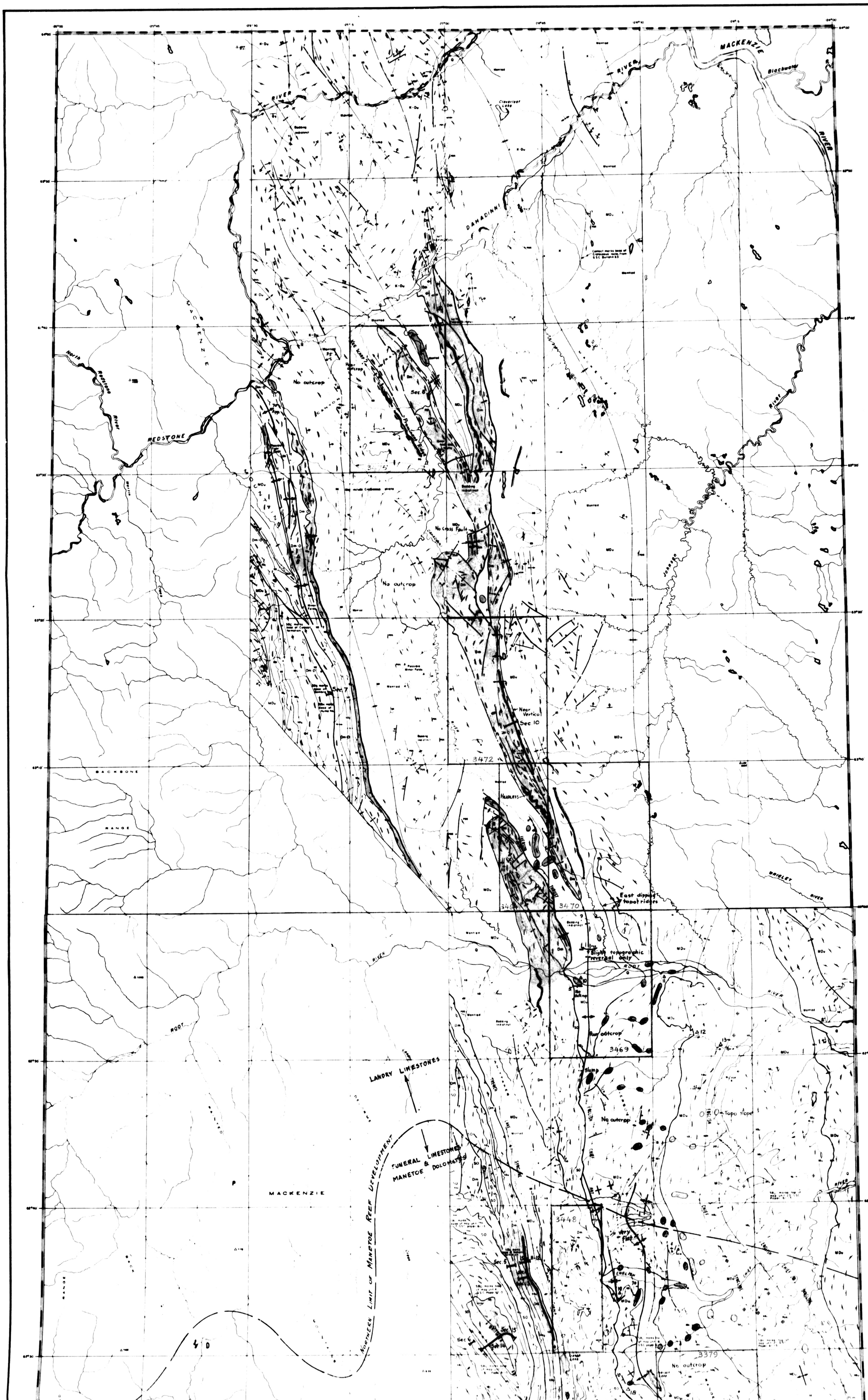
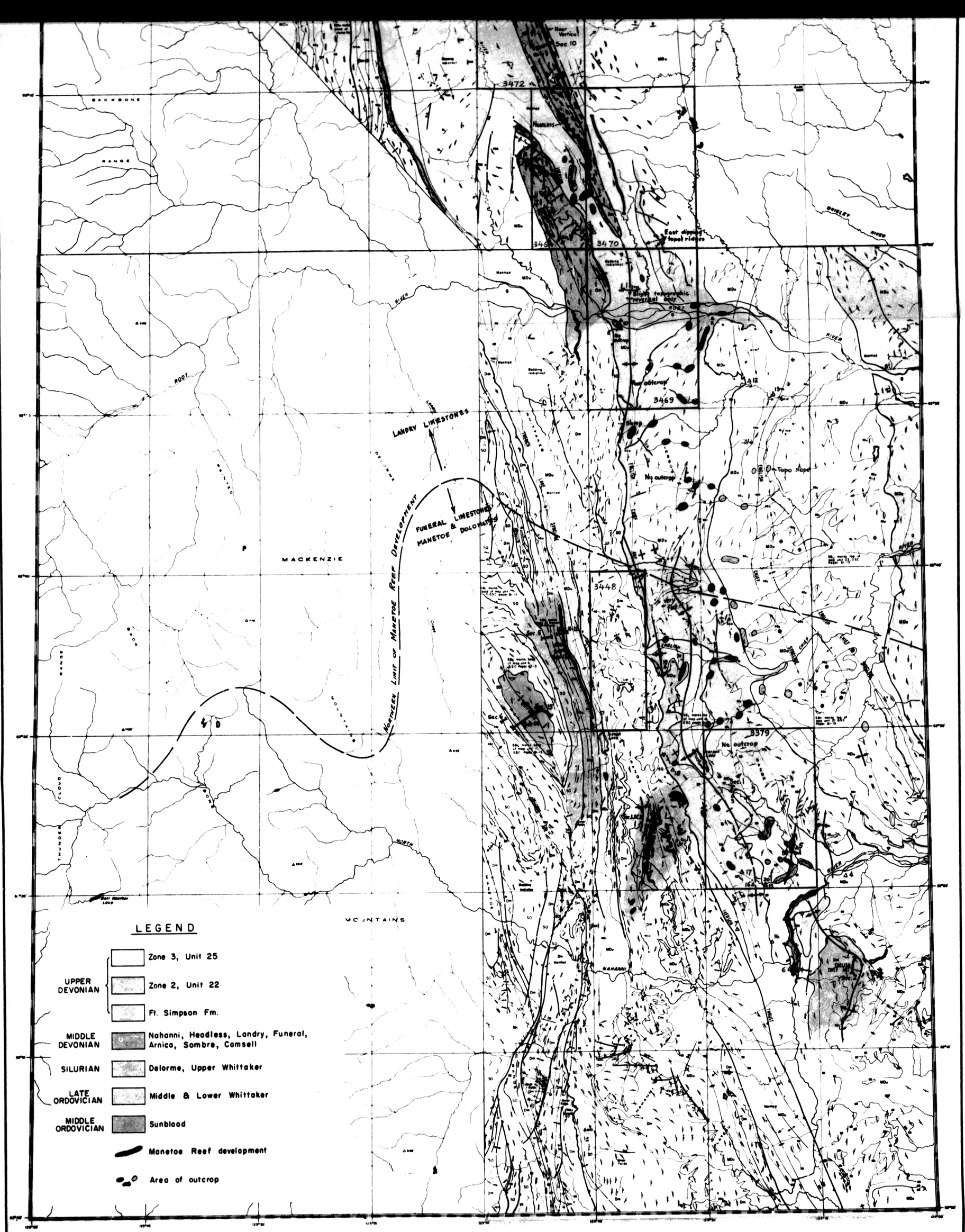

MACKENZIE
RIVER
Blackwater
RIVER
Clausen Lake
DAHADINNI
Contact marks base of Cretaceous rocks from GSC Bulletin 65
MACKENZIE
North Redstone River
REDSTONE
No outcrop
Sec 8
Bedding indistinct
No Cross Fault
No outcrop
Sec 7
Near Vertical
Sec 10
3472
BACKBONE
RANGE
HEADLESS
3468
3470
East dipping topo ridges
BAILEY
RIVER
Slight topographic reversal only
ROOT
RIVER
No outcrop
3469
Slump
LANDRY LIMESTONES
No outcrop
Topo slope
3448
very flat
3379
No outcrop
FUNERAL LIMESTONES
MANETOE & DOLOMITES
NORTHERN LIMIT OF MANETOE REEF DEVELOPMENT
MACKENZIE
RANGE
4 D



LEGEND

FORMATION OR GROUP AND DOMINANT LITHOLOGY

SEDIMENTARY ROCKS

IGNEOUS ROCKS

GEOLOGICAL SYMBOLS

GEOMORPHIC SYMBOLS

CULTURAL AND GEOGRAPHICAL SYMBOLS

AREAL GEOLOGY AND STRUCTURAL INTERPRETATION MAP OF THE NORTHERN RICHARDSON MTNS. NORTHERN PEEL PLATEAU AREA YUKON AND NORTHWEST TERRITORIES

– Prepared by –

V. ZAY SMITH ASSOCIATES LTD.
CALGARY, ALBERTA

SCALE
One inch to four miles

This map was prepared by means of stereoscopic examination of air photographs, utilizing pertinent published geologic information

INDEX TO MAP SHEETS

2 OF 2

REPORT ON

THE GEOLOGICAL SURVEY

ROOT RIVER AREA

Northwest Territories

BY

TECK CORPORATION LIMITED

Canadian Devonian Petroleum Division

JUNE 1963 - OCTOBER 1964

TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

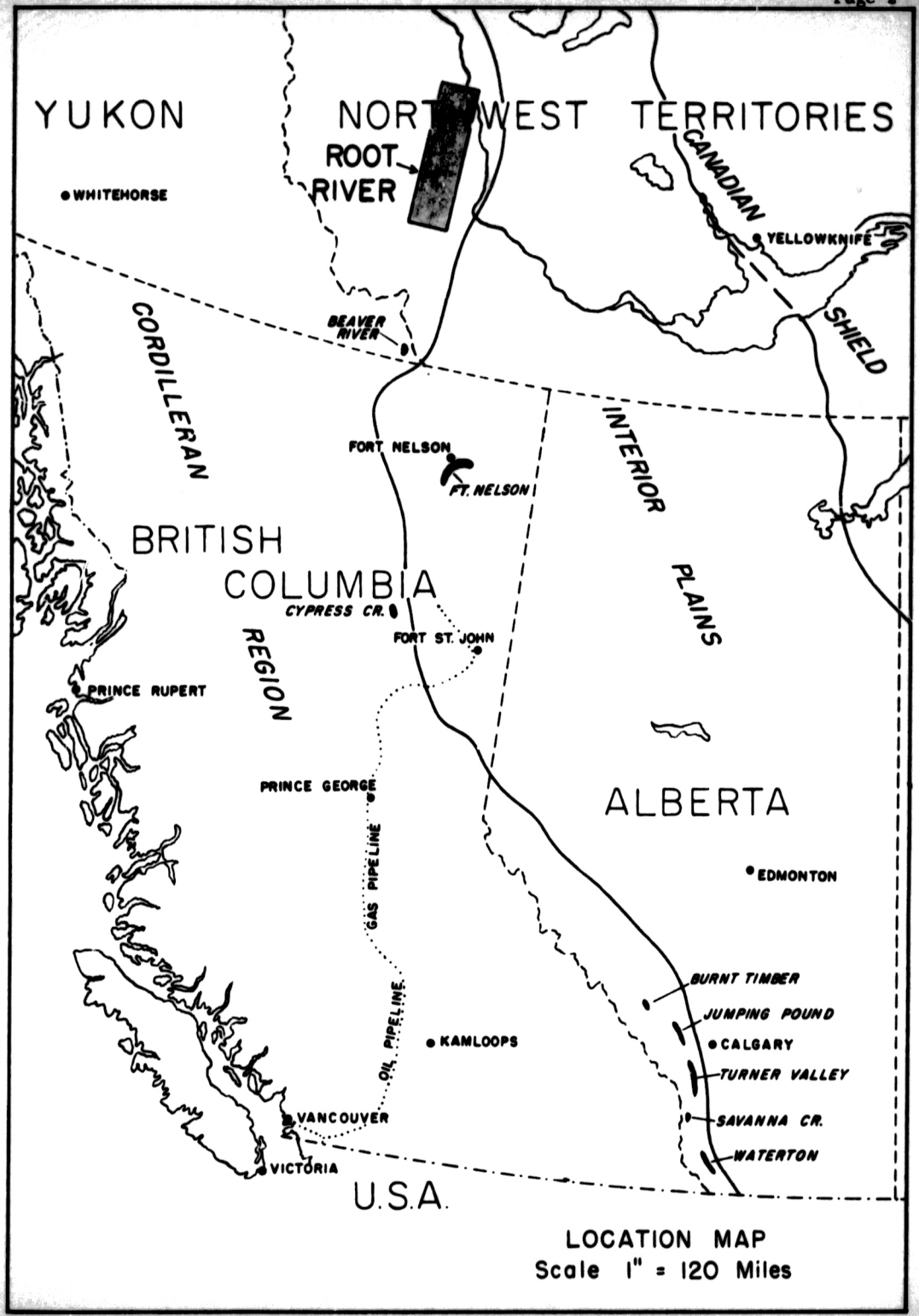
INTRODUCTION

Teck Corporation Limited and Oil and Gas Futures jointly hold five permits and Teck Corporation has a 100% interest in two permits in the general "Root - English Chief river area" of Northwest Territories. These permits are as follows:

SUMMARY OF PERMITS

Permit No.	Area	Date Acquired	Acquisition Cost	Next Obligation Date
3379	59,810	Dec. 13, 1962	$ 6,524.10	Dec. 13, 1965
3448	29,490	Dec. 14, 1962	-	Dec. 14, 1965
3464	28,995	May 10, 1963	-	Nov. 10, 1964
3469	58,320	May 23, 1963	15,163.20	Nov. 23, 1964
3470	57,990	May 23, 1963	78.00	Nov. 23, 1964
3472	57,660	May 23, 1963	14,990.00	Nov. 23, 1964
3475	56,996	May 23, 1963	78.00	Nov. 23, 1964

Acquisition of the first two permits in December of 1962 was based on field work done previously by geologists of Teck Corporation. The later acquisitions were based on a photo geological study by V. Zay Smith supplemented with Teck's own knowledge of the geology. During the summer of 1963, Teck conducted additional work in the field which comprised detailed stratigraphic studies and reconnaissance type structural studies. The stratigraphic sections and the V. Zay Smith airphoto interpretation are attached to this report. Notations have been made on the enclosed map to indicate where field work data are at variance with airphoto data.



LOCATION MAP
Scale 1" = 120 Miles

SUMMARY AND CONCLUSIONS

PERMITS 3379 and 3448

The two major prospective horizons for accumulation of oil and gas in these two permits are the Manetoe Reef of Middle Devonian age and the reefs that occur in the Silurian and Ordovician sections. The Manetoe Reef can have up to 700 feet of porous thickness and reefs of Ordovician and Silurian age can be up to 2,300 feet thick. These reefs could be productive either in association with anticlinal folding, or in structurally flat areas where they may form stratigraphic traps. The optimum case is where maximum development is associated with anticlinal folding. Other horizons have prospects but they are minor by comparison with these reef masses.

From a market standpoint the general area appears to be remote. However, the potential of the area is such that major fields will be found in this, or nearby local areas. When one or two major fields are discovered, access to markets will follow.

The topography of the stream and river channels west of the Mackenzie River is such that access to the area can be obtained at reasonable cost. A winter road would be required which could be built along the braided streams of the Root or English Chief rivers.

