% cement 10% dolomite as above traces claystone
3120	3125					90% cement 10% dolomite as above traces claystone
3125	3130					80% cement 20% dolomite as above traces claystone
3130	3135					50% cement 50% dolomite as above traces claystone
3135	3140					50% cement 50% dolomite as above
3140	3145					40% cement 60% dolomite as above
3145	3150					40% cement 60% dolomite as above
3150	3155					10% cement 90% dolomite as above
3155	3160					10% cement 90% dolomite, white, microxln, pure, hard, tight, locally porous
3160	3165					traces of cement 100% dolomite as above
3165	3170					as above
3170	3175					as above
3175	3180					as above
3180	3185					10% cement 90% dolomite, locally porous (rare)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 14

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3185	3190					10% cement 90% dolomite as above
3190	3195					10% cement 90% dolomite, white, microxln, pure, hard, tight, locally porous
3195	3200					traces cement 100% dolomite
3200	3210					as above
3210	3215					as above
3215	3220					as above
3220	3225					as above
3225	3230					as above
3230	3235					as above
3235	3240					as above
3240	3245					as above
3245	3250					as above
3250	3255					as above
3255	3260					as above
3260	3265					as above
3265	3270					as above
3270	3275					as above
3275	3280					Dolomite white, microxln, hard, tight - locally slight porosity
3280	3285					as above
3285	3290					as above
3290	3295					as above
3295	3300					as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT .... FT. PER MIN.

(Delete as Appropriate)

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION POLAR BEAR O-20
3300	3305					as above
3305	3310					as above
3310	3315					as above
3315	3320					Dolomite, whitish, microx, hard, tight, occas. porous
						NEW BIT
3320	3325					Dolomite, predominantly white, pink, beige, cryptoxln, pure, very hard, tight, locally slightly porous
3325	3330					as above
3330	3335					as above
3335	3340					as above
3340	3345					as above
3345	3350					Coral recrystallized
3350	3355					as above
3355	3360					as above
3360	3365					as above
3365	3370					as above
3370	3375					traces of dolomite, pink
3375	3380					85% dolomite, white, as above 15% dolomite, pink
3380	3385					85% dolomite, white, as above 15% dolomite, pink
3385	3390					20% dolomite, pink 80% dolomite, white, as above
3390	3395					traces of dolomite, pink Dolomite, white, as above
3395	3400					Dolomite, white, beige
3400	3405					as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 16

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3405	3410					as above
3410	3415					as above
3415	3420					as above
3420	3425					as above
3425	3430					as above
3430	3435					as above
3435	3440					as above
3440	3445					as above traces of dolomite, grey, siliceous, cryptoxln, very hard
3445	3450					as above presence of coral
3450	3455					Dolomite, white, beige, as above Dolomite, grey, siliceous, very hard, tight
3455	3460					as above
3460	3465					as above
3465	3470					Dolomite, grey, siliceous, very hard, tight Dolomite, white and pink presence of corals
3470	3475					as above
3475	3480					as above
3480	3485					Dolomite, grey-beige, occas. white, very hard, massive, brittle, cryptoxln, tight, no porosity; locally vugular porosity
3485	3490					Dolomite, dominantly grey-beige Dolomite, pink-white as above
3490	3495					Dolomite, grey-beige
3495	3500					Dolomite, grey - glauconite
3500	3505					Dolomite, grey, beige, occas. white, very hard, massive brittle, cryptoxln, tight, locally vugular - glauconite

SAMPLES NOT TAGGED

SAMPLES TAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3505	3510					Dolomite as above and limestone grey, brown, beige, occas. yellow/brown, cryptoxln, very hard, tight - glauconite
3510	3515					40% dolomite as above 60% limestone as above Glauconite
3515	3520					30% dolomite 70% limestone Glauconite
3520	3525					30% dolomite 70% limestone Glauconite
3525	3530					20% dolomite 80% limestone Glauconite
3530	3535					20% dolomite 80% limestone
3535	3540					20% dolomite 80% limestone, light beige
3540	3545					20% dolomite 80% limestone, light beige and brown/yellow, purple/brown
3545	3550					100% limestone traces of dolomite
3550	3555					90% limestone 10% dolomite
3555	3560					100% limestone
3560	3565					100% limestone, beige, grey/brown, occas. yellow/rose red, tight, hard, brittle, cryptoxln, very hard, no porosity
3565	3570					Limestone as above, showing conchoidal fractures
3570	3575					as above
3575	3580					90% limestone 10% dolomitic limestone, siliceous

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 18

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3580	3585					80% limestone 20% dolomitic limestone, siliceous
3585	3590					70% limestone 30% dolomitic limestone, siliceous
3590	3595					Limestone, beige, white, creamy-white, occas. brown - tinted yellow, pink, very hard, microxln - cryptoxln, tight
3595	3600					as above
3600	3605					as above
3605	3610					as above, dominantly creamy-white
3610	3615					as above, dominantly creamy-white
3615	3620					as above, dominantly creamy-white
3620	3625					as above, dominantly brown
3625	3630					as above, dominantly brown
3630	3635					as above, dominantly brown
3635	3640					as above, dominantly brown
3640	3645					as above, dominantly creamy-white
3645	3650					as above but fossiliferous echinoderms, crustaceans (?) radiolaria, ostracods (?), etc...
3650	3655					Limestone, creamy-white, microxln, very hard, tight
3655	3660					as above
3660	3665					as above
3665	3670					as above
3670	3675					as above
3675	3680					as above
3680	3685					as above
3685	3690					Limestone, creamy-white, microxln to cryptoxln, very hard, tight traces of limestone, bioclastic, argillaceous, fossiliferous (echinoderms, crustaceans)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT .... FT. PER MIN.

(Delete as Appropriate)

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings G.G.W.	GEOLOGICAL SAMPLE DESCRIPTION	Sheet No. 19
						POLAR BEAR 0-20	CONFIDENTIAL
3690	3695					as above	
3695	3700					as above	
3700	3705					as above	
3705	3710					same lithology presence of Brachiopods	
3710	3715					as above and white chert, occas. brown	
3715	3720					as above white chert	
3720	3725					as above	
3725	3730					as above	
3730	3735					as above	
3735	3740					Limestone, brown, cryptoxln, hard, tight, with traces of chert	
3740	3745					Limestone, medium brown, cryptoxln, hard, tight, with traces of chert	
3745	3750					Limestone, medium brown, cryptoxln, hard, tight, rare chert	
3750	3755					as above	
3755	3760					Limestone, brown, cryptoxln, hard, tight, bioclastic (echinoderms)	
3760	3765					Limestone, medium brown, cream, white, beige, cryptoxln, very hard bituminous traces (?) traces of grey chert; fossils	
3765	3770					Limestone as above	
3770	3775					Limestone as above traces of white chert	
3775	3785					as above	
3785	3800					Drilling with seawater (no samples)	

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 20

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3800	3805					50% dolomite, light grey, calcareous, moderately hard, cryptoxln - microxln 50% dolomite, beige- cream, calcareous, mod. hard, cryptoxln - microxln
3805	3810					60% dolomite, grey 40% dolomite, beige
3810	3815					90% dolomite, calcareous, light grey, dark brown, white cryptoxln-microxln, med. hard, slightly argillaceous; no porosit 10% limestone
3815	3820					90% dolomite 10% limestone
3820	3825					60% dolomite 40% limestone
3825	3830					20% dolomite as above with brachiopods 80% limestone, med. brown, microxln-cryptoxln, med. hard to hard slightly argillaceous; no porosity
3830	3835					90% limestone 10% dolomite, calcareous, dark brown, cryptoxln-microxln, med. hard to hard
3835	3840					as above
3840	3845					80% dolomite, light grey as above 20% limestone
3845	3850					60% dolomite 40% limestone
3850	3855					20% dolomite 80% limestone
3855	3860					Limestone, beige, cream, med. brown, microxln- cryptoxln, hard
3860	3870					as above
3870	3875					90% calcareous dolomite to dolomitic limestone 10% limestone
3875	3880					20% dolomite 80% limestone
3880	3885					Limestone, light - med. brown, beige, cream, microxln, hard tight

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 21

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Dtch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3885	3890					as above
3890	3895					as above
3895	3900					as above
3900	3905					as above
3905	3910					as above
3910	3915					70% limestone, med. brown, microxln, hard, tight 30% anhydrite, white
3915	3920					20% anhydrite 30% dolomitic limestone, grey, buff, microxln, hard, tight 50% dolomite
3920	3925					20% anhydrite 20% dolomitic limestone 60% dolomite
3925	3930					10% anhydrite 30% dolomitic limestone 60% dolomite
3930	3935					20% anhydrtie 40% limestone 40% dolomite
3935	3940					70% anhydrite 20% dolomite 10% limestone
3940	3945					60% anhydrite 40% limestone
3945	3950					70% limestone 30% anhydrite
3950	3960					30% dolomite, buff, cryptoxln, hard, tight 20% dolomite, pure white, macrocryst. or sucrosic slightly porous 50% anhydrite, bluish-grey
3960	3970					50% dolomite to dolomitic limestone, buff, cryptoxln - microxln locally pelletoidal, tight, hard 20% dolomite, pure white as above 30% anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 22

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Shows Gas O.G.W.	
3970	3980					as above
3980	3990					Mainly: Dolomite, beige to buff, cryptoxln to microxln hard, tight, slightly pyritic. Locally dolomitic limestone. Minor: - dolomite, crystalline, pure white, slightly porous - white gypsum
3990	4000					as above
4000	4010					80% dolomitic limestone to limestone, beige to light brown, microxln-cryptoxln, locally microbrecc. to pelletoidal 10% minor whitish, crystalline dolomite 10% white sucrosic gypsum
4010	4020					as above
4020	4030					80% limestone to dolomitic limestone, beige, grey to light brown, cryptoxln, locally hard, tight 20% dolomite; crystalline gypsum
4030	4040					as above
4040	4050					90% limestone, beige, light grey, whitish, med. hard to hard, tight 10% gypsum and anhydrite
4050	4060					Limestone, mainly grey-brown to beige, cryptoxln - microxln Traces of anhydrite
4060	4065					90% limestone and dolomitic limestone as above 10% anhydrite
4065	4070					as above and white calcite and gypsum
4070	4075					as above but the limestone is locally microbrecc.
4075	4080					50% limestone, brown, brittle, cryptoxln, hard, tight 40% limestone to dolomitic limestone, grey to beige, as above 10% anhydrite and gypsum
4080	4085					as above
4085	4090					90% limestone, brown 10% limestone to dolomite, grey to beige

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4090	4095					90% limestone brown, as above 10% anhydrite and gypsum Traces of limestone to dolomitic limestone, grey to beige as above
4095	4100					Limestone, light to med. brown, cryptoxln to microxln, hard alternating with: Limestone, grey, creamy white, cryptoxln - microxln, mod. hard Traces of anhydrite and gypsum
4100	4105					80% limestone, brown 20% limestone, dark grey-brown, microxln, slightly dolomitic
4105	4110					as above
4110	4115					as above
4115	4120					90% limestone, light to med. brown, creamy white, as above 10% limestone, dark grey to brown, as above
4120	4125					as above
4125	4130					90% limestone as above, becoming dolomitic 10% limestone to dolomite, light grey, mod. hard, microxln Traces of anhydrite and gypsum
4130	4135					as above
4135	4140					90% limestone, light to med. brown, dolomitic, cryptoxln, very hard, no porosity 10% limestone, grey to creamy white, dolomitic, microxln to cryptoxln, mod. hard; no porosity Traces of anhydrite and gypsum
4140	4145					as above
4145	4150					Dolomitic limestone as above to dolomite Traces of anhydrite and gypsum
4150	4155					75% dolomitic limestone to dolomite, light brown to beige, predominantly pelletoidal, lesser amount (20%) of cryptoxln type as above, very hard 5% anhydrite
4155	4160					95% dolomitic limestone as above; slight porosity in pelletoidal type 5% anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ... .. FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 24

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4160	4165					Dolomite to dolomitic limestone as above, increasing in cryptoxln type (50%) 5% anhydrite
4165	4170					80% dolomite, light brown, cryptoxln to crystall. (in that case, slightly porous) hard, pelletoidal or calcarenitic (20%)
4170	4175					as above
4175	4180					same dolomite, less detrital
4180	4185		about 10% of red siltstone			Dolomite, cream to light brown, mainly cryptoxln, hard, tight
4185	4190					about 20% of white, crystal. dolomite, in addition to the light brown dolomite
4190	4195					70% dolomite, light brown 30% white dolomite
4195	4200					as above
4200	4205					Dolomite (80%) rarely dolomitic limestone, tan to light brown, cryptoxln to microxln, tight, hard 20% pure white, crystal. dolo. (very slow reaction with HCl)
4205	4210		10% of red dolomitic siltstone (cavings?)			as above
4210	4215					Dolomite as above, locally finely banded
4215	4220					85% dolomite, occas. limestone (dolomitic), tan to light brown, cryptoxln to microxln, loc. pellet, tight, hard 15% pure white, crystall. dolo.
4220	4225					70% dolomite as above 30% white dolomite
4225	4230					70% dolomite, tan to light brown as above 20% dolomite, pure white 10% siltstone, red, dolomitic (cavings?)
4230	4235					as above
4235	4240					60% dolomite, tan, locally very calcareous 30% dolomite, white 10% siltstone, red, dolomitic (casts of salt dissolution)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 25

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4240	4245					as above
4245	4250					as above
4250	4260					80% dolomite, light cream to buff 10% white dolomite 10% siltstone, red (cavings?) Traces of anhydrite
4260	4270					as above
4270	4275					60% dolomite, light grey, buff, light cream, cryptoxln to microxln, tight, hard 20% limestone, light grey, microxln, tight 10% dolomite, white 10% siltstone, red
4275	4280					60% dolomite, light grey to white, microxln, hard, tight 40% limestone, light grey to cream, microxln, hard, tight Traces of red siltstone
4280	4290					30% dolomite 70% limestone Traces of red siltstone
4290	4300					20% dolomite, more light grey 80% limestone red siltstone
4300	4310					50% limestone, mainly beige to buff, cryptoxln to microxln, tight 50% dolomite, light grey, cryptoxln, med. hard, tight
4310	4320					30% limestone, beige 60% dolomite, light grey, silty to argillaceous, cryptoxln, med. hard, tight 10% siltstone, dolomitic, red (cavings?)
4320	4330					30% limestone, beige 40% dolomite, light grey 20% white, crystall. calcite and dolomite 10% siltstone, red gypsum; soft pasty blebs of K compound (?)
4330	4340					30% limestone 30% dolomite, light grey, more silty and argillaceous, soft tight 20% calcite and dolomite, white

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 26

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4330	4340 (cont)					10% siltstone, red (cavings) Blebs of K compound ? (whitish, soft, pasty) 10%
4340	4350					poor sample - not representative (very little return)
4350	4360					New element - 40% dolomite, irregularly colored, dark brown to black to tan, microxln, hard, tight (possible bitum.) 40% alternating beige, grey, whitish dolomite and limestone as above 20% cavings
4360	4370					as above
						Change of Bit
4370	4375					10% dolomite, dark brown, bituminous 60% dolomite, cream to buff, microxln to cryptoxln, hard tight, brittle 30% dolomitic shale, calcareous, blue-grey, with tiny black dots, fine grained, soft
4375	4380					10% dolomite, dark brown, bituminous (test with $CHCl_3$) 80% dolomite, cream 10% dolomitic shale, calcareous, blue-grey
4380	4385					100% dolomite, cream, brittle, microxln, hard, tight
4385	4390					100% as above, locally slightly calcareous
4390	4395					as above
4395	4400					Very good cuttings 100% dolomite as above, more calcareous no cavings at all
4400	4405					as above
4405	4410					100% dolomite, cream, microxln, brittle, locally calcareous, hard, tight Cuttings exceptionally good
4410	4415					same lithology. Actually, limestone in the process of dolomitisation
4415	4420					as above
4420	4425					as above

SAMPLES NOT TAGGED

SAMPLES TAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

Sheet No. 27

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION
4425	4430					50% dolomite, calcareous as above 50% shale, silty, dolomitic (calcimetry 42,48,50) with very fine grains of black mineral, pasty, soft, blue-grey
4430	4435					50% dolomite, calcareous/dolomite/limestone, cream, microxln, hard, tight 40% shale, silty, dolomitic 10% soft gypsum, translucent
4435	4440					80% dolomite, calcareous/dolomite/limestone, cream (same layers) as above 20% silty dolomitic shale, blue-grey, harder than above gypsum
4440	4450					80% dolomitic limestone, cream 10% silty shaly dolomite, blue-grey (with fine black dots) 10% gypsum, translucent
4450	4455					80% dolomitic limestone as above 10% limestone, same characteristics as above 10% gypsum and anhydrite
4455	4460					Mainly: dolomite to dolomitic limestone, beige to light brown, microxln, apparently not porous
4460	4465					same lithology, but more calcareous
4465	4470					50% limestone, light - med. brown, microxln, hard, no visible porosity 40% limestone, white to creamy white, microxln, mod. hard, no porosity 10% dolomite, light to med. brown, pure white, hard, microxln no porosity, slightly calcitic
4470	4475					trace dolomite as above 60% limestone as above 40% dolomite, calcareous, med. grey, microxln, argillaceous no porosity
4475	4480					80% dolomite, grey as above 10% dolomite, brown as above 10% limestone, brown, creamy white as above
4480	4485					30% dolomite, grey 20% dolomite, brown 40% limestone, brown, creamy white 10% anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . . . . . FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 28

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4485	4490					70% limestone as above 10% dolomite, grey 20% dolomite, brown becoming calcitic
4490	4495					as above
4495	4500					80% limestone, light to med. brown, as above 20% dolomite, brown as above, becoming dolomitic limestone
4500	4505					as above
4505	4510					Limestone, light to med. brown, white - creamy white, buff-grey occas. dolomitic, microxln, hard.
4510	4515					as above
4515	4520					100% limestone, light - med. brown, buff grey, creamy white, occas. dolomitic, mod - very hard, no visible porosity
4520	4530					50% dolomitic limestone as above 50% anhydrite and gypsum, white to light blue-grey
4530	4540					15% dolomitic limestone, light brown as above 85% anhydrite and gypsum, whitish, ± translucent
4540	4545					40% dolomitic limestone, beige 60% anhydrite and gypsum
4545	4550					65% dolomite to dolomitic limestone 35% anhydrite and gypsum
4550	4555					50% dolomitic limestone and limestone as above 40% anhydrite 10% dolomite, shaly and silty, blue-grey, med. hard, tight
4555	4560					60% dolomitic limestone to dolomite, beige to buff, to light brown, brittle, microxln, hard, tight 35% limestone, as above 5% anhydrite and dolomite
4560	4565					as above
4565	4570					60% dolomite as above 40% limestone as above
4570	4580					30% dolomite as above 70% limestone as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ____ FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 29

POLAR BEAR 0-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4580	4590					20% dolomite, cream to tan, microxln, hard, tight 30% limestone, cream to tan, microxln, hard, tight 50% limestone, light blue-grey, slightly dolomitic, argillaceous, med. hard
4590	4595					20% limestone as above 10% dolomite as above 70% limestone, blue-grey, argillaceous
4595	4600					20% dolomite as above 20% limestone, beige as above 60% limestone, blue-grey, argillaceous
4600	4610					as above
4610	4620					20% dolomite, buff to light brown, argillaceous, microxln, traces of porosity 80% limestone, beige cream to light blue-grey, locally argillaceous, tight traces of anhydrite
4620	4630					10% dolomite as above 90% limestone, only beige and light brown
4630	4640					50% dolomite as above 50% limestone as above
4640	4650					20% dolomite as above 80% limestone, beige to light brown to whitish
4650	4655					as above with traces of dark blue-grey dolomite
4655	4660					50% dolomite as above 50% limestone as above
4660	4665					as above traces of gypsum
4665	4670					20% dolomite as above 80% limestone as above traces anhydrite and gypsum
4670	4675					40% dolomite as above 60% limestone
4675	4680					80% limestone as above 20% dolomite as above

SAMPLES NOT TAGGED

SAMPLES TAGGED AT ..... FT. PER MIN.

(Details on Appendix)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 30

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4680	4685					90% limestone 10% dolomite
4685	4690					as above
4690	4700					as above
4700	4705					90% limestone, light to med. brown, white-cream, microxln, occas. cryst., hard, (white-cream softer than brown) no visible porosity 10% dolomite as above
4705	4710					100% limestone as above, occ. slightly dolomitic trace of dolomite as above
4710	4715					as above
4715	4720					as above
4720	4725					as above
4725	4730					limestone as above, predominantly microxln
4730	4735					as above
4735	4740					limestone, locally slightly dolomitic, brittle, microxln med. hard to hard, tight, cream to light brown
4740	4745					as above
4745	4750					limestone, locally slightly dolomitic, light grey to cream, microxln, hard, tight
4750	4760					as above
4760	4770					80% limestone, tan to buff as above 20% limestone, whitish to light grey, soft
4770	4775					60% limestone, hard, buff 40% limestone, soft, whitish, light grey
4775	4780					50% limestone, hard, as above 50% limestone, soft as above
4780	4785					40% limestone, buff 60% limestone, soft, light grey
						Change of Bit

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 31

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4785	4795					40% limestone, buff, light brown, microxln, hard, tight 50% limestone, whitish, light grey, microxln, soft 10% limestone, dolomitic, blue-grey, black specked (cavings?)
4795	4800					60% limestone, buff, hard 40% limestone, soft, whitish
4800	4805					50% limestone, tan, hard 50% limestone, whitish, soft
4805	4810					as above
4810	4820					60% limestone, tan, hard 40% limestone, soft, white-grey
4820	4825					as above
4825	4830					60% limestone, buff grey, hard, microxln to xln, tight 40% limestone, white-grey, microxln, softer
4830	4835					as above
4835	4840					60% limestone, buff, grey, hard, predominantly crystalline 40% limestone, white-grey as above
4840	4845					70% limestone, buff-grey as above 30% limestone, white-grey as above
4845	4850					as above
4850	4855					as above
4855	4860					60% limestone, buff grey as above, becoming very dark grey-brown 40% limestone white-grey as above
4860	4865					as above
4865	4870					30% limestone, white-grey, soft as above 50% limestone, buff grey, microxln, hard, tight 20% limestone, dark grey brown, microxln, hard, tight
4870	4875					40% limestone, white-grey as above 50% limestone, buff-grey as above 10% limestone, dark grey brown as above
4875	4880					40% limestone as above dolomite to dolomitic limestone, light to med. brown xln - microxln, very hard, tight (50%)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 32

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4875	4880 (cont)					dolomite - dolomitic limestone, light grey, microxln, very hard, tight (10%)
4880	4885					30% limestone as above 40% dolomite, brown as above 30% dolomite, grey as above
4885	4890					20% limestone as above, predominantly white-grey, soft type 50% dolomite, brown as above 30% dolomite, grey as above
4890	4895					40% dolomite, light to med. brown, buff-grey as above 60% dolomite, light to med. grey as above
4895	4900					50% dolomite, variegated grey and blackish, microxln, brittle, hard, tight 40% dolomite, med brown, occas. black specked, microxln, hard, tight 10% limestone, tan to light brown, platy, hard, tight
4900	4910					60% dolomite, beige to light brown, microxln, hard 40% dolomite, grey, med. hard
4910	4920					40% dolomite, beige 40% dolomite, grey 20% limestone to dolomitic limestone, creamy, cryptoxln, hard, tight
4920	4925					40% dolomite, beige to light grey 60% dolomitic limestone or limestone, dark brown to dark grey, bioclastic, microbrecciated, microxln to crystall.
4925	4930					10% dolomite, beige to light grey 50% limestone, dark brown as above 40% limestone, whitish, cryptoxln to microxln, soft, tight
4930	4935					10% dolomite 60% limestone, beige to brown, biodetrital, microbrecc. (occas), microxln to crystall. hard, tight 30% limestone, whitish, soft
4935	4940					70% limestone, brown to beige, fossiliferous, hard. 30% limestone, whitish, soft
4940	4950					as above
4950	4955					80% limestone, light brown, beige, occas. pseudobrecc. 20% limestone, whitish, soft

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . . FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 33

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4955	4960					as above
4960	4970					as above
4970	4975					60% limestone, beige-tan, hard - no more breccia neither bioclas 40% limestone, whitish, soft
4975	4980					80% limestone, light to med. brown, hard 20% limestone, whitish, soft
4980	4990					60% limestone, light to med. brown, microxln to cryst. hard tight, occas. pseudo microbrecc. 40% limestone, whitish, soft
4990	4995					as above
4995	5000					as above
5000	5010					50% limestone, beige-brown, locally. brecciat. and bioclast. 50% limestone, whitish, soft
5010	5020					as above
5020	5030					40% limestone, light brown, hard 60% limestone, whitish, soft
5030	5040					as above
5040	5050					as above
5050	5060					50% limestone, light brown, hard 50% limestone, whitish, soft
5060	5065					as above
5065	5070					as above
5070	5075					as above
5075	5080					as above
5080	5085					as above
5085	5090					60% limestone, brown as above 40% limestone, whitish, soft
5090	5095					50% limestone brown 50% limestone, white

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 34

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
5095	5100					60% limestone, white-cream, soft - firm, microxln, no visible porosity, occas. black specks/streaks 40% limestone, light to med. brown, microxln to xln, hard no porosity - locally bioclastic
5100	5105					as above
5105	5110					as above
5110	5115					as above
5115	5120					as above
5120	5125					60% limestone, brown, buff-grey 40% limestone, white-cream
5125	5130					55% limestone, brown, buff-grey 40% limestone, white-cream 5% limestone, dolomitic, light grey-buff, microxln, tight, hard
5130	5135					80% limestone 20% sand: fine to coarse, rounded, well sorted grains of quartz 2 sizes - most common: 0.2 mm - less common: 1.5 mm
5135	5140					40% limestone 30% sand, medium to very coarse (2 mm) 30% shale, green-grey, silty, soft The medium sand is locally slightly cemented
5140	5145					angular grains of quartz with mafic minerals (amphibole); white feldspar = granite
5145	5150					as above with white and black mica = granite
5150	5155					granite
5155	5160					granite
5160	5170					END OF DRILLING - October 14, 1974.

SAMPLES NOT LAGGED

SAMPLES LAGGED AT . FT. PER MIN.

(Delete as Appropriate)

AQUITAINE ET AL POLAR BEAR C-11

8710-A11-4-3

CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES

RESOURCE MANAGEMENT AND CONSERVATION BRANCH
OPERATIONS AND CONSERVATION DIVISION

East Coast ☐
Hudson Bay – ~~Hudson Strait~~ ☒
West Coast ☐

ODN FILE

Offshore Drilling Notice

This Notice is submitted in compliance with Section 52 of the "Canada Oil and Gas Land Regulations". Its approval constitutes the requisite authority to commence drilling operations under Section 4 of the "Canada Oil and Gas Drilling and Production Regulations".

Well Information

Well Name in full: AQUIT ET AL POLAR BEAR O-20 (B-11)

Operator: Aquitaine Company of Canada Ltd. — Exploratory Licence No.: 2168

Contractor: Sea and Land Drilling Contractors Inc. — Permit or Lease No.: W 1395 (W.1426)

Drilling Rig or Unit: Pentagone 82 — Estimated Well Cost: $6,900,000

Location: Unit: M Section: 20 — Grid Area: 58°30'; 86°45' 58°40' 86°45'

Coordinates: Lat.: 58°30'08.37" N — Long.: 86°47'13.15 W

Elevation: RT/KB: 77' — Water Depth: 560'

Approx. Spud Date: September 20, 1974 — Estimated Time on Location: 36 Days

Anticipated Total Depth: 6,500' From Sea Surface

Potentially Productive Intervals:

Age	Name	Lithology	Top	Thickness
Middle Silurian	Attapiskat	Reefal Limestone	3,500'	200'
Upper Ordovician	Churchill	Limestone & Dolomite	4,700'	50' - 100'
Lower Ordovician and Older	Unnamed	Unknown	5,700'	800' Maximum

Casing and Cement Program:

Name of String:	O.D	Weight/Ft.	Grade	Setting Depth below seafloor	Cement Program
Conductor	30"	1" Wall	X52	80'	400 Sacks Class G
Conductor Csg	20"	438 Wall	K55	840'	2,200 Sacks Class G
Surface Csg	13-3/8"	68#	K55	2,740'	2,200 Sacks Class G
Intermediate Csg	9-5/8"	47#	MN80	4,340'	700 Sacks Class G

B.O.P. Equipment: 1 Stack 21-1/4" X 2000

1 Stack 13-5/8" X 10000

AAPG Well Classification:
- New-field wildcat ☒
- New-pool wildcat ☐
- Shallow-pool test ☐
- Deeper-pool test ☐
- Outpost well ☐
- Development well ☐

Other Information:

Signed: Pierre Pouvreau — Title: Drilling Foreman

Date: September 13, 1974 — Company: Aquitaine Company of Canada Ltd.

Notes

Five copies of this Notice and tentative survey plan should be submitted for each well. Other requirements and procedures are given in the information circular "Offshore Exploratory Drilling".
All Notices should be addressed to the Director, Resource Management and Conservation Branch, Department of Energy, Mines and Resources, Ottawa. One copy will be returned to the Company.

Approval

RESOURCE MANAGEMENT AND CONSERVATION BRANCH

APPROVED

SEP 17 1974

DEPARTMENT OF ENERGY, MINES AND RESOURCES

OPERATIONS AND CONSERVATION DIVISION

Drilling Authority: EMR#139 Project No.: 8710-A11-4-3

MEMORANDUM

CLASSIFICATION

TO
A

Chief, Operations of Conservation Division,
Resource Management of Conservation Branch.

PA

YOUR FILE No.
Votre dossier 8710-A11-4-1
8710-A11-4-3

OUR FILE No.
Notre dossier 5361-87
5361-88

FROM
De

Legal Surveys Division,
Surveys and Mapping Branch

DATE December 2, 1974

FOLD

SUBJECT
Sujet

Final Survey Report of Aquitetal Narwhal South O-58
Aquitetal Polar Bear C-11

We have completed our examination of the subject Wells, and found that the position of Narwhal South O-58, (Lat. 58°07'59.758"N; Long. 84° 08' 02.963"W) and Polar Bear C-11, (Lat. 58° 30' 04.352"N; Long. 86° 47' 18.489"W) places them in there correct units of Grid Areas 58° 10', 84° 00', and 58° 40', 86° 45' respectively.

These two wells in one survey report has been recorded in Canada Lands Surveys Records as C.L.S.R. No. FB32119

Noted in Records
GF

D.R. Slessor,
Surveyor General,
Legal Surveys Division.

East Coast ☐
Hudson Bay - Hudson Strait ☒
West Coast ☐

RESOURCE MANAGEMENT
CONSERVATION BRANCH
ENERGY, MINES AND RESOURCES
To: M. Yungblut
OCT 31 1974
FILE # 8910-AU-4-3
File Charged to:

DEPARTMENT OF ENERGY, MINES AND RESOURCES

RESOURCE MANAGEMENT AND CONSERVATION BRANCH
OPERATIONS AND CONSERVATION DIVISION

Offshore Well Abandonment Program

This program is submitted in triplicate with respect to Sections 15 and 19 of the Canada Oil and Gas Drilling and Production Regulations. All depths referenced to Rotary Table (RT) elevation at Mean Local Low Water (MLLW)

Well Data

Well Name in Full: Aquit et al Polar Bear C-11 Grid Area: 58°40' ; 86°45'

Drilling Authority: EMR No. 139 Field Pool: Wildcat

Permit ~~Licence~~ No. 1426 Elevations: RT: 77' Sea floor: 630'

Final Coordinates: Lat. 58° 30' 04.352" N. Long. 86° 47' 18.489"W

Date Spudded: 8:30 P.M. September 21 Date Drilling Terminated: 10:30 A.M. October 15, 1974

Date Rig Released: 9:00 P.M. Oct. 20, 1974 Total Depth: 5,170'

Casing Record: (Additional space on back of form, if needed)

O.D.	Weight:	Grade:	Depth Set:	Cement and Additives:
30"	1" wall	B	710'	500 sx Class B + 3% $CaCl_2$
20"	0.438 wall	X52-K55	1227'	1100 sx Class B {600 sx + 12% Gel, 500 sx + 3% $CaCl_2$
13 3/8	68 lbs./ft.	K55	3081'	2200 sx Class B {1200 sx + 10% Gel 1000 sx neat cement mixed w/salt saturated water.

Permeable Intervals: (Additional space on back of form, if needed).

Interval:	Age/Name:	Oil, Gas and Water Encountered: ~~Tests No.~~
2657 - 2661	Kenogami	from logs no tests
3448 - 3466	Middle Kenogami	from logs no tests
5122 - 5138	Bad Cache	from logs no tests

Perforation, Stimulation, Testing and Evaluation Programs: job details to be given on the back of the form.

Plugging Program

~~Oral~~ approval of the following program was obtained by (person) G. Kuhn de Chizelle of (company) Aquitaine Company of Canada Ltd. from (person) M. G. Yungblut in the Operations and Conservation Division by means of Telex No. 4730 at 9:45 A.M. hrs. on October 15 19 74

Plug No.	Interval:	Type of Plug:	Cement and Additives:	Felt?	Date and Hour Run:
1	T.D. to 2770'	continuous cement plug set in 3 stages:	1225 sx Class B plus 10% gel	No	0:00 to 5:15 a.m. October 16
1(a)	2450'	Mercury K bridgefly	-		9:00 to 12:45 Oct. 16
2	980' to 680'	~~neat~~ cement	252 sx Class B plus 3% $CaCl_2$	No	12:45 to 14:30 October 16.

Additional information, including any variations to the original program dictated by on-the-job considerations, to be given on the back of the form.

Certification

I certify that the abandonment or suspension program was carried out in full in accordance with good offshore oil and gas field practices.

Signed G. Kuhn de Chizelle Title: Drilling Superintendent

Date: October 25, 1974 Company: Aquitaine Company of Canada Ltd.

Ltr 12/2/75

Acknowledgement

OPERATIONS AND CONSERVATION DIVISION
FEB 13 1975

OPERATIONS AND CONSERVATION DIVISION

Acknowledgement of this completed form in no way absolves the permittee or lessee of record at the time of drilling from responsibility for an abandonment or suspension program should it prove to be inadequate.

See Reverse Side

Additional Information

Casing and Cementing Record:

Permeable Intervals:

Perforation, Stimulation, Testing and Evaluation Jobs:

- No -

Equipment recovered and/or remaining at sea floor:

Recovered = BOP stack assembly; all anchors and mooring calbes ✓

Remaining at sea floor = Wellhead ✓

Other Information:
(To include variations to the original, orally approved program dictated by on-the-job considerations).

AQUITAINE COMPANY
OF CANADA LTD.

WELL HISTORY REPORT

AQUIT ET AL POLAR BEAR C-11

AQUITAINE COMPANY OF CANADA LTD

540 - Fifth Avenue S.W.

Calgary, Alberta

December 1974

Compiled by:

- Andre JOURDAN
- Pierre POUVREAU
- Bernard TILLEMENT

Submitted by:

Gerard KUHN DE CHIZELLE

AQUITAINE — DRILLING TICKET

WELL NAME: POLAR BEAR C-11

RIG	CO-ORDINATES	TIMING	CASING	LOGS
P - 82	X 58°30' 08.37 " Y 86°47' 13.15 " Z	Commenced - Sept. 21/74 Temporary Halt = Resumption of Drilling = Temporary Halt = Resumption of Drilling Completed - Oct. 14/74	ø 30" at 710' ø 20" at 1227' ø 13 3/8" at 3081' ø at ø at	DLL 1245 - 5156 Sonic-GR 1100 - 5166 FDC CNI 500 - 5167 HDT 1245 - 5165
GEOLOGIST B. Tillement A. Pochtaloff	Z KB = 77 A.M.S.L Hudson Bay			
Brought up to date on November 1974	PROVINCE Federal waters			

AGE	Formation	SCALE 1" = 500' or 1/6,000 DEPTH	LOG	CORE	DIP	Porosity TYPE	Porosity GRADE	SHOW TEST	GAIN AND LOSS	LITHOLOGY
	WATER	500								
	?	630								Mud line No samples
	UN.C	1000								
	UNIT B	1250								Halite, calcareous clay, gypsum and anhydrite, limestone
MIDDLE DEVONIAN	UNIT A	1440								1440
	UPPER KENOG	1500								Intercalations of: - limestone, pink, white buff, red brown, tight - gypsum, anhydrite - red claystone
		1730								Limestone, buff - pink, bioclastic, tight, rarely slight perous
		1970								1970
		2000								Red-brown claystone
		2320								2320
		2500								Red-brown dolomite and halite 2465 Limestone, dolo. limestone, cream, buff, microx, cryptox, slightly bituminous, tight 2728 Halite
		3000				micro vugs				3070
	EKWAN	3070								Dolomite, white, pink, beige, microx to cryptox, local sucrosic, hard, tight
		3490							gain	3490
SILURIAN		3500						Very slight gas background	Cl_2Ca water 20 bb/h	Limestone, grey, brown, microx or cryptox, tight, hard
		3900						Small gas kick $C_1/C_2 = 30$		
		4000						AT 4200 I FIT NO FLOW NO PRESSURE		Layer of anhydrite
	SEVERN	4303								4303
		4500						Very slight gas background		Halite, anhydrite, Dolomitic limestone, tan to brown microx
		4591								4591
		4906								Limestone, buff, brown, microx, tight
	RED HEAD	5000								5905
	CHURCHILL	5122								Limestone, beige, brown, whitish, microx, cryptox, tight 5122 Shale and sand
UPPER ORDOVIC.	Bad Cache	5138								5138
		T.D. 5170'								Granite
PRECAMBRIAN	Basal Clastics	5500								

inter cryst. — no significant interval — NONE

Steady gain 15 - 30 bb / hour

AQUITAINE COMPANY
OF CANADA LTD.

AQUIT ET AL POLAR BEAR C-11

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      - DLL
      - HDT
      - BHC Sonic-GR
      - FDC/CNL-GR
      - Formation Tester (FIT)
      - Porosity Analysis - Coriband

1. INTRODUCTION

1.1 Summary

The Polar Bear C-11 well was drilled in the Hudson Bay between September 21, 1974 and October 18, 1974. The Operator was Aquitaine Company of Canada Ltd., based in Calgary, acting on behalf of the "Hudson Bay Group", which was comprised of:

- Aquitaine Company of Canada Ltd.
- Atlantic Richfield Canada Ltd.
- Elf Oil Exploration and Production (Canada) Ltd.
- Petrofina Canada Ltd.
- Shell Canada Ltd.
- Sogepet Ltd.

The selected drilling unit was the semi-submersible "Pentagone 82" (P-82), owned and operated by Sea and Land Drilling Contractors Inc., a subsidiary of the Forex-Neptune group.

The P-82 was towed from the "Aquitaine et al Walrus A-71" location by the Tidewater tug supply vessel, "Supreme Tide", to this new location.

Purpose

The purpose of this wildcat was to evaluate the entire Paleozoic section of a structure discovered by seismic reflection. The structure consists of a huge monoclinal block, tilted to the S.W. and limited by a fault on its northeastern flank. The areal closure was estimated to be 122 sq. miles with vertical closure of approximately 400'. The main objective was the Attawapiskat, a reefal facies developing in the upper part of the Silurian section. Other reservoirs were expected deeper.

Summary of Drilling Operations

Two joints of 30" conductor pipe were set after drilling a 36" hole, to cover the upper part of the glacial drift.

A 20" conductor casing was then set at 1,227'. A 17-1/2" hole was drilled to 3,105' and a 13-3/8" casing was set at 3,081', before entering the expected Attawapiskat formation.

Drilling of a 12-1/4" hole was resumed to T.D. (5,170') with no further casing set, due to the lack of reservoir.

Results

The Attawapiskat is either eroded or partly present under a tight facies. No other significant reservoirs were encountered. No gas or oil shows were observed.

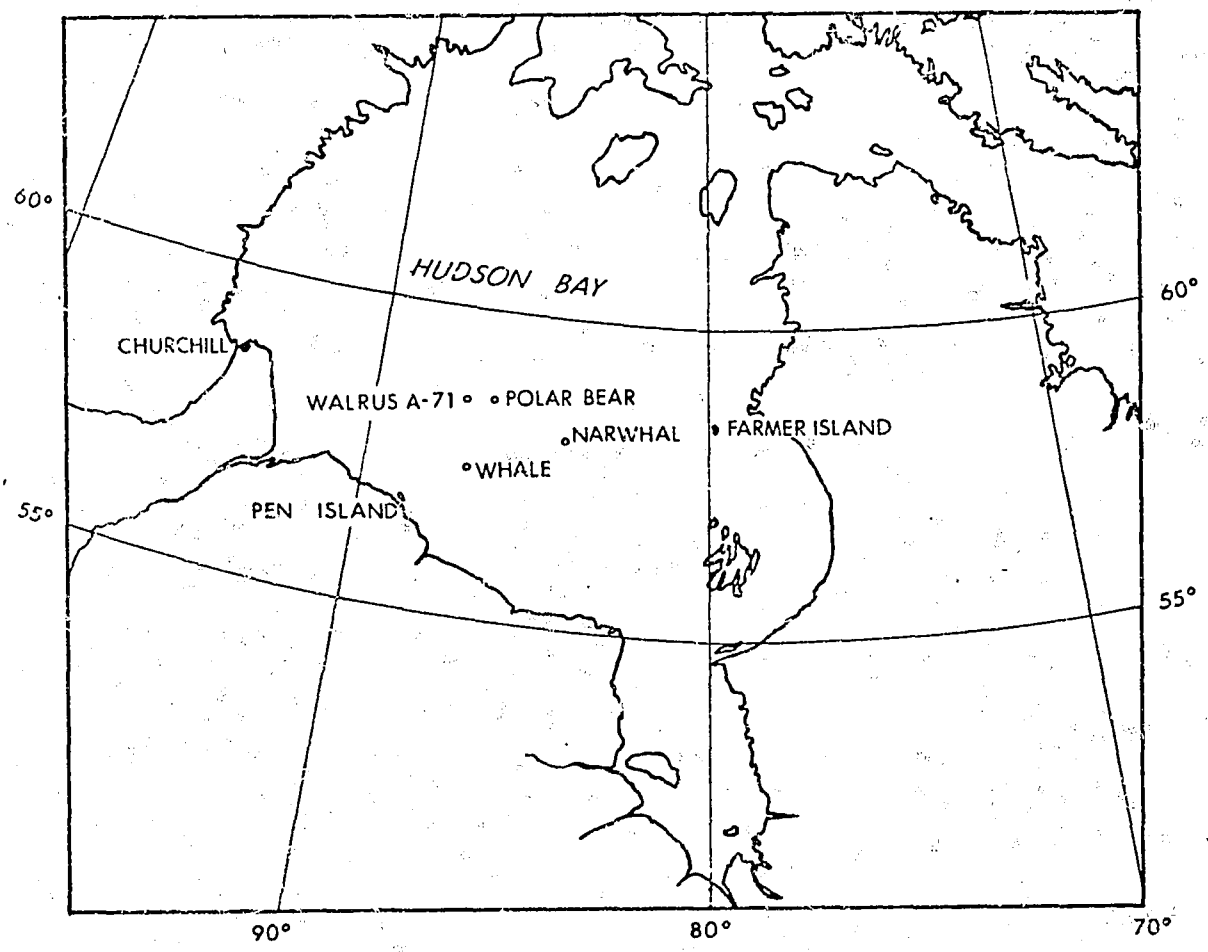
The well was plugged and abandoned, the P-32 was then towed to Cape Chidley (64^{o}W - 61^{o}N), by two Tidewater tug supply vessels, between October 20th and October 31, 1974. On October 31, 1974, the tow was resumed with the "Oceanic" tug, to the North Sea.

Details of the first leg of the tow are given in a separate report, namely, "Towing of the P-32 Out of the Hudson Bay in the Fall of 1974".

AQUITAINE
COMPANY OF CANADA LTD

SUMMER 1974 HUDSON BAY CAMPAIGN

PROGRAM: 2 WELLS TO DRILL (POLAR BEAR AND NARWHAL OR WHALE) PLUS 1 WELL TO PLUG (WALRUS A-71)



	LAT.	LONG.	IN STATUTE MILES	
			NEAREST DISTANCE TO SHORE	DISTANCE TO CHURCHILL
POLAR BEAR	58°30'04.352N	86°47'18.489"W	138 TO PEN ISLAND	274
WALRUS A-71	58°30'02"N	87°11'51" W	131 TO PEN ISLAND	260
NARWHAL	58°07'59.758" N	84°08'02.963" W	189 TO PEN ISLAND 170 TO SHORE 131 TO FARMER ISLAND	370
PEN ISLAND	56°46'25"N	88°47'25"W	—	234
WHALE	57°28'49"N	87°09'00"W	81 TO PEN ISLAND 75 TO SHORE	276

2. GENERAL DATA

2.1 Well Name and Number: Aquit et al Polar Bear C-11

2.2 Drilling Unit: Pentagone 82 (P-82) Semi-submersible type.
Marathon - Letourneau shipyard, Brownsville, Texas
(Summer 1971 to Fall 1973)
Lloyd's Class + 100 A1 (The unit is ice reinforced but no ice classification is available for this type of vessel.)

2.3 Operator: Aquitaine Company of Canada Ltd.
540 - 5th Avenue S.W.
CALGARY, Alberta
T2P 0M4

2.4 Permittees: Aquitaine Company of Canada Ltd.
Atlantic Richfield Canada Ltd.
Elf Oil Exploration and Production Canada Ltd.
Petrofina Canada Ltd.
Sogepet Limited

2.5 Drilling Contractor: Sea and Land Drilling Contractors, Inc.
(Incorporated in Panama)
8, Aquilino de la Guardia, PANAMA, R.P.

Sea and Land Drilling Contractors
Forex Neptune
Caledon Road, Eastern Wharf
DUNDEE DD1 3LW, Scotland
Telephone: (0382) 453910
Telex: 76455 - PETROBASE

2.6 Permit Number: 1426

2.7 Drilling Authority: EMR Number: 139
Date Issued: September 17, 1974

2.8 Well Location: Hudson Bay
Latitude: 58°30'04.352"N
Longitude: 86°47'18.489"W

Location determined by means of a Decca Lambda "Cesium" system.

2.9 Elevations: R.T./K.B. to Sea Level: 77'
Water Depth: 553'

2.10 Total Depth: 5,170'

2.11 Spudded: September 21, 1974, at 8:30 p.m.

2.12 Drilling Completed: October 14, 1974, at 10:30 a.m.

2.13 Well Abandoned: October 18, 1974, at 10:00 a.m.

2.14 Rig Released: P-82 under tow back to the North Sea on October 20, 1974, at 9:00 p.m. P-82 released on October 30, 1974, at 6:00 a.m.

2.15 Well Status: Plugged and Abandoned

2.16 Well Classification: New Field - Wildcat

2.17 Support Equipment:

Two Tug Supply Vessels:

Names: M/V Supreme Tide and M/V Giant Tide
Owner: Tidewater Marine Service, Inc.
Built: Hatco Verksted A/S shipyard - Ulsteinvick, Norway
(Delivered in May 1974)
Classification: Navigation: ABS A1(E) + AMS Towing unrestricted
Ice: ABS Class "C" (1971 rules)

One Supply Vessel:

Name: M/V Federal 6
Owner: Federal Offshore Services Ltd.
Built: Star Shipyard
New Westminster, B.C., Canada (1972)
Classification: Navigation: ABS Ocean going A1(E)
Ice: ABS Class "A"

One Helicopter:

Type: Bell 212 IFR Model
Owner: Dominion Pegasus Helicopters Ltd.
Classification: Licensed for commercial night and instrument flying.

AQUIT ET AL POLAR BEAR C-11

3. DRILLING DATA

3.1 Drilling Program

COMMENTS AND INSTRUCTIONS AS FOLLOWS:

AQUITAINE COMPANY
OF CANADA LTD.

HUDSON BAY

Drilling Program

(Comments and Instructions for all the wells)

3.2 Position Keeping

10 Tension Mooring Sensors

Make: Martin Decker
Type: Dynaline

10 Winches

Make: Brissoneau & Loiz — 600 Kips Brake Capacity
340 Kips Low Gear Pull

10 Anchors

Type: 30,000 lbs. LWT

10 Anchor Lines

Size: 5,000' of 2-3/4" wire rope
Weight: 13.7 lbs/ft
Type: 6 x 41 galvanized

3.3 Subsea Equipment

- Vetco temporary guide base with: 4 main guide lines
- Vetco permanent guide base
- 30" housing with left hand running thread
- 20" housing with left hand running thread
- Vetco 22" single ball flex joint
- Vetco 22" Integral MR-IV marine riser
- 13-5/8", 10,000 MSP High Profile Type SG-1 two hanger housing with left hand running thread
- Vetco 16" single ball flex joint
- Vetco 16" Integral MR-IV marine riser

3.4 Drilling Plant

1 Drawworks

Make: Emsco 3000 HP
Model: With automatic catheads
Drum Type: Grooved for 1-1/2" line

1 Electromagnetic Brake

Make: Elmagco
Model: 7838

1 Sandreel Assembly Mounted on Drawworks

9/16" x 18,000 Sandline

3 Electric Motor Drive

Make: G.E.
Model: 752 R
Type: Shunt Wound DC
Power: 930 HP nom./1000 HP max.

Maximum line pull at the hook with safety factor minimum of 2 on the weakest part (line).

10 Lines Low Gear: 1,140,000 lbs
8 Lines Low Gear: 906,000 lbs

1 Drilling Line

1-1/2" x 5,000'
Type 6 x 19
Extra improved plow steel
Nominal breaking strength 103 tons

3.5 Derrick

Make: Continental Emsco
Size: 157' x 36' x 36'
Type: Dynamic, welded panels, bolted
Capacity: API 1,150,000 lbs
Hook Load: 685,000 lbs
Pipe Racked in Derrick: 425,000 lbs
Tensionners Load: 310,000 lbs

Provision for dynamic loading is included in excess of the above values.

3.6 Pumps

2 Hole Pumps #1 & 2

Make and Size: Emsco Triplex F 1600
Driven By: Two 800 HP cont. electric motors GE 752 R
Pulsation Dampener: Emsco 20 gallons
Strokes: From about 10 to 120 SPM
Continuous Max. Pressure Possible: 3423 psi with 7" liner
Centrifugal Supercharging Pump: Mission 5 x 6 R

1 Mixing Pump

Make and Size: Emsco D 375
Driven By: One 350 HP electric motor
Pulsation Dampener: Emsco 20 gallons

2 Mixing Transfer Pumps

Make and Size: Mission 5 x 6
Driven By: A.C. electric motor

3.7 Compressors

3 Main Air Compressors

Each powered by 120 HP electric motor c/w automatic control.
Free air delivery 540 CFM pressure range 125 - 150 psi.
Water cooled.

1 Twin Air Dryer

Capacity: 440 SCFM

3 Air Tanks 150 PSI

One 350 cu. ft. for general duty
One 210 cu. ft. for BOP unit
One 32 cu. ft. for remote controls

3.8 BOP Equipment

First BOP Stack: (21-1/4" x 2000)

1 Bag Preventer

Size: 21-1/4"
W.P.: 2000 psi

Make: Hydril
Type: MSP, studded on top, with CIW #16 clamp below

1 Surge Dampener

Make: Stewart & Stevenson
Type: Passive
Capacity: 10 gallons, 3000 psi on close side

1 Drilling Spool

Size: 21-1/4" ID, WP: 2000 psi
Outlets: 2 x 3-1/8" with CIW #4 clamp hub
Connections: CIW #18 clamp hub, top and bottom

2 Kill Line Valves

Size: 3-1/8" nom.
W.P.: 5000 psi
Make: Cameron
Type: "F" with style A hydraulic operator fail safe to close
Connections: CIW #4 clamp hub, top and bottom

1 Kill Line Connector

Size: 3-1/2" nom.
W.P.: 5000 psi
Make: Vetco
Type: Stab type welded

1 Riser Mandrel

Size: 20-3/4" ID
W.P.: 2000 psi
Make: Vetco
Connection: 20" API #6B flange below

1 Bottom Connector

Size: 20-3/4" ID
W.P.: 2000 psi
Make: Vetco
Type: H4 style "D"
Connection: CIW #18 clamp hub on top

Second BOP Stack: (13-5/8" x 10,000)

1 Bag Preventer

Size: 13-5/8" ID
W.P.: 5000 psi
Make: Shaffer
Type: Spherical
Connection: CIW #15 clamp hub below and 13-5/8" API - 6BX flange above

1 Surge Dampener

Make: Stewart & Stevenson
Capacity: 10 gallons 3000 psi on closing side

2 Ram Preventers

Size: 13-5/8" ID
W.P.: 10,000 psi
Make: Cameron
Type: Double U with pressure balanced wedge lock. One set of rams equipped with shear rams, the other three with 5" pipe rams.
Connections: CIW #15 clamp hub, top and bottom

4 Choke/Kill Line Valves

Size: 3-1/16"
W.P.: 10,000 psi
Make: Cameron
Type: F with style A hydraulic operator, fail safe to close
Connection: CIW #5 clamp hub, top and bottom

2 Choke/Kill Line Connectors

Size: 3-1/2" nom.
W.P.: 10,000 psi
Make: Vetco
Type: Stab type, welded

1 Riser Mandrel

Size: 13-5/8" ID
W.P.: 10,000 psi
Make: Vetco
Connection: 13-5/8" API - 6BX flange

1 Bottom Connector

Size: 13-5/8" ID
W.P.: 10,000 psi
Make: Vetco
Type: H4, style "D"
Connection: CIW #15 clamp hub

3.9 Well Kick Report

N/A

3.10 Hole Sizes and Depths

36" hole drilled to 723'
26" hole drilled to 1,250'
17-1/2" hole drilled to 3,105'
12-1/4" hole drilled to 5,170'

3.11 Casing and Cementing Record

30" set at 710'
20" set at 1,227'
13-3/8" set at 3,081'

See casing reports for further details.

