



GEOLOGICAL SURVEY OF CANADA

DEPARTMENT OF ENERGY,
MINES AND RESOURCES

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BIOSTRATIGRAPHIC DETERMINATIONS OF FOSSILS FROM THE SUBSURFACE OF THE YUKON TERRITORY AND THE DISTRICT OF MACKENZIE

(Report and 1 figure)

B. S. Norford, M. S. Barss, W. W. Brideaux, T. P. Chamney,
W. H. Fritz, William S. Hopkins, Jr., J. A. Jeletzky,
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ABSTRACT

Identifications and age determinations are presented for fossils from twenty-three wells in the District of Mackenzie and the Yukon Territory. Ages range from Middle Cambrian to Tertiary and are based on identifications of spores, pollen, dinoflagellates, acritarchs, conodonts, foraminifers, graptolites, corals, pelecypods, brachiopods and trilobites.

RÉSUMÉ

L'auteur donne l'identification et l'âge de fossiles provenant de 23 puits du district de Mackenzie et du Yukon. L'âge des fossiles va du Cambrien moyen au Tertiaire et est déterminé par l'étude des spores, du pollen, des dinoflagellés, des acritarches, des conodontes, des foraminifères, des graptolites, des coraux, des pélecypodes, des brachiopodes et des trilobites.

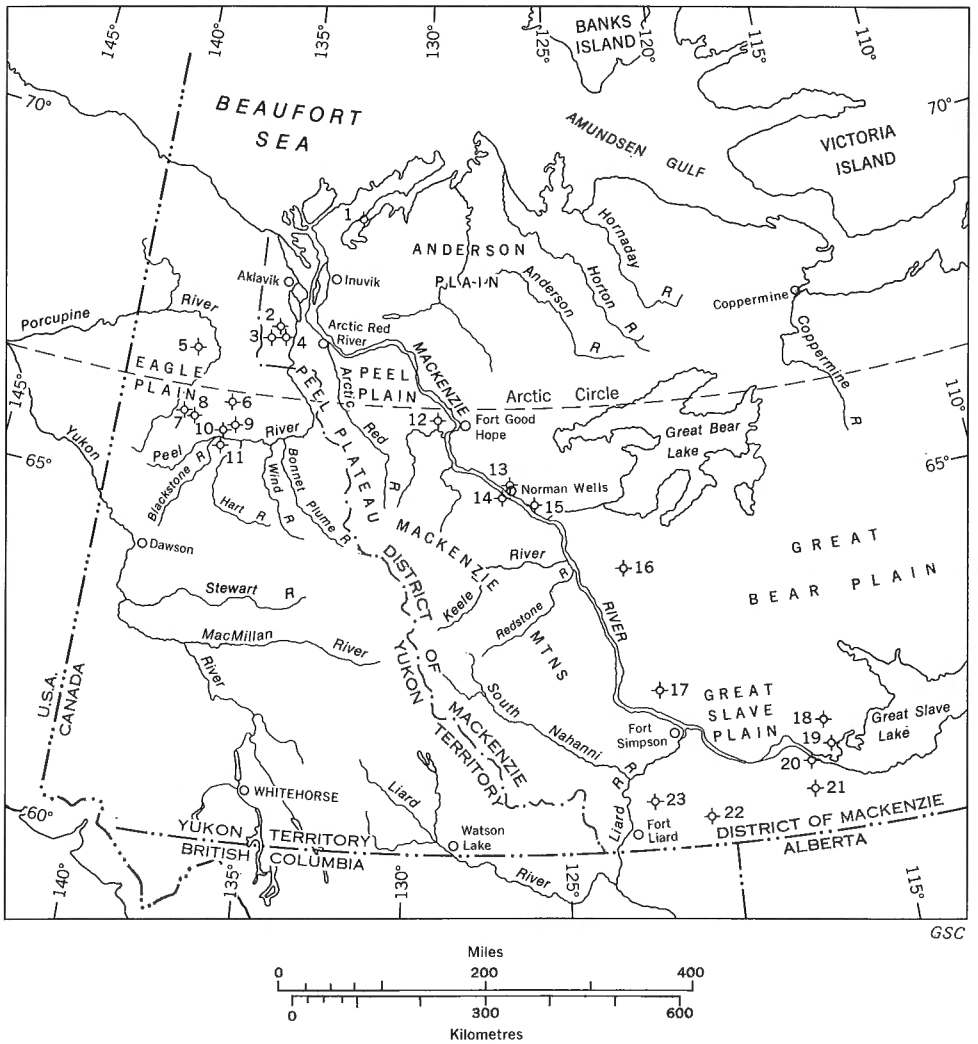


Figure 1. Map showing location of wells discussed in text

BIOSTRATIGRAPHIC DETERMINATIONS OF FOSSILS
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INTRODUCTION

The assimilation of information obtained from wells drilled in northern Canada is of prime importance to the continuing exploration of the petroleum resources of the region. Biostratigraphic dating of rocks penetrated by wells allows precise correlation of strata with rock units in other wells and with outcropping formations. It provides important age control for reconstructions of the structural configuration of the subsurface rocks and of the patterns of sedimentation during geological time.

Where possible, the fossiliferous intervals in the wells have been assigned to formations. H.R. Belyea, W.S. MacKenzie, H.L. Martin, A.E.H. Pedder, E.J. Tassonyi and C.J. Yorath are responsible for these assignments. The stratigraphic frameworks have not yet been established for the intervals reported in the remaining wells, and formational assignments are not possible. Most of the fossils are stored in the collections of the Geological Survey of Canada in Calgary; the remainder are stored in Ottawa.

Much of the information in this paper has been used by geologists of the Institute of Sedimentary and Petroleum Geology in research on the subsurface geology of northern Canada, part of which has been abstracted to appear in editions of the Schedule of Wells published by the Department of Indian Affairs and Northern Development.

The paper has been compiled by B.S. Norford; a similar paper was published earlier as Paper 70-15.

WELLS STUDIED AND SHOWN ON FIGURE 1

<u>Locality</u>	<u>Well Name</u>	<u>Year Completed</u>	<u>Ages Reported</u>	<u>Author</u>
1	I.O.E. Eskimo J-07	1969	Tertiary	Hopkins
2	I.O.E. Stoney I-50	1966	Ordovician	Norford
3	I.O.E. Stoney Core Hole F-42	1967	Jurassic- Cretaceous	Jeletzky- Brideaux
4	I.O.E. Stoney Core Hole C-2	1967	Cretaceous	Barss
5	Socony Mobil-W.M. Molar YT P-34	1964	Jurassic- Cretaceous	Chamney
6	Socony Mobil-W.M. S. Tuttle YT N-5	1965	Ordovician- Silurian	Norford

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Compiler's address: Institute of Sedimentary and Petroleum Geology
3303 - 33rd Street N.W.
Calgary 44, Alberta

<u>Locality</u>	<u>Well Name</u>	<u>Year Completed</u>	<u>Ages Reported</u>	<u>Author</u>
7	Socony Mobil-W.M. N. Cath YT B-62	1965	Silurian	Norford
8	Socony Mobil-W.M. Whitestone YT N-26	1964	Carboniferous	Barss
9	Socony Mobil-W.M. Birch YT B-34	1965	Carboniferous- Cretaceous	Barss
10	Socony Mobil-W.M. Blackie No. 1 YT M-59	1964	Carboniferous- Permian	Barss
11	S.O.B.C. Blackstone YT D-77	1962	Ordovician	Norford
12	Atlantic S.W. Airport Creek No. 1	1960	Devonian	Pedder
13	Imperial Norman Wells No. 37x	1956	Devonian	Pedder
14	Imperial Canol Mac No. 1	1943	Devonian	Pedder
15	Imperial Vermilion Ridge No. 1	1945	Cambrian	Fritz
16	Shell Blackwater Lake G-52	1964	Devonian Cretaceous	Chamney- Hopkins
17	I.O.E.-Triad Ebbutt J-70	1964	Ordovician- Silurian	Norford
18	G.P.D. Noel Mills Lake B-41	1968	Devonian	Uyeno
19	N.W.T. Deep Bay No. 2	1952	Devonian	Pedder
20	C.D.R. Chevron Mills Lake L-10	1968	Devonian	Pedder
21	Placid Chevron Kakisa J-65	1968	Devonian	Pedder
22	Union Pan Am Trainor L-59	1966	Devonian	Pedder
23	Imperial Sun Arrowhead I-46	1961	Devonian	Pedder

CORRELATIONS AND IDENTIFICATIONS OF FOSSILS

Tertiary Assemblages (Spores) by William S. Hopkins Jr.

