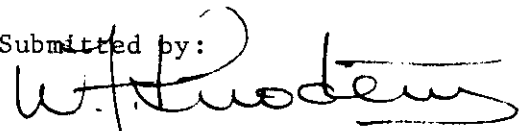


WELL HISTORY REPORT

on

UNION IOL E MAUNOIR M-48
NORTHWEST TERRITORIES
CANADA

Submitted by:



W.F. Knode III
Nueces Management Ltd.

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SUMMARY OF PERTINENT WELL DATA

NAME OF WELL: Union IOL E Maunoir M-48

LOCATION: Unit M Section 48 - Grid Corner 67°00' 124°15'
Latitude 66°57'54"N Long 124°24'00"W

UNIVERSAL WELL LOC. REF.: Lat 66.96500°N Long 124.40000°W

UNIQUE WELL IDENTIFIER: 300M486700124150

PERMITEE: Imperial Oil Enterprises Ltd.
Permit #6601 (50,262 acres)

EXPLORATORY LICENCE NO: 2022

OPERATOR: Union Oil Company of Canada Limited
335 - 8th Avenue S.W.
Calgary, Alberta.

DRILLING CONTRACTOR: Tri-City Drilling (1968) Ltd. - Rig #2

DRILLING AUTHORITY: #717 issued October 29, 1974

ELEVATION: Ground 1243' K.B. 1255.5'

SPUDED: 7:00pm January 21, 1974

DRILLING COMPLETED: March 14, 1974

RIG RELEASED: 4:00pm March 18, 1974

TOTAL DEPTH: 2830' Driller 2802' Logger

WELL STATUS: Dry & Abandoned

TOOLPUSHERS: Ben Huber - Hans Jandl

WELLSITE SUPERVISORS: Engineering - Tom Ramsay, Karl Jasinski
Geological - W.F. Knode III

HEADQUARTERS SUPERVISORS: Engineering - J.J. Sullivan, P. Eng.
Geological - W.D. Connolly

SUMMARY OF PERTINENT DATA (con'd)

AIR SUPPORT: CF-WZH De Havilland
Twin Otter - DHC-6 TransNorth Turbo Air (1971) Ltd.
Pilots: Mike Fritz, Bill Trerice
Co-Pilots: Wynn Muff, Brian Parsons
Engineers: Joe Muff, Mark Nickels

TNTA Piper Aztec CF-SK1
Contact Air CF-ZOW - Piper Navajo
Pilot - Al Furneaux

HELICOPTER SUPPORT: Hughes 500 - call letters F.G.I. (United Helicopter)
Pilot Nick Dreessen

Bell 206-B Jet Ranger
Helicopter TNTA
Don Plaster, Ray Conant-PILOTS
ENGINEERS:
Ken Demonkas, Ken Jones

DISTRIBUTION OF DATA: 1 set bags - surface to TD - D.E.M.R.
1 set cans - surface to TD - D.E.M.R.
1 set lined bags - surface to TD - IOL
1 set vials - surface to TD - IOL
1 set cans - surface to TD - IOL
1 set cans - surface to TD - Union
1 set vials - surface to TD - Union
1 set envelopes - surface to TD - Union

UNION IOL E MAUNOIR M-48

Spudded 7:00pm January 21, 1974
Tri-City Drilling Rig #2 - Unit #34
2 Pumps - Emsco D300
Tool Joints - Reed 4-1/2" x H 6" O.D.

B I T R E C O R D

	<u>BIT #</u>	<u>SIZE</u>	<u>MAKE TYPE</u>	<u>SERIAL</u>	<u>DEPTH IN</u>	<u>- OUT</u>	<u>FTG.</u>	<u>HOURS</u>
Air	1A	12-1/4	Security H7SG	279508	0	40	40	7
Air	2A	17-1/2	Security S88P	476826	0	95	95	18
Air	3A	12-1/4	Smith 3JSP	6R390-RB	95	234	139	7
Mud	4A	12-1/4	Security M44L	493951	234	283	49	8-3/4
Mud	5A	12-1/4	Smith 3JSP	HN704-RB	283	470	187	32-3/4
Mud	6A	12-1/4	Smith SL4	HC534	470	482	12	3-3/4
Mud	7A	12-1/4	Smith 3JSP	GM315RB	482	510	28	2-1/2
Air	1	8-3/4	Security M44N	451538	510	587	77	6-3/4
Air	2	8-3/4	Security S88P	342978	590	701	111	11-1/4
Air	3	8-3/4	Security S88	342979	701	-	-	-
Air	4	6-3/4	Smith L4HJ	PN650	701	727	26	8-1/4
Air	5	6-3/4	Security H88P	475004	727	1105	378	43-1/2
Air	6	6-3/4	Western J55	TN642	1105	2219	1114	72-1/2
Air	5RR	6-3/4	Security H88P	475004	2219	2830	611	43

Ground level 1243'

K.B. 1255.5

SAMPLE DESCRIPTION

UNION IOL E MAUNOIR M-48

Sample interval 10' (feet)

10'	Glacial Drift - 30% Dolomite and Limestone mainly light brown to tan, trace fossiliferous (coral sucrosic stems), 30% quartzitic Sandstone, light grey to tan, sub angular to sub rounded, coarse to fine grain, 20% Chert - clear to black, gravel to poorly sorted Sandstone, 20% Granite - red, pink.
20'	as above
30'	as above
40'	as above - higher percent of quartzitic Sandstone - add trace black mica
50'	40% Quartzitic Sandstone - tan to tan white, pinkish, very fine grain to medium grain, sub rounded to sub angular, 40% PreCambrian material - red and pink granite, greenstone, black crystalline gabbro (?), ironstone, metaquartzite (?), 20% chert and dolomite
60'	as above
70'	40% Limestone and Dolomite as in 10' - 30% dark PreCambrian, 30% Quartz and Chert
80'	as above with trace banded and honeycomb chert
90'	35% Precambrian, 25% Quartzitic Sandstone, 25% Limestone and Dolomite, 15% Chert
100'	as above (sample very coarse)
110'	as above with trace siderite nodules, pyrite (very coarse sample)
120'	50% dark Precambrian, 30% Quartzitic Sandstone, 20% Chert, Limestone, Dolomite
130'	As above - (very coarse)
140'	40% dark PreCambrian, 20% Limestone and Dolomite, 20% quartzitic Sandstone, 20% Chert - clear, milky red, black - trace light tan, massive, trace honeycomb
150'	as above
160'	as above