In summation, Permit 3379 and the surrounding area is one which could hold major reservoirs of oil and/or gas. Access to the area, while not easy, compared to areas of south and central Alberta, is not too difficult. Depths to the major objectives are approximately Manetoe reef - 1,500 feet, Silurian - Ordovician reef - 7,000 feet on the crest of the English Chief anticline at the central west side of Permit 3379.

PERMITS 3464, 3469, 3470, 3472, 3475

With the exception of 3469 these permits are considered to be much less prospective than the above due to the acute structural conditions and also due to the absence of the Manetoe Reef. However, they may be in a good environmental position for maximum development of the reefs in the Silurian and Ordovician sediments.

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P. Eng. Alta, B.C.

C. D. McCord
P. Eng. Alta, B.C.

OBJECTIVES OF SURVEY - FIELD AND REPORT PROCEDURE

The field survey was conducted on and in the vicinity of the Permits held by Teck Corporation Limited in the English Chief Area, Northwest Territories in June 1963. The Geological Survey of Canada had published a paper, G.S.C. 61-13, on "Camsell Bend and Root River Map Areas, District of Mackenzie, Northwest Territories," in the spring of 1962. Therefore, the main objective of the field survey was to supplement this information by measuring and describing in detail rock outcrops adjacent to the Permit areas. This data was compiled into stratigraphic logs that cumulatively could be used to predict a stratigraphic section most probably to be encountered by a test hole drilled on the English Chief Anticline.

The Geological Survey of Canada's work divided the exposed stratigraphic section into formations and provided excellent summary descriptions of each. An attempt was made by Teck field personnel to measure and describe the formations some distance removed from the location of G.S.C. sections, but although different locations were chosen, the best exposures were in near proximity to the sections measured by the G.S.C. Thickness figures resulting from calculations of chained profiles by Teck Corporation are very closely comparable with those published by the G.S.C. Some discrepancies in the detail of description of strata and choice of formation boundaries did result. The data in this report has not been altered to agree with the G.S.C. interpretation, but represent original field interpretations.

The information gathered from this detailed field measurement gains true value when assimilated in "Stratigraphic Logs" as presented in this report. To assist the reader to relate the various stratigraphic logs a diagrammetric summary of formation thicknesses measured and section relationships is presented on Page 5 . These logs have been used in an attempt to correlate information available to our firm from G.S.C. reports, previous field surveys and stratigraphic test holes in the area. Comments on this correlation are forwarded under a general discussion in the stratigraphic section of this report. A diagrammetric summary presentation is included on Page 7.

DIAGRAMMATIC SUMMARY

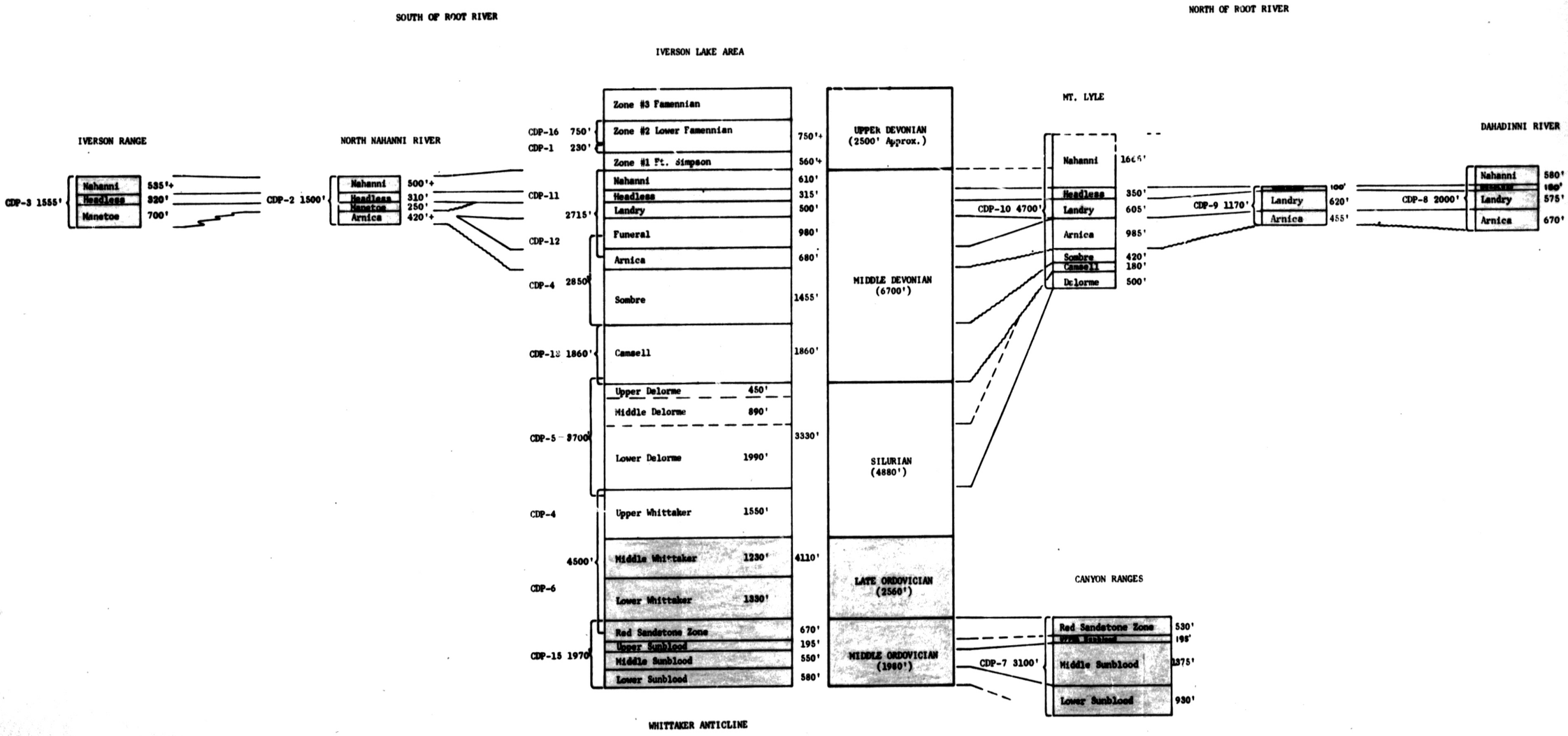
SHOWING

THICKNESSES MEASURED

and

RELATIONSHIP OF SECTIONS

ROOT RIVER AREA



STRATIGRAPHY

GENERAL DISCUSSION

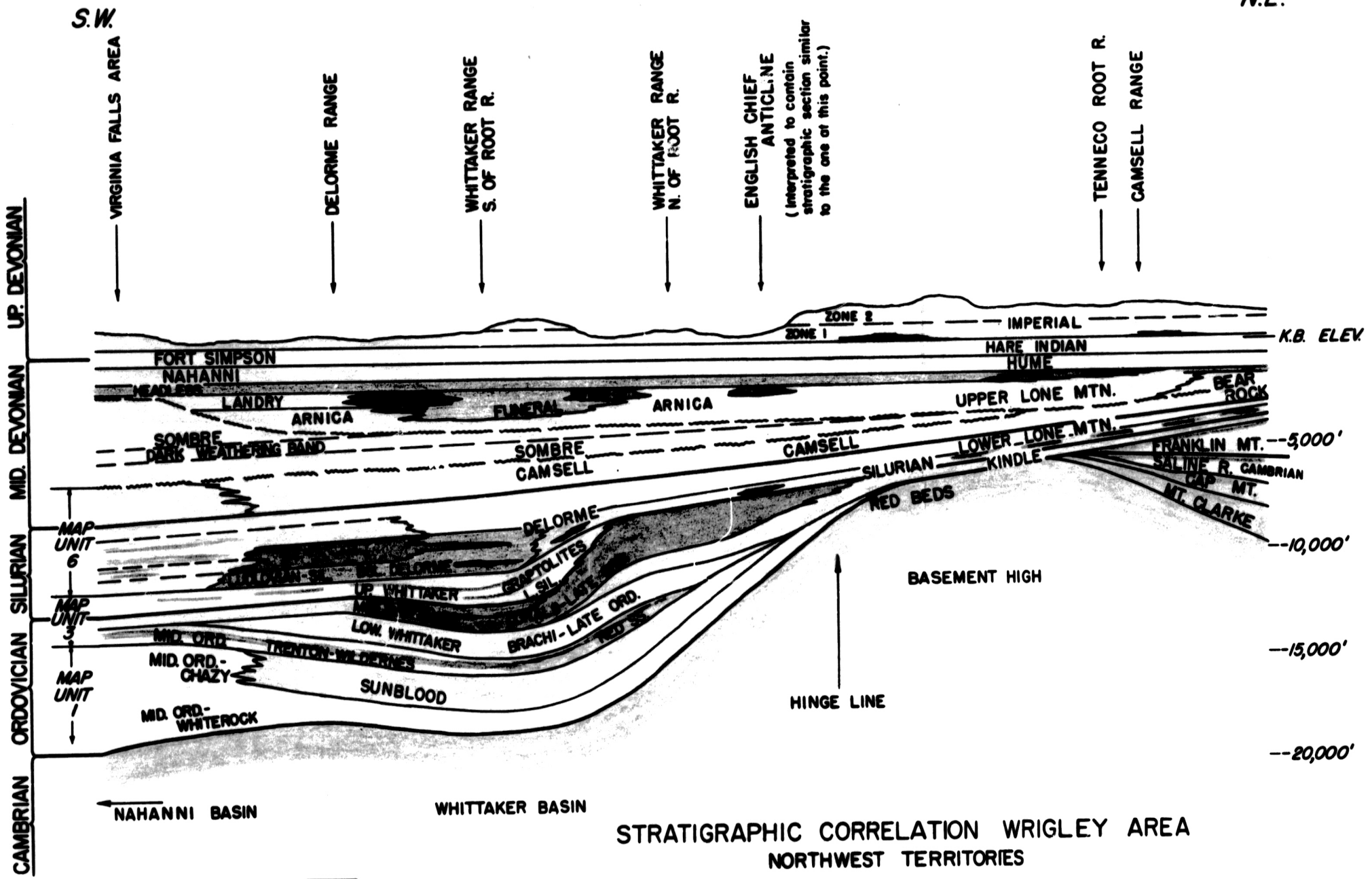
A Stratigraphic Correlation of sections known in the Wrigley area has been presented on Page 7. This comparison of sediments, their thicknesses, lithology and diagnostic fossil content reveals a vast change in sedimentary environment in a relatively short distance and the area of change is located beneath the English Chief Anticline.

Immediately to the west of the Permits held on the anticline, the sedimentary section revealed in the overthrust rocks of the Canyon Ranges has a thickness in excess of 20,000 feet in the time range from the Middle Ordovician period to the Upper Devonian period. This section is predominantly comprised of marine carbonates and shales. There are continental and evaporitic deposits.

The section contains several horizons that exhibit lateral facies changes. The outstanding section is that between the Headless and Arnica formations of Middle Devonian Age. This interval can contain one, or more, of three phases of deposition; the Landry Formation of cyclically bedded tight limestones; the Manetoe Formation of coarse crystalline, "reefal," porous, dolomite; or the Funeral Formation of black, limy shale and tight argillaceous limestone.

Two other important zones that change laterally and contain "reefal" dolomite zones are the Delorme Formation of Silurian Age and the Whittaker Formation that ranges from Late Ordovician time to early Silurian.

Within a distance of thirty miles eastward the thick stratigraphic sequence thins to less than 10,000 feet, or to one-half. This situation suggests that the pre-Devonian depositional environment changed from an actively submerging basin to an area of relatively stable shelf conditions. The English Chief Permit area could be positioned at the hinge line separating these two environments and consequently be in an area of on-lap and stratigraphic pinchout of basin sediments.



STRATIGRAPHIC CORRELATION WRIGLEY AREA
NORTHWEST TERRITORIES

STRATIGRAPHY

UPPER DEVONIAN

Zone 3

(Thickness Unknown)

Unit 25, GSC Paper 61-13

This zone of the Upper Devonian is generally tree covered as illustrated in Kodachrome #1. Approximately twenty spots were seen to have outcrop of the formation from the air. Three of these outcrop were visited by helicopter. The zone is comprised of a thick shale of a yellow-tan or green shade that may weather locally with a purplish grey colour. The zone has minor thin resistive beds in the base and is capped by a resistive siltstone bed. The fossils collected from this section represent the Upper Devonian Famennian stage. (See summary of outcrop descriptions for fossil identifications.)

Zone 2

(750' +)

Equivalent to Map Unit 22, GSC Paper 61-13

Approximately thirty-five outcrop points were noted in this formation from the air and six of these points were accessible by helicopter and were visited. Kodachromes 6, 7 and 8 illustrate three of the outcrop areas that were examined. Fossils collected from the zone indicate that the strata is of the lower Famennian stage of the Upper Devonian. It is comprised of shale, tan-grey or brown earthy weathering with numerous resistive slabby siltstone, sandstone and limestone horizons within it. The zone is capped with a massive siltstone bed that marks the boundary with the yellow homogeneous shale of Zone 3 above it.

Zone 1

Fort Simpson Formation (560+)

Equivalent to Map Unit 18, GSC Paper 61-13; has been named the Fort Simpson Formation by the Geological Survey of Canada.

This basal unit of the Upper Devonian has been referred to formerly by the author in this area as the Hare Indian Shales. It outcrops quite frequently in the area and was visited at five stations. The unit consists of shale, coal black, carbonaceous, fissile non-calcareous in the upper parts and limy with ironstone concretions and limestone bands near the Nahanni limestone contact. Shale weathers grey to black with rust and yellow streaks in patches from iron oxides. Kodachromes 9, 10 and 11 illustrate outcrop of this formation.

MIDDLE DEVONIAN

Nahanni Formation (600')

The formation as illustrated in the foreground in Kodachrome 12 is comprised of 600' of thin-bedded limestones that are blue-grey, black, fine to cryptocrystalline, tight. The formation is moderately resistive, but it does contain traces of shale laminae and consequently weathers in a rubbly nature in part. Calcite and horn corals are commonly present. The limestone often has a fetid odour. Nahanni strata can also be viewed in Kodachromes 3, 4, 5, 9, 14, 19, 20, 21 and 22 as resistive outcrop either adjacent to tree covered Fort Simpson Shale, or capping the recessive Headless Formation.

Headless Formation (300')

This formation is a thin zone about 300' in thickness that contains recessive shale beds interbedded with fossiliferous limestones similar to those of the Nahanni Formation. The formation serves as a distinct separation between the Nahanni and the Upper Devonian formations that occur below. See recessive swail in Kodachrome 13, 14, 61, 19 20, 21 and 22.

The limestone in this formation can be blue-grey, brown or black; is crypto-crystalline, argillaceous, thin-bedded to platy and weathers buff. Shales can be green-grey, soft or brown-grey, platy, limy and soft with smooth bedding planes. Generally the shale zones in this formation are covered intervals.

The formation situated stratigraphically below the Headless formation may be one of three: the Landry formation; the Manetoe formation; or the Funeral formation. These formations represent three different facies that were deposited contemporaneously.

Landry Formation (0 - 600')

The Landry formation is comprised of 600' of cyclically bedded limestone that varies in character from crypto-crystalline, siliceous; to argillaceous, shaly, brownish-blue grey grading to limy mudstone. No porosity was noted in either of these variations. The formation weathers with a characteristic serrated nature caused by the variable resistance of these cyclically deposited beds to erosion. The formation contains both thin platy and massive bedding and is generally a light grey weathered colour from a distance. The Limestones of this formation as noted above, can occupy the entire interval between the Headless and Arnica Formations as at Sections CDP 8, 9 and 10, or they can be replaced by the shales of the Funeral formation. The lower beds of the Landry were seen to phase out into shale on Section 11 & 12. Kodachrome 15 shows the Landry - Funeral Contact on Section 12, but the phasing out of limestone to shale is not evident.