I.O.E. Eskimo J-07

69°16'43"N., 132°30'59" W., figure 1, loc. 1

Depth 120-165 ft., cuttings, *Laevigatosporites* sp.
GSC loc. C-8259 *Osmunda* sp.
Baculatisporites sp.
Sphagnum spp.
Deltoidospora sp.
cf. *Gleichenia* sp.
Anemia cf. *A. poolensis* Chandler
Lycopodium spp.
Miscellaneous bisaccate conifer pollen
Taxodiaceae
Glyptostrobus sp.
Alnus sp.
cf. *Corylus* sp.
Tricolpites sp.
age: Early Tertiary.

Depth 200-280 ft., cuttings,
GSC loc. C-8259A

Laevigatosporites sp.
Verrumonoletes sp.
Sphagnum spp.
Lycopodium spp.
cf. *Baculatissporites* sp.
Deltoidospora sp.
Reticulatissporites sp.
cf. *Gleichenia* sp.
Miscellaneous bisaccate conifer pollen

cf. *Metasequoia* sp.
Glyptostrobus sp.
Taxodium sp.
cf. *Podocarpus* sp.
Paralaenipollenites sp.
Triporites spp.
Tricolpites spp.
Betula sp.
Corylus sp.
cf. *Carya* sp.
age: Paleocene.

Comments: Although the first sample contains a smaller florule than the latter sample, I consider them to be essentially the same age. Most of the listed palynomorphs could be found in the latest Cretaceous or early Tertiary, but the absence of widespread and abundant Maestrichtian forms suggests a Tertiary age. Furthermore the lack of a wide variety of dicotyledons would suggest a very early Tertiary age. Middle Paleocene to Middle Eocene was a period of explosive angiosperm differentiation which is not indicated in these samples. Consequently, I would consider both samples Paleocene, probably early Paleocene.

Cretaceous Assemblages (Spores) by William S. Hopkins Jr.

Shell Blackwater Lake G-52

64°01'49.06"N., 122°55'11.38"W., figure 1, loc. 16 (note microfossils identified by Chamney)

Depth 670-680 ft., core,
GSC loc. C-7659

Deltoidospora sp.
Osmundacidites cf. *O. wellmanii* Couper
Gleicheniidites senonicus Ross
Araucariacites sp.
Taxodiaceae-Cupressaceae
Bisaccate conifer pollen
age: probably Cretaceous.

Depth 680-690 ft., hand-
picked composite sample,
GSC loc. C-7659

Gleicheniidites senonicus Ross
Osmundacidites cf. *O. wellmanii* Couper
cf. *Cyathidites* sp.
?Cicatricosisporites sp. (preservation excep-
tionally poor)
Deltoidospora sp.
Sphagnum sp.
cf. *Verrucosisporites*
cf. *Vitreisporites*
Araucariacites sp.
Taxodiaceae-Cupressaceae
Bisaccate conifer pollen
age: probably Cretaceous.

Comments: Preservation of palynomorphs is exceptionally poor, and density in the useful two samples very low.

The samples appear to be Cretaceous, but all the palynomorphs are comparatively long ranging and not useful for detailed dating. The doubtful *Vitreisporites* would suggest Lower Cretaceous, but on the other hand, typical Lower Cretaceous forms are absent.

Early Cretaceous Assemblages (macrofossils) by J.A. Jeletzky

I.O.E. Stoney Core Hole F-42

67°21'23"N., 135°38'43"W., figure 1, loc. 3 (note: pollen identified by Brideaux, this paper, and Foraminifera identified by Chamney in Norford and others, 1970)

Depth 209 ft., core,
GSC loc. C-3655

cf. *Pleuromya borealis* Warren
Indeterminate pelecypods

age: Cretaceous, possibly Albian, cannot be dated definitively, possibly from some part of the Albian shale-siltstone division of Jeletzky (1960, p. 18).

Depth 420 ft., core,
GSC loc. C-3665

Astarte ex aff. *cantabrigiensis* Woods

age: Hauterivian to Aptian, *Astarte* ex gr. *cantabrigiensis* Woods is restricted to the Upper shale siltstone and Upper sandstone divisions of Jeletzky, (1960, pp. 13, 16). The lot C-3665 probably represents one of these divisions and is of general Hauterivian to Aptian age.

Depth 560 ft., core,
GSC loc. C-3666

Astarte ex aff. *cantabrigiensis* Woods

age: Hauterivian to Aptian, as for above collection.

I.O.E. Stoney Core Hole C-2

67°21'10"N., 135°31'00"W., figure 1, loc. 4

Depth 14 ft., core,
GSC loc. C-3672

Astarte ex aff. *cantabrigiensis* Woods
pelecypods indet.

gastropods indet.

age: Hauterivian to Aptian, as for C-3666.

Depth 35-36 ft., core,
GSC loc. C-3673

Aucellina aptiensis Pompeckj s. str.

ammonite fragments indet.

marine pelecypod indet.

marine gastropods indet.

age: Aptian. Presumably represents the upper part of the Upper sandstone division of Jeletzky, (1960, pp. 16, 17) in its Stony Creek-Vittrekwa River facies because of the frequent occurrence of typical representatives of *Aucellina aptiensis* and presence of ammonite fragments.

Depth 360 ft., core,
GSC loc. 3677

?*Inoceramus* ex gr. *neocomiensis* d'Orbigny

age: Hauterivian to Aptian. So far as known *I.* ex gr. *neocomiensis* d'Orbigny is restricted to the Hauterivian to Aptian stages of the international standard. If so the lot C-3677 would represent some part of the Upper shale-siltstone or Upper sandstone divisions of Jeletzky, (1960, pp. 13, 16). However it cannot be dated definitively because of poor preservation of the only ?*I. neocomiensis*-like shell available.

Jurassic to Cretaceous Assemblages (Palynomorphs) by W.W. Brideaux

I.O.E. Stoney Core Hole F-42

67°21'23"N., 135°38'43"W., figure 1, loc. 3 (note: macrofossils identified by Jeletzky, this paper; Foraminifera identified by Chamney in Norford and others, 1970)

Depth 20-90 ft., core,
GSC locs. C-9152 - C-9155

Hymenozonotriletes sp. A
Gleicheniidites senonicus (Ross) Skarby
Appendicisporites perplexus Singh
Reticulisporites sp.
various other trilete spores
Vitreisporites pallidus (Reissinger) Nilsson
Alisporites bilateralis Rouse
Veryhachium reductum forma *trispinoides* de Jekhowsky
PterospERMopsis australiensis Deflandre and Cookson
Baltisphaeridium sp. cf. *B. debilispinum* (MS name, Brideaux, in press)
Cleistosphaeridium multispinosum (Singh) (MS name, Brideaux, in press)
Leiofusa jurassica Cookson and Eisenack
Various acanthomorph acritarchs
Chlamydophorella nyel Cookson and Eisenack
Odontochitina operculata (Wetzel) Deflandre
Palaeoperidinium cretaceum Pocock
Cleistosphaeridium sp. cf. *C. aciculare* Davey
age: The palynologic assemblage cannot be dated more precisely than Early Cretaceous. Jeletzky gives a possible Albian age for a sample at 202 ft. Based on stratigraphic position, the assemblage listed above presumably is Albian.

