

SINCLAIR WHITEFISH RIVER K-76

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SINCLAIR WHITEFISH RIVER K-76

SECTION ONE

WELL DATA SUMMARY

a) WELL NAME: Sinclair Whitefish River K-76

b) PERMITTEE: Sinclair Canada Oil Company

c) OPERATOR: Sinclair Canada Oil Company

d) LOCATION: K-76 Grid 65°40' N 124°15' W
Latitude: 65°35'32" N
Longitude: 124°29' 16" W
Universal Well Location
Reference: Lat. 65.59222
Long. 124.48777
Unique Well Identifier: 300K766540124150

e) CO-ORDINATES: Not applicable

f) PERMIT NUMBER: 4990

g) DRILLING CONTRACTOR: Nabors Drilling Ltd., Rig #8, Rotary

h) DRILLING AUTHORITY: #328, issued November 1, 1968,
amended December 24, 1968.

i) WELL CLASSIFICATION: Wildcat

j) ELEVATIONS: Ground - 775 Est. (Using altimeter)
Used as depth datum
K.B. - 792

k) SPUD DATE: January 30, 1969, 2:30 A.M.

l) COMPLETED DRILLING: March 13, 1969, 6:30 P.M.

m) TOTAL DEPTH: 5272'

n) WELL STATUS: Dry and abandoned.

o) DATE RIG RELEASED: March 18, 1969, Midnight.

p) HOLE SIZES: 12 $\frac{1}{4}$ " to 683.83 G.L.
8-3/4" to 5272'

q) CASING: 9-5/8" OD 36#/ft. J-55 Surface casing
set at 683.83 and cemented with 500 sacks.
16" Conductor Pipe @ 28' with 30 sacks
Fondu.

*According to
should be
top of
out
1000 ft
600 ft*

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO

GEOLOGICAL SUMMARY

a) FORMATION TOPS:

| | <u>Sample</u> | <u>E-log</u> |
|---------------------------------|---------------|--------------|
| Spud in ? Lower Cretaceous | | |
| Top Paleozoic (Bear Rock equiv) | 2670 | 2664 |
| Upper siltstone | 3110 | 3110 |
| Franklin Mountain (Ord.) | 3710 | 3726 |
| Lower Paleozoic clastics | 4960 | 4960 |
| Total Depth: 5272' | | |

b) CORED INTERVALS:

| | |
|---------------------|-------------------------|
| Core #1 (2549-2565) | Recovered 11.5' |
| | Cretaceous |
| Core #2 (4507-4536) | Recovered 29' |
| | Franklin Mtn Fm. (Ord.) |

c) CORE DESCRIPTION:

Core #1 (2549-2565)

Upper 16" consists of sandstone, white to light grey, fine to medium grained, with poor to fair porosity. Remainder of core consists largely of dark grey to black, platy, carbonaceous shale.

| Drilling Rate Depth | Time | February 24, 1969 Min. per foot |
|------------------------|------|------------------------------------|
| 2549 | 1:10 | |
| 2550 | 1:48 | 38 |
| 2551 | 2:00 | 12 |
| 2552 | 2:44 | 44 |
| 2553 | 2:57 | 13 |
| 2554 | 3:16 | 19 |
| 2555 | 3:47 | 31 |
| 2556 | 4:12 | 25 |

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

| Drilling Rate Depth | Time | February 24, 1969 Min. per foot |
|------------------------|------|------------------------------------|
| 2557 | 4:37 | 25 |
| 2558 | 5:03 | 26 |
| 2559 | 5:37 | 34 |
| 2560 | 6:09 | 32 |
| 2561 | 6:41 | 32 |
| 2562 | 7:13 | 32 |
| 2563 | 7:47 | 34 |
| 2564 | 8:27 | 40 |
| 2565 | 8:58 | 31 |

Core #2 (4507-4536)

Dolomite, white to light grey and grey-green, micro to coarsely crystalline, with abundant irregular partings and inclusions of light green siltstone. Largely tight. In places slight trace fossiliferous material, now completely recrystallized.

| Drilling Rate Depth | Time | March 8, 1969 Min. per foot |
|------------------------|-------|--------------------------------|
| 4507 | 23:10 | |
| 4508 | 23:58 | 48 |
| 4509 | 00:17 | 19 |
| 4510 | 00:38 | 21 |
| 4511 | 1:02 | 24 |
| 4512 | 1:27 | 25 |
| 4513 | 1:56 | 28 |
| 4514 | 2:19 | 23 |
| 4515 | 2:43 | 24 |
| 4516 | 3:04 | 21 |
| 4517 | 3:30 | 26 |
| 4518 | 3:55 | 25 |
| 4519 | 4:27 | 32 |
| 4520 | 4:44 | 17 |
| 4521 | 5:02 | 18 |
| 4522 | 5:22 | 20 |
| 4523 | 5:38 | 16 |
| 4524 | 5:57 | 19 |
| 4525 | 6:18 | 21 |
| 4526 | 6:40 | 22 |
| 4527 | 7:00 | 20 |
| 4528 | 7:22 | 22 |
| 4529 | 7:49 | 27 |

- 3a -

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

| Drilling Rate Depth | Time | March 8, 1969 Min. per foot |
|------------------------|-------|--------------------------------|
| 4530 | 8:13 | 24 |
| 4531 | 8:43 | 30 |
| 4532 | 9:15 | 32 |
| 4533 | 9:46 | 31 |
| 4534 | 10:22 | 36 |
| 4535 | 11:00 | 38 |

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

d) SAMPLE DESCRIPTION:

0 - 310 Gravel, loose, unconsolidated glacial outwash, consisting largely of varicolored pebbles of igneous rock with minor amounts of sedimentary rock.

310 - 330 Sand, unconsolidated, white, fine grained, clean.

330 - 360 Gravel, unconsolidated, as above.

360 - 390 Sand, unconsolidated, white, fine grained.

390 - 970 Gravel, unconsolidated, glacial outwash, consisting of varicolored pebbles of igneous and sedimentary origin, angular to well rounded.

Top Cretaceous Beds 970'

970 - 1020 Shale, dark grey brown, calcareous; poor sample, consists largely of gravel cavings.

1020 - 1110 Sandstone, light grey, fine to medium grained, glauconitic, clean, with trace of intergranular porosity.

1110 - 1210 Sandstone, light grey to dark grey brown, argillaceous, soft, trace glauconite, trace ? plant remains, grading to clean, quartzitic sandstone, with trace intergranular porosity. Interbedded with shale, dark grey-brown, slightly calcareous.

1210 - 1270 Siltstone, light grey, calcareous, friable, with interbedded sandstone, light grey, fine grained, argillaceous.

1270 - 1410 Shale, medium to dark grey, with abundant glauconite, trace sandstone as above.

1410 - 1550 Sandstone, light grey, fine grained, clean, with trace of intergranular porosity. Interbedded with minor dark grey shale. Some glauconite.

1550 - 1700 Shale, dark grey, interbedded with dark brown hard siltstone and trace of dark brown, cryptocrystalline limestone.

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

1700 - 1780 Shale, medium to dark grey and grey-brown, with minor interbedded dark brown siltstone. Shale glauconitic, trace pyrite.

1780 - 1800 Shale, medium grey, with trace dark brown siltstone.

1800 - 1830 Samples very poor as trip made. Probably shale as above.

1830 - 1900 Shale, dark grey to grey brown, interbedded with dark brown siltstone. Some glauconite.

1900 - 1945 Shale, dark grey brown, with interbedded dark brown siltstone, trace pyrite.

1945 - 1955 Sandstone, fine grained, grey, slightly salt and pepper type, tight, with interbedded shale as above (70%).

1955 - 2040 Shale, dark grey brown, with interbedded dark grey brown siltstone.

2040 - 2180 Shale, dark grey brown, with thin interbeds of sandstone, dark grey, fine grained, argillaceous. Trace plant remains, pyrite.

2180 - 2230 Sandstone, light grey to light brown, fine grained, salt and pepper type, some argillaceous, calcareous, tight. Interbedded with trace shale as above.

2230 - 2300 Shale, dark grey brown, with thin interbeds of sandstone.

2300 - 2400 Sandstone, light grey, fine grained, calcareous, with trace intergranular porosity, with interbedded dark grey brown shale as before.

2400 - 2550 Sandstone, light grey, fine to medium grained, clean, quartzitic, with fair intergranular porosity, angular to subangular grains, with minor interbedded dark grey brown shale.

2550 - 2600 Sandstone as above with increasing amount of interbedded shale.

2600 - 2670 Sandstone, light grey, fine to medium grained, slightly salt and pepper, clean, glauconitic, with ? 20% interbedded dark grey shale.

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

Top Paleozoic Carbonate 2670'

2670 - 2710 Limestone, dark brown, cryptocrystalline, tight, slightly argillaceous, trace pinpoint porosity at 2690 and 2700'.

2710 - 2790 Limestone as above, dolomitic, with interbeds of light tan, cryptocrystalline dolomite. Some pin point and microvug porosity in the dolomite.

2790 - 2820 Dolomite, tan, trace light brown, cryptocrystalline, clean, scattered chips with trace pin point and occasional micro-vug porosity, poor to fair vuggy porosity at 2820.

2820 - 2960 Dolomite, light to medium brown and grey brown, cryptocrystalline to microcrystalline, some finely crystalline and sugary, with some intercrystalline and vugular porosity.

2960 - 3010 Limestone, medium brown, cryptocrystalline, very slightly argillaceous, tight. Also some finely crystalline, sugary, white limestone.

3010 - 3050 Dolomite, light to medium brown and grey brown, cryptocrystalline to finely crystalline, with intercrystalline and vuggy porosity.

3050 - 3110 Dolomite, light to medium brown and grey brown, cryptocrystalline to microcrystalline, with interbedded anhydrite, white to tan, microcrystalline to finely crystalline and sugary.

Upper siltstone unit 3110'

3110 - 3210 Siltstone, light grey-green to rust and red-brown, mottled, dolomitic, sandy (clear quartz grains, fine to medium grained, subangular to subrounded) 40-80%, interbedded with tan to off-white, very finely crystalline to cryptocrystalline anhydrite.

3210 - 3230 Anhydrite, 40%, cryptocrystalline, off white to light grey, some finely crystalline. Siltstone, 10%, rust. Shale, 40%, cavings. Sandstone 10%, poor sample.

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

3230 - 3260 Siltstone, 80%, rust to red-brown. Anhydrite, 10%, white to pink and light tan, very finely crystalline to cryptocrystalline. Sandstone, 10%, light pink to light grey, fine to medium grained.

3260 - 3270 Siltstone, 60%, rust to red-brown. Anhydrite, 30%, white to light grey, very finely crystalline to cryptocrystalline. Sandstone, 10%, light green to rust.

3270 - 3290 Siltstone, rusty to red brown and light green, as before, grading to mottled very fine grained sandstone, with interbedded olive grey to white and tan anhydrite.

3290 - 3300 Dolomite, light brown, cryptocrystalline to finely crystalline, tight.

3300 - 3500 Siltstone, red-brown to green, sandy, some dolomitic, interbedded with varying amounts of anhydrite, white, light pink, light tan and light grey, cryptocrystalline to finely crystalline and sugary. Abundant clear sand size quartz grains in both siltstone and anhydrite. Trace light brown, cryptocrystalline dolomite.

3500 - 3710 Siltstone, red-brown, very dolomitic, trace light green, trace light tan to brown dolomite, interbedded with white, microcrystalline to finely crystalline anhydrite. Siltstone and anhydrite both sandy. Possible trace dark grey shale at 3500-3510'.

Top Franklin Mtn formation 3710

3710 - 3810 Dolomite, tan to light grey and brown, cryptocrystalline, clean, grading to very sandy, medium crystalline dolomite, and interbedded with thin stringers of light grey, very dolomitic siltstone and very fine grained sandstone.

3810 - 3900 Dolomite, light grey to light tan and medium brown, cryptocrystalline to medium crystalline, slightly silty, tight, with interbedded minor white, fine to medium crystalline anhydrite.

3900 - 3970 Dolomite, light grey, light brown and medium brown, cryptocrystalline to finely crystalline, with traces of intercrystalline porosity at 3900-10, 3930-40 and 3960-70. Also some fine to coarsely crystalline pyrite at 3950-60.

SINCLAIR WHITEFISH RIVER K-76

SECTION TWO CONT'D

GEOLOGICAL SUMMARY

3970 - 4100 Dolomite, light tan to light brown, cryptocrystalline, dense, to finely crystalline, very slightly silty, tight. Trace white chert at 4040-50, also trace dark brown residue (a sulfide mineral or pyrobitumin?) in this interval.

4100 - 4250 Dolomite, white to light tan and medium brown, cryptocrystalline to medium crystalline, clean to slightly argillaceous, with trace of white pyrobitumen material or sulfide mineralization. Some dolomite contains partings and inclusions of light green siltstone.

4250 - 4440 Dolomite, white to light brown and pale green, microcrystalline to coarsely crystalline, with abundant inclusions and stringers of light green siltstone. Pyrite abundant throughout this interval.

4440 - 4650 Dolomite, white to light brown and light grey-green, microcrystalline to coarsely crystalline, hard, silty, with fairly abundant thin discontinuous stringers and small inclusions of light green siltstone. Pyrite common throughout large part of this interval.

4650 - 4800 Dolomite as above with interbedded red-brown dolomitic siltstone, Pyrite fairly common. Trace of intercrystalline porosity in dolomite at 4710'.

4800 - 4885 Dolomite, white to light green and red-brown, cryptocrystalline, very silty, with stringers of red-brown and light green dolomitic siltstone.

4885 - 4960 Dolomite, light to medium and dark, grey and brown cryptocrystalline, dense, argillaceous, tight, with trace pyrite.

Lower Paleozoic clastic zone 4960 (Ordovician-?Cambrian)

4960 - 5100 Siltstone, light grey to grey green and red brown, dolomitic, trace light green waxy shale, trace grey-brown dolomite as above. Trace pyrite at 5000, 5010'.

5100 - 5200 Siltstone, medium to dark grey and grey brown, trace red brown, slightly dolomitic, with minor interbeds white, fine grained sandstone.

5200 - 5272 Sandstone, light grey, fine grained, clean, angular to subangular quartz grains, trace glauconite, with some intergranular porosity, interbedded with medium grey brown argillaceous siltstone near base of interval.

5272' Total Depth.

SECTION
THREE

SINCLAIR WHITEFISH RIVER K-76

SECTION THREE

ENGINEERING SUMMARY

a) DRILL STEM TESTS:

D.S.T. #1 (2400-2568) February 24, 1969
Preflow 6 minutes
ISI 31 minutes, VO 60 mins., FSI 60 mins.
Good initial air blow on preflow. Strong
air blow on initial flow decreasing to nil
in 25 mins. Remaining dead during test.
Recovered 360' drilling mud, 2060' of mud cut
salt water, 19,300 P.P.M.

| | |
|-----|-------------|
| SIP | 1078 - 1065 |
| FP | 977 - 1065 |
| HP | 1123 - 1123 |

D.S.T. #2 (2930-3050) March 16, 1969
Preflow 5 minutes
ISI 41 mins., VO 61 mins., FSI 61 mins.
Fairly good air blow on initial flow (preflow).
Fairly good air blow on flow period reducing to
no blow in 15 mins.
Recovered 180' drilling mud, 540' mud cut salt
water, 660' salt water (slight mud cut), 1180'
salt water, 41,000 P.P.M.

| | |
|-----|-------------|
| SIP | 1268 - 1269 |
| FP | 990 - 1268 |
| HP | 1389 - 1389 |

b) CASING RECORD:

16" Conductor Pipe @ 28' with 30 sacks Fondu.
9-5/8" OD 36#/ft. J-55 surface casing set
at 683.83' cemented with 500 sacks.

c) BIT RECORD:

See attached.

d) MUD REPORT:

See attached.