Manetoe Formation (0-700')

Where present the Manetoe reef development occurs within the interval between the Arnica and Headless Formation and is considered to be one facies in a three phase depositional period involving Manetoe, Landry and Funeral Formations. It was

observed immediately below the Headless formation in Sections CDP-2 and CDP-3, but also occurs as isolated mounds within the Funeral Formation (Kodachrome 22). The formation is comprised of massive coarse crystalline dolomites that can be any thickness up to possibly 700 feet. The dolomites are dark grey to black, granular, or white coarse crystalline with vuggy porosity. The dolomites are thick-bedded and generally weather white with a rounded nature. Bedding is generally not discernible within the formation and it appears to be one massive zone. There are generally abundant veins and patches of white coarse crystalline dolomite with traces of quartz. The reef usually outcrops as resistive knobs surrounded by less resistive Funeral shales and are quite obvious from the air in some localities, (See Kodachromes 17 - 22 inclusive).

Funeral Formation
(0 - 980')

The Funeral Formation, as described in Section CDP-12, is a shale facies of the Landry and Manetoe formation. The formation was measured to be 980 feet thick with two-thirds of the zone being shale. The shale is black, powdery, limy, hard, weathers with a yellow-brown, slabby nature. Limestones within the formation are purplish dark grey, fine crystalline, thin bedded, fossiliferous. The formation is generally recessive and calcite veins are generally noted within the beds. The recessive nature of the formation is illustrated in Kodachrome 14 where the Funeral shales form the smooth slope immediately west of the resistive rugged limestones of the Landry Formation.

Arnica Formation
(800' +)

The Arnica formation (CDP-4 and CDP-10) is comprised of 800' $\pm$ of dolomites, massive bedded and thin-bedded. The dolomites are black, very fine granular, can be limy and siliceous with black chert inclusions, and contain considerable amounts of calcite fossil detritous which appear to be crinoid stems in some outcrop. Zones within the

formation contain breccia porosity in part. There is an indication that the calcite vein sections have been brecciated due to the presence of less competent, argillaceous, laminated, coarse grained or granular dolomite. Inter-granular and vuggy porosity was noted. In Kodachrome 23 the formation can be recognized by the dark grey weathering color. The Sombre Formation (on which a helicopter is resting), weathers light grey as do the Funeral shales stratigraphically above the Arnica Formation.

Sombre Formation (1,755')

The Sombre formation of the mapped area reaches a thickness of 1,755 feet in CDP-4. It is comprised of massively bedded dolomites, medium blue-grey with zones containing shale fractures and fossil horizons. The formation has a banded weathered character, wherein light and dark grey weathering bands reflect a variable argillaceous content of cyclically deposited strata. Shale laminae on bedding planes in the cyclic zones are brown and light green to tan weathering with rust and red staining from iron content on the more irregular bedding planes. In the basal one-third of the formation porous zones were noted in softer granular porous dolomite. Porosity is inter-granular in the two localities where it was noted. See Kodachrome 27 for close-up view of porous Sombre dolomites in Section 10, north of Root River.

Camsell Formation (180' - 1,860')

The Camsell formation thickness varies from 180' to 1,860' in the map area, the thickness being controlled possibly by depositional circumstances and also by a pre-Sombre erosion surface. The formation as illustrated in CDP-13 consists of brecciated limestones, or possibly as in Section 10 north of the Root River, these could be limy dolomites. The limestone breccia is angular and of a widely variable size with a coarse crystalline, calcite matrix, (see Kodachrome 24), orange yellow weathering. The fragments are argillaceous limestone, very finely crystalline tan grey weathering. The porous brecciated upper part of the formation weathers semi-resistive, rounded, rubbly. In the central section of the formation there are shale beds.

The shale is soft, yellow weathering with calcite veins common, but brecciation is not as well developed as at the top of the formation. The lower part of the formation is again a brecciated, massive bedded, grey buff, argillaceous, granular, crypto-crystalline limestone. Shale beds occur in part, particularly at the base of the section where they are irregularly platy, limy and orange weathering.

SILURIAN

Delorme Formation (3,330')

The Delorme formation was examined at two locations; one south of the Root River, Kodachrome 25 and one north, Section CDP-10. Section 5, south of the Root River, gives the most complete description of this thick Delorme formation. The brown-grey recessive character of the formation is illustrated in the Kodachrome view. It has been divided into three sections: the Upper Delorme; Middle Delorme; and Lower Delorme formation. All of the formation is of Silurian Age.

Upper Delorme Formation (450')

Comprised of 450' of limestone, light grey to white, finely crystalline, laminated with variable argillaceous content. Contains uneven, shaly bedding planes; is thin bedded and weathers into a yellowish cream, flaggy debris. One-half the section is covered and is considered to represent shale. The limestone was observed to grade to a limy shale in places.

Middle Delorme Formation (890')

Comprised of 890' of fossiliferous dolomite, which ranges from light grey to blue grey to dark grey, is finely crystalline, commonly argillaceous with shale laminae between unevenly, flaggy, limy beds.

The upper strata contains dolomites that are siliceous and limy with concentrated fossil zones that could be considered to be dolomitic limestones.

The dolomite in the lower half of this section is not limy, is not fossiliferous and is characterized by thin argillaceous laminae and calcite veins. Local siliceous zones with black chert also occur in this basal zone.

Lower Delorme Formation (1,990')

This zone is comprised of thick shale intervals and thin bedded and massive bedded dolomites. The dolomites are medium grey, in part limy, laminated to banded light and dark grey, and are variably argillaceous. The occasional massive bed makes the formation semi-resistive. This lower part of the formation is generally unfossiliferous and no porosity was noted in the dolomites. The massive shale beds that occur in the lower two-thirds of this Lower Delorme Formation contain shale that is black, slaty and weathers yellowish grey (Kodachrome 29). Where the shale is cyclically interbedded with the dolomites, it is limy. The Delorme Formation described in Section 10, north of the Root River, was comprised of massively bedded banded dolomite that had variable argillaceous content with a trace of granular porous beds with intergranular porosity. The dolomite was fetid and laminated on weathered surfaces in part. This section would correlate best with the dolomites found in the Lower Delorme Formation described in Section 5, northwest of Trench Lake. Here the dolomites are banded and variably resistant according to their argillaceous content and some fragmental and coarse crystalline beds were noted. This correlation would require non-deposition, or erosion of the Upper and Middle Delorme Formation, north of the Root River.

Whittaker Formation (4,130')

The thick strata included in the Whittaker Formation is diagrammatically illustrated in Section CDP-6 and CDP-14 where they have been divided into three zones. The three zones straddle the ages from Late Ordovician to Lower Silurian.

Upper Whittaker Formation (Lower Silurian) (1,550')

The Upper Whittaker is comprised of 1,550' of shale, medium dark grey that weathers a light tan to dark grey, Kodachrome 28. The shale is limy; platy in the lower portion, blocky at the top. There is a trace of calcite filled fractures, also thin beds of calcite shell fragments. Some variability in the composition of the shale is reflected by alternating zones of black, slightly siliceous shale and soft brown earth forming shale. The entire zone is recessive. An occasional outcrop of resistive, thin-bedded, black, finely crystalline limestone was noted.

ORDOVICIAN

Middle Whittaker Formation (Late Ordovician) (1,230')

The Middle Whittaker Formation is comprised of shale, black, slabby to platy, similar to Upper Whittaker, but it is now dolomitic rather than limy. The occasional thin bed of argillaceous dolomite and zone of nodular chert occur in this shale zone. The lower half of the Middle Whittaker is comprised of massively bedded dolomites that are medium greenish-grey to black in colour, very finely crystalline to crypto-crystalline, buff to dark grey weathering with abundant interstrata coarse crystalline dolomite and quartz. In the lower portions there are abundant silicified colonial and horn corals with chert nodules and thick veins of chert and white quartz.

Lower Whittaker Formation (Late Ordovician) (1,330')

The Lower Whittaker Formation is comprised of limestones; massively bedded in the central portions and thin-bedded in the upper and lower boundaries of the Section. The limestone is black, medium crystalline to crypto-crystalline, quite argillaceous, fossiliferous, with a variety of species.

The limestone in the central massive bedded section is dark grey to black crypto-crystalline and siliceous, also very fossiliferous and contains wavy purple colored fracture planes characteristic of the Section. Covered intervals in this middle massive section probably represent shale zones. Shale was described in the lower one-third of the Unit. It was black, granular, carbonaceous, soft, limy, weathered a light grey and had a trace of calcite veining. The shale also occurs in the thin bedded limestones at the base of the unit where it causes semi-spherical fracturing laminae that are characteristic of the Section. Calcitic fossil fragments continue to be common and the occasional limestone bed is a fossil fragmental. Black chert nodules were noted in the basal portion of the Unit, but were restricted to a 80 foot zone.

Red Sandstone Zone
(Middle Ordovician)
(530' - 670')

The Sun Blood Formation illustrated in Sections CDP-7 and CDP-15 is considered to be of Middle Ordovician Age. The Formation has been divided into four sections. The Upper Section consists of thin-bedded limestones and dolomites; the limestone is dark grey to black, crypto-crystalline to medium crystalline, fossiliferous in part, fragmental in part, platy, argillaceous, with shale laminae, orange weathering. Limy, slaty shale beds weather purple or rust colors from oxidation of sulphide minerals present. The shale could comprise 50% of the Section when covered intervals are interpreted to be shale. Dolomite occurs below the shale limestone interbeds, it is green grey, very finely crystalline, platy, blocky to massive in part, interbedded with platy dolomite that is limy, argillaceous, orange weathering, similar to the limestones above. This section is possibly correlatable to the red sandstone zone reported on the Nahanni range to the south (GSC Paper 60-19), and to the sandstone zone north of Root River as described in Section CDP-7 of this report. The zone

is considered in other localities to be the Trenton Wilderness stage of the Ordovician.

Sunblood Formation

Upper Sunblood (195')

The second unit of the Sunblood Formation as described in CDP-15 on the Whittaker anticline is possibly representative of the Upper Sunblood sedimentary sequence with the "Red Sandstone" and correlative limestones described above, constituting a separate younger formation.
This thinner Upper Sunblood unit is comprised of 180' - 195' of thin bedded to slabby siliceous to gritty dolomites. Coarse crystalline quartz is abundant in the very resistive beds.

Middle Sunblood (530' - 1,875')

The Middle Sunblood Formation is comprised of massively bedded dolomites that are a tan to black colour, coarse crystalline, tight with some zones of sucrose porous beds containing traces of chert nodules. The section weathers a yellow-brown colour and is characterized by an abundance of purple and milky chert beds and nodules and coarse crystalline quartz. Another characteristic common to the two sections CDP-15 and CDP-7 are the deep cuts created by differential solution of laminae or inclusions of dark grey argillaceous dolomite.

Lower Sunblood (580' - 930'?)

The lower unit of the Sunblood Formation is possibly of the White Rock stage of the Middle Ordovician. It is of a thickness in excess of 600 feet and is comprised of limestone, milky grey, crypto-crystalline to fragmental, massive bedded, inter-bedded with argillaceous, dolomitic, slaty shale. The lower part of the Section contains calcite filled fractures with iron and copper sulphide mineralization. The section weathers with a light grey colour. To the north of Root River the section that is possibly correlative is recessive and contained few good outcrop. One outcrop that could be examined was of limestone, soft, yellow, weathering.

STRATIGRAPHIC TABLE

ROOT RIVER AREA

AGE	FORMATION	THICKNESS	GENERAL STRATIGRAPHY	
UPPER DEVONIAN	Upper Famennian		Shale	Yellow-tan or green, weathers purplish grey in part. Minor thin resistive siltstone beds.
	IMPERIAL FORMATION			
	Lower Famennian	750'+	Shale	Tan-grey to brown earthy. Numerous thin siltstone, sandstone and limestone beds
	FORT SIMPSON FORMATION (Hare Indian)	560'+	Shale	Black, carbonaceous, limy, with ironstone and limestone near Nahanni contact.
MIDDLE DEVONIAN	NAHANNI FORMATION	600'	Limestone	Blue-grey to black, fine crystalline, tight fossiliferous, fetid, contains shale laminae
	HEADLESS FORMATION	300'	Shale	Green-grey, soft recessive, platy, limy with interbeds of limestone as in Nahanni.
	LANDRY FORMATION	0 - 600'	Limestone	Brownish-grey, cyclically bedded, variably argillaceous or arenaceous, tight.
	MANETOE FORMATION	0 - 700'	Dolomite	Dark grey to black, coarse crystalline, excellent intercrystalline and vuggy porosity.
	FUNERAL FORMATION	0 - 980'	Shale	Black, limy, hard, slabby, interbedded with limestone, thin-bedded, fossiliferous, tight.
	ARNICA FORMATION (Lone Mountain Fm)	800'+	Dolomites	Black, fine crystalline, siliceous with chert inclusions, tight with trace of breccia porosity.
	SOMBRE FORMATION (Lone Mountain Fm)	1755'	Dolomites	Blue-grey, massive bedded with shale laminae. Some intergranular porosity in basal beds.
	CAMSELL FORMATION	180'-1860'	Limestone Breccia	Angular, variable size fragments of argillaceous limestone in coarse crystalline, orange weathering calcite, vuggy porosity.
SILURIAN	DELORME FORMATION Upper	450'	Limestone-Shale (50 - 50)	Light grey, laminated, tight.
	(Reefal & porous in Delorme Rge. of Mtns.) Middle	890'	Dolomite	Light to dark grey with fossil and chert laminae, tight.
	Lower	1990'	Shale	Black, slaty and Dolomite, massive bedded, banded, tight.
	WHITTAKER FORMATION Upper	1550'	Shale	Medium dark grey, limy, platy, variably siliceous.
ORDOVICIAN	(Mt. Kindle) Middle Formation)	1230'	Shale & Dolomite	Black, slabby, dolomitic. Dolomite contains abundant chert, coral and coarse crystalline zones.
	Lower	1330'	Limestones	Black, argillaceous, fossiliferous, purple shale laminae.
	"RED SANDSTONE ZONE"	530'- 670'	Limestone	Shale and minor dolomite, thin bedded dark grey to black, orange and purple weathering from iron sulphides.
	SUNBLOOD FORMATION (Franklin Mtn. Fm) Upper	195'	Dolomite	Thin bedded, slabby, siliceous to gritty, with quartz.
	Middle	530'-1375'	Dolomite	Tan to black, massive bedded, trace sucrose porosity.
	Lower	580'- 930'+	Limestones	Milky-grey, massive bedded, interbedded with dolomitic slaty shale, copper sulphides and calcite in fractures.

ROOT RIVER AREA - NORTHWEST TERRITORIES

OUTCROP NOTES

These notes are records of observations made at helicopter stops where sections were not of sufficient length in all cases to warrant representation in a diagrammatic manner.

STATION 3 — Shale outcrop two miles southeast of Iverson Lake on banks of east flowing river; 65° AZ/5° NW. This outcrop is represented in a stratigraphic column CDP-1. It is comprised of a basal 155 feet of shale, soft, laminated, green and brown-grey, with very occasional thin siltstone laminae less than 1" thick, non-calcareous except at base near the Hare Indian contact where limy black concretions are present. Above this shale there are 70 feet of shale and siltstone interbedded; shale was olive green, sericitic, non-calcareous, brown weathering. Siltstone was olive green-grey, limy, cliff forming, occurring in massive beds, also thin bedded with shale laminae. This section is considered to comprise the basal part of Zone 2 in Upper Devonian sediments.