- 170' as above with 5% Chert - grey, massive - trace limestone, medium brown, dense to micro crystalline, trace birds-eye
- 180' as above - brown limestone about 10% - trace limestone - grey, dense - trace agate - 50% Precambrian, 20% quartz sandstone - white to red, 20% chert, trace coarse grained chert conglomerate - siliceous cement
- 190' Limestone - 50% - tan to light brown - micro crystalline, sucrosic, 20% dark Precambrian, 15% quartz sandstone, 15% cherts
- 200' as above with trace greenish sandstone - tight, fine to very fine grain, with 5% dense, massive grey chert - few quartz grains
- 210' as above
- 220' 80% Limestone light brown - micro crystalline, sucrosic with 10% quartz grains and chert, 10% dark Precambrian
- 230' as above
- CHANGE FROM AIR DRILLING TO MUD SYSTEM AT 234'
- 240' (sample bag 80% sawdust) 60% Limestone, 30% Precambrian, 10% chert and quartz
- 250' (sample bag 95% sawdust) as above - high percentage cavings
- 260' 35% Limestone as above, 35% dark Precambrian, 15% quartz and quartz Sandstone, 15% cherts with trace black silty shale
- 270' (sample bag 80% sawdust) 30% limestone, 40% Precambrian, 30% quartz, quartz sandstone and chert
- 280' (sample bag 95% + sawdust) as above
- 290' as above
- 300' 70% limestone, 15% Precambrian, 15% chert and quartz
- 310' as above
- * 320' Limestone - 80% mostly tan to light brown - as above - trace medium grey limestone - micro crystalline - trace vug - trace tan limestone, lime mud - 10% Precambrian, 10% quartz and chert - trace black shale
- 330' as above with trace pyrite
- 340' as above
- 350' 50% limestone, 50% Precambrian cavings
- 360' as in 320' (limestone varies in reaction to HCl - from slow reaction to full effervescence)
- 370' 80% Limestone as above, 10% Precambrian, 10% quartz and chert

- 380' 90% Limestone as above, 10% Precambrian, quartz, chert, approximately 5% is grey limestone
- 390' as above - still very scattered pinpoint vugs in coarse-grained chips
- 400' as above - trace fossil casts
- * 410' 85% tan and light brown Limestone - as above with scattered pinpoint vugs, 5% grey limestone as above, 5% Precambrian, 5% limonite with trace quartz grains and sandstone, calcite - spar, light green sandstone with glauconite
- 420' as above
- 430' 90% limestone - tan and light brown, as above, few scattered vugs - trace grey crystalline limestone - 5% limonite, 5% Precambrian, quartz grains, and sandstone, black silty shale
- 440' as above with slight iron stain on some limestone chips and with trace of a honeycombed limey mud - slightly silty - good vugular porosity
- 450' as above
- 460' as above - with increase in porosity in limestone and increase in amount of honeycombed lime mud - trace pyrite
- 470' 60% limestone - medium brown - crystalline, trace scattered pinpoint to fair vugs, - 30% limestone, tan as above with scattered honeycomb lime mud - 5% limonite, 5% chert, Precambrian, etc.
- STUCK AT 470' - JANUARY 30, 1974 - 8:30pm UNTIL 11:00PM FEB 7/74
- 480' 50% Limestone as above, 50% cavings from glacial drift (sample very coarse)
- At 482' (February 9, 1974) lost circulation followed by loss of torque -
(lost circulation a continuous problem - due to fractures)
- 490' 30% tan to medium brown limestone and lime mud, 70% cavings from glacial drift, high percentage of pyrite, quartz sandstone, quartz, chert (sample very coarse)
- 500' 80% drift cavings as above, 20% limestone as above
- 510' Limestone - 100% tan, fine to micro crystalline, sucrosic, fractured - grades to lime mud - poor to fair vug and intergranular porosity - scattered 5% limonite stained - trace quartz
- 520' as above
- 530' as above - traces of calcareous quartz sandstone, chert, siderite pebbles, Precambrian cavings
- 540' Limestone as above with partial limonite staining - as above, scattered porosity, trace quartz, light green silty shale, limonite stained quartz sandstone

- 550' as above
- 560' Limestone - as above - limonite staining as above, scattered porosity, trace quartz sandstone, light green silty shale
- 570' Limestone - as above - limonite and stain - trace dark grey chert, trace white quartz crystals
- 580' Limestone - as above - tan, mostly dense, sucrosic - small percentage fine crystalline with scattered fair vug porosity with limonite staining - trace limonite stained micro crystalline limestone - good vug porosity (leached oolites?) trace quartz grains, trace tan dolomite - dense to fine crystalline, trace siderite nodules - trace chert, quartz sandstone

NOTE - sample taken from approximately 555' - apparent area of caving - (taken after depth of 587' reached)

very coarse - light tan to dark brown, silty limestone - scattered vugs - fractured - trace of calcite lining one a large vug - when wet some pieces exhibit a secondary infill of limy silt resembling a birds-eye structure - sub linear orientation (solution breccia?)

Drilling difficulties, and above sample indicate a karst feature.

NOTE - all limestone samples have been silty - much flour in sample after thorough washing and drying.

MOST SAMPLES COULD BE CALLED DOLOMITIC LIMESTONE OR LIMY DOLOMITE - effervescence varies from active to slow

- 590' 90% Limestone - light tan to light brown, silty to micro crystalline, 10% light brown limestone - crystalline-fine - scattered pinpoint vugs, approximately 20% of sample exhibits limonite stain, trace of a white to yellowish limy, silty, unidentified substance - opaque inclusions (caliche?) - some limestone has manganese dendrites

NOTE - Sample taken February 20, 1974 from 558' (unwashed) includes limestone tan to light brown - from muds to crystalline, some crystalline with vugs partially filled with calcite, limonite stain common - small percentage thin bedded silty limy dolomite - tan - fractures effervesce more than body with small amount of a rust-colored flaky clay (terra rossa?) - slow effervescence - trace quartz grains/ with grey, salt and pepper siltstone, dark grey mud, silty, trace medium grey chert with apparent weathered surfaces, conchoidal fracture (resembles novaculite) - sample as above would indicate location or caving near the top of a karst feature

NOTE - Sample taken from February 22, 1974 from 558' (unwashed) majority (70%) of sample is silty limy dolomite - tan - fractured with 15% grey silty mud - trace thin bedded silty to crystalline-micro limy dolomite, 15% grey chert (novaculite?), trace terra rossa?

- 600' 40% Limestone - tan, silty to micro crystalline, approximately one-quarter limonite stained - small amount dendrites - scattered vugs, fractured, 40% limy dolomite - tan to light brown - crystalline-scattered vugs, 10% grey to dark grey silt and mudstone, 10% dark grey chert - brownish - conchoidal fracture - strong trace quartz grains, trace pale green silty shale, trace calcite vug lining, trace pale green fine crystalline dolomite, trace banded silty limestone - dense with narrow bands of calcite and limonite stain
- 610' as above, trace limonitic clay (terra rossa?)
- 620' as above, trace grey, waxy, limy dolomite - silty to micro crystalline, trace thin bedded silty to micro crystalline limy dolomite
- 630' 70% tan to light brown limestone and dolomite as above, 30% grey waxy silty to micro crystalline limy dolomite, limonite stain on one-quarter limestone, trace limonitic clay, banded limestone, calcareous quartz sandstone, siltstone
- 640' 80% limestone and dolomite as above, 10% grey dolomite as above, 10% grey salt and pepper siltstone as above, trace dark grey, dark brown chert with weathered surface
- 650' as above, expect no chert, more limonitic clay
- 660' 75% tan ~~dolomite~~ limestone - silty to micro crystalline to crystalline - partly limonite stained, 20% grey limy dolomite, 5% limonitic clay and siltstone, trace chert, pale green dolomite, trace calcite infill
- 670' 85% carbonates - as above, 15% grey salt and pepper siltstone, trace chert
- 680' 80% tan carbonates - as above, 15% grey limy dolomite, 5% chert, quartz grains, limonite
- 690' 90% tan carbonates - as above, 5% grey dolomite, 5% limonite, chert, quartz, salt and pepper silt
- 700' as above
- 710' 70% tan dolomitic limestone - argillaceous to silty, micro crystalline to crystalline with light green to light yellow waxy shale stringers and partings and coarse crystalline quartz seams
10% shale - blocky - light green to light yellow - waxy, 10% chert dark brown nodules with white matrix - speckled-10% cavings.
- 720' 40% Limestone - medium brown, crystalline, 40% tan ~~dolomite~~ limestone as above, 10% shale as above mainly green, blocky, 10% chert - grey to dark brown with trace of speckled chert as above, trace quartz grains
- 730' 45% ~~dolomite~~ limestone - tan to light brown, micro crystalline to fine crystalline - argillaceous-some iron stain, few thin quartz seams
45% dolomite - slightly limy, medium to dark grey, trace pyrite - trace scattered pinpoint porosity - micro to fine crystalline
10% shale - silty, limy, blocky - light green to light rusty brown, trace dendrites, trace limonite