Fig No. 5.

Location Streetside, Central Park, Bronx

PARKER DRILLING CO. OF CANADA LIMITED

WELL MUD COST SUMMARY

Mud Company

Date Spudded 2/2/19

Mud Engineer

Date Released _____

† Below Materials Returned for Credit

Total Delivered

Signatures—

Mud Engineer

Rig Supervisor

—Submit to Calgary Office Upon Completion

Total Returned

Total Used

| LOCATION | | | | | | CONTRACTOR | | | | | | RIG No. | TOOL PUSHER | | | | | | PAGE | | | | | | | | |
|----------|------|-------|------|----------|--------|------------|-------|--------|--------------|----------|-----|---------|-------------|---------------|--------|----------|-----------|-----------|-----------|--------|--------|--------|--------|--------|------|--|--|
| No. | Size | Make | Type | Jet Size | Serial | Depth Out | Feet | Hours | Accum. Hours | Dull Cnd | | | No. of DC | Wt. 1000 Lbs. | R.P.M. | Vert Dev | Pump Pres | No. 1 Spm | No. 2 Spm | Line | Line | Mud | | | Date | | |
| | | | | | | | | | | T | B | G | | | | | | | | | | Wt | Vis | pH | WL | | |
| R.R. | 5 | 8 1/2 | 1161 | 7135R | 711 | 70419 | 87000 | 6 1/4 | 1500 | 800 | 100 | 100 | 70 | 8 1/2 | 1 | Circ | To Pump | 25-7 | -2 | 1 | | | | | | | |
| R.R. | 6 | 8 1/2 | SEC | 5.58 | " | 1731178 | 2793 | 230 | 19 1/2 | 15 1/2 | 3 3 | 1 | 21 | 20-20 | 55 | 5 | 800 | 55 | | | 81 | 24 | | | | | |
| R.R. | 7 | 8 1/2 | 1161 | W01 | " | 6587 | 2944 | 51 | 134 | 76 1/4 | 1 | 1 | 21 | 20 | 65 | 3 1/2 | 1000 | 56 1/2 | | | 81 | 40 | | | | | |
| R.R. | 8 | 8 1/2 | 1161 | 7135R | " | 40419 | 3097 | 255 | 27 1/4 | 161 | 1 | 1 | 21 | 20 | 40 | 3 1/3 | 1000 | 55 1/2 | | | 81 | 43 | 11 | 13 | | | |
| R.R. | 9 | 8 1/2 | 1161 | W01 | " | 6587 | 3310 | 211 | 23 1/2 | 12 1/2 | 2 5 | 1 | 21 | 36 1/2 | 105 | 55 | 1000 | 54 1/2 | | | 81 | 40 | 9 | 12 | | | |
| R.R. | 10 | 8 1/2 | 1161 | CPW | " | 9412 | 3505 | 195 | 27 | 15 1/4 | 2 | 3 | 1 | 21 | 24 1/2 | 65 | 4 | 1000 | 54 1/2 | | | 81 | 42 | 12 | 16 | | |
| R.R. | 11 | 8 1/2 | 1161 | X16 | " | 1607 | 3160 | 155 | 16 1/4 | 11 1/4 | 3 | 2 | 1 | 21 | 30 | 65 | 1000 | 54 1/2 | | | 81 | 55 | 15 | 18 | | | |
| R.R. | 12 | 8 1/2 | 1161 | 000 | 7 1/2 | 94111 | 3720 | 60 | 11 1/4 | 18 1/2 | 2 | 1 | 1 | 21 | 25 | 65 | 4 1/2 | 1000 | 54 1/2 | | | 81 | 50 | 13 | 18 | | |
| R.R. | 13 | 8 1/2 | 1161 | X16 | " | 1965 | 3807 | 87 | 11 1/4 | 19 1/4 | 4 | 2 | 1 | 21 | 45 | 15 | 45 | 1000 | 54 1/2 | | | 81 | 44 | 1 | 15 | | |
| R.R. | 14 | 8 1/2 | 5.87 | 5.87 | " | 164004R | 4186 | 289 | 29 1/4 | 22 1/2 | 4 | 3 | 1 | 21 | 45 | 4 1/2 | 4 1/2 | 1000 | 54 1/2 | | | 81 | 44 | 7 | 18 | | |
| R.R. | 15 | 8 1/2 | 4.6 | 1335R | 7 1/2 | 7254 | 41507 | 211 | 42 | 21 1/2 | 4 | 2 | 1 | 21 | 45 | 12 | 4 1/2 | 1111 | 1000 | 54 1/2 | | 81 | 45 | 21 | 17 | | |
| R.R. | 16 | 6 1/2 | 8 | 7134C | " | 4535 | 25 | 10 1/2 | 24 1/2 | 6 1/2 | 6 | 6 | 1 | 13 | 12 | 80 | 1000 | 54 1/2 | | | 81 | 43 | 23 | 15 | | | |
| R.R. | 17 | 8 1/2 | 1161 | W412 | 7 1/2 | 1302 | 4664 | 129 | 14 1/4 | 29 1/2 | 3 | 2 | 1 | 21 | 45 | 70 | 4 1/2 | 1000 | 54 1/2 | 9 1/2 | 10 1/2 | 11 1/2 | 12 1/2 | 13 1/2 | 14 | | |
| R.R. | 18 | 8 1/2 | 1161 | W01 | 7 1/2 | 6589 | 4516 | 152 | 16 1/2 | 307 | 4 | 3 | 1 | 21 | 45 | 70 | 4 | 1000 | 56 1/2 | | | 81 | 45 | 8 | 12 | | |
| R.R. | 19 | 8 1/2 | 1161 | X135R | 7 1/2 | 7255 | 5195 | 379 | 35 1/4 | 34 1/2 | 4 1 | 1 | 21 | 45 | 40 | 1 1/2 | 1000 | 54 1/2 | | | 81 | 45 | 13 | 18 | | | |
| R.R. | 20 | 8 1/2 | 1161 | 6491 | 7 1/2 | 6584 | 5272 | 77 | 9 1/2 | 35 3/4 | 2 | 2 | 1 | 21 | 45 | 65 | 3 1/2 | 1000 | 52 1/2 | 54 1/2 | | 71 | 11 | 7 | 11 | | |

BIT RECORD

PAGE ____ OF ____

| | | | | | | | | | | | | | | | | | | | |
|-------------------------|-----------------------------------|-------------|----------------|----------------|-----------------------------------|-------|---|-------------|-------------------|--|--|--|--|--|--|--|--|--|--|
| Province | Field | Canada | LSD | Section | Twp./Rip. | Range | W | Operator | Elev. | Mud Type | | | | | | | | | |
| Location | W.L.T. <u>WILCOX</u> | Contractor | | Rig No. | Rig Make & Type | | | Tool Pusher | To | To | | | | | | | | | |
| Drill Collars | No. O.D. I.D. | Date | Month/Day/Year | Time | Pump No. 1 | Type | | | To | To | | | | | | | | | |
| 1 | 17 6 1/2" | Spudded | 2 13/11/1969 | 1:00 A.M./P.M. | 1350 | 250 | | | Special Additives | | | | | | | | | | |
| 2 | 7 7" | Set Surface | 2 14/11/1969 | 3:00 A.M./P.M. | Pump No. 2 | Type | | | | | | | | | | | | | |
| 3 | 5 of Joints - Make Size Type O.D. | Under Surf | 2 13/11/1969 | 6:00 A.M./P.M. | 1350 | 250 | | | | | | | | | | | | | |
| 4 | | Under Inter | 1 1 | A.M./P.M. | Approved | | | | | | | | | | | | | | |
| 5 | | Completion | 1 1 | A.M./P.M. | (Toolpusher) <u>Frank Karpins</u> | | | | | | | | | | | | | | |
| 6 | | Release | 1 1 | A.M./P.M. | Approved | | | | | | | | | | | | | | |
| Lost Circulation Depths | | | | | Key Seat Depths | | | | | Other Remarks - Reaming, Re-Drilling, Etc. | | | | | | | | | |

| No. | Size | Make | Type | Jet Size | Serial | Depth Out | Feet | Hours | Accum. Hours | Dull Cond. | | | No. of DC | Wt. 1000 Lbs. | R.P.M. | Vert Dev | Pump Pres | No. 1 | | No. 2 | | Mud | | Date | | |
|-----|------------|-------|-------|----------|--------|-----------|------|--------|--------------|------------|-------|-------|-----------|---------------|--------|----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | | | | | | T | B | G | | | | | | Spm | Line | Spm | Liner | Wt | Vis | pH | WL | |
| 1C | 3 1/2" 400 | Wilco | 3 1/4 | 3/4 | 93899 | 120 | 120 | 4 1/2 | 4 1/2 | 1 | 1 | 0 | 5 | 310 | 100 | 1 | | | | | | | | | | |
| 2A | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 95128 | 237 | 87 | 5 | 9 1/2 | 4 1/2 | 0 | 8 | 16 | 15 | 15 | 1 | | | | | | | | | | |
| 2B | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 515 | 321 | 61 | 3 1/2 | 12 1/2 | 4 1/2 | 3 1/2 | 10 | 15 | 15 | 15 | | | | | | | | | | | |
| 2C | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 97775 | 381 | 60 | 14 1/2 | 14 1/2 | 4 1/2 | 1 | 1 | 15 | 75 | | | | | | | | | | | | |
| 2D | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 93116 | 412 | 31 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 20 | 15 | | | | | | | | | | | | |
| 2E | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 80911 | 412 | 412 | 1 1/2 | 15 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | |
| 2F | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 93106 | 412 | 412 | 1 1/2 | 15 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | |
| 2G | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 93106 | 412 | 412 | 1 1/2 | 15 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | |
| 2H | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19702 | 322 | | | | 4 1/2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 2I | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 86911 | 410 | 28 | 2 | 12 1/2 | 4 1/2 | 1 | 1 | 20 | 15 | | | | | | | | | | | | |
| 2J | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19731 | | | | | 3 1/2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 2K | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 91620 | 5516 | 120 | 1 | 23 1/2 | 2 1/2 | 1 | 15 | 30 | 30 | 15 | | | | | | | | | | | |
| 2L | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 66647 | 720 | 27 | 11 | 3 1/2 | 2 1/2 | 1 | 21 | 30 | 30 | 15 | | | | | | | | | | | |
| 2M | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 92919 | 888 | 114 | 5 1/2 | 3 1/2 | 1 1/2 | 1 | 21 | 110 | 60 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 |
| 2N | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 83329 | | | | | 16 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | |
| 2O | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2P | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 81528 | | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2Q | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2R | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 81528 | | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2S | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2T | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 81528 | | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2U | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2V | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 81528 | | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2W | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2X | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 81528 | | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2Y | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 2Z | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3A | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 81528 | | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3B | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3C | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3D | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3E | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3F | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3G | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3H | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3I | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3J | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3K | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3L | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3M | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3N | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3O | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3P | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3Q | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3R | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3S | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3T | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3U | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3V | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3W | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3X | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3Y | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 3Z | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 4A | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 4B | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | 3 2 | 1 | | | | | | | | | | | | | | | |
| 4C | 3 1/2" 400 | Wilco | 3 1/4 | 3 1/4 | 19510 | 351 | | | | | | | | | | | | | | | | | | | | |

SINCLAIR WHITEFISH RIVER K-76

SECTION THREE CONT'D

ENGINEERING SUMMARY

e) WELL DEVIATION:

| <u>Depth</u> | <u>Degrees</u> | <u>Depth</u> | <u>Degrees</u> |
|--------------|-----------------|--------------|-----------------|
| 60 | 3/4 | 1642 | 2 $\frac{1}{2}$ |
| 90 | 3/4 | 1800 | 2 $\frac{1}{2}$ |
| 150 | 3/4 | 1988 | 3 |
| 235 | 1 | 2050 | 3 |
| 300 | 1 $\frac{1}{2}$ | 2114 | 3 |
| 334 | 1 $\frac{1}{2}$ | 2178 | 3 |
| 352 | $\frac{1}{2}$ | 2272 | 3 |
| 381 | 1 | 2367 | 3 |
| 518 | 1-1/8 | 2498 | 3 $\frac{1}{2}$ |
| 579 | 1-1/16 | 2549 | 4 |
| 639 | 15/16 | 2624 | 4-3/4 |
| 733 | $\frac{1}{2}$ | 2687 | 5 |
| 827 | 1 | 2750 | 4-7/8 |
| 1030 | 1 | 2844 | 3 $\frac{1}{2}$ |
| 1158 | 3-1/16 | 2939 | 3-3/4 |
| 1232 | 3 | 3003 | 3-3/4 |
| 1295 | 2-7/8 | 3099 | 3-1/3 |
| 1421 | 2-1/4 | 3192 | 4 |
| 3310 | 5 | | |
| 3380 | 5 | | |
| 3443 | 4-7/8 | | |
| 3505 | 4 | | |
| 3570 | 4 $\frac{1}{2}$ | | |
| 3660 | 5 | | |
| 3720 | 4-3/4 | | |
| 3800 | 4 $\frac{1}{2}$ | | |
| 4084 | 4 $\frac{1}{2}$ | | |
| 4507 | 4-1/4 | | |
| 4664 | 4 $\frac{1}{2}$ | | |
| 4816 | 4 | | |
| 5195 | 3 $\frac{1}{2}$ | | |
| 5272 | 3-7/8 | | |

SINCLAIR WHITEFISH RIVER K-76

SECTION THREE CONT'D

ENGINEERING SUMMARY

f) ABANDONMENT PLUGS:

Plug #1 5272 - 4910 Used 150 sacks cement

Plug #2 3050 - 2250 Used 530 sacks cement
Felt plug at 2220'.

Plug #3 730 - 630 Used 50 sacks cement.
Felt plug #3 at 617'.
Ten sacks cement used at
top of hole holding 2" pipe with
identification plate.

g) LOST CIRCULATION ZONES:

None reported.

h) REPORT OF BLOWOUTS:

None reported.

SINCLAIR WHITEFISH RIVER K-76

SECTION FOUR

LOGS RUN:

| <u>Type</u> | <u>Date</u> | <u>Interval</u> |
|----------------------|----------------|-----------------|
| Induction Electrolog | March 15, 1969 | 687 - 5266 |
| Acoustilog | March 15, 1969 | 687 - 5264 |
| Minilog | March 15, 1969 | 687 - 5269 |
| Densilog | March 15, 1969 | 687 - 5266.5 |
| Velocity Survey | March 15, 1969 | 687' - 5264' |

SECTION
FOUR

SINCLAIR WHITEFISH RIVER K-76

SECTION FIVE

ANALYSES

a) CORE ANALYSES:

None

b) WATER ANALYSES:

1. Chemical Analysis Report No. CBH-2-4343 D.S.T. #1
See attached.
2. Chemical Analysis Report No. CBH-2-4412 D.S.T. #2
See attached.

c) GAS ANALYSES:

None

d) OIL ANALYSES:

None



CORE LABORATORIES - CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

WATER ANALYSIS



File CBH-2-4412 Page 1 of 1

Company Sinclair Canada Oil Company

Well Sinclair Whitefish River K-76 K.B. 580' Grd. 580'

Location 65 35' 32.00" N.L. Field Whitefish
124 29' 16.00" W.L. River Area River Area Province N.W.T.