STATION 4 — Shale outcrop on the south bank of the North Nahanni River 12 miles southeast of Iverson Lake. Outcrop was of homogeneous, black, hard, sharp-edged shale, referred to as "the Hare Indian Formation" or "Zone 1 of the Upper Devonian" and considered to be equivalent to the Fort Simpson Formation (G.S.C. Paper 61-13).

STATION 5 — Limestone outcrop 8 miles southeast of Iverson Lake - limestone outcrops in the canyon of the southeast flowing stream; the limestone is black, fine to microcrystalline, tight, contains many calcite veinlets in patches; the outcrop is capped by the Hare Indian Shales, both upstream and downstream. The attitude of the limestone is 195° AZ/18° NW at this station, but is believed to be dormal in shape. The limestone would be the upper beds of the Nahanni Formation.

STATION 6 — Canyon in the North Nahanni River, 16 miles southeast of Iverson Lake.
The outcrop at this point consists of cliffs of the Hare Indian Formation, and the Nahanni Limestone outcrops at river level. The cliffs contain shale, limy fissile, coal black, with numerous large concretions; also 3 - 4 foot bands of black lithographic limestone. The shale weathers with rust and yellow colors similar to a coal deposit. Attitude at the Nahanni-Hare Indian contact was 135° AZ/9° SW (see Kodachrome's 13 and 14). The Nahanni outcrop at this point consists of limestone that becomes more argillaceous upwards and grades into the Hare Indian Shale. The lower limestone bed is irregularly platy, with pitted bedding surfaces; it is dark grey in color, not black; limestone stratigraphically higher becomes more argillaceous and more slabby bedded, somewhat granular textured, black in color, pyritic. The next beds upward in section are blue-grey to black, brownish on fractured surfaces, lithographic, tight, with pyrite laths. Higher beds are limestone, black, microgranular, pyritic, with bulbous calcite replaced brachipoda, brownish tinge on fractured surfaces. This bed lies immediately below the Hare Indian Shale. Fossils collected here were identified as Leiorhychus Castanea of Middle Givetian stage and Michelinoceras sp. (Middle Devonian).

STATION 7 — Located immediately west of the North Nahanni Canyon and located 12 miles southeast of Iverson Lake. Outcrop at this point contains very light olive green, soft shale that weathers maroon in part; it has a trace of a conchoidal fracture; this outcrop is considered to be in Zone 3 of the Upper Devonian (equivalent to Unit 25, G.S.C. Paper 61-13).

STATION 8 — Located 17 miles southwest of Long Lake in the Canyon Ranges. The outcrop consisted of limestone, brownish dark blue-grey, finely crystalline, fossiliferous, thin and thick bedded, 8" to 2' thick, weathers light grey. The bedding was semi-rubbly in part, resistive, ridge forming.

STATION 9 — Another stop on the Canyon Ranges; the lithology at this point is described in Section CDP-7.

STATION 10 — A shale outcrop located on the south bank of the Root River immediately in front of the Iverson thrust. The shale here had an attitude of 90° AZ/5° S; the outcrop consisted of a 220 foot cliff; the shale was brownish weathering, soft, limy, with some large concretions near the base of the outcrop. The shales here do not look as hard and sharp as other outcrops of the Hare Indian, but they are quite black on fresh surfaces and appear quite brown and soft particularly in the lower beds at river level. There was no "sulphur-type" yellow and orange staining on the outcrop at this elevation. Higher in the cliff the rust and yellow sulphur stains do occur on the shale, which is quite black and fractures in a concretionary manner. The shale on the upper part of the outcrop is not limy, it is quite soft, still black on a fresh surface, not silty; in fact there are no resistive beds whatsoever; weathers light grey to dark grey.

STATION 11 — Also located in the south bank of the Root River, eight miles to the east of the Iverson thrust. The outcrop consists of thick resistive siltstone beds, green colored, limy, and form the top of a 100 foot cliff; below the silt bed there are shales and massive limestones interbedded; the shale is soft, green, grey and has limy laminae. The limy laminae and limestone beds contain fossils, the most conspicuous being a bulbous brachiapoda that occurs in concentrated layers throughout the whole outcrop. These fossils were identified to be Lower Famennian in age, and included Crytospirifer Whitneyi, Leiorhynchus Walcotti and Cyrtiopsis Nahanniensis. The sediments at this section are all interpreted to belong to Zone 2 of Upper Devonian Age.

STATION 12 — Located 5 miles south of the Root River, slightly to the southeast of Station 11. Outcrop here consists of a 150 foot cliff comprised of shale, tan cream color, soft, with limy laminations and some calcite veins; outcrop weathers tan. Fossils collected along the laminae were identified as worm tubes. The outcrop is considered to be the lower part of Zone 3 of Upper Devonian Age.

STATION 13 — Shale outcrop located 2 miles to the southeast of Station 12 consists of green, soft shales inter-laminated with calcareous siltstones, near the top of Zone 3 of Upper Devonian Age. The shale laminae on the siltstone bedding planes weathers purplish and contains fossils. The specimens collected represent Famennian Age of the Upper Devonian and include Cyrtospiriffer sp. and

Leiorhynchus sp. The attitude of the beds of this outcrop was 180° AZ/25° E. The outcrop in places appeared to have a red hematitic color on the weathered surface.

STATION 14 — Located one mile west of the North Nahanni Canyon, an outcrop of banded shale, earthy brown color to tan, flaggy, silty. The lower beds are dark grey to black; it is believed that this outcrop represents the contact between the basal zone of the Upper Devonian (Fort Simpson - Hare Indian) and the Middle, (Zone 2), shales of the Upper Devonian.

STATION 15 — Nine miles southeast of Iverson Lake, in an oxbow outcrop in a stream cutting through Hare Indian type shales. This Station, as Station 14, is believed to be close to the contact between Zone 1 and Zone 2 of Upper Devonian. The tanned brown shale of Station 14 comprised the upper one-quarter of the cliff outcrop, and black semi-hard concretionary fracturing shale forms the lower three-quarters of the cliff. The concretions in the formations at this locality are not limy; they must be siliceous as they are hard and they are lighter grey colored than the weathered shale; there is no rust or yellow staining in the basal outcrop at this point. More resistive Hare Indian type shale was noted downstream from this point.

STATION 16 — Upstream from Station 15, is a brown carbonaceous zone; contains orange rusty weathering bands due to pyrite content; shale is still not limy, contains ironstone concretions. Above this zone again there are more resistive light grey to tan grey shales with light grey siltstone laminae that hold the formations up. None of the shales are calcareous or limy.

STATION 17 — Upstream from Station 16. There is perhaps another 200 - 300 feet of section of the light grey shiny shale described at Station 16. This shale unit is topped with a topographic bench formed probably by a resistive siltstone bed; an upper unit outcrops above this resistive bed in a cuesta representing approximately 480 feet of shale in a cliff, the shale is tan weathering, micro-micaceous, with thin platy resistive beds comprising 30% of the section.

Summary of Outcrop at Stations 15, 16 and 17

Zone #1, (not complete), 560 feet of Hare Indian type black semi-resistive shales and upper orange weathering carbonaceous zone outcropping in the Lower Creek region, topped by Zone #2, 620 feet of relatively recessive brown and tan, light-grey shiny, shales that have fine siltstone laminae and ridge forming siltstone or limestone beds within them.

STATION 18 Two miles due west of Iverson Lake. There is about 700 feet of section exposed on the banks of the creek. Outcrop consists of shale, brown, soft, and siltstone, light grey, of Zone #2 of Upper Devonian Age. These beds at the creek level weather much like Hare Indian with a considerable number of dark orange patches; attitudes of the bed 210° AZ/17° NW. Above the shale in the creek there are shales that are finely friable, soft, shiny, sericitic on bedding planes, containing sandstone beds one-half a foot in thickness; sandstones are medium grained, poorly cemented, argillaceous and slightly calcareous; soft brown pure shales continue to the top of the cliff. There are four or more one-half foot sandstone beds in the entire section. The scree slopes are shiny light grey, sericitic; the outcrop looks tan-grey with some orange color that is not prominent.

STATION 19 Located on the south bank of the English Chief River immediately in front of the Iverson thrust. A view of the north bank of the English Chief River from this point does not reveal any reversal on the English Chief anticline. The beds appear to go under the thrust with a horizontal attitude.

The west scarp face of a ridge was traversed at this station; the top of the ridge was covered with a soft, green shale, with limestones, green-grey, medium to fine crystalline. Float on top of the outcrop on the ridge consisted of a brown sandstone; the shale laminae here had worm burrow-type fossils one-half inch in diameter and flattened. The top of the cliff was held up by a massive argillaceous, limy, green, soft sandstone-siltstone bed. The sandstone was fine grained, argillaceous, shaly and limy, and contained white laminations; a bench of recessive shale with limestone and shale and sandstone laminae comprised the next unit and the lower part of the cliff was resistive, scarp-forming again, consisting of siltstone, green, argillaceous, soft, medium granular; elevation differences from the top of the ridge to the creek below indicated a 1,000 foot section. The zones described above were each approximately 150 - 200 feet thick. The sediments of this section are interpreted to belong to Zone #2 of Upper Devonian Age and are graphically represented on Stratigraphic Section CDP-16.

UPPER DEVONIAN

SUMMARY OF OUTCROP DESCRIPTIONS

ZONE 1 Fort Simpson Formation - Unit 18 (G.S.C. Paper 61-13)

The basal unit referred to as "the Hare Indian Formation" was examined at Stations 4, 6, 10, 15 and 19. Other outcrop areas were observed from the air and are designated as this group on a colored map.

The unit consists of shale, coal black, carbonaceous, fissile, non-calcareous in the upper parts, but limy with ironstone concretions and limestone bands near the Nahanni limestone contact. The shale weathers grey to black, with rust and yellow streaks in patches from iron oxides.

ZONE 2 Map Unit 22 (G.S.C. Paper 61-13)

Sections representing this zone were examined at Stations 3, 11, 15, 16, 17 and 19. Fossils collected at Station 11 near the top of the zone indicate that this group is of Upper Devonian, Lower Famennian stage. The fossils represented in the collection include:

Cyrtospirifer Whitneyi
Leiorhynchus Walcotti &
Cyrtiopsis Nahanniensis

This group was also observed at several locations from the air and has a tan-grey or brown earthy weathering shale section with numerous resistive, slabby siltstone horizons within it. The zone is capped with final massive siltstone bed that marks the boundary with yellowish homogeneous shale of Zone 3 above it.

ZONE 3 Map Unit 25 (G.S.C. Paper 61-13)

This group was examined at Stations 7, 12 and 13. Several outcrops examined from the air indicate the zone to be comprised of thick shale of a yellow tan or green shade that may weather a purplish grey in part. The zone has minor thin resistive beds in the base and is capped by a resistive siltstone bed.

No section was seen to outcrop above this upper resistive bed in the English Chief Syncline, although topographic ridges suggest that there may be another group, or age of rocks present. The fossils collected at Station 13 include Cyrtospirifer sp. and Leiorhynchus sp. These fossils represent the Upper Devonian Famennian stage.

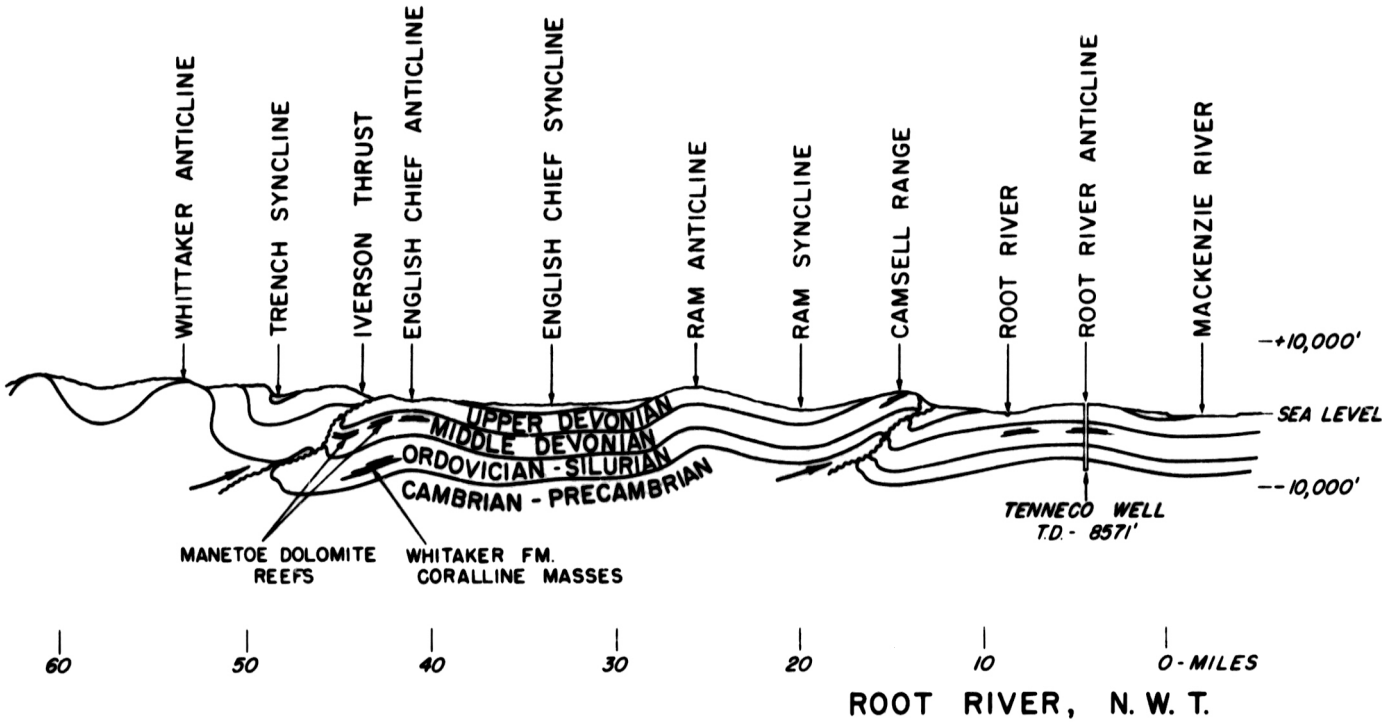
STRUCTURE AND TOPOGRAPHY

The Permits of the English Chief and Root River areas are located in a position that is transitional between two major topographic units; the interior plains and the Rocky Mountain Cordillera. East of the permits there are three narrow arcuate mountain ranges en-echelon in a general northerly strike. These mountains rise sharply from the peneplained interior plains to the east of them by means of near vertical thrust scarps. These thrust scarp mountains are considered to be within the interior plains province because the area between them and the Rocky Mountain Cordillera is not thrusted and mountainous. This inter-mountain area wherein the permits are situated, has been gently folded and uplifted from the interior peneplain. The relatively gently folded anticlines are believed to provide 2,000 - 3,000 feet of closure in the subsurface without rupture by thrust faulting. The terrain is generally underlain by soft Upper Devonian shales and is usually gently rolling and tree covered. Sharper folds and erosion have combined to expose Devonian carbonates in more rugged ridges and steep walled canyons in a minor portion of the area.

The topography then is directly related to structural conditions in the English Chief - Root River Area. The rugged Canyon Ranges of the Rocky Mountains form a massive topographic division immediately west of the Permit areas as they reflect the repeated thrust faulting from more acute diastrophism than experienced to the east in the interior plain.

Major east-west valleys of the North Nahanni, English Chief, Root River and Redstone rivers cut through the mountain and plain areas as tributaries to the north flowing Mackenzie River. These rivers are gently graded and their valleys are broad and gravel filled.

Access to the English Chief anticline from the Mackenzie river is estimated to be relatively good. The main hazard to roads constructed along the river valleys would be washout during periods of high volume runoff.