3.12 Perforation and Shooting Record

N/A

3.13 Plug Back and Squeeze Cement Jobs

See plug back and abandonment report.

3.14 Drilling Fluid

See Magcobar mud report.

3.15 Fishing Operations

See fishing operation reports.

3.16 Lost Circulation and Gain Zones

See report.

3.17 Drill Cuttings

- The sampled intervals are as follows:

  Glazed vials: 1,260' to 5,170' in 10' intervals
  Unwashed samples: 1,260' to 5,170' in 10' intervals
  Canned samples: 1,530' to 5,170' in 30' intervals

- Companies receiving a complete set of canned samples are:

  Resource Management and Conservation Branch - Bedford, N.S.
  Aquitaine Company of Canada Ltd.

- Companies receiving a complete set of glazed vials and unwashed samples are:

  Aquitaine Company of Canada Ltd. (2 sets of unwashed samples)
  Atlantic Richfield Canada Ltd.
  Shell Canada Ltd.
  Elf Oil Exploration and Production Canada Ltd.
  Resource Management and Conservation Branch (7 dram vials)

- Companies receiving a complete set of glazed vials only are:

  Petrofina Canada Ltd.
  Sogepet Ltd.
  G.S.C. - Institute of Sedimentation and Petroleum (2 dram vials)

3.18 Cores

N/A

3.19 Bit Records and Hydraulics

See report.

3.20 Time Distribution

See Graphical Well Analysis and Time Analysis reports.

3.21 Penetration Rate Log

See Graphical Well Analysis.

3.22 Deviation Plot

See Deviation Survey report and Graphical Well Analysis.

3.23 Abandonment Plugs

See report.

3.24 Well Diagram

See Graphical Well Analysis.

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No Moving 9/10 DATE 31/10/74

PENETRATION

PHASES

Cross out which ever not applicable

	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled-cored						

BITS / PARAMETERS

EACH BIT	6	7	8	9 Make	10 Ø	11 Type	12 No.	13 Nozzles	14 Cumul	15 Weight	16 R.P.M.	17 Flow Rate	18 Mud Pressure
Drilled-cored													
Drilled-cored													
Drilled-cored													
Drilled-cored													

MUD

CHARACTERISTICS

19

Wt mini ____ Wt maxi ____ V mini ____ V maxi ____

F ____ VA ____ Vp ____ Yv ____

Gel 0 ____ 10 ____ S% ____ pH ____

Pf ____ Le ____ Solid. ____ NaCL ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	Wt M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME	
			P-82 position at 6:00 a.m., Calgary time, October 31st is 64°W.
			At this date and hour the P-82 daily rate ceases to be applicable.
			FINAL REPORT

TIME ANALYSIS 28

1 - R.U.D. ____ 9 - Mis. op. ____

2 - D ____ 10 - W.C. ____

3 - Red ____ 11 - Casing ____

4 - D.T. ____ 12 - Circ ____

5 - H.O. ____ 13 - Fishing ____

6 - Cor ____ 14 - Aband ____

7 - C.T. ____ 15 - Rep ____

8 - Test ____ 16 - W.T. ____

17 - Vac ____

29 PROGRAMME

30 PEOPLE ON BOARD : ____

31 WEATHER

Wind/Kn ____

Direction ____

Waves /ft ____

Slip jt. ____

Current ____

Swells/ft ____

Direction ____

Température ____

32 Support Vessels

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 | 2 No Moving 3 DATE 29/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled-cored						
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

	mini	maxi	mini	maxi
Wt		Wt	V	V
F		VA	Vp	Yv
Gel 0		10	S%	pH
Pf		Lc	Solid.	NaCL

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage	25 CORES	26 DEVIATION

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME

P-82 position at 6:00 a.m., Calgary time, October 29th -
60°50'N, 67°47'W

- tow line from Supreme Tide broken. Back-up line ready to be used but waiting on weather before making connection, if required.
- Oceanic tug met P-82 but its winch is frozen.

Present Status: Waiting on weather.

TIME ANALYSIS 28

1 - R.U.D.		10 - W.C.	
2 - D		11 - Casing	
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

29 PROGRAMME

30 PEOPLE ON BOARD :

31 WEATHER

Wind/Kn	50/60
Direction	300°
Waves /ft	25'
Slip jt.	
Current	
Swells/ft	
Direction	
Température	

32 Support Vessels

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL: Polar Bear
RIG

2 No: Moving 5/6/7
DATE: 26/27/28 October 74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL Drilled-cored	3		4		5	
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS / PARAMETERS

Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
9	10	11	12	13	14	15	16	17	18

MUD

CHARACTERISTICS

19
Wt mini ____ Wt maxi ____ V mini ____ V maxi ____
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid. ____ NaCl ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME

P-82 position:

October 27th at 9:30 a.m.: 62°34'N; 73°20'W

October 28th at 8:00 a.m.: 61°17'N; 69°45'W

Should meet the "Oceanic" tug in Ungava Bay on October 29th - morning.

28 TIME ANALYSIS

1 - R.U.D.	10 - W.C.
2 - D	11 - Casing
3 - Red	12 - Circ
4 - D.T.	13 - Fishing
5 - H.O.	14 - Aband
6 - Cor	15 - Rep
7 - C.T.	16 - W.T.
8 - Test	17 - Vac
9 - Mis. op.	

29 PROGRAMME

30 PEOPLE ON BOARD :

31 WEATHER

Wind/Kn
Direction
Waves /ft
Slip jt.
Current
Swells/ft
Direction
Température

32 Support Vessels

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No Moving 4 DATE 25/10/74

PHASES

Cross out which ever is applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled-cored						

PENETRATION

EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

W' mini _____ W' maxi _____ V mini _____ V maxi _____

F _____ VA _____ Vp _____ Yv _____

Gel 0 _____ 10 _____ S% _____ pH _____

Pf _____ Lc _____ Solid _____ NaCL _____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS _____

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage _____

25 CORES _____

26 DEVIATION _____

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
			P-82 position at 7:00 a.m., October 25th -
			62°07'N: 80°42'W
			14 miles west of Mansel Island

TIME ANALYSIS

28

1 - R.U.D.		9 - Mis. op.	
2 - D		10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME: Towing out of Hudson Bay

30 PEOPLE ON BOARD : _____

31 WEATHER

Wind/Kn	12
Direction	
Waves /ft	
Slip jt.	
Current	
Swells/ft	4'
Direction	
Température	27°

32 Support Vessels: Giant & Supreme Towing

406

Fed

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No Moving 3 DATE 24/10/74

PHASES

PENETRATION

Cross out which ever not applicable	DEPTH ft.	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	3		4		5	
Drilled-cored						
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt ____ mini Wt ____ maxi V ____ mini V ____ maxi

F ____ VA ____ Vp ____ Yv ____

Gel 0 ____ 10 ____ S% ____ pH ____

Pf ____ Lc ____ Solid ____ NaCL ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS ____

23 WEIGHT (in mud)	D.C.	D.P.	W/M.D.

24 FORMATION Type . Stage ____

25 CORES ____

26 DEVIATION ____

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME

P-82 position at 9:40 October 24th -

60°30'N; 82°10'W

Giant Tide passed towline at 5:00 a.m.

Towing from columns B and C.

Route west of Mansel Island. Expect to be at Nottingham by October 26th.

Wind 35 Sea calm but picking up.

TIME ANALYSIS 9 - Mis. op. ____ 28

1 - R.U.D. ____ 10 - W.C. ____

2 - D ____ 11 - Casing ____

3 - Red ____ 12 - Circ ____

4 - D.T. ____ 13 - Fishing ____

5 - H.O. ____ 14 - Aband ____

6 - Cor ____ 15 - Rep ____

7 - C.T. ____ 16 - W.T. ____

8 - Test ____ 17 - Vac ____

29 PROGRAMME ____

30 PEOPLE ON BOARD : ____

31 WEATHER

Wind/Kn ____

Direction ____

Waves /ft ____

Slip jt. ____

Current ____

Swells/ft ____

Direction ____

Température ____

32 Support Vessels

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 — 2 No. Moving 2 DATE 23/10/74

PENETRATION

PHASES — Cross out which ever not applicable

	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL Drilled-cored	3		4		5	
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19
Wt mini ____ Wt maxi ____ V mini ____ V maxi ____
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid ____ NaCL ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME

Rig position at 6:30 a.m., October 23rd was:
59°49'; 83°25'

Giant Tide 100 nautic miles SW of P-82.
Should reach the convoy at 10:00 p.m., October 23rd.

TIME ANALYSIS — 38

1 - R.U.D.	10 - W.C.
2 - D	11 - Casing
3 - Red	12 - Circ
4 - D.T.	13 - Fishing
5 - H.O.	14 - Aband
6 - Cor	15 - Rep
7 - C.T.	16 - W.T.
8 - Test	17 - Vac
9 - Mis. op.	

29 PROGRAMME

30 PEOPLE ON BOARD :

31 WEATHER

Wind/Kn 60
Direction 60°
Waves /ft
Slip jt.
Current
Swells/ft
Direction
Température

32 Support Vessels

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 | 2 No Moving 1 DATE 22/10/74

PENETRATION

PHASES — Cross out which ever not applicable

	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled-cored						
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt mini _____ Wt maxi _____ V mini _____ V maxi _____

F _____ VA _____ Vp _____ Yv _____

Gel 0 _____ 10 _____ S% _____ pH _____

Pf _____ Lc _____ Solid _____ NaCl _____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS _____

23 WEIGHT (in mud)	D.C.	D.P.	Wt M.D.

24 FORMATION Type . Stage _____

25 CORES _____

26 DEVIATION _____

NOTES

27

TIME LOG FROM	TO	ELAPSED TIME

Rig position at 6:45 a.m., October 22nd -
59°19' N; 84°45'W

At 1:40 October 22nd, towline broke. It was repaired at 9:00 a.m.

Giant Tide left Churchill at 8:15 a.m., October 22nd, on its way to assist the Supreme Tide with towing the P-82.

406

28 TIME ANALYSIS

1 - R.U.D.	10 - W.C.
2 - D	11 - Casing
3 - Red	12 - Circ
4 - D.T.	13 - Fishing
5 - H.O.	14 - Aband
6 - Cor	15 - Rep
7 - C.T.	16 - W.T.
8 - Test	17 - Vac
9 - Mis. op.	

29 PROGRAMME _____

30 PEOPLE ON BOARD : _____

31 WEATHER

Wind/Kn 20/25
Direction 260°
Waves /ft 7'
Visability: 1 mile
Current
Swells/ft
Direction
Temperature

32 Support Vessels

Supreme Tide

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 | 2 No 30 DATE 21/10/74

PHASES

PENETRATION

Cross out which ever not applicable	DEPTH ft.	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL Drilled	3 5,170		4 0		5	
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt mini	Wt maxi	V mini	V maxi
F	VA	Vp	Yv
Gel 0	10	S%	pH
Pf	Lc	Solid.	NaCL

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ON BOARD

21

Potable Water:	435 T
Fuel:	505 T
JP4:	1240 Imp. Gal.

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

ROM	TO	ELAPSED TIME	
0:00	9:30	9:30	Waiting on weather.
9:30	21:00	11:30	Picking up anchors with Giant Tide.
21:00	24:00	3:00	Towing.
			Anchors A1, E2, D2 and C2 on board P-82.
			RIG RELEASED at 9:00 p.m., October 20, 1974.

TIME ANALYSIS

1 - R.U.D.	11:30	9 - Mis. op.	28
2 - D		10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	9:30
		17 - Vac	

29 PROGRAMME

30 PEOPLE ON BOARD : 26

31 WEATHER 10:00 a.m.

Wind/Kn 45/55
Gusting to 65
Direction: 140°
Waves: 15'/20'
Current
Swells/ft
Direction
Température

32 Support Vessels

Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No. 29 DATE 20/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL Drilled-	3 5,170		4 0		5	
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt mini ____ Wt maxi ____ V mini ____ V maxi ____

F ____ VA ____ Vp ____ Yv ____

Gel 0 ____ 10 ____ S% ____ pH ____

Pf ____ Lc ____ Solid. ____ NaCl ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

21

PRODUCTS ON BOARD

Potable Water:	499 T
Drilling Water:	212 T
Fuel:	326 T
Turbo Fuel:	612 gal + 5 drums
Barite:	103 T
Cement:	13 T

STRING

22 ELEMENTS — Dumping cement and barite.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type. Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME	
0:00	24:00	24:00	Wait on weather.
			8:00 A.M. STATUS: Sea conditions improving. P-82 should be able to start unloading Supreme Tide in 1 hour.
			NOON STATUS: Unloading Supreme Tide - should be unloaded by 2:00 p.m. Giant Tide retrieved A1 anchor since 8:00 a.m. and placed on board P-82. 3 anchors to retrieve.

TIME ANALYSIS

28

1 - R.U.D.	10 - W.C.
2 - D	11 - Casing
3 - Red	12 - Circ
4 - D.T.	13 - Fishing
5 - H.O.	14 - Aband
6 - Cor	15 - Rep
7 - C.T.	16 - W.T. 24:00
8 - Test	17 - Vac
9 - Mis. op.	

29 PROGRAMME: Retrieve Anchors

30 PEOPLE ON BOARD: 49

31 WEATHER

Wind/Kn	35/55
Direction	NNW
Waves /ft	10'/12'
Slip jt.	
Current	
Swells/ft	8' - 9'
Direction	N
Température	23/25

32 Support Vessels: Giant Tide; Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 28 | RIG P-82 | DATE 19/10/74

PENETRATION

PHASES (Cross out which ever not applicable)

	DEPTH ft.	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL Drilled	5,170		0			
EACH BIT						
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure

REMARKS: Fed 6 arrived in Churchill late October 18th to load spare winch and spare anchors. Supreme Tide arrived at the P-82 October 19th at 2:00 a.m. - will attach towline as soon as weather improves. Have another three helicopter flights to transfer all people - operation to continue as soon as remaining anchors are recovered.

MUD

CHARACTERISTICS

Wt mini	Wt maxi	V mini	V maxi
F	VA	Vp	Yv
Gel 0	10	S%	pH
Pf	l.c	Solid	NaCl

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS ON BOARD

Potable Water:	493 T
Drilling Water:	212 T
Fuel:	334 T
Turbo Fuel:	612 gal + 5 drums
Barite:	121 T
Cement:	43 T

STRING

ELEMENTS

WEIGHT (in mud)	D.C.	D.P.	W.M.D.

FORMATION Type, Stage

CORES

DEVIATION

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	10:00	10:00	Move and secure material on board P-82.
10:00	12:00	2:00	Pick up anchor E1.
12:00	14:45	2:45	Pick up anchor A2.
14:45	17:45	3:00	Pick up anchor C2.
17:45	24:00	6:15	Pass one anchor from Giant Tide to P-82 to make repair to tow line guide on Giant Tide.
			8:00 A.M. STATUS: Waiting on weather. Wind - 45 Kn - Waves - 15/16'

TIME ANALYSIS

1 - R.U.D.	24:00	9 - Mis. op.	
2 - D		10 - W.C	
3 - Red		11 - Casing	
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

PROGRAMME

PEOPLE ON BOARD : 49

WEATHER

Wind/Kn	25
Direction	W
Waves /ft	2'
Slip jt.	
Current	
Swells/ft	6' - 8'
Direction	W
Température	

Support Vessels

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No 27 DATE 18/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL Drilled-cored	3 5,170		4 0		5	
EACH BIT 6			7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	©	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19
Wt mini ____ Wt maxi ____ V mini ____ V maxi ____
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid ____ NaCL ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS ____

23 WEIGHT (in mud)	D.C.	D.P.	Wt M.D.

24 FORMATION Type . Stage ____

25 CORES ____

26 DEVIATION ____

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	5:00	5:00	Lay down drill pipe.
5:00	14:30	9:30	Pull out of hole 13-5/8" stack.
14:30	23:30	9:00	Lay down drill pipe.
23:30	24:00	0:30	Move materials on deck.
			Anchors B2 and D1 are picked up by the Federal 6.
			8:00 A.M. STATUS: Giant Tide has picked up E2 and is working on another anchor. Supreme Tide should arrive at the P-82, equipped with tow bar, at midnight October 18th.

TIME ANALYSIS 28

1 - R.U.D.		10 - W.C.	
2 - D		11 - Casing	
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	24:00
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

29 PROGRAMME Loading - Unloading and Retrieve Anchors

30 PEOPLE ON BOARD 53

31 WEATHER

Wind/Kn	18/20
Direction	NNE
Waves /ft	
Slip jt.	
Current	
Swells/ft	
Direction	
Température	25

32 Support Vessels

Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 26
RIG P-82 | DATE 17/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft	ins.	TIME h.	min.
TOTAL Drilled-cored	5,170		0			
EACH BIT						
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS / PARAMETERS

Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure

MUD

CHARACTERISTICS

Wt mini ____ Wt maxi ____ V mini ____ V maxi ____
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid ____ NaCL ____

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS ADDED / ON BOARD

35 sx Magcogel
6 sx $CaCl_2$

Drilling Water:	477 T
Potable Water:	343 T
Fuel:	353 T
Turbo Fuel:	507 gal + 11 drums
Barite:	121 T
Cement:	43 T

STRING

ELEMENTS

WEIGHT (in mud)	D.C.	D.P.	W/ M.D.

FORMATION Type . Stage

CORES

DEVIATION

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	5:15	5:15	Cemented from T.D. to 2,770' (3 stages) Class B - 1225 sx + 10% gel.
5:15	7:15	2:00	Pulled to 2,000' - flow check - well flowing - Dowell squeeze OK (no more flow after 1 hour).
7:15	9:00	1:45	Pulled out open ended D.P. - Trip in and out to recover seat protector.
9:00	12:45	3:45	Ran and set Model K bridge plug at 2,450'.
12:45	14:30	1:45	Set top cement plug from 980' to 680' (252 sx Class B + 3% Calcium Chloride).
14:30	17:00	2:30	Pulled out to stack - displaced with sea water - washed stack & riser.
17:00	24:00	7:00	Lay down D.C. and D.P. and unloading of Supreme Tide.

TIME ANALYSIS 9 - Mis. op. ____

1 - R.U.D. ____	10 - W.C ____
2 - D ____	11 - Casing ____
3 - Red ____	12 - Circ ____
4 - D.T. ____	13 - Fishing ____
5 - H.O. ____	14 - Aband 24:00
6 - Cor ____	15 - Rep ____
7 - C.T. ____	16 - W.T. ____
8 - Test ____	17 - Vac ____

PROGRAMME: Abandonment

PEOPLE ON BOARD: 53

WEATHER

Wind/Kn	23
Direction	NNW
Waves /ft	7'
Slip jt.	
Current	
Swells/ft	9'
Direction	NNW
Température	24 - 30

Support Vessels: Fed 6

406

8:00 A.M. STATUS: Retrieving riser and BOP stack.

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No 25 DATE 16/10/74

PHASES

PENETRATION

Cross out which are not applicable	DEPTH ft	ins	PENET. ft	ins	TIME h.	min.
TOTAL Drilled-cored	4 5,170		0		5	
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt mini ____ Wt maxi ____ V mini ____ V maxi ____

F ____ VA ____ Vp ____ Yv ____

Gel 0 ____ 10 ____ S% ____ pH ____

Pf ____ Lc ____ Solid ____ NaCl ____

GAINS

20	this day bbls	cumul bbls
Mud		
Ca-Cl2 Water	200	2420

PRODUCTS / ON BOARD

21

Potable Water:	350 T
Drilling Water:	490 T
Fuel:	472 T
Turbo Fuel:	657 gal + 11 drums
Cement:	93 T
Barite:	121 T

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27

TIME LOG FROM	TO	ELAPSED TIME	
0:00	19:15	19:15	Logging. Dipmeter, FIT and Velocity survey.
19:15	24:00	4:45	Run in open ended D.P. for abandonment cement plugs.
			8:00 A.M. STATUS: Pull out to run 13-3/8" cement retainer Mercury K.

TIME ANALYSIS 9 - Mis. op. 19:15

1 - R.U.D.	10 - W.C.
2 - D	11 - Casing
3 - Red	12 - Circ
4 - D.T.	13 - Fishing
5 - H.O.	14 - Aband 4:45
6 - Cor	15 - Rep
7 - C.T.	16 - W.T.
8 - Test	17 - Vac

29 PROGRAMME Abandonment

30 PEOPLE ON BOARD : 64

31 WEATHER

Wind/Kn	32/36
Direction	NNW
Waves /ft	8/10'
Slip jt.	1'
Current	
Swells/ft	6/8'
Direction	NNW
Température	19 - 24

32 Support Vessels

Extreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 24

RIG P-82 | DATE 15/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	ins	PENET. ft	ins	TIME h.	min.
TOTAL	5,074		96		10	30
Drilled-~~cored~~	5,170					

PENETRATION

EACH BIT	DEPTH ft	ins	PENET. ft	ins	TIME h.	min.
	5,074		96		10	30
Drilled-~~cored~~	5,170					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
Reed	12¼	S62	#11 713196	3/14	389'/ 39:00

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
75/ 80,000	45	550	2300

MUD

CHARACTERISTICS

Wt 10.3 Wt 10.5 V 36 V 38

F mini 70 VA maxi 15.5 Vp mini 10 Yv maxi 11

Gel 0 4 10 12 S% 0.25 pH 10.5

Pf 0.2 Lc ____ Solid 6 NaCl 255000

~~LOSSES and~~ GAINS

	this day bbls	cumul bbls
Mud		
Ca-Cl2	200	2220

PRODUCTS ADDED / ON BOARD

10 sx	Caustic	Potable Water: 351 T
10 sx	Kelsan	Drilling Water: 505 T
10 sx	Drispac	Fuel: 482 T
60 sx	Salt gel	Turbo Fuel: 567 gal + 13 drums
		Cement: 93 T
		Barite: 121 T

STRING

ELEMENTS Same as yesterday. Water

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	86000	266000

FORMATION Type . Stage: Precambrian at 5,140'

CORES:

DEVIATION: 5,165' - 1/4°

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	10:30	10:30	Drilling to final depth of 5,170'.
10:30	11:30	1:00	Circulating.
11:30	12:00	0:30	Totco survey.
12:00	15:30	3:30	Pull out bit #11.
15:30	24:00	8:30	Logging. FD Neutron - Gamma Ray Sonic - Dual Laterolog.
			(Dipmeter ran after midnight.)
			8:00 A.M. STATUS: Preparation for FIT.

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	10:30	11 - Casing	
3 - Red		12 - Circ	1:00
4 - D.T.	3:30	13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.	9:00		

PROGRAMME: Logging

PEOPLE ON BOARD: 64

WEATHER

Wind/Kn	50/54
Direction	NNW
Waves /ft	20/22'
Slip jt.	1'
Curren:	
Swells/ft	15' - 18'
Direction	NNW
Temperature	20/31

Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 23

RIG P-82 | DATE 14/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft	ins.	TIME h.	min.
TOTAL	4,826		248		24	00
Drilled ~~cored~~	5,074					

PENETRATION

EACH BIT	DEPTH		PENET.		TIME	
	4,826		248		24	00
Drilled ~~cored~~	5,074					
Drilled cored						
Drilled ccred						
Drilled cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
Reed	12¼	S62	#11 713196	3/14	293'/ 28:30

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
75/ 80,000	45	550	2300

MUD

CHARACTERISTICS

Wt 10.2 Wt 10.6 V 35 V 41

F mini 72 VA maxi 10.5 Vp mini 6 Yv maxi 9

Gel 0 4 10 10 S% 0.25 pH 10.5

Pf 0.2 Lc ____ Solid 4.5% NaCl 264000

~~LOSSES and~~ GAINS

	this day bbls	cumul bbls
Mud		
Ca-Cl2	240	2020

PRODUCTS ADDED / ON BOARD

96 sx	Magcogel	
16 sx	Caustic Soda	
6 sx	Kelsan XC	
6 sx	Drispac	

Potable Water:	366 T
Drilling Water:	585 T
Fuel:	494 T
Turbo Fuel:	567 gal + 13 drums
Cement:	93 T
Barite:	121 T

STRING

ELEMENTS Same as yesterday. Water

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	84000	264000

FORMATION Type. Stage: Bad Cache

CORES:

DEVIATION:

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	24:00	24:00	Drilling.

8:00 A.M. STATUS: Drilling at 5,161' (4 - 5'/hr).

REMARKS: Giant Tide has retrieved the 2 piggy back anchors on D1 and D2.

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	24:00	11 - Casing	
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

PROGRAMME: Drilling and Logging

PEOPLE ON BOARD: 64

WEATHER

Wind/Kn	20/22
Direction	NNW
Waves /ft	4'
Slip jt.	0.5'
Current	
Swells/ft	5'
Direction	N
Température	25 - 32

Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | RIG P-82 | No. 22 | DATE 13/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	DEPTH ins	PENET. ft	PENET. ins	TIME h.	TIME min.
TOTAL	4,673		153		16	00
Drilled ~~cored~~	4,826					

PENETRATION

	DEPTH ft	DEPTH ins	PENET. ft	PENET. ins	TIME h.	TIME min.
EACH BIT	4,673		108		11	30
Drilled ~~cored~~	4,781		45		4	30
Drilled ~~cored~~	4,826					
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
Security	12¼	M88	528208	3/14	411'/ 46:00
Reed	12¼	S62	713196	3/14	45'/4:30

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
75/ 80,000	45	550	2200
75/80,000	45	550	2200

MUD — CHARACTERISTICS

Wt 10 | Wt 10.3 | V 31 | V 36

F mini 70 | VA maxi 15.5 | Vp mini 8 | Yv maxi 15

Gel 0 7 | 10 14 | S% 0.25 | pH 10.5

Pf 0.3 | Lc | Solid. 4% | NaCl 270000

~~LOSSES~~ and GAINS

	this day bbls	cumul bbls
Mud		
Ca-Cl2	240	1780

PRODUCTS ADDED

90 sx	Salt gel
10 sx	Caustic
10 sx	Kelsan XC
8 sx	Drispac

ON BOARD

Potable Water:	310 T
Drilling Water:	626 T
Fuel:	504 T
Turbo Fuel:	567 gal + 13 drums
Cement:	93 T
Barite:	121 T

STRING

ELEMENTS Same as yesterday. Water

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	81000	261000

FORMATION Type . Stage: Churchill River

CORES:

DEVIATION: 4,775' - 1/2°

NOTES — TIME LOG

ROM	TO	ELAPSED TIME	
0:00	11:30	11:30	Drilling.
11:30	12:15	0:45	Circulated and flow check.
12:15	12:30	0:15	Totco survey.
12:30	19:30	7:00	Pull bit #10 out of hole and run in bit #11 - slipped 10'
			drilling line.
19:30	24:00	4:30	Drilling.
			8:00 A.M. STATUS: Drilling at 4,910' (10'/hr)

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	0:15
2 - D	16:00	10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.	7:00	12 - Circ	0:45
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

PROGRAMME: Drilling

PEOPLE ON BOARD: 62

WEATHER

Wind/Kn	34/36
Direction	SSE
Waves /ft	6' - 8'
Slip jt.	1' - 2'
Current	
Swells/ft	8'
Direction	S
Temperature	24/26

Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | RIG P-82 | No 21 | DATE 12/10/74

PENETRATION

PHASES (Cross out which ever not applicable)

	DEPTH ft	ins.	PENET. ft	ins.	TIME h.	min.
TOTAL	4,465		208		24	00
Drilled ~~-cored~~	4,673					

BITS / PARAMETERS

	Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
EACH BIT	Security	12¼	M88	#10 528208	3/14	303'/ 34:30	75/ 80,000	45	550	2200
Drilled ~~-cored~~										
Drilled-cored										
Drilled-cored										
Drilled-cored										

MUD

CHARACTERISTICS

Wt 10.2 Wt 10.4 V 34 V 35

F mini 80 VA maxi 8 Vp mini 4 Yv maxi 8

Gel 0 4 10 11 S% 0.25 pH 10.5

Pf 0.2 Lc ____ Solid. 4% NaCL 225000

Ca = 70,000

LOSSES and GAINS

	this day bbls	cumul bbls
Mud		
Ca⁻⁻	240	1540
Cl_2		

PRODUCTS ADDED / ON BOARD

10 sx Caustic

Potable Water:	312 T
Drilling Water:	642 T
Turbo Fuel:	602 gal + 13 drums
Fuel:	516 T
Cement:	93 T
Barite:	121 T

STRING

ELEMENTS Same as yesterday. Water

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	78000	258000

NOTES

FORMATION Type . Stage

CORES

DEVIATION

TIME LOG FROM	TO	ELAPSED TIME	
0:00	24:00	24:00	Drilling.
			3:00 A.M. STATUS: Drilling at 4,753'

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	24:00	11 - Casing	
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

PROGRAMME: Drilling

PEOPLE ON BOARD: 73

WEATHER

Wind/Kn	58 - 60
Direction	NNW
Waves /ft	18' - 20
Slip jt.	2' - 3'
Current	
Swells/ft	24'
Direction	NW
Température	27 - 37

Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | RIG P-82 | No 21 | DATE 12/10/74

PENETRATION

PHASES (Cross out which ever not applicable)

	DEPTH ft	ins.	PENET. ft	ins.	TIME h.	min.
TOTAL	4,465		208		24	00
Drilled ~~-cored~~	4,673					

BITS / PARAMETERS

	Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
EACH BIT	Security	12¼	M88	#10 528208	3/14	303'/ 34:30	75/ 80,000	45	550	2200
Drilled ~~-cored~~										
Drilled-cored										
Drilled-cored										
Drilled-cored										

MUD

CHARACTERISTICS

Wt 10.2 Wt 10.4 V 34 V 35

F mini 80 VA maxi 8 Vp mini 4 Yv maxi 8

Gel 0 4 10 11 S% 0.25 pH 10.5

Pf 0.2 Lc ____ Solid. 4% NaCL 225000

Ca = 70,000

LOSSES and GAINS

	this day bbls	cumul bbls
Mud		
Ca⁻⁻	240	1540
Cl_2		

PRODUCTS ADDED / ON BOARD

10 sx Caustic

Potable Water:	312 T
Drilling Water:	642 T
Turbo Fuel:	602 gal + 13 drums
Fuel:	516 T
Cement:	93 T
Barite:	121 T

STRING

ELEMENTS Same as yesterday. Water

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	78000	258000

NOTES

FORMATION Type . Stage

CORES

DEVIATION

TIME LOG FROM	TO	ELAPSED TIME	
0:00	24:00	24:00	Drilling.
			3:00 A.M. STATUS: Drilling at 4,753'

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	24:00	11 - Casing	
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

PROGRAMME: Drilling

PEOPLE ON BOARD: 73

WEATHER

Wind/Kn	58 - 60
Direction	NNW
Waves /ft	18' - 20
Slip jt.	2' - 3'
Current	
Swells/ft	24'
Direction	NW
Température	27 - 37

Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 20
RIG P-82 | DATE 11/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	3 4,370		4 95		5 10	30
Drilled ~~cored~~	4,465					

PENETRATION

	6 DEPTH ft	ins.	7 PENET. ft.	ins.	8 TIME h.	min.
EACH BIT	4,370		95		10	30
Drilled ~~cored~~	4,465					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	⌀	Type	No.	Nozzles	Cumul
9 Security	10 12¼	11 M88	12 #10 528208	13 3/14	14 95'/ 10:30

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15 75/ 80,000	16 45	17 550	18 2200

MUD

CHARACTERISTICS

19
Wt 9.6 Wt 10.5 V 37 V 38
F mini 80 VA maxi 10.0 Vp mini 6 Yv maxi 8
Gel 0 4 10 10 S% 0.25 pH 10.5
Pf 0.2 Lc ____ Solid. 5% NaCl 254000

LOSSES and GAINS

20	this day bbls	cumul bbls
Mud		
Ca-Cl2	240	1300

PRODUCTS ADDED / ON BOARD

21
84 sx Salt Gel

Potable Water:	315 T
Drilling Water:	648 T
Turbo Fuel:	792 gals + 3 drums
Fuel:	530 T
Cement:	93 T
Barite:	121 T

STRING

22 ELEMENTS Same as yesterday. Water

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	200000	75000	255000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION 4,360' - 1/2°

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	0:30	0:30	Flow check and drop totco.
0:30	3:45	3:15	Pull bit #9.
3:45	5:00	1:15	Run seat protector retrieving tool and retrieve seat protector.
5:00	8:15	3:15	Run test plug and test BOP stack. Test Hydril to 2500 psi,
			test all other functions and choke manifold to 5000 psi.
8:15	11:00	2:45	Pull test plug and run seat protector.
11:00	13:30	2:30	Run bit #10, slip 16' of drilling line.
13:30	24:00	10:30	Drilling.
			8:00 A.M. STATUS: Drilling at 4,542' (19'/hr).

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	10:30	11 - Casing	
3 - Red		12 - Circ	
4 - D.T.	5:45	13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.	7:45		

29 PROGRAMME Drilling

30 PEOPLE ON BOARD : 63

31 WEATHER

Wind/Kn	26 - 28
Direction	NNW
Waves /ft	6' - 8'
Slip jt.	0.5'
Current	
Swells/ft	6'
Direction	NW
Temperature	30 - 35

32 Support Vessels
Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No. 19 | RIG P-82 | DATE 10/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	4,100					
Drilled ~~cored~~	4,370		270		22	30

BITS

EACH BIT	6 DEPTH ft	ins.	7 PENET. ft.	ins.	8 TIME h.	min.	9 Make	10 Ø	11 Type	12 No.	13 Nozzles	14 Cumul
Drilled ~~cored~~	4,100											
	4,370		270		22	30	Security	12¼	M88	#9 527806	3/14	663'/ 67:00
Drilled-cored												
Drilled-cored												
Drilled-cored												

PARAMETERS

15 Weight	16 R.P.M.	17 Flow Rate	18 Mud Pressure
75/ 80,000	45	550	2200

MUD

CHARACTERISTICS

19
Wt 9.9 Wt 10 V 32 V 36
F mini 80 VA maxi 8 Vp mini 4 Yv maxi 8
Gel 0 5 10 12 S% 0.25 pH 11.0
Pf 0.3 Lc ____ Solid. 4.5% NaCL 180000
Ca = 56,000

LOSSES and GAINS

20	this day bbls	cumul bbls
Mud		
Ca-Cl2	240	1060

PRODUCTS ADDED / ON BOARD

21

72 sx	Magcogel	Potable Water:	225 T
16 sx	Caustic Soda	Drilling Water:	612 T
8 sx	Kelsan XC	Turbo Fuel:	792 gals + 3 drums
		Fuel:	355 T
72 sx	Salt	Cement:	55 T
55 gal	Magonol	Barite:	121 T

STRING

22 ELEMENTS Same as yesterday. Water

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	75000	255000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	9:15	9:15	Drilling (4,100' - 4,180').
9:15	10:00	0:45	Flow check and circulate sample.
10:00	20:30	10:30	Drilling (4,180' - 4,321').
20:30	21:15	0:45	Flow check and circulate sample.
21:15	24:00	2:45	Drilling (4,321' - 4,370').
			8:00 A.M. STATUS: Testing BOP stack.

28 TIME ANALYSIS 9 - Mis. op. ____

1 - R.U.D.		10 - W.C.	
2 - D	22:30	11 - Casing	
3 - Red		12 - Circ	1:30
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	

29 PROGRAMME Drilling

30 PEOPLE ON BOARD: 63

31 WEATHER

Wind/Kn	36 - 38
Direction	N
Waves /ft	6'
Slip jt.	0.5' - 1.0'
Current	
Swells/ft	4'
Direction	N
Température	25 - 30

32 Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 18

RIG P-82 | DATE 9/10/74

PHASES — PENETRATION

Cross out which ever not applicable	3 DEPTH ft.	ins.	4 PENET. ft.	ins.	5 TIME h.	min.
TOTAL	3,854		246		24	00
Drilled ~~cored~~	4,100					
EACH BIT	6 3,854		7 246		8 24	00
Drilled ~~cored~~	/,100					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS — PARAMETERS

Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
9 Security	10 12¼	11 M88	12 #9 527806	13 3/14	14 393'/ 44:30	15 75/ 80,000	16 45	17 550	18 2200

MUD

CHARACTERISTICS

19
Wt 9.6 Wt 10 V 32 V 37
F mini 80 VA maxi 7.5 Vp mini 4 Yv maxi 7
Gel 0 5 10 12 S% 0.25 pH 10.5
Pf 0.3 Lc ____ Solid 4.5 NaCl 181500

LOSSES and GAINS

20	this day bbls	cumul bbls
Mud		
Ca-Cl2	240	820

PRODUCTS ADDED / ON BOARD

21

144 sx	Magcogel
16 sx	Caustic
8 sx	Kelsan

Potable Water:	236 T
Drilling Water:	434 T
Fuel:	376 T
Turbo Fuel:	732 gal + 3 drums
Cement:	55 T
Barite:	121 T

STRING

22 ELEMENTS Same as yesterday. Water

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	71000	251000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27

FROM	TO	ELAPSED TIME	
0:00	24:00	24:00	Drilling.
			8:00 A.M. STATUS: Drilling at 4,185' (10 - 12'/hr)

TIME ANALYSIS 9 - Mis. op. 28

1 - R.U.D.	10 - W.C.
2 - D 24:00	11 - Casing
3 - Red	12 - Circ
4 - D.T.	13 - Fishing
5 - H.O.	14 - Aband
6 - Cor	15 - Rep
7 - C.T.	16 - W.T.
8 - Test	17 - Vac

29 PROGRAMME Drilling

30 PEOPLE ON BOARD : 63

31 WEATHER

Wind/Kn	40/44
Direction	W
Waves /ft	8'
Slip jt	3' - 4'
Current	
Swells/ft	4' 6'
Direction	NW
Température	26 - 35

32 Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 | 2 No. 17 DATE 8/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	3 3,707		4 147		5 20	30
Drilled ~~cored~~	3,854					

BITS / PARAMETERS

EACH BIT	6 DEPTH ft.	ins.	7 PENET. ft.	ins.	8 TIME h.	min.	9 Make	10 Ø	11 Type	12 No.	13 Nozzles	14 Cumul	15 Weight	16 R.P.M.	17 Flow Rate	18 Mud Pressure
	3,707		147		20	30	Security	12¼	M88	#9 527806	3/14	147'/ 20:30	70/ 80,000	45	550	2300
Drilled ~~cored~~	3,854															
Drilled-cored																
Drilled-cored																
Drilled-cored																

MUD

CHARACTERISTICS

19
Wt 9.5 Wt 9.7 V 35 V 40
F mini 80 VA maxi 11 Vp mini 7 Yv maxi 8
Gel 0 10 10 28 S% 0.25 pH 10
Pf 0.2 Lc ____ Solid 4.5% NaCl 198000
Ca = 37000

LOSSES and GAINS

20	this day bbls	cumul bbls
Mud		
Ca-Cl2 Water	240	580

PRODUCTS ADDED / ON BOARD

21

18 sx	Caustic	
40 sx	Salt Gel	
100 sx	Magcogel	
1 sx	Kelsan XC	

Potable Water:	245 T
Drilling Water:	486 T
Turbo Fuel:	792 gal + 3 drums
Fuel:	286 T
Cement:	55 T
Barite:	121 T

STRING

22 ELEMENTS Same as yesterday.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	100000	68000	248000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME	
0:00	3:30	3:30	Run in bit #9.
3:30	15:30	12:00	Drilling.
15:30	17:30	2:00	Drilling from 3,783' to 3,804' - changed mud to sea water. Drilling rate increasing from 6' to 18/20' per hour.
17:30	24:00	6:30	Drilling from 3,804' to 3,854' - changed sea water back to mud (unable to clean the hole).
			8:00 A.M. STATUS: Drilling at 3,926' (12 to 14'/hr)

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	23
2 - D	20:30	10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.	3:30	12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME Drilling

30 PEOPLE ON BOARD : 64

31 WEATHER

Wind/Kn	20/28
Direction	SSW
Waves /ft	4'
Slip ft.	0.5'
Current	
Swells/ft	0
Direction	
Temperature	24 - 31

32 Support Vessels: Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 16

RIG P-82 | DATE 7/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	1 3,551		4		5	
Drilled ~~cored~~	3,707		156		20	00
EACH BIT	6 3,551		7		8	
Drilled ~~cored~~	3,707		156		20	00
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9 Reed	10 12¼	11 S62J	12 #8 714345	13 3/14	14 384'/ 40:00

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15 70,000	16 40/45	17 550	18 2300

MUD

CHARACTERISTICS

19
Wt 10.9 Wt 11.1 V 35 V 38
F mini 75 VA maxi 15 Vp mini 10 Yv maxi 10
Gel 0 9 10 20 S% 1 pH 11
Pf 0.3 Lc ____ Solid 8.8% NaCl 31500
Ca = 55000

LOSSES and GAINS

20	this day bbls	cumul
Mud		
Ca-Cl2	240	340

PRODUCTS ADDED / ON BOARD

21

10 sx	Caustic	
55 sx	Salt Gel	
6 sx	Spersene	

ON BOARD	
Potable Water:	260 T
Drilling Water:	480 T
Fuel:	398 T
Turbo Fuel:	792 gal + 3 drums
Cement:	55 T
Barite:	121 T

STRING

22 Water

ELEMENTS Bit/Float Valve/(8) 9½" D.C./(13) 8½" D.C./(1) Flexwate/DIV/(14) Flexwate/5" D.P.

23 WEIGHT (in mud)	D.C.	D.P.	W! M.D.
	90000	65000	235000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION 3,700' - 1/2°

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME	
0:00	3:00	3:00	Drilling.
3:00	3:15	0:15	Flow check.
3:15	20:15	17:00	Drilling. (Flow check each connection.)
20:15	20:45	0:30	Flow check - drop totco - pumped heavy pill.
20:45	23:45	3:00	Pull out bit - flow check at shoe = 2 bbls in 15 min.
23:45	24:00	0:15	Run in bit #9.
			8:00 A.M. STATUS: Drilling at 3,736' (10'/hr)

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	28
2 - D	20:00	10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.	3:15	12 - Circ	0:45
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME Drilling

30 PEOPLE ON BOARD 64

31 WEATHER

Wind/Kn	18/20
Direction	NNW
Waves /ft	4'
Slip jt.	0.5'
Current	
Swells/ft	0
Direction	
Température	26/31

32 Support Vessels

Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL: Polar Bear | 2 No.: 15 | RIG: P-82 | DATE: 6/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
3 TOTAL	3,323		4 228		5 20	00
Drilled-cored	3,551					
6 EACH BIT	3,323		7 228		8 20	00
Drilled-cored	3,551					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9 Reed	10 12¼	11 S62J	12 #8 714345	13 3/14	14 228'/ 20:00

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15 55/ 70,000	16 40/45	17 550	18 2200

MUD

CHARACTERISTICS

19
Wt 10.5 Wt 10.6 V 40 V 43
mini maxi mini maxi
F 80 VA 11 Vp 6 Yv 10
Gel 0 6 10 15 S% 1 pH 11
Pf 0.5 Lc ____ Solid. 6.8% NaCL 272000
Ca = 24000

LOSSES and GAINS

20

	this day	cumul
Mud		
Ca Cl2	100 bbl	100 bbl

PRODUCTS ADDED / ON BOARD

21

30 sx	Salt Gel	Potable Water:	268 T
16 sx	Caustic	Drilling Water:	580 T
10 sx	Spersene	Fuel:	410 T
25 T	Barite (Making 350	Turbo Fuel:	252 gal + 14 drums
bbls liquid mud safety stock)		Cement:	73 T
		Barite:	98 T

STRING

22 ELEMENTS: Water
Bit/Float Valve/(8) 9½" D.C./(10) 8½" D.C./(1) Flexwate/DIV/(14) Flexwate/5" D.P.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	85000	60000	225000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	0:15	0:15	Repair on riser slip joint.
0:15	3:00	2:45	Run in bit #8. (Pick up (3) 8½" D.C. and slipped drilling line.)
3:00	3:15	0:15	Ream to bottom.
3:15	14:45	11:30	Drilling. (Flow check at 3,470': gain 3 bbl in 15 min.)
14:45	15:30	0:45	Circulated bottom up.
15:30	24:00	8:30	Drilling.
			Drilling break at 3,460' - 3,470' (2 min/ft - gain: 20 bbls in 40 min.)
			*8:00 A.M. STATUS: Drilling at 3,620' (10 - 12'/hr)

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	28
2 - D	20:00	10 - W.C.	
3 - Red	0:15	11 - Casing	
4 - D.T.	2:45	12 - Circ	0:45
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	0:15
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME: Drilling

30 PEOPLE ON BOARD: 64

31 WEATHER

Wind/Kn	36
Direction	NNW
Waves /ft	6'
Slip jt	1.5' to 2'
Current	
Swells/ft	4'
Direction	NW
Temperature	29 - 32

32 Support Vessels: Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No. 14
RIG P-82 | DATE 5/10/74

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3 3,105		4		5	
Drilled-~~cored~~	3,323		218		17	45

PENETRATION

EACH BIT	6 DEPTH ft.	6 DEPTH ins.	7 PENET. ft.	7 PENET. ins.	8 TIME h.	8 TIME min.
	3,105		218		17	45
Drilled-~~cored~~	3,323					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14
Hughes	12¼	X1G	#7 68674	3/14	218'/ 17:45

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18
45-55,000	50/70	550	2100

MUD

CHARACTERISTICS

19
Wt 10.2 Wt 10.5 V 40 V 42
F mini 65 VA maxi 18 Vp mini 10 Yv maxi 16
Gel 0 20 10 28 S% 3 pH 11.5
Pf 0.8 Lc ____ Solid. 7% NaCl 285000

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

21
6 sx Caustic

PRODUCTS ADDED / ON BOARD

Drilling Water:	582 T
Potable Water:	285 T
Fuel:	426 T
JP4:	252 gal + 15 drums
Barite:	138 T
Cement:	75 T

STRING

22
ELEMENTS Bit/Float Valve/(8) 9½" D.C./(7) 8½" D.C./(1) Flexwate/Drop in Valve/(14) Flexwate/ 5" D.P.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	68000	47000	215000

24
FORMATION Type . Stage

25
CORES

26
DEVIATION 3,315' - 1/2°

NOTES

27

TIME LOG ROM	TO	ELAPSED TIME	
0:00	0:15	0:15	Drilling out cement.
0:15	0:30	0:15	Clean hole to bottom.
0:30	18:15	17:45	Drilling. (Formation pressure test at 3,200' - 775 psi on surface - gradient .8: no break down).
18:15	18:45	0:30	Totco survey.
18:45	21:30	2:45	Pull out bit #7.
21:30	24:00	2:30	Repair on slip joint.
			8:00 A.M. STATUS: Drilling at 3,379' (15'/hr)

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	17:45	11 - Casing	0:30
3 - Red		12 - Circ	
4 - D.T.	2:45	13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	2:30
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.	0:30		

29
PROGRAMME Drilling

30
PEOPLE ON BOARD : 65

31 WEATHER

Wind/Kn	36/36
Direction	W
Waves /ft	6'
Slip ft.	1.5'
Current	
Swells/ft	4'
Direction	W
Température	31°

33
Support Vessels
Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No. 13 | RIG P-82 | DATE 4/10/74

PHASES

Cross out which ever not applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL Drilled-cored	3,105		0			

PENETRATION

EACH BIT	6	7	8
Drilled-cored			
Drilled-cored			
Drilled-cored			
Drilled-cored			

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14
Hughes	12¼	X1G	68674	3/14	

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt 10.4 Wt 10.8 V 41 V 42

F mini 7.5 VA maxi 15 Vp mini 10 Yv maxi 10

Gel 0 5 10 14 S% ____ pH 10.5

Pf 0.3 Lc ____ Solid. 3% NaCl 31500

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

21

8 sx Caustic

PRODUCTS ADDED ON BOARD

Potable Water:	298 T
Drilling Water:	585 T
Fuel:	422 T
Turbo Fuel:	247 gal + 15 drums
Barite:	138 T
Cement:	75 T

STRING

22 ELEMENTS Bit/Sub/(8) 9½" D.C./Sub/(7) 8½" D.C./Sub/(1) Flexwate/Drop in Valve/(14) Flexwate/D.P.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	63000	47000	210000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

ROM	TO	ELAPSED TIME	
0:00	9:30	9:30	Run 13-5/8" BOP and riser - test C.K. lines at 2500 psi.
9:30	10:30	1:00	Run retreiving tool - pull out seat protector.
10:30	14:45	4:15	Run test tool - test seal at 5000 psi - bag preventer 2500 psi - middle, lower and upper pipe rams and choke manifold at 5000 psi - test OK.
14:45	15:30	0:45	Pump saturated salt water through choke manifold and choke and kill line.
15:30	17:00	1:30	Pull test tool and run seat protector.
17:00	21:00	4:00	Run bit #7 - inspected D.C. thread - run casing protector on drill pipe.
21:00	24:00	3:00	Drill out cement and float. Top of cement at 2,988'.

406

28 TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	
2 - D		10 - W.C.	
3 - Red		11 - Casing	24:00
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME

30 PEOPLE ON BOARD: 61

31 WEATHER

Wind/Kn	20/22
Direction	SSE
Waves /ft	5'/6'
Slip jt.	
Current	
Swells/ft	
Direction	
Température	34°

32 Support Vessels

Supreme Tide

8:00 A.M. STATUS: Drilling at 3,214' (15'/hr)

OM 102

DRILLING REPORT

AQUITAINE

1 WELL: Polar Bear RIG: P-82 2 No: 12 DATE: 3/10/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled ~~cored~~	3,105		0			
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow - Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt mini _____ Wt maxi _____ V mini _____ V maxi _____

F _____ VA _____ Vp _____ Yv _____

Gel 0 _____ 10 _____ S% _____ pH _____

Pf _____ Lc _____ Solid _____ NaCl _____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED / ON BOARD

21

Potable Water:	305 T
Drilling Water:	585 T
Fuel:	443 T
Turbo Fuel:	382 gal + 15 drums
Barite:	97 T
Cement:	18 T

STRING

22 ELEMENTS _____

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage _____

25 CORES _____

26 DEVIATION _____

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME	
0:00	5:30	5:30	Run in 13-3/8" casing shoe at 3,081'.
5:30	6:45	1:15	Circulated.
6:45	10:00	3:15	Cementing job: 1200 sx Class B + 10% gel followed with
			1000 sx Neat mixed with salt saturated water.
10:00	13:45	3:45	Waiting on cement (float shoe and float collar did not hold).
13:45	14:45	1:00	Pulled out landing string.
14:45	24:00	9:15	Pulled out 20-3/4" stack - installed 13-5/8" stack on spider
			beams.
			8:00 A.M. STATUS: 13-5/8" stack landed - connecting
			Choke and Kill line.

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D		11 - Casing	24:00
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.	28		

29 PROGRAMME: Running 13-5/8" BOP

30 PEOPLE ON BOARD: 63

31 WEATHER

Wind/Kn	32
Direction	S
Waves /ft	4'
Slip ft.	0
Current	
Swells/ft	2'
Direction	S
Temperature	31°

32 Support Vessels: Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No. 11 DATE 2/10/74

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL Drilled-cored	3		4 0		5	

PENETRATION

BITS

PARAMETERS

	Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
EACH BIT	6	7	8	9	10	11	12	13	14	15	16	17	18
Drilled-cored													
Drilled-cored													
Drilled-cored													
Drilled-cored													

MUD

CHARACTERISTICS

19
Wt 10.7 Wt 10.8 V 41 V 43
F mini 64 VA maxi 15 Vp mini 8 Yv maxi 14
Gel 0 7 10 14 S% 0 pH 10.5
Pf 0.4 Lc ____ Solid. 6% NaCl 315000

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21		ON BOARD	
60 sx	Magcogel	Potable Water:	310 T
240 sx	Salt	Drilling Water:	315 T
50 sx	Salt gel	Turbo Fuel:	387 gal + 15 drums
11 Tons	Barite (used to mix heavy pills)	Fuel:	362 T
		Barite:	67 T
		Cement:	92 T

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG FROM	TO	ELAPSED TIME	
0:00	9:30	9:30	Logging (Dual Laterolog - Sonic BHL/FDC - CNL/Dipmeter)
9:30	12:30	3:00	Picked up and made up 13-5/8 housing for stand-by in derrick.
12:30	16:00	3:30	Run in bit for hole control (lay down (3) 8½" D.C. - crack on one).
16:00	17:30	1:30	Circulated.
17:30	19:30	2:00	Pull out bit.
19:30	24:00	4:30	Run in 13-3/8" casing.
			8:00 A.M. STATUS: Mixing cement.