- 740' 70% dolomite limestone - tan, light brown, greenish, micro to fine crystalline, limonite stain - trace quartz seam - trace brown chert
15% medium to dark grey dolomite as above, 15% rust red silty shale - slightly limy
- 750' 80% dolomite limestone - as above, 10% grey dolomite as above, 10% light greenish silty shale - limy
- 760' 80% dolomite - dark grey, slightly limy, micro crystalline, 20% tan limestone - as above, trace limonite, trace red micro crystalline dolomite limestone
- 770' as 760'
- 780' 50% grey dolomite - as above, 40% tan to light brown, limy dolomite - micro to fine crystalline, 10% reddish dolomite - micro crystalline
- 790' 50% grey dolomite - medium to dark grey, micro crystalline, 50% tan dolomite - limy - micro to fine crystalline - grades to light to medium brown and dark brown - trace tan limestone - honeycomb vugs - crystalline - argillaceous - trace limonite stain on tan limestone
- 800' as above
- 810' sample approximately 50% cement-balance as above
- 820' Dolomite - medium to dark grey - micro crystalline - trace pyrite
- 830' as above, trace tan limestone, trace cement
- 840' as above, trace quartz
- 850' 50% Dolomite - medium brown to medium grey - micro crystalline, trace pinpoint porosity - trace pyrite
50% green shale - blocky to fissile
- 860' 80% Dolomite as above, 20% green shale
- 870' 80% Dolomite as above, pyritic, 10% shale as above, 10% cement, trace tan dolomitic limestone
- 880' 80% dolomite - dark grey to dark brown, micro crystalline, trace pyrite, 20% green shale - fissile to blocky
- 890' as above - add trace limonite stain
- 900' Dolomite and shale as above, 10% cement
- 910' Dolomites 85% as above, 15% green shale, trace quartz
- 920' 75% Dolomites as above, 15% tan to light grey limestone, micro-crystalline, trace pyrite, trace quartz vein, 10% green shale

930'	80% light to medium grey dolomite - trace pyrite - micro crystalline 20% green waxy fissile shale
940'	35% medium brown dolomite, micro to fine crystalline, 35% green shale - waxy, fissile, 30% dolomite - light to medium grey, trace pyrite, trace quartz
950'	70% Shale - green, waxy, dark red, purple, slightly pyritic - blocky to fissile - very slightly calcareous - with brownish and reddish silstone 30% dolomites as above
960'	60% Shale - red, green, purple, waxy to silty to very fine grain Sandstone - interbedded with light grey to light brown, limy dolomite - micro crystalline - argillaceous, 40% to medium brown, medium grey trace pyrite in shale partings
970'	70% Dolomite - slightly limy - tan to medium brown, light to medium grey - micro crystalline to crystalline, pyrite specks 30% Shale as above - green only - waxy to silty
Saline River 978'	
980'	As above - trace reddish silty shale
990'	non-useable sample - changed to different blowey line without first cleaning out - sample all from top part of hole
1000'	60% Shale - green, waxy to silty - some purple, silty - slightly pyritic, 30% dolomite - tan to medium brown, light to medium grey, dense to micro crystalline, some limy, argillaceous 10% anhydrite, quartz, sandstone, quartz crystals
1010'	as above - no anhydrite - trace quartz, some dolomite exhibits fair vugular porosity, trace cavings
1020'	80% green shale - waxy to slightly silty, pyritic, 20% interbeds (thin) of light brown and light grey dolomite
1030'	60% green shale as above, 40% dolomite - scattered fair vugular porosity
1040'	as above
1050'	(?) (brought in when depth approximately 1100') 50% dolomite - medium brown - flecked with green waxy shale - micro crystalline - very slightly argillaceous, calcite seams 50% green shale as above, pyritic - silty trace pyrite globules, quartz

AT THIS POINT WATER VOLUME INCREASED FROM + 70 bph TO + 200 bph - NO CUTTINGS FROM 1050 to 1110 - SUPPOSITION OF AN ANHYDRITE SECTION WITH CUTTINGS DISSOLVED BY HIGH WATER VOLUME - LOST CIRCULATION AT 1105'

- 1110' 70% Shale - dark green and dark grey - silty, pyritic
30% Dolomite - tan, medium grey, medium brown - scattered
vugs - microcrystalline, trace quartz grains
- 1120' as above
- 1130' 65% Shale - green - as above - pyritic
20% Shale - brick red - silty - fissile
15% dolomites as above, trace pyrite
- 1140' as above, trace quartz grains - trace grey dense dolomite with
fair vugular porosity
- 1150' 60% Shale - green and red as above
40% Dolomites - as above (porosity)
- 1160' as above (porosity)
- 1170' as above with 10% (approximately) anhydrite - white to pink,
65% shale, 25% dolomite
- 1180' 30% green shale, 30% brick red shale, 25% anhydrite, 15% dolomite
- 1190' same as 1180'
- 1200' 40% green shale, 40% red shale, 20% anhydrite
- 1210' as above - trace gypsum
- 1220' 50% green shale, 30% brick red shale, 20% anhydrite - trace
dolomite, quartz
- 1230' Shale and anhydrite as above - add grey silty shale, trace gypsum
- 1240' same as 1230'
- 1250' as above
- 1260' as above (samples silty - reddish wash water)
- 1270' 85% shale - green, red, grey - silty
15% anhydrite - white, pink, trace gypsum
- 1280' 70% anhydrite - light grey, platy, 20% shale - green and grey, silty
10% gypsum - white, columnar
- 1290' Insufficient sample to cut - very small amount for cans - only
cuttings visible were shales
- 1300' 70% shale - green, grey, red - silty
30% anhydrite - white, pink, red
- 1310' 60% shale - grey, green, trace red, 20% anhydrite, 20% red to
white honeycomb - appears to be partially leached anhydrite
seams (salt casts?) - trace white gypsum
- 1320' as above
- 1330' Shale - grey, green, yellowish, red - 90%
10% anhydrite