Formation Interval 2830' - 3050'

Sampled from DST #2 (50' Above Tool) by

Date sampled Mar. 16/69 Date analyzed Mar. 18/69 Analyst J.C.

Recovery Salt Water (41,000 ppm)

Mud type _____ Water cushion _____

Total Solids:

Resistivity 0.146 Ohm-meters @ 75 °F Calculated 49,992 mg/liter

Specific gravity 1.034 @ 60°F By evaporation @ 110°C - mg/liter

pH 7.4 H₂S Absent By evaporation @ 180°C - mg/liter

Refractive Index 1.338 @ 75°F At ignition - mg/liter

MILLIGRAMS PER LITER

| Na + K | Ca | Mg | Fe | Ba | Br | I | Cl | HCO ₃ | SO ₄ | CO ₃ | OH |
|--------|-------|-----|------|------|----|---|--------|------------------|-----------------|-----------------|----|
| 17,082 | 1,537 | 257 | Abs. | Abs. | - | - | 25,725 | 181 | 5,390 | - | - |

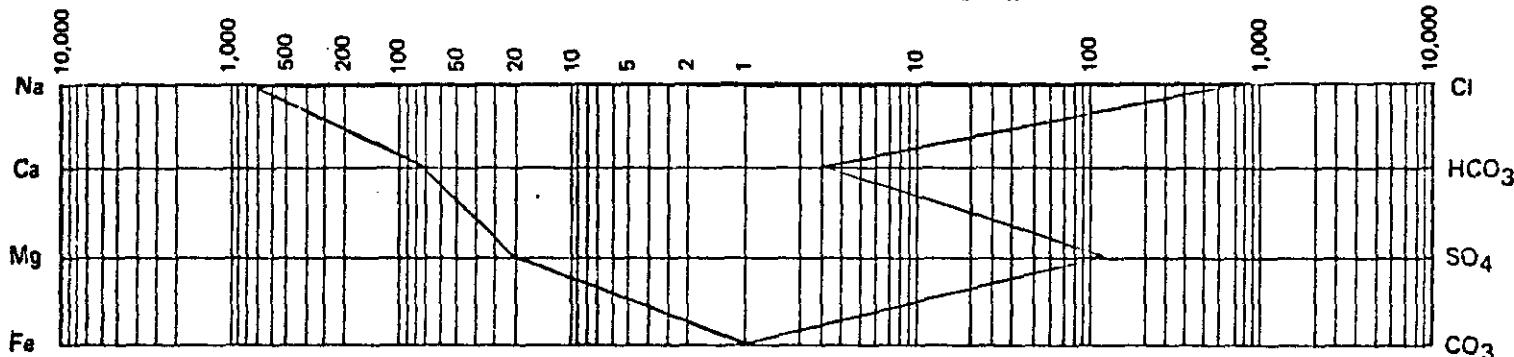
PER CENT CALCULATED SOLIDS

| | | | | | | | | | | | |
|------|-----|-----|------|------|---|---|------|-----|------|---|---|
| 34.1 | 3.0 | 0.5 | Abs. | Abs. | - | - | 51.4 | 0.3 | 10.7 | - | - |
|------|-----|-----|------|------|---|---|------|-----|------|---|---|

MEQ PER LITER

| | | | | | | | | | | | |
|-------|------|------|------|------|---|---|-------|-----|-------|---|---|
| 742.7 | 76.7 | 21.1 | Abs. | Abs. | - | - | 725.4 | 3.0 | 112.1 | - | - |
|-------|------|------|------|------|---|---|-------|-----|-------|---|---|

LOGARITHMIC PATTERN MEQ PER LITER





CORE LABORATORIES - CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

WATER ANALYSIS



File CF H-2-4343 (Page 1 of 1)

Company Sinclair Canada Oil CompanyWell Sinclair Whitefish River K-76 K.B. 580' Grd. 580'
65 35'32.00 N.L. Whitefish River
Location 124 29'16.00 W.L. Field Area Province Northwest TerritoriesFormation Interval 2400' - 2568'Sampled from DST No. 1 (Top of Tool) by Date sampled Date analyzed March 5, 1969 Analyst AMRecovery Mud type Water cushion

Total Solids:

Resistivity 0.34 Ohm-meters @ 67 °F Calculated 21,131 mg/literSpecific gravity 1.0150 @ 60°F By evaporation @ 110°C - mg/literpH 6.7 H₂S Absent By evaporation @ 180°C - mg/literRefractive Index 1.339 @ 67°F At ignition - mg/liter

MILLIGRAMS PER LITER

| Na + K | Ca | Mg | Fe | Ba | Br | I | Cl | HCO ₃ | SO ₄ | CO ₃ | OH |
|--------|-----|----|-------|------|----|---|--------|------------------|-----------------|-----------------|----|
| 7,526 | 403 | 64 | Pres. | Abs. | - | - | 10,739 | 34 | 2,365 | - | - |

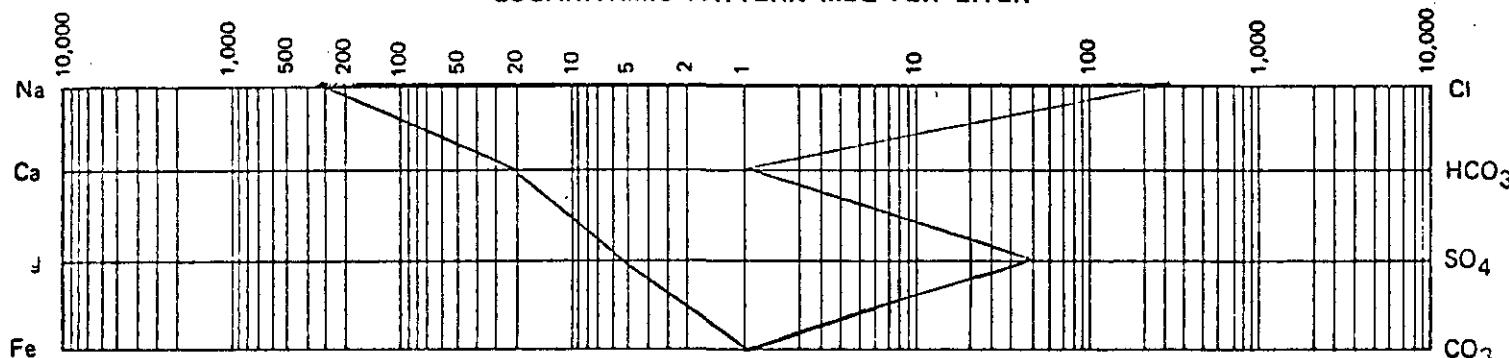
PER CENT CALCULATED SOLIDS

| | | | | | | | | | | | |
|------|-----|-----|-------|------|---|---|------|-----|------|---|---|
| 35.6 | 1.9 | 0.3 | Pres. | Abs. | - | - | 50.8 | 0.2 | 11.2 | - | - |
|------|-----|-----|-------|------|---|---|------|-----|------|---|---|

MEQ PER LITER

| | | | | | | | | | | | |
|-------|------|-----|-------|------|---|---|-------|-----|------|---|---|
| 327.2 | 20.1 | 5.3 | Pres. | Abs. | - | - | 302.8 | 0.6 | 49.2 | - | - |
|-------|------|-----|-------|------|---|---|-------|-----|------|---|---|

LOGARITHMIC PATTERN MEQ PER LITER



SINCLAIR WHITEFISH RIVER K-76

SECTION SIX

COMPLETION SUMMARY

a) TUBING RECORD:

Nil

b) PERFORATION RECORD:

Nil

c) CEMENTATION RECORD:

Abandonment Plugs

Plug #1 5272-4910 Used 150 sacks cement

Plug #2 3050-2250 Used 530 sacks cement.
Felt plug #2 at 2220'.

Plug #3 730-630 Used 50 sacks cement.
Felt plug #3 at 617'.
Ten sacks cement used at
top of hole - holding 2"
pipe with identification
plate.

d) ACIDIZATION AND FRACTURING RECORD:

Nil

e) BACK PRESSURE AND PRODUCTION TESTS:

Nil.

WELL HISTORY REPORT

SINCLAIR WHITEFISH RIVER K-76

Lat 65°35'32" North
Long 124°29'16" West

NORTHWEST TERRITORIES

CANADA

REPORT SUBMITTED BY:

S. Paskevich
S. Paskevich

May 2, 1969

Date

CHEMICAL ANALYSIS

for

SINCLAIR CANADA OIL COMPANY

Sinclair Whitefish River K-76
Whitefish River Area
Northwest Territories



CORE LABORATORIES - CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

WATER ANALYSIS



File CI H-2-4343 (Page 1 of 1)

Company Sinclair Canada Oil CompanyWell Sinclair Whitefish River K-76 K.B. 65 35'32.00 N.L. Grd. 580'
124 29'16.00 W.L. Whitefish RiverLocation Field Area Province Northwest TerritoriesFormation Interval 2400' - 2568'Sampled from DST No. 1 (Top of Tool) by _____Date sampled _____ Date analyzed March 5, 1969 Analyst AM

Recovery _____

Mud type _____ Water cushion _____

Total Solids:

Resistivity 0.34 Ohm-meters @ 67 °F Calculated 21,131 mg/literSpecific gravity 1.0150 @ 60°F By evaporation @ 110°C - mg/literpH 6.7 H₂S Absent By evaporation @ 180°C - mg/literRefractive Index 1.339 @ 67°F At ignition - mg/liter

MILLIGRAMS PER LITER

| Na + K | Ca | Mg | Fe | Ba | Br | I | Cl | HCO ₃ | SO ₄ | CO ₃ | OH |
|--------|-----|----|-------|------|----|---|--------|------------------|-----------------|-----------------|----|
| 7,526 | 403 | 64 | Pres. | Abs. | - | - | 10,739 | 34 | 2,365 | - | - |

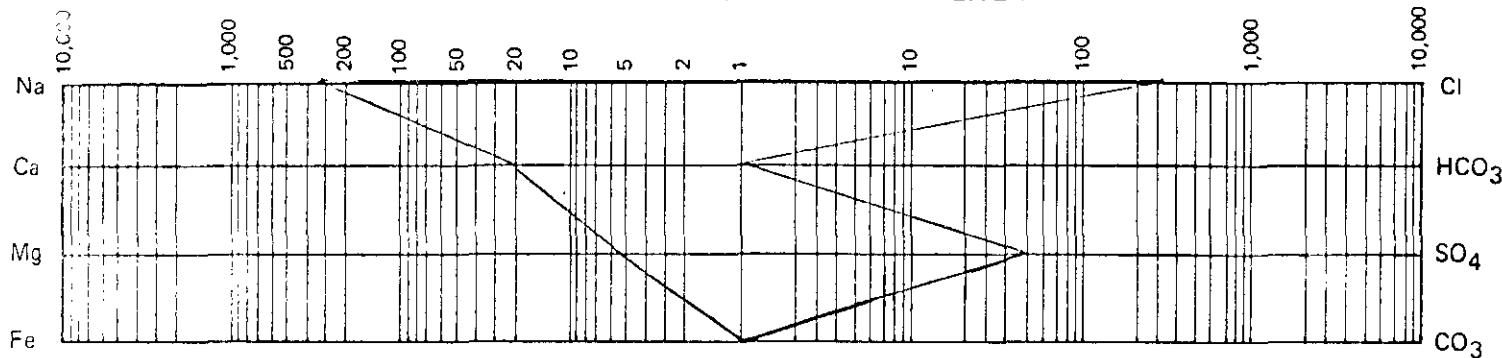
PER CENT CALCULATED SOLIDS

| | | | | | | | | | | | |
|------|-----|-----|-------|------|---|---|------|-----|------|---|---|
| 35.6 | 1.9 | 0.3 | Pres. | Abs. | - | - | 50.8 | 0.2 | 11.2 | - | - |
|------|-----|-----|-------|------|---|---|------|-----|------|---|---|

MEQ PER LITER

| | | | | | | | | | | | |
|-------|------|-----|-------|------|---|---|-------|-----|------|---|---|
| 327.2 | 20.1 | 5.3 | Pres. | Abs. | - | - | 302.8 | 0.6 | 49.2 | - | - |
|-------|------|-----|-------|------|---|---|-------|-----|------|---|---|

LOGARITHMIC PATTERN MEQ PER LITER



CHEMICAL ANALYSIS

for

SINCLAIR CANADA OIL COMPANY

Sinclair Whitefish River K-76
Whitefish River Area
Northwest Territories



CORE LABORATORIES - CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

WATER ANALYSIS



File CBH-2-4412 Page 1 of 1

Company Sinclair Canada Oil CompanyWell Sinclair Whitefish River K-76 K.B. 580' Grd. 580'Location 65 35' 32.00" N.L. Whitefish
124 29' 16.00" W.L. Field River Area Province N.W.T.Formation Interval 2830'-3050'Sampled from DST #2 (50' Above Tool) by Date sampled Mar. 16/69 Date analyzed Mar. 18/69 Analyst J.C.Recovery Salt Water (41,000 ppm)Mud type Water cushion

Total Solids:

Resistivity 0.146 Ohm-meters @ 75 °F Calculated 49,992 mg/literSpecific gravity 1.034 @ 60°F By evaporation @ 110°C - mg/literpH 7.4 H₂S Absent By evaporation @ 180°C - mg/literRefractive Index 1.338 @ 75°F At ignition - mg/liter

MILLIGRAMS PER LITER

| Na + K | Ca | Mg | Fe | Ba | Br | I | Cl | HCO ₃ | SO ₄ | CO ₃ | OH |
|--------|-------|-----|------|------|----|---|--------|------------------|-----------------|-----------------|----|
| 17,082 | 1,537 | 257 | Abs. | Abs. | - | - | 25,725 | 181 | 5,390 | - | - |