Depth 450-460 ft., core,
GSC loc. C-9156

Stereisporites antiquasporites (Wilson and Webster) Dettmann
Gleicheniidites senonicus (Ross) Skarby
Eucommiidites troedssonii Erdtman
Cerebropollenites mesozoicus (Couper) Nilsson
various unidentified bisaccate grains
Oligosphaeridium complex (White) Davey and Williams
Palaeoperidinium cretaceum Pocock
various unidentified acritarchs and dinoflagellates
age: The palynologic assemblage cannot be dated more precisely than Early Cretaceous. Jeletzky gives a Hauterivian to Aptian age for a sample at 420 ft.

Depth 725-730 ft., core
GSC loc. C-4343

Rouseisporites sp. cf. *R. reticulatus* Pocock
Gleicheniidites senonicus (Ross) Skarby
Appendicisporites perplexus Singh
Deltoidospora sp.
Vitreisporites pallidus (Reissinger) Nilsson
various unidentified bisaccate grains
Eucommiidites troedssonii Erdtman
Classopollis sp.
various inaperturate pollen grains
Veryhachium reductum forma *trispinoides* de Jekhowsky

Microdinium opacum (MS name, Brideaux, in press)
"Broomea" jaegeri Alberti
Oligosphaeridium sp. cf. *O. albertense* Pocock
Oligosphaeridium complex (White) Davey and Williams
Odontochitina operculata (Wetzel) Deflandre
Deflandrea sp. cf. *D. perlucida* Alberti
Chlamydothorella nyei Cookson and Eisenack
Dingodinium cerviculum Cookson and Eisenack
Palaeoperidinium cretaceum Pocock
Pseudoceratium pelliferum Gocht (?auct. non Gocht); Pocock
various unidentified dinoflagellates
age: Early Cretaceous, Neocomian (Barremian) to Aptian. Chamney (in Norford and others, 1970, p. 2) assigns this sample a Neocomian (Barremian) age based on the foraminiferal assemblage.

Depth 795-800 ft., core,
GSC loc. C-9157

Tigrisporite scurrandus Norris
Cicatricosisporites australiensis (Cookson) Potonié
Cyathidites minor Couper
Trilobosporites sp.
Rouseisporites reticulatus Pocock
Rouseisporites triangularis Pocock
Vitreisporites pallidus (Reissinger) Nilsson
Perinopollenites elatoides Couper
Esesipollenites tumulus Balme
Classopollis sp.
unidentified bisaccate grains
various acanthomorph acritarchs
Pterospermopsis australiensis Deflandre and Cookson
Microdinium opacum (MS name, Brideaux, in press)
Fromea amphora Cookson and Eisenack
Palaeostomocystis fragilis Cookson and Eisenack
Cleistosphaeridium multispinosum (Singh) (MS name, Brideaux, in press)
Cleistosphaeridium spp.
Hystriosphera ramosa (Ehrenberg) Wetzel var. *ramosa* Davey and Williams
? *Prolisosphaeridium* sp.
Odontochitina operculata (Wetzel) Deflandre
Dingodinium cerviculum Cookson and Eisenack
Palaeoperidinium cretaceum Pocock
Deflandrea sp. cf. *D. perlucida* Alberti
Pseudoceratium? nudum Gocht
"Broomea" jaegeri Alberti
Gonyaulacysta cretacea Neale and Sarjeant
Chlamydothorella nyei Cookson and Eisenack
Systematophora sp.
Palaeostomocystis sp. cf. *P. sinuosa* Cookson and Eisenack
age: Early Cretaceous, Neocomian, Hauterivian-Barremian.

Depth 900-910 ft., core,
GSC loc. C-4344

various trilete spores
Vitreisporites pallidus (Reissinger) Nilsson
Gleicheniidites senonicus (Ross) Skarby
various acanthomorph acritarchs
Hystriosphera ramosa (Ehrenberg) Wetzel
Odontochitina operculata (Wetzel) Deflandre
various dinoflagellate cysts
recycled Late Devonian-Early Mississippian spores
age: The palynologic assemblage cannot be dated more precisely than Early Cretaceous. Chamney (in Norford and others, 1970, p. 3) assigns the sample an Early Cretaceous, Neocomian, Hauterivian-Barremian age based on foraminiferal assemblages.

Depth 1,010-1,020 ft.,
core, GSC loc. C-4345

Vitreisporites pallidus (Reissinger) Nilsson
age: cannot be dated more precisely than Jurassic-Cretaceous. Chamney (in Norford and others, 1970, p. 3) assigns the sample an Early Cretaceous, Neocomian age based on foraminiferal assemblages.

Carboniferous to Cretaceous Assemblages (Spores) by M.S. Barss

Socony Mobil-W.M. Birch YT B-34

66°03'03.14"N., 136°51'17.51"W., figure 1, loc. 9

Depth 944-945.6 ft., core,
GSC loc. C-7430

Vitreisporites
Alisporites
Cycadopites
Cicatricosisporites
age: Early Cretaceous.

Depth 952-954 ft., core,
GSC loc. C-7431

Vitreisporites
Alisporites
Cycadopites
Lycopodiumsporites
Pityosporites
Podocarpites
Cicatricosisporites
other bisaccate types
Mississippian spores
age: Early Cretaceous.

Depth 1,298 ft., core,
Hart River Formation,
upper sandstone member,
GSC loc. C-7432

Vittatina
Limitisporites
Pityosporites
Protohaploxylinus
Potonieisporites
Mississippian spores
age: Permian.

Depth 1,300 ft., core,
Hart River Formation,
upper sandstone member,
GSC loc. C-7433

Vittatina, numerous
age: probably Permian.

- Depth 2,322-2,325 ft., core,
Hart River Formation,
middle member,
GSC loc. C-7436
- Florinites visendus* (Ibrahim) Schopf, Wilson and
Bentall
Potonieisporites elegans (Wilson and Kosanke)
Wilson and Venkatachala
Florinites sp.
Punctatisporites spp.
Densosporites spp.
Reticulatisporites cancellatus (Waltz) Playford
age: probably Middle Namurian. The presence
of *Florinites* and *Potonieisporites*
could indicate a Pennsylvanian or
possibly younger age. However the
other spores that are present appear to
have the same color and preservation
and their association with these two
taxa can be compared with the assemblage
reported by Felix and Burbridge (1967)
from the Springer Formation of Southern
Oklahoma.
- Depth 2,325-2,330 ft., core,
Hart River Formation,
middle member,
GSC loc. C-7437
- Florinites guttatus* Felix and Burbridge
Florinites visendus (Ibrahim) Schopf, Wilson and
Bentall
Perotrilites perinatus Hughes and Playford
Guthorlisporites sp.
Rugospora sp.
Schopfiipollinites sp.
Propriisporites sp.
Densosporites rarispinosus Playford
Murospora cf. *M. aurita* (Waltz) Playford
Potoniespores delicatus Playford
Potonieisporites elegans (Wilson and Kosanke)
Wilson and Venkatachala
age: probably Middle Namurian.
- Socony Mobil-W.M. Blackie No. 1 YT M-59
65°58'54.92"N., 137°11'10.87"W., figure 1, loc. 10
- Depth 1,960-1,964.6 ft.,
core 1, Hart River Formation,
upper sandstone member,
GSC loc. C-7445
- Vittatina*
Striatoabietites
Laevigatosporites
age: Permian (spores are broken and very
poorly preserved).
- Depth 1,974.3-1,978.6 ft.,
core 1, Hart River Formation,
upper sandstone member,
GSC loc. C-7446
- Vittatina* spp.
age: Permian.
- Depth 2,117.6 ft., core 2,
Hart River Formation,
upper sandstone member,
GSC loc. C-7447
- A specimen of a striate bisaccate type
age: Permian.
- Depth 2,127-2,130 ft.,
core 2, Hart River Formation,
upper sandstone member,
GSC loc. C-7448
- Potonieisporites* sp.
age: Permian.