- 1340' 60% Shales as above, 30% dolomite - medium to dark grey, dark brown, dense to micro crystalline, approximately 5% good vugular porosity - leached (?), same calcite infill, 10% anhydrite
- 1350' 60% Dolomite - dense to very slightly microcrystalline, medium to dark grey, mainly dark brown, almost black
25% Silty shales as above,
15% Anhydrite
- 1360' 45% Dolomite as above, scattered good vug porosity in some light grey chips, 40% Silty shales - as above, 5% yellow Siltstone, 10% Anhydrite
- 1370' 70% Shale - red brown, greens (waxy and dark)
20% Dolomite - as above, trace vug porosity
10% anhydrite - trace yellow siltstone
- 1380' 50% Dolomite - light tan to medium brown to dark brown and dark grey - dense to micro crystalline, scattered good vug porosity
50% Shale - light to medium green (waxy to silty) light to medium grey (silty), brick red (silty)
trace tan to light brown Siltstone, trace Anhydrite
- 1390' 85% Dolomite - as above (lighter shades predominate) scattered good vug porosity
15% Shales
trace Siltstone, pyrite
- 1400' 70% Shale - mainly green and brick red, with grey - slightly silty
20% Dolomites - as above, no porosity
10% Anhydrite - white, pink
- 1410' 85% Dolomite - dense to microcrystalline - trace porosity
15% Shale - green and brick red
- 1420' 60% Shale, 40% Dolomite, trace porosity, trace anhydrite, gypsum (?) sample silty
- 1430' 85% Shale - grey, green, brick red - slightly silty to waxy (green-waxy)
5% Dolomite - scattered vugs
10% Anhydrite
- 1440' 50% Dolomite as above - scattered good vug porosity
50% Shales as above
- 1450' 70% Dolomite - scattered good vug porosity
30% Shale; trace pyrite
- 1460' 50% Dolomite - trace porosity, 50% Shale
trace anhydrite, gypsum

1470' as above

1480' as above (very small amount of sample)
trace yellow clay

1490' 70% Shale - waxy green, grey, brick red - silty
30% Dolomite - light grey to dark grey, dark brown, scattered
good vug porosity
trace anhydrite

1500' as above

1510' (small sample) as above - 70% shale, 30% dolomite - trace porosity,
trace anhydrite

1520' (small sample) as above

1530' (sample very silty) - 60% Shales, 40% Dolomites - scattered porosity,
trace anhydrite, gypsum

1540' (sample very silty) as above

1550' 70% Shale, 30% Dolomite
trace yellowish (limonite-stain) silty Sandstone - very porous,
calcareous, trace anhydrite

1550' 70% Shale, 30% Dolomites
trace yellowish (limonite-stain) silty Sandstone - very porous
fine to medium grain - very calcareous; trace anhydrite

1560' (very small sample recovery) - 80% Shale - green, brick red, purple
15% Dolomites, 5% Anhydrite

1570' (small sample) 75% Shale, 10% Dolomite
15% Unidentified - resembles imperfect geodes - clear crystals
with a white amorphous, sinuous, center

1580' (small sample) - 75% Shale - green, waxy, red and green mottled
silty (predominates), light grey, silty, yellowish silty
15% Dolomite - light grey - dense to microcrystalline, scattered good
vugs - some partially infilled with calcite - some appear to be the
result of leaching
10% Unidentified (1570') and anhydrite

1590' 80% Shales as above, 10% Dolomite - no porosity, 10% Anhydrite

1600' (sample silty - dusty) 80% Shale - mainly grey, also green,
red and red and green mottled
15% Dolomite - mainly grey - dense - few vugs (solution?)
5% Anhydrite

1610' 50% Shales; 40% Dolomite - dense to slightly microcrystalline -
light grey - vugular porosity, looks like leaching
10% Anhydrite

1620' 80% Shales; 10% Dolomite; 10% Anhydrite

1630' (sample very silty) as above

1640' as above (silty sample), trace pyrite, trace black shale

1650' WET - clear crystals of evaporite, pinkish opaque evaporite, dark grey sandy, siltstone, clear bronze rhombic crystals (all traces)
DRY - 80% Shale - dark red, purple, medium green waxy and dark green, light green-grey, grey, mottled red and green
10% Dolomite - tan, vuggy (leached?)
10% Anhydrite - white to pink - platy to columnar

1660' WET - clear crystalline material (evaporite) as seam filling
in red shale - trace
DRY - as above

1670' WET grey shale with cavities (leached?) - trace dark grey slightly sandy siltstone
DRY 90% Shales varicolored, interbedded - as above
10% Anhydrite

1680' 90% Shale - varicolored, trace vugs, leaching or casts
5% Dolomite - light grey, vuggy
5% Anhydrite

1690' 90% Shales, 5% Dolomite - light grey - dense, 5% Anhydrite

1700' as above

1710' as above

1720' 90% Shales, 10% Anhydrite

1730' as above

1740' as above, trace clear anhydrite crystals

1750' as above

1760' as above

1770' as above

1780' (sample had slight oil smell before washing) examined wet and dry - shales and anhydrite - one chip of light grey dolomite - vugular

1790' as above

1800' as above

- 1810' Shales and anhydrite ~ as above
one chip of a reddish, poorly bedded, silt to very fine grained sandstone - very poorly cemented - calcareous
- 1820' as above including silty and very fine grain sandstone
- 1830' WET - approximately 25% light grey and tan dense to microcrystalline dolomite - exceeding small chips
DRY - shales with anhydrite - trace siltstone - grey, trace dolomite
- 1840' Shales and anhydrite
trace tan to grey (light) dolomite - few vugs

(SAMPLE VOLUME VARIES FROM POOR TO PRACTICALLY NON-EXISTENT)

- 1850' as above - dolomite probably cavings
- Mount Cap 1862' 1860' as above, considerable dolomite in very fine chips - also clear, rhombic (?) crystals ~ trace
- 1870' (very small chips)
50% Shale - black, dark grey, dark green, small amount brick red
10% Dolomite - light to medium grey, tan - dense to microcrystalline
20% Anhydrite
20% Dolomite - limy - light brown to medium brown - stained - fair to good pinpoint porosity - most grains fluorescence, micro to fine crystalline, very calcareous
- 1880' 30% Dolomite - limy - light to medium brown - very fine to fine grained, good pinpoint porosity, fair stain - some very fine grain - tight, very slightly glauconitic
40% Shale as above
20% Dolomite as above
10% Anhydrite
- 1890' 60% limy dolomite - light to medium brown - micro to fine crystalline majority good to excellent porosity, silty to very fine grain, some calcite crystals in porosity, light brown chips, silty, tight poor to fair stain
40% Shale - with dolomite, trace anhydrite
- 1900' 40% limy dolomite - light brown, silty to very fine grain - tight
40% Sandstone - light brown interbedded with dark grey silty shale - appears varved
20% Shale, dolomite, anhydrite cavings
- 1910' 60% black shale (in HCl, chips loose blackness and appear argillaceous to silty - eventually effervescence - black may be bitument coating - fissile)
25% light brown silty to very fine grain sandstone, thinly interbedded with dark shale (varve?) tight
15% Shale, dolomite, anhydrite cavings

1920' 50% Black shale
30% tan silty to very fine grain Sandstone - tan - tight -
laminated with dark shale
10% brown Sandstone - very fine grain - fair to good porosity
10% cavings

1930' black Shale 50%
40% laminated shale - silty sandstone
10% cavings
trace porosity-sandstone

1940' higher percentage of cavings - no porosity
rest as above

1950' as above, no porosity

1960' 70% black shale - slightly silty in part
10% tight, light brown silty sandstone
20% cavings