TIME ANALYSIS 9 - Mis. op. 9:30

1 - R.U.D.		10 - W.C.	
2 - D		11 - Casing	14:30
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	

29 PROGRAMME
Run in 13-3/8" casing

30 PEOPLE ON BOARD : 64

31 WEATHER

Wind/Kn	30/36
Direction	NNW
Waves /ft	5/6'
Slip ft.	1.5'
Current	
Swells/ft	4'
Direction	NNW
Temperature	30

32 Support Vessels
Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 | 2 No. 10 DATE 1/16/74

PHASES

Cross out which ever not applicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3 2,792		4 313		5 13	30
Drilled ~~cored~~	3,105					

PENETRATION

BITS

	Make	Ø	Type	No.	Nozzles	Cumul
EACH BIT	9	10	11	12	13	14
Drilled ~~cored~~	Reed	17½	Y 13	#6 809090	3x22	313'/ 13:30
Drilled-cored						
Drilled-cored						
Drilled-cored						

PARAMETERS

	Weight	R.P.M.	Flow Rate	Mud Pressure
EACH BIT	15	16	17	18
Drilled ~~cored~~	50/ 60,000	80 - 100	1000	2900
Drilled-cored				
Drilled-cored				
Drilled-cored				

MUD

CHARACTERISTICS

19
Wt 10.7 Wt 10.8 V 41 V 43
F mini 60 VA maxi 18 Vp mini 11 Yv maxi 14
Gel 0 7 10 14 S% 0 pH 10.5
Pf 0.4 Lc ____ Solid 6% NaCl 31500

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21
6 sx Caustic
348 sx Salt

STRING

22 ELEMENTS Bit/(8) 9½" D.C./(10) 8½" D.C./(1) Flexwate/Drop in valve/(14) Flexwate/5" D.P.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	80000	47000	207000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION 1/4° at 3,100'

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	2:30	2:30	Pulled out overshot with fish.
2:30	4:30	2:00	Ran in with bit #6 and slipped drilling line.
4:30	4:45	0:15	Ream to bottom. (11')
4:45	18:15	13:30	Drilling.
18:15	19:15	1:00	Circulation.
19:15	19:30	0:15	Totco survey.
19:30	22:30	3:00	Pull out bit #6.
22:30	24:00	1:30	Logging.
			6:00 A.M. STATUS: Logging (Dipmeter in progress)

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	28
2 - D	13:30	10 - W.C.	
3 - Red	0:15	11 - Casing	
4 - D.T.	5:00	12 - Circ	1:00
5 - H.O.		13 - Fishing	2:30
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME: Logging

30 PEOPLE ON BOARD: 62

31 WEATHER

Wind/Kn	32 - 38
Direction	NNW
Waves /ft	5'
Slip jt.	1.5'
Current	
Swells/ft	8'
Direction	NNW
Température	30°

32 Support Vessels: Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 9 | RIG P-82 | DATE 30/9/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	2,625		167		12	15
Drilled ~~cored~~	2,792					

BITS / PARAMETERS

EACH BIT	6 DEPTH ft	ins.	7 PENET. ft.	ins.	8 TIME h.	min.	9 Make	10 Ø	11 Type	12 No.	13 Nozzles	14 Cumul	15 Weight	16 R.P.M.	17 Flow Rate	18 Mud Pressure
Drilled ~~cored~~	2,625		167		12	15	Security	17½	M4N	#5 527129	3x20	167'/ 12:15	55/ 67,000	90 - 100	1000	2700
Drilled ~~cored~~	2,792															
Drilled-cored																
Drilled-cored																
Drilled-cored																

MUD

CHARACTERISTICS

19
Wt 10.5 Wt 10.8 V 45 V 49
mini maxi mini maxi
F 55 VA 16 Vp 10 Yv 12
Gel 0 7 10 14 S% 0.25 pH 10
Pf 0.2 Lc 55 Solid. 6% NaCL 31500

LOSSES and GAINS

20

	this day	cumul
Mud		
Water		

PRODUCTS ADDED ON BOARD

21

6 sx	Kelsan XC	Potable Water:	330 T
12 sx	Caustic Soda	Drilling Water:	725 T
6 sx	Magcogel	Fuel:	286 T
590 sx	Salt	Turbo Fuel:	642 gal + 15 drums
		Barite:	78 T
		Cement:	92 T

STRING

22 ELEMENTS Bit/(8) 9½" D.C./(10) 8½" D.C./(1) Flexwate/Drop in valve/(14) Flexwate/5" D.P.

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	60000	35000	175000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	5:45	5:45	Finished trip for bit #5.
5:45	18:00	12:15	Drilling.
18:00	24:00	6:00	Fishing for twist off in flexwate D.P. (twist off in box - 10 single above D.C.).
			8:00 A.M. STATUS: Drilling at 2,889' (30'/hr)

TIME ANALYSIS 9 - Mis. op. 28

1 - R.U.D.		10 - W.C.	
2 - D	12:15	11 - Casing	
3 - Red		12 - Circ	
4 - D.T.	5:45	13 - Fishing	6:00
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	

29 PROGRAMME Drilling

30 PEOPLE ON BOARD: 67

31 WEATHER

Wind/Kn	28/30
Direction	NW
Waves /ft	3'
Slip jt.	1'
Current	
Swells/ft	?'
Direction	NW
Temperature	32

32 Support Vessels: Giant Tide

405

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No 8 DATE 29/9/74

PHASES

Cross out which ever not applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3 2,204		4 421		5 23	15
Drilled-~~cored~~	2,625					

PENETRATION

BITS

PARAMETERS

	6		7		8		Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
							9	10	11	12	13	14	15	16	17	18
EACH BIT	2,204		421		23	15	Hughes	17½	OSC3	#4 CC499	3x20	802'/ 35:45	35/ 45,000	110	1000	2700
Drilled-~~cored~~	2,625															
Drilled-cored																
Drilled-cored																
Drilled-cored																

MUD

CHARACTERISTICS

19
Wt 9.6 Wt 10 V 42 V 44
F mini 41 VA maxi 18 Vp mini 11 Yv maxi 14
Gel 0 5 10 17 S% 0.8 pH 11
Pf 0.4 Lc ____ Solid. 7 NaCl 93000

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED ON BOARD

21

5 sx	Kelsan XC
16 sx	Caustic
3 sx	Drispac

Potable Water:	363 T
Drilling Water:	730 T
Fuel:	300 T
Turbo Fuel:	642 gal + 15 drums
Cement:	92 T
Barite:	78 T

STRING

22 ELEMENTS Same as yesterday.

23

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	60000	35000	175000

NOTES

24 FORMATION Type . Stage

25 CORES

26 DEVIATION 2,625' = 0°

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	23:15	23:15	Drilling.
23:15	23:30	0:15	Circulated.
23:30	23:45	0:15	Totco survey.
23:45	24:00	0:15	Pull out bit #4.
			8:00 A.M. STATUS: Drilling at 2,661'.

TIME ANALYSIS 9 - Mis. op. 0:30

1 - R.U.D.		10 - W.C.	
2 - D	23:15	11 - Casing	
3 - Red		12 - Circ	
4 - D.T.	0:15	13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	

29 PROGRAMME Drilling

30 PEOPLE ON BOARD: 67

31 WEATHER

Wind/Kn	25
Direction	WNW
Waves /ft	4'
Slip jt.	0.5
Current	
Swells/ft	8'
Direction	WNW
Temperature	34

32 Support Vessels

Giant Tide

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 7 | RIG P-82 | DATE 28/9/74

PENETRATION

PHASES	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	1,823		381		12	30
Drilled-cored	2,204					
EACH BIT	1,823		381		12	30
Drilled-cored	2,204					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS / PARAMETERS

Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
Hughes	17½	OSC3	CC499	3x 20/32	381/ 12:30	30 to 45,000	90/110	1000	2600

MUD

CHARACTERISTICS

Wt 9.5	Wt 9.9	V 42	V 45				
F mini 29	VA maxi 17.5	Vp mini 8	Yv maxi 19				
Gel 0 5	10 14	S% 0	pH 10.5				
Pf 0.3	Lc	Solid. 8%	NaCL 50000				

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS ADDED ON BOARD

9 sx	Drispac
39 sx	Magcogel
8 sx	Caustic Soda
55 gal	Magconol

Cement:	42 T
Potable Water:	352 T
Drilling Water:	778 T
Fuel:	316 T
Turbo Fuel:	642 gal + 15 drums
Barite:	78 T

STRING

ELEMENTS: Same as yesterday.

WEIGHT (in mud)	D.C.	D.P.	W/ M.D.
	50000	30000	180000

FORMATION Type . Stage

CORES

DEVIATION

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	6:30	6:30	Repaired motion compensator.
6:30	7:45	1:15	Run bit #4.
7:45	8:15	0:30	Slipped drilling line.
8:15	9:00	0:45	Finished tripping bit #4.
9:00	12:00	3:00	Drilling.
12:00	12:30	0:30	Circulation - Washed tight hole at 1,865'.
12:30	24:00	11:30	Drilling.
			8:00 A.M. STATUS: Drilling at 2,360'.

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	0:30
2 - D	12:30	10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.	2:00	12 - Circ	0:30
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	6:30
8 - Test		16 - W.T.	
		17 - Vac	

PROGRAMME: Drilling

PEOPLE ON BOARD: 63

WEATHER

Wind/Kn	30
Direction	WNW
Waves /ft	4' - 6'
Slip it.	0.5'
Current	
Swells/ft	6'
Direction	W
Température	32

Support Vessels: Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 | 2 No. 6 DATE 27/9/74

PHASES

PENETRATION

Cross out which ever not applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3 1,510		4 313		5 14	30
Drilled-~~cored~~	1,823					
EACH BIT	6 1,510		7 313		8 14	30
Drilled-~~cored~~	1,823					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9 Hughes	10 17½	11 OSC3	12 CC500	13 3x20	14 573'/ 22:00

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15 35/ 45,000	16 90/ 110	17 900	18 2500

MUD

CHARACTERISTICS

19
Wt 8.3 Wt 9.4 V 44 V 60
F mini 25 VA maxi 16 Vp mini 10 Yv maxi 12
Gel 0 4 10 16 S% 0 pH 11
Pf 0.4 Lc ____ Solid. 4% NaCl 53000

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED ON BOARD

21

10 sx	Caustic
20 sx	Kelsan XC
6 sx	Magcogel

Cement:	92 T
Pot. Water:	352 T
Drlg. Water:	766 T
Fuel:	326 T
Turbo:	642 gal + 15 drums
Barite:	78 T

STRING

22 ELEMENTS Same as yesterday.

23 WEIGHT (in mud)

D.C.	D.P.	W.M.D.
60000	26000	176000

24 FORMATION Type . Stage

25 CORES

26 DEVIATION at 1,810' - 0.5°

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	0:45	0:45	Changed wash pipe packing.
0:45	9:45	9:00	Drilling.
9:45	10:30	0:45	Circulate - Totco survey.
10:30	16:00	5:30	Drilling.
16:00	17:00	1:00	Circulated tight hole connection.
17:00	17:15	0:15	Totco survey.
17:15	18:45	1:30	Pulled out of hole.
18:45	24:00	5:15	Repair on motion compensator.
			8:00 A.M. STATUS: Resuming Drilling

TIME ANALYSIS 9 - Mis. op. 1 (28)

1 - R.U.D.		10 - W.C.	
2 - D	14:30	11 - Casing	
3 - Red		12 - Circ	1
4 - D.T.	1:30	13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	6
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	

29 PROGRAMME Drilling

30 PEOPLE ON BOARD : 68

31 WEATHER

Wind/Kn	10/12
Direction	NNE
Waves /ft	2'
Slip jt.	0.5
Current	
Swells/ft	3'
Direction	N
Température	32

32 Support Vessels

Supreme Tide

406

OM 102

DRILLING REPORT

ACQUITAINE

WELL Polar Bear | No 5
RIG P-82 | DATE 26/9/74

PENETRATION

PHASES

Cross out which ever is not applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	1,250		260		7	30
Drilled ~~cored~~	1,510					

BITS

EACH BIT	Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
Drilled ~~cored~~ 1,510	Hughes	17½	OSC3	CC500	3x20	260/ 7:30	30/ 40,000	80/100	1000	2300
Drilled-cored										
Drilled-cored										
Drilled-cored										

MUD

CHARACTERISTICS

Wt 9 | Wt 9.3 | V 38 | V 46
F mini 15 | VA maxi 34 | Vp mini 12 | Yv maxi 24
Gel 0 4 | 10 19 | S% 0 | pH 11
Pf 0.7 | Lc | Solid 4% | NaCL 48000

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS ADDED

102 sx	Magcogel
9 sx	Kelsan XC
8 sx	Drispac
18 sx	Caustic Soda

ON BOARD

Potable Water	338 T
Drill Water	596 T
Fuel	260 T
Turbo Fuel	642 gal ÷ 15 drums
Barite	78 T
Cement	92 T

STRING

ELEMENTS Bit/(8) 9-1/2" D.C./(4) 8-1/2" D.C./(1) Flexwate/Drop Invalve/(14) Flexwate/5" D.P.

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	50000	20000	170000

FORMATION Type . Stage

CORES

DEVIATION

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	9:15	9:15	Run 20-3/4" stack and 22" riser.
9:15	10:00	0:45	Ran in testing tool.
10:00	10:45	0:45	Tested stack - pipe ram 2000# - Hydril 1500# - OK.
10:45	11:30	0:45	Pulled out testing tool.
11:30	13:30	2:00	Run in 17-1/2" bit.
13:30	15:00	1:30	Tested casing 500# - OK.
15:00	15:45	0:45	Drilled out cement and shoe.
15:45	23:15	7:30	Drilling.
23:15	24:00	0:45	Pull out bit to 20" casing shoe to change wash pipe packing.
			8:00 A.M. STATUS: Drilling at 1,666'

TIME ANALYSIS

1 - R.U.D.		9 - Mis. op.	
2 - D	7:30	10 - W.C.	
3 - Red		11 - Casing	15:45
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	0:45
8 - Test		16 - W.T.	
		17 - Vac	

PROGRAMME: Drilling 17-1/2" hole

PEOPLE ON BOARD: 72

WEATHER

Wind/Kn	14
Direction	S
Waves /ft	5'/6'
Slip jt.	0.5
Current	
Swells/ft	3'
Direction	S
Temperature	33

Support Vessels: Fed 6 en route to Churchill for repairs.

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No. 4

RIG P-82 | DATE 25/9/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	1,140		110		5	30
Drilled ~~cored~~	1,250					

BITS

Make	Ø	Type	No.	Nozzles	Cumul
Hughes	26	OSC3	FM023	Reg	527/ 16:15

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
35,000	80/100	1000	1700

EACH BIT

	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
Drilled ~~cored~~	1,140 / 1,250		110		5	30
Drilled-cored						
Drilled-cored						
Drilled-cored						

MUD

CHARACTERISTICS

	mini	maxi	mini	maxi
Wt		Wt	V	V
F		VA	Vp	Yv
Gel 0		10	S%	pH
Pf		Lc	Solid	NaCL

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS on Board

Potable Water	345 T	Turbo Fuel	736 gal + 15 drums
Drilling Water	640 T		
Fuel	270 T		
Barite	78 T		
Cement	82 T		

STRING

ELEMENTS: Same as yesterday.

WEIGHT (in mud)	D.C.	D.P.	W.M.D.
	60000	20000	170000

FORMATION Type . Stage

CORES

DEVIATION

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	5:30	5:30	Drill to 1,250'.
5:30	7:30	2:00	Spotted mud - totco - short trip and spotted 340 bbls mud.
7:30	9:00	1:30	Pull out of hole for 20" casing.
9:00	16:30	7:30	Rig up for casing and welding job to replace defective female thread on shoe joint.
16:30	21:00	4:30	Run in 20" casing. Shoe at 1,227'.
21:00	23:00	2:00	Cementing 600 sx + 3% pre-hydrated gel, followed by 500 sx neat cement + 3% $CaCl_2$ + pre-heated water at 75°.
23:00	24:00	1:00	Disconnected running tool and pulled out same. 8:00 A.M. STATUS: Run in to test 20-3/4" BOP stack.

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	5:30	11 - Casing	18:30
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

PROGRAMME: Running and Testing 20-3/4" stack

PEOPLE ON BOARD: 72

WEATHER

Wind/Kn	26/38
Direction	NW
Waves /ft	4/6
Slip jt.	
Current	
Swells/ft	8
Direction	NW
Température	32

Support Vessels: Federal 6

406

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No. 3

RIG P-82 | DATE 24/9/74

PHASES — PENETRATION

Cross out which ever not applicable	DEPTH ft	DEPTH ins	PENET. ft	PENET. ins	TIME h.	TIME min.
TOTAL	723		417		10	45
Drilled ~~cored~~	1,140					
EACH BIT	723		417		10	45
Drilled ~~cored~~	1,140					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS — PARAMETERS

Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
Hughes	26	OSC	FM029	Reg	417'/ 10:45	20/ 35,000	80/ 100	1000	900/ 1000

MUD

CHARACTERISTICS

Wt mini	Wt maxi	V mini	V maxi
F	VA	Vp	Yv
Gel 0	10	S%	pH
Pf	Lc	Solid.	NaCL

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS ADDED

30 sx Magcogel

3 sx Caustic

STRING

ELEMENTS Bit/Float Valve/ (8) 9-1/2" D.C. / (4) 8-1/2" D.C./15 Flexwate/5" D.P.

WEIGHT (in mud)	D.C.	D.P.	W! M.D.
	60000	15000	165000

FORMATION Type . Stage

CORES

DEVIATION at 1,250' = 1°

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	4:00	4:00	Run in 26" bit - difficulties to pass through 30" housing.
			Run TV.
4:00	5:30	1:30	Pulled out running bit with guide frame.
5:30	7:00	1:30	Re-run T.V. - repositioned P-82.
7:00	8:15	1:15	Waiting on cement.
8:15	8:30	0:15	Run in hole - top cement at 705'.
8:30	10:45	2:15	Drilled out cement to 723'.
10:45	12:30	1:45	Drilling to 765'.
12:30	15:00	2:30	Rig repairs (power failure).
15:00	24:00	9:00	Drilling to 1,140'.
			8:00 A.M. STATUS: Pulling out drlg assembly to run 20" csg

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	10:45	11 - Casing	10:45
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	2:30
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.			

PROGRAMME: 20" casing

PEOPLE ON BOARD: 68

WEATHER

Wind/Kn	25/30
Direction	WNW
Waves /ft	2/3
Slip jt.	
Current	
Swells/ft	3/5
Direction	WNW
Température	37

Support Vessels: Giant Tide

406

OM 1C2

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 2 No. 2 DATE 23/9/74

PENETRATION

PHASES

Cross out which ever not applicable	DEPTH ft	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	3 648		4		5	
Drilled ~~cored~~	723		75		9	45
EACH BIT	6 648		7 75		8 9	45
Drilled ~~cored~~	723					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9 SMF	10 26	11 TS25	12 1815	13	14 93'/13:15
Security	36	Hole Opener			

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15 25/27000	16 80/100	17 GPM 500/600	18 PSI 500/800

MUD

CHARACTERISTICS

19
Wt mini ____ Wt maxi ____ V mini ____ V maxi ____
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid ____ NaCl ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21
45 sx Magcogel
4 sx Caustic

STRING

22 ELEMENTS Same as yesterday

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES Piggy back on D1 and D2 anchors

26 DEVIATION at 723' - 3/4°

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	9:45	9:45	Drilling.
9:45	12:15	2:30	Pumped 120 bbls mud - Totco - short trip. Pumped 120 bbls
12:15	16:45	4:30	Run 30" csg with stinger - shoe at 710'.
16:45	18:15	1:30	Cement job. 500 sx Class B mixed with 50 bbls sea water
			heated to 75° plus 3% $CaCl_2$.
18:15	20:15	2:00	Pull out and lay down running tool and stinger.
20:15	23:00	2:45	Pick up (2) 9-1/2 D.C. and run in 26" bit.
23:00	23:45	0:45	A1, B1, B2, C1, D2, E1 and E2 tested to 100 tons.
			D1 to 80 tons - A2 and C2 already tested to 100 tons.
23:45	24:00	0:15	Run in 26" bit.
			8:00 A.M. STATUS: Starting drilling out cement.

406

TIME ANALYSIS

1 - R.U.D.		10 - W.C.	
2 - D	9:45	11 - Casing	14:15
3 - Red		12 - Circ	
4 - D.T.		13 - Fishing	
5 - H.O.		14 - Aband	
6 - Cor		15 - Rep	
7 - C.T.		16 - W.T.	
8 - Test		17 - Vac	
9 - Mis. op.	28		

29 PROGRAMME 26" drilling

30 PEOPLE ON BOARD : 68

31 WEATHER

Wind/Kn	10/12
Direction	SE
Waves /ft	2/3
Slip jt.	
Current	
Swells/ft	0
Direction	
Température	38

32 Support Vessels
Giant Tide

OM 102

DRILLING REPORT

AQUITAINE

WELL Polar Bear | No 1
RIG P-82 | DATE 22/9/74

PHASES

PENETRATION

Cross out which ever not applicable	DEPTH ft	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	630		18		3	30
Drilled ~~cored~~	648					
EACH BIT						
Drilled ~~cored~~	630		18		3	30
Drilled ~~cored~~	648					
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS / PARAMETERS

Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
SMF	26	TS25	1815	--	18/3:30	5,000 to	60	100 to	0 - 400
Security	36	Hole Opener				30,000		500	

MUD

CHARACTERISTICS

Wt mini	Wt maxi	V mini	V maxi
F	VA	Vp	Yv
Gel 0	10	S%	pH
Pf	Lc	Solid.	NaCL

LOSSES and GAINS

	this day	cumul
Mud		
Water		

PRODUCTS ADDED

4 sx Caustic
48 sx Magcogel

STRING

ELEMENTS: Bit - Hole Opener - Float Valve - (6) 9-1/2 D.C. - (13) Flexwate

WEIGHT (in mud)	D.C.	D.P.	Wt M.D.

FORMATION Type . Stage

CORES

DEVIATION

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
			RKB/Seabed = 630' Water Depth = 553'
0:00	9:00	9:00	Stand-by for anchors settling.
9:00	15:45	6:45	Anchors test - All anchors holding 70 tons and over.
15:45	18:00	2:15	Run temporary guide base.
18:00	20:30	2:30	Run in drilling assembly.
			POLAR BEAR SPUD AT 20:30.
20:30	24:00	3:30	Drilling 36" hole from 630' to 648'
			(first 7 feet = soft formation - rough drilling beyond 637')
			8:00 A.M. STATUS: Drilling at 713'

TIME ANALYSIS

1 - R.U.D.	18:00	9 - Mis. op	
2 - D	3:30	10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.	2:30	12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

PROGRAMME: Run 30" casing

PEOPLE ON BOARD: 69

WEATHER

Wind/Kn	32
Direction	W
Waves /ft	2
Slip jt.	
Current	
Swells/ft	3' (4 sec)
Direction	NW
Température	38

Support Vessels
Giant Tide
Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82

2 No Moving 3 DATE 21/9/74

PHASES

Cross out which ever not applicable	DEPTH ft.	ins.	PENET. ft.	ins.	TIME h.	min.
TOTAL	3		4		5	
Drilled-cored						

PENETRATION

	6		7		8	
EACH BIT						
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19

Wt mini _____ Wt maxi _____ V mini _____ V maxi _____

F _____ VA _____ Vp _____ Yv _____

Gel 0 _____ 10 _____ S% _____ pH _____

Pf _____ Lc _____ Solid _____ NaCL _____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS _____

23 WEIGHT (in mud)	D.C.	D.P.	Wt M.D.

24 FORMATION Type . Stage _____

25 CORES _____

26 DEVIATION _____

NOTES

TIME LOG FROM	TO	ELAPSED TIME	
0:00	7:00	7:00	Stand-by for anchor setting.
7:00	13:00	6:00	Re-position E1, E2 and D2 anchors.
13:00	22:00	9:00	Testing Anchors: A1 = 100 Tons C2 = 100 Tons
			A2 = 90 Tons D1 = Missing
			B1 = 45 Tons D2 = 45 Tons
			B2 = 70 Tons E1 = 45 Tons
			C1 = 60 Tons E2 = 45 Tons
22:00	24:00	2:00	Stand-by for anchors settling.
			8:00 A.M. STATUS: Waiting to repair D1 anchor (sea too rough for diving job) and waiting on anchors settling.

TIME ANALYSIS

1 - R.U.D.	24	9 - Mis. op.	28
2 - D		10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME: Anchoring

30 PEOPLE ON BOARD : 73

31 WEATHER

Wind/Kn	24/30
Direction	NNE
Waves /ft	4/8
Slip jt.	
Current	
Swells/ft	3/4 (5 sec)
Direction	NE
Température	37

32 Support Vessels: Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear RIG P-82 (020)

2 No Moving 2 DATE 20/3/74

PENETRATION

PHASES — Cross out what is not applicable

	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled-cored						
EACH BIT	6		7		8	
Drilled-cored						
Drilled-cored						
Drilled-cored						
Drilled-cored						

BITS

Make	Ø	Type	No.	Nozzles	Cumul
9	10	11	12	13	14

PARAMETERS

Weight	R.P.M.	Flow Rate	Mud Pressure
15	16	17	18

MUD

CHARACTERISTICS

19
Wt ____ (mini) Wt ____ (maxi) V ____ (mini) V ____ (maxi)
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid ____ NaCL ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W.M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27

TIME LOG FROM	TO	ELAPSED TIME	
0:00	7:15	7:15	Dropped anchors D1, E2, B1, C2, E1, B2, and A2.
			Tested: anchors holding 60 to 70 tons.
7:15	21:00	13:45	Re-positioned E2, A1 and C2 to move P-82 on the exact
			shot point. Tested anchors: not holding.
21:00	24:00	3:00	Waiting to try to get the anchors buried.
			8:00 A.M. STATUS: Anchors not holding. Supreme Tide
			checking all the anchors.

TIME ANALYSIS 28

1 - R.U.D. 24	9 - Mis. op.
2 - D	10 - W.C.
3 - Red	11 - Casing
4 - D.T.	12 - Circ
5 - H.O.	13 - Fishing
6 - Cor	14 - Aband
7 - C.T.	15 - Rep
8 - Test	16 - W.T.
	17 - Vac

29 PROGRAMME: Anchoring

30 PEOPLE ON BOARD: 74

31 WEATHER

Wind/Kn	22 - 24
Direction	WNW
Waves /ft	3 - 5
Slip jt.	
Current	
Swells/ft	
Direction	
Temperature	36

32 Support Vessels: Supreme Tide

406

OM 102

DRILLING REPORT

AQUITAINE

1 WELL Polar Bear (O20) RIG P-82

2 No Moving 1 DATE 19/9/74

PENETRATION

PHASES

Cross out whichever is inapplicable	DEPTH ft.	DEPTH ins.	PENET. ft.	PENET. ins.	TIME h.	TIME min.
TOTAL	3		4		5	
Drilled-cored						

BITS

PARAMETERS

EACH BIT	Make	Ø	Type	No.	Nozzles	Cumul	Weight	R.P.M.	Flow Rate	Mud Pressure
	6	7	8	9	10	11	12	13	14	15	16	17	18
Drilled-cored													
Drilled-cored													
Drilled-cored													
Drilled-cored													

MUD

CHARACTERISTICS

19
Wt mini ____ Wt maxi ____ V mini ____ V maxi ____
F ____ VA ____ Vp ____ Yv ____
Gel 0 ____ 10 ____ S% ____ pH ____
Pf ____ Lc ____ Solid ____ NaCL ____

LOSSES and GAINS

20	this day	cumul
Mud		
Water		

PRODUCTS ADDED

21

STRING

22 ELEMENTS

23 WEIGHT (in mud)	D.C.	D.P.	W!M.D.

24 FORMATION Type . Stage

25 CORES

26 DEVIATION

NOTES

27 TIME LOG

FROM	TO	ELAPSED TIME	
0:00	14:30	14:30	Connect new pennant line to E1 line. Picked up C2, B1, D2 and A1. Lost E1 anchor - line broken. Racked anchors.
14:30	20:30	6:00	Moving from Walrus to Polar Bear location.
20:30	24:00	3:30	Dropped E1 anchor. Balasting the unit. Picked up buoys for anchoring operation.
			8:00 A.M. STATUS: All anchors dropped. Testing anchors in progress.

TIME ANALYSIS 28

1 - R.U.D.	24	9 - Mis. op.	
2 - D		10 - W.C.	
3 - Red		11 - Casing	
4 - D.T.		12 - Circ	
5 - H.O.		13 - Fishing	
6 - Cor		14 - Aband	
7 - C.T.		15 - Rep	
8 - Test		16 - W.T.	
		17 - Vac	

29 PROGRAMME
Testing Anchors
Spudding well

30 PEOPLE ON BOARD : 74

31 WEATHER

Wind/Kn	20
Direction	NNE
Waves /ft	3 - 4
Slip jt.	
Current	
Swells/ft	
Direction	
Température	36

32 Support Vessels
Supreme Tide
Giant Tide

406

Fed 6

OM 102

AQUITAINE

WELL: Polar Bear C-11

CASING RUNNING IN ORDER: ø

DATE: Sept 30/74

13 3/8"

No.	LENGTH	ACCUM. LENGTH	NOTES (WALL-GRADE - NEW OR USED)	No.	LENGTH	ACCUM. LENGTH	NOTES (WALL-GRADE NEW OR USED)
Shoe	1.80			48	41.24	1774.97	68 lbs/ft
1	38.79	40.59	68 lbs/ft	49	41.15	1816.12	K 55
2	43.12	83.71	K 55	50	40.00	1856.12	New
Float	1.55	85.26	New	51	31.08	1887.20	
3	39.71	124.97		52	38.26	1925.46	
4	40.92	165.89		53	38.09	1963.55	
5	42.23	208.12		54	35.13	1998.68	
6	41.81	249.93		55	30.24	2028.92	
7	41.68	291.61		56	30.04	2058.96	
9	43.25	334.86		57	39.74	2098.70	
10	42.54	377.40		58	36.78	2135.48	
11	42.51	419.91		59	38.98	2174.46	
12	40.15	460.06		60	37.96	2212.42	
13	40.73	500.79		61	35.12	2247.54	
14	42.12	542.96		62	40.37	2287.91	
15	40.00	582.96		63	40.28	2328.19	
16	38.98	621.94		64	39.01	2367.20	
17	40.71	662.65		65	39.99	2407.19	
18	41.41	704.06		75	34.90	2442.09	(61 joints)
19	43.17	747.23					
20	42.14	789.37					
21	41.80	831.17					
23	42.11	873.28					
24	41.48	914.76					
25	43.81	958.57					
26	43.08	1001.65					
27	42.02	1043.67					
29	36.13	1079.80					
30	40.70	1120.50					
31	41.69	1162.19					
32	41.57	1203.76					
33	40.84	1244.60					
34	42.75	1287.35					
35	43.00	1330.35					
36	37.53	1367.88					
37	40.28	1408.16					
38	37.95	1446.11					
39	39.31	1485.42					
40	41.78	1527.20					
42	41.05	1568.25					
43	39.55	1607.80					
44	40.38	1648.18					
45	42.36	1690.54					
45	43.19	1733.73					

CASING REPORT

AQUITAINE

Signature Tool Pusher:

Signature Drilling Superintendent: Blair Johnson

Documents Attached: Casing running order

Well: Baker Four | Rig: P-22 | Heightable: -30

Ø: 13 3/8" | Shoe: 3081 | Date: 9/10/74

CASING DESIGN

No	THREAD	Grade	Coupling	Thickness	LENGTH Ft.	"
2	8 Round	K55	st+c	.422	81	91
59	8 Round	K55	st+c	.422	2356	82
1	Baker Shoe				1	80
1	Baker Collar				1	55
1	13 5/8 Housing				20	00
	Total accessories				23	25

TOTAL casing: 2438. 74

Below [redacted] TABLE: 619. 25

SHOE: 3081. 34

CHARACTERISTICS LENGTH Ft.	"	DEPTH FROM Ft.	"	TO Ft.	"	Wt lbs/Ft.	Burst Psi	WEIGHT Section	Cum.	COLLAPSE Psi	Reduct Due To Tension	At Setting Depth W^T	S.F.	TENSION lbs.	S.F.
2461	99	619	25	3081	34	68	3450	1681		1950					

OBJECT OF CASING: Intermediate Casing

ACCESSORIES

TYPE	Qty.	PLACE AND NOTES	TYPE	Qty.	PLACE AND NOTES
Float guide	1	Baker on bottom			
Float collar	1	Baker 2 joints up			
Centralizers	3	1st, 2nd and 52nd joint			
Casing basket	1	13 5/8" landed 619.25			

DRAWING

CASING

MUD CHARACTERISTICS: Saturated salt gel chemical 10.8 ppg. 42 sec vis. PV 10 yp 10 wl 75 ca 2600 Chlorides 315 PPM

WELD OR BAKER-LOK: Baker loK

MAKE UP TORQUE: 15,502 ft lbs

TYPE OF LUBRICANT: Kopr - Kote

FILL UP: Every joint with mud

PUMP PRESSURE END OF JOB: 500 psi

STATIC PRESSURE END OF JOB:

CEMENT TOP THEOR.: Sea bottom

TEMP. SURVEY: None run BHT 81F

INSIDE CASING:

HANGING: On 13 5/8" Housing

PRESSURE CASING TEST: 1500 psi

RECIPROCATING: Locked to 20"

SLURRY WT: 15 pcf-12.3 37 salt wt. 1

TYPE OF CEMENT: class B | Qty.: 2600 sacks

VOL. MUD BEHIND CEMENT: 300 bbls

1st stage 1200 sacks class B 10% gel

2nd stage 1000 sacks class B 37% salt

HOUR	TIME	ORDER OF OPERATIONS
		October 1/74
0- 9:30	9:30	Logging with Schlumberger
12:00	2:30	Pick up 13 5/8 Housing
12:30	:30	Stand 13 5/8 housing in derrick
16:00	3:30	Lay down 3-8 1/2 DC - Trip in to condition for casing
17:30	1:30	Spot heavey pill
19:30	2:00	P.O.O.H. Pit #6 to run casing
24:00	4:30	Run 13 3/8" casing
		October 2/74
0-- 5:30	5:30	Run 13 3/8 casing to 3081 latch and test to 45,000# over pull
6:45	1:15	Circulate
10:00	3:15	Cement with 1200 sacks 10% gel at 12.3 pcf + 1000 sacks 37% salt At 16.1
12:00	2:00	W.O.C. floats not holding
13:45	1:45	W.O.C.
14:45	1:00	Back out running tool and P.O.O.H. lay down

OM 110

AQUITAINE

WELL: Polar Bear C-11

OM 111

CASING RUNNING IN ORDER: ø

DATE: 24/9/74

20" Casing

No.	LENGTH	ACCUM. LENGTH	NOTES (WALL-GRADE - NEW OR USED)	No.	LENGTH	ACCUM. LENGTH	NOTES (WALL-GRADE - NEW OR USED)
1 Shoe	4434		New 0.438 wall W/Vetco type "L" modified buttress				
2	4225	8659					
3	4430	13089					
4	4352	17441					
5	4401	21842					
6 ✓	4334	26176	X52 and X55 (mixed)				
7	4089	30265					
8	4310	34575					
9	4324	38899					
10	4328	43227					
11	4255	47482					
12	4203	51685					
13 x-o	4325	56010	Buttress x Squnch Joint "ST"				
14 housing	4430	60440					

CASING REPORT

AQUITAINE

Signature Tool Pusher	Signature Drilling Superintendant	Documents Attached	Well / Rig / Heightable	ø / Shoe / Date
P.R. File	Lou Pajak	Csg Running Eq order "	Polar Bear / P.82 / 121'	30" / 1227' / 24/9/82

CASING DESIGN

No	THREAD	Grade	Coupling	Thickness	LENGTH Ft	"
1	Shoe - - - LT	K52	L	0.438	44	34
11	Joints - Rut - L	K55			472	51
1	Cross- Over	L x ST			42	25
1	Housing				44	30

Below SHOE: TOTAL: 604.40 TABLE: 622.60 1227.00

CHARACTERISTICS

LENGTH Ft	"	DEPTH FROM Ft	"	TO Ft	"	Wt lb/Ft	Burst Psi	WEIGHT Section	Cum.	COLLAPSE Psi	Reduct Due To Tension	At Setting Depth W.T	S.F	TENSION lbs	S.F

OBJECT OF CASING: Surface Casing

ACCESSORIES

TYPE	Qty.	PLACE AND NOTES	TYPE	Qty.	PLACE AND NOTES
Float Shoe	1	Baker			

DRAWING

CASING

MUD CHARACTERISTICS: Sea water + Gel Mud
WELD OR BAKERLOK:
MAKE UP TORQUE: Buttress Type L + Squnch Out ST
TYPE OF LUBRICANT:
FILL UP: Every Joint with Sea Water

PUMP PRESSURE END OF JOB:
STATIC PRESSURE END OF JOB:
CEMENT TOP: THEOR: Sea Bed
TEMP. SURVEY
INSIDE CASING: 1180'
HANGING: On 30" Housing
PRESSURE CASING TEST: Plug not Bumped
RECIPROCATING: Locked to 30"

SLURRY WT: 13.4 and 15.5 VOL: 180.5 cuft
TYPE OF CEMENT: Class B Qty: 1100 sx
VOL. MUD BEHIND CEMENT: 210 bbls Sea water

Mixed first 600 sx with gel 180 bbls
followed with 500 sx class B pure cement
mixed with 50 bbls sea water + 3% CL2CA

HOUR	TIME	ORDER OF OPERATIONS
24/9 05.30		Resume 26" Drilling at 1250' - and survey - Spot mud
	3.30	P.O. to 30" Shoe - Retrieve survey - R.I.H.
09.00		Spot 340 bbls mud - P.O.H. 26" Drilling Assy.
	12.00	Run 20" Csg - Faulty Box coupling on shoe Jt.
		Had to cut- off and reweld correct joint.
21.00		
	3.00	Cementing 20" Csg
24.00		Back - off landing Tool - P.C.O.H.

Note:
1) On running 20" casing - Pin of Jt. # 2 dropped right in to shoulder of box on joint #1
2) These two Jts were layed down and 2 intermediate Jts were picked up to check make- up - OK
3) Box of Jt #1 was cut - off and replaced with box of spare Jt. This caused 7 hrs 30 min lost time on casing Job.

Lou Pajak

AQUITAINE

WELL: POLAR BEAR C-11

ON 111

CASING RUNNING IN ORDER: ø 30"

DATE:

No.	LENGTH	ACCUM. LENGTH	NOTES (WALL-GRADE - NEW OR USED)	No.	LENGTH	ACCUM. LENGTH	NOTES (WALL-GRADE - NEW OR USED)
			1" New				
1	4225		Shoe Joint				
			Grade B				
2	4302	8[illegible].27	Housing + extension				

CASING REPORT

AQUITAINE

Signature Tool Pusher: [illegible]

Signature Drilling Superintendent: [illegible]

Documents Attached: Csg Inventory; [illegible]

Well: Jupiter 1 ST

Rig: [illegible]

Heightable: [illegible]

ϕ 30"

Shoe 723'

Date: Sept 22/23

CASING DESIGN

No	THREAD	Grade	Coupling	Thickness	LENGTH Ft	"
1	Shoe Joint	B	St.	1"	42	25
1	Housing + extension	B		"	43	02

TOTAL: 85. 27

ABOVE TABLE: 624. 73

SHOE: 710. 00

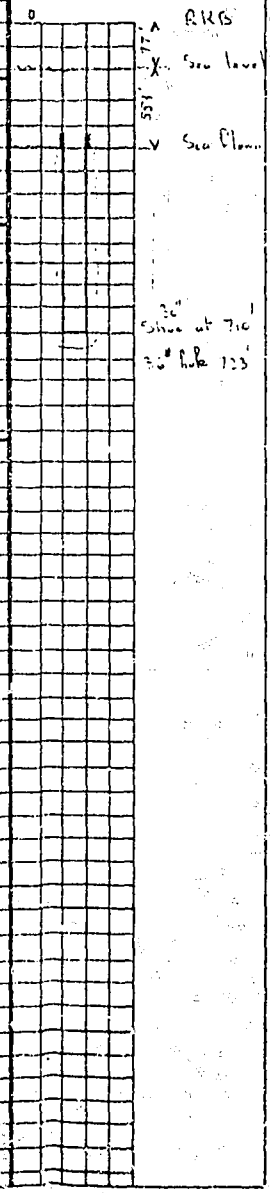
CHARACTERISTICS						Burst	WEIGHT		COLLAPSE				TENSION	
LENGTH		DEPTH FROM		TO		Wt					At Setting Depth			
Ft	"	Ft	"	Ft	"	lbs/Ft	Psi	Section	Cum.	Psi	Reduct Due To Tension	WT	SF	lbs	SF

OBJECT OF CASING: Surface Casing

ACCESSORIES

TYPE	Qty.	PLACE AND NOTES	TYPE	Qty.	PLACE AND NOTES

DRAWING



CASING

MUD CHARACTERISTICS: Drilling with sea water

WELD OR BAKER LOK: Squnch Joint "S"

MAKE UP TORQUE:

TYPE OF LUBRICANT:

FILL UP: With sea water

PUMP PRESSURE END OF JOB:

STATIC PRESSURE END OF JOB:

CEMENT TOP THEOR: Sea Bed

TEMP. SURVEY:

INSIDE CASING: 700'

HANGING: On temporary base

PRESSURE CASING TEST:

RECIPROCATING:

SLURRY WT: 15.2 / 15.7 VOL: 500 cu.ft.

TYPE OF CEMENT: Class H Qty: 500 sx

VOL. MUD BEHIND CEMENT: 20 bbls Sea water

Run casing with 6" stinger

Displaced slurry with 20 bbls Sea water

Cement additive: 3% CaCl2

HOUR	TIME	ORDER OF OPERATIONS
22/9 9:45	-	Resume 36" Drilling at 723'
		Spot 120 bbls of gel mud - Drop survey
		Short trip - Retrieve survey - Run back to
12:45	2:30	bottom. Spot 120 bbls of mud - P.O.H.
16:45	4:30	Run 30" casing
18:15	1:30	Cement job
		WOC. Pick up 9 1/2 DC - Run 26" Drilling assy
		Test all anchors up to 100 t - OK
23/9 8:00	2:30	Drilling out cement and shoe
10:30		Drilling 26" Hole

5112-2

PAGE ___ OF ___

BIT RECORD

AQUITAINE
COMPANY OF CANADA LTD.

WELL NAME Polar Bear C-11
LOCATION Hudson Bay
CONTRACTOR Sea and Land
RIG No. P 82
DATE SPUDDED September 22. 1974
DATE RIG RELEASED October 2, 1974 (Tow back to North Sea)

DRILL PIPE : SIZE O.D. 5" WT. 19.5 lbs. TYPE T.J. 4-1/2 IF FW
SIZE O.D. ____ WT. ____ TYPE T.J. ____
DRILL COLLARS : No. 8 O.D. 9-1/2 I.D. 3" TYPE T.J. ____
No. 13 O.D. 8-1/2 I.D. 3" TYPE T.J. ____
No. ____ O.D. ____ I.D. ____ TYPE T.J. ____
No. ____ O.D. ____ I.D. ____ TYPE T.J. ____

BIT NO.	SIZE	MAKE	TYPE	SERIAL NO.	NOZZLE SIZES	DEPTH OUT	FEET	HOURS	CUM. HOURS	NO. of D.C.'s	WT. 1000#	RPM	DULL COND T	DULL COND B	DULL COND G	REMARKS
R.R. 1	26	SMF	TS25	1815	Reg.	723	93	13:15	13:15	6	5/30	80/100	4	3	1	
	36	SEC	Hole	- Opener									2	2	1	
2	26	HTC	OSC	EM029	Reg.	1250	527	16:15	29:30	12	35	80/100	4	3	1	
3	17-1/2	HTC	OSC-3	CC500	20/32	1823	573	23:00	52:30	12	30/45	80/100	2	5	1	
4	17-1/2	HTC	OSC-3	CC499	20/32	2625	802	37:45	90:15	12	30/45	80/100	5	5	1	
5	17-1/2	SEC	M4N	527129	20/32	2792	167	8:00	98:15	18	55/68	90	5	3	1	
6	17-1/2	REED	Y13	809090	20/32	3105	313	13:30	111:45	18	45/50	90	6	4	1	
7	12-1/4	HTC	X1G	68674	14/32	3323	218	17:45	129:30	15	45/50	50/70	8	4	1/8	
8	12-1/4	REED	S62	714345	14/32	3707	384	40:00	169:30	18	50/70	40/45	4	5	1	
9	12-1/4	SEC	M88	527806	14/32	4370	663	67:00	236:30	18	75/80	40/45	1	6	1	
10	12-1/4	SEC	M88	528208	14/32	4780	410	46:00	282:30	18	75/80	40/45	1	7	1	
11	12-1/4	REED	S-62	713196	14/32	5170	390	39:00	321:30	18	75/80	40/45	8	6	1/8	

FORM 5113 - 1

BIT HYDRAULICS

AQUITAINE COMPANY OF CANADA LTD.

WELL NAME Polar Bear C-11
LOCATION Hudson Bay
CONTRACTOR Sea and Land
RIG No. P 82
DATE SPUDDED September 22, 1974
DATE RIG RELEASED October 2, 1974 (Tow back to North Sea)

PUMP No. 1 MAKE EMSCO - Triplex TYPE F 1600

PUMP No. 2 MAKE EMSCO - Triplex TYPE F 1600

BIT NO.	PUMP No.1 LINER	PUMP No.1 SPM	PUMP No.2 LINER	PUMP No.2 SPM	G.P.M.	PUMP PRESSURE	ANNULAR VELOCITY	MUD WT	MUD VIS.	MUD YP	MUD PV	HHP AT BIT	REMARKS
1	7"	75	7"	75	100/600	0/800		SEA WATER					Drilling with sea water - Mud plug every
2	7"	85	7"	85	1000	800/1700		SEA WATER					single to clean the hole (no returns)
3	7"	85	7"	85	1000	2400	100	8.6	46	12	10		" " " " " " "
4	7"	85	7"	85	1000	2700	100	9.5	44	14	11		
5	7"	85	7"	85	1000	2700	100	10.5	43	12	10		
6	7"	85	7"	85	1000	2900	100	10.7	43	14	11		
7	7"	/	7"	94	550	2100	115	10.2	40	16	10		
8	7"	/	7"	94	550	2300	115	10.9	35	10	10		
9	7"	/	7"	94	550	2200	115	9.7	32	8	4		
10	7"	/	7"	94	550	2200	115	10.2	34	8	4		
11	7"	/	7"	94	550	2300	115	10.2	35	9	6		

FORM 5162-1

DEVIATION SURVEY REPORT

AQUITAINE
COMPANY OF CANADA LTD

WELL NAME: Polar Bear C-11 LOCATION: Hudson Bay

DEPTH	DEVIATION	DEPTH	DEVIATION
723'	3/4°		
1,250'	1°		
1,810'	1/2°		
2,625'	0°		
3,100'	1/4°		
3,315'	1/2°		
3,700'	1/2°		
4,360'	1/2°		
4,775'	1/2°		
5,165'	1/4°		

AQUITAINE HUDSON BAY PROJECT

TECHNICAL SECTION

The accompanying Mud Summaries include the following for each respective well:

1. Individual mud checks.
2. Weekly summary, including comments from Mud Engineers.
3. Product consumption and cost summary for each well.

General Remarks

The original Drilling Mud Program as proposed by Craig Willis was basically followed, keeping the mud system quite simple and flexible.

The primary hole problem was intrusion from the calcium chloride water flows as were encountered during the drilling of Walrus in 1969. The drilling mud system was able to control the hole conditions. However, complete containment of the problem was not achieved.

Hole stability did not appear to be a problem and in all probability was due to the high chloride and calcium content throughout along with the special attention given to the hydraulics program.

On two occasions, during the drilling of the Polar Bear test, hole cleaning problems were encountered. The first section at approximately 1500 - 2000 feet when mud shale was encountered and again at about 3700 feet trying to drill with sea water. The system proved sufficiently flexible on both occasions to control the problem.

Further discussions are necessary for future planning on how best to contain the salt water flows. However, due to the high calcium chloride flows, a similar system would again be recommended.

DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC.
525 404 - 6th AVENUE S. W., CALGARY 1, ALBERTA

OILFIELD PRODUCTS DIVISION
SECURITY - BVACO - DUISERSON - MAGCOBAR

MUD SUMMARY

FOR

AQUITAINE ET AL POLAR BEAR 020

DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC.
525, 304 - 6th AVENUE S. W., CALGARY 1, ALBERTA

Magcobar CANADA
OILFIELD PRODUCTS DIVISION
SECURITY - BWACO - GUIBERSON - MAGCOBAR

LIST OF MUD COSTS FOR MUD USED RE AQUITAINE

POLAR BEAR 020

As taken from Weekly Well Summary

PRODUCT	PRODUCT USED	PRICE PER Sx	TOTAL AMOUNT
Magcobar	1208	6.23	7,525.84
Magcogel	977	5.85	5,715.45
Calcium Chloride	120	16.61	1,993.20
Spersene	16	20.16	322.56
Caustic Soda	258	14.23	3,671.34
Drispac	38	115.46	4,387.48
Kelzan XC	63	190.93	12,028.59
Magconol	55 gal	11.01	605.55
Salt	1750	5.19	9,082.50
Salt Gel	409	5.18	2,118.62
		TOTAL MUD COST	$47,451.13
		MUD ENGINEERING SERVICES	4,000.00
			$51.451.13

NOT LEGIBLE
ILLISIBLE

Magcobar

OILFIELD PRODUCTS DIVISION (SECURITY — SWACO — GUIBERSON — MAGCOBAR)

1–MAGCOBAR CALGARY OFFICE
2–MAGCOBAR CALGARY OFFICE
3–CUSTOMER COPY
4–MUD ENGINEER COPY

WEEKLY SUMMARY

Well Name & L.S.D. [illegible] Contractor [illegible] Page [illegible] of [illegible]

MUD PROPERTIES AND SUMMARY

Date	Depth	Mud Weight	Fun Vis.	V.G. Temp	App. Vis.	Plas. Vis.	Yield Pt.	Gels. 0	Gels. 10	W.L.	H.T. H.P. F.L.	M.B.T.	P.H.	Alkalinities PF	Alkalinities MF	CHL M	CAL. PPM	Percent Oil	Percent Solids	Sand Cont
Day No																				
Day No																				
Day No																				
Day No																				
[illegible] Day No	SETTING UP - CHECKING ANCHORS - PREMIXING MUD - CEMENT WATER																			
[illegible] Day No	Paying Anchors																			
[illegible] Day No	[illegible] [illegible]																			

WEEK ENDING: 21 SEP

MUD ENGINEER: Pellney

ACCUMULATIVE TRANS. TO DATE $ ____________

MATERIALS USED AND COSTS

	MAGCOBAR	MAGCOGEL	$CaCl_2$	Caustic	Estimated Daily Cost $	Estimated Accum. Cost $
Day 1						
Day 2						
Day 3						
Day 4						
Day 5		80	85		[illegible]	
Day 6						
Day 7		48		4	[illegible]	[illegible]
WEEK ENDING TOTALS		128	85	4	$	[illegible]
ACCUMULATED TOTALS						$

NOT LEGIBLE
ILLISIBLE

Magcobar CANADA

1–MAGCOBAR CALGARY OFFICE
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3–CUSTOMER COPY
4–MUD ENGINEER COPY

OILFIELD PRODUCTS DIVISION (SECURITY — SWACO — GUIBERSON — MAGCOBAR)

WEEKLY SUMMARY

Well Name & L.S.D. [illegible] ET AL POLAR BEAR 020 Contractor [illegible] Page [illegible] of [illegible]

MUD PROPERTIES AND SUMMARY

Date	Depth	Mud Weight	Fun Vis.	V.G. Temp	App. Vis.	Plas. Vis.	Yield Pt.	Gels 0	Gels 10	W.L.	H.T. H.P. F.L.	M.B.T.	P.H.	PF	MF	CHL M	CAL. PPM	Oil	Solids	Sand Cont
[illegible] Day No [illegible]	[illegible]	SET 90' 30" CASING – [illegible] 250 bbls																		
[illegible] Day No 3	[illegible]	DRILLING 27 1/2" HOLE – SEA WATER; PUMPING 10 bbls PER SINGLE																		
[illegible] Day No 4	[illegible]	[illegible]; RAN TO 1250 WITH 20" CASING AND CEMENT																		
[illegible] Day No [illegible]	[illegible]	[illegible].7	[illegible]	52	17	10	12	4	19	15		17.5	10.5	.2		34000	1200	0	3	0
[illegible] Day No [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	16	10	12	4	16	35		20[illegible]	11.0	.4		[illegible]	2000	0	4 1/4	
[illegible] Day No 7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6	14	26		[illegible]	11	.4		[illegible]	2200	0	[illegible] 1/4	
[illegible] Day No [illegible]	2350	9.9	43		17.5	8	19	5	14	28		25[illegible]	10.5	.3		50000	2600	0	[illegible]	0
	2500	9.6	42		19	10	18	4	13	33		258	10.0	.1		75000	2400	0	5 1/2	0
	[illegible]	[illegible]	[illegible]		[illegible]	11	[illegible]	[illegible]	17	41		[illegible]	11.0	.4		93000	2700	0	[illegible]	1/4

Remarks:
- Day 5: DRILLING – RED SHALE AND LIMESTONE – POSSIBLE SMALL STRINGERS SALT
- Day 6: DRILLING – TRIPPED HOLE GOOD NO FILL FIXED COMPENSATOR 12 hrs
- Day 7: DRILLING – HOLE TIGHT ON CONNECTIONS TILL RED SHALE DRILLED
- Day 8: DRILLING SALT STRINGERS IN THE LIMESTONE – 100 bags salt used for rig use.