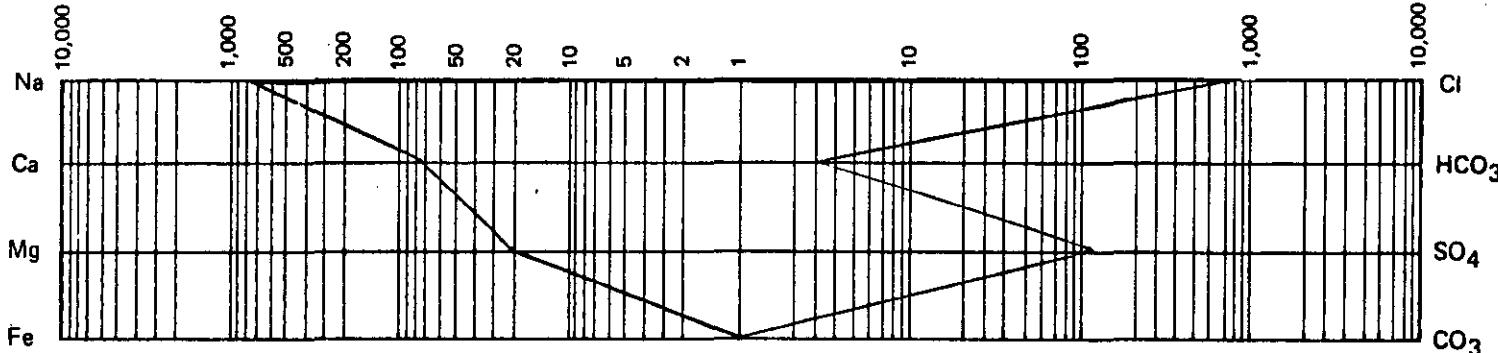
PER CENT CALCULATED SOLIDS

| | | | | | | | | | | | |
|------|-----|-----|------|------|---|---|------|-----|------|---|---|
| 34.1 | 3.0 | 0.5 | Abs. | Abs. | - | - | 51.4 | 0.3 | 10.7 | - | - |
|------|-----|-----|------|------|---|---|------|-----|------|---|---|

MEQ PER LITER

| | | | | | | | | | | | |
|-------|------|------|------|------|---|---|-------|-----|-------|---|---|
| 742.7 | 76.7 | 21.1 | Abs. | Abs. | - | - | 725.4 | 3.0 | 112.1 | - | - |
|-------|------|------|------|------|---|---|-------|-----|-------|---|---|

LOGARITHMIC PATTERN MEQ PER LITER



DRILL-STEIN TEST DATA

| | | | |
|-------------|---------------------------|-------------|---------------|
| Well Name | SI. CLAIR WHITEFISH RIVER | Test No. | 1 |
| Well Number | K-76 | Zone Tested | 310 ft |
| Company | NAISORG DRILLING | Interval | 2400-2460 |
| Comp. Rep. | R. Kremp | Tester | P. Dakus |
| | | Date | Oct. 24, 1971 |



DRILL-STEM TEST DATA

| | | | | |
|-------------|--------------------------|--------|-------------|-----------------|
| Well Name | SINCLAIR WHITEFISH RIVER | | Test No | 1 |
| Well Number | K-76 | | Zone Tested | TIGHT |
| Company | NABORS DRILLING | | Interval | 2400-2568 |
| Comp. Rep | F. Kremp | Tester | P. Dakus | Date Feb. 24/69 |

Type of Test Bottom Hole RFS Tool No. 55

Preflow 6 mins. ISI 31 mins. Flow 60 mins FSI 60 mins.

| Specify Inside or Outside | Ins REC. No. 2843 6300 RANGE 12 HR CLOCK | Outs REC No. 2660 6400 RANGE 12 HR CLOCK | REC No. |
|---------------------------|---|---|---------|
| DEPTH | 2411 | 2431 | |
| Initial Hydro Mud Press | 1115 | 1123 | |
| Initial Shut-In Press | 1068 | 1078 | |
| Initial Flow Press | 968 | 977 | |
| Final Flow Press | 1057 | 1065 | |
| Final Shut-In Press | 1057 | 1065 | |
| Final Hydro Mud Press | 1115 | 1123 | |

Mud Drop Nil Fluid Loss 10.4 Mud Weight 9.1
 Viscosity 75 Temperature 84° Net Pay Tested EST. 110'
 Top Packer Depth 2394' Bottom Packer Depth 2400' Total Depth 2568'
 Drill Pipe Size 3 1/2" IF Wt 13.30 Drill Collar I.D. 2 3/8" Ft. Run 383'
 Surface Choke Size 1 1/8" ADJ. Bottom Choke Size 1" Main Hole Size 8 3/4"
 Anchor Size 4 3/4" OD Rat Hole Size Feet of Rat Hole
 Cushion Amount Type Rubber Size 7 1/2"

Fluid Recovery Total Feet 2420'
 Recovered 300' Feet of Drilling Mud
 Recovered 2060 Feet of Mus Cut Salt Water @ 19,300 P.P.M.
 (REFACTOMETER)
 Recovered Feet of
 Recovered Feet of

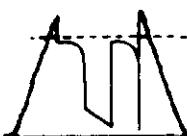
Gas Recovery How Measured Riser size:

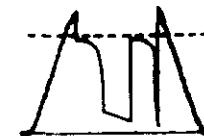
| | | | | | |
|------|---------|----------------|--------------|---|---------|
| mins | Temp. F | Press Rdg. psi | Orifice Size | = | MCF/Day |
| mins | Temp. F | Press Rdg. psi | Orifice Size | = | MCF/Day |
| mins | Temp. F | Press Rdg. psi | Orifice Size | = | MCF/Day |
| mins | Temp. F | Press Rdg. psi | Orifice Size | = | MCF/Day |
| mins | Temp. F | Press Rdg. psi | Orifice Size | = | MCF/Day |
| mins | Temp. F | Press Rdg. psi | Orifice Size | = | MCF/Day |

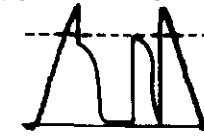
Bleed Off Time for Drill Pipe

REMARKS Good initial air blow on preflow. Strong air blow on initial flow decreasing to nil in 25 min. Remaining dead during test.
 Drained sample on lease.

| | | |
|-----------------|--|-----------------------|
| | 45 LANDING SUB | |
| | 45 CHAMBER | |
| | 45 TOOL OR P.O. SUB | 1.10 |
| | CO SUB | 1.00 |
| | SHUT IN TOOL | 5.20 |
| | R.F.S. No. 55 | 3.30 |
| | R.F.S. No. | |
| | HYDRAULIC TOOL | 7.10 |
| | JARS | 5.30 |
| | RECORDER No. | DEPTH |
| | RECORDER No. | DEPTH |
| | SAFETY JOINT | 1.70 |
| | BY PASS SUB | |
| 1. PACKER DEPTH | 2394 | |
| | PACKER | 6.00 |
| 2. PACKER DEPTH | 2400 | |
| | PACKER | 5.00 |
| | ANCHOR-SPECIFY | 1.00 |
| | Perfs. | 10.00 |
| | BLANK OFF OR BY PASS SUB | |
| | RECORDER No. 2843 | 5.00 DEPTH 2411 |
| | | 15.00 |
| 3. PACKER DEPTH | | |
| | PACKER | |
| 4. PACKER DEPTH | | |
| | PACKER | |
| | ANCHOR-SPECIFY | |
| | RECORDER No. 2660 | 5.00 DEPTH 2431 |
| | Drill Collar | 118.00 |
| | Perfs. | 11.00 |
| TOTAL DEPTH | 2568 | |
| | BULLNOSE | 2.50 |
| | DST CHARTS FOR COMPARATIVE VISUAL ANALYSIS | |
| | | TOTAL TAN PIPE 167.50 |
| | | TOTAL TEST TOOL 85.20 |


 HIGH PERMEABILITY
 STRONG DAMAGE EFFECT

 HIGH PERMEABILITY
 NO DAMAGE EFFECT

 MEDIUM PERMEABILITY
 STRONG DAMAGE EFFECT

 MEDIUM PERMEABILITY
 NO DAMAGE EFFECT

 LOW PERMEABILITY
 STRONG DAMAGE EFFECT

 LOW PERMEABILITY
 NO DAMAGE EFFECT



DST PRESSURE INCREMENTS

Recorder No. 2843

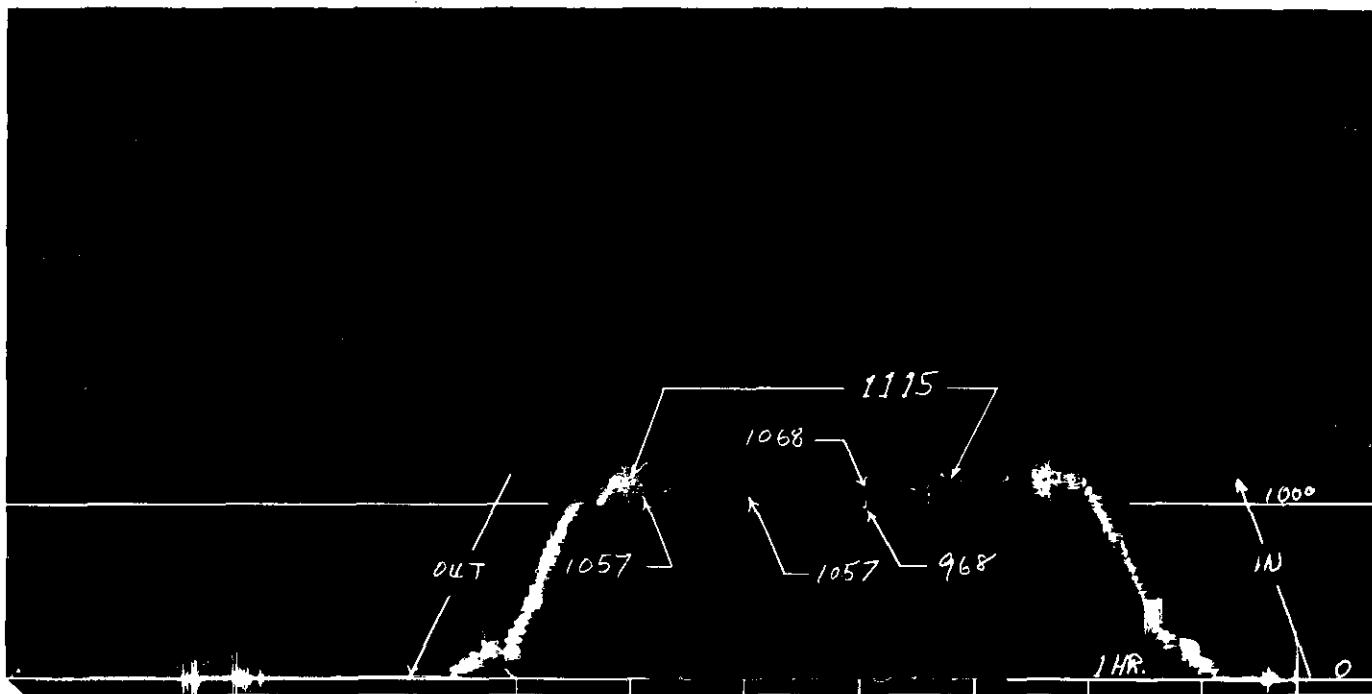
Depth 2411

| Point | INITIAL CIP | | | | FINAL CIP | | | |
|-------|-----------------|-------|------------|------|-----------------|-------|------------|------|
| | Time Doff. " | T + 0 | T + 0 0 | PSIG | Time Doff. " | T + 0 | T + 0 0 | PSIG |
| 1 | 0 | | | 1144 | 0 | | | 1057 |
| 2 | 5 | | | 1071 | 5 | | | 1057 |
| 3 | 10 | | | 1071 | 10 | | | 1057 |
| 4 | 15 | | | 1071 | 15 | | | 1057 |
| 5 | 20 | | | 1069 | 20 | | | 1057 |
| 6 | 25 | | | 1068 | 25 | | | 1057 |
| 7 | 30 | | | 1068 | 30 | | | 1057 |
| 8 | 31 | | | 1068 | 35 | | | 1057 |
| 9 | | | | | 40 | | | 1057 |
| 10 | | | | | 45 | | | 1057 |
| 11 | | | | | 50 | | | 1057 |
| 12 | | | | | 55 | | | 1057 |
| 13 | | | | | 60 | | | 1057 |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
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| 19 | | | | | | | | |
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| 23 | | | | | | | | |
| 24 | | | | | | | | |

SINCLAIR WHITEFISH RIVER K-76

Ins. Rec. No. 2843

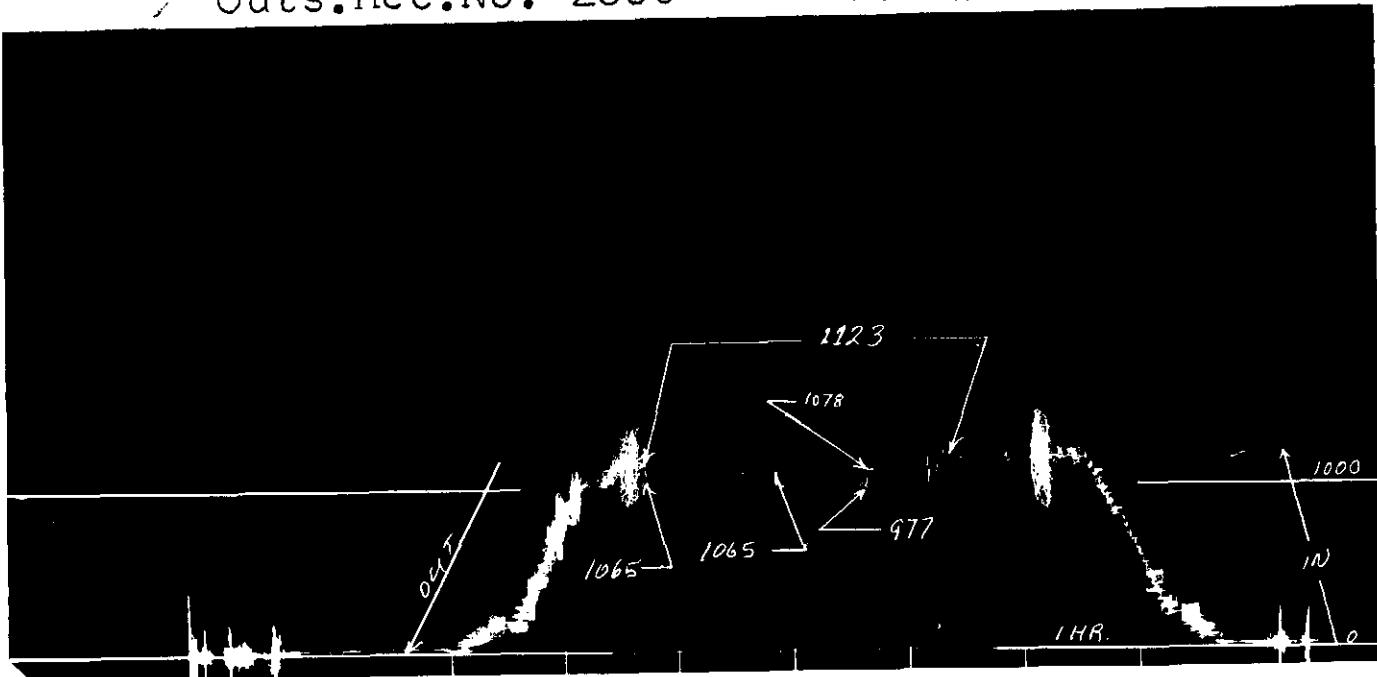
Test # 1



SINCLAIR WHITEFISH RIVER K-76

Outs. Rec. No. 2660

Test # 1





DRILL-STEM TEST DATA

| | | | |
|-------------|--------------------------|-------------|-----------------|
| Well Name | SINCLAIR WHITEFISH RIVER | Test No | 2 |
| Well Number | K76 | Zone Tested | BEAR RIVER ROCK |
| Company | NABORS DRILLING LTD. | Interval | 2930-3050 |
| Comp Rep | M. MARTINOFF | Tester | A. LOEWEN |