1970' as 1960'

1980' 50% black bitumen shale
30% light to medium brown, silty to very fine grain sandstone -
sub angular, slightly calcareous - fair fluorescence - no
visible porosity - some chips have seams of a white amorphous
material
20% cavings

1990' 70% black shale
10% sandstone - as above
20% cavings

2000' 40% black shale
40% sandstone
20% cavings

2010' 80% shales - light to dark green, brick red, pale purple,
dark purple
15% black shale - as above
5% anhydrite - white

2020' WET shales - trace brown chert and what appears to be coal
DRY - 60% green and red shales
30% black shale as above (part coal?)
10% brown silty sandstone (tight) - as above

2030' 50% dolomite - dark to medium brown, dark grey - microcrystalline,
tight
40% shale - light to dark green, rust red, dark grey - some
slightly silty - fissile to blocky
10% anhydrite, black shale, coal?, trace chert - medium brown

- 2040' as above
- 2050' 70% shale - light grey and light green predominate - slightly silty with other shales as above
30% dark dolomite as above
trace anhydrite
- 2060' as above
trace medium brown sandstone - sub angular - slight dark brown mica fleck - scattered porosity - calcareous - silty to very fine grain, trace pyrite
- 2070' variegated shales as above
- 2080' shales as above
- 2090' as above
- 2100' 65% shales - dark green, light green, light grey, dark grey and black, predominate - also brick red - black shale resembles coal
20% dolomites - medium to dark brown - dense to microcrystalline very limy
10% sandstone - medium to dark brown - silty to fine grain - sub angular, slightly to very calcareous - micromica
5% anhydrite
- 2110' 75% shales - mainly light green with light grey, light brownish - red, ranging to dark green and dark grey - calcareous in part
25% dolomitic limestone - mainly medium brown - ranging to dark brown - dense to crystalline - slightly fluorescence.
(gas odor)
- 2120' 60% shales - dark shades predominate
40% dolomitic limestone - microcrystalline - coarse crystalline in small part, medium to dark brown - slight trace porosity
trace pyrite, trace sandstone - medium to dark brown - silty to very fine grain - very calcareous - good porosity - sub angular - micaceous (?), slightly pyritic - or glauconitic
(gas odor)
- 2130' 70% shales - dark predominant
30% dolomitic limestone
trace sandstone - silty to very fine grain - very calcareous - pyritic - inclusions of what is probably glauconite - black to dark green - one chip approximately 90% glauconite
trace pyrite
- 2140' 75% shales - as above (approximately 60% dark, 40% light)
15% dolomitic limestone
5% glauconitic sandstone
5% white to pink anhydrite - amorphous to columnar

- 2150' 90% shales (80% dark)
5% dolomitic limestone
5% glauconitic sandstone
trace quartz grains, anhydrite
- 2160' 70% shales
30% dolomite - light to medium grey - microcrystalline - tight
trace sandstone, anhydrite
- 2170' as above - add a dark brown dense to coarsely crystalline dolomite
- 2180' 50% variegated shales
30% dolomites - medium to dark brown - dense to micro-crystalline
tight
20% sandstone - silty to very fine grain - glauconitic - sub rounded
no fluorescence
- 2190' 60% shales, 40% dolomites
trace sandstone, quartz (milky - seams), anhydrite
- 2200' 60% dolomites
40% shales
trace glauconitic sandstone, anhydrite
- 2210' 70% dolomites
30% shales
trace anhydrite
- 2220' 40% dolomite
40% limestone - medium to dark brown - microcrystalline - tight
20% shales
trace glauconitic siltstone
- 2230' 70% variegated shales
20% dark brown limestone
10% dolomite
trace glauconitic siltstone
- 2240' 90% shales
10% dolomite
trace white amorphous to columnar anhydrite which has been
present in every sample since Saline River
- 2250' 90% shales -(dark approximately 70%) trace mica-flake
10% dolomite
trace pyritic limestone
- 2260' 60% shales - becoming silty
30% dolomite
10% limestone

- 2270' 90% dolomite (to limy dolomite) dark brown - some medium brown microcrystalline, tight
10% shales - silty
- 2280' 75% dolomite - as above
25% shales (trace mica) silty
- 2290' 60% shales - silty
40% dolomite
- 2300' 70% shales - silty - dark grey, almost black, predominates - then light grey and light green silty shale - almost siltstone with medium to brick red, red
30% dark brown dolomite
trace tan siltstone, anhydrite
- 2310' same as 2300'
- 2320' 50% dark dolomite - trace mica
50% varicolored silty shales
trace glauconite - stone - mainly glauconitic in a matrix ranging from silty to very fine grain sandstone - slightly calcareous - sub rounded, glauconitic from black and green fine grain size to coarse - slight trace pyrite in this stone plus in sample
- 2330' 40% dark dolomites - becoming more micaceous - trace vug porosity
40% shales - silty
20% sandstone - very glauconitic - mostly tan, ranging to medium brown, and light to medium grey - glauconite fine grain to coarse grains - possible quartz - trace scattered porosity
trace pyrite and in shale
- 2340' 60% glauconitic sandstone - trace coarse quartz grain - trace porosity
20% silty shales
20% dolomite
- 2350' 45% shales (1/2 light green and grey, 1/2 dark)
45% dolomite
10% glauconitic sandstone - trace porosity
- 2360' 1/3 sandstone - glauconitic - slightly micaceous
1/3 dolomite - micaceous
1/3 shales - silty
- 2370' dolomite as above - some very micaceous
30% shales - as above
30% silty sandstone - as above

Old Fort Island
Member 2366'

Old Fort Island
Porosity 2436'

2380'	as above dolomite more micaceous
2390'	as above
2400'	40% micaceous dolomite 40% silty shale 20% glauconitic silty sandstone
2410'	60% shales - mostly silty 20% dolomite 20% sandstone
2415'	(circulated) 40% sandstone - (occasional coarse quartz grain) 40% shales 20% dolomite
2420'	90% varicolored shales 10% micaceous dolomite trace glauconitic sandstone, pyrite
2430'	80% varicolored shales 10% micaceous dolomite 10% glauconitic sandstone
2440'	70% shales 15% dolomite - slightly micaceous 15% glauconitic sandstone - silty to very fine grain trace glauconitic sandstone - medium to coarse quartz grains - sub rounded to rounded - some frosted
2450'	80% shales - trace mica 10% silty to very fine grain glauconitic sandstone 10% quartzite sandstone - medium to coarse grained - tan - sub angular to rounded, quartz grains - scattered porosity - slightly glauconitic - fair fluorescence
2460'	70% shales 15% silty glauconitic sandstone 15% tan quartzite - slightly pyritic - trace porosity - slightly glauconitic
2470'	70% shales 10% glauconitic sandstone 20% quartzite - more pyritic pyrite common
2480'	20% tan quartzite - slightly pyritic, glauconitic - poor to fair porosity, poor to fair fluorescence 10% glauconitic silty sandstone 70% varicolored shales (black, red, green, some light tan) light tan very micaceous - rest slightly