MATERIALS USED AND COSTS

Day	Magcobar	Magcogel	CaCl2	Caustic	Drispac	[illegible] FC	[illegible]	Salt	Estimated Daily Cost $	Estimated Accum. Cost $
[illegible]		[illegible]		24					[illegible]	[illegible]
3		30		3[illegible]					[illegible]	[illegible]
4		24							[illegible]	2015.
[illegible]		107		18	8	9			3610.	[illegible]
[illegible]		20		10		6			1404.	7030.
7		20		8	[illegible]		55		1750.	[illegible]
[illegible]		44		16	3	5		100	2729	11913.
WEEK ENDING TOTALS		307		59	20	20	55	100		[illegible]
ACCUMULATED TOTALS		435	85	63	20	20	55	100	$	

WEEK ENDING: 2[illegible] [illegible]

MUD ENGINEERS: Kelley

ACCUMULATIVE TRANS. TO DATE $ ____________

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ILLISIBLE

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OILFIELD PRODUCTS DIVISION (SECURITY — SWACC — GUIBERSON — MAGCOBAR)

WEEKLY SUMMARY

Well Name & L.S.D. [illegible] POLAR [illegible] – 020 Contractor [illegible] #22 Page 3 of [illegible]

MUD PROPERTIES AND SUMMARY

Date	Depth	Mud Weight	Fun Vis.	V.G. Temp	App Vis.	Plas. Vis.	Yield Pt.	Gels 0	Gels 10	W.L.	H.T. H.P. F.L.	M.B.T.	P.H.	PF	MF	CHL M	CAL. PPM	Oil	Solids	Sand Cont
2 [illegible] Day No	[illegible]82	10.1	42	6[illegible]	16	8	10	5	14	50		20[illegible]	10.0	.3		100000	2600	0	9	1/
	2730	10.6	43	68	16	10	12	6	14	60		20[illegible]	10.5	.2		200000	2500	0	6	1/4
	DRILLING – [illegible] SALT TO SATURATE – WASH OUT IN PIPE [illegible] COLLAR [illegible] HOLE																			
[illegible] Day No	[illegible]	10.7	41	52	16	10	12	7	14	55			10.0	.2		315M	2900	0	6	0
	3105	10.8	43	53	18	11	12	7	14	60			10.5	.4		315M	2700	0	6	0
	TRIPPED [illegible] FOR COLLARS AND [illegible] SAME – HOLE APPEARS IN GOOD SHAPE – NO FILL IN BRIDGES – DRILLING SALT – GPM ON 17 [illegible] HOLE 1100																			
OCT Day No	3105	10.8	42	53	15	8	14	7	15	65			10.5	.4		315M	2700	0	6	0
	RUN LOGS HOLE GOOD – TRIPPED IN AND OUT PREPARE TO RUN 13 3/8" casing – MIXED UP GEL WATER FOR CEMENT – MIXED UP SLUG FOR TRIPS – MIXED UP SALT WATER FOR CEMENT																			
2 Day No	3105	10.8	41		15	10	10	5	10	70			10.5	.3		315M	2600	0	6	1/4
	RUN CASING – CEMENTING – CHANGE STACK – WOC																			
3 Day No	3105	10.8	41		15	10	10	5	14	75			10.5	.3		315M	2600	0	6	0
	DRILL OUT FLOAT AND SHOE – DRILL AHEAD																			
[illegible] Day No	3214	10.4	40		16	7	19	6	15	85			11.5	.8		290000	2600	0	4	1/
[illegible] Day No 1	3375	10.6	42		13	10	16	20	22	80			11.5	.8		280M	2600	–	7	1/
	CALCIUM CHLORIDE WATER, INFLUX AT 10BPH, BUILT 13 ppg STANDBY TANK Ca++ 10000 at 2000 hrs																			

MATERIALS USED AND COSTS 11,91[illegible]

Day	MAGCOBAR	MAGCOGEL	CaCl2	Caustic	Drispac	[illegible]	[illegible]	Salt	Salt Gel	Estimated Daily Cost $	Estimated Accum. Cost $
1		6		16		6		500		4418	16[illegible]
2				12				348	5	2235.	185[illegible]
3	08	60						420		3070.	216[illegible]
4	220 (FOR TRIPS MISSED IN TOUR BOOK									1360.	230[illegible]
5				8						110.	231[illegible]
6				6						[illegible]	232[illegible]
7	900	10 Sx spersene		16					3	6193	293[illegible]
WEEK ENDING TOTALS	1208	66	–	54	–	6	–	1358	80	$	293[illegible]
ACCUMULATED TOTALS	1208	501	85	117	20	26		5514[illegible]	80		$

WEEK ENDING: October 5, 1974

MUD ENGINEER: [illegible] ACCUMULATIVE TRANS. TO DATE $ ______

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Magcobar CANADA

OILFIELD PRODUCTS DIVISION (SECURITY — SWACO — GUIBERSON — MAGCOBAR)

WEEKLY SUMMARY

Well Name & L.S.D. [illegible]   Contractor [illegible]   Page [illegible] of [illegible]

MUD PROPERTIES AND SUMMARY

Date	Depth	Mud Weight	Fun Vis.	V.G. Temp	App. Vis.	Plas. Vis	Yield Pt.	Gels 0	Gels 10	W.L.	H.T. H.P. F.L.	M.B.T.	P.H.	Alkalinities PF	Alkalinities MF	CHL M	CAL. PPM	Percent Oil	Percent Solids	Sand Cont
[illegible] Day No 1	[illegible]	[illegible]	37		13	[illegible]	10	6	15	60			11	.2		272	24		8.0	1/
	DRILL - CaCl2 water flow at 8-10 bph. Trip (MIXED 20 bbl) [illegible]																			
[illegible] Day No [illegible]	[illegible]	11	30		15	10	10	4	20	72			11	.2		315	55M		3.0	1/
	DRILL - [illegible] SEA WATER (COULD NOT CLEAN HOLE) CUTTING MUD WEIGHT BACK TO (9.[illegible] [illegible] PREHYDRATED GEL)																			
[illegible] Day No [illegible]	[illegible]	9.[illegible]	3[illegible]		11.5	7	11	10	20	200			10	.2		198	37[illegible]		4.3	1/
[illegible] Day No [illegible]	[illegible]	[illegible]	36		7.5	4	7.[illegible]	5	12	80			10.5	.3		101	56M		4.5	1/
[illegible] Day No	[illegible]	10.[illegible]	32		7	5	4	2	2	80			10.5	.2		257	72		5	1/
	[illegible]	10.[illegible]	30		12	5	40	5	17	80			10.5	.2		205	72		5	1/
	[illegible] - DRILL																			
[illegible] Day No	[illegible]	10.2	37		10	6	8	4	10	80			10.5	.2		257	72		5	1/
[illegible] Day No	47[illegible]	10	26		8	4	7	4	10	80			10.5	.2		224	70		4	1/
	TRIP FOR BIT																			

MATERIALS USED AND COSTS

Day	MAGCOBAR	MAGCOGEL	CaCl2	Caustic	[illegible]	[illegible]	[illegible]	[illegible]	Estimated Daily Cost $	Estimated Accum. Cost $
1				10			58			
	[illegible] SEESPUT									
2		100		10	1		40		1200.	21[illegible].
3		124		16	8				2531.	2[illegible].
4		72		10	8			72	3156.	30170.
5							84		435.	2[illegible].
6				10					143.	30[illegible].
7				10			30		608.	37[illegible].
Week ending totals		296		80	17		2[illegible]	72	$	37[illegible].
Accumulated totals	1200	797	85	197	43	55	349	15[illegible]0	$	

WEEK ENDING: OCTOBER 12, 1974

MUD ENGINEER: D. Werth

ACCUMULATIVE TRANS. TO DATE'S ______

NOT LEGIBLE
ILLISIBLE

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OILFIELD PRODUCTS DIVISION (SECURITY — SWACO — GUIBERSON — MAGCOBAR)

WEEKLY SUMMARY

Well Name & L.S.D. [illegible] Contractor [illegible] Page [illegible] of [illegible]

MUD PROPERTIES AND SUMMARY

Date	Depth	Mud Weight	Fun Vis.	V.G. Temp	App. Vis.	Plas. Vis.	Yield Pt.	Gels 0	Gels 10	W.L.	H.T.H.P. F.L.	M.B.T.	P.H.	Alkalinities PF	Alkalinities MF	CHL M	CAL. PPM	Percent Oil	Percent Solids	Sand Cont.
Day No	[illegible]	[illegible]	[illegible]		15.5	8	15	7	10	70			10.5	.2		[illegible]	72		[illegible]	[illegible]
Day No.	5170	10.3	37		10.5	6	9	4	10	72			10.5	.2		264	75		5	1/
	5170	10.4	38		15.5	10	11	4	12	70			10.5	.2		255	75		6	1/
		[illegible]																		
Day No																				
Day No																				
Day No																				
Day No																				
Day No																				

MATERIALS USED AND COSTS

MAGCOBAR | MAGCOGEL | ... | Estimated Daily Cost $ | Estimated Accum. Cost $

76 16 10 [illegible]

64 45 10 20 60 220 35 — [illegible]

INVENTORY ADJUSTMENT FOR BROKEN [illegible]

WEEK ENDING: OCTOBER 19, 1974

WEEK ENDING TOTALS: 100 61 20 18 60 220 35 — $ [illegible]

MUD ENGINEER: D Worth

ACCUMULATIVE TRANS. TO DATE $ ____________

ACCUMULATED TOTALS: 1208 977 258 63 38 409 1750 120 — $

NOT LEGIBLE
ILLISIBLE

Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. I Date Wed 25

Well Name Pantenne tial Palae Base Legal Description 020

Company "Pantenne Contractor Pentagone

Report For Mr. PAJAK / Johnson Report For Mr. Mailbox

Address Rig Address Rig

Sample From: Pit ☐ Flow Line ☐ Flowline Temp ____ °F.	Mud Properties		Hole and Circulation Data		Swaco Equipment
Time Sample Taken	1730	1700	Spud Date 21 Sept		☐ D. Silter
Depth	1380	1510	Fill Last Trip No S.11 Ft.		☐ D. Sander
Weight Flow Line	9.6	9.7	Surface Casing 30 in. @ 725 Ft.		☐ Super Screen
Weight Suction	9.6	9.1	Intermediate Casing 20" in. @ 1250 Ft.		☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	45	46	Bit Type	Bit Size 17½ in.	☐ D. Gasser
V.G. Temp. Reading - ° F.	58	62	Mud in Hole 500 bbls.	Tanks 320 bbls.	☐ Adjustable Choke
Fann Viscosity (Cps.)	14.5	17	Total Mud in System 820 bbls.		☐ Super Choke
Plastic Viscosity (Cps.)	7	10	#1 Pump Size 7 x 12 in.	Strokes Min.	☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	15	12	#2 Pump Size x in.	Strokes Min. 27	☐ Trip Guard
Gel Strength (Initial)	3	4	Bbls./ Stroke	Output 27 Bbls. Min.	☐ P.V.T.
Gel Strength (10 Min.)	17	19	Mud Cycle 32 Min.		☐ Mud Weigher
API Water Loss (cc. in 30 min.)	20	16	Circulating BTM Up 18 Min.		☐ Flo-Sensor
Cake Thickness (32nds.)	2	2	Drill Pipe 5½ in.	Ann. Vel.	Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)	—	—	Drill Collar 9½ in.	Ann. Vel.	Ft./Min.
CEC (API Equiv. #/bbl. Bent.)	17.5	17.5	Drill Collar	in. Ann. Vel.	Ft./Min.
pH. Strip ☐ Beckman ☐	10.5	10.5	Circ. Pressure 2400 PSI	Hydrostatic Press	PSI
P. Alkalinity (Pf)	.1	.2	REMARKS – (Give operation, hole condition, and nature of any problems.)		
M. Alkalinity (Mf)	—	—	Drilling		
Salt ☑ PPM Chloride ☐ PPM	32,000	34,000			
Calcium PPM ☐	1100	1100	① possible salt stringer		
Oil Content (% by Vol.)	0	0			
Solids Content (% by Vol.)	3%	3%	② Bd Shale / Limestone		
Sand Content (% by Vol.)	0	¼			

SUGGESTIONS – (To be followed only if the operator deems advisable)

① Hold V.s 39-50 sec/qt

② Run 7" Drum Sea Water

③ Hi wt under 9.0 #/gal

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER Del Killam	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless

ILLISIBLE

Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 11 Date 26 Sept

Well Name Ipiatik Stat Palac Legal Description 020

Company Ipiatik Contractor Penlayne

Report For Mr. Lou Pagat / Johnson Report For Mr. C Matthews

Address R.S Address R.S

Sample From: Pit ☐ Flow Line ☐
Flowline Temp. ____ ° F.

Mud Properties			
Time Sample Taken	1:00		
Depth	1700		
Weight Flow Line	9.3		
Weight Suction	9.1		
Funnel Viscosity (Sec./Qt.)	40		
V.G. Temp. Reading - ° F.			
Fann Viscosity (Cps.)	16		
Plastic Viscosity (Cps.)	10		
Yield Point (lbs./100 Sq. Ft.)	12		
Gel Strength (Initial)	4		
Gel Strength (10 Min.)	7		
API Water Loss (cc. in 30 min.)	8.5		
Cake Thickness (32nds.)	2		
API HT-HP Fluid Loss (CC/30 min.)	—		
CEC (API Equiv. #/bbl. Bent.)	—		
pH. Strip ☐ Beckman ☐	11.0		
P. Alkalinity (Pf)	.4		
M. Alkalinity (Mf)	—		
Salt ☐ PPM Chloride ☑ PPM	53 000		
Calcium PPM ☐	400		
Oil Content (% by Vol.)	0		
Solids Content (% by Vol.)	4%		
Sand Content (% by Vol.)	—		

Hole and Circulation Data					
Spud Date	21 Sept.				
Fill Last Trip	No Fill	Ft.			
Surface Casing	30 In. @	725	Ft.		
Intermediate Casing	20" In. @	1225	Ft.		
Bit Type	Bit Size	17½	In.		
Mud in Hole	550 bbls. Tanks	350	bbls.		
Total Mud in System	900	bbls.			
#1 Pump Size x	In. Strokes Min.				
#2 Pump Size x	In. Strokes Min.				
Bbls./ Stroke	Output	.27	Bbls. Min.		
Mud Cycle	33	Min.			
Circulating BTM Up	24 300	Min.			
Drill Pipe	5½	In.	Ann. Vel.	100	Ft./Min.
Drill Collar	9½	In.	Ann. Vel.	135	Ft./Min.
Drill Collar		In.	Ann. Vel.		Ft./Min.
Circ. Pressure	2400	PSI	Hydrostatic Press	380	PSI

REMARKS – (Give operation, hole condition, and nature of any problems.)

Swaco Equipment	
☐	D. Silter
☐	D. Sander
☐	Super Screen
☐	Centrifuge
☐	D. Gasser
☐	Adjustable Choke
☐	Super Choke
☐	Monitor
☐	Trip Guard
☐	P.V.T.
☐	Mud Weigher
☐	Flo-Sensor

SUGGESTIONS – (To be followed only if the operator deems advisable.)

1) Hold Wt 9.3 on Less

2) Vis 40-50 on Gel

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC shall not be liable for any damage resulting from same and it is to be held harmless

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 12 Date 27

Well Name Northern Ethel Pool Legal Description 020

Company Pentagone Contractor Pentagone

Report For Mr. Jim Paisley/Stan Johnson Report For Mr. C. Malbrec.

Address R.D. Address R.D.

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ ° F.

Mud Properties			Hole and Circulation Data			Swaco Equipment
Time Sample Taken	3:00		Spud Date 21 Sept			☐ D. Silter
Depth	1200		Fill Last Trip No. 11	Ft.		☐ D. Sander
Weight Flow Line	9.5		Surface Casing 20 In. @ 725'	Ft.		☐ Super Screen
Weight Suction	9.5		Intermediate Casing 20 In. @ 1225	Ft.		☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	43		Bit Type	Bit Size 17 1/2	In.	☐ D. Gasser
V.G. Temp. Reading - ° F.	81		Mud in Hole 625 bbls.	Tanks 350	bbls.	☐ Adjustable Choke
Fann Viscosity (Cps.)	18		Total Mud in System 975	bbls.		☐ Super Choke
Plastic Viscosity (Cps.)	10		#1 Pump Size 7 x 12 In.	Strokes Min.		☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	16		#2 Pump Size 7 x 12 In.	Strokes Min.		☐ Trip Guard
Gel Strength (Initial)	6		Bbls./ Stroke	Output 26	Bbls. Min.	☐ P.V.T.
Gel Strength (10 Min.)	10		Mud Cycle 38	Min.		☐ Mud Weigher
API Water Loss (cc. in 30 min.)	9.6		Circulating BTM Up 29	Min.		☐ Flo-Sensor
Cake Thickness (32nds.)	2		Drill Pipe 5 1/2	In.	Ann. Vel. 100	Ft./Min.
API HT HP Fluid Loss (CC/30 min.)	—		Drill Collar 9 1/2	In.	Ann. Vel. 130	Ft./Min.
CEC (API Equiv. #/bbl. Bent.)	24		Drill Collar	In.	Ann. Vel.	Ft./Min.
pH. Strip ☐ Beckman ☐	11		Circ. Pressure 2700	PSI	Hydrostatic Press 990	PSI
P. Alkalinity (Pf)	.4		REMARKS – (Give operation, hole condition, and nature of any problems.)			
M. Alkalinity (Mf)	—		Drilling hole was			
Salt ☐ PPM Chloride ☐ PPM	43,000		Tight on connection cleaned			
Calcium PPM ☐	2,000		up when drilling into shale.			
Oil Content (% by Vol.)	0					
Solids Content (% by Vol.)	6%					
Sand Content (% by Vol.)	Trace					

SUGGESTIONS – (To be followed only if the operator deems advisable.)

(1) Hold Vis 45-55 sec/qt

(2) Run Desilters to hold Wt.

(3) Run 9 x 2, 2" stream sea water

(4) Add 4 bags Caustic Soda.

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER Dick Gilbert	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

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Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION ISECURITY • SWACO • GUIBERSON • MAGCOBARI

CHECK No. ____ Date Sept 29/82

Well Name Provost et Hardisty C20 Legal Description ____

Company Mobil ____ Contractor Loffland Bros 82

Report For Mr. Lovell & Mr. Johnson Report For Mr. C. MacLeod

Address ____ Address Rig

Sample From: Pit ☐ Flow Line ☐ Flowline Temp ____ °F.	Mud Properties			Hole and Circulation Data				Swaco Equipment
Time Sample Taken				Spud Date				☐ D. Silro
Depth	2250	2900	2972	Fill Last Trip		Ft.		☐ D. Sander
Weight Flow Line	9.0	9.1	10	Surface Casing	In. @	Ft.		☐ Super Screen
Weight Suction	9.0	9.1	10	Intermediate Casing	In. @	Ft.		☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	45	42	44	Bit Type	Bit Size	In.		☐ D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole	bbls. Tanks	bbls.		☐ Adjustable Choke
Fann Viscosity (Cps.)	18	15	18	Total Mud in System		bbls.		☐ Super Choke
Plastic Viscosity (Cps.)	8	10	11	#1 Pump Size x	Strokes In. Min.			☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	10	18	14	#2 Pump Size x	Strokes In. Min.			☐ Trip Guard
Gel Strength (Initial)	4	4	5	Bbls./ Stroke	Output	Bbls. Min.		☐ P.V.T.
Gel Strength (10 Min.)	11	12	13	Mud Cycle		Min.		☐ Mud Weigher
API Water Loss (cc. in 30 min.)	28	23	21	Circulating BTM Up		Min.		☐ Flo-Sensor
Cake Thickness (2nds.)				Drill Pipe	In.	Ann. Vel.		Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar	In.	Ann. Vel.		Ft./Min.
CEC (API Equiv. #/bbl. Bent.)	25	25	25	Drill Collar	In.	Ann. Vel.		Ft./Min.
pH. Strip ☐ Beckman ☐	10.5	10	10	Circ. Pressure	PSI	Hydrostatic Press		PSI
P. Alkalinity (Pf)	.3	.1	.2	REMARKS – (Give operation, hole condition, and nature of any problems.)				
M. Alkalinity (Mf)				Drill Soft Stringers				
Salt ☐ PPM Chloride ☒ PPM	5600	7300	8200					
Calcium PPM ☒	2200	Nil	2200					
Oil Content (% by Vol.)								
Solids Content (% by Vol.)	6	5.5	7					
Sand Content (% by Vol.)	0	0	1/2					

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOSAR ENGINEER D. Kellaway	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless.

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Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 5

Date [illegible]

Well Name [illegible]	Legal Description
Company [illegible]	Contractor [illegible] 82.
Report For Mr. [illegible] Stan Johnson	Report For Mr. C. [illegible]
Address [illegible]	Address [illegible]

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ___ °F.	Mud Properties		
Time Sample Taken			
Depth	2362	2050	
Weight Flow Line	10.1	10.6	
Weight Suction	10.1	10.5	
Funnel Viscosity (Sec./Qt.)	42	63.	
V.G. Temp. Reading - °F.			
Fann Viscosity (Cps.)	16	16	
Plastic Viscosity (Cps.)	8	10	
Yield Point (lbs./100 Sq. Ft.)	16	12	
Gel Strength (Initial)	5	4	
Gel Strength (10 Min.)	14	12	
API Water Loss (cc. in 30 min.)	30	100	
Cake Thickness (32nds.)	2	2	
API HT-HP Fluid Loss (CC/30 min.)			
CEC (API Equiv. #/bbl. Bent.)	20	20	
pH. Strip ☑ Beckman ☐	10	10.5	
P. Alkalinity (Pf)	.3	2	
M. Alkalinity (Mf)			
Salt ☐ PPM Chloride ☑ PPM	[illegible]	[illegible]	
Calcium PPM ☑	[illegible]	2570	
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	8	6	
Sand Content (% by Vol.)	1/4	1/4	

Hole and Circulation Data				Swaco Equipment
Spud Date				☐ D. Silter
Fill Last Trip			Ft.	☐ D. Sander
Surface Casing	In. @		Ft.	☐ Super Screen
Intermediate Casing	In. @		Ft.	☐ Centrifuge
Bit Type	Bit Size		In.	☐ D. Gasser
Mud in Hole	bbls. Tanks		bbls.	☐ Adjustable Choke
Total Mud in System			bbls.	☐ Super Choke
#1 Pump Size	x In.	Strokes Min.		☐ Monitor
#2 Pump Size	x In.	Strokes Min.		☐ Trip Guard
Bbls./Stroke	Output		Bbls. Min.	☐ P.V.T.
Mud Cycle			Min.	☐ Mud Weigher
Circulating BTM Up			Min.	☐ Flo-Sensor
Drill Pipe	In.	Ann. Vel.	Ft./Min.	
Drill Collar	In.	Ann. Vel.	Ft./Min.	
Drill Collar	In.	Ann. Vel.	Ft./Min.	
Circ. Pressure	PSI	Hydrostatic Press	PSI	

REMARKS — (Give operation, hole condition, and nature of any problems.)

Drilling
Adding salt to saturate system

wash out in string, left Drill collars in hole.

SUGGESTIONS — (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Kolleen	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

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Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 62

Date Sept 30/74

Well Name [illegible]

Legal Description

Company [illegible]

Contractor [illegible] 82

Report For Mr. [illegible]

Report For Mr. C. [illegible]

Address [illegible]

Address [illegible]

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ °F.	Mud Properties		
Time Sample Taken			
Depth	1850	2105	
Weight Flow Line	10.2	10.0	
Weight Suction	10.2	10.0	
Funnel Viscosity (Sec./Qt.)	37	42	
V.G. Temp. Reading - °F.			
Fann Viscosity (Cps.)	16	18	
Plastic Viscosity (Cps.)	10	11	
Yield Point (lbs./100 Sq. Ft.)	12	12	
Gel Strength (Initial)	7	7	
Gel Strength (10 Min.)	14	16	
API Water Loss (cc. in 30 min.)	50	60	
Cake Thickness (32nds.)			
API HT-HP Fluid Loss (CC/30 min.)			
CEC (API Equiv. #/bbl. Bent.)	25	20	
pH. Strip ☑ Beckman ☐	10	10.5	
P. Alkalinity (Pf)	.2	.4	
M. Alkalinity (Mf)			
Salt ☑ PPM Chloride ☐ PPM	315M	315M	
Calcium PPM ☑	2000	2700	
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	6	6	
Sand Content (% by Vol.)	0	0	

Hole and Circulation Data		Swaco Equipment
Spud Date		☐ D. Silter
Fill Last Trip	Ft.	☐ D. Sander
Surface Casing In. @	Ft.	☐ Super Screen
Intermediate Casing In. @	Ft.	☐ Centrifuge
Bit Type — Bit Size	In.	☐ D. Gasser
Mud in Hole bbls. Tanks	bbls.	☐ Adjustable Choke
Total Mud in System	bbls.	☐ Super Choke
#1 Pump Size x In. Strokes Min.		☐ Monitor
#2 Pump Size x In. Strokes Min.		☐ Trip Guard
Bbls./Stroke Output 76.2	Bbls. Min.	☐ P.V.T.
Mud Cycle	Min.	☐ Mud Weigher
Circulating BTM Up	Min.	☐ Flo-Sensor

Drill Pipe	In.	Ann. Vel.	Ft./Min.
Drill Collar	In.	Ann. Vel.	Ft./Min.
Drill Collar	In.	Ann. Vel.	Ft./Min.
Circ. Pressure	PSI	Hydrostatic Press	PSI

REMARKS – (Give operation, hole condition, and nature of any problems.)

Recover Drill collars.
Drilling salt

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Kelsey	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

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Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 7 Date Oct 17th

Well Name Louisiane d'Estrie Sec Legal Description

Company Pontaine Contractor Pontaine 32

Report For Mr. Jean Paul Shallenger Report For Mr C. Wallace

Address Ki. Address Ki.

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ___ ° F.	Mud Properties			Hole and Circulation Data				Swaco Equipment	
Time Sample Taken				Spud Date				☐	D. Silter
Depth	5105			Fill Last Trip			Ft.	☐	D. Sander
Weight Flow Line	10.6			Surface Casing	In. @		Ft.	☐	Super Screen
Weight Suction	10.5			Intermediate Casing	In. @		Ft.	☐	Centrifuge
Funnel Viscosity (Sec./Qt.)	52			Bit Type	Bit Size		In.	☐	D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole	bbls. Tanks		bbls.	☐	Adjustable Choke
Fann Viscosity (Cps.)	15			Total Mud in System			bbls.	☐	Super Choke
Plastic Viscosity (Cps.)	3			#1 Pump Size	x In.	Strokes Min.		☐	Monitor
Yield Point (lbs./100 Sq. Ft.)	12			#2 Pump Size	x In.	Strokes Min.		☐	Trip Guard
Gel Strength (Initial)	4			Bbls./ Stroke	Output		Bbls. Min.	☐	P.V.T.
Gel Strength (10 Min.)	15			Mud Cycle			Min.	☐	Mud Weigher
API Water Loss (cc. in 30 min.)	6.5			Circulating BTM Up			Min.	☐	Flo-Sensor
Cake Thickness (32nds.)				Drill Pipe	In.	Ann. Vel.			Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar	In.	Ann. Vel.			Ft./Min.
CEC (API Equiv. #/bbl. Bent.)				Drill Collar	In.	Ann. Vel.			Ft./Min.
pH. Strip ☐ Beckman ☐	10.5			Circ Pressure	PSI	Hydrostatic Press			PSI
P. Alkalinity (Pf)	.3			REMARKS – (Give operation, hole condition, and nature of any problems.)					
M. Alkalinity (Mf)				Log. Run in hole good. Trip out. Rig to run 13 3/8 casing					
Salt ☐ PPM Chloride ☐ PPM	3150								
Calcium PPM ☐	2400								
Oil Content (% by Vol.)									
Solids Content (% by Vol.)	10								
Sand Content (% by Vol.)	–								

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Kallsen	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless

Magcobar — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 8 Date Oct 7

Well Name Hudson and Tolar Dear — Legal Description —

Company Pembina — Contractor Parlex one 82

Report For Mr. Kaufman & Shoultzman — Report For Mr. C. Millard

Address K. — Address K.

Sample From: Pit — Flow Line —
Flowline Temp. ____ ° F.

Mud Properties			
Time Sample Taken			
Depth	3165		
Weight Flow Line	11.9		
Weight Suction	12.0		
Funnel Viscosity (Sec./Qt.)	41		
V.G. Temp. Reading ° F.			
Fann Viscosity (Cps.)	15		
Plastic Viscosity (Cps.)	10		
Yield Point (lbs./100 Sq. Ft.)	10		
Gel Strength (Initial)	5		
Gel Strength (10 Min.)	11		
API Water Loss (cc. in 30 min.)	7.0		
Cake Thickness (32nds.)	2		
API HT-HP Fluid Loss (CC/30 min.)			
CEC (API Equiv. #/bbl. Bent.)			
pH: Strip ☑ Beckman ☐	10.5		
P. Alkalinity (Pf)	.3		
M. Alkalinity (Mf)			
Salt ☐ PPM Chloride ☐ PPM	53% M		
Calcium PPM ☐	2500		
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	6		
Sand Content (% by Vol.)	TR		

Hole and Circulation Data			
Spud Date			
Fill Last Trip		Ft.	
Surface Casing	In. @	Ft.	
Intermediate Casing	In. @	Ft.	
Bit Type	Bit Size	In.	
Mud in Hole	bbls. Tanks	bbls.	
Total Mud in System		bbls.	
#1 Pump Size	x In. Strokes Min.		
#2 Pump Size	x In. Strokes Min.		
Bbls / Stroke	Output	Bbls. Min.	
Mud Cycle		Min.	
Circulating BTM Up		Min.	
Drill Pipe	In.	Ann. Vel.	Ft./Min.
Drill Collar	In.	Ann. Vel.	Ft./Min.
Drill Collar	In.	Ann. Vel.	Ft./Min.
Circ. Pressure	PSI	Hydrostatic Press	PSI

Swaco Equipment	
☐	D. Sifter
☐	D. Sander
☐	Super Screen
☐	Centrifuge
☐	D. Gasser
☐	Adjustable Choke
☐	Super Choke
☐	Monitor
☐	Trip Guard
☐	P.V.T.
☐	Mud Weigher
☐	Flo-Sensor

REMARKS – (Give operation, hole condition, and nature of any problems.)

Run Csg; Cement Change Stacks.

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER Kellam	
ADDRESS	PHONE	ADDRESS	PHONE / MOBILE

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Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 9 Date Oct 3.

Well Name Hardigan Gal Fed. Boar Legal Description

Company Hyperlatic Contractor Fontaine 67.

Report For Mr. Tom Fogarty Stan Johnston Report For Mr. C. Fitzpatrick.

Address Kin Address King.

Sample From: Pit ... Flow Line ... Flowline Temp ____ °F.	Mud Properties			Hole and Circulation Data				Sweco Equipment
Time Sample Taken				Spud Date				☐ D. Silter
Depth	3105			Fill Last Trip			Ft.	☐ D. Sander
Weight Flow Line	10.0			Surface Casing	In. @		Ft.	☐ Super Screen
Weight Suction	10.2			Intermediate Casing	In. @		Ft.	☐ Centrifuge
Funn. Viscosity (Sec./Qt.)	41			Bit Type	Bit Size		In.	☐ D. Gasser
°F. Temp. Reading				Mud in Hole	bbls. Tanks		bbls.	☐ Adjustable Choke
Fann Viscosity (Cps.)	15			Total Mud in System			bbls.	☐ Super Choke
Plastic Viscosity (Cps.)	10			#1 Pump Size	x In.	Strokes Min.		☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	10			#2 Pump Size	x In.	Strokes Min.		☐ Trip Guard
Gel Strength (Initial)	5			Bbls./ Stroke	Output		Bbls. Min.	☐ P.V.T.
Gel Strength (10 Min.)	14			Mud Cycle			Min.	☐ Mud Weigher
API Water Loss (cc. in 30 min.)	7.5			Circulating BTM Up			Min.	☐ Flo-Sensor
Cake Thickness (32nds.)	2			Drill Pipe	In.	Ann. Vel.		Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar	In.	Ann. Vel.		Ft./Min.
CEC (API Equiv. #/bbl. Bent.)				Drill Collar	In.	Ann. Vel.		Ft./Min.
pH: Strip ☐ Beckman ☐	10.5			Circ. Pressure	PSI	Hydrostatic Press		PSI
P. Alkalinity (Pf)	.3			REMARKS – (Give operation, hole condition, and nature of any problems.)				
M. Alkalinity (Mf)				Drill out Float & Shoe.				
Salt ☐ PPM Chloride ☐ PPM	31.5M							
Calcium PPM ☐	2500			Drill 12¼ hole.				
Oil Content (% by Vol.)								
Solids Content (% by Vol.)	6							
Sand Content (% by Vol.)								

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Kelley	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and the suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless.

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Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 10 Date Oct 4

Well Name Anticipated Total Depth — Legal Description

Company Aquitaine — Contractor Pantagone #2

Report For Mr. Lou Pagat Stan Johnson — Report For Mr. C. Malbeuf

Address Rig — Address Rig

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ ° F.	Mud Properties			Hole and Circulation Data				Swaco Equipment	
Time Sample Taken				Spud Date				☐	D. Silter
Depth	3214			Fill Last Trip			Ft.	☐	D. Sander
Weight Flow Line	10+			Surface Casing	In. @		Ft.	☐	Super Screen
Weight Suction	10+			Intermediate Casing	In. @		Ft.	☐	Centrifuge
Funnel Viscosity (Sec./Qt.)	40			Bit Type	Bit Size		In.	☐	D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole	bbls. Tanks		bbls.	☐	Adjustable Choke
Fann Viscosity (Cps.)	16			Total Mud in System			bbls.	☐	Super Choke
Plastic Viscosity (Cps.)	7			#1 Pump Size	x In.	Strokes Min.		☐	Monitor
Yield Point (lbs./100 Sq. Ft.)	19			#2 Pump Size	x In.	Strokes Min.		☐	Trip Guard
Gel Strength (Initial)	6			Bbls./ Stroke	Output		Bbls. Min.	☐	P.V.T.
Gel Strength (10 Min.)	14			Mud Cycle			Min.	☐	Mud Weigher
API Water Loss (cc. in 30 min.)	8.5			Circulating BTM Up			Min.	☐	Flo-Sensor
Cake Thickness (32nds.)				Drill Pipe	In.	Ann. Vel.			Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar	In.	Ann. Vel.			Ft./Min.
CEC (API Equiv. #/bbl. Bent.)				Drill Collar	In.	Ann. Vel.			Ft./Min.
pH. Strip ☐ Beckman ☐	11.5			Circ. Pressure	PSI	Hydrostatic Press			PSI
P. Alkalinity (Pf)	.8			REMARKS – (Give operation, hole condition, and nature of any problems.)					
M. Alkalinity (Mf)				Drill 12¼ hole.					
Salt ☐ PPM Chloride ☐ PPM	2900 M								
Calcium PPM ☐	2000								
Oil Content (% by Vol.)									
Solids Content (% by Vol.)	4								
Sand Content (% by Vol.)	1/4								

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Kallsen	
ADDRESS	PHONE	ADDRESS	PHONE / MOBILE

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Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 11 Date Oct 5

Well Name Hamilton et al Tolar Fee. Legal Description

Company Aquitaine Contractor Pantasonic #2.

Report For Mr. Lee Kirk Stan Johnson. Report For Mr. C. Mathes.

Address Rig Address Rig

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ °F.

Mud Properties			
Time Sample Taken	0500		
Depth	550'		
Weight Flow Line	10.6		
Weight Suction	10.5		
Funnel Viscosity (Sec./Qt.)	42		
V.G. Temp. Reading - ° F.			
Fann Viscosity (Cps.)	18		
Plastic Viscosity (Cps.)	10		
Yield Point (lbs./100 Sq. Ft.)	16		
Gel Strength (Initial)	20		
Gel Strength (10 Min.)	28		
API Water Loss (cc. in 30 min.)	30		
Cake Thickness (32nds.)	3		
API HT-HP Fluid Loss (CC/30 min.)			
CEC (API Equiv. #/bbl. Bent.)			
pH, Strip ☐ Beckman ☐	11.5		
P. Alkalinity (Pf)	.8		
M. Alkalinity (Mf)			
Salt ☐ PPM Chloride ☐ PPM	3200		
Calcium PPM ☐	2000		
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	7		
Sand Content (% by Vol.)	1/2		

Hole and Circulation Data				Swaco Equipment
Spud Date				☐ D. Silter
Fill Last Trip			Ft	☐ D. Sander
Surface Casing	In. @		Ft.	☐ Super Screen
Intermediate Casing	In. @		Ft.	☐ Centrifuge
Bit Type	Bit Size	12 1/4	In.	☐ D. Gasser
Mud in Hole	bbls. Tanks		bbls.	☐ Adjustable Choke
Total Mud in System			bbls.	☐ Super Choke
#1 Pump Size x	Strokes In. Min.			☐ Monitor
#2 Pump Size x	Strokes In. Min.			☐ Trip Guard
Bbls./ Stroke	Output		Bbls. Min.	☐ P.V.T.
Mud Cycle			Min.	☐ Mud Weigher
Circulating BTM Up			Min.	☐ Flo-Sensor
Drill Pipe	In.	Ann. Vel.		Ft./Min.
Drill Collar	In.	Ann. Vel.		Ft./Min.
Drill Collar	In.	Ann. Vel.		Ft./Min.
Circ. Pressure	PSI	Hydrostatic Press		PSI

REMARKS – (Give operation, hole condition, and nature of any problems.)

Drill 12 1/4 hole.

Calcium Chloride water influx ± 10 BpH. Built 13ppg Standby pit.

SUGGESTIONS – (To be followed only if the operator deems advisable.) Cu++ 19000 @ 20:00 hrs

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. McGrath	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

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Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 12 Date Oct 6

Well Name Pembina Cardium Pool	Legal Description
Company Pembina	Contractor Pembina 92.
Report For Mr. Lou Kyle, Stan Johnson	Report For Mr. C. Holbrook
Address Km	Address Km

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ °F.	Mud Properties
Time Sample Taken	0730
Depth	3620
Weight Flow Line	10.7
Weight Suction	10.7
Funnel Viscosity (Sec./Qt.)	37
V.G. Temp. Reading - ° F.	
Fann Viscosity (Cps.)	11
Plastic Viscosity (Cps.)	6
Yield Point (lbs./100 Sq. Ft.)	10
Gel Strength (Initial)	6
Gel Strength (10 Min.)	15
API Water Loss (cc. in 30 min.)	8.0
Cake Thickness (32nds.)	3
API HT-HP Fluid Loss (CC/30 min.)	
CEC (API Equiv. #/bbl. Bent.)	
pH. Strip ☐ Beckman ☐	11
P. Alkalinity (Pf)	.4
M. Alkalinity (Mf)	
Salt ☐ PPM Chloride ☐ PPM	272
Calcium PPM ☐	24
Oil Content (% by Vol.)	
Solids Content (% by Vol.)	8.8
Sand Content (% by Vol.)	1/2

Hole and Circulation Data				Swaco Equipment
Spud Date				☐ D. Silter
Fill Last Trip			Ft.	☐ D. Sander
Surface Casing	In. @		Ft.	☐ Super Screen
Intermediate Casing	In. @		Ft.	☐ Centrifuge
Bit Type	Bit Size 12 1/4		In.	☐ D. Gasser
Mud in Hole	bbls. Tanks		bbls.	☐ Adjustable Choke
Total Mud in System			bbls.	☐ Super Choke
#1 Pump Size 7	x 12 In. Strokes Min. 98			☐ Monitor
#2 Pump Size	x In. Strokes Min.			☐ Trip Guard
Bbls./ Stroke	Output 14		Bbls. Min.	☐ P.V.T.
Mud Cycle			Min.	☐ Mud Weigher
Circulating BTM Up			Min.	☐ Flo-Sensor
Drill Pipe	In.	Ann. Vel.	115	Ft./Min.
Drill Collar	In.	Ann. Vel.	185	Ft./Min.
Drill Collar	In.	Ann. Vel.	241	Ft./Min.
Circ. Pressure 2400	PSI	Hydrostatic Press		PSI

REMARKS – (Give operation, hole condition, and nature of any problems.)

Drill Calc water flow 6-10 Bp.

Trip for bit flowed 26 bbl on trip

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Smith	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless.

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Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 13. Date Oct 7

Well Name Equitiman Gal Boat Sand — Legal Description

Company Equitiman — Contractor Penbogone 82.

Report For Mr. Lou Wright Stan Johnson. — Report For Mr. C. Halbert.

Address Rig — Address Rig

Sample From: Pit ☐ Flow Line ☐
Flowline Temp. _____ ° F.

Mud Properties		Hole and Circulation Data		Swaco Equipment
Time Sample Taken	0800	Spud Date		☐ D. Silter
Depth	3926	Fill Last Trip Ft.		☐ D. Sander
Weight Flow Line	11	Surface Casing In. @ Ft.		☐ Super Screen
Weight Suction	11	Intermediate Casing In. @ Ft.		☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	39	Bit Type	Bit Size 12 1/4 In.	☐ D. Gasser
V.G. Temp. Reading ° F.		Mud in Hole bbls.	Tanks bbls.	☐ Adjustable Choke
Fann Viscosity (Cps.)	15	Total Mud in System bbls.		☐ Super Choke
Plastic Viscosity (Cps.)	10	#1 Pump Size 7 x 12 In.	Strokes Min. 90	☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	10	#2 Pump Size x In.	Strokes Min.	☐ Trip Guard
Gel Strength (Initial)	9	Bbls./ Stroke	Output 10 Bbls. Min.	☐ P.V.T.
Gel Strength (10 Min.)	20	Mud Cycle Min.		☐ Mud Weigher
API Water Loss (cc. in 30 min.)	30	Circulating BTM Up Min.		☐ Flo Sensor
Cake Thickness (32nds.)	3	Drill Pipe In.	Ann. Vel.	Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)		Drill Collar In.	Ann. Vel.	Ft./Min.
CEC (API Equiv. #/bbl. Bent.)		Drill Collar In.	Ann. Vel.	Ft./Min.
pH. Strip ☐ Beckman ☐	10	Circ. Pressure PSI	Hydrostatic Press	PSI
P. Alkalinity (Pf)	.2	REMARKS – (Give operation, hole condition, and nature of any problems.)		
M. Alkalinity (Mf)		Drill. Displace hole to Sea water.		
Salt ☐ PPM Chloride ☐ PPM	31,500	but wouldn't clean hole.		
Calcium PPM ☐	550	Cutting mud wt back to 9.5 ppg.		
Oil Content (% by Vol.)				
Solids Content (% by Vol.)	3.8			
Sand Content (% by Vol.)	1/2	Adding pre hydrated gel.		

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Worth.	
ADDRESS	PHONE	ADDRESS	PHONE / MOBILE

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 14 Date [illegible]

Well Name [illegible] Legal Description [illegible]

Company [illegible] Contractor [illegible]

Report For Mr. [illegible] Report For Mr. [illegible]

Address [illegible] Address [illegible]

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ ° F.	Mud Properties		
Time Sample Taken	[illegible]		
Depth	[illegible]		
Weight Flow Line	[illegible]		
Weight Suction	[illegible]		
Funnel Viscosity (Sec./Qt.)	[illegible]		
V.G. Temp. Reading - ° F.			
Fann Viscosity (Cps.)	[illegible]		
Plastic Viscosity (Cps.)	[illegible]		
Yield Point (lbs./100 Sq. Ft.)	[illegible]		
Gel Strength (Initial)	[illegible]		
Gel Strength (10 Min.)	[illegible]		
API Water Loss (cc. in 30 min.)	[illegible]		
Cake Thickness (32nds.)	[illegible]		
API HT-HP Fluid Loss (CC/30 min.)			
CEC (API Equiv. #/bbl. Bent.)			
pH. Strip ☑ Beckman ☐	[illegible]		
P. Alkalinity (Pf)	[illegible]		
M. Alkalinity (Mf)			
Salt ☑ PPM Chloride ☐ PPM	[illegible]		
Calcium PPM ☑	[illegible]		
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	[illegible]		
Sand Content (% by Vol.)	[illegible]		

Hole and Circulation Data				Swaco Equipment
Spud Date				☐ D. Silter
Fill Last Trip			Ft.	☐ D. Sander
Surface Casing	20	In. @ [illegible]	Ft.	☐ Super Screen
Intermediate Casing	[illegible]	In. @ [illegible]	Ft.	☐ Centrifuge
Bit Type	Bit Size 12¼		In.	☐ D. Gasser
Mud in Hole [illegible] bbls.	Tanks [illegible]		bbls.	☐ Adjustable Choke
Total Mud in System	[illegible]		bbls.	☐ Super Choke
#1 Pump Size 7	x 12 In.	Strokes Min. 92		☐ Monitor
#2 Pump Size 7	x 12 In.	Strokes Min.		☐ Trip Guard
Bbls./ Stroke .143	Output 14.01		Bbls. Min.	☐ P.V.T.
Mud Cycle	75		Min.	☐ Mud Weigher
Circulating BTM Up	50.		Min.	☐ Flo-Sensor
Drill Pipe	5"	In.	Ann. Vel. 115	Ft./Min.
Drill Collar	8½	In.	Ann. Vel. 135	Ft./Min.
Drill Collar	9½	In.	Ann. Vel. 241	Ft./Min.
Circ. Pressure [illegible]	PSI	Hydrostatic Press [illegible]		PSI

REMARKS – (Give operation, hole condition, and nature of any problems.)

Drill 12¼ hole. Run 2% Starch
& Sea water & Rosing pre hydrated
gel to Hold wt 9-6-10 ppg
Vis 35-40.

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. McFall	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

ILLISIBLE

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 15 Date January 3/74

Well Name St Lucie et al Joint Ext No 1-20 Legal Description Ex 247 W 55 291

Company Pacific Petroleums Contractor Kenting

Report For Mr. Sanderson Report For Mr. Claude Wilson

Address Calgary Address Calgary

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ ° F.	Mud Properties			Hole and Circulation Data		Swaco Equipment
Time Sample Taken	0215			Spud Date		☐ D. Silter
Depth	11198			Fill Last Trip Ft.		☐ D. Sander
Weight Flow Line	9.9			Surface Casing 13 3/8 In. @ 3091 Ft.		☐ Super Screen
Weight Suction	9.4			Intermediate Casing In. @ Ft.		☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	36			Bit Type Bit Size 12 1/4 In.		☐ D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole 700 bbls. Tanks 350 bbls.		☐ Adjustable Choke
Fann Viscosity (Cps.)	21.5			Total Mud in System 1050 bbls.		☐ Super Choke
Plastic Viscosity (Cps.)	4			#1 Pump Size 7 x 12 In. Strokes Min. 98		☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	7			#2 Pump Size 7 x 12 In. Strokes Min.		☐ Trip Guard
Gel Strength (Initial)	5			Bbls./ Stroke .103 Output 14 Bbls. Min.		☐ P.V.T.
Gel Strength (10 Min.)	12			Mud Cycle 75 Min.		☐ Mud Weigher
API Water Loss (cc. in 30 min.)	2½			Circulating BTM Up 50 Min.		☐ Flo-Sensor
Cake Thickness (32nds.)	2			Drill Pipe 5 In. Ann. Vel. 115 Ft./Min.		
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar 9½ In. Ann. Vel. 125 Ft./Min.		
CEC (API Equiv. #/bbl. Bent.)				Drill Collar 9½ In. Ann. Vel. 221 Ft./Min.		
pH. Strip ☐ Beckman ☐	10.5			Circ. Pressure 2250 PSI Hydrostatic Press 2750 PSI		
P. Alkalinity (Pf)	.3			REMARKS – (Give operation, hole condition, and nature of any problems.)		
M. Alkalinity (Mf)				Drilling 12 1/4"		
Salt ☐ PPM Chloride ☐ PPM	1200					
Calcium PPM ☐	520					
Oil Content (% by Vol.)						
Solids Content (% by Vol.)	4.5					
Sand Content (% by Vol.)	½					

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER Dubrow	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 16 Date October 10/76

Well Name Lynx Imperial et al Lynx Beaverhill Lake O-20 Legal Description 56°41' N 118°20' W

Company Lynx Petroleum Consolidated Contractor Precision #2

Report For Mr. Stan Johnston Report For Mr. Bruce Mackie

Address Lynx Address Lynx

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ °F.	Mud Properties			Hole and Circulation Data		Swaco Equipment
Time Sample Taken	15:00		10:00	Spud Date		☐ D. Silter
Depth	1585		1270	Fill Last Trip	nil Ft.	☐ D. Sander
Weight Flow Line	10.3		10.3	Surface Casing	13⅜ In. @ 500 Ft.	☐ Super Screen
Weight Suction	10.2+		10.2+	Intermediate Casing	In. @ Ft.	☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	51.5		53	Bit Type	Bit Size 12¼ In.	☐ D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole 725 bbls.	Tanks 400 bbls.	☐ Adjustable Choke
Fann Viscosity (Cps.)	7		12	Total Mud in System	1125 bbls.	☐ Super Choke
Plastic Viscosity (Cps.)	5		7	#1 Pump Size 7 x 12 In.	Strokes Min. 93	☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	4		10	#2 Pump Size 7 x 12 In.	Strokes Min.	☐ Trip Guard
Gel Strength (Initial)	2		5	Bbls./ Stroke .145 Output	14 Bbls. Min.	☐ P.V.T.
Gel Strength (10 Min.)	9		17	Mud Cycle	80 Min.	☐ Mud Weigher
API Water Loss (cc. in 30 min.)	30		30	Circulating BTM Up	45 Min.	☐ Flo-Sensor
Cake Thickness (32nds.)	2		2	Drill Pipe 5	In. Ann. Vel. 175	Ft./Min.
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar 8½	In. Ann. Vel. 185	Ft./Min.
CEC (API Equiv. #/bbl. Bent.)				Drill Collar 9½	In. Ann. Vel. 241	Ft./Min.
pH. Strip ☐ Beckman ☐	10.5		10.5	Circ. Pressure 2300	PSI Hydrostatic Press 1590	PSI
P. Alkalinity (Pf)	.2		.2	REMARKS – (Give operation, hole condition, and nature of any problems.)		
M. Alkalinity (Mf)				Top Joint Stuck (Electrofreed		
Salt ☐ PPM Chloride ☐ PPM	2357		2357	good on top)		
Calcium PPM ☐	72		72	Drilling 12¼" hole.		
Oil Content (% by Vol.)						
Solids Content (% by Vol.)	5		5			
Sand Content (% by Vol.)	Tr		1A			

SUGGESTIONS – (To be followed only if the operator deems advisable.) Adding Shale Gel & Bring Vis 38 to 40. Sec/Qt.

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 17 Date October 13/74

Well Name Lightning Lake Test #20 Legal Description 56°47' W 58°29' N

Company Lightning Lake Canada Contractor Pentagone #2

Report For Mr. Stuart Johnston Report For Mr. Claude Marois

Address Rig Address Rig

Sample From: Pit ☐ Flow Line ☐ Flowline Temp ____ °F.	Mud Properties			Hole and Circulation Data		Swaco Equipment	
Time Sample Taken	12:00			Spud Date		☐	D. Silter
Depth	4541			Fill Last Trip	Ft.	☐	D. Sander
Weight Flow Line	10.2			Surface Casing 13 3/8 In. @ 3081	Ft.	☐	Super Screen
Weight Suction	10.2			Intermediate Casing In. @	Ft.	☐	Centrifuge
Funnel Viscosity (Sec./Qt.)	37			Bit Type Bit Size 12 1/4	In.	☐	D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole 740 bbls. Tanks 400	bbls.	☐	Adjustable Choke
Fann Viscosity (Cps.)	10			Total Mud in System 1140	bbls.	☐	Super Choke
Plastic Viscosity (Cps.)	6			#1 Pump Size 7 x 12 In. Strokes Min. 90		☐	Monitor
Yield Point (lbs./100 Sq. Ft.)	3			#2 Pump Size 7 x 12 In. Strokes Min.		☐	Trip Guard
Gel Strength (Initial)	4			Bbls./ Stroke .113 Output 10	Bbls. Min.	☐	P.V.T.
Gel Strength (10 Min.)	10			Mud Cycle 92	Min.	☐	Mud Weigher
API Water Loss (cc. in 30 min.)	50			Circulating BTM Up 46	Min.	☐	Flo-Sensor
Cake Thickness (32nds.)	2			Drill Pipe 5 In. Ann. Vel. 115	Ft./Min.		
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar 8 1/2 In. Ann. Vel. 185	Ft./Min.		
CEC (API Equiv. #/bbl. Bent.)				Drill Collar 9 1/2 In. Ann. Vel. 241	Ft./Min.		
pH. Strip ☐ Beckman ☐	10.5			Circ. Pressure 2500 PSI Hydrostatic Press 2114	PSI		
P. Alkalinity (Pf)	.2			REMARKS – (Give operation, hole condition, and nature of any problems.)			
M. Alkalinity (Mf)				Drilling 12 1/4" Hole.			
Salt ☐ PPM Chloride ☐ PPM	2370						
Calcium PPM ☐	120						
Oil Content (% by Vol.)							
Solids Content (% by Vol.)	5						
Sand Content (% by Vol.)	Tr						

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER D. Merritt	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless.