WEST TO EAST STRUCTURAL SECTION THROUGH PERMIT 3448
SHOWING
INTERPRETATION OF SUBSURFACE CONDITIONS BENEATH ENGLISH CHIEF ANTICLINE

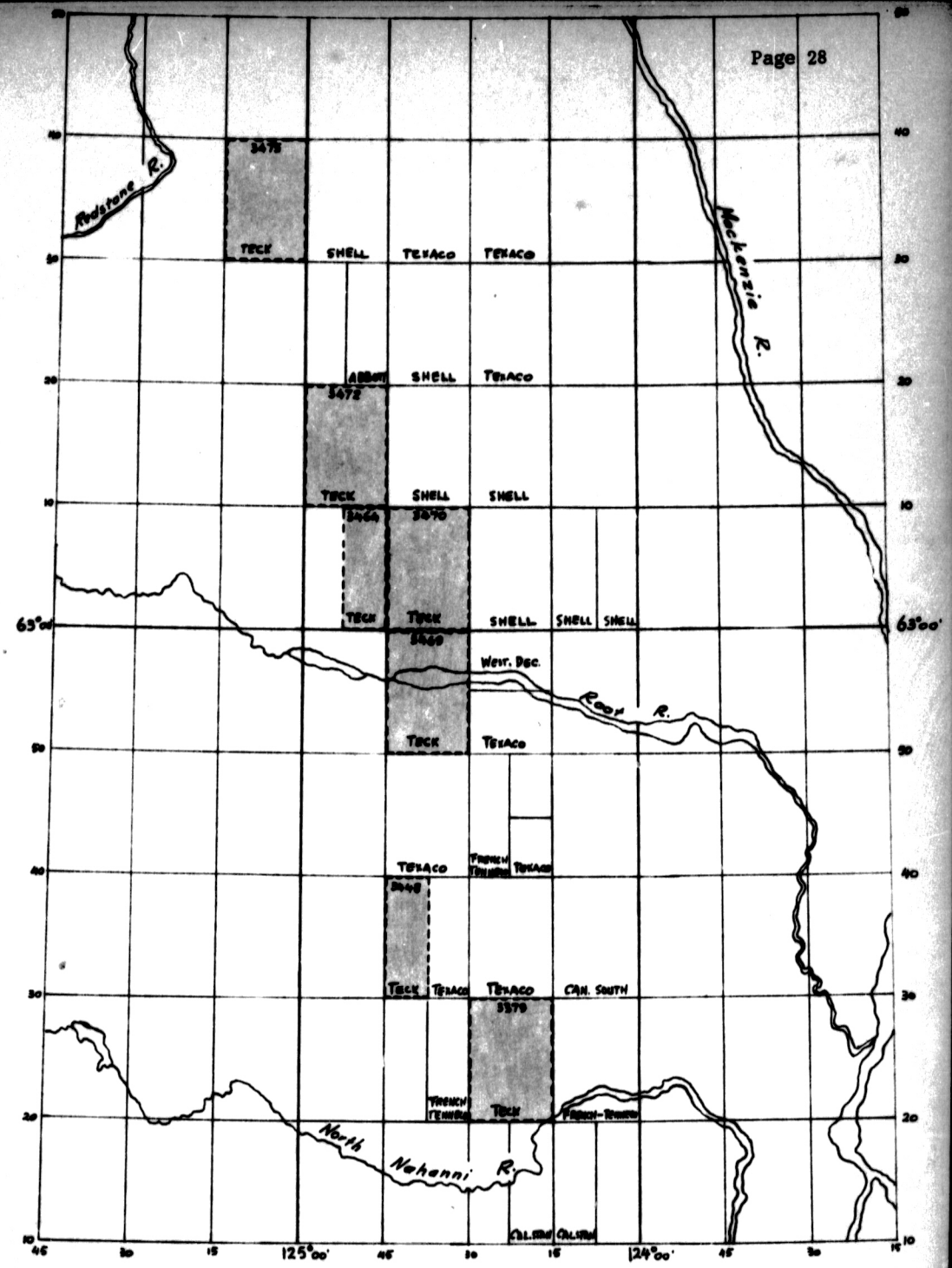
TECK CORPORATION LIMITED

SUMMARY OF PERMITS

ROOT RIVER AREA

NORTHWEST TERRITORIES

Permit No.	Area Acres	Acquisition Cost $	Interest	Next Obligation Date and Deposit Required
3379	59,310	6,524.10	Teck - 100%	Dec. 13, 1965 $ 17,798.
3448	29,490	nil	Teck - 100%	Dec. 14, 1965 $ 8,847.
3464	28,995	nil	Teck - 50% Oil & Gas Futures 50%	Nov. 10, 1964 $ 4,349.
3469	58,320	15,163.20	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,748.
3470	57,990	78.00	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,699.
3472	57,660	14,990.00	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,649.
3475	56,996	78.00	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,549.



ROOT RIVER AREA PERMIT MAP
NORTHWEST TERRITORIES

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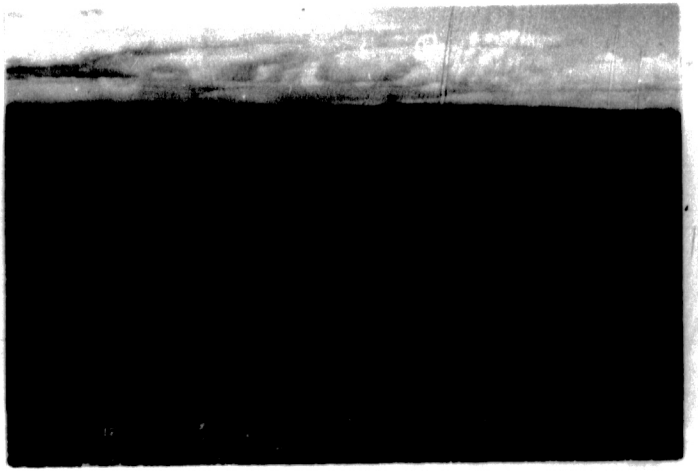
Smith, V. Zay Areal Geology and Structural Interpretation Map, Root River Area, May 1963.

1

Panorama of Permit No. 3379 located southeast of Iverson Lake. View is to northeast from the southwest corner of the Permit. Shale and siltstones of Zones 1 and 2 of Upper Devonian Age underlie the subdued, tree covered terrain of this Permit.

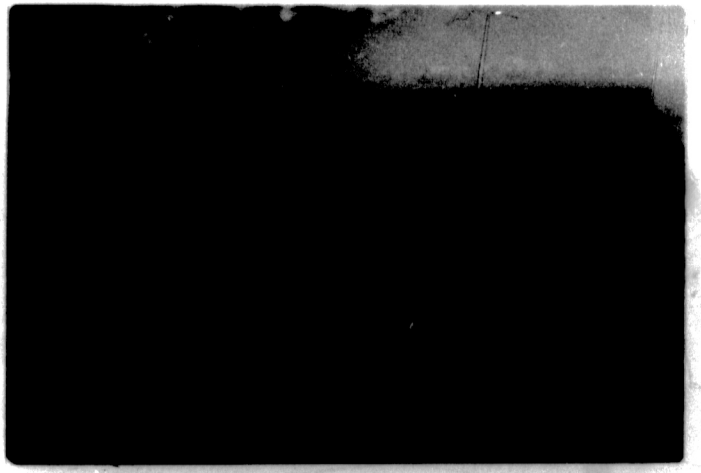


2

View south from English Chief River showing terrain of Permit No. 3379. Iverson Lake in middleground is located near northwest corner of the Permit.

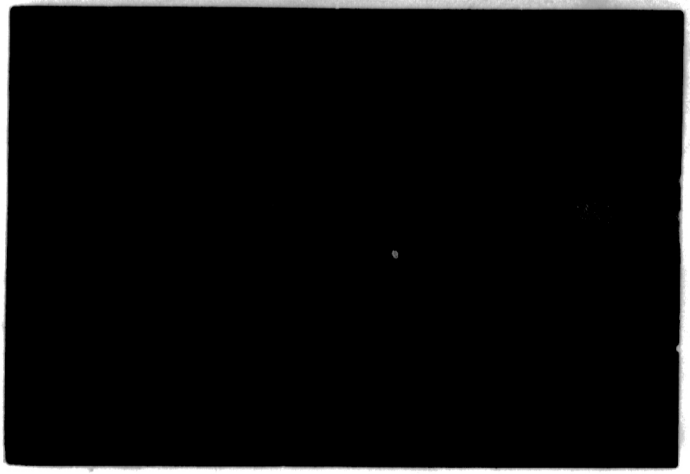
3

View northeast from the central area of Permit 3464 showing the sharp anticlinal structure of the Dahadinni range at this point. The ridge is Upper Devonian Limestones and the grassed valley is comprised of shales of the Ft. Simpson formation.



4

View to northwest from the southeast corner of Permit 3475 along the Dahadinni River. Section 8 was measured where the river cuts through the limestone ridge in middleground.



5

View to south across Permit 3472 from the north boundary. The small lake is on the geological map and can be used to correlate the picture with the mapped structure.

6

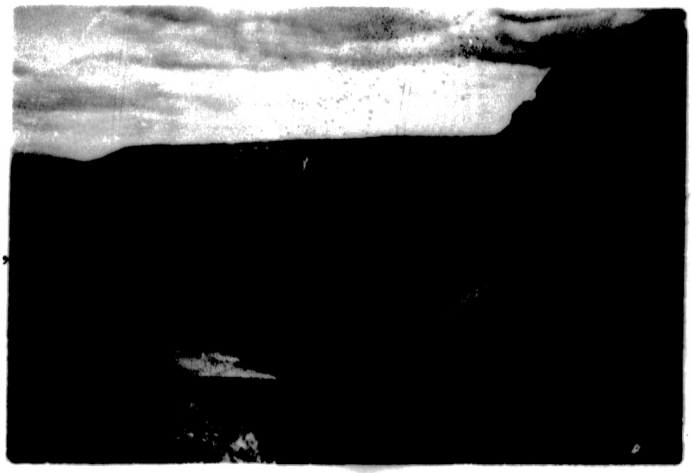
Close-up view of shale and siltstone zone #2 of Upper Devonian Age. The strata lies immediately above shales of the Fort Simpson Formation. This Kodachrome was taken in the upper 1/3 of Stratigraphic Section C.D.P. - 1.

7

Close-up view of shales and limestones of Zone #2 of Upper Devonian Age at Station #11 on the Root River.

8

View eastward from the junction of the Iverson Fault trace and the English Chief River. The ridge (Station #19 - Section C.D.P. - 16) contains shales, sandstones and limestones of Zone #2 of Upper Devonian Age. The strata is flat lying and comprise the west limb of the English Chief anticline.

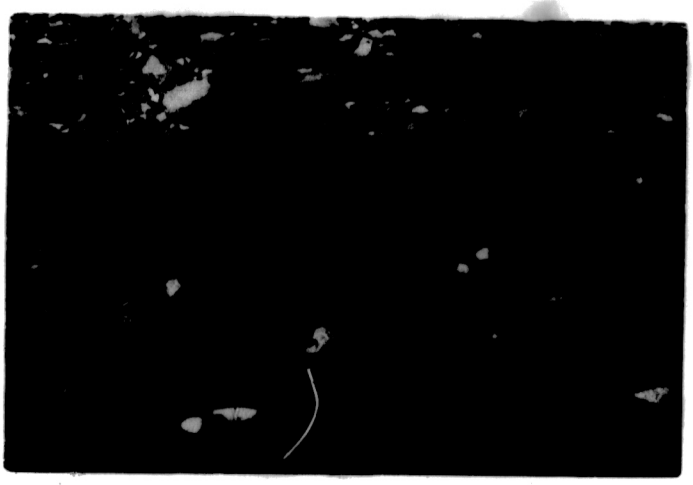


9

View of Nahanni - Fort Simpson Contact at Station 6 on North Nahanni River.

10

Close-up view of basal, limy shale beds of Fort Simpson Formation at Station 6. North Nahanni River.



11

View of northwest of Dahadinni Canyon of Permit 3475. River cuts shales of Fort Simpson Formation along the axis of a Syncline.

12

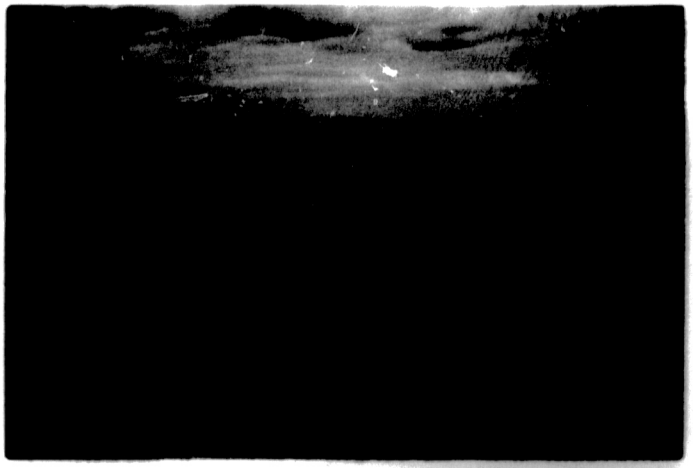
View of outcrop described at Section 8. The top of this north Wall of the Dahadinni Canyon was traversed.

13

View of northwest from southeast side of Permit #3475. Section 8 was measured at right middleground. Sharp anticline structure is evident in bedding of Nahanni, Headless and Landry Formations in foreground.

14

View to northwest along west side of Trench Lake Valley. English Chief River is foreground. The serrated sharp ridge results from the erosion of vertical beds of the Landry Formation. The shaly, recessive Headless and Funeral formation and the dark grey Arnica Formation can be readily delineated in this view.

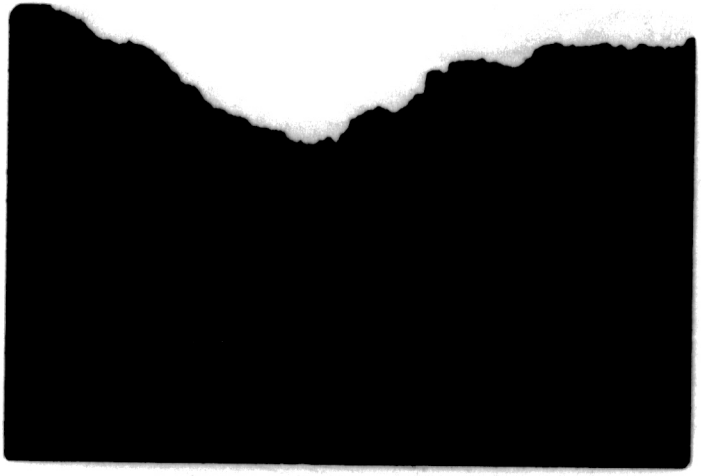


15

Close-up view of the basal beds of the Landry Formation at Section 21. Recessive Funeral Formation shales underlie scree slope to left of the massive limestone of the Landry.

16

View North as above, showing recessive zone of the Headless Formation, stratigraphically above the Landry Formation - Sec. 12.



17

Close-up view of porous dolomites of the Manetoe Formation Section 3. An indication of bedding is evident on the left side of this outcrop, but generally the formation is of a "massive reef" nature.