- Depth 2,173-2,176 ft.,
core 4, Hart River Formation,
upper sandstone member,
GSC loc. C-7449
- Vittatina*, numerous
Striomonosaccites sp.
Limitisporites (sacs very badly broken)
age: Permian.
- Depth 2,963 ft., core 6,
Hart River Formation,
middle member, GSC
loc. C-7450
- Vittatina* spp.
Potoniopsis sp.
Limitisporites sp.
Vestigisporites sp.
age: Permian.
- Depth 2,970 ft., core 6,
Hart River Formation,
middle member, GSC
loc. C-7451
- Vittatina* sp.
Striatopodocarpites sp.
Striomonosaccites sp.
cf. *Lueckisporites* sp.
bisaccate type undet.
age: Permian.
- Depth 3,805 ft., core 7,
Hart River Formation,
middle member, GSC
loc. C-7452
- Vittatina* sp.
Protohaploxylinus sp.
Limitisporites sp.
Striatoabietites
age: Permian.
- Depth 3,900-3,903 ft.,
core 7, Hart River
Formation, middle member,
GSC loc. C-7453
- Vittatina* spp.
Protohaploxylinus sp.
Limitisporites sp.
age: Permian.
- Depth 3,905-3,910 ft.,
core 7, Hart River
Formation, middle member,
GSC loc. C-7454
- Vittatina* spp.
Florinites sp.
Vestigisporites sp.
age: Permian. There are not many spores for
interval 1,960-3,910 ft. and they are
in various states of preservation. The
immediate impression is that they belong
to the same assemblage. This assemblage
has been reported from the Tatonduk
River (Bamber and Barss, 1969) and is
considered to be of Permian age. Some
of the forms have their beginning in
latest Pennsylvanian but the abundance
of the striate bisaccate and striate
types without any evidence of typical
late Pennsylvanian types present would
favour the Permian age. There are re-
worked Mississippian spores in nearly
every sample (see Martin, 1969).
- Depth 6,322.6-6,327 ft.,
core 11, unnamed shale
unit, GSC loc. C-7465
- Densosporites* sp.
cf. *Stenozonotriletes* sp.
age: possibly Mississippian.
- Depth 6,336 ft., core 11,
unnamed shale unit,
GSC loc. C-7467
- Densosporites* spp.
Convolutispora sp.
Lycospora sp.
Monilospora sp.
Densosporites bialatus (Waltz) Potonié and Kremp
Anulatisporites anulatus (Loose) Potonié and Kremp
Murospora cf. *M. aurita* (Waltz) Playford
age: Viséan.

Socony Mobil-W.M. Whitestone YT N-26
66°05'59"N., 138°20'00"W., figure 1, loc. 8

Depth 7,940 ft., core 9, unnamed shale unit, GSC loc. C-7476	<i>Densosporites</i> sp. <i>Convolutispora</i> sp. <i>Reticulatisporites</i> sp. spores are very dark and poorly preserved age: no age determination possible.
Depth 7,940 ft., core 9, unnamed shale unit, GSC loc. C-7478	some very dark poorly preserved spores. <i>Murospora</i> cf. <i>M. aurita</i> (Waltz) Playford age: Viséan to Namurian suggested by the presence of <i>M. cf. M. aurita</i> .

Devonian to Cretaceous Assemblages (Foraminifera and associated microfaunas)
by T.P. Chamney

Socony Mobil-W.M. Molar YT P-34
67°03'59"N., 138°36'00"W., figure 1, loc. 5

Depth 270-500 ft., cuttings, Eagle Plains Formation, GSC locs. C-7966 - C-7970	<i>Haplophragmoides</i> ex gr. <i>H. linki</i> Nauss <i>Spiroplectammina</i> ex gr. <i>S. webberi</i> Tappan <i>Saccammina</i> sp. <i>Reophax</i> spp. <i>Bathysiphon</i> sp. (coarse) <i>?Ammodiscus</i> sp. megaspore Type III B age: Late Cretaceous, possibly youngest marine Campanian.
Depth 500-800 ft., cuttings, Eagle Plains Formation, GSC locs. C-7971 - C-7976	<i>Gaudryina</i> cf. <i>G. bearpawensis</i> Wickenden <i>Haplophragmoides</i> spp. <i>Hippocrepina</i> sp. <i>Hyperammina</i> sp. age: Late Cretaceous, probably Campanian, based on the <i>Gaudryina</i> .
Depth 800-1,000 ft., cuttings, Eagle Plains Formation, GSC locs. C-7977 - C-7980	<i>Gaudryina</i> cf. <i>G. bearpawensis</i> Wickenden <i>Haplophragmoides</i> spp. <i>Hyperammina</i> sp. <i>Hippocrepina</i> sp. <i>Plectina</i> sp. <i>Textularia</i> sp. radiolarians-discoid, pyritized forms age: Late Cretaceous, Campanian, as for above collections.
Depth 1,000-1,400 ft., cuttings, Eagle Plains Formation, GSC locs. C-7981 - C-7988	<i>Gaudryina</i> cf. <i>G. bearpawensis</i> Wickenden <i>Haplophragmoides</i> spp. <i>Hyperammina</i> sp. <i>Hippocrepina</i> sp. <i>Plectina</i> sp. <i>Textularia</i> sp. radiolarians - discoid, pyritized forms <i>Ammodiscus</i> sp. <i>Lituotuba</i> sp. <i>Verneuilinoides</i> sp. megaspores Type I C (sphericle forms) age: probably Campanian, as for above collections.

Depth 1,352-1,900? ft.,
cuttings, Eagle Plains
Formation, GSC locs.
C-7989 - C-8000

common light grey (white) irregular discoid
bodies (algal)
plant remains
vertebrate bones
teeth (?fish)
Saccammina (?*Pelosina*) sp. (rare, primitive)
Haplophragmoides sp. (rare, coarsely agglutinated)
age: Early Senonian (provisionally), based
on stratigraphic position and on faunal
and lithologic similarity to the Upper
Cretaceous pale shale zone of the
Anderson Plain.

Depth 1,900-2,500 ft.,
cuttings, Eagle Plains
Formation, GSC locs.
C-8001 - C-8016

Gavelinella spp.
Lenticulina spp.
Trochamminoides sp.
Trochammina spp. including ex gr. *T. ribstonensis*
Wickenden
Haplophragmoides spp.
Ammodiscus sp.
Miliammina sp.
Haplophragmoides ex gr. *H. eocalcula* Stelck and
Wall
Verneuilinoides - *Gaudryina* spp.
age: Late Cretaceous, Cenomanian. *Trochammina*
ex gr. *T. ribstonensis* Wickenden
indicates Late Cretaceous but the
general microfossil assemblage is
comparable to that of the Grandstand
Formation of Alaska (Tappan, 1962) or
the unnamed shale overlying the Lower
Cretaceous, Trevor Formation (Mountjoy
and Chamney, 1969)

Depth 2,500-3,300 ft.,
cuttings, GSC locs.
C-8017 - C-8034

Miliammina sp.
Psamminopelta sp.
Gaudryina sp.
Tritaxia - like *Gaudryina* sp.
Ammobaculites fragmentarius Cushman
Lenticulina sp.
Gavelinella sp.
?Eopondidella sp.
age: Albian, probably Middle Albian;
indicating an unconformable relationship
with the overlying sequence. The top
of ?Middle/Early Albian quartzitic sand-
stone is picked at 6,090 ft. in the well.
Thus the interval 2,500 to 6,090 represents
an abnormally thick development of
Middle Albian rocks and possibly some
part of this interval is actually Upper
Albian.