Type of Test By Pass Straddle RFS Tool No 5

Preflow 0 mins ISI 41 mins Flow 61 mins FSI 01 mins

| Specify Inside or Outside | Ins REC No 2600 6400 RANGE 12 HR CLOCK | Outs REC No 5041 3500 RANGE 12 HR CLOCK | REC No |
|---------------------------|---|--|----------------|
| DEPTH | 2817 | 2861 | RANGE HR CLOCK |
| Initial Hydro Mud Press | 1366 | 1389 | |
| Initial Shut-In Press | 1253 | 1268 | |
| Initial Flow Press | 871 | 990 | |
| Final Flow Press | 1245 | 1268 | |
| Final Shut-In Press | 1253 | 1269 | |
| Final Hydro Mud Press | 1366 | 1389 | |

Mud Drop 14 Mud Weight 9.2
Viscosity 130 Temperature °F 130 Net Pay Tested 2201
Top Packer Depth 2830 Bottom Packer Depth 3050 Total Depth 272
Drill Pipe Size 3 1/2" Wt. 13.3 Drill Collar I.D. 2 7/8" Ft. Run 600
Surface Choke Size Nil Bottom Choke Size 1 1/2" Main Hole Size 8 3/4"
Anchor Size 3 1/2" OD Rat Hole Size Nil Feet of Rat Hole Nil
Cushion Amount Nil Type N.A. Rubber Size 7 5/8"

Fluid Recovery Total Feet 2560
Recovered 180 Feet of DRLG. Mud
Recovered 40 Feet of Mud Cut Salt Water
Recovered 600 Feet of Salt Water (slight mud cut)
Recovered 1180 Feet of Salt Water, 41,000 PPM
Recovered Feet of

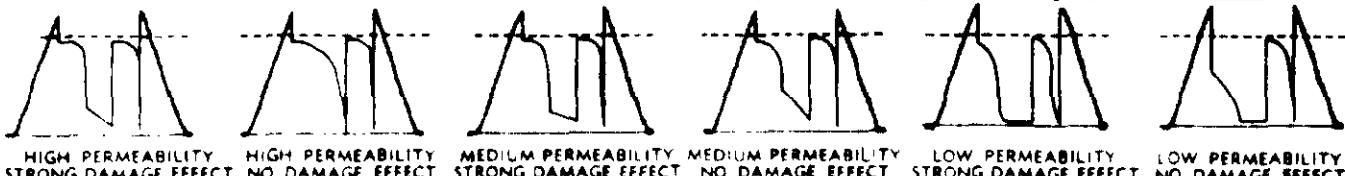
Gas Recovery How Measured Riser size:

mins Temp. F Press Rdg. psi Orifice Size = MCF/Day
mins Temp. F Press Rdg. psi Orifice Size = MCF/Day
mins Temp. F Press Rdg. psi Orifice Size = MCF/Day
mins Temp. F Press Rdg. psi Orifice Size = MCF/Day
mins Temp. F Press Rdg. psi Orifice Size = MCF/Day
mins Temp. F Press Rdg. psi Orifice Size = MCF/Day

Blow Off Time for Drill Pipe

REMARKS Fairly good air blow on initial flow (preflow). Fairly good air blow on flow period reducing to no blow in 15 min.

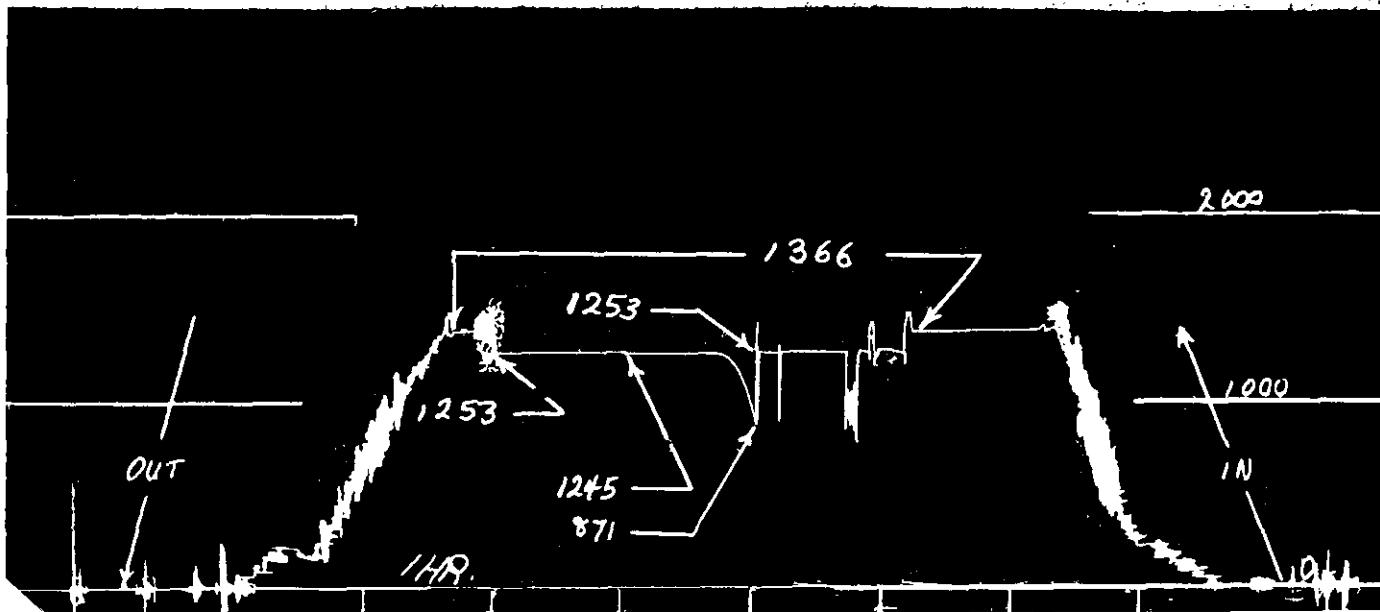
| | | | |
|----------------------|--|---------|---------------------------------|
| | 45 LANDING SUB | | |
| | 45 CHAMBER | | |
| | 3500 ft. O. SUB | 1.00 | |
| | CO SUB | 2.20 | |
| | SHUT IN TOOL | 4.85 | |
| | R.F.S. No. 55 | 2.30 | |
| | R.F.S. No. Sub | 1.00 | |
| | HYDRAULIC TOOL | 7.10 | |
| | JARS Sutliff Hyp. | 6.60 | |
| | RECORDER No. 2660-Ins | 5.00 | DEPTH 2817 |
| | SAFETY JOINT Bowen | 1.50 | |
| | BY PASS SUB | 1.00 | |
| 1. PACKER DEPTH | PACKER | | |
| 2. PACKER DEPTH 2830 | PACKER | 5.00 | TOTAL TOOL ABOVE INTERVAL 37.55 |
| | ANCHOR-SPECIFY | 1.00 | |
| | Perfs | 29.00 | |
| | DRILLING DEFOR. BY PASS SUB | 1.00 | |
| | RECORDER No. 5041-Outs | 1.00 | DEPTH 2861 |
| | c/o | 1.00 | |
| | 6 1/4" Drill Collars | 181.00 | |
| | c/o Subs | 4.00 | |
| 3. PACKER DEPTH 3050 | PACKER | 3.00 | TOTAL INTERVAL 220.00 |
| | | 3.00 | |
| 4. PACKER DEPTH | PACKER | | |
| | ANCHOR-SPECIFY | | |
| | | | |
| | RECORDER No. | | DEPTH |
| | Perfs | 4.00 | |
| | 3 1/2" Drill Pipe | 2210.20 | |
| | Perfs | 2.00 | |
| TOTAL DEPTH 3272 | BULLNOSE | 2.80 | TOTAL TAIL PIPE 2222.00 |
| | DST CHARTS FOR COMPARATIVE VISUAL ANALYSIS | | TOTAL TEST TOOL 88.35 |



SINCLAIR WHITEFISH RIVER, K76

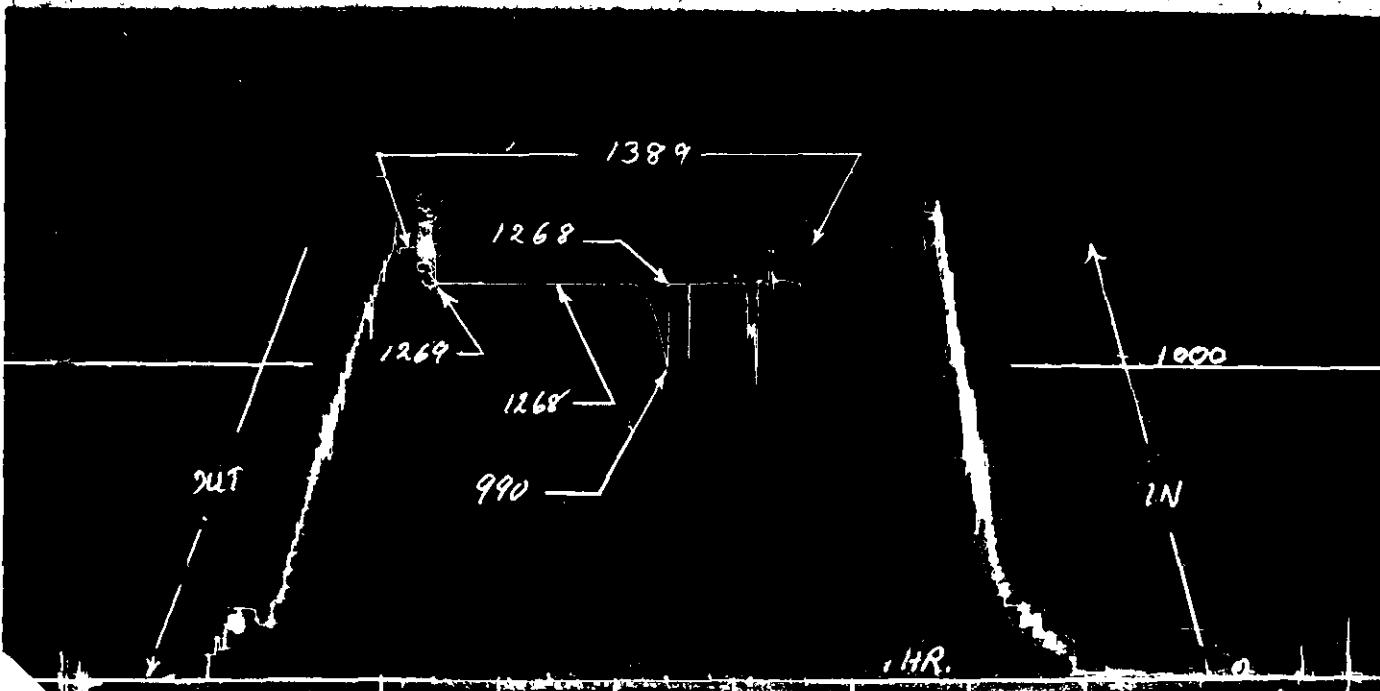
Ins. Rec. No. 2660

Test # 2



SINCLAIR WHITEFISH RIVER K76

Outs. Rec. No. 5041 Test # 2



Cretaceous Assemblages (Foraminifera and associated microfaunas)
by T.P. Chamney and B. Johnson (Atlantic Richfield Canada, Limited)

Sinclair Whitefish River K-76
65°35'32"N., 124°29'16"W., figure 1a, loc. 12

Depth 380 ft., cuttings,
GSC loc. C-12204

wood fragments
vertebrate (fish) bone
siliceous spheres
gastropods
Haplophragmoides sp.
H. cf. H. spissus Stelck and
Wall
spore cases, including barrel-shaped spore
case of *Microcarppolithes* type
age: Both *Haplophragmoides spissus*
(late middle Albian) and
Microcarppolithes are of Albian
age. Lithological data suggest
occurrence of Pleistocene deposits
at this horizon; these include
reworked Cretaceous material.

Depth 1,360 ft., cutting
GSC loc. C-12211

D. Foster

64

Report No. 14 TPC Gen. 1971.

K-76

Report on nineteen subsurface samples from Whitefish River No. K76, Sinclair, Great Bear Lake Map-area, District of Mackenzie, collected and prepared by Atlantic Richfield Canada Limited (N.T.S. 96F).

The relevant parts of any manuscript prepared for publication that paraphrase or quote from this report should be referred to the Western Paleontology Section, Calgary, for possible revision.

NOTE: Identifications, paleoecology and provisional age assignments were made jointly by B. Johnson, Atlantic Richfield Canada Limited, and T.P. Chamney, Institute of Sedimentary and Petroleum Geology, Calgary.

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 380 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample contains Foraminifera, spore cases, wood fragments, and gastropods, a piece of vertebrate (fish) bone and siliceous spheres.</p> <p>Only two agglutinated Foraminifera were found in this sample:</p> <p><i>Haplophragmoides</i> sp.</p> <p><i>Haplophragmoides</i> cf. <i>spissus</i> Stelck and Wall</p> <p>A barrel shaped spore case of the <i>Microcarppolithes</i> type was also found.</p> <p>age: Both <i>Haplophragmoides spissus</i> (Upper Middle Albian) and <i>Microcarppolithes</i> sp. are of Albian age.</p> <p>The lithological data suggests at this horizon Pleistocene deposits exist, and that the Pleistocene deposits include reworked Cretaceous material.</p> | C-12204 |
| 850 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample contains only an amber spore case and a badly corroded unidentifiable ostracod (with a straight hinge).</p> <p>age: Not determinable from biota.</p> <p>Lithological data suggests that Pleistocene deposits exist at this horizon, in which case the biota found may well be reworked.</p> | C-12205 |
| 960 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>One badly preserved unidentifiable, <i>Haplophragmoides</i> was found with and "Inoceramus" calcite prism.</p> <p>age: <i>Inoceramus</i> is a Jurassic and Cretaceous indicator. Lithological data suggests Pleistocene deposits exist at this horizon. In which case the biota found may well be of reworked Mesozoic material.</p> | C-12206 |

**RESTRICTED TO
STAFF USE ONLY**

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 990 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Poor recovery consisting of one agglutinated Foraminifera, two indistinguishable (?) ostracods, a radiolarian and a piece of pyritised burrow infill.</p> <p>The agglutinated Foraminifera is badly preserved but appears to be: <i>Miliammina</i> aff. <i>bisobscura</i> Stelck and Wall</p> <p>The radiolarian is discoid and preserved in pyrite</p> <p>age: <i>Miliammina biscobsura</i> is a Cretaceous form.</p> <p>environment: The recovery is so poor that interpretations are hazardous. The presence of a radiolarian signifies this area must have had access to open marine conditions. <i>Miliammina</i> tends to be a bottom dwelling form.</p> | C-12207 |
| 1100 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>No fauna - just a single unidentified megaspore was found with siliceous spheres, -- organic (?).</p> <p>age: Unknown. Lithological data suggests at this horizon Cretaceous deposits are present.</p> | C-12208 |
| 1180 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Iron stained <i>Inoceramus</i> calcite prisms and fragments from the nacreous layer of a pelecypod are found with a pyritised (?) <i>Haplophragmoides</i> sp. and pyritised wood fragments.</p> <p>age: "Inoceramus" fragments are of Mesozoic Age, and in the N.W.T. are usually indicative of Cretaceous.</p> <p>environment: <i>Inoceramus</i> is a marine pelecypod, the high iron content in the water indicated by the shell staining and pyritisation would suggest poor circulation, probably in the close proximity of a land mass.</p> | C-12209 |
| 1260 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Abundance of <i>Inoceramus</i> prisms are found with agglutinated Foraminifera pyritised wood fragments and plant rootlets.</p> <p>The agglutinated Foraminifera are fine grained and of both the simple and complex types.</p> <p><i>Haplophragmoides</i> ex gr. <i>gigas minor</i> Cushman</p> <p><i>Haplophragmoides</i> sp.</p> <p><i>Reophax</i> sp.</p> | C-12210 |

Stratigraphy & Footage

Locality, Microfossils & Age

GSC Loc. No.