18

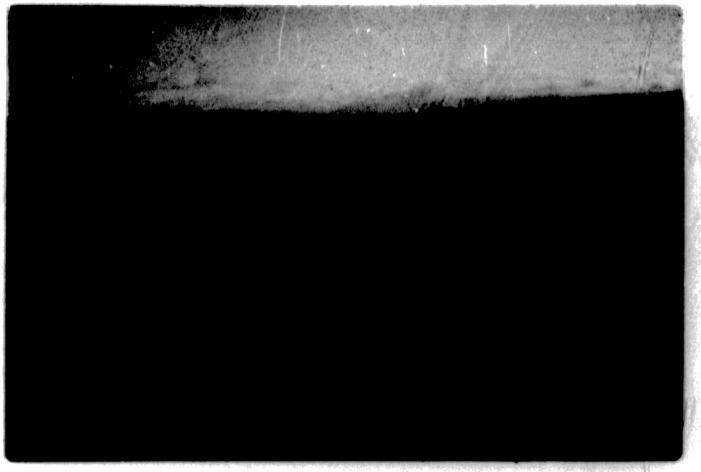
Another view of Manetoe Formation in Section 3. Massive bedding is suggested in the outcrop. The dip is 20° east away from viewer.

19

An areal view of a "patch reef" outcrop of Manetoe Formation within an environment of Funeral shale. Location is six miles southwest of Sec. 3. Nahanni Limestones outcrop on west dip slope to the right in the Kodachrome.

20

A view to the northeast of the general location of Section 3. The irregularly resistive Manetoe Formation outcrops below the recessive thin Headless Formation. In the right foreground the Southern pinchout of the "Manetoe Reef" within the Funeral Shales can be seen.



21

Close-up northeast view of the Manetoe Formation. The recessive Headless Formation is well expressed in this photo as it was above. The northward termination of the Manetoe can be seen in this photo.

22

An eastward view of Section 3 showing from top to bottom the Nahanni, Headless, Funeral and Manetoe Formation.

23

View East across Sec. 4 includes the dark grey Arnica Formation and the light grey weathering Sombre Formation on which the helicopter is sitting. Funeral shales and Landry limestones form the ridge in the background.

24

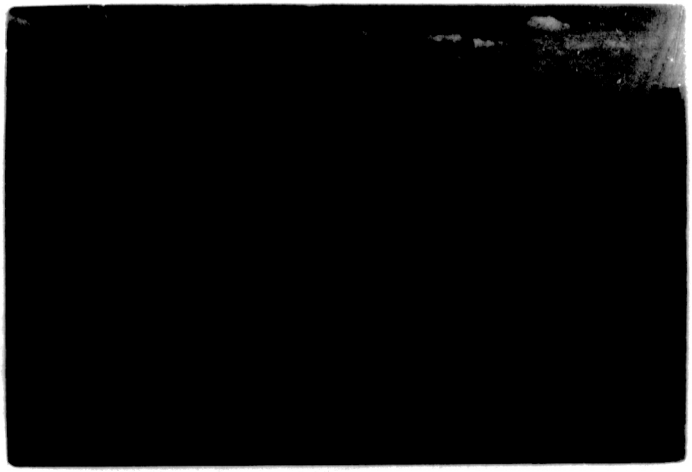
View northwest across Section 13. Picture includes the entire Camsell Formation. The Camsell generally forms a resistive yellowish weathering ridge as illustrated in this Kodachrome.

25

View north across Sec. 5 shows shaly brown grey nature of outcrop of Delorme Formation (Main Large Ridge in Middle-ground). The west flank of the Camsell Formation ridge is present at extreme right in the picture.

26

View to southeast of dark grey weathering Arnica Formation at Section 10. High peak on ridge is Mount Lyle located near south boundary of Permit #3472.



27

Close-up view of porous coarse crystalline dolomite of Sombre formation near axis of anticlinal structure of Section 10. Sample 1030 on Strat. Section.

28

Close-up view of the shales in the Upper Whittaker Formation. This outcrop is at Sample #6401 on the stratigraphic column of Section 6 & 14.

29

Close-up view of Flaggy Dolomite and Shale of Lower Delorme Formation Sample #2508 on Strat. Section 5.

C.D.P.-1

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 1
IVERSON LAKE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates :62° 26' N. - 124° 11' W.
Geographic Location :2 Miles SE of Iverson Lake (130°AZ.)
Geologists :C.D. Mc Cord, K.W. Campbell.
Date of measurement: June 8, 1963

FOSSIL SYMBOLS

F	Fossiliferous		Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda	⊙	Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN	ZONE 2 - (Unit 22 - G.S.C.)	100	200						Siltstone - olive grey, limy, thin bedded, shale laminae. Shale - olive green soft sericitic non calc. brown weathering, black when wet. Siltstone - olive green, limy, cliff forming. Shale - soft, laminated green and brown grey, with occ. very thin siltstone laminae less than 1/8 inch thick, Non calc. except at base at creek level where occ. limy black concretion occurs. Concoidal fracturing and rusty weathering characteristic of basal zone. Downstream the base of the section is revealed to be harder black siliceous, globby shale. Sharp edges and coal black characteristics are quite different from overlying section. Rusty streaky weathering; has similar characteristics to Hare Indian Formation Shales where they outcrop in the Mahanni River Canyon and are resting on Mahanni Limestone.		

1

IVERSON LAKE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates :62° 26' N. - 124° 11' W.
Geographic Location :2 Miles SE of Iverson Lake (130°AZ.)
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FOSSIL SYMBOLS

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B	Brachiopoda		Foraminifera
G	Gastropoda		Crinoid
	Coral		Algae

POROSITY SYMBOLS

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v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN ZONE 2 - (Unit 22 - G.S.C.)											

100

200

500

Siltstone - olive grey, limy, thin bedded, shale laminae.

Shale - olive green soft sericitic non calc. brown weathering, black when wet.

Siltstone - olive green, limy, cliff forming.

Shale - soft, laminated green and brown grey, with occ. very thin siltstone laminae less than 1/8 inch thick. Non calc, except at base at creek level where occ. limy black concretion occurs. Conchoidal fracturing and rusty weathering characteristic of basal zone.

Downstream the base of the section is revealed to be harder black siliceous, blobby shale. Sharp edges and coal black characteristics are quite different from overlying section. Rusty streaky weathering; has similar characteristics to Hare Indian Formation Shales where they outcrop in the Mahanni River Canyon and are resting on Mahanni Limestone.

C.D.P.-2

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 2
NORTH NAHANNI RIVER

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 15' N. - 124° 11' W.
Geographic Location : 18 Miles SE of Iverson Lake (145° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement : June 8, 1963

FOSSIL SYMBOLS

F	Fossiliferous		Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda		Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	NAHANNI FM.							200	Limestone - black, finely crystalline, one half foot thick bed, fossiliferous, weathers rubbly.	100' Limestone - black, finely crystalline, fossiliferous, rubbly weathering, thin bedded, trace of sucrose texture.	
									Limestone - black, finely crystalline to [illegible], outcrop intermittant.		
								400	Limestone - light grey, sucrose.		
									Limestone - brown, granular, fossiliferous, with single thin corals.		Favosite SP. L. Givetian - (Middle Devonian)
									Limestone - dark grey to black, sulphurous, corals abundant along bedding planes.		Dendrostella rhenana L. Givetian - (Middle Devonian)
								600			Prismatophyllum kirki L. Givetian or U. Eifelian (Middle Devonian)
									Limestone - brownish, blue-grey, fossiliferous, weathers light grey, etched on weathered surface.		
								800		340' Limestone - dark brown grey, granular, abundant corals, fetid, weathers light grey, thin bedded, dense.	
									Limestone - finely crystalline, dense, fossiliferous, contains brachiopodia and colonial corals.		
								1000			
								1200	Limestone - brownish grey, granular, massive bedded, (one bed 30 feet thick), many large colonial coral fragments, weathers like a breccia.		
								1247		160' Limestone - brown grey to black, finely crystalline, to finely sucrose, argillaceous, abundant fossils.	Fossil Flora: Dispylitum sp. Calamites alpensis Cladopora (Middle Devonian)
		500									

1 of

MIDDLE DEVONIAN

1200	Limestone - brownish grey, granular, massive bedded, (one bed 30 feet thick), many large colonial coral fragments, weathers like a breccia.	160' Limestone - brown grey to black, finely crystalline, to finely sucrose, argillaceous, abundant fossils, thick bedded, rubbly, very light grey weathering, covered interval- possible shale beds.
1267		
1347	Limestone - as above, black, finely crystalline to sucrose, fossiliferous.	
	Limestone - as above, argillaceous, fossiliferous, weathers very light grey.	
1474		
155	Limestone - brown, [illegible], (10 foot thick bed,).	140' Limestone - blue-grey, crpxl, argillaceous, thin bedded to platy, weathers buff?
	Limestone - black, granular.	
1685	Limestone - blue-grey, finely crystalline, argillaceous, platy, weathers buff.	
17??	Limestone - as above	
	Limestone - black, crpxl, trace of vertical striations from movement within beds.	
1882		
	Limestone - brownish grey, crpxl, , thick bedded, (1 foot to 3 feet), occasional 1 foot, lime, shale bed.	60' Limestone - brown to black, argillaceous, crpxl., siliceous, thick bedded, trace of limy shale.
1922		
2082	Limestone - black, as above, argillaceous, quite siliceous, concoidal fracture interbedded in part with light tan limestone, siliceous.	
	Dolomite - white, coarse crystalline, thick bedded, coarse inter-crystalline and vuggy porosity, malachite staining, weathers white, rounded, (granitic like), with occasional bed black limestone as above.	
2282		140' Dolomite - white, coarse crystalline with inter-crystalline and vuggy porosity, thick bedded, weathers white, rounded.
2482	Dolomite - black, granular, with white, coarse crystalline, limy dolomite infilling vugs, patchy porosity.	
		110' Dolomite - black, granular, coarse crystalline; patchy, vuggular, and inter-crystalline porosity.
2682	Dolomite - brown to black, granular, in part vuggy, grades from vuggy at top to medium crystalline, buff grey, dense at base.	
2882	Dolomite - black, coarsely crystalline, in part inter-crystalline porosity.	80' Dolomite - inter-bedded, dense, crpxl. and granular, vuggy.
	Dolomite - interbedded, tan, argillaceous, dense, and brown grey, granular, vuggy. Weathers as "step fall" in creek.	
3082	Dolomite - black, medium crystalline, dense, trace of vuggy beds as above, in part argillaceous stratifications.	80' Dolomite - black, medium crystalline, dense, argillaceous.
3282		
	Dolomite - black-grey, finely crystalline, dense, becoming siliceous and limy	140' Dolomite - black, finely crystalline, dense, siliceous and limey.
3612	Limestone - brown, sucrose, vuggular, cliff forming.	20' Limestone - sucrose.
	Dolomite - stratified black, buff and brown, fine dolomite with blebs of calcite, weathers dark grey and salmon color, (calcite), cliff forming.	130' Dolomite - black, buff and brown, limy, with calcite blebs, cliff forming.
3812		
3857		
	Base of [illegible] outcrop.	

Fossil Flora
Dispalillum sp.
Lycopodites alpensis
Cladopora
(Middle Devonian)

2 OF 2

C.D.P.-3

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 3
IVERSON RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 23' 26" N. - 124° 37' 03" W.
Geographic Location : 6 Miles SW of Iverson Lake (219°AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement : June 9, 1963

FOSSIL SYMBOLS

F	Fossiliferous	m	Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda	⊙	Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	NAHANNI FM.							100	Limestone - black, very finely crystalline, argillaceous, crinoid stems.	The Nahanni section measured here is not believed to represent all of the upper beds of the formation	
									Scree slopes-Nahanni type limestone, dark grey to black, very finely crystalline, argillaceous, in part brecciated, healed with coarse crystalline calcite.		
									Limestone - float, Nahanni type as above.		
								413	Limestone - dark grey, very finely crystalline, quite argillaceous, flaggy, siliceous.	535' Limestone - dark grey to black, very fine xln, argillaceous, quite fossiliferous, in part brecciated, rubbly, contains coarse xln calcite in fracture. Siliceous in basal 300 feet.	
								500			
									Limestone scree - dark grey, very finely crystalline, argillaceous as above, horn corals and colonial corals. Scree is rubbly from uneven bedding plane but is sharp-edged from siliceous content.		
								500			

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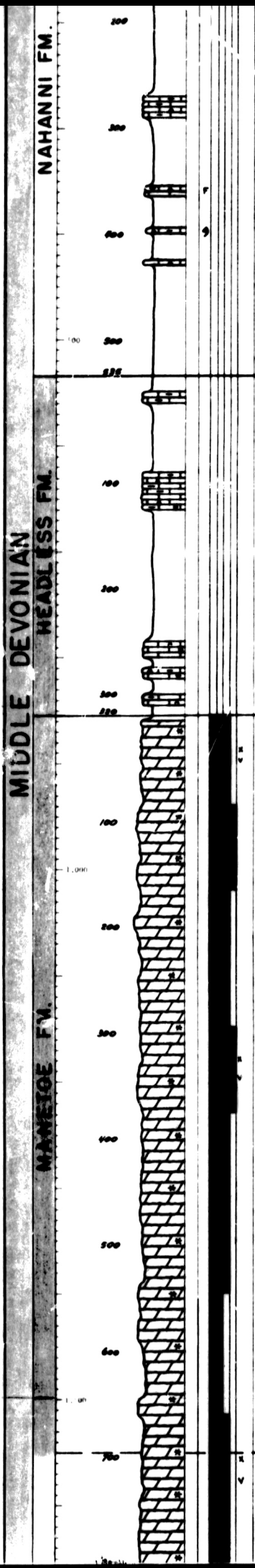

Limestone - float, Nahanni type as above.

Limestone - dark grey, very finely cry talline, quite argillaceous, flaggy, siliceous

Lime-tone scree - dark grey, very finely cry-talline, argillaceous as above, horn corals and colonial corals. Scree is rubbly from uneven bedding plane but is sharp-edged from siliceous content.

535' Limestone - dark grey to black, very fine xln, argillaceous, quite fossiliferous, in part brecciated, rubbly, contains coarse xln calcite in fracture. Siliceous in basal 900 feet.

Lime-tone - tan grey as above. The small outcrop dips north east into south west sloping hill.

Lime tone - dark grey, siliceous, in part brecciated by interlacing calcite veins.

Covered bench-probably shale zone and possibly also some brecciation resulting from movement within limestone bed.

Lime-tone - dark grey as above, in part brecciated, with calcite patches.

Lime tone - partial outcrop of recessive weathering black, siliceous, with calcite filled fractures and [illegible] on vertical planes similar to cone and cone fracture.

320' Limestone - dark grey to tan grey at top of formation, crpxl, siliceous, arg, mostly contains calcite filled fractures.

Dolomite - black, coarse cry talline, with inter-cry-talline and vuggy porosity, thin pseudo-bedding in top five feet, then massive, rubbly weathering below.

Dolomite - as above, becoming light grey and more rubbly, pseudo-bedding, dip 20 degrees to the

Covered interval.

Dolomite - black, coarse cry-talline, with abundant veining and patches of white coarse cry talline dolomite, also coarse clear crystalline quartz in larger vugs.

Dolomite - buff, coarse cry-talline, with white dolomite patches as above. No bedding discernible.

Dolomite - dark grey, porous, with occasional band of pure white, vugular, coarse cry-talline dolomite.

Dolomite - continuous reef-type outcrop as above.

700' True thickness believed to be represented by this section.

Dolomite - dark grey to black, coarse xln, with abundant veining and patches of white, coarse xln dolomite and in part quartz. Inter-xln and vuggy porosity, massive, rubbly weathering except top 5' where thin pseudo-bedding was observed.

Dolomite - continuous outcrop as above, no definite bedding, fracturing common with variously oriented planes.