Depth 3,300-4,150 ft.,
cuttings, GSC locs.
C-8035 - C-8055

Hyperammina spp. (weak)
Bathysiphon sp. (coarsely agglutinated)
Ammodiscus sp. (rare)
Gavilinelina sp.
Haplophragmium sp.
Trochammina sp.
Reophax (*Proteonina*) sp.
Lituotuba sp.
age: Albian

- Depth 4,150-4,650 ft.,
cuttings, GSC locs.
C-8056 - C-8065
- Hyperammina* sp. (weak, similar to above faunules)
Bathysiphon sp.
abundant small black iron spheres
- Depth 4,660 - 5,300 ft.,
cuttings, GSC locs.
C-8066 - C-8080
- Miliammina sproulei* Nauss
Dictyometra sp.
Conorbina sp.
Hyperammina (*Shizammina*) spp. (abundant)
Reophax sp. (coarsely agglutinated)
age: Early to Middle Albian.
- Depth 5,300-5,750 ft.,
cuttings, GSC locs.
C-8081 - C-8090
- ?*Trochamminoides* sp. (rare)
Reophax sp. (same as in above faunules)
wood fragments, pyritized and carbonized increase
age: Early to Middle Albian?
- Depth 5,750-6,100 ft.,
cuttings, GSC locs.
C-8091 - C-8100
- Trochamminoides* cf. *T. eilete* Tappan
age: ?Albian; approximately stratigraphically
equivalent to occurrence of same species
in Division 11 of the Reindeer D-27
well. (Chamney, 1971).
- Depth 6,090-6,530 ft.,
cuttings, GSC locs.
C-8101 - C-8111
- Barren, dark grey, hard quartzitic sandstone.
- Depth 6,550-7,100 ft.,
cuttings, GSC locs.
C-8112 - C-8119
- Trochamminoides* cf. *T. eilete* Tappan
Serovaina sp.
Hippocrepina barksdalei (Tappan)
Ammobaculites cf. *A. fragmentarius* Cushman
Haplophragmoides spp.
age: probably Early Albian; based on *T. eilete* occurring fairly early in the Albian of Yukon (Tappan, 1962) and the stratigraphic position of the depositional interval.
- Depth 7,100-7,400 ft.,
cuttings, GSC locs.
C-8120 - C-8127
- Dictyometra* spp. (abundant, pyritized)
Ammobaculites spp.
Hippocrepina sp.
Hyperammina sp.
Haplophragmoides sp. (minute)
Reophax sp. 9B
? *Siphotextularia* sp.
age: Early Albian; can be referred to the Lower Albian Division 14 of the Reindeer D-27 borehole (Chamney, 1971); and represents the biostratigraphic equivalent of the Lower Albian part of the Martin House Formation (Mountjoy and Chamney, 1969).

Depth 7,400-7,650 ft.,
cuttings, GSC locs.
C-8128 - C-8137

Haplophragmoides duoflatis Chamney
Gaudryina tappanae Chamney
?Siphotextularia (Bimonilina) sp.
Ammobaculites sp.
Textularia sp.
Trochammina sp. ("exotic" development)
Hyperammina spp. (very abundant)
belemnite phragmacone fragments
fish teeth and bones
age: earliest Cretaceous, ?Neocomian; a
local (?) unconformity postulated at
7,400 ft.

Depth 7,650-7,900 ft.,
cuttings, GSC locs.
C-8138 - C-8142

Marginulinopsis phragmites Loeblich and Tappan
Marginulinopsis spp.
Dentalina sp.
Astacolus sp.
Saracenaria sp.
Lenticulina spp.
Lagena sp.
Nodosaria sp.
polymorphinid (*?Polymorphina* sp.)
belemnite phragmacone fragments
age: Callovian or Early Oxfordian. *M.*
phragmites Loeblich and Tappan is an
index species for the Middle/Late
Jurassic (Callovian) as is the general
acme of occurrence of lagenid
Foraminifer.
environment: This division is the strongest
marine environment encountered in the
borehole based on the quantity of
Foraminifera and the common occurrence
of pseudopelagic, calcareous, lagenid
Foraminifera.

Depth 7,979.5-8,143.5 ft.,
cuttings, GSC locs.
C-8143 - C-8153

Haplophragmoides canui Cushman
Ammobaculites ex gr. *A. barrowensis* Tappan
Gaudryina ex gr. *G. fischeri* Tappan
Haplophragmoides ex gr. *H. goodenoughensis*
Chamney

megaspores: Type IA, crenulated spheres,
(pyrite casts, very abundant)
age: Late Jurassic; based on the stratigraphic
position between Early and Late Jurassic
assemblages and occurrence of *H. canui*.
The electric log indicates a major rock
characteristic change at the depth
8,052 feet within the sandstone
sequence.

Depth 8,150-8,704 ft.,
cuttings, GSC locs.
C-8154 - C-8167

?megaspore cases, Type IA (pyritized)
Trochamminoides sp. (pyritized)
Haplophragmoides ex gr. *H. neocomiana* (Chapman)
Ammodiscus ex gr. *A. aspera* Terquem, similar to
A. thomasi Chamney (Wilkie Point-Bug Creek
Formations) (pyritized casts)
age: Middle to Early Jurassic; Toarcian to
Bathonian.

Shell Blackwater Lake G-52

64°01'20"N., 122°55'12"W., figure 1, loc. 16 (note pollen identified by Hopkins)

Depth 600-640 ft.,
cuttings, GSC loc.
C-7955

Haplophragmoides ex gr. *H. spissus* Stelck and
and Wall, common
Haplophragmoides spp.
Trochammina sp. (few)
Miliammina ex gr. *M. sproulei* Nauss
Ammodiscus spp. (few)
?Psammionopelta sp. (rare)
?Lituotuba sp. (few)
Siphotextularia cf. *S. rayi* Tappan (few)
Urigerinammina cf. *U. manitobensis* Wickenden
(few)
Verneuilinoides sp. (abundant)
Ammobaculites fragmentarius Cushman (common)
Saccammina (*Pelosina*) sp. (few)
Saccammina lathrami Tappan (few)
Hippocrepina sp. (rare)
Hyperammina sp. (rare)
Serovaina (*Valvulineria*) sp. (rare)
radiolaria: *Dictyometra* sp. (pyritized), (common)
?Dentalina sp.
Inoceramus sp. prisms (common)
vertebrate bone (pyritized, few)
echinoid spines (pyritized, few)
pyrite rods, (abundant)
pyritized wood, (common)
siderite pellets, (very abundant)
age: Early Cretaceous, Albian, possibly
Early Albian.
environment: restricted marine, but with
access to open marine.

Depth 640-650 ft.,
cuttings, GSC loc.
C-7956

Haplophragmoides ex gr. *H. spissus* Stelck and
Wall, (few)
H. spp.
Ammobaculites fragmentarius Cushman (few)
Siphotextularia cf. *S. rayi* Tappan, (rare)
?Gaudryina sp. (rare)
Miliammina ex gr. *M. sproulei* Nauss
vertebrate bone (few)
wood, pyritized (common)
radiolaria: *Dictyometra* sp. (pyritized, few)
megaspores Type 1D
siderite pellets (very abundant)
age: Early Cretaceous, Albian possibly
Early Albian.
environment: restricted marine, but with
access to open marine.