Minerals: The sample contained cubic "salt hoppers" replaced by calcite, and a milky white botrioidal form of selenite as a pseudomorph of certain Tertiary rotalids, having a flattened/concave pseudoventral side and a convex pseudodorsal (spiral) surface.

age: *Inoceramus* is characteristic of Cretaceous strata in N.W.T. *Haplophragmoides gigas minor* is a Lower Cretaceous form Middle/Upper Albian.

environment: *Inoceramus* is indicative of marine conditions. The "salt hoppers" and pyrite suggests that there were stagnant conditions in the bottom waters, although the *Haplophragmoides* specimens present indicate better circulation probably existed at shallower depths.

1360 feet

Sinclair Whitefish River
65°35'32"N., 124°29'16"W.

C-12211

Inoceramus prisms, agglutinated Foraminifera and megaspores are present in this sample. The agglutinated Foraminifera include fine and coarse, simple and complex types. The most prominent single group is the dwarf *Haplophragmoides*. spp. The following were found:

Haplophragmoides sp. (at least 3 species)

Ammobaculites sp.

Hyperammina sp.

Trochammina sp.

Gaudryina sp. (short stubby)

Verneuilinoides sp.

Bathysiphon cf. *brosgei* Tappan

(?) *Reophax*

(?) *Verneuilina*

Minerals: There is a flood of glauconite and a few pyrite nodules.

age: *Gaudryina* sp. (short stubby) is a Middle Albian form. *Bathysiphon brosgei* is Albian

environment: The high proportion of dwarf *Haplophragmoides* species and the tubular *Hyperammina* sp. are indicative of restricted marine environment (*Inoceramus* fragments).

Pyrite is associated with restricted marine conditions.

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|--|---------------------|
| 1560 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p><i>Inoceramus</i> prisms, agglutinated Foraminifera and wood fragments are present in this sample. The agglutinated Foraminifera include fine and coarse, simple and complex types. Dwarf <i>Haplophragmoides</i> are the most prominent forms. The following forms were found:</p> <p><i>Reophax</i> sp. <i>Textularia</i> sp. <i>Haplophragmoides</i> ex gr. <i>spissus</i> Stelck and Wall (?) <i>Trochammina</i> sp. <i>Ammobaculites</i> sp. (?) <i>Proteonina</i> sp. <i>Haplophragmoides</i> aff. <i>linki</i> Nauss <i>Haplophragmoides</i> cf. <i>globosa</i> Lozo <i>Haplophragmoides</i> cf. sp. 23 Chamney ex gr. <i>H. multiplus</i> Stelck and Wall <i>Trochamminoides</i> (?) n. sp. Minerals: Pyrite, but no glauconite age: Cretaceous environment: The high proportion of dwarf <i>Haplophragmoides</i> species are indicative of restricted marine environment, (<i>Inoceramus</i> fragments), probably shallow.</p> | C-12212 |
| 1660 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Agglutinated Foraminifera, pyritised organic fragments (wood) and a spore were found in this sample. The agglutinated Foraminifera are of both complex and simple types, and are coarser than those of Sinclair Whitefish River samples 1360 feet and 1560 feet. The following forms were found in the sample:</p> <p>(?) <i>Trochammina</i> sp. <i>Ammobaculites fragmentarius</i> Cushman <i>Haplophragmoides</i> sp. (at least 2 species) <i>Gaudryina</i> sp. (?) <i>Dorothia</i> sp. <i>Gaudryina</i> sp. (short stubby) <i>Reophax</i> aff. <i>subfusiformis</i> Earland <i>Verneuilina</i> sp. <i>Ammodiscus</i> cf. <i>mangusi</i> Tappan age: <i>Gaudryina</i> sp. (short stubby) is of Middle Albian Age. The <i>Gaudryina</i> specimens are sharply tricarinate, indicative of older forms of the species, (also indicative of Middle Albian). environment: The abundance and variety of both simple and complex agglutinated Foraminifera suggests the sample was formed in a marine environment, probably near shore and close to a good food supply. The lack of <i>Inoceramus</i> prisms and wood fragments is surprising, but may be attributable to tidal current winnowing.</p> | C-12213 |

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 1750 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample contains fine and coarse grained Foraminifera including both the simple and complex types, though the latter are more numerous, and some unidentifiable (?) organic material replaced by pyrite.</p> <p>The faunal list includes:</p> <p><i>Reophax</i> aff. <i>troyeri</i> Tappan <i>Reophax</i> sp. <i>Proteonina</i> sp. <i>Bathysiphon</i> sp. <i>Ammobaculites</i> aff. <i>wenonahae</i> Tappan <i>Ammobaculites fragmentarius</i> Cushman (stubby form) <i>Gaudryina</i> aff. <i>subcretecea</i> Cushman (?) <i>Trochammina</i> sp. <i>Glomospirella</i> sp. <i>Spirolectammina</i> aff. <i>ammovitrea</i> Tappan <i>Haplophragmoides</i> sp. 95 Chamney ex gr. <i>H. spissus</i> Stelck and Wall <i>Haplophragmoides</i> aff. <i>laeusleri</i> Lloyd <i>Haplophragmoides</i> ? n. sp. <i>Haplophragmoides</i> aff. <i>neocomianus</i> Chapman <i>Haplophragmoides</i> ? n. sp. ex gr. <i>H. globosa</i> Lozo age: <i>Ammobaculites fragmentarius</i> is an indicator of Middle/Upper Albian times. environment: The abundance of forms, especially the fine grained complex, arenaceous Foraminifera indicates a marine environment rich in nutrients (good food supply) though the dwarf nature of the <i>Haplophragmoides</i> and <i>Ammobaculites</i> present, suggest some degree of restriction.</p> | C-12214 |
| 1940 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample is made up predominantly of agglutinated Foraminifera and pyritised organic fragments. There is also radiolaria, megaspores, vertebrate teeth and vertebrate bone fragments.</p> <p>The agglutinated Foraminifera consist mainly of coarse grained simple forms and fine grained complex types, and the sample includes the following forms:</p> <p><i>Ammobaculites fragmentarius</i> Cushman (?) <i>Verneuilinoides</i> sp. <i>Gaudryina</i> sp. (short stubby) <i>Reophax</i> sp. (at least 3 species) <i>Haplophragmoides paralius</i> Skolnick (?) <i>Saccammina lathrami</i> Tappan <i>Gathysiphon brosgei</i> Tappan <i>Haplophragmoides</i> ex gr. <i>H. gigas minor</i> Cushman <i>Haplophragmoides</i> ex gr. <i>collyra</i> Nauss</p> | C-12215 |

Stratigraphy & Footage

Locality, Microfossils & Age

GSC Loc. No.

The radiolaria found is *Dictyometra* sp. 9
Chamney - characteristically found preserved
in pyrite.

age: The first appearance of *Dictyometra*
sp. 9. (Middle Albian) in the well
samples and the presence of
Ammobaculites fragmentarius and (?)
Saccammina lathrami is a good indica-
tion that this sample is of Middle
Albian Age.

environment: The presence of radiolaria in
the sample means this area must have
had access to open marine conditions.
The variety and number of Foraminifera
also indicated marine conditions. There
has been a good deal of pyritisation of
wood fragments, plant rootlets and faecal
pellets, this combined with the very coarse
grained nature of the agglutinated forms
suggests the bottom waters were almost cer-
tainly more restricted than the surface waters.
The presence of wood and spores suggests a
land mass was fairly close.

2130 feet

Sinclair Whitefish River
65°35'32"N., 124°29'16"W

C-12216

The sample contains both simple and complex
arenaceous Foraminifera.

The fauna includes the following forms:

Reophax sp.

Bathysiphon sp.

Ammobaculites cf. *wenonahae* Tappan

Gaudryina sp. (short stubby)

Verneuilina sp.

Trochammina aff. *rainwateri* Cushman and Applin

Lituotuba ? n. sp.

Haplophragmoides aff. *inflata* Gauger

Haplophragmoides aff. *spissus* Stelck and Wall

Trochamminoidea sp. 4A minute Chamney

age: *Gaudryina* sp. (short stubby) is a Middle Albian form as is
Trochammina rainwateri and *Ammobaculites wenonahae*

environment: The abundance and variety of forms
indicates open marine conditions. The coiled
nature of the *Lituotuba* suggests the waters were
active, this may indicate this area was near the
mouth of a large river which brought in good food
supplies and kept the waters moving.

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 2310 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample is rich in both simple and complex arenaceous Foraminifera, wood fragments and pyritised? organic material.</p> <p>The forms found include the following:</p> <p><i>Reophax cf. troyeri</i> Tappan <i>Reophax</i> sp. <i>Ammobaculites fragmentarius</i> Tappan (stubby forms) <i>Saccammina cf. lathrami</i> Tappan <i>Trochammina cf. rutherfordi</i> Stelck and Wall (?) <i>Trochammina rainwateri</i> Cushman and Applin <i>Gaudryina</i> sp. (?) <i>Hippocrepina</i> sp. <i>Verneuilina</i> sp. <i>Glomospirella</i> sp. <i>Psamminopelta bowsheri</i> Tappan</p> <p>Minerals: Pyrite and orange/red metallic mineral (also found in S.W.R. 2570, may well be an alloy - from the drilling equipment).</p> <p>age: <i>Ammobaculites fragmentarius</i>, <i>Psamminopelta bowsheri</i> and <i>Trochammina rainwateri</i> are Upper and Middle Albian forms. <i>Trochammina rutherfordi</i> is the ancestral form of <i>Trochammina ribstonensis</i>, Wickenden. So it seems likely this sample is early Middle Albian or Late Lower Albian.</p> <p>environment: The abundance and number of forms indicates marine conditions, some dwarf forms exist - so the bottom waters may well have been more restricted. Wood fragments suggest land may have been close (probably with a river maintaining a good food supply in this area).</p> | C-12217 |
| 2550 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample consists of agglutinated Foraminifera and a large amount of amorphous pyrite. The agglutinated Foraminifera found appear to be a poorly preserved dwarf fauna.</p> <p><i>Gaudryina nanushukensis</i> Tappan (?) <i>Hippocrepina</i> sp. <i>Haplophragmoides</i> ex gr. <i>gigas minor</i> Nauss <i>Haplophragmoides</i> aff. <i>platus</i> Loeblich <i>Haplophragmoides</i> <i>multiplus</i> Stelck and Wall <i>Textularia</i> aff. <i>T. gravenor</i> Stelck and Wall aff. <i>T. topagorukensis</i> Tappan (?) <i>Verneuilinoides</i> sp. (?) <i>Miliammina</i> sp. (?) <i>Trochammina</i> sp. <i>Bathysiphon</i> sp.</p> | C-12218 |

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|--|---------------------|
| | <p>age: <i>Gaudryina nanushukensis</i> is a Lower Cretaceous, Albian form. The tenuated and rugged (dwarf) forms of <i>Gaudryina</i> and (?) <i>Hippocrepina</i> are more indicative of the older forms of these two genera. As there is already at least 1200 feet of Middle Albian above this core level, it seems probable that this is either a Lower Middle Albian or Lower Albian sample.</p> <p>environment: The dwarf nature of the Foraminifera and the large quantities of amorphous pyrite suggest this deposit formed under toxic conditions. At this time there does not appear to have been any freshening of the sea waters from fluvial or deltaic sources (total lack of wood fragments but with megaspores).</p> | |
| 2570 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This is a poor microfossil sample containing only an <i>Inoceramus</i> prism (may be contamination), wood fragments, a single <i>Haplophragmoides</i> (species unidentifiable) and a pyritised sphere showing faint traces of suturing.</p> <p>Minerals: Pyrite and a "bornite-like" mineral</p> <p>age: Indeterminate. But from the stratigraphic position in the well it could possibly be assigned to the Middle or Lower Albian.</p> <p>environment: May have been very restricted near shore.</p> | C-12219 |
| 2590 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>In this sample were complex arenaceous Foraminifera, carbonaceous fragments and pyritised organic material (worm tubes).</p> <p>The faunal list includes the following:</p> <p><i>Trochammina</i> sp.</p> <p><i>Haplophragmoides</i> sp. 95 Chamney</p> <p><i>Haplophragmoides coahuilaensis</i> Conkin and Conkin</p> <p><i>Haplophragmoides</i> aff. <i>duoflatis</i> Chamney</p> <p><i>Haplophragmoides gigas minor</i> Nauss</p> <p>Minerals: Pyrite</p> <p>age: <i>Haplophragmoides gigas minor</i> and <i>Haplophragmoides coahuilaensis</i> are Lower Cretaceous forms, and the position of the sample in the well indicates a Lower Albian Age.</p> | C-12220 |

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|--|---------------------|
| | environment: Marine, probably restricted (due to pyrite and lack of variety of generic types). | |
| 2610 feet | Sinclair Whitefish River 65°35'32"N., 124°29'16"W. This sample contains simple and complex, fine grained arenaceous Foraminifera and pyritised faecal pellets. The following forms were found: <i>Haplophragmoides</i> sp. <i>Haplophragmoides coahulaensis</i> Conkin and Conkin age: <i>Haplophragmoides coahulaensis</i> is a Lower Cretaceous, form, from the position of the sample in the column an age of Lower Albian appears most probable. environment: Marine, probably restricted - few forms, and those which are found are dwarf forms. | C-12221 |
| 2620 feet | Sinclair Whitefish River 65°35'32"N., 124°29'16"W. This sample contains agglutinated Foraminifera, vertebrate bone fragments, pyritised wood fragments and worm tubes. The following fauna was found: <i>Haplophragmoides</i> ex gr. <i>gigas minor</i> Nauss (?) <i>Reophas</i> sp. <i>Ammobaculites</i> sp. age: Lower Cretaceous. The specimens are all too badly preserved and deformed for a more accurate dating. From the position in the well the sample is probably of Lower Albian Age. environment: There is a suggestion that the sample represents restricted marine conditions probably near land. | C-12222 |
| 2660 feet | Sinclair Whitefish River 65°35'32"N., 124°29'16"W. This sample contains a perplexing mixture of complex arenaceous Foraminifera, brachiopod spines, protistid spheres, vertebrate bone fragments, ? conodont teeth and pyritised wood fragments. The fauna list includes the following: <i>Haplophragmoides</i> aff. <i>neocomianus</i> var. <i>scalloensis</i> Chapman (?) <i>Tritaxis</i> sp. (?) <i>Gaudryina</i> sp. (?) <i>Chara</i> (?) <i>Conodont</i> (?) <i>Productid</i> spines Minerals: Pyrite | C-12223 |

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age: The sample is a mixture of Cretaceous and Paleozoic forms (probably Devonian). The Cretaceous material may be contamination. environment: The basal Cretaceous was probably restricted marine to brackish. The Devonian sample appears to represent marine conditions, close to land.