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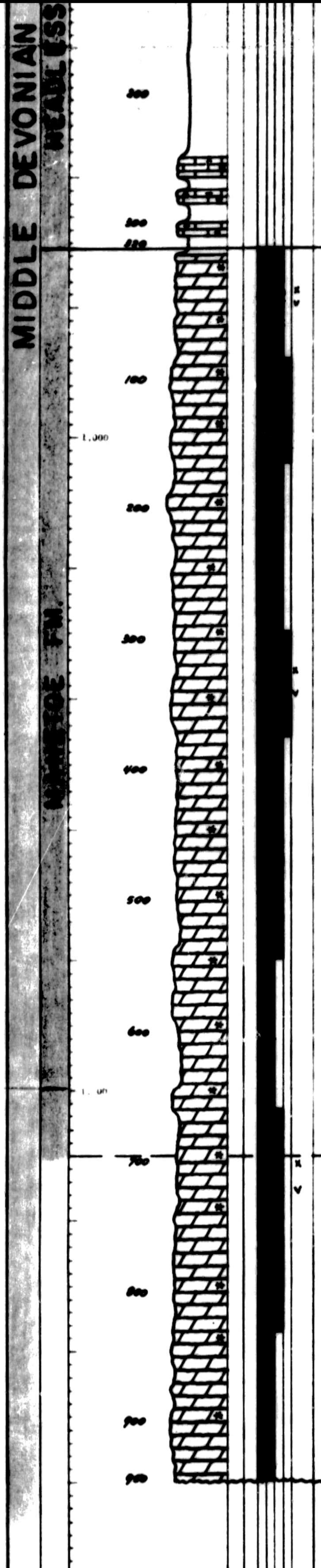

covered bench-probably shale zone and possibly also some brecciation resulting from movement within limestone beds.

1100

66 Limestone - dark grey as above, in part brecciated, with calcite patches.

1165 Limestone - partial outcrop is recessive wall, black, [illegible], siliceous, with calcite filled fractures and [illegible] on vertical planes similar to cone and cone structure.

1250 Dolomite - black, coarse crystalline, with inter-crystalline and vuggy porosity, thin pseudo-bedding in top five feet, then massive, rubbly weathering below.

1450 Dolomite - as above, becoming light grey and more rubbly, pseudo-bedding, dip 20 degrees to the [illegible]

Covered interval.

1550

Dolomite - black, coarse crystalline, with abundant veining and patches of white coarse crystalline dolomite, also coarse clear crystalline quartz in larger vugs.

1750

Dolomite - buff, coarse crystalline, with white dolomite patches as above. No bedding discernible.

1950

Dolomite - dark grey, porous, with occasional band of pure white, [illegible]dular, coarse crystalline dolomite.

2150

Dolomite - continuous reef-type outcrop as above.

2350

Dolomite - continuous outcrop as above, no definite bedding, fracturing common with variously oriented planes.

2550

2656 This general impression of a roll over is gained from viewing the reef section from the top of the funeral shale outcrop to the west.

Dolomite - black coarse crystalline, not as vuggy, not as granular as above.

Fault zone probably strikes along the stream course.

Immediately west of creek an outcrop of funeral formation was examined : 250 feet of shale and limestone, limestone is black, lithographic, micro-micaceous, granular, platy, very argillaceous, with beds and laminae of shale. The shale is [illegible], soft. Both limestone and shale weather irregularly platy, brown weather characteristic similar to a shale slope, dip 6° west.

[illegible] the lower 250 feet of section described above. For this reason and with consideration of the reversal of attitude an west dipping fault is proposed at the creek contact.

320' Limestone - dark grey to tan grey at top of formation, crpxl, siliceous, arg. mostly contains calcite filled fractures.

700' True thickness believed to be represented by this section.

Dolomite - dark grey to black, coarse xln, with abundant veining and patches of white, coarse xln dolomite and in part quartz. Inter-xln and vuggy porosity, massive, rubbly weathering except top 5' where thin pseudo-bedding was observed.

250' Shale and limestones - limestone black, crpxl, also granular, mmic, very arg., platy, with beds and laminae of soft, [illegible] shale.

C.D.P.-4

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 4
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 35' N. - 124° 50' W.
Geographic Location: 7 Miles NW of Trench Lake (332° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement: June 10, 1963

FOSSIL SYMBOLS

F	Fossiliferous		Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda	⊙	Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm.)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	FUNERAL FM.		100			F B		76	Section above is covered Funeral Formation Shales. Limestone - black, very fine crystalline, dense, dolomitic, slight siliceous, very argillaceous, fossiliferous, weathers very dark grey.		
			200						Limestone as above, thin bedded, interbedded with shale. Dolomitic limestone beds 4--6" thickness with 2 inch shale laminae between.	335' - Limestone and shale interbedded. Limestone - black very fine crystalline, dense, dolo, sl. siliceous, concoidal fracture, fossiliferous, weathers dark grey. Shale - black, limy, weathers tan and dark grey.	
			300					276	Interval covered with shale scree - Shale black, weathers tan, but overall effective color is dark grey.		
			100			⊙		476	Dolomite - black, very fine granular - argillaceous, micro-micaceous, with white coarse crystalline dolomite in veinlettes - brecciation by veinlettes in part, crinoid stems common, resistive.		
									Dolomite as above, with oval black chert inclusions, thick bedded.	290' - Dolomite - black, very fine granular - (arg.), in part micro-micaceous, in part brecciated by interlaced veinlettes of coarse crystalline white dolomite. Crinoid stems common.	

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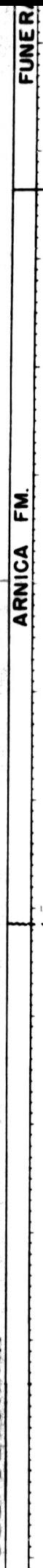


Interval covered with shale scree - Shale black, weathers tan, but overall effective color is dark grey.

Shale - black, limy, weathers tan and dark grey.

Dolomite - black, very fine granular - argillaceous, micro-micaceous, with white coarse crystalline dolomite in veinlettes - brecciation by veinlettes in part, crinoid stems common, resistive.

Dolomite as above, with oval black chert inclusions, thick bedded.

290' - Dolomite - black, very fine granular - (arg.), in part micro-micaceous, in part brecciated by interlaced veinlettes of coarse crystalline white dolomite. Crinoid stems common. Black chert inclusions in lower half.

Interval mostly covered but semi-resistant.

170' - Covered interval. Probably thin bedded dolomite as below.

Dolomite as above, with white dolomite veins and black chert, thin 1--4 inch beds separated by shale laminae that weather with hematitic red color in part.

60' - Dolomite - black, very fine granular, thin bedded, with shale laminae.

Dolomite - dark grey, very fine crystalline, occasional band thin bedding as above, with numerous shale fractures parallel to bedding spaced at 1--3 inch intervals.

Occasional interbed of light grey dolomite with angular laminations, weathers with red hematitic color as above.

Coarse crystalline white dolomite is present in patches, veining is sparse. Outcrop weathers quite dark grey.

160' - Dolomite - dark grey, very fine crystalline, thick bedded and thin bedded in bands. Shale parting planes and laminae, in part red weathering bedding planes. Dark grey weathering.

Unconformable contact

Probably the upper two divisions of the Sombre formation have been eroded at this section location.

Dolomite - medium grey, granular, argillaceous.

Dolomite - blue grey, calcareous, thick bedded, with zones of shale fractures as above, weathers a medium light grey.

Fossil beds - coral ? - appear as calcite filled, isolated worm burrows.

Dolomite - medium blue grey, thick bedded, with zones of shale fractures and fossil horizons. Banded weathered surfaces of light and dark grey beds.

Amphipora sp.

Middle Devonian

Dolomite - Interbedded light and dark grey, fine to very fine crystalline, thick 2 foot beds. Banded weathered surface of light and dark grey, reflect variable argillaceous content of dolomite beds.

Dolomite - green grey, [illegible], massive bedded, friable, siliceous with interbed of dolomite dark grey, very fine crystalline, thin bedded.

Shale - light green grey, dolomitic, tan weathering.

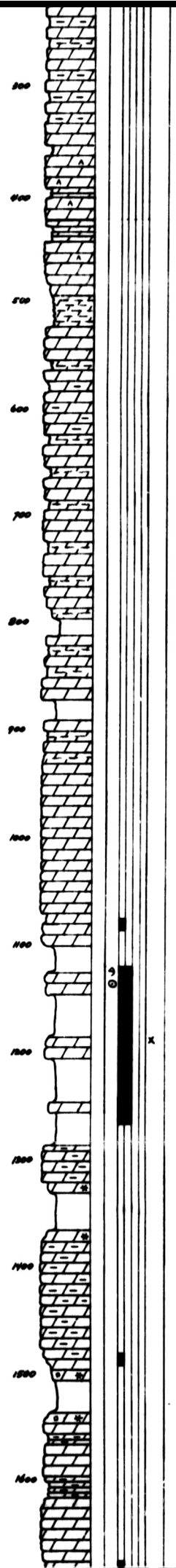
Dolomite - green grey, [illegible], massive bedded with shale, as above, as occasional interbed.

710' - Dolomite - green grey and medium blue grey interbedded and banded, with shale laminae on partings planes in cyclic zones. Shales are brown and light green-tan weathering with

2 of

MIDDLE DEVONIAN

SOMBRE FM.



variable argillaceous content of dolomite beds.

14.4

14'4 Dolomite - green grey, [illegible], massive bedded, friable, siliceous with interbed of dolomite dark grey, very fine crystalline, thin bedded.

16'4 Shale - light green grey, dolomitic, tan weathering.

Dolomite - green grey, [illegible] massive bedded with shale,as above,as occasional interbed.

17'1

Dolomite - medium blue grey, in part tan grey, [illegible] massive bedded with interbeds of tan weathering dolomitic shale. Shale laminations cause uneven, rusty colored,weathered bedding planes.

19'1

Dolomite - interbedded as above, medium light blue grey, [illegible], occasional bed of brown, sandy dolomite in float on covered interval,thin shale laminae separate massive dolomite beds in 15--25 foot intervals.

20'1

Dolomite - medium light grey, fine crystalline, weathers light and dark grey, banded, some beds laminated on weathered surfaces, resistive. Thick bedded 1--4 foot thickness.

22'3

Dolomite - granular - porous.

23'9

Dolomite - medium grey, granular, porous, 2 foot bedded,trace of corals, crinoids and trilobites.

Dolomite - granular as above - softer with duller sound than fine crystalline dolomite.

24'1

Dolomite - granular as above.

Dolomite - light and dark grey, [illegible] to very fine crystalline.

Covered interval-possible breccia zone as in beds bordering it.

Dolomite - as above variable color and crystalline size dependant on argillaceous content.

26'1

Dolomite - granular, porous.

Dolomite - interbedded as above, much brecciated float in saddle and in outcrop on each side.

29'4

Dolomite - very argillaceous, tan weathering on occasion, thin bedded.

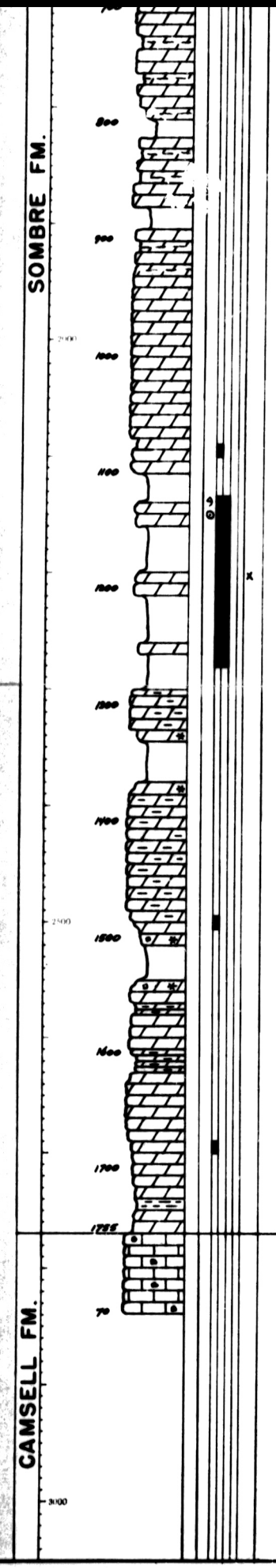
71'0' - Dolomite - green grey and medium blue grey interbedded and banded, with shale laminae on parting planes in cyclic zones. Shales are brown and light green-tan weathering with rust and red staining from iron content on some of the irregular bedding planes. Dolomite variably siliceous, brittle.

20'0' - Dolomite - medium grey, granular with intergranular porosity,softer and less brittle than dolomite above. Fossiliferous,corals and crinoids.

46'0' - Dolomite - massively bedded, variable color, and crystalline to [illegible]. Banded weathered surface, with breccia zones and occasional isolated bed of granular porous dolomite as above.

Devonella sp.
(Lower or Middle Devonian)

13 of



1921

Dolomite - interbedded as above, medium light blue grey, [illegible], occasional bed of brown, sandy dolomite in float on covered interval, thin shale laminae separate massive dolomite beds in 15--25 foot intervals.

2061

Dolomite - medium light grey, fine crystalline, weathers light and dark grey, banded, some beds laminated on weathered surfaces, resistive. Thick bedded 1--4 foot thickness.

2261

Dolomite - granular porous.

2349

Dolomite - medium grey, granular, porous, 2 foot bedded, trace of corals, crinoids and trilobites.

Dolomite - granular as above - softer with duller sound than fine crystalline dolomite.

2461

Dolomite - granular as above.

Dolomite - light and dark grey, crypti. to very fine crystalline.

Covered interval-possible breccia zone as in beds bordering it.

Dolomite - as above variable color and crystalline size dependant on argillaceous content.

2661

Dolomite - granular, porous.

Dolomite - interbedded as above, much brecciated float in saddle and in outcrop on each side.

2861

Dolomite - very argillaceous, tan weathering on occasion, thin bedded.

Dolomite - blue grey, very fine crystalline.

Dolomite - granular, porous.

2998

Limestone - breccia - fragments of angular dark blue grey limestone and medium grey, [illegible] limestone.

Weathers light grey with yellow and orange colors on calcite patches and veins. Weathers rounded and rubbly - in part massively bedded.

200' - Dolomite - medium grey, granular with intergranular porosity, softer and less brittle than dolomite above. Fossiliferous, corals and crinoids.

465' - Dolomite - massively bedded, variable color, and crystalline to [illegible]. Banded weathered surface, with breccia zones and occasional isolated bed of granular porous dolomite as above.

70' - Limestone - breccia.