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 10 Date 6 March 12/74

Well Name Dunvegan et al Fairview 02 Legal Description 55°47'24"/59°29'11"

Company Dunvegan N.G. Canada Ltd. Contractor Pantozone #2

Report For Mr. Earl Shelton Report For Mr. Chris Mawhinney

Address ~~Fairview~~ Address Fairview

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ ° F.	Mud Properties		
Time Sample Taken	1445		
Depth	7720		
Weight Flow Line	10.4		
Weight Suction	10.		
Funnel Viscosity (Sec./Qt.)	56		
V.G. Temp. Reading - ° F.			
Fann Viscosity (Cps.)	9		
Plastic Viscosity (Cps.)	4		
Yield Point (lbs./100 Sq. Ft.)	7		
Gel Strength (Initial)	6		
Gel Strength (10 Min.)	10		
API Water Loss (cc. in 30 min.)	20		
Cake Thickness (32nds.)	-		
API HT-HP Fluid Loss (CC/30 min.)			
GEC (API Equiv. #/bbl. Bent.)			
pH. Strip ☐ Beckman ☐	10.5		
P. Alkalinity (Pf)	2.2		
M. Alkalinity (Mf)			
Salt ☑ PPM Chloride ☐ PPM	2250		
Calcium PPM ☐	320		
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	4		
Sand Content (% by Vol.)	trace		

Hole and Circulation Data					Swaco Equipment
Spud Date					☐ D. Silter
Fill Last Trip				Ft.	☐ D. Sander
Surface Casing	13 3/8	In. @	3081.	Ft.	☐ Super Screen
Intermediate Casing		In. @		Ft.	☐ Centrifuge
Bit Type		Bit Size	12 1/4	In.	☐ D. Gasser
Mud in Hole	760 bbls.	Tanks	430	bbls.	☐ Adjustable Choke
Total Mud in System	1160			bbls.	☐ Super Choke
#1 Pump Size	7 x 12	In.	Strokes Min.		☐ Monitor
#2 Pump Size	7 x 12	In.	Strokes Min.	94	☐ Trip Guard
Bbls./ Stroke	.143	Output	13.2	Bbls. Min.	☐ P.V.T.
Mud Cycle	61			Min.	☐ Mud Weigher
Circulating BTM Up	43			Min.	☐ Flo-Sensor
Drill Pipe	5	In.	Ann. Vel.	110	Ft./Min.
Drill Collar	8 1/2	In.	Ann. Vel.	176	Ft./Min.
Drill Collar	9 1/2	In.	Ann. Vel.	230	Ft./Min.
Circ. Pressure	2200 PSI		Hydrostatic Press	2570	PSI

REMARKS — (Give operation, hole condition, and nature of any problems.)

Drlg to 12:15
Trip to 1930 (Hole OKay)
Drlg 12¼"

SUGGESTIONS — (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER	
ADDRESS	PHONE	ADDRESS	PHONE / MOBILE

NOT LEGIBLE
ILLISIBLE

Magcobar CANADA

FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 19

Date October 13/74

Well Name [illegible] Bear O 20

Legal Description 86°47'W 58°29'N.

Company [illegible] Co Can Ltd.

Contractor Pentagone 22

Report For Mr. [illegible] Johnston

Report For Mr. Claude [illegible]

Address [illegible]

Address [illegible]

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ °F.	Mud Properties		
Time Sample Taken	1300		
Depth	3310		
Weight Flow Line	10.2		
Weight Suction	10.2		
Funnel Viscosity (Sec./Qt.)	56		
V.G. Temp. Reading - °F.			
Fann Viscosity (Cps.)	13.5		
Plastic Viscosity (Cps.)	12		
Yield Point (lbs./100 Sq. Ft.)	15		
Gel Strength (Initial)	7		
Gel Strength (10 Min.)	14		
API Water Loss (cc. in 30 min.)	7.0		
Cake Thickness (32nds.)	2		
API HT-HP Fluid Loss (CC/30 min.)			
CEC (API Equiv. #/bbl. Bent.)			
pH. Strip ☑ Beckman ☐	10.5		
P. Alkalinity (Pf)	.3		
M. Alkalinity (Mf)			
Salt ☑ PPM Chloride ☐ PPM	[illegible]		
Calcium PPM ☐	[illegible]		
Oil Content (% by Vol.)			
Solids Content (% by Vol.)	[illegible]		
Sand Content (% by Vol.)	[illegible]		

Hole and Circulation Data				
Spud Date				
Fill Last Trip	— Ft.			
Surface Casing	13 3/8 In. @ 3081 Ft.			
Intermediate Casing	In. @ Ft.			
Bit Type	Bit Size 12 1/4 In.			
Mud in Hole	72.5 bbls.	Tanks 400 bbls.		
Total Mud in System	1155 bbls.			
#1 Pump Size	7 x 12 In.	Strokes Min.		
#2 Pump Size	7 x 12 In.	Strokes Min. 90		
Bbls./Stroke	.143	Output 13.1 Bbls. Min.		
Mud Cycle	88 Min.			
Circulating BTM Up	58. Min.			
Drill Pipe	5 In.	Ann. Vel.	110	Ft./Min.
Drill Collar	8 1/2 In.	Ann. Vel.	170	Ft./Min.
Drill Collar	9 1/2 In.	Ann. Vel.	230	Ft./Min.
Circ. Pressure	2100 PSI	Hydrostatic Press		PSI

Swaco Equipment
☐ D. Silter
☐ D. Sander
☐ Super Screen
☐ Centrifuge
☐ D. Gasser
☐ Adjustable Choke
☐ Super Choke
☐ Monitor
☐ Trip Guard
☐ P.V.T.
☐ Mud Weigher
☐ Flo-Sensor

REMARKS — (Give operation, hole condition, and nature of any problems.)

Drlg 12 1/4" hole.

Adding Prehydrated Gel, Kelzan & Drispac to increase YV.
Hole Appears to be Cleaning Better

SUGGESTIONS—(To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER	
		D. [illegible]	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

NOT ELIGIBLE

Magcobar CANADA — FIELD DRILLING MUD REPORT

OILFIELD PRODUCTS DIVISION (SECURITY • SWACO • GUIBERSON • MAGCOBAR)

CHECK No. 20 Date Dec 14/74

Well Name Fountain of al Four Bear 020 Legal Description E6°47 W1 58°29 W.

Company Fountain Oil Can Ltd. Contractor Pentagone 82

Report For Mr. Stan Johnston Report For Mr. Claude Mulligan

Address Rig Address Rig

Sample From: Pit ☐ Flow Line ☐ Flowline Temp. ____ ° F.	Mud Properties			Hole and Circulation Data		Swaco Equipment
Time Sample Taken	19:45	1200		Spud Date		☐ D. Silter
Depth	5160	5172		Fill Last Trip Ft.		☐ D. Sander
Weight Flow Line	10.3	10.4		Surface Casing 13 3/8 In. @ 3081 Ft.		☐ Super Screen
Weight Suction	10.2+	10.2		Intermediate Casing In. @ Ft.		☐ Centrifuge
Funnel Viscosity (Sec./Qt.)	37	38		Bit Type Bit Size 12 1/4 In.		☐ D. Gasser
V.G. Temp. Reading - ° F.				Mud in Hole 800 bbls. Tanks 450 bbls.		☐ Adjustable Choke
Fann Viscosity (Cps.)	19.5	15.5		Total Mud in System 1200 bbls.		☐ Super Choke
Plastic Viscosity (Cps.)	6	10		#1 Pump Size 7 x 12 In. Strokes Min.		☐ Monitor
Yield Point (lbs./100 Sq. Ft.)	9	11		#2 Pump Size 7 x 12 In. Strokes Min. 94		☐ Trip Guard
Gel Strength (Initial)	4	4		Bbls./ Stroke .143 Output 13.4 Bbls. Min.		☐ P.V.T.
Gel Strength (10 Min.)	10	12.		Mud Cycle 90 Min.		☐ Mud Weigher
API Water Loss (cc. in 30 min.)	7.2	7.0		Circulating BTM Up 70 Min.		☐ Flo-Sensor
Cake Thickness (32nds.)	2	2		Drill Pipe 5 In. Ann. Vel. 110 Ft./Min.		
API HT-HP Fluid Loss (CC/30 min.)				Drill Collar 8 1/2 In. Ann. Vel. 190 Ft./Min.		
CEC (API Equiv. #/bbl. Bent.)				Drill Collar 9 1/2 In. Ann. Vel. 230 Ft./Min.		
pH. Strip ☐ Beckman ☐	10.5	10.5		Circ. Pressure 2700 PSI Hydrostatic Press 7200. PSI		
P. Alkalinity (Pf)	2	.2		REMARKS – (Give operation, hole condition, and nature of any problems.)		
M. Alkalinity (Mf)				Drlg 12¼" Hole.		
Salt ☑ PPM Chloride ☐ PPM	2744	2755		Circulate Bottoms up, trip out		
Calcium PPM ☐	240	240		to Log.		
Oil Content (% by Vol.)						
Solids Content (% by Vol.)	5	6		Logging to 22:00		
Sand Content (% by Vol.)	1/4	1/4				

SUGGESTIONS – (To be followed only if the operator deems advisable.)

MAGCOBAR WAREHOUSE		MAGCOBAR ENGINEER Dwivedi	
ADDRESS	PHONE	ADDRESS	PHONE MOBILE

In consideration of the furnishing of this report and oral suggestions, it is agreed that DRESSER MAGCOBAR CANADA, DIVISION OF DRESSER INDUSTRIES INC. shall not be liable for any damage resulting from same and it is to be held harmless.

AQUITAINE COMPANY
OF CANADA LTD.

FISHING OPERATION REPORT

Aquit et al Polar Bear C-11

During the drilling of the Polar Bear C-11 well, only one fishing job was required, due to a twist-off in the flexweight drill pipes, used above the drill collars.

A bad Collar

A crack and the start of a washout was found in the box of the first 8-1/2" D.C., above the 9-1/2" D.C. Fortunately, this crack was discovered while running in to condition the hole for the 13-3/8" casing. The damaged drill collar was laid down before complete failure occurred.

The damage appeared to be due to fatigue failure on the last engaged thread, probably caused by high rotation in rough, hard drilling, with the drill collars not being stabilized.

Well Situation

Status: Drilling in 17-1/2" hole at 2,792'.

Drilling Assembly: Bit, (6) 9-1/2" D.C., (10) 8-1/2" D.C., 15 Flexweight (48#), 21 stands of 5" E-19.50 D.P.

As a loss of pump pressure was recorded, the driller stopped drilling, to make a quick pump check. As he could see no problem at the pumps, he decided to pull out. While the bit was 5 to 6 feet off bottom, the string parted. The failure was a twist-off in the female tool joint of a flexweight drill pipe.

Fishing Operation

An 11-3/4" OD Bowen Series 150P overshot, dressed with a 6-1/2" basket grapple and an oversize guide for the 17-1/2" hole, was run to catch the fish. Eight hours later, the fish was laid down on the floor.

AQUITAINE COMPANY
OF CANADA LTD.

LOST CIRCULATION AND GAIN ZONES

Aquit et al Polar Bear C-11

Lost Circulation

No mud loss was recorded during the drilling of this well.

Gain

The first gain (20 bbls in 40 min.) was recorded at 3,470', in the Ekwan formation (dolomite), after a short drilling break (from 3,460' - 3,470' at 2 min/ft).

3,460' - 3,470':	20 bbls in 40 min. of $CaCl_2$ water
3,470' - 3,900':	steady gain of 15 bbls/hour
3,900' - 4,800':	steady gain of 10 - 15 bbls/hour
4,800' - 5,170':	steady gain of 10 bbls/hour

Remarks: Varied mud weights seemed to have no apparent effect on the influx rate of the $CaCl_2$ water. At 3,804', an attempt to increase the penetration rate was made, by replacing the 11.1 ppg drilling mud with sea water. This was not very successful as the flow remained at 10 -15 bbls/hour.

AQUITAINE COMPANY
OF CANADA LTD.

ABANDONMENT REPORT

Aquit et al Polar Bear C-11

Well Situation

30" casing shoe at 723'
20" casing shoe at 1,227'
13-3/8" casing shoe at 3,081'
T.D. 12-1/4" hole at 5,170'

Plugging

A 3 stage continuous cement plug was run, to cover all open parts of the hole. A bridge plug was set in the 13-3/8" casing, for additional safety before setting the top cement plug.

First Stage

5,170' - 4,370' (800'): 425 sx of Oilwell Class B cement + 10% pre-hydrated gel. Slurry weight 12.3.

Second Stage

4,370' - 3,570' (800'): 425 sx of Oilwell Calss B cement + 10% pre-hydrated gel. Slurry weight 12.3.

Third Stage

3,570' - 2,770' (800'): 375 sx of Oilwell Class B cement + 10% pre-hydrated gel. Slurry weight 12.3.

Bridge Plug

A 13-3/8" Mercury Model K bridge plug was run with the drill pipes and set at 2,450'.

Top of Cement Plug

980' - 680': 252 sx of Oilwell Class B cement + 3% $CaCl_2$.

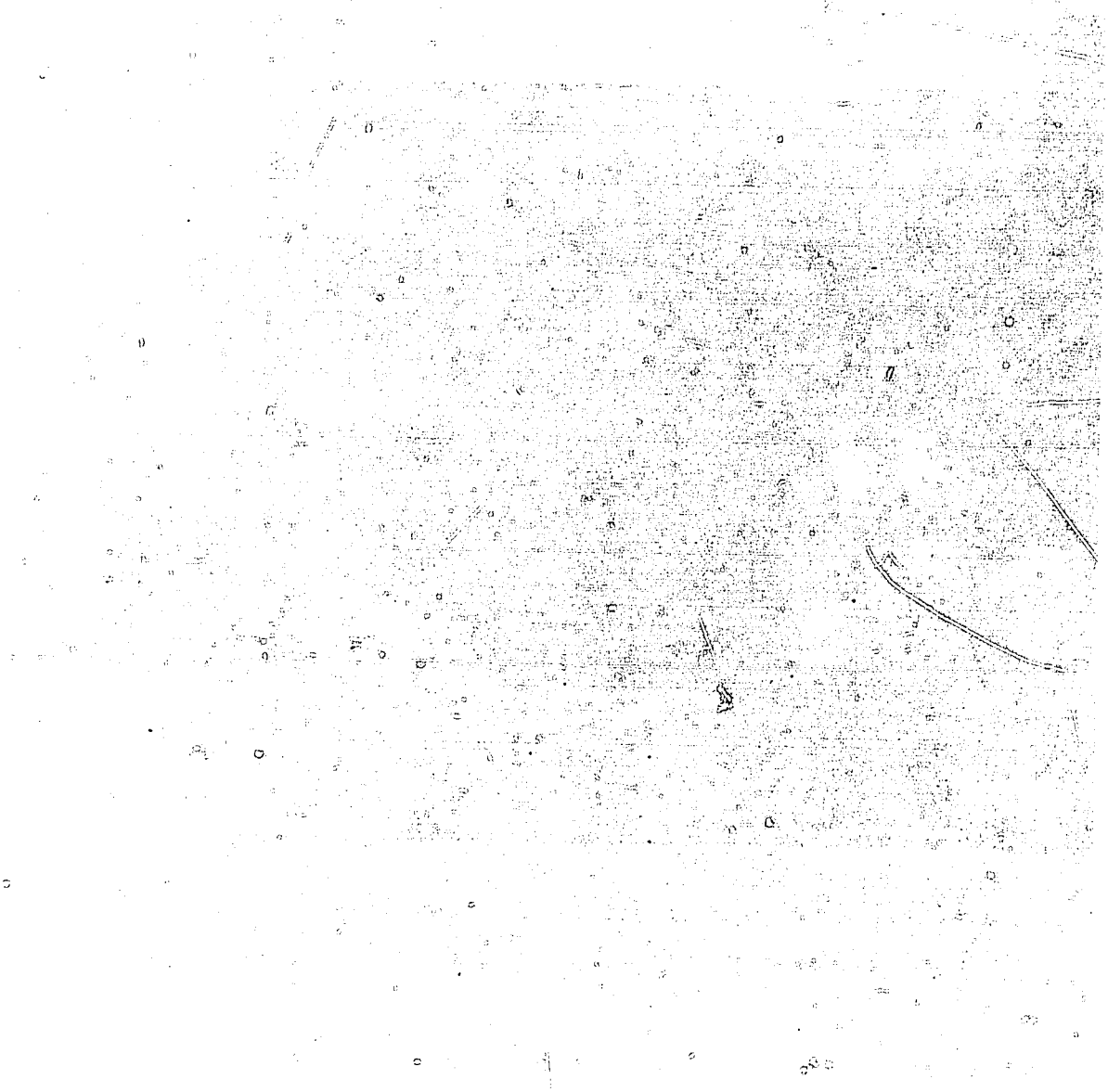
Wellhead Recovery

As the time limit for the rig to leave the Hudson Bay was very close, and the weather was rapidly getting worse, a decision was made (with the agreement of EMR) to leave the two guide bases on the sea floor.

The 16" riser and 13-5/8" BOP stack were pulled out, following the standard procedure.

Timing

A total of 52.45 hours were spent from the time the drill pipes were run in the hole to plug, until the 13-5/8" BOP stack was secured on the spider deck.



AQUITAINE COMPANY
OF CANADA LTD.

TIME ANALYSIS

Aquit et al Polar Bear C-11

1.	Rigging Up and Tearing Down:	105.00 hrs	13.73%
2.	Drilling:	322.45 hrs	42.20%
3.	Re-drilling:	0.30 hrs	0.06%
4.	Drilling Trip:	45.30 hrs	5.95%
5.	Hole Opening:	Nil	
6.	Coring:	Nil	
7.	Coring Trip:	Nil	
8.	Testing:	Nil	
9.	Miscellaneous Operations:	48.15 hrs	6.30%
10.	Well Completion:	Nil	
11.	Casing:	122.15 hrs	15.99%
12.	Circulation:	7.15 hrs	0.95%
13.	Fishing Job:	8.30 hrs	1.11%
14.	Abandon:	52.45 hrs	6.90%
15.	Repairs:	18.30 hrs	2.42%
16.	Waiting Time:	33.30 hrs	4.38%
	Total:	764.45 hrs	

AQUITAINE COMPANY
OF CANADA LTD.

TIME ANALYSIS

Aquit et al Polar Bear C-11

1. Rigging Up and Tearing Down

105.00 hours or 13.73% of total time. A lot of time was lost due to rough weather and problems in getting the anchors to hold. 21 hours were spent waiting for the anchors to settle and 2 x 20,000# piggy-back anchors were used on anchor-lines D1 and D2.

Time was also lost on retrieving the anchors due to rough sea conditions and the fact that the job was done mainly by one supply vessel. (The anchor winch of the Federal 6 was unserviceable and the tow line of the Supreme Tide was attached to the rig from the beginning of retrieving the anchors.)

2. Drilling

322.45 hours or 42.20% of the total time.

Average drilling rate 5,170'/322.45 = 16.02'/hour on all diameters.

The heavy $CaCl_2$ water (11.5 ppg) flowing into the well and keeping the mud weight over 10 ppg, impaired the penetration rate. An attempt to drill with only sea water (9.5 ppg) increased the drilling rate from 4'/hr to 18'/hr. Unfortunately, we were obliged to return to the original mud due to hole cleaning problems.

3. Re-drilling

0.30 hours or 0.06% for checking the hole.

4. Drilling Trip

45.30 hours for 11 bits.

This performance was better than that of Narwhal South. The floormen were becoming a little more experienced.

5. Hole Opening

None

6. Coring

None

7. Coring Trip

None

8. Testing

None

9. Miscellaneous Operations

48.15 hours or 6.30% of total time for electrical surveys, velocity survey and 10 deviation surveys.

10. Well Completion

None

11. Casing

122.15 hours or 15.99% of total time for 20", 30" and 13-3/8" casings. Same as for "Drilling Trip", the performance was better than that of Narwhal South.

7.30 hours were lost cutting and re-welding a new type "L" modified buttress box coupling on the 20" shoe joint, to replace a faulty machined coupling.

12. Circulation

7.15 hours or 0.95%.

The circulations were reduced to their minimum as the hole conditions were very good at all times.

13. Fishing Job

8.30 hours or 1.11% of total time was spent in recovering the drilling bottom assembly after a twist-off occurred in the flexweight drill pipes, just above the drill collars.

14. Abandon

52.45 hours or 6.90% of total time.

This time was spent plugging the well, laying down drill pipes and drill collars and in recovering the riser and BOP stack.

15. Repairs

18.30 hours or 2.42%, divided as follows:

- 2.45 for repair on slip joint (leak at the packing);
- 11.45 for repair on motion compensator (leak at the lower piston rod);
- 1.30 for change of the injection wellhead wash pipe packing;
- 2.30 for rig power failure.

16. Waiting Time

33.30 hours or 4.38% of total time was spent waiting on weather, during retrieving of the anchors (sea was too rough for the supply boats working on the anchors).

The rig performance was excellent.

WELL HISTORY

GEOLOGICAL PART

POLAR BEAR C-11

1. PROGNOSIS AND PROGRAM *see confidential section*
2. DRILLING TICKET
   SAMPLE DESCRIPTION
3. DAILY GEOLOGICAL REPORTS
4. WATER ANALYSIS
5. LOGGING
   - logging record
   - log evaluation
   - logs in pocket
     - composite wellsite log (Ex-logging)
     - pressure log (Ex-logging)
     - off-line utilities (2 scales)
     - interpretative log
     - DLL
     - HDT
     - BHC Sonic - GR
     - FDC/CNL - GR
     - formation tester (FIT)
     - porosity analysis - Coriband

1. PROGNOSIS AND PROGRAM

2. DRILLING TICKET

SAMPLE DESCRIPTION

AQUITAINE — DRILLING TICKET

WELL NAME: POLAR BEAR C-11

RIG	CO-ORDINATES	TIMING	CASING	LOGS
P-82	X 58°30' 08.37"	Commenced Sept 21/74	ø 30" at 710'	DLL 1245 - 5156
GEOLOGIST	Y 86°47' 13.15"	Temporary Halt	ø 20" at 1227'	Sonic-GR 1100 - 5166
B. Tillement	Z	Resumption of Drilling	ø 13 3/8" at 3081'	FDC CNI 500 - 5167
A. Pochitaloff	Z KB 77 A.M.S.L	Temporary Halt -	ø at	HDT 1245 - 5165
	Hudson Bay	Resumption of Drilling	ø at	
Brought up to date on	PROVINCE	Completed Oct. 14/74		
November 1974	Federal waters			

SCALE 1" = 500' or 1/6,000

AGE	Formation	DEPTH	LOG	CORE	DIP	Porosity TYPE	Porosity GRADE	SHOW-TEST	GAIN AND LOSS	LITHOLOGY
	WATER	500								
	WATER	630								Mud Line
?	?	1000								No samples
?	?	1250								Halite, calcareous clay, gypsum and anhydrite, limestone
MIDDLE DEVONIAN	UN. C	1440								1440
MIDDLE DEVONIAN	UNIT B	1500								Intercalations of: - limestone, pink, white buff, red brown, tight - gypsum, enhydrite - red claystone
MIDDLE DEVONIAN	UNIT B	1730								1730 Limestone, buff - pink, bioclastic, tight, rarely slight porous
MIDDLE DEVONIAN	UNIT A	1970								1970
MIDDLE DEVONIAN	UNIT A	2000								Red-brown claystone
MIDDLE DEVONIAN	UNIT A	2320								2320
MIDDLE DEVONIAN	KENOG	2500								Red-brown dolomite and halite 2465 Limestone, dolo. limestone, cream, buff, microx, cryptox, slightly bituminous, tight 2728 Halite
MIDDLE DEVONIAN	UPPER KENOG	3000				micro vugs				3070
SILURIAN	EKWAN	3070								Dolomite, white, pink, beige, microx to cryptox, local sucrosic, hard, tight
SILURIAN	EKWAN	3490							gain	3490
SILURIAN	EKWAN	3500						Very slight gas background	Cl_2Ca water 20 bb/h	Limestone, grey, brown, microx or cryptox, tight, hard
SILURIAN	SEVERN	3900						3900 Small gas kick $C_1/C_2 = 30$		
SILURIAN	SEVERN	4000								Layer of anhydrite
SILURIAN	SEVERN	4303						AT 4200 I FIT : NO FLOW NO PRESSURE		4303
ORDOVIC.	RED HEAD	4500								Halite, enhydrite, Dolomitic limestone, tan to brown microx
ORDOVIC.	RED HEAD	4591								4591
ORDOVIC.	CHURCHILL	4906						Very slight gas background		Limestone, buff, brown, microx, tight
ORDOVIC.	CHURCHILL	5000								5906 Limestone, beige, brown, whitish, microx, cryptox, tight
ORDOVIC.	Basal Carbonates	5122								5122 Shale and sand
PRECAMBRIAN	Basal Clastics	5138	T.D. 5170'							5138 Granite
PRECAMBRIAN	Basal Clastics	5500								

Steady gain 15-30 bb/hour

inter cryst. — no significant interval — ZONE

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 1

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
						70%
1250	1260					Brick red brown, silty to sandy, plastic, slightly calcareous clay traces of gypsiferous silica (chert) 30% cement
1260	1270					60% red brown clay, traces of gypsum - chert 40% cement
1270	1280					50% clay as above, brick red brown orange, locally yellow 50% cement
1280	1295					80% clay, brick red brown; gypsiferous chert 20% cement
1295	1310					85% clay as above; traces gypsum 15% cement
1310	1325					85% clay, brick red traces of gypsum 15% cement
1325	1340					85% clay as above (locally yellow) 15% cement, concretion chert (rare)
1340	1355					100% clay as above gypsum (trace) concretion chert (rare)
1355	1370					80% clay, sandy or silty, brick red 20% gypsum or anhydrite and chert
1370	1385					80% clay, calcareous or micrite, argillaceous, red brown sandy or silty, hard, occasionally soft 20% gypsum
1385	1400					70% micrite, argillaceous, red brown, silty, hard 30% gypsum or anhydrite
1400	1410					90% micrite, argillaceous as above 10% gypsum
1410	1420					90% micrite, argillaceous as above 10% fibrous gypsum
1420	1430					90% micrite, argillaceous as above 10% gypsum
1430	1440					100% micrite, argillaceous as above gypsum (traces)
1440	1450					50% limestone, white, buff, micrite, hard, slightly porous 50% micrite, argillaceous as above traces gypsum
1450	1460					80% limestone, white, buff as above 20% micrite, argillaceous, red

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 2

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1460	1470					90% limestone (4 types) 10% micrite, argillaceous, red 1. Limestone: white, buff, micrite, hard, slightly porous 2. Limestone: rose, purple, argillaceous, hard, silty 3. Limestone: yellow (traces) 4. Limestone: very argillaceous, red brown, silty or sandy, slightly porous
1470	1480					20% anhydrite (white) microcrystalline 80% limestone as above (4 types)
1480	1490					Limestone, white, buff, predominantly micrite
1490	1500					Limestone as above, predominantly white
1500	1510					80% predominantly limestone, argillaceous, rose purple, hard, silty, white 20% gypsum or anhydrite
1510	1520					Limestone as above, predominantly rose, purple
1520	1530					80% limestone, argillaceous, dominantly purple 20% anhydrite
1530	1540					as above
1540	1550					90% limestone, dominantly white, buff, (micrite) compact; abundant purple limestone 10% gypsum
1550	1560					90% limestone, white and purple 10% gypsum
1560	1570					Limestone as above traces of gypsum
1570	1580					90% limestone, argillaceous, purple, locally breccia (dominant) 10% clay, brick red, silty
1580	1590					Limestone, white, dominantly purple 10% clay, brick red (sandy or silty) traces anhydrite
1590	1600					Dominantly limestone as above traces anhydrite
1600	1610					70% limestone 20% anhydrite 10% brick red clay
1610	1620					Limestone white, dominantly purple 30% anhydrite
1620	1630					as above, white often purple 20% anhydrite - gypsum

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 3

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1630	1640					Limestone, dominantly purple salt casts
1640	1650					40% anhydrite 60% limestone, white or purple, dominantly argillaceous concretion brick red, porous (salt?)
1650	1660					80% limestone, as above, white or purple, argillaceous 20% anhydrite
1660	1670					Limestone, white, buff, dominantly dolomitic traces of brick red clay 20% anhydrite
1670	1680					10% anhydrite, as above abundant aggregates (porous)
1680	1690					as above - brick red clay (traces) 10% anhydrite
1690	1700					50% white anhydrite limestone, white, cream, red brown plus dolomitic; limestone m. brown, micritic, tight
1700	1705					50% anhydrite 50% limestone as above
1705	1710					20% anhydrite 80% limestone, white-rose or red brown, dolomitic, micrite, compact
1710	1715					10% anhydrite 90% limestone as above, white and red brown
1715	1720					20% anhydrite 80% limestone, dominantly red brown, occasionally calcite veining
1720	1725					10% anhydrite 90% limestone
1725	1730					100% limestone, white rose or red brown fossils
1730	1740					Limestone, argillaceous, red brown, soft
1740	1745					Limestone, white rose, red brown, compact, occasionally silty 10% anhydrite
1745	1750					Limestone as above fossils
1750	1760					100% limestone, white rose or red brown, micrite, compact slightly argillaceous or silty, fossils traces anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 4

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION
1760	1770					as above, fossils vuggy dolomite, abundant
1770	1780					100% limestone as above traces of brick red clay gastropods, fossils
1780	1790					limestone, white, buff, micrite, locally porous vuggy dolomite (rare) traces of brick red clay, partly plastic
1790	1800					Limestone, white, buff, micrite, locally slightly porous (partly plastic) fossils traces of limestone, rose or red brown aggregates (rare) traces of brick red clay
1800	1810					Limestone, dominantly white, buff Limestone, rose, yellow or red brown aggregates (rare) traces of red clay (partly plastic 10%) crinoids
1810	1815					as above (limestone, dominantly white plus limestone, color varicolored) fossils
1815	1820					as above 80% Limestone dominantly white limestone color-different traces of brick red clay (20%) partly plastic Change bit
1820	1830					80% limestone, white, buff as above fossils - crinoids abundant concretions of brick red clay (20%)
1830	1840					80% limestone, white - rose, micrite, compact (partly plastic)
1840	1845					Limestone, white-rose as above traces brick red clay fossils
1845	1850					as above
1850	1855					limestone, white-rose, micritic, bioclastic, hard, tight bioclastic - abundant fossils concretion (claystone) traces porosity, silty, calcareous, soft traces of brick red clay

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION — Sheet No. 5

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1855	1860					as above
1860	1870					80% limestone as above 20% concretions, brick red clay and gypsum
1870	1875					as above
1875	1880					70% limestone 30% concretions and claystone - brick red, slightly silty, calcareous, soft (gypsum)
1880	1890					70% limestone 30% concretions, claystone
1890	1895					as above
1895	1900					80% limestone, rose 20% concretions, claystone (brick red)
1900	1910					as above
1910	1915					as above traces anhydrite fossils
1915	1920					as above
1920	1925					as above
1925	1930					80% limestone 20% claystone, slightly silty, calcareous, brown or red, bioclastic, micritic, white-rose, hard, tight
1930	1960					as above
1960	1970					70% limestone 20% claystone 10% grey yellow, siliceous; limestone friable, micritic yellow, argillaceous content
1970	1980					40% limestone, rose 40% siliceous limestone 20% claystone
1980	1990					50% partly plastic, red brown, slightly calcareous, silty 10% limestone as above 40% limestone, siliceous
1990	2320					Claystone, brown red, occasionally mauve, very soft, slightly calcareous, very silty, plastic; crinoids
2320	2330					40% claystone as above 60% dolomite, red brown, occasionally purple, buff, cream grey, brown, micritic, medium hard, tight; traces of dolomite cryptoxln, cream

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 6

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2330	2335					40% Claystone 60% dolomite
2335	2340					20% claystone 80% dolomite
2340	2350					40% claystone 60% dolomite
2350	2360					70% claystone 30% dolomite
2360	2370					60% claystone 40% dolomite
2370	2375					20% claystone 10% dolomite (red brown, cream, buff) 70% anhydrite, white, light grey
2375	2380					40% claystone 10% dolomite 50% anhydrite
2380	2390					30% claystone 30% dolomite 40% anhydrite
2390	2400					50% claystone 10% dolomite 40% anhydrite SALT FROM 2380' - 2465'
2400	2410					40% claystone 20% dolomite 40% anhydrite
2410	2420					as above
2420	2430					30% claystone 30% dolomite 40% anhydrite
2430	2440					30% claystone 30% dolomite 30% anhydrite 10% traces limestone, white, cream, fiable
2440	2450					30% claystone 30% dolomite traces shale, green-grey, soft, no. cal. 40% anhydrite
2450	2460					20% claystone 10% shale 40% dolomite, predominantly buff, beige 30% anhydrite crinoids, coral

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

WELL HISTORY

GEOLOGICAL PART

POLAR BEAR C-11

1. PROGNOSIS AND PROGRAM *see confidential section*
2. DRILLING TICKET
   SAMPLE DESCRIPTION
3. DAILY GEOLOGICAL REPORTS
4. WATER ANALYSIS
5. LOGGING
   - logging record
   - log evaluation
   - logs in pocket
     - composite wellsite log (Ex-logging)
     - pressure log (Ex-logging)
     - off-line utilities (2 scales)
     - interpretative log
     - DLL
     - HDT
     - BHC Sonic - GR
     - FDC/CNL - GR
     - formation tester (FIT)
     - porosity analysis - Coriband

2. DRILLING TICKET

SAMPLE DESCRIPTION

2. DRILLING TICKET

SAMPLE DESCRIPTION

AQUITAINE — DRILLING TICKET

WELL NAME: POLAR BEAR C-11

RIG	CO-ORDINATES	TIMING	CASING	LOGS
P-82	X 58°30' 08.37"	Commenced Sept 21/74	ø 30" at 710'	DLL 1245 - 5156
GEOLOGIST	Y 86°47' 13.15"	Temporary Halt	ø 20" at 1227'	Sonic-GR 1100 - 5166
B. Tillement	Z	Resumption of Drilling	ø 13 3/8" at 3081'	FDC CNI 500 - 5167
A. Pochitaloff	Z KB 77 A.M.S.L	Temporary Halt -	ø at	HDT 1245 - 5165
	Hudson Bay	Resumption of Drilling	ø at	
Brought up to date on	PROVINCE	Completed Oct. 14/74		
November 1974	Federal waters			

SCALE 1" = 500' or 1/6,000

AGE	Formation	DEPTH	LOG	CORE	DIP	Porosity TYPE	Porosity GRADE	SHOW-TEST	GAIN AND LOSS	LITHOLOGY
	WATER	500								
	WATER	630								Mud Line
?	?	1000								No samples
?	?	1250								Halite, calcareous clay, gypsum and anhydrite, limestone
MIDDLE DEVONIAN	UN. C	1440								1440
MIDDLE DEVONIAN	UNIT B	1500								Intercalations of: - limestone, pink, white buff, red brown, tight - gypsum, enhydrite - red claystone
MIDDLE DEVONIAN	UNIT B	1730								1730 Limestone, buff - pink, bioclastic, tight, rarely slight porous
MIDDLE DEVONIAN	UNIT A	1970								1970
MIDDLE DEVONIAN	UNIT A	2000								Red-brown claystone
MIDDLE DEVONIAN	UNIT A	2320								2320
MIDDLE DEVONIAN	KENOG	2500								Red-brown dolomite and halite 2465 Limestone, dolo. limestone, cream, buff, microx, cryptox, slightly bituminous, tight 2728 Halite
MIDDLE DEVONIAN	UPPER KENOG	3000				micro vugs				3070
SILURIAN	EKWAN	3070								Dolomite, white, pink, beige, microx to cryptox, local sucrosic, hard, tight
SILURIAN	EKWAN	3490							gain	3490
SILURIAN	EKWAN	3500						Very slight gas background	Cl_2Ca water 20 bb/h	Limestone, grey, brown, microx or cryptox, tight, hard
SILURIAN	SEVERN	3900						3900 Small gas kick $C_1/C_2 = 30$		
SILURIAN	SEVERN	4000								Layer of anhydrite
SILURIAN	SEVERN	4303						AT 4200 I FIT : NO FLOW NO PRESSURE		4303
ORDOVIC.	RED HEAD	4500								Halite, enhydrite, Dolomitic limestone, tan to brown microx
ORDOVIC.	RED HEAD	4591								4591
ORDOVIC.	CHURCHILL	4906						Very slight gas background		Limestone, buff, brown, microx, tight
ORDOVIC.	CHURCHILL	5000								5906 Limestone, beige, brown, whitish, microx, cryptox, tight
ORDOVIC.	Basal Carbonates	5122								5122 Shale and sand
PRECAMBRIAN	Basal Clastics	5138	T.D. 5170'							5138 Granite
PRECAMBRIAN	Basal Clastics	5500								

Steady gain 15-30 bb/hour

inter cryst. — no significant interval — ZONE

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 1

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
						70%
1250	1260					Brick red brown, silty to sandy, plastic, slightly calcareous clay traces of gypsiferous silica (chert) 30% cement
1260	1270					60% red brown clay, traces of gypsum - chert 40% cement
1270	1280					50% clay as above, brick red brown orange, locally yellow 50% cement
1280	1295					80% clay, brick red brown; gypsiferous chert 20% cement
1295	1310					85% clay as above; traces gypsum 15% cement
1310	1325					85% clay, brick red traces of gypsum 15% cement
1325	1340					85% clay as above (locally yellow) 15% cement, concretion chert (rare)
1340	1355					100% clay as above gypsum (trace) concretion chert (rare)
1355	1370					80% clay, sandy or silty, brick red 20% gypsum or anhydrite and chert
1370	1385					80% clay, calcareous or micrite, argillaceous, red brown sandy or silty, hard, occasionally soft 20% gypsum
1385	1400					70% micrite, argillaceous, red brown, silty, hard 30% gypsum or anhydrite
1400	1410					90% micrite, argillaceous as above 10% gypsum
1410	1420					90% micrite, argillaceous as above 10% fibrous gypsum
1420	1430					90% micrite, argillaceous as above 10% gypsum
1430	1440					100% micrite, argillaceous as above gypsum (traces)
1440	1450					50% limestone, white, buff, micrite, hard, slightly porous 50% micrite, argillaceous as above traces gypsum
1450	1460					80% limestone, white, buff as above 20% micrite, argillaceous, red

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 2

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1460	1470					90% limestone (4 types) 10% micrite, argillaceous, red 1. Limestone: white, buff, micrite, hard, slightly porous 2. Limestone: rose, purple, argillaceous, hard, silty 3. Limestone: yellow (traces) 4. Limestone: very argillaceous, red brown, silty or sandy, slightly porous
1470	1480					20% anhydrite (white) microcrystalline 80% limestone as above (4 types)
1480	1490					Limestone, white, buff, predominantly micrite
1490	1500					Limestone as above, predominantly white
1500	1510					80% predominantly limestone, argillaceous, rose purple, hard, silty, white 20% gypsum or anhydrite
1510	1520					Limestone as above, predominantly rose, purple
1520	1530					80% limestone, argillaceous, dominantly purple 20% anhydrite
1530	1540					as above
1540	1550					90% limestone, dominantly white, buff, (micrite) compact; abundant purple limestone 10% gypsum
1550	1560					90% limestone, white and purple 10% gypsum
1560	1570					Limestone as above traces of gypsum
1570	1580					90% limestone, argillaceous, purple, locally breccia (dominant) 10% clay, brick red, silty
1580	1590					Limestone, white, dominantly purple 10% clay, brick red (sandy or silty) traces anhydrite
1590	1600					Dominantly limestone as above traces anhydrite
1600	1610					70% limestone 20% anhydrite 10% brick red clay
1610	1620					Limestone white, dominantly purple 30% anhydrite
1620	1630					as above, white often purple 20% anhydrite - gypsum

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 3

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1630	1640					Limestone, dominantly purple salt casts
1640	1650					40% anhydrite 60% limestone, white or purple, dominantly argillaceous concretion brick red, porous (salt?)
1650	1660					80% limestone, as above, white or purple, argillaceous 20% anhydrite
1660	1670					Limestone, white, buff, dominantly dolomitic traces of brick red clay 20% anhydrite
1670	1680					10% anhydrite, as above abundant aggregates (porous)
1680	1690					as above - brick red clay (traces) 10% anhydrite
1690	1700					50% white anhydrite limestone, white, cream, red brown plus dolomitic; limestone m. brown, micritic, tight
1700	1705					50% anhydrite 50% limestone as above
1705	1710					20% anhydrite 80% limestone, white-rose or red brown, dolomitic, micrite, compact
1710	1715					10% anhydrite 90% limestone as above, white and red brown
1715	1720					20% anhydrite 80% limestone, dominantly red brown, occasionally calcite veining
1720	1725					10% anhydrite 90% limestone
1725	1730					100% limestone, white rose or red brown fossils
1730	1740					Limestone, argillaceous, red brown, soft
1740	1745					Limestone, white rose, red brown, compact, occasionally silty 10% anhydrite
1745	1750					Limestone as above fossils
1750	1760					100% limestone, white rose or red brown, micrite, compact slightly argillaceous or silty, fossils traces anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 4

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION
1760	1770					as above, fossils vuggy dolomite, abundant
1770	1780					100% limestone as above traces of brick red clay gastropods, fossils
1780	1790					limestone, white, buff, micrite, locally porous vuggy dolomite (rare) traces of brick red clay, partly plastic
1790	1800					Limestone, white, buff, micrite, locally slightly porous (partly plastic) fossils traces of limestone, rose or red brown aggregates (rare) traces of brick red clay
1800	1810					Limestone, dominantly white, buff Limestone, rose, yellow or red brown aggregates (rare) traces of red clay (partly plastic 10%) crinoids
1810	1815					as above (limestone, dominantly white plus limestone, color varicolored) fossils
1815	1820					as above 80% Limestone dominantly white limestone color-different traces of brick red clay (20%) partly plastic Change bit
1820	1830					80% limestone, white, buff as above fossils - crinoids abundant concretions of brick red clay (20%)
1830	1840					80% limestone, white - rose, micrite, compact (partly plastic)
1840	1845					Limestone, white-rose as above traces brick red clay fossils
1845	1850					as above
1850	1855					limestone, white-rose, micritic, bioclastic, hard, tight bioclastic - abundant fossils concretion (claystone) traces porosity, silty, calcareous, soft traces of brick red clay

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION — Sheet No. 5

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
1855	1860					as above
1860	1870					80% limestone as above 20% concretions, brick red clay and gypsum
1870	1875					as above
1875	1880					70% limestone 30% concretions and claystone - brick red, slightly silty, calcareous, soft (gypsum)
1880	1890					70% limestone 30% concretions, claystone
1890	1895					as above
1895	1900					80% limestone, rose 20% concretions, claystone (brick red)
1900	1910					as above
1910	1915					as above traces anhydrite fossils
1915	1920					as above
1920	1925					as above
1925	1930					80% limestone 20% claystone, slightly silty, calcareous, brown or red, bioclastic, micritic, white-rose, hard, tight
1930	1960					as above
1960	1970					70% limestone 20% claystone 10% grey yellow, siliceous; limestone friable, micritic yellow, argillaceous content
1970	1980					40% limestone, rose 40% siliceous limestone 20% claystone
1980	1990					50% partly plastic, red brown, slightly calcareous, silty 10% limestone as above 40% limestone, siliceous
1990	2320					Claystone, brown red, occasionally mauve, very soft, slightly calcareous, very silty, plastic; crinoids
2320	2330					40% claystone as above 60% dolomite, red brown, occasionally purple, buff, cream grey, brown, micritic, medium hard, tight; traces of dolomite cryptoxln, cream

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 6

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2330	2335					40% Claystone 60% dolomite
2335	2340					20% claystone 80% dolomite
2340	2350					40% claystone 60% dolomite
2350	2360					70% claystone 30% dolomite
2360	2370					60% claystone 40% dolomite
2370	2375					20% claystone 10% dolomite (red brown, cream, buff) 70% anhydrite, white, light grey
2375	2380					40% claystone 10% dolomite 50% anhydrite
2380	2390					30% claystone 30% dolomite 40% anhydrite
2390	2400					50% claystone 10% dolomite 40% anhydrite SALT FROM 2380' - 2465'
2400	2410					40% claystone 20% dolomite 40% anhydrite
2410	2420					as above
2420	2430					30% claystone 30% dolomite 40% anhydrite
2430	2440					30% claystone 30% dolomite 30% anhydrite 10% traces limestone, white, cream, fiable
2440	2450					30% claystone 30% dolomite traces shale, green-grey, soft, no. cal. 40% anhydrite
2450	2460					20% claystone 10% shale 40% dolomite, predominantly buff, beige 30% anhydrite crinoids, coral

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(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 7

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2460	2470					10% claystone 10% shale 20% dolomite, buff, light, brown, occasionally grey/white, translucid, hard, voids, cryptoxln 60% anhydrite
2470	2475					10% claystone and shale 20% limestone, buff, very hard, blocky, cryptoxln, tight 20% dolomite 50% anhydrite
2475	2480					10% claystone 10% shale 20% dolomite 30% anhydrite 30% limestone, buff, cryptoxln....
2480	2485					20% dolomite 10% claystone 20% anhydrite 50% limestone, cream, light brown, microxln, cryptoxln, plus limestone as above, very hard, voids
2485	2490					10% claystone 10% dolomite 10% anhydrite 70% limestone (voids dominant)
2490	2495					traces claystone 10% dolomite 10% anhydrite 80% limestone (voids dominant)
2495	2500					10% dolomite anhydrite (traces) 90% limestone, oolitic, buff, cream, micritic, tight, med. hard
2500	2505					10% claystone 20% dolomite, white, grey, microxln, hard 70% limestone (3 types)
2505	2510					20% claystone 20% dolomite, white grey 60% limestone, cryptoxln, oolitic
2510	2515					20% claystone 20% dolomite 60% limestone, dominantly cryptoxln
2515	2520					20% claystone 20% dolomite 60% limestone (3 types)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION — Sheet No. 8

POLAR BEAR O-20 — CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2520	2525					20% claystone 20% dolomite 60% limestone (voids dominant)
2525	2530					20% claystone 10% dolomite 70% limestone (dominantly oolitic)
2530	2540					10% claystone 10% dolomite 80% limestone (3 types) becoming dolomitic
2540	2550					10% claystone dolomite traces 90% limestone (3 types) as above
2550	2560					10% claystone traces dolomite 90% limestone (3 types) corals
2560	2570					10% claystone traces dolomite 90% limestone (dominantly cryptoxln, tight) corals
2570	2580					10% claystone 10% dolomite 80% limestone (cryptoxln dominant)
2580	2590					100% limestone, porous traces claystone and dolomite traces of asphalt
2590	2600					100% limestone, porous traces as above
2600	2610					100% limestone, cream, light brown, microxln - cryptoxln voids, buff, tight, hard, porous)
2610	2620					100% limestone as above, light brown - dark brown, microxln cryptoxln voids, very hard
						Change bit
2620	2630					Dolomitic limestone, microxln, medium brown, tight, locally voids, very hard.
2630	2640					as above
2640	2650					Dolomitic limestone, med. brown, microxln, tight, locally porous, very hard.
2650	2655					as above
2655	2660					dolomitic limestone, med. brown, microxln, tight 10% limestone, dark brown, bituminous, microxln, soft

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 9

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2660	2665					as above - traces por.
2665	2670					as above
2670	2675					Dol. limestone, light - medium brown, microxln, tight and limestone, dark brown, bituminous as above
2675	2680					limestone, light-med. brown, microxln, tight - locally porous traces limestone, dark brown, bituminous, soft corals
2680	2685					as above - trace bituminous limestone
2685	2690					as above
2690	2695					as above - no bituminous limestone
2695	2700					as above
2700	2705					as above
2705	2710					as above
2710	2715					90% limestone 10% shale cream, med. hard or soft, calcareous
2715	2720					50% limestone, light - med. brown, microxln, tight, locally porous, hard (20% + 30% = 50%) claystone, red brown, very soft, calcareous occasionally silty, plastic
2720	2725					30% limestone 10% dolomite 10% anhydrite 50% claystone
2725	2730					as above
2730	2740					80% claystone 20% limestone
2740	2750					80% claystone 20% limestone
2750	2760					as above
2760	2770					60% claystone 40% limestone, brown, cream, med. brown, grey, hard, micrite-argillaceous, tight
2770	2780					40% claystone 60% limestone
2780	2790					Fishing.. SALT ON THE BIT 50% claystone 50% limestone

SAMPLES NOT LAGGED

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AQUITAINE
COMPANY OF CANADA LTD.