2690 feet

Sinclair Whitefish River
65°35'32"N., 124°29'16"W.

C-12224

The sample contained only a single megaspore, a piece of pyrite infill, and an arenaceous Foraminifera - *Ammobaculoides* sp.

age: *Ammobaculoides* is a Cretaceous form. On lithological data Devonian is considered to exist at this horizon, on the basis of data found higher in the section. The *Ammobaculoides* specimen is almost certainly contamination in the sample.

environment: indeterminate



T.P. Chamney.

Western Paleontology Section,
Institute of Sedimentary and Petroleum Geology,
Calgary, November 25, 1971.

D. Foster

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Report No. 14 TPC Gen. 1971.

K-76

Report on nineteen subsurface samples from Whitefish River No. K76, Sinclair, Great Bear Lake Map-area, District of Mackenzie, collected and prepared by Atlantic Richfield Canada Limited (N.T.S. 96F).

The relevant parts of any manuscript prepared for publication that paraphrase or quote from this report should be referred to the Western Paleontology Section, Calgary, for possible revision.

NOTE: Identifications, paleoecology and provisional age assignments were made jointly by B. Johnson, Atlantic Richfield Canada Limited, and T.P. Chamney, Institute of Sedimentary and Petroleum Geology, Calgary.

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 380 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample contains Foraminifera, spore cases, wood fragments, and gastropods, a piece of vertebrate (fish) bone and siliceous spheres.</p> <p>Only two agglutinated Foraminifera were found in this sample:</p> <p><i>Haplophragmoides</i> sp.</p> <p><i>Haplophragmoides</i> cf. <i>spissus</i> Stelck and Wall</p> <p>A barrel shaped spore case of the <i>Microcarppolithes</i> type was also found.</p> <p>age: Both <i>Haplophragmoides spissus</i> (Upper Middle Albian) and <i>Microcarppolithes</i> sp. are of Albian age.</p> <p>The lithological data suggests at this horizon Pleistocene deposits exist, and that the Pleistocene deposits include reworked Cretaceous material.</p> | C-12204 |
| 850 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample contains only an amber spore case and a badly corroded unidentifiable ostracod (with a straight hinge).</p> <p>age: Not determinable from biota.</p> <p>Lithological data suggests that Pleistocene deposits exist at this horizon, in which case the biota found may well be reworked.</p> | C-12205 |
| 960 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>One badly preserved unidentifiable, <i>Haplophragmoides</i> was found with and "Inoceramus" calcite prism.</p> <p>age: <i>Inoceramus</i> is a Jurassic and Cretaceous indicator. Lithological data suggests Pleistocene deposits exist at this horizon. In which case the biota found may well be of reworked Mesozoic material.</p> | C-12206 |

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| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 990 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Poor recovery consisting of one agglutinated Foraminifera, two indistinguishable (?) ostracods, a radiolarian and a piece of pyritised burrow infill.</p> <p>The agglutinated Foraminifera is badly preserved but appears to be: <i>Miliammina</i> aff. <i>bisobscura</i> Stelck and Wall</p> <p>The radiolarian is discoid and preserved in pyrite</p> <p>age: <i>Miliammina biscobsura</i> is a Cretaceous form.</p> <p>environment: The recovery is so poor that interpretations are hazardous. The presence of a radiolarian signifies this area must have had access to open marine conditions. <i>Miliammina</i> tends to be a bottom dwelling form.</p> | C-12207 |
| 1100 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>No fauna - just a single unidentified megaspore was found with siliceous spheres, -- organic (?).</p> <p>age: Unknown. Lithological data suggests at this horizon Cretaceous deposits are present.</p> | C-12208 |
| 1180 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Iron stained <i>Inoceramus</i> calcite prisms and fragments from the nacreous layer of a pelecypod are found with a pyritised (?) <i>Haplophragmoides</i> sp. and pyritised wood fragments.</p> <p>age: "Inoceramus" fragments are of Mesozoic Age, and in the N.W.T. are usually indicative of Cretaceous.</p> <p>environment: <i>Inoceramus</i> is a marine pelecypod, the high iron content in the water indicated by the shell staining and pyritisation would suggest poor circulation, probably in the close proximity of a land mass.</p> | C-12209 |
| 1260 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Abundance of <i>Inoceramus</i> prisms are found with agglutinated Foraminifera pyritised wood fragments and plant rootlets.</p> <p>The agglutinated Foraminifera are fine grained and of both the simple and complex types.</p> <p><i>Haplophragmoides</i> ex gr. <i>gigas minor</i> Cushman</p> <p><i>Haplophragmoides</i> sp.</p> <p><i>Reophax</i> sp.</p> | C-12210 |

Stratigraphy & Footage

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Minerals: The sample contained cubic "salt hoppers" replaced by calcite, and a milky white botrioidal form of selenite as a pseudomorph of certain Tertiary rotalids, having a flattened/concave pseudoventral side and a convex pseudodorsal (spiral) surface.

age: *Inoceramus* is characteristic of Cretaceous strata in N.W.T. *Haplophragmoides gigas minor* is a Lower Cretaceous form Middle/Upper Albian.

environment: *Inoceramus* is indicative of marine conditions. The "salt hoppers" and pyrite suggests that there were stagnant conditions in the bottom waters, although the *Haplophragmoides* specimens present indicate better circulation probably existed at shallower depths.

1360 feet

Sinclair Whitefish River
65°35'32"N., 124°29'16"W.

C-12211

Inoceramus prisms, agglutinated Foraminifera and megaspores are present in this sample. The agglutinated Foraminifera include fine and coarse, simple and complex types. The most prominent single group is the dwarf *Haplophragmoides*. spp. The following were found:

Haplophragmoides sp. (at least 3 species)

Ammobaculites sp.

Hyperammina sp.

Trochammina sp.

Gaudryina sp. (short stubby)

Verneuilinoides sp.

Bathysiphon cf. *brosgei* Tappan

(?) *Reophax*

(?) *Verneuilina*

Minerals: There is a flood of glauconite and a few pyrite nodules.

age: *Gaudryina* sp. (short stubby) is a Middle Albian form. *Bathysiphon brosgei* is Albian

environment: The high proportion of dwarf *Haplophragmoides* species and the tubular *Hyperammina* sp. are indicative of restricted marine environment (*Inoceramus* fragments).

Pyrite is associated with restricted marine conditions.

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|--|---------------------|
| 1560 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p><i>Inoceramus</i> prisms, agglutinated Foraminifera and wood fragments are present in this sample. The agglutinated Foraminifera include fine and coarse, simple and complex types. Dwarf <i>Haplophragmoides</i> are the most prominent forms. The following forms were found:</p> <p><i>Reophax</i> sp. <i>Textularia</i> sp. <i>Haplophragmoides</i> ex gr. <i>spissus</i> Stelck and Wall (?) <i>Trochammina</i> sp. <i>Ammobaculites</i> sp. (?) <i>Proteonina</i> sp. <i>Haplophragmoides</i> aff. <i>linki</i> Nauss <i>Haplophragmoides</i> cf. <i>globosa</i> Lozo <i>Haplophragmoides</i> cf. sp. 23 Chamney ex gr. <i>H. multiplus</i> Stelck and Wall <i>Trochamminoides</i> (?) n. sp. Minerals: Pyrite, but no glauconite age: Cretaceous environment: The high proportion of dwarf <i>Haplophragmoides</i> species are indicative of restricted marine environment, (<i>Inoceramus</i> fragments), probably shallow.</p> | C-12212 |
| 1660 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>Agglutinated Foraminifera, pyritised organic fragments (wood) and a spore were found in this sample. The agglutinated Foraminifera are of both complex and simple types, and are coarser than those of Sinclair Whitefish River samples 1360 feet and 1560 feet. The following forms were found in the sample:</p> <p>(?) <i>Trochammina</i> sp. <i>Ammobaculites fragmentarius</i> Cushman <i>Haplophragmoides</i> sp. (at least 2 species) <i>Gaudryina</i> sp. (?) <i>Dorothia</i> sp. <i>Gaudryina</i> sp. (short stubby) <i>Reophax</i> aff. <i>subfusiformis</i> Earland <i>Verneuilina</i> sp. <i>Ammodiscus</i> cf. <i>mangusi</i> Tappan age: <i>Gaudryina</i> sp. (short stubby) is of Middle Albian Age. The <i>Gaudryina</i> specimens are sharply tricarinate, indicative of older forms of the species, (also indicative of Middle Albian). environment: The abundance and variety of both simple and complex agglutinated Foraminifera suggests the sample was formed in a marine environment, probably near shore and close to a good food supply. The lack of <i>Inoceramus</i> prisms and wood fragments is surprising, but may be attributable to tidal current winnowing.</p> | C-12213 |

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
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| 1750 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample contains fine and coarse grained Foraminifera including both the simple and complex types, though the latter are more numerous, and some unidentifiable (?) organic material replaced by pyrite.</p> <p>The faunal list includes:</p> <p><i>Reophax</i> aff. <i>troyeri</i> Tappan <i>Reophax</i> sp. <i>Proteonina</i> sp. <i>Bathysiphon</i> sp. <i>Ammobaculites</i> aff. <i>wenonahae</i> Tappan <i>Ammobaculites fragmentarius</i> Cushman (stubby form) <i>Gaudryina</i> aff. <i>subcretecea</i> Cushman (?) <i>Trochammina</i> sp. <i>Glomospirella</i> sp. <i>Spirolectammina</i> aff. <i>ammovitrea</i> Tappan <i>Haplophragmoides</i> sp. 95 Chamney ex gr. <i>H. spissus</i> Stelck and Wall <i>Haplophragmoides</i> aff. <i>laeusleri</i> Lloyd <i>Haplophragmoides</i> ? n. sp. <i>Haplophragmoides</i> aff. <i>neocomianus</i> Chapman <i>Haplophragmoides</i> ? n. sp. ex gr. <i>H. globosa</i> Lozo age: <i>Ammobaculites fragmentarius</i> is an indicator of Middle/Upper Albian times. environment: The abundance of forms, especially the fine grained complex, arenaceous Foraminifera indicates a marine environment rich in nutrients (good food supply) though the dwarf nature of the <i>Haplophragmoides</i> and <i>Ammobaculites</i> present, suggest some degree of restriction.</p> | C-12214 |
| 1940 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample is made up predominantly of agglutinated Foraminifera and pyritised organic fragments. There is also radiolaria, megaspores, vertebrate teeth and vertebrate bone fragments.</p> <p>The agglutinated Foraminifera consist mainly of coarse grained simple forms and fine grained complex types, and the sample includes the following forms:</p> <p><i>Ammobaculites fragmentarius</i> Cushman (?) <i>Verneuilinoides</i> sp. <i>Gaudryina</i> sp. (short stubby) <i>Reophax</i> sp. (at least 3 species) <i>Haplophragmoides paralius</i> Skolnick (?) <i>Saccammina lathrami</i> Tappan <i>Gathysiphon brosgei</i> Tappan <i>Haplophragmoides</i> ex gr. <i>H. gigas minor</i> Cushman <i>Haplophragmoides</i> ex gr. <i>collyra</i> Nauss</p> | C-12215 |

Stratigraphy & Footage

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The radiolaria found is *Dictyometra* sp. 9 Chamney - characteristically found preserved in pyrite.

age: The first appearance of *Dictyometra* sp. 9. (Middle Albian) in the well samples and the presence of *Ammobaculites fragmentarius* and (?) *Saccammina lathrami* is a good indication that this sample is of Middle Albian Age.

environment: The presence of radiolaria in the sample means this area must have had access to open marine conditions. The variety and number of Foraminifera also indicated marine conditions. There has been a good deal of pyritisation of wood fragments, plant rootlets and faecal pellets, this combined with the very coarse grained nature of the agglutinated forms suggests the bottom waters were almost certainly more restricted than the surface waters. The presence of wood and spores suggests a land mass was fairly close.

2130 feet

Sinclair Whitefish River
65°35'32"N., 124°29'16"W

C-12216

The sample contains both simple and complex arenaceous Foraminifera.

The fauna includes the following forms:

Reophax sp.

Bathysiphon sp.

Ammobaculites cf. *wenonahae* Tappan

Gaudryina sp. (short stubby)

Verneuilina sp.

Trochammina aff. *rainwateri* Cushman and Applin

Lituotuba ? n. sp.

Haplophragmoides aff. *inflata* Gauger

Haplophragmoides aff. *spissus* Stelck and Wall

Trochamminoidea sp. 4A minute Chamney

age: *Gaudryina* sp. (short stubby) is a Middle Albian form as is *Trochammina rainwateri* and *Ammobaculites wenonahae*

environment: The abundance and variety of forms indicates open marine conditions. The coiled nature of the *Lituotuba* suggests the waters were active, this may indicate this area was near the mouth of a large river which brought in good food supplies and kept the waters moving.