Depth 650-660 ft.,
cuttings, GSC loc.
C-7957

Haplophragmoides sp. (few)
Saccammina sp. (few)
?Reophax sp. (rare)
ammonite shell fragments (few)
Inoceramus sp. prisms (common)
siderite pellets (common)
wood, carbonized (few)
coal (common)

age: Early Cretaceous, Albian, possibly
Early Albian.
environment: marine, becoming more restricted
than overlying intervals.

Depth 660-670 ft.,
cuttings, GSC loc.
C-7958 ?*Styliolina* ex gr. *S. fissurella* (Hall) (common)
vertebrate bone (few)
age: Paleozoic, Devonian, possibly Middle
Devonian (Givetian).
environment: marine, shallow.

Depth 670-680 ft.,
cuttings, GSC loc.
C-7959 gastropoda spp. (few)
Styliolina ex gr. *S. fissurella* (Hall) (few)
pyrite spheres, common
age: Paleozoic, Devonian, possibly Middle
Devonian (Givetian).
environment: marine, shallow, near shore.

Depth 680-690 ft.,
cuttings, GSC loc.
C-7960 productid spines, (few)
Ostracoda sp. (rare)
Styliolina ex gr. *S. fissurella* (Hall) (few)
age: Paleozoic, Devonian, possibly Middle
Devonian (Givetian).
environment: marine, undifferentiated.

Comments: Unpublished studies by Chamney and Cook reveal Upper Cretaceous rocks resting directly on the Devonian at 66°28'N., 123°40'W., about fifty miles north of the Blackwater Lake G-52 borehole. If the disappearance of the entire Lower Cretaceous sequence within this relatively short distance was due to depositional thinning then one would expect quite restricted marine conditions to have been present during deposition of the Lower Cretaceous sequence in the Blackwater G-52 borehole. However, the paleoecological evidence for interpretation of the environment of deposition indicates that quite good marine conditions (with access to open marine) were present at that time. Therefore, structural deformation involving truncation of the Lower Cretaceous prior to the Late Cretaceous marine overlap might better explain the stratigraphic relationships in the Blackwater G-52 well.

Devonian Assemblages (Conodonts) by T.T. Uyeno

G.P.D. Noel Mills Lake B-41
61°40'05"N., 116°53'17.02"W., figure 1, loc. 18

Depth 325-330 ft., core,
Fort Simpson Formation,
GSC loc. C-8918 *Polygnathus* cf. *P. xylus* Stauffer
Ozarkodina? sp. (fragmentary specimen)
age: Middle to Late Devonian.

Depth 345-350 ft., core,
Fort Simpson Formation,
GSC loc. C-8922 *Elsoneilla rhenana* Lindström and Ziegler
(*falcodus* element)
Angulodus cf. *A. demissus* Huddle
Icriodus symmetricus Branson and Mehl
Hindeodella sp.
age: early Late Devonian, lower part of the
Lower *Polygnathus asymmetricus* Zone.

Depth 350-365 ft., core,	<i>Icriodus cymbiformis</i> Branson and Mehl
Fort Simpson Formation,	<i>Polygnathus</i> cf. <i>P. xylus</i> Stauffer
GSC locs. C-8923 - C-8925	indet. fragments
	age: Middle to Late Devonian.

Devonian Assemblages (Corals and other megafossils) by A.E.H. Pedder

Imperial Sun Arrowhead I-46

60°45'37"N., 122°22'47"W., figure 1, loc. 22 (note ostracodes identified by Braun in Norford and others, 1970)

Depth 6,415 ft., core,	<i>Stachyodes verticillata</i> (McCoy)
GSC loc. C-8859	<i>Thamnopora</i> sp. undet.
	<i>Temnophyllum</i> sp. nov.
	<i>Grypophyllum mackenziense</i> (Pedder)
	<i>Cyrtina</i> sp. indet.
	age: Late Devonian, <i>mackenziense</i> Zone.

Depth 6,424 ft., core,	<i>Thamnopora</i> sp. undet.
GSC loc. C-8861	<i>Cladochonus</i> sp. indet.
	<i>Temnophyllum</i> sp. nov.
	<i>Grypophyllum</i> sp. indet.
	<i>Cyrtina</i> sp. indet.
	age: Middle or Late Devonian.

Depth 6,426 ft., core,	<i>Grypophyllum mackenziense</i> (Pedder)
GSC loc. C-8862	age: Late Devonian, <i>mackenziense</i> Zone.

Depth 6,427.5 ft., core,	<i>Alveolites</i> sp. undet.
GSC loc. C-8865	<i>Thamnopora</i> sp. undet.
	<i>Cladochonus</i> sp. indet.
	<i>Temnophyllum</i> sp. nov.
	<i>Grypophyllum</i> sp. indet.
	age: Middle or Late Devonian

Depth 6,428.5-6,429 ft.,	<i>Thamnopora</i> sp. undet.
core, GSC locs. C-8863 -	<i>Temnophyllum</i> sp. indet. and sp. nov.
C-8864	stromatoporoids, not studied
	age: Middle or Late Devonian.

Depth 6,431-6,432 ft.,	<i>Thamnopora</i> sp. undet.
core, GSC locs. C-8866 -	<i>Temnophyllum</i> sp. nov.
C-8868	<i>Grypophyllum mackenziense</i> (Pedder)
	<i>Alveolites</i> sp. undet.
	age: Late Devonian, <i>mackenziense</i> Zone.

Depth 6,435-6,436 ft.,	<i>Thamnopora</i> sp. undet.
core, GSC locs. C-8869 -	<i>Temnophyllum</i> sp. nov.
C-8870	<i>Alveolites</i> sp. undet.
	<i>Cladochonus</i> sp. indet.
	<i>Grypophyllum</i> sp. nov.
	age: Middle or Late Devonian.

Depth 6,439 ft., core,	<i>Thamnopora</i> sp. undet.
GSC loc. C-8872	<i>Temnophyllum</i> sp. nov.
	age: Middle or Late Devonian.

Depth 6,439.5 ft., core,
GSC loc. C-8871

Stachyodes verticillata (McCoy)
Thamnopora sp. undet.
Cladochonus sp. indet.
Temnophyllum sp. nov.
Grypophyllum mackenziense (Pedder)
age: Late Devonian *mackenziense* Zone.

Depth 6,442.5 ft., core,
GSC loc. C-8873

Stachyodes verticillata (McCoy)
Thamnopora sp. undet.
Temnophyllum sp. nov.
Grypophyllum sp. indet.
age: Middle or Late Devonian

Comments: Probably the entire 30-foot interval is referable to the *Grypophyllum mackenziense* Zone. Elsewhere, notably at Powell Creek, *Grypophyllum mackenziense* occurs with conodonts identified by Uyeno as being diagnostic of the upper *hermanni-cristatus* Zone. This part of the zone has generally been regarded as latest Middle Devonian in North America, but in Europe it is now considered to be the earliest Upper Devonian conodont horizon (Kullman and Ziegler, 1970).

In terms of local stratigraphy it should be older than the Waterways Formation of northeastern Alberta and younger than the *Stringocephalus*-bearing beds of the Sulphur Point Formation of southern Great Slave Lake.

Atlantic S.W. Airport Creek No. 1
66°21'10"N., 129°14'44"W., figure 1, loc. 12

Depth 371 ft., core,
114 ft. above base,
9 ft. below top of
Ramparts Formation,
GSC loc. C-9107

Thamnopora sp. undet.
Spinatrypa sp. indet.
Ladjia? sp. indet., ex gr. *L. landesi* Crickmay
age: Late Devonian, *mackenziense* Zone?

Depth 376 ft., core,
109 ft. above base,
14 ft. below top of
Ramparts Formation,
GSC loc. C-9108

Alveolites sp. undet.
Spinatrypa sp. indet.
Emanuelia? sp. undet.
age: pre-Famennian, Devonian.