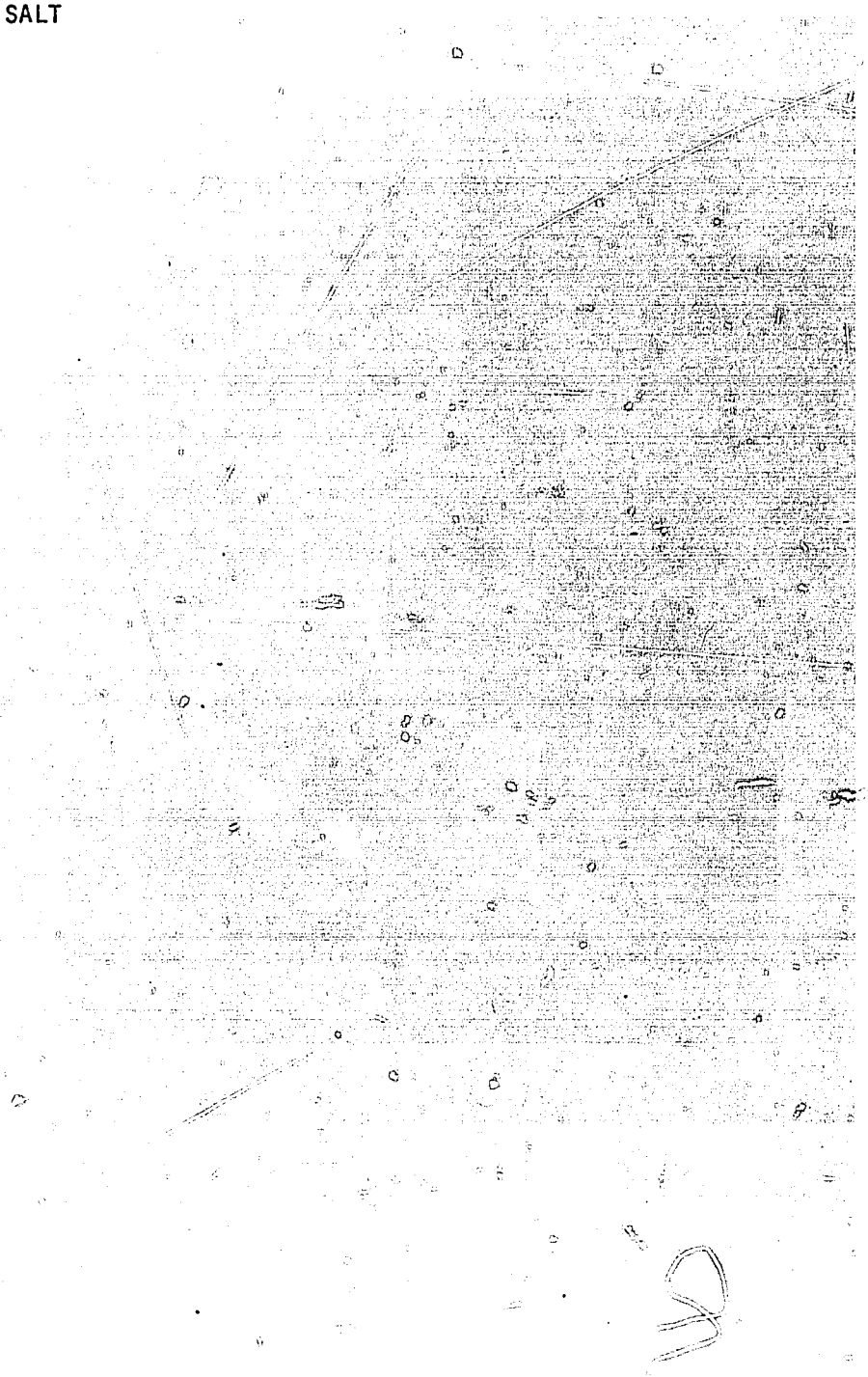
GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 10

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2790	2800					70% claystone 30% limestone
2800	2810					SALT



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AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 11

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
2810	2820					Salt - white, clear, xln traces of claystone, red brown
2820	2830					as above
2830	2840					as above
2840	2850					as above
2850	2860					as above
2860	2870					as above
2870	2880					as above
2880	2890					as above
2890	2900					as above
2900	2910					as above
2910	2920					as above
2920	2930					as above
2930	2940					90% salt 10% claystone
2940	2950					70% salt 30% claystone
2950	2960					60% salt 40% claystone
2960	2970					60% salt 40% claystone
2970	2980					60% salt 40% claystone
2980	2990					60% salt 40% claystone
2990	3000					60% salt 40% claystone
3000	3010					70% salt 30% claystone

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(Delete as Appropriate)

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AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 12

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3010	3020					60% salt 30% claystone 10% dolomitic shale, red, light brown, hard, blocky
3020	3030					as above
3030	3040					40% salt 40% claystone 10% shale 10% limestone light grey, hard, micritic, argillaceous, bituminous traces
3040	3050					as above
3050	3060					as above
3060	3070					as above
3070	3080					10% salt 30% claystone 10% shale 10% limestone 40% dolomite, white, pure, hard, massive, brittle, cryptoxln, tight, locally porous
3080	3090					traces of salt 30% claystone 10% shale 10% limestone 50% dolomite white as above and dolomite buff, cream, hard, massive, microxln, occas. quite porous
3090	3095					10% shale 30% claystone 60% dolomite, porous
3095	3100					20% claystone 80% dolomite, porous
3100	3105					as above
						13 5/8" casing
3105	3110					10% cement 90% dolomite as above

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(Delete as Appropriate)

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AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 13

CONFIDENTIAL

GEOLOGICAL SAMPLE DESCRIPTION

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3110	3115					20% cement 80% dolomite as above
3115	3120					90% cement 10% dolomite as above traces claystone
3120	3125					90% cement 10% dolomite as above traces claystone
3125	3130					80% cement 20% dolomite as above traces claystone
3130	3135					50% cement 50% dolomite as above traces claystone
3135	3140					50% cement 50% dolomite as above
3140	3145					40% cement 60% dolomite as above
3145	3150					40% cement 60% dolomite as above
3150	3155					10% cement 90% dolomite as above
3155	3160					10% cement 90% dolomite, white, microxln, pure, hard, tight, locally porous
3160	3165					traces of cement 100% dolomite as above
3165	3170					as above
3170	3175					as above
3175	3180					as above
3180	3185					10% cement 90% dolomite, locally porous (pore)

SAMPLES NOT LAGGED

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(Delete as Appropriate)

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AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 14

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3185	3190					10% cement 90% dolomite as above
3190	3195					10% cement 90% dolomite, white, microxln, pure, hard, tight, locally porous
3195	3200					traces cement 100% dolomite
3200	3210					as above
3210	3215					as above
3215	3220					as above
3220	3225					as above
3225	3230					as above
3230	3235					as above
3235	3240					as above
3240	3245					as above
3245	3250					as above
3250	3255					as above
3255	3260					as above
3260	3265					as above
3265	3270					as above
3270	3275					as above
3275	3280					Dolomite white, microxln, hard, tight - locally slight porosity
3280	3285					as above
3285	3290					as above
3290	3295					as above
3295	3300					as above

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(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 15

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3300	3305					as above
3305	3310					as above
3310	3315					as above
3315	3320					Dolomite, whitish, microx, hard, tight, occas. porous
						NEW BIT
3320	3325					Dolomite, predominantly white, pink, beige, cryptoxln, pure, very hard, tight, locally slightly porous
3325	3330					as above
3330	3335					as above
3335	3340					as above
3340	3345					as above
3345	3350					Coral recrystallized
3350	3355					as above
3355	3360					as above
3360	3365					as above
3365	3370					as above
3370	3375					traces of dolomite, pink
3375	3380					85% dolomite, white, as above 15% dolomite, pink
3380	3385					85% dolomite, white, as above 15% dolomite, pink
3385	3390					20% dolomite, pink 80% dolomite, white, as above
3390	3395					traces of dolomite, pink Dolomite, white, as above
3395	3400					Dolomite, white, beige
3400	3405					as above

SAMPLES NOT LAGGED

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(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 16

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3405	3410					as above
3410	3415					as above
3415	3420					as above
3420	3425					as above
3425	3430					as above
3430	3435					as above
3435	3440					as above
3440	3445					as above traces of dolomite, grey, siliceous, cryptoxln, very hard
3445	3450					as above presence of coral
3450	3455					Dolomite, white, beige, as above Dolomite, grey, siliceous, very hard, tight
3455	3460					as above
3460	3465					as above
3465	3470					Dolomite, grey, siliceous, very hard, tight Dolomite, white and pink presence of corals
3470	3475					as above
3475	3480					as above
3480	3485					Dolomite, grey-beige, occas. white, very hard, massive, brittle, cryptoxln, tight, no porosity; locally vugular porosity
3485	3490					Dolomite, dominantly grey-beige Dolomite, pink-white as above
3490	3495					Dolomite, grey-beige
3495	3500					Dolomite, grey - glauconite
3500	3505					Dolomite, grey, beige, occas. white, very hard, massive brittle, cryptoxln, tight, locally vugular - glauconite

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AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 17

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3505	3510					Dolomite as above and limestone grey, brown, beige, occas. yellow/brown, cryptoxln, very hard, tight - glauconite
3510	3515					40% dolomite as above 60% limestone as above Glauconite
3515	3520					30% dolomite 70% limestone Glauconite
3520	3525					30% dolomite 70% limestone Glauconite
3525	3530					20% dolomite 80% limestone Glauconite
3530	3535					20% dolomite 80% limestone
3535	3540					20% dolomite 80% limestone, light beige
3540	3545					20% dolomite 80% limestone, light beige and brown/yellow, purple/brown
3545	3550					100% limestone traces of dolomite
3550	3555					90% limestone 10% dolomite
3555	3560					100% limestone
3560	3565					100% limestone, beige, grey/brown, occas. yellow/rose red, tight, hard, brittle, cryptoxln, very hard, no porosity
3565	3570					Limestone as above, showing conchoidal fractures
3570	3575					as above
3575	3580					90% limestone 10% dolomitic limestone, siliceous

SAMPLES NOT LAGGED

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(Delete as Appropriate)

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AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 18

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3580	3585					80% limestone 20% dolomitic limestone, siliceous
3585	3590					70% limestone 30% dolomitic limestone, siliceous
3590	3595					Limestone, beige, white, creamy-white, occas. brown - tinted yellow, pink, very hard, microxln - cryptoxln, tight
3595	3600					as above
3600	3605					as above
3605	3610					as above, dominantly creamy-white
3610	3615					as above, dominantly creamy-white
3615	3620					as above, dominantly creamy-white
3620	3625					as above, dominantly brown
3625	3630					as above, dominantly brown
3630	3635					as above, dominantly brown
3635	3640					as above, dominantly brown
3640	3645					as above, dominantly creamy-white
3645	3650					as above but fossiliferous echinoderms, crustaceans (?) radiolaria, ostracods (?), etc...
3650	3655					Limestone, creamy-white, microxln, very hard, tight
3655	3660					as above
3660	3665					as above
3665	3670					as above
3670	3675					as above
3675	3680					as above
3680	3685					as above
3685	3690					Limestone, creamy-white, microxln to cryptoxln, very hard, tight traces of limestone, bioclastic, argillaceous, fossiliferous (echinoderms, crustaceans)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 19

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION
3690	3695					as above
3695	3700					as above
3700	3705					as above
3705	3710					same lithology presence of Brachiopods
3710	3715					as above and white chert, occas. brown
3715	3720					as above white chert
3720	3725					as above
3725	3730					as above
3730	3735					as above
3735	3740					Limestone, brown, cryptoxln, hard, tight, with traces of chert
3740	3745					Limestone, medium brown, cryptoxln, hard, tight, with traces of chert
3745	3750					Limestone, medium brown, cryptoxln, hard, tight, rare chert
3750	3755					as above
3755	3760					Limestone, brown, cryptoxln, hard, tight, bioclastic (echinoderms)
3760	3765					Limestone, medium brown, cream, white, beige, cryptoxln, very hard bituminous traces (?) traces of grey chert; fossils
3765	3770					Limestone as above
3770	3775					Limestone as above traces of white chert
3775	3785					as above
3785	3800					Drilling with seawater (no samples)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT FT. PER MIN.

(Delete as Appropriate)

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 20

POLAR BEAR 0-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.S.W.	
3800	3805					50% dolomite, light grey, calcareous, moderately hard, cryptoxln - microxln 50% dolomite, beige- cream, calcareous, mod. hard, cryptoxln - microxln
3805	3810					60% dolomite, grey 40% dolomite, beige
3810	3815					90% dolomite, calcareous, light grey, dark brown, white cryptoxln-microxln, med. hard, slightly argillaceous; no porosity 10% limestone
3815	3820					90% dolomite 10% limestone
3820	3825					60% dolomite 40% limestone
3825	3830					20% dolomite as above with brachiopods 80% limestone, med. brown, microxln-cryptoxln, med. hard to hard slightly argillaceous; no porosity
3830	3835					90% limestone 10% dolomite, calcareous, dark brown, cryptoxln-microxln, med. hard to hard
3835	3840					as above
3840	3845					80% dolomite, light grey as above 20% limestone
3845	3850					60% dolomite 40% limestone
3850	3855					20% dolomite 80% limestone
3855	3860					Limestone, beige, cream, med. brown, microxln- cryptoxln, hard
3860	3870					as above
3870	3875					90% calcareous dolomite to dolomitic limestone 10% limestone
3875	3880					20% dolomite 80% limestone
3880	3885					Limestone, light - med. brown, beige, cream, microxln, hard tight

SAMPLES NOT LAGGED

SAMPLES LAGGED AT FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 21

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3885	3890					as above
3890	3895					as above
3895	3900					as above
3900	3905					as above
3905	3910					as above
3910	3915					70% limestone, med. brown, microxln, hard, tight 30% anhydrite, white
3915	3920					20% anhydrite 30% dolomitic limestone, grey, buff, microxln, hard, tight 50% dolomite
3920	3925					20% anhydrite 20% dolomitic limestone 60% dolomite
3925	3930					10% anhydrite 30% dolomitic limestone 60% dolomite
3930	3935					20% anhydrtie 40% limestone 40% dolomite
3935	3940					70% anhydrite 20% dolomite 10% limestone
3940	3945					60% anhydrite 40% limestone
3945	3950					70% limestone 30% anhydrite
3950	3960					30% dolomite, buff, cryptoxln, hard, tight 20% dolomite, pure white, macrocryst. or sucrosic slightly porous 50% anhydrite, bluish-grey
3960	3970					50% dolomite to dolomitic limestone, buff, cryptoxln - microxln locally pelletoidal, tight, hard 20% dolomite, pure white as above 30% anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT FT. PER MIN

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 22

CONFIDENTIAL

GEOLOGICAL SAMPLE DESCRIPTION

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
3970	3980					as above
3980	3990					Mainly: Dolomite, beige to buff, cryptoxln to microxln hard, tight, slightly pyritic. Locally dolomitic limestone. Minor: - dolomite, crystalline, pure white, slightly porous - white gypsum
3990	4000					as above
4000	4010					80% dolomitic limestone to limestone, beige to light brown, microxln-cryptoxln, locally microbrecc. to pelletoidal 10% minor whitish, crystalline dolomite 10% white sucrosic gypsum
4010	4020					as above
4020	4030					80% limestone to dolomitic limestone, beige, grey to light brown, cryptoxln, locally hard, tight 20% dolomite; crystalline gypsum
4030	4040					as above
4040	4050					90% limestone, beige, light grey, whitish, med. hard to hard, tight 10% gypsum and anhydrite
4050	4060					Limestone, mainly grey-brown to beige, cryptoxln - microxln Traces of anhydrite
4060	4065					90% limestone and dolomitic limestone as above 10% anhydrite
4065	4070					as above and white calcite and gypsum
4070	4075					as above but the limestone is locally microbrecc.
4075	4080					50% limestone, brown, brittle, cryptoxln, hard, tight 40% limestone to dolomitic limestone, grey to beige, as above 10% anhydrite and gypsum
4080	4085					as above
4085	4090					90% limestone, brown 10% limestone to dolomite, grey to beige

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 23

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4090	4095					90% limestone brown, as above 10% anhydrite and gypsum Traces of limestone to dolomitic limestone, grey to beige as above
4095	4100					Limestone, light to med. brown, cryptoxln to microxln, hard alternating with: Limestone, grey, creamy white, cryptoxln - microxln, mod. hard Traces of anhydrite and gypsum
4100	4105					80% limestone, brown 20% limestone, dark grey-brown, microxln, slightly dolomitic
4105	4110					as above
4110	4115					as above
4115	4120					90% limestone, light to med. brown, creamy white, as above 10% limestone, dark grey to brown, as above
4120	4125					as above
4125	4130					90% limestone as above, becoming dolomitic 10% limestone to dolomite, light grey, mod. hard, microxln Traces of anhydrite and gypsum
4130	4135					as above
4135	4140					90% limestone, light to med. brown, dolomitic, cryptoxln, very hard, no porosity 10% limestone, grey to creamy white, dolomitic, microxln to cryptoxln, mod. hard; no porosity Traces of anhydrite and gypsum
4140	4145					as above
4145	4150					Dolomitic limestone as above to dolomite Traces of anhydrite and gypsum
4150	4155					75% dolomitic limestone to dolomite, light brown to beige, predominantly pelletoidal, lesser amount (20%) of cryptoxln type as above, very hard 5% anhydrite
4155	4160					95% dolomitic limestone as above; slight porosity in pelletoidal type 5% anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT .... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 24

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4160	4165					Dolomite to dolomitic limestone as above, increasing in cryptoxln type (50%) 5% anhydrite
4165	4170					80% dolomite, light brown, cryptoxln to crystall. (in that case, slightly porous) hard, pelletoidal or calcarenitic (20%)
4170	4175					as above
4175	4180		about .10% of red siltstone			same dolomite, less detrital
4180	4185					Dolomite, cream to light brown, mainly cryptoxln, hard, tight
4185	4190					about 20% of white, crystal. dolomite, in addition to the light brown dolomite
4190	4195					70% dolomite, light brown 30% white dolomite
4195	4200					as above
4200	4205					Dolomite (80%) rarely dolomitic limestone, tan to light brown, cryptoxln to microxln, tight, hard 20% pure white, crystal. dolo. (very slow reaction with HCl)
4205	4210		10% of red dolomitic siltstone (cavings?)			as above
4210	4215					Dolomite as above, locally finely banded
4215	4220					85% dolomite, occas. limestone (dolomitic), tan to light brown, cryptoxin to microxln, loc. pellet, tight, hard 15% pure white, crystall. dolo.
4220	4225					70% dolomite as above 30% white dolomite
4225	4230					70% dolomite, tan to light brown as above 20% dolomite, pure white 10% siltstone, red, dolomitic (cavings?)
4230	4235					as above
4235	4240					60% dolomite, tan, locally very calcareous 30% dolomite, white 10% siltstone, red, dolomitic (casts of salt dissolution)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 25

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4240	4245					as above
4245	4250					as above
4250	4260					80% dolomite, light cream to buff 10% white dolomite 10% siltstone, red (cavings?) Traces of anhydrite
4260	4270					as above
4270	4275					60% dolomite, light grey, buff, light cream, cryptoxln to microxln, tight, hard 20% limestone, light grey, microxln, tight 10% dolomite, white 10% siltstone, red
4275	4280					60% dolomite, light grey to white, microxln, hard, tight 40% limestone, light grey to cream, microxln, hard, tight Traces of red siltstone
4280	4290					30% dolomite 70% limestone Traces of red siltstone
4290	4300					20% dolomite, more light grey 80% limestone red siltstone
4300	4310					50% limestone, mainly beige to buff, cryptoxln to microxln, tight 50% dolomite, light grey, cryptoxln, med. hard, tight
4310	4320					30% limestone, beige 60% dolomite, light grey, silty to argillaceous, cryptoxln, med. hard, tight 10% siltstone, dolomitic, red (cavings?)
4320	4330					30% limestone, beige 40% dolomite, light grey 20% white, crystall. calcite and dolomite 10% siltstone, red gypsum; soft pasty blebs of K compound (?)
4330	4340					30% limestone 30% dolomite, light grey, more silty and argillaceous, soft tight 20% calcite and dolomite, white

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 26

CONFIDENTIAL

GEOLOGICAL SAMPLE DESCRIPTION

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4330	4340 (cont)					10% siltstone, red (cavings) Blebs of K compound ? (whitish, soft, pasty) 10%
4340	4350					poor sample - not representative (very little return)
4350	4360					New element - 40% dolomite, irregularly colored, dark brown to black to tan, microxln, hard, tight (possible bitum.) 40% alternating beige, grey, whitish dolomite and limestone as above 20% cavings
4360	4370					as above
						Change of Bit
4370	4375					10% dolomite, dark brown, bituminous 60% dolomite, cream to buff, microxln to cryptoxln, hard tight, brittle 30% dolomitic shale, calcareous, blue-grey, with tiny black dots, fine grained, soft
4375	4380					10% dolomite, dark brown, bituminous (test with $CHCl_3$) 80% dolomite, cream 10% dolomitic shale, calcareous, blue-grey
4380	4385					100% dolomite, cream, brittle, microxln, hard, tight
4385	4390					100% as above, locally slightly calcareous
4390	4395					as above
4395	4400					Very good cuttings 100% dolomite as above, more calcareous no cavings at all
4400	4405					as above
4405	4410					100% dolomite, cream, microxln, brittle, locally calcareous, hard, tight Cutting exceptionally good
4410	4415					same lithology. Actually, limestone in the process of dolomitisation
4415	4420					as above
4420	4425					as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 27

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	GEOLOGICAL SAMPLE DESCRIPTION
4425	4430					50% dolomite, calcareous as above 50% shale, silty, dolomitic (calcimetry 42,48,50) with very fine grains of black mineral, pasty, soft, blue-grey
4430	4435					50% dolomite, calcareous/dolomite/limestone, cream, microxln, hard, tight 40% shale, silty, dolomitic 10% soft gypsum, translucent
4435	4440					80% dolomite, calcareous/dolomite/limestone, cream (same layers) as above 20% silty dolomitic shale, blue-grey, harder than above gypsum
4440	4450					80% dolomitic limestone, cream 10% silty shaly dolomite, blue-grey (with fine black dots) 10% gypsum, translucent
4450	4455					80% dolomitic limestone as above 10% limestone, same characteristics as above 10% gypsum and anhydrite
4455	4460					Mainly: dolomite to dolomitic limestone, beige to light brown, microxln, apparently not porous
4460	4465					same lithology, but more calcareous
4465	4470					50% limestone, light - med. brown, microxln, hard, no visible porosity 40% limestone, white to creamy white, microxln, mod. hard, no porosity 10% dolomite, light to med. brown, pure white, hard, microxln no porosity, slightly calcitic
4470	4475					trace dolomite as above 60% limestone as above 40% dolomite, calcareous, med. grey, microxln, argillaceous no porosity
4475	4480					80% dolomite, grey as above 10% dolomite, brown as above 10% limestone, brown, creamy white as above
4480	4485					30% dolomite, grey 20% dolomite, brown 40% limestone, brown, creamy white 10% anhydrite

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 28

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4485	4490					70% limestone as above 10% dolomite, grey 20% dolomite, brown becoming calcitic
4490	4495					as above
4495	4500					80% limestone, light to med. brown, as above 20% dolomite, brown as above, becoming dolomitic limestone
4500	4505					as above
4505	4510					Limestone, light to med. brown, white - creamy white, buff-grey occas. dolomitic, microxln, hard.
4510	4515					as above
4515	4520					100% limestone, light - med. brown, buff grey, creamy white, occas. dolomitic, mod - very hard, no visible porosity
4520	4530					50% dolomitic limestone as above 50% anhydrite and gypsum, white to light blue-grey
4530	4540					15% dolomitic limestone, light brown as above 85% anhydrite and gypsum, whitish, ± translucent
4540	4545					40% dolomitic limestone, beige 60% anhydrite and gypsum
4545	4550					65% dolomite to dolomitic limestone 35% anhydrite and gypsum
4550	4555					50% dolomitic limestone and limestone as above 40% anhydrite 10% dolomite, shaly and silty, blue-grey, med. hard, tight
4555	4560					60% dolomitic limestone to dolomite, beige to buff, to light brown, brittle, microxln, hard, tight 35% limestone, as above 5% anhydrite and dolomite
4560	4565					as above
4565	4570					60% dolomite as above 40% limestone as above
4570	4580					30% dolomite as above 70% limestone as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121 -1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 29

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4580	4590					20% dolomite, cream to tan, microxln, hard, tight 30% limestone, cream to tan, microxln, hard, tight 50% limestone, light blue-grey, slightly dolomitic, argillaceous, med. hard
4590	4595					20% limestone as above 10% dolomite as above 70% limestone, blue-grey, argillaceous
4595	4600					20% dolomite as above 20% limestone, beige as above 60% limestone, blue-grey, argillaceous
4600	4610					as above
4610	4620					20% dolomite, buff to light brown, argillaceous, microxln, traces of porosity 80% limestone, beige cream to light blue-grey, locally argillaceous, tight traces of anhydrite
4620	4630					10% dolomite as above 90% limestone, only beige and light brown
4630	4640					50% dolomite as above 50% limestone as above
4640	4650					20% dolomite as above 80% limestone, beige to light brown to whitish
4650	4655					as above with traces of dark blue-grey dolomite
4655	4660					50% dolomite as above 50% limestone as above
4660	4665					as above traces of gypsum
4665	4670					20% dolomite as above 80% limestone as above traces anhydrite and gypsum
4670	4675					40% dolomite as above 60% limestone
4675	4680					80% limestone as above 20% dolomite as above

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 30

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4680	4685					90% limestone 10% dolomite
4685	4690					as above
4690	4700					as above
4700	4705					90% limestone, light to med. brown, white-cream, microxln, occas. cryst., hard, (white-cream softer than brown) no visible porosity 10% dolomite as above
4705	4710					100% limestone as above, occ. slightly dolomitic trace of dolomite as above
4710	4715					as above
4715	4720					as above
4720	4725					as above
4725	4730					limestone as above, predominantly microxln
4730	4735					as above
4735	4740					limestone, locally slightly dolomitic, brittle, microxln med. hard to hard, tight, cream to light brown
4740	4745					as above
4745	4750					limestone, locally slightly dolomitic, light grey to cream, microxln, hard, tight
4750	4760					as above
4760	4770					80% limestone, tan to buff as above 20% limestone, whitish to light grey, soft
4770	4775					60% limestone, hard, buff 40% limestone, soft, whitish, light grey
4775	4780					50% limestone, hard, as above 50% limestone, soft as above
4780	4785					40% limestone, buff 60% limestone, soft, light grey
						Change of Bit

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

FORM 5121-1

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 31

CONFIDENTIAL

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4785	4795					40% limestone, buff, light brown, microxln, hard, tight 50% limestone, whitish, light grey, microxln, soft 10% limestone, dolomitic, blue-grey, black specked (cavings?)
4795	4800					60% limestone, buff, hard 40% limestone, soft, whitish
4800	4805					50% limestone, tan, hard 50% limestone, whitish, soft
4805	4810					as above
4810	4820					60% limestone, tan, hard 40% limestone, soft, white-grey
4820	4825					as above
4825	4830					60% limestone, buff grey, hard, microxln to xln, tight 40% limestone, white-grey, microxln, softer
4830	4835					as above
4835	4840					60% limestone, buff, grey, hard, predominantly crystalline 40% limestone, white-grey as above
4840	4845					70% limestone, buff-grey as above 30% limestone, white-grey as above
4845	4850					as above
4850	4855					as above
4855	4860					60% limestone, buff grey as above, becoming very dark grey-brown 40% limestone white-grey as above
4860	4865					as above
4865	4870					30% limestone, white-grey, soft as above 50% limestone, buff grey, microxln, hard, tight 20% limestone, dark grey brown, microxln, hard, tight
4870	4875					40% limestone, white-grey as above 50% limestone, buff-grey as above 10% limestone, dark grey brown as above
4875	4880					40% limestone as above dolomite to dolomitic limestone, light to med. brown xln - microxln, very hard, tight (50%)

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 32

CONFIDENTIAL

POLAR BEAR 0-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4875	4880 (cont)					dolomite - dolomitic limestone, light grey, microxln, very hard, tight (10%)
4880	4885					30% limestone as above 40% dolomite, brown as above 30% dolomite, grey as above
4885	4890					20% limestone as above, predominantly white-grey, soft type 50% dolomite, brown as above 30% dolomite, grey as above
4890	4895					40% dolomite, light to med. brown, buff-grey as above 60% dolomite, light to med. grey as above
4895	4900					50% dolomite, variegated grey and blackish, microxln, brittle, hard, tight 40% dolomite, med brown, occas. black specked, microxln, hard, tight 10% limestone, tan to light brown, platy, hard, tight
4900	4910					60% dolomite, beige to light brown, microxln, hard 40% dolomite, grey, med. hard
4910	4920					40% dolomite, beige 40% dolomite, grey 20% limestone to dolomitic limestone, creamy, cryptoxln, hard, tight
4920	4925					40% dolomite, beige to light grey 60% dolomitic limestone or limestone, dark brown to dark grey, bioclastic, microbrecciated, microxln to crystall.
4925	4930					10% dolomite, beige to light grey 50% limestone, dark brown as above 40% limestone, whitish, cryptoxln to microxln, soft, tight
4930	4935					10% dolomite 60% limestone, beige to brown, biodetrital, microbrecc. (occas), microxln to crystall. hard, tight 30% limestone, whitish, soft
4935	4940					70% limestone, brown to beige, fossiliferous, hard. 30% limestone, whitish, soft
4940	4950					as above
4950	4955					80% limestone, light brown, beige, occas. pseudobrecc. 20% limestone, whitish, soft

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

GEOLOGICAL SAMPLE DESCRIPTION

Sheet No. 33

POLAR BEAR O-20

CONFIDENTIAL

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
4955	4960					as above
4960	4970					as above
4970	4975					60% limestone, beige-tan, hard - no more breccia neither bioclast 40% limestone, whitish, soft
4975	4980					80% limestone, light to med. brown, hard 20% limestone, whitish, soft
4980	4990					60% limestone, light to med. brown, microxln to cryst. hard tight, occas. pseudo microbrecc. 40% limestone, whitish, soft
4990	4995					as above
4995	5000					as above
5000	5010					50% limestone, beige-brown, locally. brecciat. and bioclast. 50% limestone, whitish, soft
5010	5020					as above
5020	5030					40% limestone, light brown, hard 60% limestone, whitish, soft
5030	5040					as above
5040	5050					as above
5050	5060					50% limestone, light brown, hard 50% limestone, whitish, soft
5060	5065					as above
5065	5070					as above
5070	5075					as above
5075	5080					as above
5080	5085					as above
5085	5090					60% limestone, brown as above 40% limestone, whitish, soft
5090	5095					50% limestone brown 50% limestone, white

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ..... FT. PER MIN.

(Delete as Appropriate)

AQUITAINE
COMPANY OF CANADA LTD.

Sheet No. 34

CONFIDENTIAL

GEOLOGICAL SAMPLE DESCRIPTION

POLAR BEAR O-20

From	To	Core C Ditch D	No. of Ft. Porous	No. of Ft. Non-Porous	Showings O.G.W.	
5095	5100					60% limestone, white-cream, soft - firm, microxln, no visible porosity, occas. black specks/streaks 40% limestone, light to med. brown, microxln to xln, hard no porosity - locally bioclastic
5100	5105					as above
5105	5110					as above
5110	5115					as above
5115	5120					as above
5120	5125					60% limestone, brown, buff-grey 40% limestone, white-cream
5125	5130					55% limestone, brown, buff-grey 40% limestone, white-cream 5% limestone, dolomitic, light grey-buff, microxln, tight, hard
5130	5135					80% limestone 20% sand: fine to coarse, rounded, well sorted grains of quartz 2 sizes - most common: 0.2 mm - less common: 1.5 mm
5135	5140					40% limestone 30% sand, medium to very coarse (2 mm) 30% shale, green-grey, silty, soft The medium sand is locally slightly cemented
5140	5145					angular grains of quartz with mafic minerals (amphibole); white feldspar = granite
5145	5150					as above with white and black mica = granite
5150	5155					granite
5155	5160					granite
5160	5170					END OF DRILLING - October 14, 1974.

SAMPLES NOT LAGGED

SAMPLES LAGGED AT ... FT. PER MIN.

(Delete as Appropriate)

3. DAILY GEOLOGICAL REPORTS

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	1 DATE 16/10/74	2 No. 25	DAILY REPORT GEOLOGY - SHOWS	3 FOOTAGE 0 Ft.	4 Hr.	5 LAST DEPTH 5170 Ft.	6 WELL NAME POLAR BEAR

From 7	To 8	Drilling Rate 9	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
3250	3278					1-7		POROSITY ZONES FROM LOG ANALYSES
3448	3466					7		
3532	3540					7		
3800	3808					6		
3816	3840					2-9		
3910	3914					6.5		
3980	3992					3-7		
4188	4208					6.5		
5122	5126					18		
5132	5138					17		

TYPE OF DRILLING TYPE OF BIT 16 AGE/FORMATION Precambrian at 5140' 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. Cuttings 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio C_1/C_2 30	Ratio C_1/C_3 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio C_1/C_2 35	Ratio C_1/C_3 36	Duration /Choke 37	Duration Kick 38	Density Suct. 39	Density Comp. 40	Sample 41

MUD

42 D — V — F — NaCl — % Fuel —

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49
Total 46			Daily Total 50		

REMARKS 51

F.I.T. at 4200', no flow, pressure = 0

Program Plugging 52

Position at 8 A.M. 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE 1	No. 2	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE 3 / 4	LAST DEPTH 5	WELL NAME 6
	15/10/74	24		96 Ft. / Hr.	5170 Ft.	POLAR BEAR

From 7	To 8	Drilling Rate 9	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
5074	5125							Limestone tight, as above
5125	5140							Shale, green, argillaceous - sandstone
5140	5170							Basement - Granite

TYPE OF DRILLING TYPE OF BIT 16 AGE/FORMATION Below Top Precambrian 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio C_1/C_2 30	Ratio C_1/C_3 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio C_1/C_2 35	Ratio C_1/C_3 36	Duration / Choke 37	Duration Kick 38	Density Suct. 39	Density Comp. 40	Sample 41

MUD

42 D — V — F — NaCl — % Fuel —

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49

Total 46 Daily Total 50

REMARKS 51

Logging CNL, FD, GRS, DLL

Program 1. F.I.T. @ approx. 4200' 2. Velocity Survey 52

Position at 8 A.M. @ T.D. 5170' 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE (1)	No. (2)	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE (3)	(4) Hr.	LAST DEPTH (5)	WELL NAME (6)
	14/10/74	23		248 Ft.		5074 Ft.	POLAR BEAR

From (7)	To (8)	Drilling Rate Min/ft	CARBONATE W.UW 1 min (10)	3 min (11)	15 min (12)	POROSITY Type (13)	Grade (14)	LITHOLOGY (15)
4826	4880	4-6	95	95	96			Alternating: limestone, light-brown, microxln, hard, tight
								limestone, grey, soft
4880	4915							Dolomite, grey, black brown, microxln, hard, tight
4915	5074							Alternating: limestone, tan, occasionally facies fossiliferous, hard, tight
								limestone, light grey, soft
								no permeability

TYPE OF DRILLING — TYPE OF BIT — (16) AGE/FORMATION Bad Cache (17)

OIL SHOWS

Depth or Time (18)	Colour (19)	Odour (20)	Fluorescence Direct Mud (21)	Direct Cuttings (22)	Extr. Cuttings (23)	Colour Intensity (24)

(25) Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background (26): Constant / Increasing / Decreasing / Regularly / Irregularly

From (27)	To (28)	% (29)	Ratio C_1/C_2 (30)	Ratio C_1/C_3 (31)

Gas Shows (Kicks)

Depth or Time (32)	% Max. (33)	Nature (34)	Ratio C_1/C_2 (35)	Ratio C_1/C_3 (36)	Duration /Choke (37)	Duration Kick (38)	Density Suct. (39)	Density Comp (40)	Sample (41)

MUD

(42) D / V / F / NaCl / % Fuel

Gain From (43)	Gain To (44)	Gain bbl/h (45)	Loss From (47)	Loss To (48)	Loss bbl/h (49)

Total (46) — Daily Total (50)

REMARKS (51)

Total gas and gains as yesterday

Program (52) logging

Position at 8 A.M. (53) Drilling at 5161' (10'/hr) sandstone and shale resting on precambrian. Top precambrian at 5140'

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DATE (1)	No. (2)	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE (3)	(4)	LAST DEPTH (5)	WELL NAME (6)
13/10/74	22		153 Ft.	Hr.	4826 Ft.	POLAR BEAR

From (7)	To (8)	Drilling Rate Min/ft (9)	CARBONATE W.UW 1 min (10)	3 min (11)	15 min (12)	POROSITY Type (13)	Grade (14)	LITHOLOGY (15)
4673	4826	5-7	88	95	99			Limestone, light-brown, cream, microxln, hard, tight

CONFIDENTIAL

TYPE OF DRILLING | TYPE OF BIT (16) | AGE/FORMATION Churchill River (17)

OIL SHOWS

Depth or Time (19)	Colour (19)	Odour (20)	Fluorescence Direct Mud (21)	Direct Cuttings (22)	Extr. (23)	Colour Intensity (24)

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background (26)

From (27)	To (28)	% (29)	Ratio C_1/C_2 (30)	Ratio C_1/C_3 (31)

Constant
Increasing
Decreasing
Regularly
Irregularly

Gas Shows (Kicks)

Depth or Time (32)	% Max. (33)	Nature (34)	Ratio C_1/C_2 (35)	Ratio C_1/C_3 (36)	Duration /Choke (37)	Duration Kick (38)	Density Suct. (39)	Density Comp. (40)	Sample (41)

MUD

42

	Gain From (43)	Gain To (44)	Gain bbl/h (45)	Loss From (47)	Loss To (48)	Loss bbl/h (49)
D						
V						
F						
NaCl						
% Fuel	Total (46)			Daily Total (50)		

REMARKS (51)

From 4760' interbedded limestone, blue-grey, soft
Calcium Chloride water and total gas same as yesterday

Program (52)

Position at 8 A.M. Drilling at 4910' (lithology as above plus dolomite) (53)

FORM 6104

AQUITAINE COMPANY OF CANADA LTD.

1 DATE	2 No.	DAILY REPORT GEOLOGY - SHOWS	3 FOOTAGE	4 Hr.	5 LAST DEPTH	6 WELL NAME
12/10/74	21		208 Ft.		4673 Ft.	POLAR BEAR

From 7	To 8	Drilling Rate 9 Min/ft	CARBONATE W.I.W 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
4465	4520	4-7	mn 46	90	97			Limestone to calcareous limestone, cream, microxln, hard, tight
			mx 77	98	99			
4520	4555	4-7						anhydrite
4555	4673							Limestone, dolomitic; limestone, anhydritic, cream to light brown microxln, hard, tight; interbedded blue-grey dolomite, argillaceous and silty

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. Cuttings 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26 Constant / Increasing / Decreasing / Regularly / Irregularly

From 27	To 28	% 29	Ratio $C1/C2$ 30	Ratio $C1/C3$ 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio $C1/C2$ 35	Ratio $C1/C3$ 36	Duration / Choke 37	Duration Kick 38	Density Suct 39	Density Comp 40	Sample 41

MUD

42 D / V / F / NaCl / % Fuel

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49

Total 46 | Daily Total 50

REMARKS 51

From 4580' to 4620' poor total gas as yesterday - steady gain of Cl_2Ca water, 10 barrels per hour

Program 52

Position at 8 A.M. Drilling at 4753' (limestone, dolomite, tight) 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
	1 11/10/74	2 20		3 95 Ft.	4 Hr.	5 4465 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	9 Min/ft	10	11	12	13	14	15
4370	4465	5-7	mn 25	69	88			Monotonous sequence of cream limestone, more or less dolomitic,
			mx 59	89	99			locally dolomite, microxln, hard, tight.

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background — 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct.	Density Comp.	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / NaCl / % Fuel

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49

Total 46 | Daily Total 50

REMARKS. 51

4425 - 4450 interbeds of shale, dolomitic, silty, soft

Program 52

Position at 8 A.M. Drilling at 4542' (Limestone - anhydrite) 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DAILY REPORT GEOLOGY - SHOWS

DATE	No.	FOOTAGE		LAST DEPTH	WELL NAME
1 10/10/74	2 19	3 270 Ft.	4 Hr.	5 4370 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	9 Min/ft	10	11	12	13	14	15
4100	4308	3-7 mn	32	75	93			Alternating - Dolomite lt. brown to lt. grey, cryptoxln to fine xln hard, tight; Limestone cream to lt. brown, locally dolomitic, cryptoxln, hard, tight: locally some anhydrite
		mx	80	91	94			
4308	4358	1-2						Probable soluble salt - NA and K
4358	4370	3-5	42	60	65			Dolomite tan - dark brown, fine xln, hard

TYPE OF DRILLING | TYPE OF BIT | 16 | AGE/FORMATION Possible Churchill at 4308' 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26 Constant / Increasing / Decreasing / Regularly / Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct.	Density Comp.	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42

	Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
D	43	44	45	47	48	49
V						
F						
NaCl						
% Fuel	Total 46			Daily Total 50		

REMARKS 51

TOTAL GAS VERY POOR
300 ppm.

Program: 52

Position at 8 A.M. 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE 1	No. 2	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE 3	4 Hr.	LAST DEPTH 5	WELL NAME 6
	09/10/74	18		246 Ft.		4100 Ft.	POLAR BEAR

From 7	To 8	Drilling Rate 9 MIN/FT	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
3854	3910	6-8	mn 70	94	97			Limestone and dolomite. Limestone cream to med. brown, fine xln,
			av 91	94	97			hard
3910	4000	4-6	mn 12	23	28			Alternating limestone as above - dolomite cream, cryptoxln to
			mx 38	64	72			fine xln, no porosity; anhydrite
4000	4100	4-7	77	86	88			Limestone locally dolomitic as above

TYPE OF DRILLING | TYPE OF BIT 16 | AGE/FORMATION Possible Ekwan 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct: Mud 21	Direct: Cuttings 22	Extr. 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio C_1/C_2 30	Ratio C_1/C_3 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio C_1/C_7 35	Ratio C_1/C_3 36	Duration /Choke 37	Duration Kick 38	Density Suct. 39	Density Comp. 40	Samples 41

MUD

42

	Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49
D						
V						
F						
NaCl						
% Fuel	Total 46			Daily Total 50		

REMARKS 51

Very poor total gas 350-600 ppm
from 3885' to 3935'

Program 52

Position at 8 A.M. Drilling at 4185' Limestone and dolomite 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DAILY REPORT
GEOLOGY - SHOWS

DATE	No.	FOOTAGE		LAST DEPTH	WELL NAME
1 08/10/74	2 17	3 147 Ft.	4 20:30 Hr.	5 3854 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	9 MIN/FT	10	11	12	13	14	15
3707	3805	7-10	84	89	95			White chert, conchoidal fracture; limestone cream, white, med. brown beige, cryptoxln - fine xln, very hard, tight, fossiliferous
3805	3854	5	82	89	91			Limestone, dolomitic, light - med. brown, beige, cream, cryptoxln - fine xln, hard - very hard, slightly argillaceous, no glauc. with intercalations: dolomite, calcareous, dark brown, light grey, cryptoxln - fine xln, medium hard, no glauc.

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION | 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Fluorescence Direct Cuttings	Fluorescence Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26

Constant
Increasing
Decreasing
Regularly
Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct.	Density Comp.	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / NaCl / % Fuel

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49
Total 46			Daily Total 50		

REMARKS 51

Program 52

Position at 8 A.M. Drilling at 3926' 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE 1: 07/10/74	No. 2: 16	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE 3: 156 Ft.	4: 20:00 Hr.	LAST DEPTH 5: 3707 Ft.	WELL NAME 6: POLAR BEAR

From 7	To 8	Drilling Rate 9 Min/ft	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
3551	3707	7	92	96	100			Limestone grey, brown, beige, cream, white, occas. yellow-brown cryptoxln, very hard, locally slightly argillaceous, fossiliferous, locally silicified

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. Cuttings 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background — 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio C_1/C_2 30	Ratio C_1/C_3 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio C_1/C_2 35	Ratio C_1/C_3 36	Duration /Choke 37	Duration Kick 38	Density Suct. 39	Density Comp. 40	Sample 41

MUD

42 D — V — F — NaCl — % Fuel

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49

Total 46 | Daily Total 50

REMARKS 51

Program 52

Position at 8 A.M. 53 — Drilling at 3736'

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
1 06/10/74	2 15		3 228 Ft.	4 20:00 Hr.	5 3551 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	Min/ft	10	11	12	13	14	15
3323	3390	4-5	19	49	100			Dolomite white, pink, beige, cryptoxln -fine xln, very hard, tight, locally slightly pseudo coral, recrystallized
3390	3485	3-7	25	55	100			Dolomite white, beige, pink, cryptoxln, very hard, tight, locally slightly porous coral; dolomite dark brown, grey, silicified cryptoxln, very hard, conchoidal fractures. Circulate calcium chloride water 20 bbls in 40 minutes between 3460' and 3470'
3485	3510	6	34	62	100			Dolomite grey, beige, occasionally white, very hard, cryptoxln, tight, locally vuggy
3510	3551	6-7	75	81	100			Limestone slightly dolomitic, grey, brown beige, occasionally yellow brown, cryptoxln, very hard, tight, glauc.

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Fluorescence Direct Cuttings	Fluorescence Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26 Constant / Increasing / Decreasing / Regularly / Irregularly

From	To	%	Ratio $C1/C2$	Ratio $C1/C3$
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio $C1/C2$	Ratio $C1/C3$	Duration / Choke	Duration Kick	Density Suct.	Density Comp.	Sample
32	33	34	35	36	37	38	39	40	41

MUD

	Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
42 D						
V	43	44	45	47	48	49
F						
NaCl						
% Fuel	Total 46			Daily Total 50		

REMARKS 51

Program: Drilling 52

Position at 8 A.M.: Drilling at 3670' 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE (1)	No. (2)	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE (3)	(4)	LAST DEPTH (5)	WELL NAME (6)
	05/10/74	14		218 Ft.	17:45 Hr.	3323 Ft.	POLAR BEAR

From (7)	To (8)	Drilling Rate (9) Min/ft	CARBONATE W.UW 1 min (10)	3 min (11)	15 min (12)	POROSITY Type (13)	Grade (14)	LITHOLOGY (15)
3105	3323	4-5	20	50	90			Dolomite white, pink, beige, cryptoxln or fine xln, very hard, tight, locally slightly porous

TYPE OF DRILLING | TYPE OF BIT (16) | AGE/FORMATION (17)

OIL SHOWS

Depth or Time (18)	Colour (19)	Odour (20)	Fluorescence Direct Mud (21)	Direct Cuttings (22)	Extr. (23)	Colour Intensity (24)

(25) Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background (26): Constant, Increasing, Decreasing, Regularly, Irregularly

From (27)	To (28)	% (29)	Ratio C_1/C_2 (30)	Ratio C_1/C_3 (31)

Gas Shows (Kicks)

Depth or Time (32)	% Max. (33)	Nature (34)	Ratio C_1/C_2 (35)	Ratio C_1/C_3 (36)	Duration /Choke (37)	Duration Kick (38)	Density Suct. (39)	Density Comp (40)	Sample (41)

MUD

(42) D / V / F / NaCl / % Fuel

Gain From (43)	Gain To (44)	Gain bbl/h (45)	Loss From (47)	Loss To (48)	Loss bbl/h (49)

Total (46) | Daily Total (50)

REMARKS (51)

Program (52)

Position at 8 A.M. (53): Drilling at 3379'

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
1 02/10/74	2 11		3 0 Ft.	4 0 Hr.	5 3105' Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	9	10	11	12	13	14	15

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pesty-Dry

GAS SHOWS

Gas Background

26 Constant / Increasing / Decreasing / Regularly / Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct	Density Comp	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / NaCl / % Fuel

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49
Total 46			Daily Total 50		

REMARKS LOGGING 51

Dual laterlog (finished Oct. 1) from 1245' to 3102'
Sonic - BHL from 1100' to 3103'
FDC - CNL from 500' to 3106'
Dipmeter (good correlation with Walrus A-7l only, up to 2715')

Program: run stack 13 5/8 — 52

Position at 8 A.M.: Cementing 13 3/8 csg — 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE (1)	No. (2)	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE (3)	(4)	LAST DEPTH (5)	WELL NAME (6)
	02/10/74	11		0 Ft.	0 Hr.	3105' Ft.	POLAR BEAR

From (7)	To (8)	Drilling Rate (9)	CARBONATE W.UW 1 min (10)	3 min (11)	15 min (12)	POROSITY Type (13)	Grade (14)	LITHOLOGY (15)

TYPE OF DRILLING | TYPE OF BIT | (16) AGE/FORMATION (17)

OIL SHOWS

Depth or Time (18)	Colour (19)	Odour (20)	Fluorescence Direct Mud (21)	Direct Cuttings (22)	Extr. (23)	Colour Intensity (24)

(25) Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background (26)

Constant
Increasing
Decreasing
Regularly
Irregularly

From (27)	To (28)	% (29)	Ratio C_1/C_2 (30)	Ratio C_1/C_3 (31)

Gas Shows (Kicks)

Depth or Time (32)	% Max. (33)	Nature (34)	Ratio C_1/C_2 (35)	Ratio C_1/C_3 (36)	Duration /Choke (37)	Duration Kick (38)	Density Suct (39)	Density Comp. (40)	Sample (41)

MUD

(42) D — V — F — NaCl — % Fuel

Gain From (43)	Gain To (44)	Gain bbl/h (45)	Loss From (47)	Loss To (48)	Loss bbl/h (49)
Total (46)			Daily Total (50)		

REMARKS (51) LOGGING

Dual laterlog (finished Oct. 1) from 1245' to 3102'
Sonic - BHL from 1100' to 3103'
FDC - CNL from 500' to 3106'
Dipmeter (good correlation with Walrus A-71 only, up to 2715')

Program (52): run stack 13 5/8

Position at 8 A.M. (53): Cementing 13 3/8 csg

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE (1)	No. (2)	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE (3)	(4)	LAST DEPTH (5)	WELL NAME (6)
	01/10/74	10		313 Ft.	13:30 Hr.	3105 Ft.	POLAR BEAR

From (7)	To (8)	Drilling Rate (9) Min/ft	CARBONATE W.UW 1 min (10)	3 min (11)	15 min (12)	POROSITY Type (13)	Grade (14)	LITHOLOGY (15)
2792	3030	1-2	1	3	7			Salt white; minor clay brown, cream, calcareous, occas. silty, dns., plastic:
								Salt plus clay plus dolomitic shale red, light brown, hard
3030	3070	3	2	6	18			blocky; limestone light grey, fnxln, argillaceous, hard, slightly
								bituminous:
3070	3105	4-7	5	19	45			Dominantly Dolomite white, cryptoxln, pure, hard, tight; locally
								PSEUDO Dolomite buff, cream, cryptoxln, hard, occas. quite porous,
								minor salt, shale.

TYPE OF DRILLING | TYPE OF BIT | (16) AGE/FORMATION (17)

OIL SHOWS

Depth or Time (18)	Colour (19)	Odour (20)	Fluorescence Direct Mud (21)	Direct Cuttings (22)	Extr. (23)	Colour Intensity (24)

(25) Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background (26)

Constant
Increasing
Decreasing
Regularly
Irregularly

From (27)	To (28)	% (29)	Ratio C1/C2 (30)	Ratio C1/C3 (31)

Gas Shows (Kicks)

Depth or Time (32)	% Max. (33)	Nature (34)	Ratio C1/C2 (35)	Ratio C1/C3 (36)	Duration /Choke (37)	Duration Kick (38)	Density Suct. (39)	Density Comp (40)	Sample (41)

MUD

(42) D / V / F / NaCl / % Fuel

Gain From (43)	Gain To (44)	Gain bbl/h (45)	Loss From (47)	Loss To (48)	Loss bbl/h (49)

Total (46) | Daily Total (50)

REMARKS (51)

1/ Laterlog
2/ After midnight - Sonic - BHC - Xray
3/ FDC - CHL
4/ Dipmeter in progress

Program (52)

Position at 8 A.M. (53)

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
1 30/9/74	2 9		3 167 Ft.	4 12:15 Hr.	5 2797 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	"Min/ft	10	11	12	13	14	15
2625	2650	3-14	37	75	85			Light or medium brown, dolomitic, fine xln, tight, medium hard, limestone.
2650	2725	2-7	80	90	92			Light to medium brown, buff, fine xln, tight, very hard, limestone. From 2665' to 2675', 10% of dark brown, fine xln, bituminous, soft, limestone.
2725	2797	1-2	37	62	65			Salt probable, with brown/red, calcareous, occasionally silty, soft, plastic clay, and brown, fine xln, tight, limestone.

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

26 Constant / Increasing / Decreasing / Regularly / Irregularly

Gas Background From	To	%	Ratio C_1/C_2	C_1/C_3	Gas Shows (Kicks) Depth or Time	% Max.	Nature	Ratio C_1/C_2	C_1/C_3	Duration /Choke	Kick	Density Suct.	Comp.	Sample
27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / NaCl / % Fuel

Gain From	To	bbl/h	Loss From	To	bbl/h
43	44	45	47	48	49
Total 46			Daily Total 50		

REMARKS 51

Program 52

Position at 8 A.M. 53

FORM 6:04

AQUITAINE COMPANY OF CANADA LTD	DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
	1 29/9/74	2 8		3 421 Ft.	4 23:15 Hr.	5 2625 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
7	8	9 Min/ft	10	11	12	13	14	15
2204	2325	1-2	10	13	14			Clay, brown/red, soft, slightly calcareous, very silty, plastic$; abundant fossils
2325	2380	3-14	24	53	80			Clay as above; Dolomite, red/brown, buff, cream, grey, fine xln, medium hard, tight; traces of dolomite, cream, cryptoxln, tight.
2380	2465	1	10	22	30			Salt-anhydrite, white, light grey; dolomite buff, fine xln, tight; Clay as above.
2465	2625	3-4	84	95	95			Dolomite, buff, light brown or grey, white, cryptoxln, hard, por; Limestone, buff, cryptoxln, tight, very hard; limestone, cream, light brown, cryptoxln, very hard, tight; limestone buff, cream, fine xln, oolitic, tight, hard.
								NOTE: at 2530 - limestone becoming dolomitic - carbonates 25-71-90 Bituminous traces in limestone

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26 Constant / Increasing / Decreasing / Regularly / Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct.	Density Comp	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / NaCl / % Fuel

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49
Total 46			Daily Total 50		

REMARKS 51

Program 52

Position at 8 A.M. 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE 1	No. 2	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE 3	4	LAST DEPTH 5	WELL NAME 6
	28/9/74	7		381 Ft.	12:30Hr.	2204 Ft.	POLAR BEAR

From 7	To 8	Drilling Rate 9 Min/ft	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
1823	1960	2	79	80	80			Limestone, white/buff, rose, fine xln, tight, abundant fossils; Intercalations of clay, brown/red, slightly silty, calcareous, soft, with gypsum
1960	1980	1	20	33	41			As above, with intercalations of gray, yellow, silicious, friable, fine xln, argillaceous content.
1980	2204	1-2	7	14	18			Clay, brown/red, occasionally purple, very soft, slightly calcareous, very silty, plastic

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio $C1/C2$ 30	Ratio $C1/C3$ 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio $C1/C2$ 35	Ratio $C1/C3$ 36	Duration /Choke 37	Duration Kick 38	Density Suct. 39	Density Comp 40	Sem. pls 41

MUD

42 D — V — F — NaCl — % Fuel

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49

Total 46 | Daily Total 50

REMARKS 51

Program 52

Position at 8 A.M. Drilling at 2360'. From 2320' - dolomite 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DATE	No.	FOOTAGE		LAST DEPTH	WELL NAME
1 27/9/74	2 6	3 313 Ft.	4 15:30 Hr.	5 1848 Ft.	6 POLAR BEAR

DAILY REPORT
GEOLOGY - SHOWS

From 7	To 8	Drilling Rate 9 Min/ft	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
1535	1685	1-3	62	68	72			White, cream, pink, yellow orange, brick red, hard, occasionally silty, argillaceous limestone. Intercalations of anhydrite.
1685	1755	2-3	50	62	70			Dominantly: Medium buff, dolomitic, cryptocrystalline, hard, tight, limestone Minor red, brown, argillaceous silty, limestone Traces of clay, brick red
1755	1848	2	79	86	87			Dominantly: buff, pink, cryptocrystalline, tight, locally slightly porous limestone with abundant fossils Intercalations of: Red, brown, yellow, argillaceous, silty or sandy limestone Anhydrite

TYPE OF DRILLING | TYPE OF BIT 16 | AGE/FORMATION 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio C_1/C_2 30	Ratio C_1/C_3 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio C_1/C_2 35	Ratio C_1/C_3 36	Duration /Choke 37	Duration Kick 38	Density Suct. 39	Density Comp. 40	Sample 41

MUD

42 D V F NaCl % Fuel

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49

Total 46 | Daily Total 50

REMARKS 51

Program 52

Position at 8 A.M. 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD

DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
1 26/9/74	2 5		3 260 Ft.	4 7:30 Hr.	5 1510 Ft.	6 POLAR BEAR

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min.	POROSITY Type	Grade	LITHOLOGY
7	8	Min/ft	10	11	12	13	14	15
1250	1405	1	5	16				Red-brown, locally yellow or reddish, silty to sandy plastic clay
								Traces of chert and anhydrite
1405	1450	1-2	48	64	70			Red-brown argilaceous and/or dolomitic, sandy or silty, crypto-
								crystalline, Hard, occassional soft limestone
1450	1510	1-3	80	82	83			White, pink, yellow-orange, brick-red, occassional silty argilaceous
								limestone.
								Intercalation of white dolomite

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION DEVON - Unit C to 1405'/Unit B from 1405' 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26 Constant / Increasing / Decreasing / Regularly / Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct.	Density Comp.	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / NaCl / % Fuel

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49
Total 46			Daily Total 50		

REMARKS 51

Program 52

Position at 8 A.M. Drilling 1666' 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE 1	No. 2	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE 3	4	LAST DEPTH 5	WELL NAME 6
	25/9/74	4		1250 Ft.	5:30 Hr.	1140 Ft.	POLAR BEAR

From 7	To 8	Drilling Rate	CARBONATE W.UW 1 min 10	3 min 11	15 min 12	POROSITY Type 13	Grade 14	LITHOLOGY 15
		Min/ft						
1140	1250	2-3						No sample -
								Sample on bit: black-brown clay, silty to sandy, plastic, calcareous;
								Occassional pebble fine grained sandstone

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time 18	Colour 19	Odour 20	Fluorescence Direct Mud 21	Direct Cuttings 22	Extr. 23	Colour Intensity 24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background 26

Constant
Increasing
Decreasing
Regularly
Irregularly

From 27	To 28	% 29	Ratio C_1/C_2 30	Ratio C_1/C_3 31

Gas Shows (Kicks)

Depth or Time 32	% Max. 33	Nature 34	Ratio C_1/C_2 35	Ratio C_1/C_3 36	Duration /Choke 37	Duration Kick 38	Density Suct. 39	Density Comp. 40	Sample 41

MUD

42 D / V / F / NaCl / % Fuel

Gain From 43	Gain To 44	Gain bbl/h 45	Loss From 47	Loss To 48	Loss bbl/h 49
Total 46			Daily Total 50		

REMARKS 51

Program 52

Position at 8 A.M. 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE (1)	No. (2)	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE (3) (4)	LAST DEPTH (5)	WELL NAME (6)
	24/9/74	3		417 Ft / 10:45 Hr.	1,140 Ft.	Polar Bear

From (7)	To (8)	Drilling Rate (9)	CARBONATE W.UW 1 min (10)	CARBONATE W.UW 3 min (11)	CARBONATE W.UW 15 min (12)	POROSITY Type (13)	POROSITY Grade (14)	LITHOLOGY (15)
723	1,140	1' - 2'						No return to surface.