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|---|---------------------|
| 2310 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample is rich in both simple and complex arenaceous Foraminifera, wood fragments and pyritised? organic material.</p> <p>The forms found include the following:</p> <p><i>Reophax cf. troyeri</i> Tappan <i>Reophax</i> sp. <i>Ammobaculites fragmentarius</i> Tappan (stubby forms) <i>Saccammina cf. lathrami</i> Tappan <i>Trochammina cf. rutherfordi</i> Stelck and Wall (?) <i>Trochammina rainwateri</i> Cushman and Applin <i>Gaudryina</i> sp. (?) <i>Hippocrepina</i> sp. <i>Verneuilina</i> sp. <i>Glomospirella</i> sp. <i>Psamminopelta bowsheri</i> Tappan</p> <p>Minerals: Pyrite and orange/red metallic mineral (also found in S.W.R. 2570, may well be an alloy - from the drilling equipment).</p> <p>age: <i>Ammobaculites fragmentarius</i>, <i>Psamminopelta bowsheri</i> and <i>Trochammina rainwateri</i> are Upper and Middle Albian forms. <i>Trochammina rutherfordi</i> is the ancestral form of <i>Trochammina ribstonensis</i>, Wickenden. So it seems likely this sample is early Middle Albian or Late Lower Albian.</p> <p>environment: The abundance and number of forms indicates marine conditions, some dwarf forms exist - so the bottom waters may well have been more restricted. Wood fragments suggest land may have been close (probably with a river maintaining a good food supply in this area).</p> | C-12217 |
| 2550 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This sample consists of agglutinated Foraminifera and a large amount of amorphous pyrite. The agglutinated Foraminifera found appear to be a poorly preserved dwarf fauna.</p> <p><i>Gaudryina nanushukensis</i> Tappan (?) <i>Hippocrepina</i> sp. <i>Haplophragmoides</i> ex gr. <i>gigas minor</i> Nauss <i>Haplophragmoides</i> aff. <i>platus</i> Loeblich <i>Haplophragmoides</i> <i>multiplus</i> Stelck and Wall <i>Textularia</i> aff. <i>T. gravenor</i> Stelck and Wall aff. <i>T. topagorukensis</i> Tappan (?) <i>Verneuilinoides</i> sp. (?) <i>Miliammina</i> sp. (?) <i>Trochammina</i> sp. <i>Bathysiphon</i> sp.</p> | C-12218 |

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|--|---------------------|
| | <p>age: <i>Gaudryina nanushukensis</i> is a Lower Cretaceous, Albian form. The tenuated and rugged (dwarf) forms of <i>Gaudryina</i> and (?) <i>Hippocrepina</i> are more indicative of the older forms of these two genera. As there is already at least 1200 feet of Middle Albian above this core level, it seems probable that this is either a Lower Middle Albian or Lower Albian sample.</p> <p>environment: The dwarf nature of the Foraminifera and the large quantities of amorphous pyrite suggest this deposit formed under toxic conditions. At this time there does not appear to have been any freshening of the sea waters from fluvial or deltaic sources (total lack of wood fragments but with megaspores).</p> | |
| 2570 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>This is a poor microfossil sample containing only an <i>Inoceramus</i> prism (may be contamination), wood fragments, a single <i>Haplophragmoides</i> (species unidentifiable) and a pyritised sphere showing faint traces of suturing.</p> <p>Minerals: Pyrite and a "bornite-like" mineral</p> <p>age: Indeterminate. But from the stratigraphic position in the well it could possibly be assigned to the Middle or Lower Albian.</p> <p>environment: May have been very restricted near shore.</p> | C-12219 |
| 2590 feet | <p>Sinclair Whitefish River 65°35'32"N., 124°29'16"W.</p> <p>In this sample were complex arenaceous Foraminifera, carbonaceous fragments and pyritised organic material (worm tubes).</p> <p>The faunal list includes the following:</p> <p><i>Trochammina</i> sp.</p> <p><i>Haplophragmoides</i> sp. 95 Chamney</p> <p><i>Haplophragmoides coahuilaensis</i> Conkin and Conkin</p> <p><i>Haplophragmoides</i> aff. <i>duoflatis</i> Chamney</p> <p><i>Haplophragmoides gigas minor</i> Nauss</p> <p>Minerals: Pyrite</p> <p>age: <i>Haplophragmoides gigas minor</i> and <i>Haplophragmoides coahuilaensis</i> are Lower Cretaceous forms, and the position of the sample in the well indicates a Lower Albian Age.</p> | C-12220 |

| <u>Stratigraphy & Footage</u> | <u>Locality, Microfossils & Age</u> | <u>GSC Loc. No.</u> |
|-----------------------------------|--|---------------------|
| | environment: Marine, probably restricted (due to pyrite and lack of variety of generic types). | |
| 2610 feet | Sinclair Whitefish River 65°35'32"N., 124°29'16"W. This sample contains simple and complex, fine grained arenaceous Foraminifera and pyritised faecal pellets. The following forms were found: <i>Haplophragmoides</i> sp. <i>Haplophragmoides coahulaensis</i> Conkin and Conkin age: <i>Haplophragmoides coahulaensis</i> is a Lower Cretaceous, form, from the position of the sample in the column an age of Lower Albian appears most probable. environment: Marine, probably restricted - few forms, and those which are found are dwarf forms. | C-12221 |
| 2620 feet | Sinclair Whitefish River 65°35'32"N., 124°29'16"W. This sample contains agglutinated Foraminifera, vertebrate bone fragments, pyritised wood fragments and worm tubes. The following fauna was found: <i>Haplophragmoides</i> ex gr. <i>gigas minor</i> Nauss (?) <i>Reophas</i> sp. <i>Ammobaculites</i> sp. age: Lower Cretaceous. The specimens are all too badly preserved and deformed for a more accurate dating. From the position in the well the sample is probably of Lower Albian Age. environment: There is a suggestion that the sample represents restricted marine conditions probably near land. | C-12222 |
| 2660 feet | Sinclair Whitefish River 65°35'32"N., 124°29'16"W. This sample contains a perplexing mixture of complex arenaceous Foraminifera, brachiopod spines, protistid spheres, vertebrate bone fragments, ? conodont teeth and pyritised wood fragments. The fauna list includes the following: <i>Haplophragmoides</i> aff. <i>neocomianus</i> var. <i>scalloensis</i> Chapman (?) <i>Tritaxis</i> sp. (?) <i>Gaudryina</i> sp. (?) <i>Chara</i> (?) <i>Conodont</i> (?) <i>Productid</i> spines Minerals: Pyrite | C-12223 |

Stratigraphy & Footage

Locality, Microfossils & Age

GSC Loc. No.

age: The sample is a mixture of Cretaceous and Paleozoic forms (probably Devonian). The Cretaceous material may be contamination. environment: The basal Cretaceous was probably restricted marine to brackish. The Devonian sample appears to represent marine conditions, close to land.

2690 feet

Sinclair Whitefish River
65°35'32"N., 124°29'16"W.

C-12224

The sample contained only a single megaspore, a piece of pyrite infill, and an arenaceous Foraminifera - *Ammobaculoides* sp.

age: *Ammobaculoides* is a Cretaceous form. On lithological data Devonian is considered to exist at this horizon, on the basis of data found higher in the section. The *Ammobaculoides* specimen is almost certainly contamination in the sample.

environment: indeterminate



T.P. Chamney.

Western Paleontology Section,
Institute of Sedimentary and Petroleum Geology,
Calgary, November 25, 1971.

65° 35' 32" / 124° 25' 16"



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Amoco Canada
Petroleum Company Ltd.

Bentall Building
444-7th Avenue S.W.
Calgary 2, Alberta, Canada

January 5, 1973

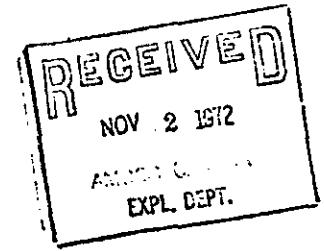
Dr. D. J. McLaren
Institute of Sedimentology & Petroleum Geology
3303 - 33 Street Northwest
CALGARY

T2L 2A7

With reference to our letter to you dated August 10, 1972, regarding the Sinclair Whitefish River K-76 well, Northwest Territories, we are enclosing the information gathered from examination of small composite samples of unwashed cuttings supplied by your Institute.

C. O. Grasdal

C. O. Grasdal,
District Geologist
MLR:cg
Enclosure (1)



AMOCO PRODUCTION COMPANY
RESEARCH CENTER

SOURCE ROCK EVALUATION

2 cuttings samples (Upper Cretaceous Little Bear and Slater River Formations)
Sinclair Whitefish River K-76 well, Northwest Territories

Geochemistry Group

R. J. Harwood

Distribution: D. W. Paape, Attn C. O. Grasdal ✓
W. G. Ayrton
Central Source Rock File
R. K. Taylor
W. R. Walton
J. A. Momper

Technical Service 8569CZ
Job 9418
Requested by C. O. Grasdal
AMOCO CANADA PETROLEUM COMPANY, LTD.

Robert K. Thompson (Oct 31, 1972)

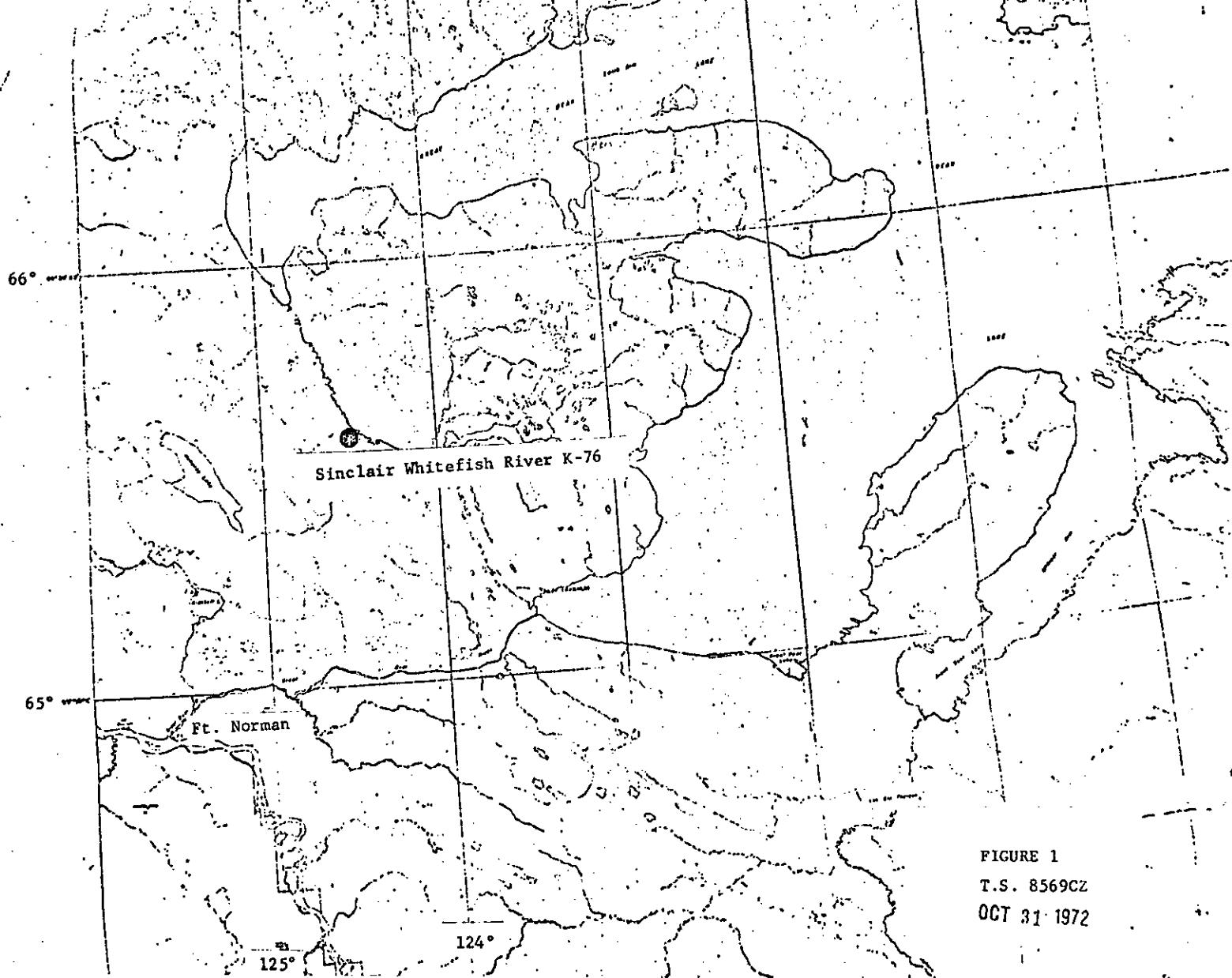


FIGURE 1
T.S. 8569CZ
OCT 31 1972

Sinclair Whitefish River K-76
Northwest Territories, Canada
Amoco Canada
T.S. 8569CZ

INTRODUCTION

The subject two cuttings samples of shale from the Upper Cretaceous Little Bear and Slater River Formations in the Whitefish River well (Figure 1) were submitted for source rock analyses on August 15, 1972 by C. O. Grasdal as part of the continuing source rock evaluation of northwestern Canada.

SUMMARY AND CONCLUSIONS

The Little Bear shale sample has a poor hydrocarbon generation capability on the basis of its organic carbon values, while the Slater River sample has a fair hydrocarbon generation capability on the same basis. The Little Bear sample is a POTENTIAL gas source in the pregeneration diagenesis stage, while the Slater River sample is a POSSIBLY EFFECTIVE gas source rock in the early to peak hydrocarbon generation stage. Moderate amounts of extract in these two samples probably are either migrated oil or a contaminant as they are not consistent with the low oil-generating capability indicated by elemental analyses of the kerogens. The heavy hydrocarbon plots are inconclusive with respect to establishing the origins of the extract, but the chromatograms do suggest bacterial alteration of the extract.

DISCUSSION

The sample of shale from the Cretaceous Little Bear Formation has a poor hydrocarbon generation capability on the basis of its low organic carbon value (Table 1). It is rated as a POTENTIAL gas source in the pregeneration stage of diagenesis as shown by its elemental analysis (Table 2) carbon, hydrogen, and oxygen values, plus its low hydrogen to carbon ratio. A moderate amount of extract (Table 1, Figure 2) is present in this sample, which is inconsistent with the gas-generating nature of the kerogen. Therefore, this extract has probably migrated into the subject rock from elsewhere or is a contaminant. The small amounts of the normal paraffins in proportion to the other hydrocarbons in the extract suggest bacterial alteration.

The shale sample from the Cretaceous Slater River Formation has a fair hydrocarbon generation capability on the basis of its organic carbon value (Table 1), and also is a gas-generating source bed as shown by the elemental

analysis data (Table 2). However, the more advanced level of carbonization as compared with the previous sample indicates that the kerogen in this sample is in the early to peak hydrocarbon generation stage and thus the rock can be rated as a POSSIBLY EFFECTIVE gas source. The extract (Table 1, Figure 2) in this sample probably is not indigenous in view of the gas generating character of this kerogen and may be contamination. Again, the heavy hydrocarbon chromatogram suggests bacterial alteration of the extract.

These data are being included on the northwest Canada source rock maps currently under preparation. There are no nearby data in the source rock files for comparison; the nearest data point is approximately 60 miles away from an outcrop sample that is included in a technical service (T.S. 8468CZ) in progress.

Robert J. Harwood
Robert J. Harwood

RJH:glj

OCT 31 1972

OFFICE Amoco Canada
AUTHORIZED BY C. O. Grasdal
TECHNICAL SERVICE NUMBER 8569CZ
STATE Northwest Territories COUNTY

AREA Southern
DATE 8-29-72

AMOCO PRODUCTION COMPANY
RESEARCH CENTER
SOURCE ROCK EVALUATION

Sinclair Whitefish River K-76, 65°35'32"N, 124°29'16"W

| SAMPLE | | FORMATION | AGE | LITHOLOGY | DEPTH FT | INSOLUBLE RESIDUE % | TOTAL ORGANIC CARBON WT. % | EXTRACTABLE ORGANIC HYDROCARBON BBL/ACRE FT. | EXTRACTABLE HYDROCARBON DBL/ACRE FT. | EXTRACT. HYDROCARBON EXT. ORG. | EXTRACT. ORGANIC TOTAL ORG. | Hydrocarbon Generation Capability | |
|--------|------|-----------|-----|-----------|----------|---------------------|----------------------------|--|--------------------------------------|--------------------------------|-----------------------------|-----------------------------------|--|
| NUMBER | TYPE | | | | | * | | | | | | | |

WELL NAME WHITEFISH RV K 76.

| | | | | | | | | | | | | |
|-----|------|------------|------|-------|--------|------|-----|------|------|------|------|------|
| 2 | CUTT | LITTLEBEAR | CRET | SHALE | 1220.0 | 72.5 | 0.4 | 21.3 | 13.9 | 0.65 | 0.16 | POOR |
| 222 | CUTT | SLATERRIVE | CRET | SHALE | 2020.0 | 81.6 | 0.7 | 11.7 | 5.5 | 0.47 | 0.05 | FAIR |

*Non-extractable organic carbon

TABLE I

OCT 31 1972