- 2490' as above - fair to good porosity and fluorescence in quartzite sandstone
- 2500' as above with porosity - trace bitumen stain in quartzitic sandstone
- 2510' as above (lower percentage of sandstone due to higher amount of cavings)
(trace purplish slightly silty shale)
- 2520' 50% varicolored shales (trace dark grey shale with white inclusions in a dendrite pattern)
20% Old Fort quartz sandstone
20% glauconitic sandstone
10% white chalky material and anhydrite
trace clear quartzite (meta quartzite?) trace glauconitic inclusions - appears welded, not like Old Fort
(fines mostly loose quartz grains)
- 2530' 60% varicolored shales - some micaceous
25% Old Fort quartz sandstone - still fair to good porosity, stain
10% glauconitic sandstone
5% anhydrite
still trace of quartzite
(fines mostly loose quartz grains)
- 2540' as above
- 2550' as above
- 2560' percentage as above - large percentage of shale is light grey very slightly silty and light green, waxy
- 2570' as above
- 2580' as above
- 2590' as above - reappearance of purplish shale
- 2600' as above - fines all quartz grains
- 2610' as above - appearance of dark grey, slightly silty shale - slightly micaceous and a black fissile shale - slightly pyritic shales constitute 60% of sample - light grey, light to medium green - waxy, light brick red, pale purple
20% Old Fort sandstone
10% glauconitic sandstone
10% anhydrite
Fines approximately 50% quartz grains, 50% shale chips

2620'	same percentage as 2610' - trace grey shale with red (hematite?) inclusions, trace white quartzite
2630'	as 2610'
2640'	as above - add trace pale yellow silty shale
2650'	60% shales - light to medium green, waxy, predominant - then reddish, small amount purplish 30% quartz sandstone and loose quartz grains 10% anhydrite trace dolomite
Proterozoic 2660'	80% shales - light to medium to dark green, waxy - then reddish, trace mica, pyrite 10% quartz sandstone 10% anhydrite, glauconitic sandstone
2670'	60% shales 10% quartz sandstone 10% anhydrite, glauconitic sandstone 10% tan limestone - dense to microcrystalline 10% tan to yellowish green shale to silty shale
2680'	70% shales 20% quartz sandstone and quartz grains 10% anhydrite, glauconitic sandstone trace black botryoidal matter
2690'	as above - approximately 20% of sample is tan to yellow to greenish yellow shale to silty shale black botryoidal matter still a trace
2700'	80% shales - green, red, dark, trace tan-yellow - trace mica, pyrite 10% quartz sandstone and grains 10% glauconitic sandstone, anhydrite trace orange, flaky material - f.v.i.d.k.
2710'	80% varicolored shales (some very micaceous) 20% quartzitic sandstone, anhydrite, quartz grains, glauconitic sandstone, still trace orange chips
2720'	as above - no orange chips
2730'	60% green shale - light, medium and dark - trace mica - blocky to fissile 30% other shales - mainly reddish 10% quartzitic sandstone, anhydrite, quartz grains, glauconitic sandstone

2740'	as above
2750'	as above
2760'	as above
2770'	80% shales - light, medium and dark green, part waxy, reddish, purplish, black, light to medium grey - some mica, pyrite, trace birdseye 20% anhydrite, quartzitic sandstone, glauconitic sandstone
2780'	as above trace grey dense dolomite - trace white micaceous platy shale
2790'	as above
2800'	as above
2810'	as above
2820'	as above
2830'	70% varicolored shales - red and green predominant - some mica 10% Old Fort quartzitic sandstone 10% anhydrite 10% glauconitic sandstone and other cavings

UNION IOL E MAUNOIR M-48

CHRONOLOGICAL

20'	January 21/74 8:00am - 52°	Spud conductor hole 7:00pm Drill to 20' - 17-1/4" hole - drill with air and power swivel
	January 22/74 8:00am - 54°	Drill conductor hole - lay down power swivel From 20' to 95' - 17-1/4" hole - run 13-3/8" conductor pipe to 95'
	January 23/74 8:00am - 53°	Run 3 joints of 95' of 54.5#, 13-3/8", K-55 8rd casing - cement with 300 sacks permafrost cement
	January 24/74 8:00am - 50°	Drill 12-1/4" hole from 95' to 234' - progress 139' Surveys: 112' 7/8°, 202' 3/4°
	January 25/74 8:00am - 48°	Depth 234' Changeover from air to mud - lost circulation
	January 26/74 8:00am - 50°	Depth 234' Mix mud - Additives: 40 sack sawdust, 100# kelzan, 1500# gel, 100# caustic Viscosity - 410
	January 27/74 8:00am - 38°	Drill 12-1/4" hole from 234' to 253' - progress 19' Lost circulation - mixing mud Additives: 150# kelzan, 3300# gel, 150# caustic Viscosity - 200
	January 28/74 8:00am - 48°	Drill 12-1/4" hole from 253' to 283' - progress 30' Survey: 283' 1-1/2° Additives: 1400# gel, 50# caustic, 100# kelzan Viscosity - 210
	January 29/74 8:00am - 16°	Drill 12-1/4" hole from 283' to 359' - progress 76' Survey: 330' 2° Additives: 3000# gel, 300# kelzan, 50# caustic Viscosity 350
	January 30/74 8:00am - 16°	Drill 12-1/4" hole from 359' to 470' - progress 111' Lost circulation then stuck pipe at 8:00pm Survey: 393' 2° Additives: - none Viscosity - 240

January 31/74 8:00am - 15 ⁰	Mix mud, work stuck pipe and jar at 470' Additives: 32 sack sawdust, 18 sack cane fiber, 4800# gel, 50# caustic, 50# kelzan Viscosity 250
February 1/74 8:00am - 29 ⁰	Jar pipe, mix mud, and wait on Schlumberger at 470' Additives: 5000# gel, 150# caustic, 150# kelzan Viscosity - 240+
February 2/74 8:00am - 34 ⁰	Fishing at 470' Additives: 5700# gel, 200# caustic, 300# kelzan Viscosity 460
February 3/74 8:00am - 42 ⁰	Fishing at 470' Additives: 1000# gel, 50# kelzan Viscosity 450
February 4/74 8:00am - 39 ⁰	Fishing at 470' Additives: 1300# gel, 50# kelzan
February 5/74 8:00am - 24 ⁰	Fishing (washover) at 470' Additives: 3200# gel, 200# kelzan, 28 sack sawdust, 12 sack cane fiber Viscosity 300
February 6/74 8:00am - 14 ⁰	Fishing at 470' + rig repairs Additives: - none Viscosity 540
February 7/74 8:00am - 28 ⁰	Repair low clutch and jar at 470' Additives: 400# gel Viscosity 500
February 8/74 8:00am - 44 ⁰	Recover fish - drill 12-1/4" hole to 472' Additives: 400# gel Viscosity 525
February 9/74 8:00am - 44 ⁰	Drill 12-1/4" hole to 482' - repair torque - progress 10' Additives: 13,100# gel, 450# kelzan, 12 sack cane fiber, 85 sack sawdust Viscosity 500
February 10/74 8:00am - 43 ⁰	Install torque, mix mud, drill 12-1/4" hole to 510' - progress 28' Additives: 6900# gel, 42 sack sawdust, 300# kelzan, 4 sack cane fiber Viscosity 450
February 11/74 8:00am - 44 ⁰	Run casing - 13 joints, 9-5/8", 36#, K-55, 8rd Class A casing set at 510' KB with Howco DV tool at 153' KB. 3 Baker centralizers and Baker float shoe Additives: 16,100# gel, 78 sack sawdust, 200# kelzan, 14 sack cane fiber