TYPE OF DRILLING | TYPE OF BIT | (16) AGE/FORMATION (17)

OIL SHOWS

Depth or Time (18)	Colour (19)	Odour (20)	Fluorescence Direct Mud (21)	Fluorescence Direct Cuttings (22)	Fluorescence Extr. (23)	Colour Intensity (24)

(25) Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background (26)

From (27)	To (28)	% (29)	Ratio C_1/C_2 (30)	Ratio C_1/C_3 (31)

Constant
Increasing
Decreasing
Regularly
Irregularly

Gas Shows (Kicks)

Depth or Time (32)	% Max. (33)	Nature (34)	Ratio C_1/C_2 (35)	Ratio C_1/C_3 (36)	Duration /Choke (37)	Duration Kick (38)	Density Suct. (39)	Density Comp. (40)	Sample (41)

MUD

(42) D / V / F / NaCl / % Fuel

Gain From (43)	Gain To (44)	Gain bbl/h (45)	Loss From (47)	Loss To (48)	Loss bbl/h (49)

Total (46) | Daily Total (50)

REMARKS (51)

CONFIDENTIAL

Program (52)

Position at 8 A.M. Preparation to run 20" casing. (53)

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE 1	No. 2	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE 3	4	LAST DEPTH 5	WELL NAME 6
	23/9/74	2		75 Ft.	9:45 Hr.	723 Ft.	Polar Bear

From	To	Drilling Rate	CARBONATE W.UW 1 min	3 min	15 min	POROSITY Type	Grade	LITHOLOGY
	8	9 min/ft	10	11	12	13	14	15
648	723	3 - 12						No return to surface - trace of clay black brown on bit.

TYPE OF DRILLING | TYPE OF BIT | 16 AGE/FORMATION 17

OIL SHOWS

Depth or Time	Colour	Odour	Fluorescence Direct Mud	Direct Cuttings	Extr.	Colour Intensity
18	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

26

Constant
Increasing
Decreasing
Regularly
Irregularly

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Suct	Density Comp.	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D ___ V ___ F ___ NaCl ___ % Fuel ___

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49
Total 46			Daily Total 50		

REMARKS 51

CONFIDENTIAL

Program 52

Position at 8 A.M. Drilling out cement. 53

FORM 6104

AQUITAINE COMPANY OF CANADA LTD	DATE	No.	DAILY REPORT GEOLOGY - SHOWS	FOOTAGE		LAST DEPTH	WELL NAME
	1 22/9/74	2 1		3 18 Ft.	4 3:30 Hr.	5 648 Ft	6 Polar Bear

From	To	Drilling Rate	CARBONATE WASH			POROSITY		LITHOLOGY
			1 min	3 min	15 min	Type	Grade	
7	8	9 min/ft	10	11	12	13	14	15
630	648	1 - 4						No return to surface.

TYPE OF DRILLING | TYPE OF BIT | 16 | AGE/FORMATION | 17

OIL SHOWS

From or Time	Colour	Odour	Fluorescence		Extr.	Colour Intensity
			Direct			
			Mud	Cuttings		
19	19	20	21	22	23	24

25 Oil/Bitumen/Fluid-Heavy-Pasty-Dry

GAS SHOWS

Gas Background

From	To	%	Ratio C_1/C_2	Ratio C_1/C_3
27	28	29	30	31

26 Constant / Increasing / Decreasing / Regularly / Irregularly

Gas Shows (Kicks)

Depth or Time	% Max.	Nature	Ratio C_1/C_2	Ratio C_1/C_3	Duration /Choke	Duration Kick	Density Succ.	Density Comp	Sample
32	33	34	35	36	37	38	39	40	41

MUD

42 D / V / F / Ph / Cl / Fuel

Gain From	Gain To	Gain bbl/h	Loss From	Loss To	Loss bbl/h
43	44	45	47	48	49

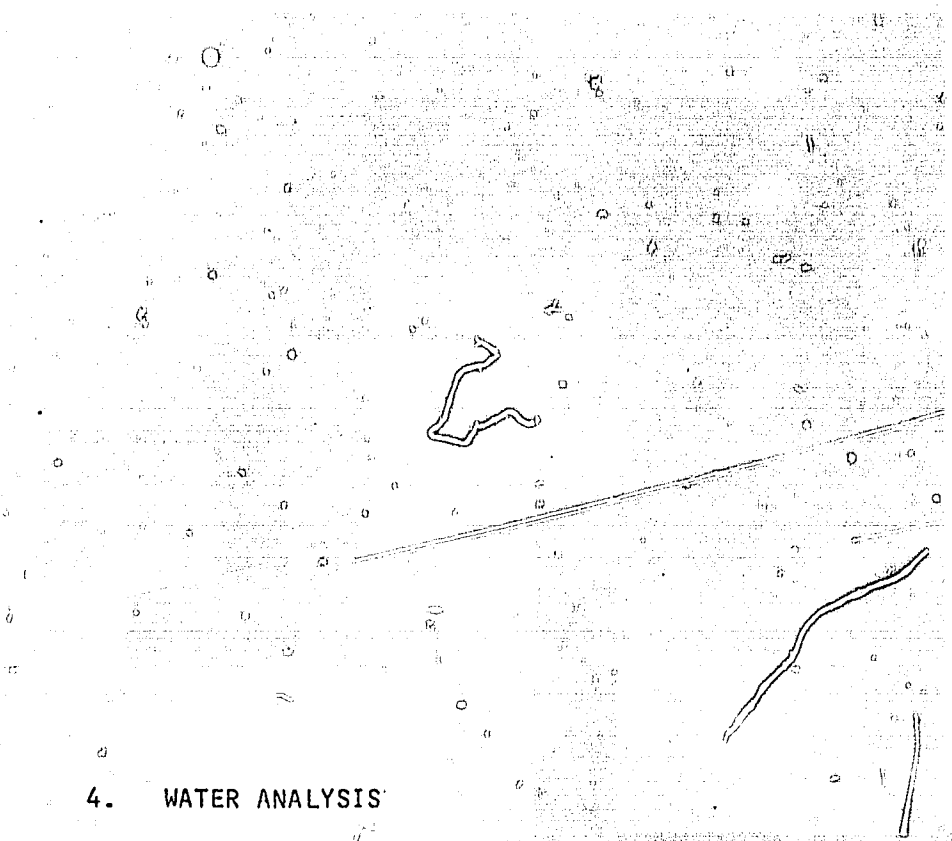
46 Total | 50 Daily Total

REMARKS 51

CONFIDENTIAL

Program 52

Position at 8 A.M. Drilling at 713'. 53



4. WATER ANALYSIS

CORE LABORATORIES - CANADA LTD.
Petroleum Reservoir Engineering
CALGARY ALBERTA

Plastic — CONTAINER IDENTITY

WATER ANALYSIS

7021-41470 — LABORATORY NUMBER

Aquitaine Company of Canada Ltd. — OPERATOR

1 of 2 — PAGE

58° 30' 08.00 N.L.
86° 47' 13.00 W.L. — LOCATION

Aquit et al Polar Bear O-20 — WELL OR SAMPLE LOCATION NAME

77' KB - sea level — ~~GR ELEV.~~

553' Water Depth

Hudson Bay — FIELD OR AREA

POOL OR ZONE

SAMPLER

TEST TYPE & NO.

TEST RECOVERY

Formation Water A — POINT OF SAMPLE

Approx. 3500' — AMT. & TYPE CUSHION

@ °F — MUD RESISTIVITY

TEST INTERVALS OR PERFS.

PUMPING FLOWING GAS LIFT SWAB

WATER BBLS/D. OIL BBLS/D. GAS MFC/D.

SEPARATOR RESERVOIR

@ °F CONTAINER WHEN SAMPLED

@ °F CONTAINER WHEN RECEIVED

SEPARATOR

PRESSURES, PSIG — TEMPERATURES, °F

Oct. 25/74 — DATE SAMPLED (D/M/Y)

Oct. 29/71 — DATE RECEIVED (D/M/Y)

A.A. — DATE ANALYSED (D/M/Y) / ANALYST

REMARKS

ION	MG/L	MG%	MEQ/L
Na+K	12500	2.4	543.7
K			
Ca	163566	31.0	8162.0
Mg	11078	2.1	910.6
Ba			
Sr			
Fe		TRACE	

ION	MG/L	MG%	MEQ/L
Cl	340519	64.4	9604.8
Br			
I			
HCO_3	820	0.2	13.4
SO_4	0	0.0	0.0
CO_3	0	0.0	0.0
OH	0	0.0	0.0
H_2S	NOT DETECTED		

TOTAL SOLIDS MG/L

BY EVAPORATION @ 110°C

BY EVAPORATION @ 180°C

528464 — CALCULATED

AT IGNITION

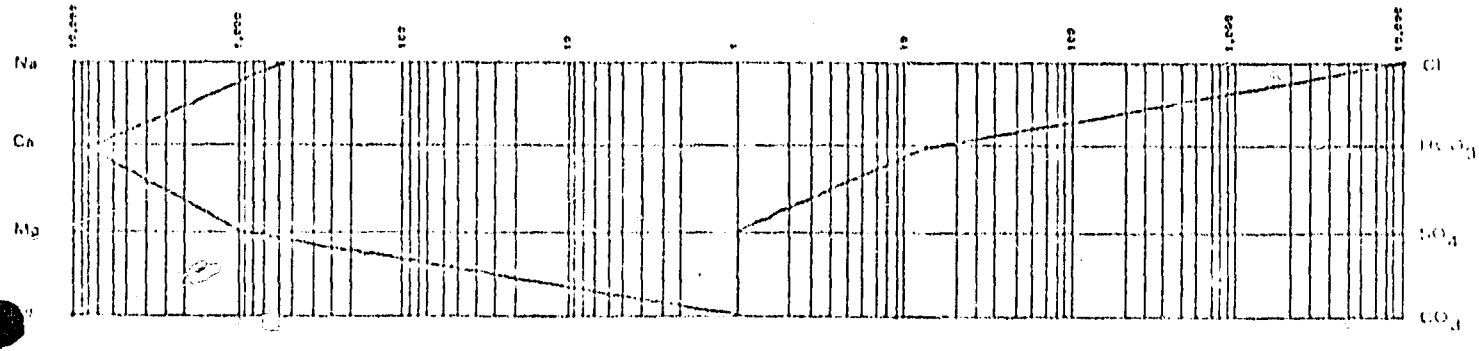
1.3835 @ 60°F — SPECIFIC GRAVITY

1.4367 @ 19°C — REFRACTIVE INDEX

4.7 — pH

0.103 @ 25°C — RESISTIVITY (OHM/METER)

LOGARITHMIC PATTERN MEQ PER LITER



REMARKS NaCl equiv 530785

Note. This sample has been taken when circulating after electrical loggings and before setting the first abandonment cement plug.

CORE LABORATORIES - CANADA LTD.
Petroleum Reservoir Engineering
CALGARY ALBERTA

Plastic — CONTAINER IDENTITY

WATER ANALYSIS

7021-41470 — LABORATORY NUMBER

Aquitaine Company of Canada Ltd. — OPERATOR

2 of 2 — PAGE

58° 30' 08.00 N.L.
86° 47' 13.00 W.L. — LOCATION

Aquit et al Polar Bear O-20 — WELL OR SAMPLE LOCATION NAME

77' — KB-mean level

553' — Water Depth

Hudson Bay — FIELD OR AREA

POOL OR ZONE

SAMPLER

TEST TYPE & NO.

TEST RECOVERY

Production Water H — POINT OF SAMPLE

Approx. 3500' — AMT. & TYPE CUSHION

@ °F — MUD RESISTIVITY

TEST INTERVALS OR PERFS.

PUMPING FLOWING GAS LIFT SWAB

WATER BBLS/D. OIL BBLS/D. GAS MFC/D.

SEPARATOR RESERVOIR — @ °F CONTAINER WHEN SAMPLED — @ °F CONTAINER WHEN RECEIVED — SEPARATOR

PRESSURES, PSIG — TEMPERATURES, °F

Oct. 25/74 — DATE SAMPLED (D/M/Y)
Oct. 29/74 — DATE RECEIVED (D/M/Y)
A.A. — DATE ANALYSED (D/M/Y) / ANALYST

REMARKS

ION	MG/L	MG%	MEQ/L
Na+K	5236	1.0	227.7
K			
Ca	156769	31.1	7822.8
Mg	14170	2.8	1164.7
Ba			
Sr			
Fe		TRACE	

ION	MG/L	MG%	MEQ/L
Cl	326331	64.8	9204.6
Br			
I			
HCO_3	771	0.2	12.6
SO_4	0	0.0	0.0
CO_3	0	0.0	0.0
OH	0	0.0	0.0
H_2S	NOT DETECTED		

TOTAL SOLIDS MG/L

BY EVAPORATION @ 110°C

BY EVAPORATION @ 180°C: 503277 — CALCULATED

AT IGNITION

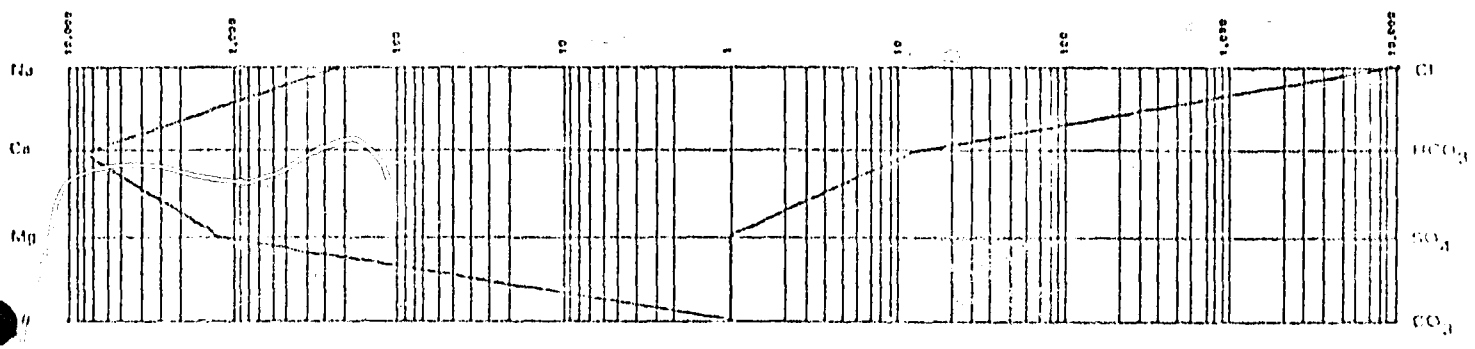
1.3763 @ 60°F — SPECIFIC GRAVITY

1.4354 @ 19°C — REFRACTIVE INDEX

4.5 — pH

0.087 @ 25°C — RESISTIVITY (OHM/METER)

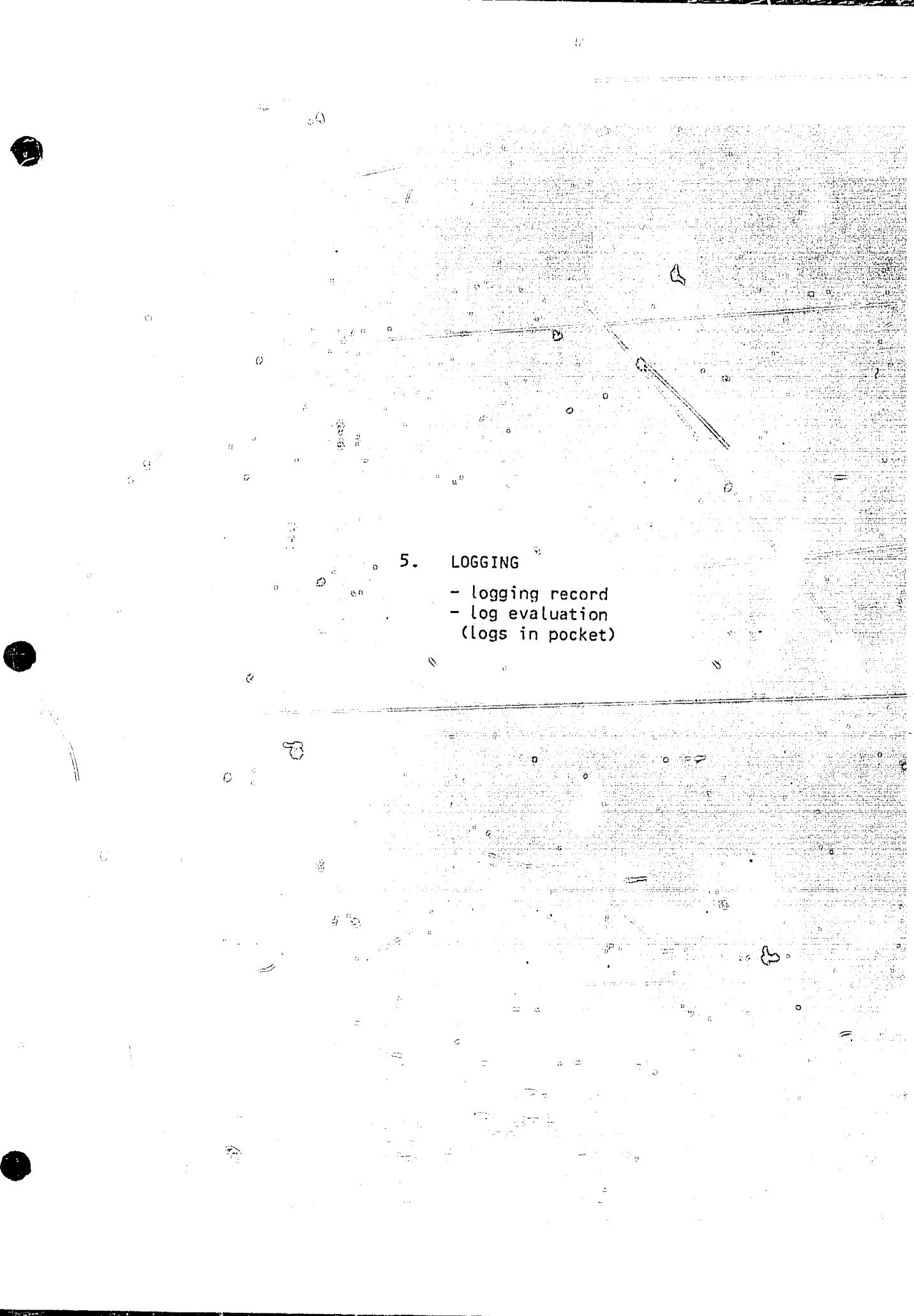
LOGARITHMIC PATTERN MEQ PER LITER



REMARKS

HaCl equiv 509045

Note Sample taken when circulating after the electrical logging and before setting the first abandonment cement plug.



5. LOGGING

- logging record
- log evaluation
  (logs in pocket)

FORM 5105

LOGGING RECORD

AQUITAINE
COMPANY OF CANADA LTD.

TYPE (ABBREVIATE)	DATE	DEPTH LOGGED		RUN No.	REMARKS (LOGGING CO. ETC.)
		FROM	TO		
DLL	Oct. 1/74	1245	3102	1	Schlumberger (Frontier)
	Oct 14/74	3100	5156	2	
FDC-CNL	Oct. 1/74	500	3106	1	
	Oct 14/74	3078	5167	2	
SLC-GR	Oct. 1/74	1100	3106	1	
	Oct 14/74	3078	5166	2	
HDT	Oct. 1/74	1230	3112	1	
	Oct 14/74	3078	5168	2	
Formation Tester	Oct 15/74	4199	4199	1	

M E M O R A N D U M

TO: M.E. Hriskevich DATE: November 6, 1974

FROM: A.J. Brinker FILE: W.F.

RE: Aquitaine et al Polar Bear C-11 Log Evaluation

Well Data:

Kelly Bushing:	77'
Kelly Bushing to Sea Floor:	630'
Casing:	30" to 710'
	20" to 1,227'
	13 3/8" to 3,081'
Open Hole:	12¼" to 5,170'
Logs Run:	Run 1 at 3,105'
	DLL, CNL-FDC, BHC-GR, HDT
	Run 2 at 5,170'
	DLL, CNL-FDC, BHC-GR, HDT, FIT, SRS

An evaluation of the logs showing porosity, water saturation and lithology in the AQUITAINE ET AL POLAR BEAR C-11 well is included herein.

1,227' - 1,384'	- hole is too large for logging tools to indicate lithology.
1,384' - 1,446'	primarily shale possibly with some sand.
1,446' - 1,470'	sand grading into limestone and becoming shaley near the bottom of the interval some porosity, approximately 3% is indicated in the interval 1,450' - 58' water saturation 100%
1,470' - 1,480'	shale

1,480' - 1,486' - dolomite with 7% porosity and 100% water saturation

1,485' - 1,495' - limestone

1,495' - 1,506' - shale

1,506' - 1,520' - limestone, shale, gypsum

1,520' - 1,550' - limestone and shale

1,550' - 1,590' - limestone and shale

1,590' - 1,690' - limestone shale dolomite with gypsum indicated at 1,661' and 1,668' and 1,684'

1,690' - 1,695' - dense dolomite

1,695' - 1,730' - porous limestone averaging 10% with 100% water saturation

1,730' - 1,782' - limestone with shale

1,782' - 1,808' - porous limestone averaging 8% with 100% water saturation

1,808' - 1,875' - shaley limestone

1,875' - 1,970' - shaley dolomite

1,970' - 2,323' - primarily shale

2,323' - 2,337' - dolomite

2,337' - 2,380' - shale

2,380' - 2,466' - salt

2,466' - 2,528' - primarily dolomite with some 5% porosity Sw = 100%

2,528' - 2,660' - gypsum

2,660' - 2,674' - dolomite with some shale

2,694' - 2,726' - shale

2,726' - 2 840' - salt

2,840' - 2,900' - salt with radioactive material

2,900' - 3,034' - salt

3,034' - 3,046' - limestone

3,046' - 3,076' - salt

3,076' - 3,110' - large hole

3,110' - 3,140' - dolomite with gypsum

3,140' - 3,190' - dense dolomite

3,190' - 3,204' - gypsum

- 3,250' - dolomite

3,250' - 3,274' - dolomtie with an average of 3% porosity Sw = 100

3,274' - 3,281' - gypsum

3,281' - 3,446' - dolomite

3,446' - 3,464' - dolomite with up to 5% porosity Sw = 100%

3,464' - 3,468' - gypsum

3,468' - 3,500' - dolomite with increasing amount of shale

3,500' - 3,804' - dense dolomite

- on indication of porosity, 3,540' may be due to gypsum

3,804' - 3,809' - gypsum

3,809' - 3,820' - dolomite with some shale and possibly some gypsum

3,820' - 3,853' - dolomite averaging 3% porosity with a minimum water saturation of 50%.

3,853' - 3,880' - dense dolomite

3,880 - 3,906' - dense limestone

3,906' - 3,912' - anhydrite

3,912' - 3,915' - porous dolomite (5%) or gypsum

3,915' - 3,920' - anhydrite

3,920' - 3,927' - dense dolomite

3,927' - 3,938' - anhydrite

3,938' - 3,948' - dense limestone grading into dense dolomite

3,948' - 3,966' - anhydrite grading into dolomite and gypsum

3,966' - 3,982' - dense dolomite

3,982' - 4,006' - dolomite with porosity averaging 3% Sw = 100%

4,006' - 4,050' - limey dolomite, dense

4,050' - 4,070' - dolomite

4,070' - 4,116' - limestone, dense

4,116' - 4,128' - anhydrite

4,128' - 4,155' - dolomite with some gypsum

4,155' - 4,164' - dolomite with 4% porosity Sw = 100%

4,164' - 4,170' - limestone dense

4,170' - 4,176' - dolomite with 3% porosity Sw = 100%

4,176' - 4,186' - dense limestone

4,186' - 4,230' - gypsum

4,230' - 4,296' - limestone, dense

4,296' - 4,306' - gypsum

4,306' - 4,356' - salt

4,356' - 4,378' - gypsum

4,378' - 4,382' - dolomite

4,382' - 4,386' - gypsum

4,386' - 4,425' - dolomite with 2-3% porosity Sw = 100%

4,425' - 4,235' - anhydrite

4,435' - 4,439' - dolomite dense

4,439' - 4,458' - gypsum

4,458' - 4,470' - dolomite 1% porosity Sw = 100%

4,470' - 4,492' - dolomite with gypsum and anhydrite

4,492' - 4,514' - dolomite, dense

4,514' - 4,548' - anhydrite

4,548' - 4,558' - gypsum

4,558' - 4,580' - dolomite dense

4,580' - 4,592' - shale

4,592' - 4,604' - limestone grading to dolomite

4,604' - 4,608' - anhydrite

4,608' - 68' - dolomite, dense

4,668' - 4,868' - limestone, dolomite, dense

4,868' - 4,910' - gypsum

4,910' - 5,124' - limestone, dense

5,124' - 5,138' - shale

5,138' - 5,150' - sand with 1-2% porosity and Sw = 40%

VBMcKeown/sgb

SOCIETE NATIONALE DES PETROLES D'AQUITAINE
DEPARTMENT OF ENERGY AND MINES
C. R. P. - GEOLOGY

AQUITAINE & AL.

POLAR BEAR C-11 WELL (HUDSON BAY, CANADA)

GEOLOGICAL AND GEOCHEMICAL STUDY

Note R/GEO n° 57/75 4 March, 1975

Authors :

Palynoplanktology : G. PENIGUEL
N. CAZABAN, M.C. GELLIBERT, G.HAYE

Micropaléontology : J. LE FEVRE

Microfacies : M. TIXIER

Optical study of the organic matter : A.M. CASSOU, M. CORREIA

Geochemistry : J. CONNAN, B. PORTHAULT
R. MAGALHAES-GOMES

MAIN RESULTS

The biostratigraphic attributions very well fit with lithostratigraphy and have been synthetized in Figure 2.

The depositional environment is constantly restricted but apparently unfavourable to organic matter accumulations, except for scarce horizons in the Kenogami Formation, where some bituminous deposits have been noticed, associated with stromatoporoidal dolomites.

The source-rock potential must be considered as low in the whole section, due to the general paucity of organic matter contents, as well as to the very low maturation grade.

The present report is a tentative synthesis of all the stratigraphic, petrographic, mineralogical and geochemical analyses made by the geological staff of the S.N.P.A. Research Centre on the Polar Bear well. The preliminary results exposed in the note R/GEO nr. 28/75 of January 24th, 1975 have been thus completed and updated.

I. / BIOSTRATIGRAPHY /

The biostratigraphical results have been obtained both from palynoplanktology and micropaleontology (Ostracodes and Conodonts) ; they have been summarized in Figure 2.

1.1. PALYNOPLANKTOLOGY

Fourty one composite samples have been studied between 1,260' and 5,170' by various palynoplanktological techniques (Spores, Acritarchs, Chitinozoans and Scolecodonts). The spacing between each sample varies between 100' and 200'.

The investigated section has been found rather irregularly fossiliferous. Three main intervals have been distinguished, roughly corresponding with the Devonian, the Silurian and the Ordovician :

1/ The upper part of the section is rather poor and sporadically contains microorganisms which are either very common, or long-ranging or facies controlled (e.g. Tasmanaceae). Only very scarce specimens of some species of Spores, Acritarchs and Chitinozoans may provide a relatively accurate datation. Scolecodonts are biostratigraphically meaningless.

2/ The middle part of the section is very poor in palynoplanktological microfossils, and often barren. Very scarce long-ranging species are present in some horizons.

3/ The lower part of this well is conversely very rich : microfossils are numerous, very typical and provide precise stratigraphical attributions. This is the case for the three major groups : Acritarchs, Chitinozoans and Scolecodonts. The identified assemblages are very close to those previously described in our note (R/GEO nr. 354/70) of December 1970 and related to Canada and Northern U.S. The scale used in the present report is accordingly the same. In addition, the state of preservation of these microorganisms is generally very good.

On the basis of palynoplanktological data, the well section may be subdivided in 7 main intervals ranging from the Upper-Middle Devonian to the Upper-Middle Ordovician. Five of these intervals are relatively well-defined, the two others, located within the Silurian, are imprecise or stratigraphically unsignificant,as it is always the case in this basin.

The different intervals are hereafter described by their palynoplanktological contents and assigned an assumed age.

1.1.1. 1,260' - 1,960'

This first upper interval only contains Acritarchs and principally Tasmanaceous types as Hy 118, Hy 119, Hy 127, Hy 151. A unique interesting species is present :

Hy 45 - Polyedrixium decorum,

the range of which is Middle to Upper Devonian in Northern America.

Assumed age : "Upper to Middle Devonian"
(= 20 to 26 C.UP-PA of our scale)

1.1.2. 2,000' - 3,060'

Various microfossils occur. The most interesting for stratigraphy are the following :

Acritarchs :

Hy 45 - Polyedrixium decorum
(as in the overlying interval)
Hy 51 - Evittia sp.
Hy 53 - Navifusa bacillum

and a very particular Tasmanaceae :

Hy 361

Spores :

Sr 21 - Densosporites sp.
Sr 53 - Hymenozonotriletes longus
Sr 119 - Verrucosisporites premnus
Sr 129 - Geminospora lemurata
Sr 130 - Hystrichosporites porrectus
Sr 214 - Grandispora sp.

Chitinozoans :

Cz 199 - Eisenackitina castor

Cz 205 - Angochitina devonica

Scolecodonts :

The occurring species are stratigraphically unsignificant because of their too long range.

In this interval we can successively distinguish the C.UP-PA units 17-19, 19/20 and 20.

Assumed age : "Middle Devonian"

1.1.3. 3,060' - 3,160'

This is a very particular composite sample containing very significant Chitinozoans.

A Devonian type :

Cz 205 - Angochitina devonica

is mixed with another type ranging up to the Silurian :

Cz 333 - Cyathochitina cf. dispars

(C.UP-PA : 13-15/16-19)

Therefore we interprete this sample as taken at the Devonian/Silurian limit.

Assumed age : "Devonian/Silurian limit"

1.1.4. 3,180' - 3,360'

This interval is very poor. It is possible to mention the presence of :

an Acritarch :

Hy 361 (particular Tasmanaceae)

and Chitinozoan :

Cz 333 - Cyathochitina cf. dispars

which has been found in the above horizon. Owing to the logical unit succession, it may be concluded that this sequence corresponds to the C.UP-PA units 13-15.

Assumed age : "Lower Silurian"

1.1.5. 3,360' - 3,660'

Barren.

Assumed age : Undetermined.

1.1.6. 3,660' - 4,410'

All microfossils present are long-ranging and, thus, of poor stratigraphical usefulness.

Acritarchs :

There are only common Tasmanaceae.

Chitinozoans :

Cz 39a - Conochitina gordonensis
Cz 39b - Conochitina brevis
Cz 333 - Cyathochitina cf. dispars
Cz 343 - Conochitina acuminata
Cz 349 - Conochitina probocifera

Scolecodonts :

Very common, but devoid of stratigraphical significance.

The all C.UP-PA comprised between 5 and 14 are possible.

Assumed age : "Lower Silurian to Ordovician"

1.1.7. 4,460' - 5,130'/5,170'

This is the richest interval containing a very abundant and various assemblage of Acritarchs, Chitinozoans and Scolecodonts. The major species or types are :

Acritarchs :

Hy 11 - Leiofusa cf. estrecha
Hy 78 - Dasydiacrodium sp.
Hy 83 - Peteinosphaeridium bergströmii
Hy 87 - Baltisphaeridium saharicum
Hy 101 - Baltisphaeridium sp.
Hy 163
Hy 197 - Polygonium sp.
Hy 318 - Veryhachium sp.
Hy 319 - Polygonium sp.
Hy 320 - Baltisphaeridium sp.

Chitinozoans :

Cz 35 - Cyathochitina calix
Cz 39c - Conochitina micracantha
Cz 94 - Hoegisphaera complanata
Cz 311 - Desmochitina minor
Cz 317 - Conochitina cactacea
Cz 318 - Conochitina micracantha micracantha
Cz 325 - Hercochitina sp.
Cz 326 - Hercochitina sp.
Cz 327 - Hercochitina sp.
Cz 338 - Conochitina sp.
Cz 351 - Desmochitina sp.

Scolecodonts :

D 39 - Paleoenonites angiportus
D 125 - Diopatraites sulcatus
D 161
D 201
D 218 - Staurocephalites sp.

The C.UP-PA units 3-6, 4-6, 5-6, 5-7 are successively involved.

Assumed age : "Upper to Middle Ordovician"
(possible "Upper Caradocian to Ashgillian")

1.1.8. Comparison with lithostratigraphy

If we compare the palynostratigraphical results with lithostratigraphy, we can state that :

- Units C and B correspond to our "Upper to Middle Devonian".
- Unit A and Kenogami are close to "Middle Devonian".
- The limit between Kenogami Formation and Ekwan Formation is located within our composite sample 3,060'-3,160', attributed to the Devonian/Silurian limit.
- The Ekwan Formation corresponds to Lower Silurian, as determined by palynoplanktology.
- The Severn Formation is not accurately defined by means of palynoplanktology (Lower Silurian to Ordovician). It is probably Silurian in age but this attribution cannot be ascertained by our technique.

- The common attributions of the Churchill River and Bad Cache Rapids Formations fit with the identified Upper to Middle Ordovician.

Therefore, there is a total agreement between lithostratigraphy and palynostratigraphy.

1.1.9. Comparison with microfaunal results

The results are complementary in the Silurian and very close in the Ordovician. No discrepancy has been noticed.

1.1.10. Comparison with the nearest wells

1/ Narwhal 1 - N 58

a. The Devonian interval determined in Polar Bear C-11 seems to be more complete than in Narwhal 1 - N 58. It is also better defined. But it can be assumed that only the Middle Devonian is present in both wells. The occurrence of Lower Devonian is questionable.

b. The Silurian has been identified in Polar Bear C-11 whereas there is no evidence in Narwhal 1 - N 58.

c. The Ordovician (as palynologically determined) is not directly comparable. The interval corresponding to units 7 and 7/8 C.UP-PA ("Ashgillian"), 2,570' to 3,260' in Narwhal 1 - N 58, seems to be absent in Polar Bear C-11.

Below, the palynological assemblages are very similar in both wells.

2/ Walrus A-71

a. The upper part of the Devonian is better defined and perhaps more complete in Walrus A-71 than in Polar Bear C-11 because in the first well, it is possible to distinguish the separate C.UP-PA 22-23, 22-24 and 25-26. In the second one, these units are grouped and less precise : 20-23 and 20-26.

However, this Devonian part may be very comparable in the two wells :

Walrus A-71	Polar Bear C-11
1,100'-2,684'	1,260'-1,960'

The Middle Devonian (C.UP-PA 20, 19/20 and 17-19) is very similar in both cases :

Walrus A-71	Polar Bear C-11
2,715'-3,450' (?)	2,000'-3,060'

Between 3,450' and 3,730', an interval lacking in Polar Bear has been found in Walrus.

b. Devonian/Silurian limit

A good composite sample is representative of this limit in Polar Bear C-11 (3,060'-3,160'), and a similar one was found in Walrus A-71 (3,800'-3,921'), according to our previous results.

c. Silurian and Ordovician

On the basis of our palynoplanktological data and hypothesis, these two systems were not recognized in Walrus A-71 whereas they are very well represented in Polar Bear C-11. The Ordovician has been particularly clearly identified.

1.2. MICROPALEONTOLOGY (CONODONTS AND OSTRACODS CHIEFLY)

In the same way as in the Narwhal 1 N 58 well, composite samples were taken every 50' for acid treatment in Polar Bear C-11 ; 26 intervals were therefore analyzed within the 3,100'-5,170' interval.

The zonation obtained in the Ordovician/Silurian can be compared to that of the Narwhal 1 N 58 well, although the biozone SC 6equivalent (Lower Attawapiskat and "sole" of this formation) could not be identified. Plate II gives the correlation derived from "extracted microfauna" between the 6 boreholes drilled, up to now, in Hudson Bay.

1.2.1. MAIN RESULTS

1.2.1.1. Silurian

- Interval 3,120' - 3,360'

The three samples taken in this interval have been found barren.

- Interval 3,390' - 3,450'

A Conodont of the "simple cone" type gives the first age indication for the Silurian, going down the well.

- Biozone SC_5_(red code)

The presence of this biozone has been recognized between 3,480' and 3,720'. Certain morpho-types of Conodonts included in it have been found in the Narwhal 1 N 58 and Polar Bear C-11 wells exclusively, and they establish a precise correlation between the 2,550'-2,600' and 3,480'-3,540' intervals of these boreholes respectively.

- Biozone SC_4_(green code)

Conodonts characteristic of this biozone have been identified between 3,750' and 4,170'. We also notice the presence of some Ostracodes.

1.2.1.2. Ordovician (+ Ordovician/Silurian limit)

- Biozone OC_3_(mauve code)

The presence of index species of this zone has been observed between 4,500' and 4,560'.

- From Conodont assemblages, the Ordovician/Silurian limit can be situated between 4,500' and 4,560'. On the basis of lithological information, it would be located more precisely between 4,300' and 4,500'. By correlation with the first evidence of Ordovician in Narwhal at 3,260', it can be assumed that the limit would be actually situated at 4,300' in Polar Bear (see Plate II).

- Biozone OC_2b (brown code)

This zone has been identified between 4,770' and 4,830'.

- Biozone OC_2a (mauve_striped_code)_

This biozone ranges between 4,860' and 4,920'.

- Biozone OC_1_

In spite of the absence of characteristic Conodonts, this biozone can be inferred from the biofacies (phosphate organisms) observed between 4,950' and 5,100'.

1.2.2. REMARKS

From the study of cuttings, it seems that the thickness of the Ordovician in Polar Bear is inferior by about 200' to that of Narwhal, and superior by about 100' and 200' respectively to that of Houston Comeault and Pen Island/Kaskattama wells.

The non-identification of biozones SC 6 and SC 7 at Polar Bear does not substantiate a reliable comparison of the thicknesses of the Silurian in the Bay.

2. / LITHOLOGICAL AND MINERALOGICAL DATA (Pl. IV) /

The stratigraphical terminology used hereafter is identical to that of the well log ; furthermore the lithological breaks very well fit with the biostratigraphical limits, as shown in Figure 2.

2.1. UNIT C (1,260'-1,385')

This unit is chiefly characterized by red silty claystones, with gypsum or anhydrite and minor carbonates. Clay minerals are composed of poorly crystallized illite with minor chlorite.

2.2. UNIT B (1,385'-1,980')

This interval is richer in carbonates (mostly microcrystalline limestones) than the overlying one, but argillaceous and evaporitic interbeds are still present. Illite is dominant and better crystallized than above in the clay mineral assemblage.

2.3. UNIT A (1,980'-2,380')

The increase in the insoluble residue in HCl reflects the dominance of argillaceous materials in this interval ; dolomite prevails within the carbonate fraction. In addition, caved limestones from the above deposits have been observed in cuttings. No major change has to be noted in the clay mineral composition.

2.4. KENOGAMI FORMATION str. s. (2,380'-3,070') POLAR BEAR Fm

This formation is dominated by calcareous dolomites associated with evaporites. Bitumen concentrations have been noticed in stromatoporoid carbonates between 2,560' and 2,680'. A slight increase in chlorite proportion can be mentioned in the clay mineral assemblage.

2.5. EKWAN FORMATION (3,070'-3,485')

This formation is essentially composed of pure dolomite with very minor cryptocrystalline silica. The poorly crystallized clay fraction is dominated by illitic minerals associated with some chlorite.

2.6. SEVERN FORMATION (3,485'-4,308')

Two parts can be distinguished within this formation : calcite prevails over dolomite in the upper one (down to 3,780'), whereas dolomite is dominant and associated with anhydrite in the lower one ; in addition, pellets are frequent in this lower part.

The clay fraction is exclusively composed of illitic minerals but very poorly crystallized in the lower interval.

2.7. CHURCHILL RIVER FORMATION (4,308'-4,915')

No striking change has been observed in the mineralogical composition, except for a relative decrease in the proportions of evaporites and dolomite downward (however dolomite is again dominant at the base). Illitic minerals, including a fair proportion of mixed-layered ones, are the components of the clay fraction.

2.8. BAD CACHE RAPIDS FORMATION (4,915'-5,140')

Microbrecciated limestones, locally bioclastic, are the major facies, associated with microcrystalline and slightly dolomitic limestones. The basal part of the formation is constituted of a fine- to coarse-grained sandstone overlying green-grey soft shales which rest on the Precambrian basement. No change has to be noted in the clay mineral assemblage.

3. MICROFACIES OBSERVATIONS

The observed materials are generally devoid of significant elements ; they chiefly involve dolo- and calcimicrites or microsparites frequently associated with anhydrite or salt. Some bioclastic or pelletoidal horizons also occur but they do not support valuable microfacies correlations between Polar Bear and the previously studied wells of Hudson Bay (Pen 1, Kaskattama 1, Walrus A-71 and Narwhal South N-58).

4. / MINERAL GEOCHEMISTRY /

4.1. BORON AND PALEOSALINITY (Pl. IV)

Boron concentrations indicate an hypersaline environment throughout the section, except in the uppermost "Unit C", where they are closer to normal marine ones, probably due to an increase in freshwater inflow. The hypersalinity is particularly marked in the lower part of the section (up to the upper Severn Formation).

4.2. STATISTICAL STUDY OF MAJOR AND TRACE ELEMENTS

The records of trace and major element concentrations have been processed by factor analysis, in order to find out the significant geochemical associations. With regard to the relatively low number of samples and to the similar behaviour of these elements in the Polar Bear and Narwhal South wells, the sets of values from these two wells have been processed together, because this attenuates the influence of analytical fluctuations and favours comparisons between the two well sections. Four major factors have been displayed by this statistical analysis, as shown in Figure 3.

Factor 1, which represents over 30 % of the total variance, is a dilution one, opposing silica and organic carbon to lithophile and "siderophile" elements. These ones are particularly enriched in the Devonian, whereas the factor scores regularly decrease from base to top in the Ordovician-Silurian interval : this may indicate that the continental supply was minimal in the uppermost Severn and in the Ekwan Formation.

Factor 2 clearly reflects an organophile association principally including organic carbon, loss at ignition, molybdenum and copper. It means that the organic matter was deposited in a reducing environment enabling the formation of organo-metallic complexes. This factor is evidenced by Figure 4 and its variations are represented in Plate V, showing that organophile concentrations particularly occur in the Lower Severn Formation, in the Bad Cache Rapids Formation and, to a lesser extent, in the Churchill Formation. These concentrations seem to be principally associated with pelletoidal facies.

Factor 3 is a lithophile association chiefly grouping the aluminum-bearing, as opposed to the magnesium-bearing minerals (See Fig. 4). Its variations are rather limited in the section, except for a slight increase in the Bad Cache Rapids Formations.

Factor 4 is principally led by Ba and Sr, which are particularly abundant in the Ekwan Formation, presumably due to diagenetical processes in primarily porous carbonates.

The statistical analysis also suggests that the chlorite occurring in the Devonian is probably of detrital origin, as in Narwhal South.

5. / STUDY OF THE ORGANIC MATTER /

5.1. QUANTITY OF ORGANIC MATTER (Fig. 5, Pl. V)

Organic matter contents are very poor throughout the investigated section, except for some horizons in the Kenogami Formation, which contain bituminous deposits, related with a stromatoporoidal dolomite.

5.2. QUALITY OF ORGANIC MATTER

Several data contribute in the definition of the quality of organic matter :

- Optical observation of organic components in transmitted and reflected light (see Pl. V) : an estimate of the representativity of this observation is given by the ratio of recovered organic matter in the preparations, versus total organic carbon.
- Scores of the "organophile factor" from factor analysis.
- Yields and composition of chloroform extractable organic matter (particularly the chromatographical patterns, Fig. 6 and Pl. V).
- Carbon-ratio.

It appears that the quality of organic matter is generally fair in most of the section, except for the upper part (units B and C). However the poor yields of extractable hydrocarbons show that this fair quality is quite insufficient to counterbalance the poor quantity of organic matter. In addition, the highest amounts of chloroform extract recorded in the basal Churchill River Formation are obviously influenced by contamination, as shown by chromatograms of total alkanes (see Fig. 6).

5.3. MATURATION

This parameter has been determined by means of :

- optical study of organic matter in transmitted and reflected light (states of preservation, vitrinite reflectance, intensity of fluorescence) ;
- study of the chloroform extractable organic matter (including chromatography of total alkanes, Fig. 6) ;
- amount and composition of sorbed gases (Fig. 7) ;
- carbon-ratio.

All these data confirm the immaturity of the sediments under study, as previously assumed in the note R/GEO nr. 28/75. Therefore, the scarce organic matter enrichments observed in the Kenogami Formation cannot be valorized at all, as well as the fair quality of the organic matter contained in the Ordovician-Silurian interval.

6. / CONCLUSIONS /

6.1. BIOSTRATIGRAPHY

The biostratigraphic attributions have been summarized in Figure 2. No particular remark has to be done concerning the Polar Bear C-11 well. Nevertheless, the chronostratigraphic discrepancy between palynology and microfauna still persists for the C 4 core in Walrus. This is brought forward by a definite palynological correlation of the Walrus C 4 core with the 3,060'-3,160' interval in Polar Bear as opposed to the correlation chart of Plate II.

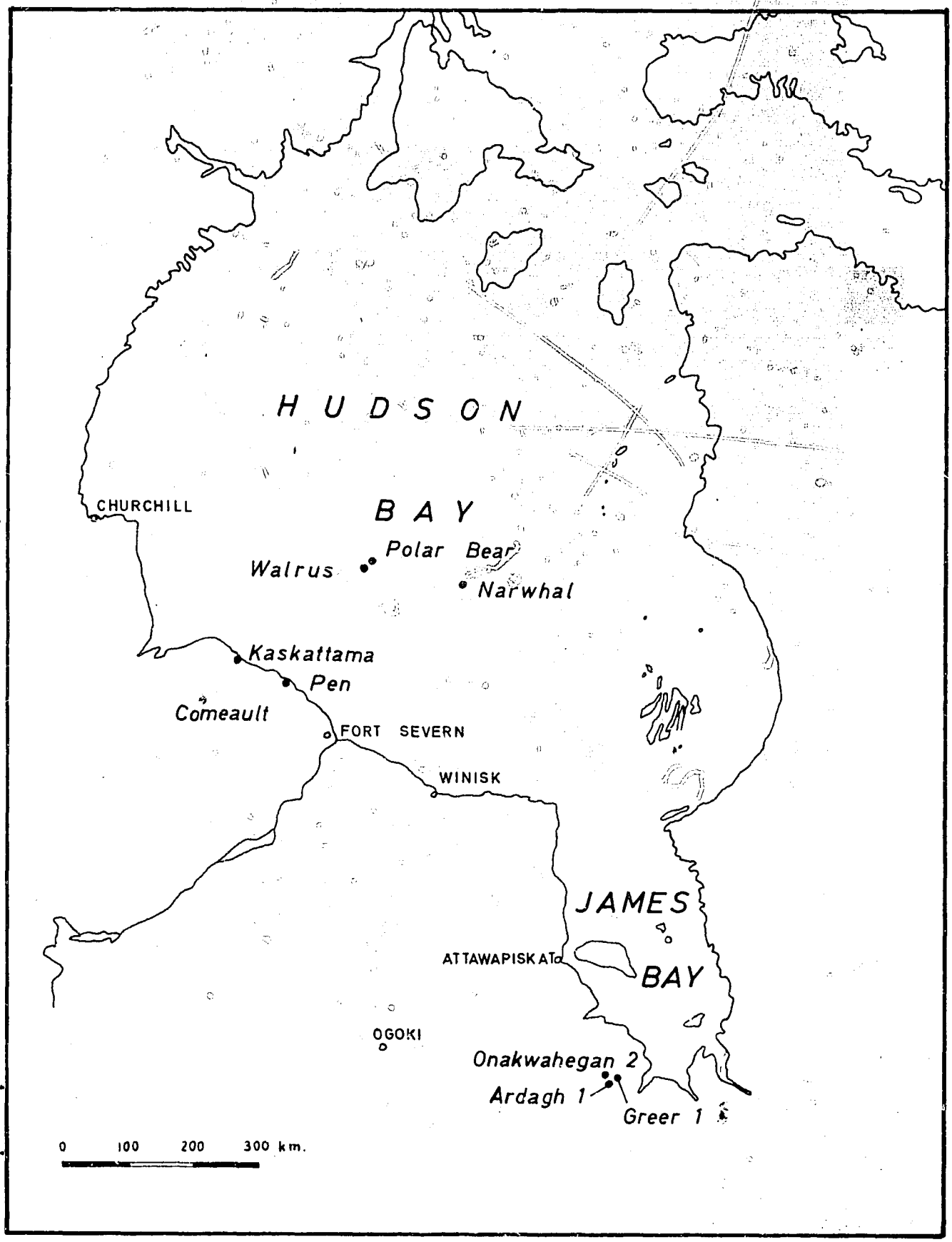
6.2. ENVIRONMENTAL REMARKS

An hypersaline and reducing environment has been found throughout the investigated interval, except for the uppermost part of the section (unit C) in which the increase in the detrital supply probably concurs with freshwater inflows. No evidence of the proximity of reefal buildings has been shown by microfacies study.