Depth 378.5 ft., core,
106.5 ft. above base,
16.5 ft. below top of
Ramparts Formation,
GSC loc. C-9109

Alveolites sp. undet.
Thamnopora sp. indet.
Grypophyllum mackenziense (Pedder)
Emanuelia? sp. undet.
age: Late Devonian, *mackenziense* Zone.

Depth 382 ft., core,
103 ft. above base,
20 ft. below top of
Ramparts Formation,
GSC loc. C-9110

Thamnopora sp. undet.
age: Silurian to pre-Famennian, Devonian.

Depth 387 ft., core,
98 ft. above base,
25 ft. below top of
Ramparts Formation,
GSC loc. C-9102

Thamnopora sp. undet.
Moravophyllum sp. nov.
age: Middle Devonian.

Depth 388 ft., core,
97 ft. above base,
26 ft. below top of
Ramparts Formation,
GSC loc. C-9111

Thamnopora sp. undet.
Temnophyllum sp. nov.
age: Middle to Late (pre-Famennian) Devonian.

Depth 390-391 ft.,
core, 94-95 ft. above
base, 28-29 ft. below
top of Ramparts Formation,
GSC loc. C-9112

Thamnopora sp. undet.
Temnophyllum richardsoni (Meek)
T. sp. nov.
Disphyllum? sp. undet.
Grypophyllum sp. indet.
Tabulophyllum sp. indet.
age: Middle Devonian, *aleskanus* Zone.

Depth 394 ft., core,
91 ft. above base,
32 ft. below top of
Ramparts Formation,
GSC loc. C-9113

Plasmophyllum sp. indet.
age: Early or Middle Devonian.

Depth 397.5-398.5 ft.,
core, 86.5-87.5 ft.
above base, 35.5-36.5 ft.
below top of Ramparts
Formation, GSC loc. C-9114

Amphipora sp. undet.
Thamnopora sp. undet.
Plasmophyllum sp. indet.
Emanuelia sp. indet.
age: Early or Middle Devonian.

Comments: The upper 17 feet (C-9107 to C-9109) of the Ramparts Formation (broad sense) in this well are referable to the *Grypophyllum mackenziense* Zone (see comments on Arrowhead No. I-46 well). The underlying *Stringocephalus aleskanus* Zone is present 28 feet below the top of the Ramparts (C-9112) and may extend to within 25 feet of the top (C-9102) since *Moravophyllum* has not previously been found in beds as young as the *mackenziense* Zone.

Depth 1,359 ft., core,
271 ft. above base,
84 ft. below top of
Hume Formation, GSC
loc. C-9105

Sociophyllum glomerulatum (Crickmay)?
age: Middle Devonian, *adoceta* or
dysmorphostrota Zones.

Depth 1,365 ft., core,
265 ft. above base,
90 ft. below top of
Hume Formation, GSC loc.
C-9106

Radiastraea verrilli (Meek)
age: Middle Devonian, *adoceta* or
dysmorphostrota Zones.

Comments: *Sociophyllum glomerulatum* (Crickmay), which may be present in C-9105 (single small corallite only), and *Radiastraea verrilli* (Meek) are common in the upper Hume *Carinatina dysmorphostrota* Zone, but also occur in the lower Hume "*Schuchertella*" *adoceta* Zone. On the basis of conodonts, Uyeno now considers the entire Hume to be Eifelian.

Union Pan Am. Trainor L-59

60°28'33"N., 120°40'50"W., figure 1, loc. 23 (note revisions of corals identified by Pedder in Norford and others, 1970, p. 10)

Depth 5,831.5-5,838.25 ft.,
core, GSC locs. C-8981 -
C-8982

Grypophyllum spp.
age: Middle or Late Devonian, early Frasnian.

- Depth 5,846 ft., core,
GSC loc. C-3984 *Hermatostroma* sp. (identified by N.R. Fischbuch)
Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.
- Depth 5,835 ft., core,
GSC loc. C-3985 *Stachyodes* sp.
Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.
- Depth 5,867.5-5,901.5 ft.,
core, GSC locs. C-8983 -
C-8986, C-9005 *Grypophyllum mackenziense* (Pedder)
age: Late Devonian, *mackenziense* Zone.
- Depth 5,917 ft., core,
GSC loc. 399 *Temnophyllum* n. sp.
age: Middle or Late (pre-Famennian) Devonian.
- Depth 5,927 ft., core,
GSC loc. C-9006 *Stachyodes verticillata* (McCoy)
Thamnopora sp. undet.
Cladochonus sp. indet.
Temnophyllum sp. nov.
Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.
- Depth 5,927.5 ft., core,
GSC loc. C-9007 *Thamnopora* sp. undet.
Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.
- Depth 5,933-5,935 ft.,
core, GSC locs. C-9008 -
C-9009 *Thamnopora* sp. undet.
Temnophyllum sp. nov.
Cyrtina sp. indet.
atrypid, indet.
age: Middle or Late (pre-Famennian) Devonian.
- Depth 5,937 ft., core,
GSC loc. C-9010 *Stachyodes* sp. indet.
Thamnopora sp. undet.
Cladochonus sp. indet.
Temnophyllum (?) sp. nov.
Grypophyllum sp. indet.
Cyrtina sp. indet.
age: Middle or Late (pre-Famennian) Devonian.
- Depth 5,938.5 ft., core,
GSC loc. C-9011 *Alveolites* sp. undet.
Grypophyllum mackenziense (Pedder)?
age: Late Devonian, *mackenziense* Zone.
- Depth 5,939.5 ft., core,
GSC loc. C-9012 *Stachyodes verticillata* (McCoy)
Thamnopora sp. undet.
Temnophyllum sp. nov.
Grypophyllum sp. indet.
Cyrtina sp. indet.
age: Middle or Late (pre-Famennian) Devonian,
early Frasnian.
- Depth 5,940 ft., core,
GSC loc. C-9013 *Alveolites* sp. undet.
Thamnopora sp. undet.
Temnophyllum sp. nov.
Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.

- Depth 5,942 ft., core,
GSC loc. C-9014 *Thamnopora* sp. undet.
 Cladochonus sp. indet.
 Temnophyllum sp. nov.
 Grypophyllum mackenziense (Pedder)
 age: Late Devonian, *mackenziense* Zone.
- Depth 5,944 ft., core,
GSC loc. C-403 *Thamnopora* sp.
 Temnophyllum sp. nov.
 age: Middle or Late (pre-Famennian) Devonian.
- Depth 5,949 ft., core,
GSC loc. C-9015 *Alveolites* sp. undet.
 Thamnopora sp. undet.
 Cladochonus sp. indet.
 Temnophyllum sp. nov.
 Grypophyllum sp. indet.
 Cyrtina sp. indet.
 age: Middle or Late (pre-Famennian) Devonian.

Comments: *Grypophyllum mackenziense*, which is an important index to at least part of the post-*Stringocephalus* and pre-Waterways interval in western Canada, occurs from 5,867.5 to 5,942 feet (C-8983 to C-9014). This coral is also believed to be a megafossil index to the upper part of the *hermanni-oristatus* conodont zone, which in Germany is now taken as the lowest Upper Devonian zone (see comments on Arrowhead No. I-46 well).

The black micritic beds between 5,923 and 5,950 feet (C-9005 to C-9015) appear to be identical in both age and facies to the interval between 6,413 and 6,443 feet in the Imperial Oil Arrowhead I-46 well. Although these intervals have been assigned to the Pine Point Formation in the past, there can now be no doubt that they are younger than both the Sulphur Point and Pine Point exposures on the south shore of Great Slave Lake.