February 12/74
8:00am - 36°
Cement casing - W.O.C. - head up
Cemented by Dowell - 1st stage 240 sack oilwell +
2% CaCl₂ - plug down 2:00am. 2nd stage 240 sack
oilwell + 2% CaCl₂ tailed in with 240 sack Perma-Frost
cement - plug down 6:15 AM - good returns to
surface - average slurry 15.4#/gal
Additives: 2300# gel, 18 sack sawdust, 100# kelzan,
5 sack cane fiber

February 13/74
8:00am - 18°
Nippling up
Rig inspection by Greg Wood Conservation
Engineer - satisfactory

February 14/74
8:00am - 17°
Drill out - drill 8-3/4" hole
Nipple up - pressure test BOPs
Change over to air drilling
Bit #1 - 8-3/4" security M44N - #451538 -
77' - 6-3/4 hours

February 15/74
8:00am - 28°
Drill 8-3/4" hole from 510' to 587' - progress 77'
Water encroachment and sloughing hole
Survey: 520' 2'
Additives: 2500# gel, 200# kelzan
Pipe tally - 587.34
Strap tally - 586.39
Difference - 0.95
Bit #2 - 8-3/4" S88P - #342978 - 111' - 11-1/4 hours

February 16/74
8:00am - 9°
Running open hole cement plugs and drilling mousehole.
Plug #1 - at 532' with 120 sack
oilwell cement + 3% CaCl₂. Start mix at 7:10am -
plug down at 7:30am - displaced with 6 bbls water
Additives - 500# gel, 50# kelzan

February 17/74
8:00am - 24°
Run cement plug #2 - string new travelling block -
Drop mud pill
Plug #2 at 534' with 120 sack oilwell cement +
10% NaCl₂ - start mix at 12:25am, plug down
at 12:45am
Additives: 500# gel, 50# kelzan

February 18/74
8:00am - 29°
Mix mud - drop 2 mud pills - run cement plug #3
Plug #3 at 538' - 120 sack oilwell + 3% CaCl₂ -
start mix at 12:34pm - plug down at 12:45pm
Additives: 7000# gel, 500# kelzan, 70 sack sawdust,
35 sack cane fiber

February 19/74
8:00am - 10°
Clean out hole - drill to 590' - troubles with plugged bits, infill coming up hole

February 20/74
8:00am - 32°
Running cement plugs -
Plug #4, at 512' - 60 sack oilwell cement + 3% CalC2 - start mix at 3:50am, plug down at 4:00am
Plug #5 - at 490' with Howco RTTS tool - cemented with 120 sack oilwell + 3% CaCl2, followed by 60 sack PermaFrost cement - plug down at 6:30pm
Plug #6 - at 490' with Howco RTTS tool - 120 sack oilwell + 2% CaCl2 followed by 60 sack PermaFrost cement - start mix at 10:50pm - plug down at 11:15pm - plug on vacuum

February 21/74
8:00am - 27°
Run Plug #7 - then clean hole to 558'
Plug #7 - at 490' with Howco RTTS tool - 120 sack oilwell + 2% CaCl2 followed by 60 sack PermaFrost cement - start mix at 4:50am - plug down at 5:20am - on vacuum

February 22/74
8:00am - 28°
Plug #8 and W.O.C. - find top of plug #8 at 480'
Plug #8 at 492' with Howco RTTS tool - ran 40 sack diesel gel plug followed by 300 sack cement + 8% NaCl - start mix at 2:15am - plug down at 3:00am

February 23/74
8:00am - 20°
Running plugs
Diesel gel plug #2 at 558' with 46 sack gel - plug down 12:45am
Plug #9 at 492' with Howco RTTS tool - 100 sack oilwell cement + 7% NaCl - start mix 2:15am plug down 2:45am
Diesel Gel Plug #3 at 558' with 50 sack gel + 12 bbls diesel - plug down 2:45pm
Plug #10 at 492' - Howco RTTS tool - diesel gel plug #4 with 50 sacks gel + 12 bbls diesel - plug down 5:15pm - tailed in behind #4 with plug #10 - 120 sack oilwell cement + 7% NaCl - plug down 6:15pm

February 24/74
8:00am - 35°
W.O.C. - drill 8-3/4" hole from 590' to 701'
Total Progress 111'
Survey: 653' 3-1/2 °
Trip for Bit #3 - 8-3/4" security S88 #342979 - no footage

February 25/74
8:00am - 24°
Work tight hole - drop gel plugs
Diesel gel plug #5 - 28 sack gel + 7 bbls diesel at 545' - plug down 10:00am.
Diesel gel plug #6 - 40 sack gel + 10 bbls diesel at 570' - plug down 11:00am

February 26/74 8:00am - 28°	Clean to 650' - wait on liner
February 27/74 8:00am - 15°	Wait on liner <u>Diesel gel plug #7</u> - 40 sack gel + 10 bbls diesel fuel-plug down at 9:00pm at 562'
February 28/74 8:00am - 13°	Run liner - cement plug fails - bank liner <u>diesel gel plug #8</u> - 28 sack gel + 7 bbls diesel fuel - plug down at 10:00pm at 570'. Ran 5 joints, 7-5/8", O.D., 26#, K-55 Butress casing liner set at 633' - circulate liner for 30 minutes prior to cementing with stiff foam - cemented with 20 sack oilwell cement + 7% NaCl - displaced plug with 22 bbls water (overdisplaced by 10 bbls - no latch down seat) tripped out with liner - Gasket rubber and fine cuttings lodged between seat and plug)
March 1/74 8:00am - 16°	Wait on liner - clean to bottom - circulate
March 2/74 8:00am - 12°	Run liner - run diesel gel and cement plug Ran 7-5/8", O.D., 26#, K-55 Class A liner and set at 635', cemented with 30 sack oilwell cement + 8% NaCl - start mix at 8:30am - finish at 8:40am - displace plugs with 14.5 bbls H ₂ O - maximum pump pressure 1000 psi - plug down at 8:45am - top of liner at 414' 96" into top of 9-5/8" casing Ran Howco RTTS tool and set at 413' - ran diesel gel plug #9 with 20 sack gel + 5 bbls diesel - plug down 9:45pm. Followed by cement plug #11 with 50 sack oilwell cement + 8% NaCl and cement + 5#/bbl lost circulation material - plug down 10:00pm - plug not on vacuum - bled back and staged 4 bbl displacement
March 3/74 8:00am - 33°	W.O.C. and changed 4-1/2" pipe rams to 3-1/2"
March 4/74 8:00am - 24°	Drill 6-3/4" hole from 701' to 727' Wait on 3-1/2" drill pipe - drill out plug, float and shoe. Top of liner at 414' top of plug at 599' Bit #4 - 6-3/4" L4HJ #PN 650 26' 8-1/4 hours Bit #5 - 6-3/4" H88P #475004 378' 43-1/2 hours