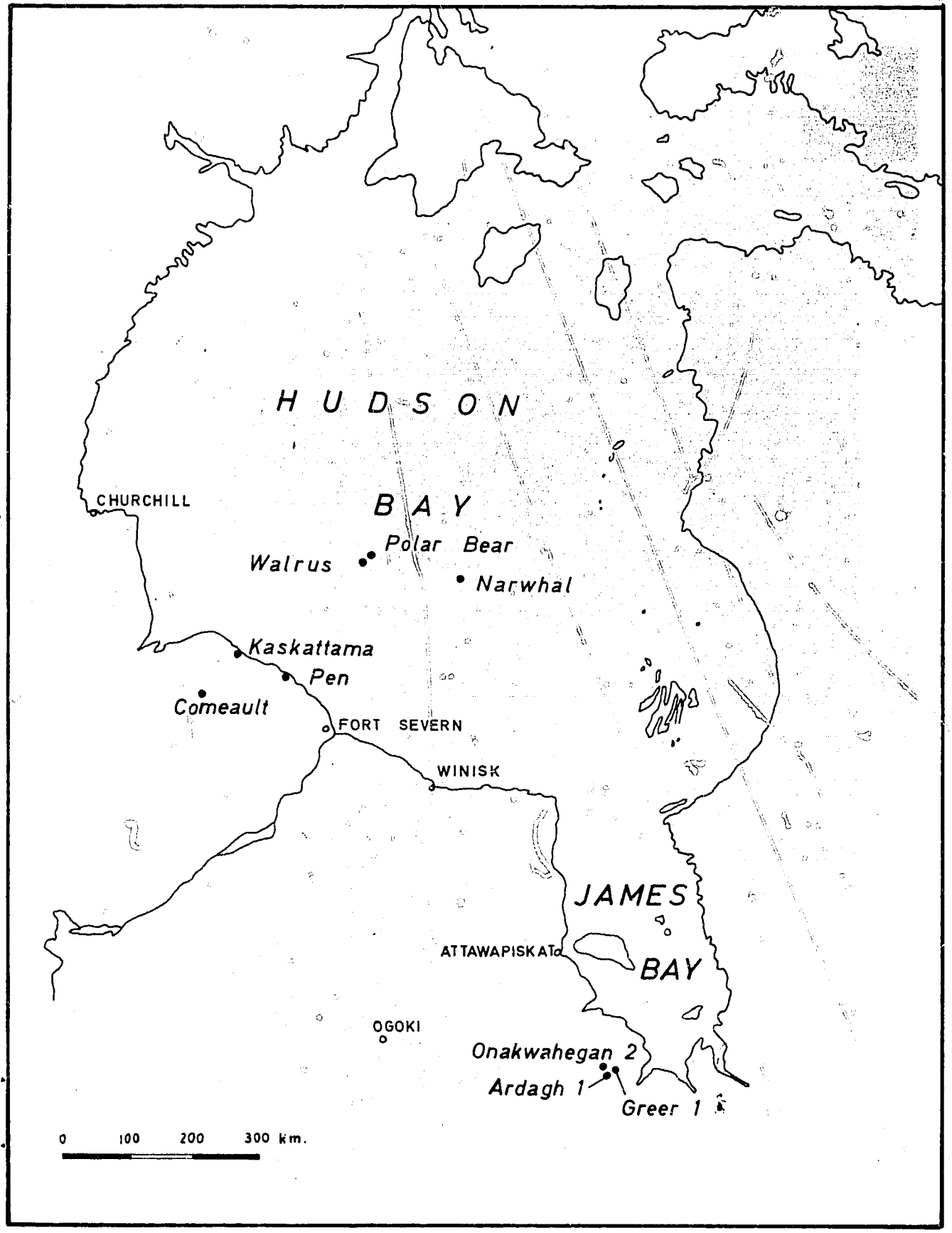
6.3. SOURCE-ROCK POTENTIAL

Organic matter contents are very poor throughout the section, except for some horizons in the Kenogami Formation. In addition, the sediments under study are obviously immature. For these two reasons, the source-rock potential of the whole section can be considered as low.

LOCATION MAP



LOCATION MAP



POLAR BEAR · TENTATIVE SYNTHESIS OF STRATIGRAPHICAL DATA

▨ non investigated intervals

Depths	Well data	Conodonts - Ostracods	Palynoplanktology	Assumed attributions
1250'	Unit C		1260'	1260'
1385'	Unit B		Upper to Middle Devonian	Upper to Middle Devonian
1980'	Unit A	No data	1960'–2000'	1960'–2000'
2380'	Kenogami		Middle Devonian	Middle Devonian
3070'	Ekwan	3120' Barren 3360'–3390' Silurian ? 3450'–3480'	3060' Devonian / Silurian 3160'–3180' Lower Silurian 3360'–3660'	3060' Devonian/Silurian limit 3160'–3180'
3485'	Severn River	Lower Silurian	Lower Silurian to Ordovician	Lower Silurian
4308'	Churchill River	4170' Barren or non diagnostic microfossils 4500' Upper to Middle Ordovician	4410'–4460'	4170' Lower Silurian to Ordovician 4410'–4460'
4905'	Bad Cache Rapids	5100'	Upper to Middle Ordovician 5130'–5170'	Upper to Middle Ordovician
5180'	Precambrian			Precambrian

FACTORS	1	2	3	4	
% Variance	30.67	20.95	12.98	14.63	

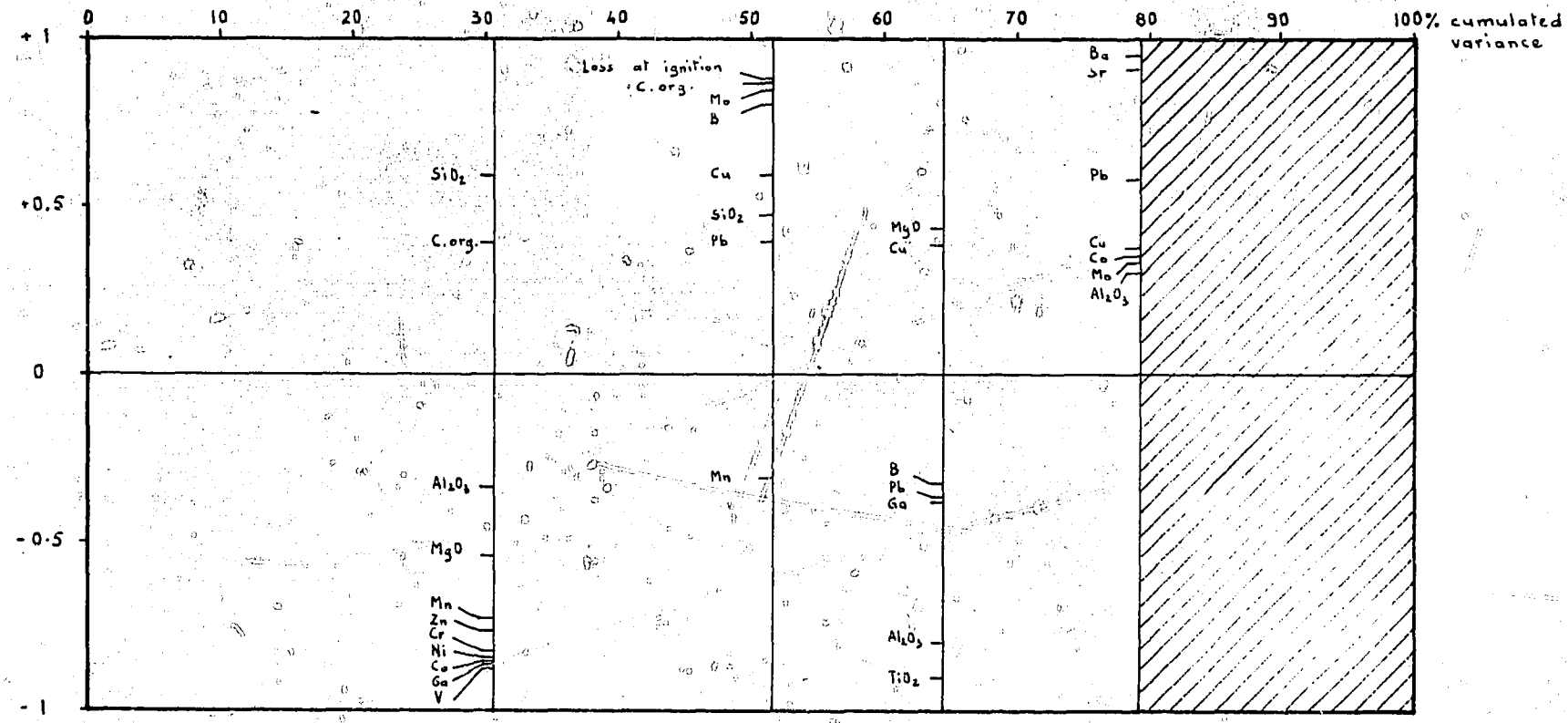


Fig. 3 FACTOR ANALYSIS (VARIMAX MATRIX)

Major factors and weights of variables in the combined set of samples of NARWHAL and POLAR BEAR

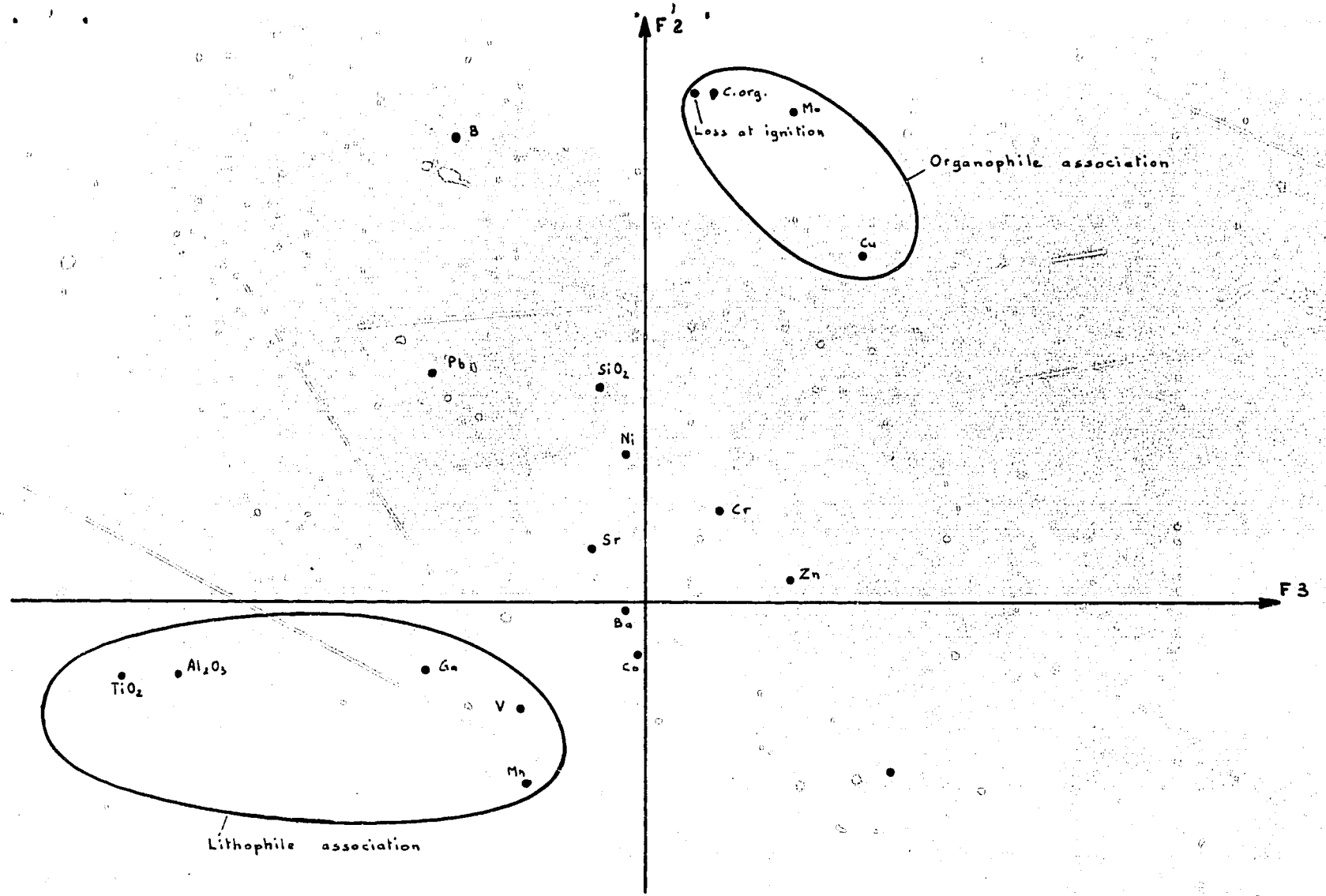
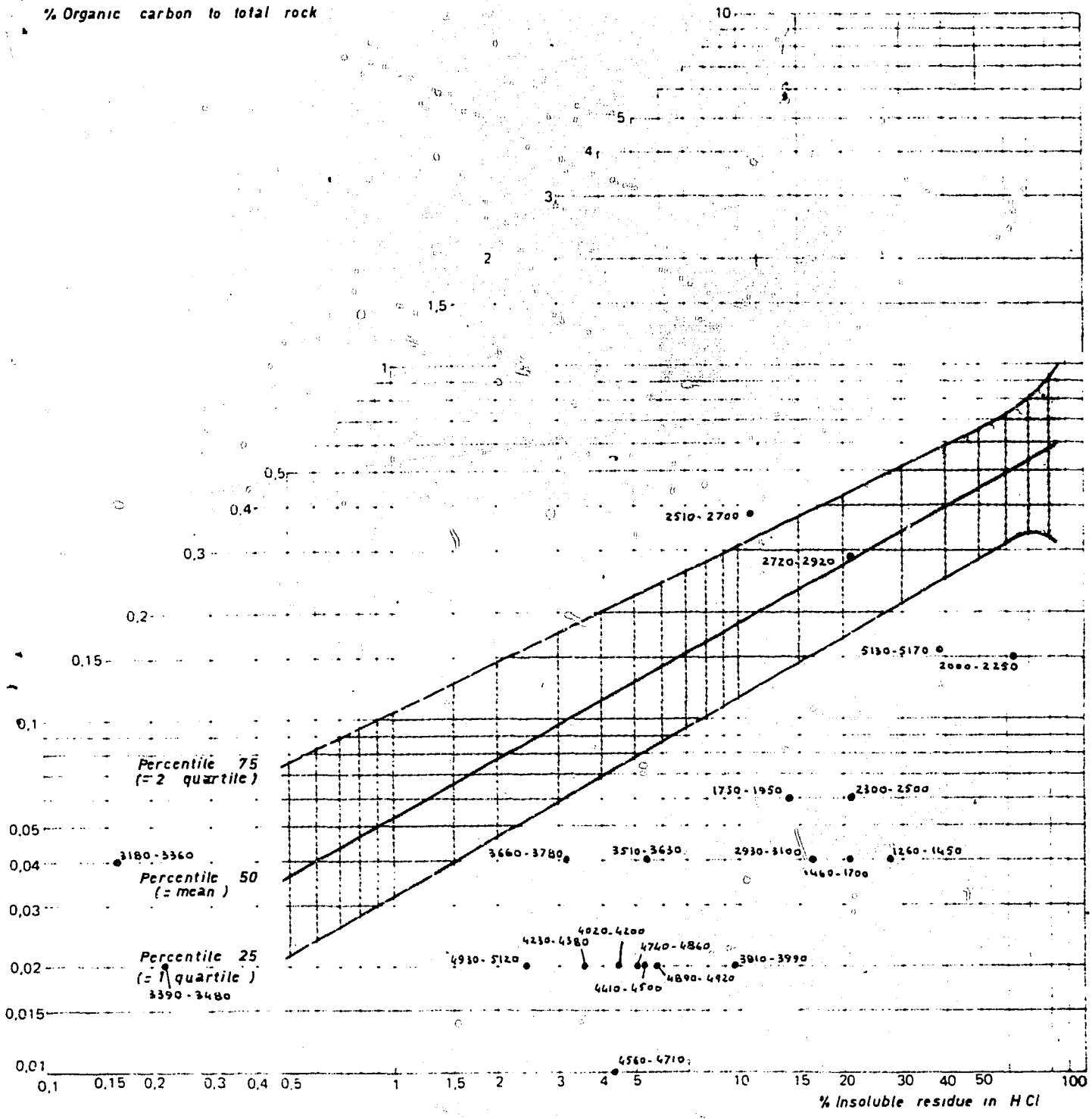


Fig: 4 FACTOR ANALYSIS - Distribution of variables in the plane of factors 2 and 3 (combined set of samples of NARWHAL and POLAR BEAR

NOT LEGIBLE
ILLISIBLE

Fig. 5



ORGANIC CARBON CONTENTS

The shaded area represents the carbon concentration of 50 % of the samples in a statistical set of random sedimentary rocks

Polar Bear

FIG. 6

4020' - 4200'

The gas chromatogram of total alkanes shows abundant quantities of n-alkanes, especially in the high molecular range ($n\text{-}C_{24}$ - $n\text{-}C_{32}$). The n-alkane spectrum is peaking at $n\text{-}C_{30}$ and a strong predominance of even molecules is obvious. This pecularity is often observed for carbonates deposited under highly reducing conditions (association with evaporites). Moreover this even predominance indicates that the organic matter is not mature. This immaturity is confirmed by the occurrence of steranes and triterpanes in the branched and cyclic alkanes.

4410' - 4500'

The total alkane fraction contains n-alkanes in the range $n\text{-}C_{16}$ - $n\text{-}C_{33}$. No odd-even predominance appears. The branched and cyclic alkanes are mostly composed of high molecular weight structures (bump region). Such a finger print is frequently associated to impregnations of carbonate rocks.

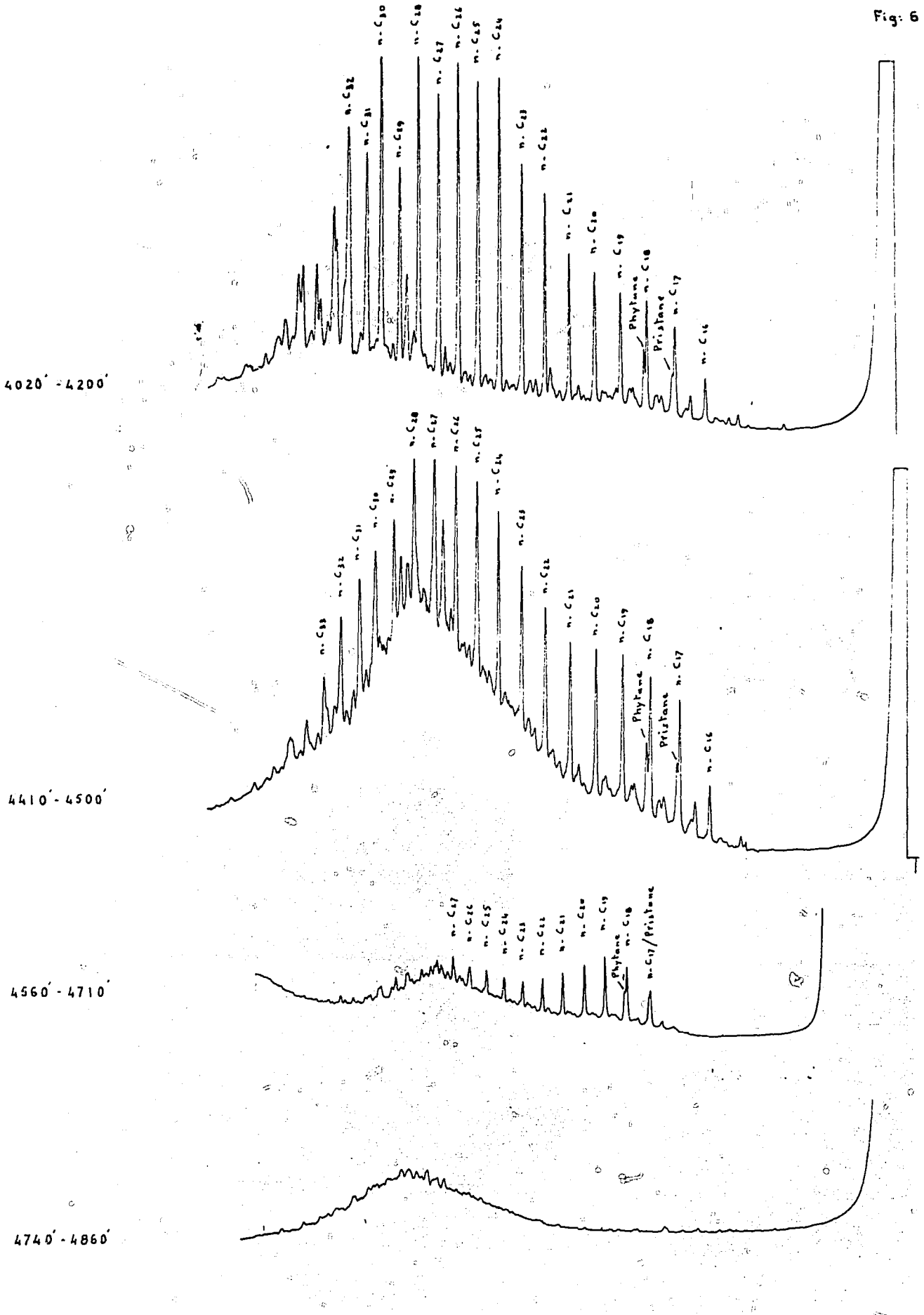
4560' - 4710'

The gas chromatogram of total alkanes shows a n-alkane distribution ranging from $n\text{-}C_{16}$ to $n\text{-}C_{27}$. This n-alkane spectrum is peaking at $n\text{-}C_{19}$. Steranes and triterpanes are detectable in the branched and cyclic fraction. All these characteristics mean that the organic matter of this sample is mostly algal or sapropelic and that it is not very mature.

4740' - 4860'

The total alkanes are devoid of n-alkanes. Such a chromatogram may correspond to an "impregnation" which has been degraded by bacteria or to a pollutant product such as drill pipe grease, wonderseal, lubricating oil, ...

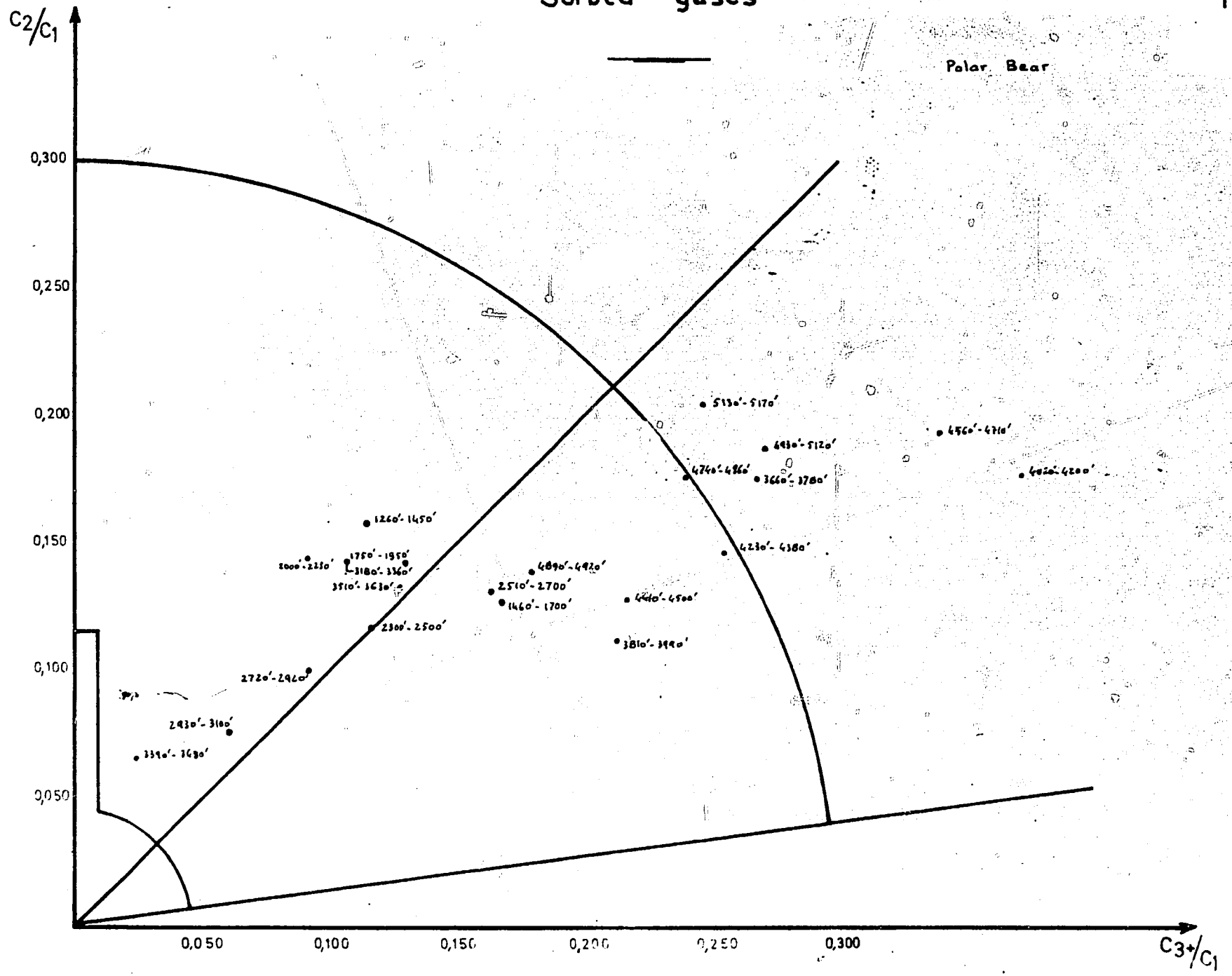
Fig: 6



POLAR BEAR Chromatograms of total alkanes

Sorbed gases

Fig. 7



ORGANIC ANALYTICAL DATA

COUNTRY or AREA HUDSON BAY

SECTION POLAR BEAR

Note R/Geo n° 57/75

R: Rare
S: Some
C: Common
F: Frequent
A: Abundant

STRATIGRAPHY	SAMPLE IDENTIFICATION	GROSS LITHOLOGY	INSOLUBLE RESIDUE in HCl	ORGANIC CARBON DATA: TOTAL ROCK % weight	TOTAL ROCK relative value (percentiles) 25 50 75	Fine grained fraction (< 5µ)	CARBON RATIO C (fine grained)/C (total residue)	CARBON RATIO total residue	CARBON RATIO fine grained fraction	CHLOROFORM EXTRACT ppm	% ext. org. C	GROSS COMPOSITION Sat.	Arom.	NSO'S	Asph.	Arom./Sat.	HC Arom. + Sat.	HC Org. C	CHROMATOGRAPHY OF TOTAL ALKANES	SORBED GASES ml/kg of total rock	≠HC g /°/₀org.C	% CH_4	TRACE ELEMENTS ORGANOPHILE ASSOCIATION FROM FACTOR ANALYSIS (scores of factor 2) -2 -1 0 +1 +2	Recovered OM %	Recovered OM/total organic C	OPTICAL STUDY OF ORGANIC MATTER: TYPE OF ORGANIC MATTER Transmitted light MOL	MOT	MOV	MOC	others	Resulting type	Reflected light Fluor.	Liptinite Exinite	Huminite Vitrinite
UP. to MIDDLE DEVON.	Unit C																																	
	1385	1260 - 1450	Red silty clay w. gyps. or anhyd., quartz grains, dolom. lms.	27,14	0,04		0,35	2.33		88	* *									2,30	* *	76,80		0.03	0.75	C	-	-	R	-	I_A			
	Unit B	1460 - 1700	Lms., slight. dol. and arg. & anhyd.	20,14	0,04		0,64	3.20		12	* *									4,62	* *	76,66		0.03	0.75	C	-	-	C	-	II^o			
		1750 - 1950	Red-brn. lms., slight arg.	14,75	0,06		0,67	1.68		11	* *									4,73	* *	78,44		0.03	0.50	F	-	-	S	-	I_B			
	1980																																	
DEVONIAN	Unit A	2000 - 2250	Brn. red clayst., dol. + cavings from above	60,34	0,15		0,51	2.04		60	4,0									3,17	2.11	79,50		0.03	0.20	F	-	-	R	-	I_A	40	50	30
	2380	2300 - 2500	Pellet lms., dol., anhyd.	20,78	0,06		0,68	2.26		20	* *									2,98	* *	80,50		0.03	0.50	S	R	-	C	-	III_A^o		?	
MIDDLE	KENOGAMI	2510 - 2700	Dol., dol. lms., lms. & minor red shale, some stromatopoid struct. (?)	11,31	0,38		5,36	1.60	0,69	0.59	264	7.0								2,38	0.63	76,55		0.30	0.79	S	-	S	F	-	III_A^o	50	60	40
		2720 - 2920	Dol., anhyd., red-brn. lms. (cavings?)	21,41	0,28		1,33	1.01	0,62	0.58	142	5,1								3,31	1.18	82,91		0.03	0.11	S	-	S	F	-	III_A^o	50	60	40
?	3070	2930 - 3100	Gy. - red brn. dol. + gyps. or anhyd.	17,30	0,04		0,58	2.90			11	* *								0,91	* *	87,40		0.03	0.75	C	-	S	C	-	II_B-III_A^o			
SILURIAN?	EKWAN	3180 - 3360	Dolomites	0,17	0,04						30	* *								0,20	* *	76,10		0.01	0.25	C	-	-	S	-	I_B			
	3485	3390 - 3480	Dolomites	0,23	0,02						13	* *								0,06	* *	91,47		0.01	0.50(?)	S	-	-	S	-	Indet			
		3510 - 3630	Calcisparite & dol. w. anhyd.	5,49	0,04		0.92	1.42		0.70	16	* *								0,34	* *	79,48		0.01	0.25	S	-	-	C(?)	-	III_A^o(?)			
	SEVERN	3660 - 3780	Calcisparite & dol. w. anhyd.	3,21	0,04		3.73	2.98	0:65	0.60	60	* *								1,88	* *	69,70		0.01	0.25	C	-	-	C	-	II^o			
		3810 - 3930	Pellet lms., dol., anhyd.	9,81	0,02		10.00	7.75	0.20	0.46	148	* *								3,47	* *	75,08		0.01	0.50(?)	C	-	-	F	-	II_B-III_A			
SILURIAN	River	4020 - 4200	Dol. & pellet lms. or dol.	4,49	0,02		14.40	3.56	0.26	0.43	409	* *	6.1	20.7	41.7	31.6	3.40	26.8	* *	4,27	* *	64,11		0.01	0.50(?)	S	-	-	A	-	III_A^o			
LOWER	4308	4230 - 4380	Pellet lms. or dol. & dol. w. some anhyd. inclusions	3,66	0,02		7.16	1.78	0.34	0.50	205	* *	7.9	25.0	50.1	17.0	3.15	32.9	* *	4,41	* *	70,80		0.01	0.50(?)	C	-	S	S	-	II^o			
		4410 - 4500	Pellet dol. and lms. w. minor anhyd.	5,33	0,02		10.00	2.33	0.50	0.50	210	* *	10.7	19.6	35.1	34.5	1.83	30.3	* *	0,62	* *	74,56		0.01	0.50(?)	C	-	S	S	-	II^o			
ORDOVICIAN	CHURCHILL	4560 - 4710	Lms. w. some second silica, dol. and minor anhyd.	4,25	0,01		8.64	2.46	0.33	0.52	321	* *	20.2	22.2	42.8	14.8	1.10	42.4	* *	3,42	* *	65,31		0.01	1.00(?)	F	-	S	F	-	II_B^o			
		4740 - 4860	Pellet & brecciat. lms. & dol.	5,19	0,02		5.14	1.21	0.59	0.42	601	* *	56.1	18.1	23.9	1.9	0.32	74.2	* *	4,48	* *	70,71		0.01	0.50(?)	F	-	S	F	-	II_B^o	40	60	30
MIDDLE to UPPER	4915	4890 - 4920	Gy. dol. & minor lms.	5,82	0,02		4.22	1.45	0.59	0.57	172	* *								6,52	* *	75,88		0.01	0.50(?)	C	-	C	F	-	II_B-II_A^o	55	70	20
	BAD CACHE	4930 - 5129	Lms., slight. dol., w. brecciated and laminite-like structures	2,49	0,02		7.80	1.25	0.55	0.49	161	* *								1,90	* *	68,72		0.01	0.50(?)	F	-	S	F	-	II_B^o	40	60	25
	5140	5130 - 5170	Same as above w. some granitic fragments	39,30	0,16		3.30	7.67		0.58	91	* *								2,80	1.75	69,00		0.01	0.06	F	-	R	C	-	I_B-II_A		?	
PRECAMBRIAN																																		

* non representative values due to the very poor insoluble residue

** unsignificant results

The sign ° indicates that a major part of the material is composed of colloidal organic matter

ORGANIC ANALYTICAL DATA

SECTION POLAR BEAR

R: Rare
S: Some
C: Common
F: Frequent
A: Abundant

MOL (ligneous organic matter)
MOT (tracheids)
MOV (cellular vegetal organic matter)
MOC (colloidal organic matter)

N RATIO fine grained fraction	CHLOROFORM EXTRACT ppm	% ext. org. C	GROSS COMPOSITION Sat.	Arom.	NSO'S	Asph.	Arom./Sat.	HC Arom. + Sat.	HC Org. C	CHROMATOGRAPHY OF TOTAL ALKANES	SORBED GASES ml/kg of total rock	≠HC g %org.C	% CH_4	TRACE ELEMENTS ORGANOPHILE ASSOCIATION FROM FACTOR ANALYSIS (scores of factor 2) -2 -1 0 +1 +2	OPTICAL STUDY OF ORGANIC MATTER Recovered OM %	Recovered OM / total organic C	TYPE OF ORGANIC MATTER Transmitted light MOL	MOT	MOV	MOC	others	Resulting type	Reflected light Fluor.	Liptinite Exinite	Huminite Vitrinite	Inertinite	DIAGENETIC EVOLUTION States of preservation	Light absorption	Fluorescence	Vitrinite reflectance	SAMPLE IDENTIFICATION
	88	* *									2,30	* *	76,80		0.03	0.75	C	-	-	R	-	I_A					?				1260-1450
	12	* *									4,62	* *	76,66		0.03	0.75	C	-	-	C	-	II°					3,00?				1460-1700
	11	* *									4,73	* *	78,44		0.03	0.50	F	-	-	S	-	I_B					3,00				1750-1950
	60	4,0									3,17	2.11	79,50		0.03	0.20	F	-	-	R	-	I_A	40	50	30	20	?		3.00	?	2000-2250
	20	* *									2,98	* *	80,50		0.03	0.50	S	R	-	C	-	III_A°	←	?	→		2,75/3,00		?	?	2300-2500
0.59	264	7.0									2,38	0.63	76,55		0.30	0.79	S	-	S	F	-	III_A°	50	60	40	-	2,75		3.00	0.46	2510-2700
0.58	142	5,1									3,31	1.18	82,91		0.03	0.11	S	-	S	F	-	III_A°	50	60	40	-	2,75		3.50	0.42	2720-2520
	11	* *									0,91	* *	87,40		1.03	0.75	C	-	S	C	-	II_B-III_A°					2,75				2930-3100
	30	* *									0,20	* *	76,10		0.01	0.25	C	-	-	S	-	I_B					2,75/3,00				3180-3360
	13	* *									0,06	* *	91,47		0.01	0.50(?)	S	-	-	S	-	Indet					?				3390-3480
0.70	16	* *									0,34	* *	73,46		0.01	0.25	S	-	-	C(?)	-	III_A°(?)					?				3510-3630
0.60	60	* *									1,88	* *	69,70		0.01	0.25	C	-	-	C	-	II°					2.75				3660-3780
0.46	148	* *									3,47	* *	75,08		0.01	0.50(?)	C	-	-	F	-	II_B-III_A°					2.75				3810-3990
0.43	409	* *	6.1	20.7	41.7	31.6	3.40	26.8	* *		4,27	* *	64,11		0.01	0.50(?)	S	-	-	A	-	III_A°					2.75				4020-4200
0.50	205	* *	7.9	25.0	50.1	17.0	3.15	32.9	* *		4,41	* *	70,80		0.01	0.50(?)	C	-	S	S	-	II					2.00/2.25				4230-4380
0.50	210	* *	10.7	19.6	35.1	34.5	1.83	30.3	* *		0,62	* *	74,56		0.01	0.50(?)	C	-	S	S	-	II					2.50/2.75				4410-4500
0.52	321	* *	20.2	22.2	42.8	14.8	1.10	42.4	* *		3,42	* *	65,31		0.01	1.00(?)	F	-	S	F	-	II_B°					2.50/2.75				4560-4710
0.42	601	* *	56.1	18.1	23.9	1.9	0.32	74.2	* *		4,48	* *	70,71		0.01	0.50(?)	F	-	S	F	-	II_B°	40	60	30	10	2.50/2.75		4.00	0.43	4740-4860
0.57	172	* *									6,52	* *	75,88		0.01	0.50(?)	C	-	C	F	-	II_B-II_A°	55	70	20	10	2.50/2.75		3.00	0.44	4890-4920
0.49	161	* *									1,90	* *	68,72		0.01	0.50(?)	F	-	S	F	-	II_B°	40	60	25	15	2.50/2.75		3.50	0.42	4930-5120
0.58	91	* *									2,80	1.75	69,00		0.01	0.06	F	-	R	C	-	I_B-II_A	←	?	→		2.75/3.00		3.00	0.43	5130-5170

** unsignificant results

The sign ° indicates that a major part of the material is composed of colloidal organic matter

Major mineralogical and mineral chemical data

Note R/Geo n°: 57/75

STRATIGRAPHY	COLUMNAR SECTION	SAMPLING FOR GEOCHEMIS.	GROSS LITHOLOGY
Upper to middle DEVONIAN — Unit C	1000'	1260' - 1450'	Red silty clay; some quartz grains; gypsum and anhydr.; brecciated dolomitic lms.
1250' / 1385'			
Unit B		1460' - 1700'	Micritic, slightly dolom. and argil. lms; anhydrite
		1750' - 1950'	Red brn. micr. lms., somewhat argil.
1980'	2000'		
Unit A		2000' - 2250'	Dol. brn. red clayst. w/some cavings from the above lms.
2380'		2300' - 2500'	Pellet lms.; dolomicrosparite to dolosparite; anhydrite
Middle DEVONIAN — KENOGAMI		2510' - 2700'	Dolospar.; dolomicrospar.; dol. lms.; pellet lms. w/ stromatopor. struct. (?); minor red shale
		2720' - 2920'	(Salt); dolomicrosparite, red brn. micr. lms. (cavings ?); anhydrite
? 3070'	3000'	2930' - 3100'	(Salt); gy., red brn. dolosparite and dolomicrite; gypsum or anhydrite
SILURIAN ? EKWAN		3180' - 3360'	Dolomicrite and dolomicrosparite
		3390' - 3480'	Same as above
3485'		3510' - 3630'	Calcisparite and dolosparite w/ anhydritic inclusions
Lower SILURIAN — SEVERN River		3660' - 3780'	Same as above
		3810' - 3990'	Pelletoidal micrite, dolomicrosparite; anhydrite
	4000'	4020' - 4200'	Pelletoidal micrite or dolomicrite; dolosparite
? 4308'		4230' - 4380'	Pelletoidal micrite, dolomicrosparite; brn. dolomicrite w/some anhydritic inclus.
Middle to upper ORDOVICIAN — CHURCHILL		4410' - 4500'	Pelletoidal dolomicrite or dolomicrospar.; micrite; minor anhydrite
		4560' - 4710'	Slightly siliceous micrite; dolomicrosparite; some pellet lms.; minor anhyd.
		4740' - 4860'	Pelletoidal and brecciated micrite to dolomitized w. some bioclasts(?), dolomicrite, dolomicrosparite
4915'		4890' - 4920'	Gy. dolomicrite; dolomicrosparite; minor micrite
BAD CACHE RAPIDS	5000'	4930' - 5120'	Microbrecciated lms.; swht. dolom. in place; scarce laminated structures (?)
5140'			
PRECAMBRIAN	TD 5170'	5130' - 5170'	Same as above w/some granitic fragments (principally quartz + microcline)

MAJOR MINERALOGICAL COMPONENTS

quartz
dolomite
calcite
insoluble residue in HCl
50%

CLAY MINERALS

chlorite
illite
m.l. illite-montmor.
50%

PALEOSALINITY FROM BORON CONCENTRATION

hyposaline | normal marine | hypersaline
200 320 400 600 ppm

1114
823
1082

POLAR BEAR C-11

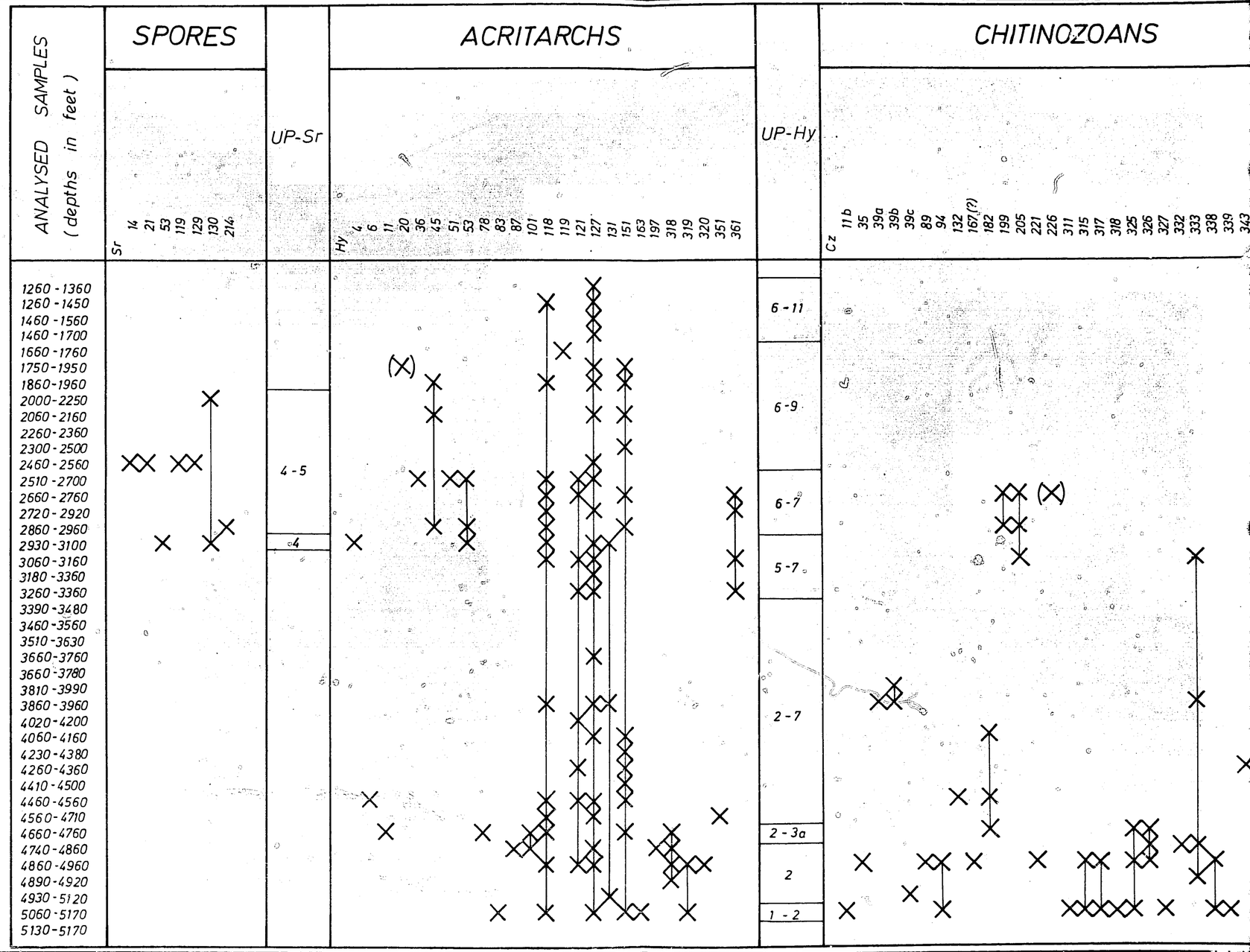
HUDSON BAY - CANADA

VERTICAL DISTRIBUTION OF

SPORES, ACRITARCHS,

CHITINOZOANS AND SCOLECODONTS.

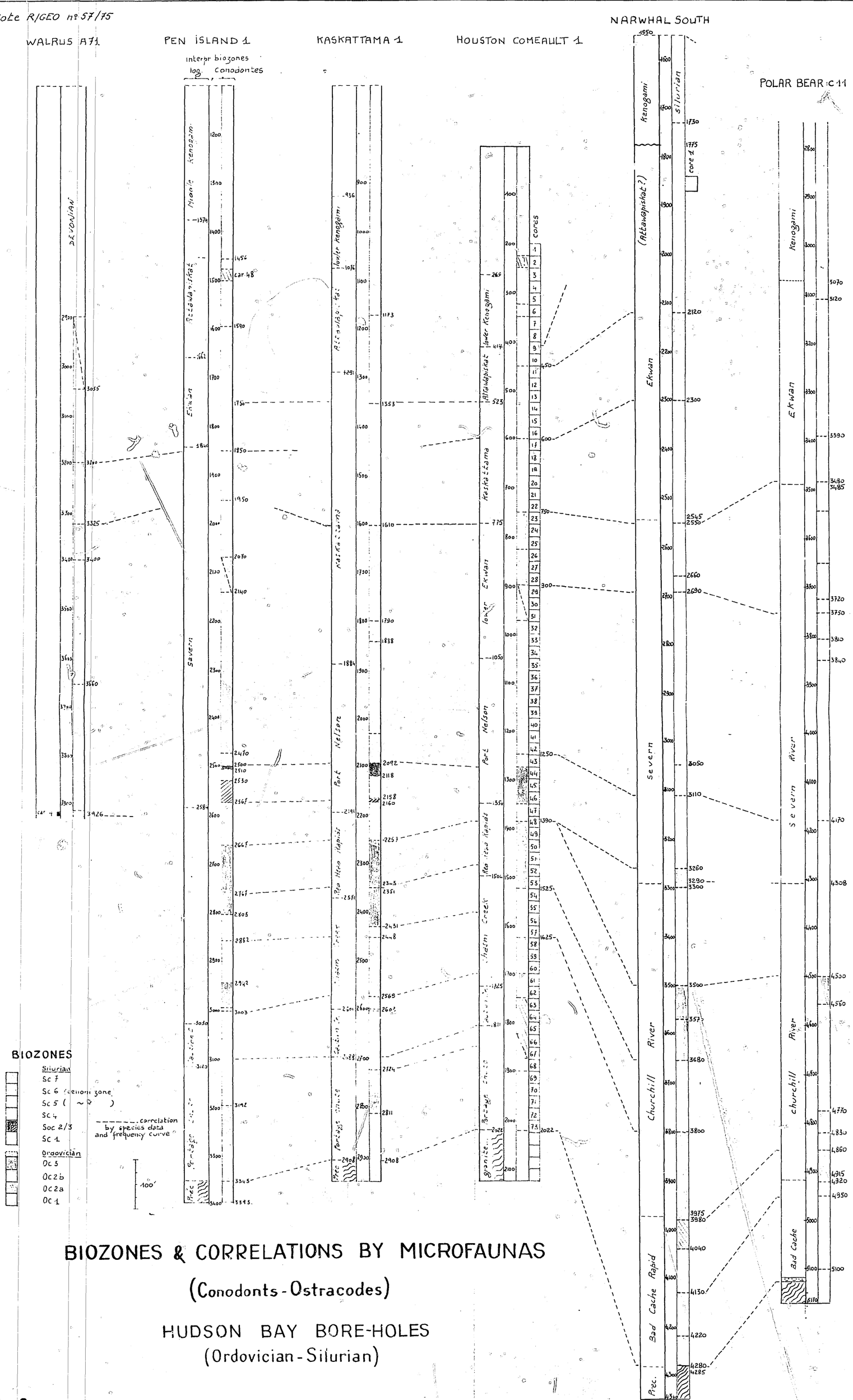
Note R/Geo n° 57/15



1 of

Hy	CHITINOZOANS	UP-Cz	SCOLECODONTS	UP-D	C UP-PA	ASSUMED PALYNOPLANKTOLOGICAL AGE
	Cz: 11b, 35, 39a, 39b, 39c, 89, 94, 132, 167(?), 182, 199, 205, 221, 226, 311, 315, 317, 318, 325, 326, 327, 332, 333, 338, 339, 343, 345, 351, 358		D: 1, 5, 15, 18, 20, 39, 42, 53, 61, 62, 81, 90, 104, 114, 125, 127, 128, 134, 148, 161, 162, 164, 165, 167, 169, 174, 176, 185, 193, 201, 215, 218, 222			
11					20 - 26	"Upper to Middle DEVONIAN"
9					20 - 23	
7		7			20	" Middle DEVONIAN"
7		2-5a/5b-7		3 - 8	19/20	
					17 - 19	
					13-15/16-19	"DEVONIAN/SILURIAN"
					13 - 15	"Lower SILURIAN"
7		2 - 4				Undetermined
					5 - 14	"Lower SILURIAN to ORDOVICIAN"
3a		2		3 - 7	5 - 7	
		1b / 2		3	5 - 6	"Upper to Middle ORDOVICIAN"
2				2 - 3	4 - 6	
					3 - 6	

Note RIGEO n° 57/75



BIOZONES & CORRELATIONS BY MICROFAUNAS

(Conodonts - Ostracodes)

HUDSON BAY BORE-HOLES

(Ordovician - Silurian)

Pl : 2

POLAR BEAR C 11

ORDOVICIAN AND SILURIAN MICROFAUNAS

Note R/Geo n° 57 /75

BIOZONES

DEPTH (feet)

CUTTING

SAMPLING

PROCESSING

Acid attack

CONODONTS

- black sphere
- simple cone indet
- simple cone group k1/1349
- simple cone group k1/1349 ?
- «Oneotodus» (sensu JENTZSCH) aff. K453
- Roundya sp
- Ozarkodina cf. adiutricis
- Spathognathodus cf. celloni
- Spathognathodus sp
- fragment Neoprioniodus planus ?
- Ligonodina sp
- Hadrognathus staurognathoides ?
- Undet. Conodont
- Neospathognathodus bullatus ?
- Distomodus ? CN 481
- Ligonodina sp
- Undet Conodont aff. W 3045
- Spathognathodus ? sp
- Undet fragment
- Lonchodina ? n. sp
- Ozarkodina sp
- Ozarkodina gp. n. sp. A&B POL, REX, NI.
- Ligonodina ? sp (massive)
- Ligonodina ? variabilis
- Lonchodina sp
- Undet conodont
- Lonchodina sp. CN 673
- fragment Ligonodina variabilis ?
- Oistodus/Drepanodus sp.
- Belodina ? sp
- Undet fragment
- Ambalodus sp + Amorphognathus sp
- Plectodina undulata
- Undet Conodont
- R. paucidentatus (R. sym. symmetricus)
- Ligonodina (gp. Pl. undulata ?)
- Ozarkodina ? sp
- simple cone PB 5130

Ostrac.

- Ostracodes ?
- Ostracodes PB/4290

Various organisms

- Crinoids (white)
- spicules
- Crinoids (yellow)

Phosphate organisms

- massive phosphate elements
- Conularia sp
- phosphate element PB 3480 a
- phosphate element PB 3480 b
- «egg case» like ?
- phosphate element PB 4950
- Conularia plate

STAGES

DEPTH (feet)	Sc 5	STAGES
3000		
3100		
3200		
3300		
3400		
3480		3480
3500		?
3600		

-3480-
Sc 5
3500
3600
Sc 5
3700
-3720-
-3750-
3800
3900
Sc 4
4000
4100
-4170-
4200
4300
4400
-4500-
4500
Oc 3
-4560-
4600
4700
-4770-
Oc 2b
4800
-4830-
-4860-
Oc 2a
4900
-4920-
-4950-
5000
Oc 1
-5100-
5100
5170

SILURIAN

4170

ORDOVICIAN

4500

5125

flat

flat present

flat

flat

flat

AQUITAINE — INTERPRETATIVE LOG — POLAR BEAR C-11

OPERATOR	PERMIT or LEASE	TIMING	CASING	TOTAL DEPTH
AQUITAINE	H.B. OFFSHORE	COMMENCED : Sept. 21 / 74	ø 30" at 710'	T.D. 5170
CONTRACTOR	PROVINCE	TEMPORARY HALT :	ø 20" at 1227'	GEOLOGICAL FORMATION AT SPUDDING LEVEL
SEA & LAND	FEDERAL WATERS	RESUMPTION OF DRILLING :	ø 13 3/8" at 3081'	GLACIAL DRIFT
RIG	CO-ORDINATES	TEMPORARY HALT :	ø at	GEOLOGICAL FORMATION AT BOTTOM HOLE
P-82	X = 58° 30' 08.37"	RESUMPTION OF DRILLING :	ø at	PRECAMBRIAN
BROUGHT UP TO DATE ON	Y = 86° 47' 13.15" Z =	COMPLETED : Oct. 14 / 74		SCALE
November 1, 1974	ZKB = 77 A.M.S.L.			2 inches to 100 feet

COMMENTS,

Logs run :

Type:	Int:	
DLL	1245 - 3102	3100 - 5156
Sonic BHC - GR	1100 - 3103	3078 - 5166
FDC - CNL	500 - 3106	3078 - 5167
Dipmeter	1245 - 3100	3078 - 5165

Test : F.I.T. at 4199
no flow ; no pressure

The Formation Tops are Provisory.

Status : Dry & Abandoned