Placid Chevron Kakisa J-65
60°44'42"N., 117°27'07"W., figure 1, loc. 21

- Depth 2,598 ft., core,
153 ft. below top,
57 ft. above base of
Sulphur Point Formation,
GSC loc. C-4189 *Stringophyllum* sp. indet.
 age: Middle Devonian.
- Depth 2,608 ft., core,
163 ft. below top,
47 ft. above base of
Sulphur Point Formation,
GSC loc. C-4191 *Heliolites relictus* Stumm subsp. nov.
 age: Middle Devonian, Givetian (?) *H. relictus*
 Stumm was originally described from
 Givetian strata in Nevada. Its presence
 here may prove to be a link in correlat-
 ing it with the Horn Plateau Formation
 which contains the same form.

C.D.R. Chevron Mills Lake L-10
61°09'55"N., 117°19'40"W., figure 1, loc. 20

- Depth 1,845-1,850 ft.,
core, 143-148 ft. below
top of Lower Keg River
Formation, 6-11 ft. above
transition to Chinchaga
equiv., GSC loc. C-7954 *Alveolites* sp. nov.
 age: Middle Devonian, probably late Eifelian.
 This species is probably identical with
 an undescribed species occurring in the
 Hume Formation. The Hume Formation is
 now regarded as being entirely of late
 Eifelian age.

N.W.T. Deep Bay No. 2

61°18'00"N., 116°48'00"W., figure 1, loc. 19

Depth 366-371 ft., core,
21-25 ft. below top and
284-289 ft. above base of
Slave Point Formation
(Imperial Oil sample)

Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.

Depth 660-664 ft., core,
5-9 ft. below top and
9-13 ft. above base of
Watt Mountain Formation
(Imperial Oil sample)

Grypophyllum sp. nov.
age: Middle or Late Devonian.

Imperial Canol Mac No. 1

65°15'30"N., 126°59'00"W., figure 1, loc. 14

Depth 2,262 ft., core,
165 ft. below top and
327 ft. above base of
Ramparts Formation
(Imperial Oil sample)

Grypophyllum sp.
age: Middle or Late Devonian.

Depth 2,290 ft., core,
193 ft. below top and
299 ft. above base of
Ramparts Formation
(Imperial Oil sample)

Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.

Imperial Norman Wells No. 37x

65°16'57"N., 126°51'50"W., figure 1, loc. 13

Depth 1,161-1,172 ft.,
core, 138-149 ft. below
top of Ramparts Formation,
267-278 ft. above bottom
of hole, also in Ramparts
Formation, (Imperial Oil
sample)

Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.

Depth 1,257-1,262 ft.,
core, 234-239 ft. below top
of Ramparts Formation, 177-
182 ft. above bottom of
hole, also in Ramparts
Formation (Imperial Oil
sample)

Grypophyllum mackenziense (Pedder)
age: Late Devonian, *mackenziense* Zone.

Comments: Crickmay (1970) asserts that the Beavertail (equals upper Ramparts in the broad sense), Slave Point and lower Swan Hills Formations may be correlated on the basis of the tetracorals "*Alaiophyllum*" *mackenziense* and species of *Neoglomunaria*, and that the zone made recognizable by these fossils is either earliest Frasnian, or on the borderline between the Frasnian and Givetian. Conodonts identified by Uyeno indicate that the range of *Grypophyllum mackenziense* is equivalent to the upper *hermanni cristatus* Zone, which in Germany is now regarded as the oldest Upper Devonian conodont assemblage (see comments on Arrowhead No. I-46 well).

Ordovician and Silurian Assemblages (Corals, Brachiopods and Graptolites)
by B.S. Norford

Socony Mobil-W.M. N. Cath YT B-62

66°11'13.5"N., 138°41'53"W., figure 1, loc. 7

Depth 6,037.5-6,039 ft., echinoderm debris
core, Road River Formation, solitary coral
GSC locs. C-9989 and C-9990 *Favosites* 2 spp.
Heliolites sp.
age: Silurian to Middle Devonian.

Depth 6,040 ft., core, *Cyrtograptus* cf. *C. lundgreni* Tullberg
Road River Formation, *Monograptus* aff. *M. flemingi* (Salter)
GSC loc. C-9991 age: Silurian, Wenlock.

I.O.E. Stoney I-50

67°29'44"N., 135°22'46"W., figure 1, loc. 2

Depth 8,944-8,962 ft., echinoderm debris
core, GSC locs. C-1459 - indeterminate ostracode
C-1466 indeterminate solitary coral
Catenipora sp.
Favosites 2 spp.
pentamerid brachiopod
age: Silurian.

Socony Mobil-W.M. S. Tuttle YT N-5

66°24'51.2"N., 136°46'22.7"W., figure 1, loc. 6

Depth 8,339-8,340 ft., indeterminate ostracodes
core, Gossage Formation, *Atrypella* sp.
GSC locs. C-10010 - C-10011 age: probably Late Silurian, Ludlow.

Depth 8,897.5-8,898 ft., indeterminate gastropods and straight cephalopod
core, Road River Formation, *Alispira* sp.
GSC locs. C-10012 - C-10013 *Pentameroides* sp.
Encrinurus cf. *E. princeps* Poulsen
age: Silurian, probably Late Llandovery.

Depth 9,523-9,530.5 ft., echinoderm debris
core, GSC locs. C-10014 - *Bighornia* sp.
C-10015 *Palaeophyllum* sp.
Catenipora sp.
Palaeofavosites sp.
age: Late Ordovician.

I.O.E.-Triad Ebbutt J-70

62°19'31"N., 121°57'03"W., figure 1, loc. 17 (note conodonts and ostracodes
identified by Uyeno and Braun in Norford and others, 1970, pp. 11-12)

Depth 2,616-2,625 ft., *Favistina* sp.
core, Ronning Group, GSC *Lobocorallium* sp.
locs. C-10016 and C-10016a *Palaeofavosites* 2 spp.
age: Late Ordovician.

S.O.B.C. Blackstone YT D-77

65°46'10.77"N., 137°14'54.78"W., figure 1, loc. 11

- Depth 9,305 ft., core, *Bighornia* sp.
GSC loc. C-2930 age: Late Ordovician.
- Depth 9,310.5 ft., core, indeterminate brachiopods
GSC loc. C-2931 *Megamyaonia* sp.
age: Late Ordovician.
- Depth 9,323.5-9,324.5 ft., undetermined stromatoporoid
core, GSC locs. C-2934 and *Palaeophyllum* spp.
C-2935 age: probably Late Ordovician.
- Depth 9,330-9,335.5 ft., echinoderm debris
core, GSC locs. C-2938 undetermined stromatoporoid
and C-2939 *Bighornia* sp.
Catenipora sp.
age: Late Ordovician.

Middle Cambrian Assemblages (Brachiopods and Trilobites) by W.H. Fritz

Imperial Vermilion Ridge No. 1

65°07'51"N., 126°05'00"W., figure 1, loc. 15

- Depth 5,788-5,806 ft., *Glossopleura* sp.
core, Mount Cap Formation, *Hyolithes* sp.
GSC locs. C-6860 - C-6862 *Paterina?* sp.
Lingulella sp.
Micromitra sp.
age: lower Middle Cambrian *Glossopleura*
Zone. Fossils from this zone have been
reported from 3,233-3,235 ft. in the
Shell Keele River L-4 well (Fritz in
Norford and others, 1970). In the
southern Canadian Cordillera, fossils
of the *Glossopleura* Zone are present
in the uppermost Gordon Shale and the
upper part of the Cathedral Formation
(Fritz and Norris, 1966), and in
Mountjoy's (1963, p. 9) Map Unit 3.
- Depth 5,952-5,972 ft., *Glossopleura* sp.
core, Mount Cap Formation, *Hyolithes* sp.
GSC locs. C-6863 - C-6866 age: lower Middle Cambrian *Glossopleura* Zone,
as for above collection.

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