March 5/74 8:00am - 26°	Drill 6-3/4" hole from 727' to 865' - progress 138' Survey: 790' 4°
March 6/74 8:00am - 30°	Drill 6-3/4" hole from 865' to 1105' - progress 240 feet Surveys: 915' 3-3/4°, 1073' 3-1/4°
March 7/74 8:00am - 37°	Drill 6-3/4" hole from 1105' to 1453' - progress 348' Bit #6 - 6-3/4" J-55 #TN642 - 1114' - 72-1/2 hours Additives: 200# Kelzan Survey: 1370' 5-1/4°
March 8/74 8:00am - 46°	Drill 6-3/4" hole from 1453' to 1734' - progress 281' Surveys: 1450' 4-1/2°, 1540' 4°, 1645' 3°
March 9/74 8:00am - 41°	Drill 6-3/4" hole from 1734' to 1925' - progress 191' Survey: 1778' 2-3/4°
March 10/74 8:00am - 36°	Drill 6-3/4" hole from 1925' to 2200' - progress 275' Survey: 2000' 3°
March 11/74 8:00am - 15°	Drilled 6-3/4" hole from 2200' to 2415' - progress 215' 1st T.D. at 10:45pm Bit #5 RR, 6-3/4" Security, H88P #475004 - 611' 43 hours
March 12/74 8:00am - 16°	Attempt to log - bridge off - drill from 2415' to 2440' - 6-3/4" Additives: 2700# gel, 200# kelzan
March 13/74 8:00am - 28°	Drill 6-3/4" hole from 2440' to 2690' - progress 250'
March 14/74 8:00am - 14°	Drill 6-3/4" hole from 2690' to 2830' TD Progress 140' Survey: 2690' 5-1/4°
March 15/74 8:00am - 25°	Cleaning hole - attempting to log
March 16/74 8:00am - 25°	Log - run Plug #1 - stuck pipe Ran Gamma Ray Neutron by Schlumberger - surface to TD - in drill pipe <u>Plug #1</u> 100 sack oilwell from 2830'-2510' start mix at 8:00pm - plug down 8:15pm. Worked pipe up to 2662' and stuck - backed off manually after working pipe 6 hours - top of fish at 1778- total 28 joints, 3-1/2" drill pipe in hole as fish

March 17/74
8:00am - 24°

Work stuck pipe - run Plug #2
Plug #2 - 950' to 1100' with 60 sack - start mix
at 5:25pm - plug down 5:30pm.
W.O.C. 7 hours - ran in found top of plug at
960' - ran Baker Model K bridge plug at
410' in 9-5/8" casing
Ran plug #3 by Dowell on top of bridge plug
with 25 sack cement - plug down 2:15am March 18.

March 18/74
8:00am - 8°

Plug down 2:15am
Cut off casing bowl 4' below ground - weld
on plate - cemented stub with 4 sack - installed
well name plate on well center.
RIG RELEASED at 4:00pm March 18, 1974



WATER ANALYSIS
FOR
UNION OIL COMPANY OF CANADA LTD.
UNION IOL E MAUNOIR M-48
MAUNOIR AREA
NORTHWEST TERRITORIES

CORE LABORATORIES - CANADA LTD.

Petroleum Reservoir Engineering

CALGARY - EDMONTON - REGINA



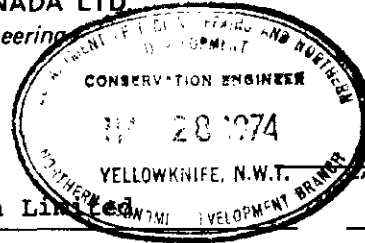
CORE LABORATORIES - CANADA LTD
Petroleum Reservoir Engineering
CALGARY ALBERTA



Plastic

CONTAINER IDENTITY

WATER ANALYSIS



7021-4303

LABORATORY NUMBER

1 of 1

PAGE

1243'

MB ELEV. GRD. ELEV.

Union Oil Company of Canada Limited

Union IOL E Maunoir M-48

WELL OR SAMPLE LOCATION NAME

Maunoir Area, Northwest Territories

FIELD OR AREA

POOL OR ZONE

SAMPLER

TEST TYPE & NO.

TEST RECOVERY

Water at 1105'

@ OF

POINT OF SAMPLE

AMT. & TYPE CUSHION

MUD RESISTIVITY

PUMPING

FLOWING

GAS LIFT

SWAB

WATER

BBLS/D.

OIL

BBLS/D.

GAS

MFC/D.

TEST INTERVALS OR PERFS.

SEPARATOR RESERVOIR

CONTAINER
WHEN SAMPLED

CONTAINER
WHEN RECEIVED

SEPARATOR

PRESSURES, PSIG

TEMPERATURES, °F

March 12/74

March 22/74

D.J.

DATE SAMPLED (D/M/Y)

DATE RECEIVED (D/M/Y)

DATE ANALYSED (D/M/Y)

ANALYST

REMARKS

ION	MG/L	MG%	MEQ/L
Na+K	48	7.3	2.1
K			
Ca	105	16.1	5.2
Mg	26	4.0	2.1
Ba			
Sr			
Fe		TRACE	

ION	MG/L	MG%	MEQ/L
Cl	48	7.3	1.4
Br			
I			
HCO ₃	239	36.5	3.9
SO ₄	169	25.8	3.5
CO ₃	19	2.9	0.6
OH	0	0.0	0.0
H ₂ S		ABSENT	

TOTAL SOLIDS MG/L

BY EVAPORATION @ 110°C BY EVAPORATION @ 180°C

654

AT IGNITION

CALCULATED

1.0004 @ 60°F
SPECIFIC GRAVITY

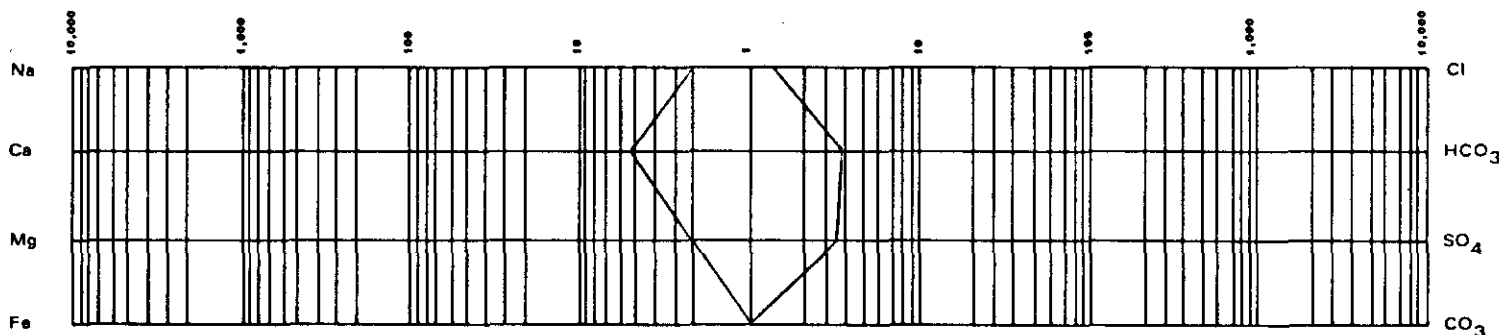
1.3310 @ 24°C
REFRACTIVE INDEX

8.5

pH

5.57 @ 25°C
RESISTIVITY (OHM/METERS)

LOGARITHMIC PATTERN MEQ PER LITER



REMARKS