Dechenella sp. (Lower or Middle Devonian)

4 of 4

C.D.P.-5

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 5
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 34' N. - 124° 51' W.
Geographic Location : 6.5 Miles NW of Trench Lake (324°AZ.)
Geologists : C.D. McCord, K.W. Campbell
Date of measurement : June 10, 1963

FOSSIL SYMBOLS

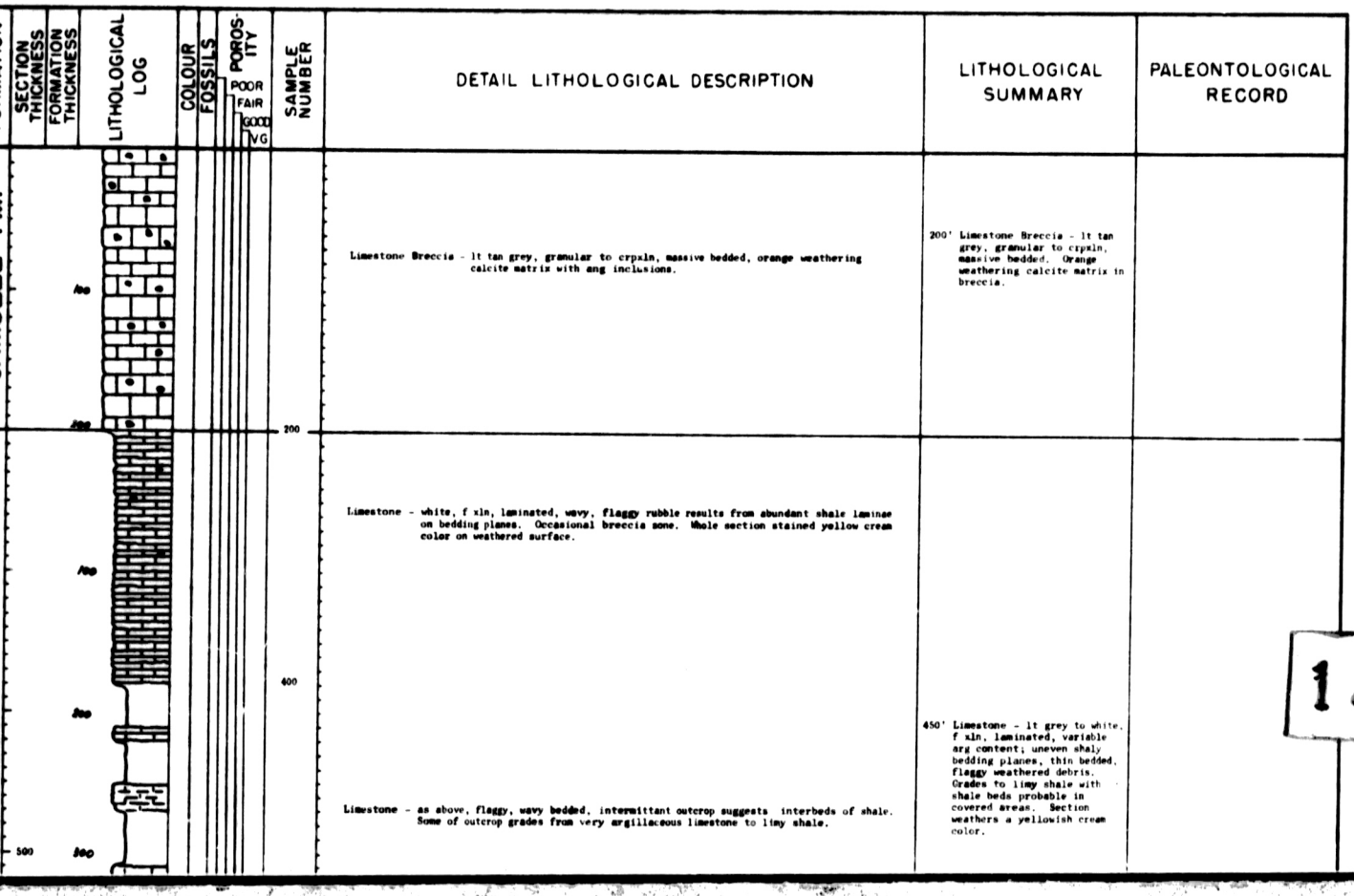
F	Fossiliferous	ш	Stromatopora
B	Brachiopoda	♈	Foraminifera
G	Gastropoda	⊙	Crinoid
ϟ	Coral	⌒	Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark



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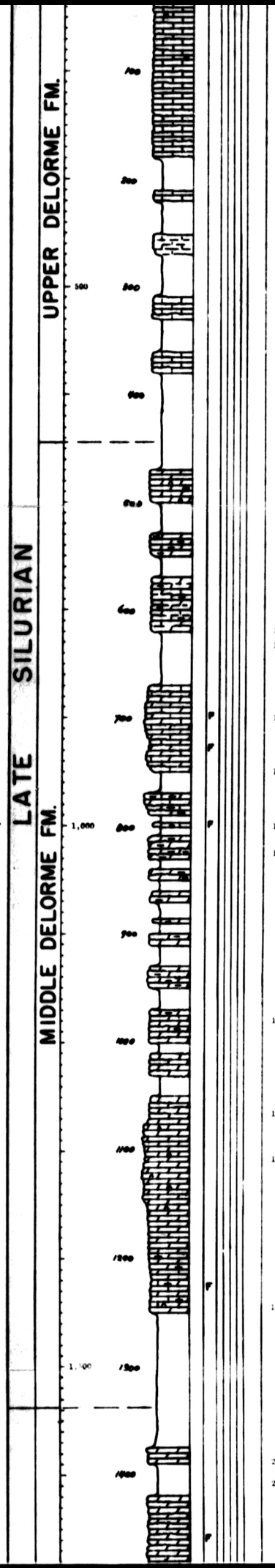


Limestone - white, f xln, laminated, wavy, flaggy rubble results from abundant shale laminae on bedding planes. Occasional breccia zone. Whole section stained yellow cream color on weathered surface.

Limestone - as above, flaggy, wavy bedded, intermittant outcrop suggests interbeds of shale. Some of outcrop grades from very argillaceous limestone to limy shale.

Dolomite - lt grey, f xln, siliceous, platy to slabby, with occasional coarse xln qtz vein.

Dolomite - dk blue grey to black, granular, arg, weathers dark grey with rust colored oxides. Formation has a yellow appearance from a distance. No lt.grey beds or brilliant yellow patches as in Cammell formation above.

Dolomite - as above, limy, fossiliferous, becoming more rubbly due to wavy shale laminae and semi-spheres. Occasional thin, limy beds have abundant bulbous brachiopoda and bryozoan. Ripple marked bedding surfaces on two inch thick flagstones. Limy brown shale laminae.

Dolomite - dk grey to black, micro xln, limy, very fossiliferous in specific beds that could be considered dolo limestone. Fossils collected at 1200'.

Dolomite - dk grey, f xln, arg, flaggy, fossiliferous, limy. Shale zones suggested by alternating resistive beds and covered zones in 20 foot intervals. Fossils collected at 1375.

Dolomite - as above, nodular, wavy, dolomite flagstone in scattered outcrop, some coarse xln calcite in veins, no fossils.

Dolomite - as above, dk blue grey, thinly laminated.

Dolomite - as above, dk grey to black, siliceous, with black chert.

Dolomite - as above black limy, yellow weathering, fossiliferous, slabby.

Covered Interval - rusty colored dolomite debris.

Color change on ridge to north.

Dolomite - med grey, f xln, smooth bedding planes, not limy, not fossiliferous.

Dolomite - as above, uneven flaggy, 3 - 4 inch bedding, fossiliferous.

450' Limestone - lt grey to white, f xln, laminated, variable arg content; uneven shaly bedding planes, thin bedded, flaggy weathered debris. Grades to limy shale with shale beds probable in covered areas. Section weathers a yellowish cream color.

100' Dolomite - lt grey to blue grey, f xln to granular siliceous in upper beds at formation boundary with occasional quartz veins. Lower beds arg with rust colored iron oxides. Entire section has a pale yellow appearance from a distance.

290' Dolomite - limy, dk grey, f xln, arg, shale laminae, uneven thin flaggy beds. Fossiliferous, in concentrated zones that could be considered dolomitic limestone. Possible shale zones in covered intervals. Calcite veins noted.

240' Dolomite - not limy, dk grey, f xln, nodular, wavy flagstones debris, thinly laminated argillaceous, with calcite veins, no fossils.

100' Dolomite - dk grey, to black, siliceous with black chert, resistive outcrop.

80' Dolomite - limy, black, fossiliferous, slabby, in part siliceous, weathers yellow.

170' Recessive covered interval with rust colored dolomite debris. Small outcrop is not limy, not fossiliferous, med grey, f xln.

100' Dolomite - med grey, f xln, fossiliferous, not limy.

Conites sp.
Megambonia ariculoidea.
(L Devonian or latest sil.)

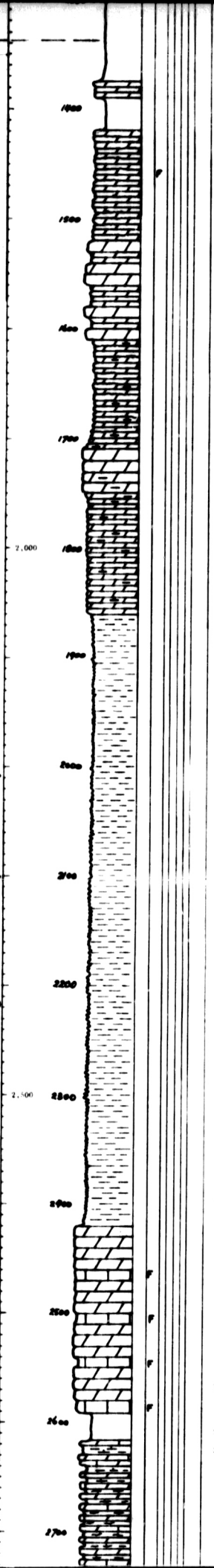
Megambonia ariculoidea

Strupheodenta sp.
(L Devonian or latest sil.)

2 of

SILURIAN (Probably Ludlovian - G.S.C. Paper 61-13)

LOWER DELORME FM. (Reefal in Delorme Range - G.S.C. Paper 61-13)



Color change on ridge to north.

2085 — Dolomite - med grey, f xln, smooth bedding planes, not limy, not fossiliferous.

2110

Dolomite - as above, uneven flaggy, 1 - 4 inch bedding, fossiliferous.

[80' Dolomite - med grey, f xln, fossiliferous, not limy; flaggy in top half, more massive, unfossiliferous in lower half, with occasional coarse xln bed.

2123

Dolomite - as above, occasional coarse xln, more massive bed.

2247 — Dolomite - limy, laminated, uneven flagstone, weathers yellowish grey.

2308 — Dolomite - limy, flaggy as above.

[50' Dolomite - limy, laminated to banded, lt and dk grey, variably argillaceous. Generally thin bedded, flaggy with some massive beds that make section semi-resistive. Yellow grey weathered color.

Dolomite - color banded, lt and dk grey reflecting variable shale content? In part more massive bedded, banded, also limy and flaggy as before. Outcrop is relatively resistive.

2508

Shale - black, slaty, smooth, even cleavage surfaces, weathers yellowish grey.

2708

[60' Shale, black, slaty, weathers yellowish grey.

Shale - black, slty as above.

2908

Shale - as above.

3108

Dolomite - black, crystln, tight, with occasional fossiliferous limestone bed, both massive bedded.

[80' Dolomite - black, crystln, tight, massive bedded, resistive, with occasional fossiliferous limestone bed.

3208

Covered scarp.

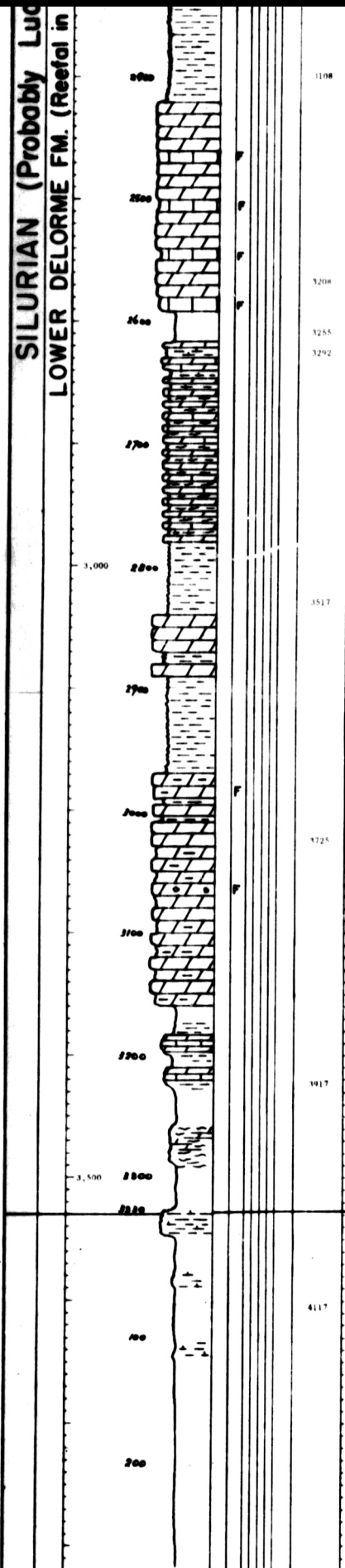
3255

3292 — Dolomite - limy, thinly interlaminated with shale, also limy.

[40' Dolomite and Shale, interbedded, both black, v f xln and limy, bedding 1 - 4 inches thick, shale is slaty.

Dolomite and Shale - interbedded, both black, v f xln and limy, bedding 1 - 4 inches thick, shale is slaty.

13 of



1108		
	Dolomite - black, crystln, tight, with occasional fossiliferous limestone bed, both massive bedded.	180' Dolomite - black, crystln, tight, massive bedded, resistive, with occasion fossiliferous limestone bed.
3208		
3255	Covered -soil.	
3292	Dolomite - limy, thinly inter-laminaed with shale, also limy.	
	Dolomite and Shale - interbedded, both black, v f xln and limy, bedding ½ - 4 inches thick, shale is slaty.	140' Dolomite and Shale inter-bedded - limy, black, v f xln beds ½ - 4 inches thick.
	Shale - med gr. slaty, lt grey weathered color - not yellowish as shale zone above.	
3517		
	Dolomite - lt grey, granular, with dk arg dolomite inclusions, massive bedded.	
	Shale - as above.	
	Dolomite - black, coar - xln, massive.	230' Shale with Dolomite - shale med grey, slaty, lt grey weathering, not yellowish - as - Dolomite - lt grey, granular, massive bedded, with large arg dolo inclu-sion, fossiliferous in basal beds.
	Dolomite - med to lt grey, coarse grained, fossiliferous, massive bedded much shale debris on outcrop - probably occasional interbed of shale.	
3725		
	Dolomite - banded black and med grey, coarse xln and crystln, in part fragmental - black dolomite matrix with white fossil fragments. Massive bedded - forms resistive cliff.	150' Dolomite - med gr and black banded, coarse xln to crystln in pt fragmental, massive bedded, resistive, cliff forming.
	Shale, Dolomite and Limestone interbedded - section is recessive with poor outcrop of massive banded limy dolomite. Dark weathered bands limy, rust weathered bands are not. Bands ½ - 1 inches wide.	
3917		170' Shale with Dolomite and Limestone - poor carbonate outcrops are banded, dark weathering bands are limy rust weathering bands dolo-mite, arg. Lower section knodular in character with shale and dolomite lenticu-larly inter-laminated.
	Scree Slope - abundant rubbly debris, arg dolomite or knodular, dolomitic shale. Argillaceous mat., between savy dolomitic laminae.	
	Shale - black, limy, semi-slate, weathers yellowish grey, sword shaped debris rather than platy.	
4117		
	Covered slope for 500' of section - Scree is sword like debris as shale outcrop above.	500' Shale - debris on covered lower slope of ridge. Sword shaped limy shale is considered to be in upper Whittaker formation.

4 of 4

C.D.P.-6 & 14

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 6 & 14
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 01' N. - 124° 55' W.
Geographic Location : 6 Miles W of Trench Lake (280° AZ)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement. June 11 & 17, 1963

FOSSIL SYMBOLS

- Fossiliferous
- B Brachiopoda
- G Gastropoda
- Coral
- Stromatopora
- Foraminifera
- Crinoid
- Algae

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

- Limestone
- Dolomite
- Dolomitic Limestone
- Argillaceous Limestone
- Argillaceous Dolomite
- Silty Limestone
- Limestone Breccia
- Dolomite Breccia
- Rugose to Rubbly
- Coarse Crystallization
- Shale
- Calcareous Shale
- Anhydritic Shale
- Salt Casts
- Pyritic / Micaceous
- Siliceous
- Siltstone
- Ironstone
- Sandstone
- Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
								1700	Shale - Outcrop immediately above considered to be Lower Delorme Formation. medium dark grey, lim[illegible], irregularly laminated, orange weathering, sword shape rather than slab shape debris. See base of section 5.		Favosites of capax (Upper Ordovician or Lower Silurian)
									Shale - scree slope, blocky, dark grey-black, lim[illegible], with limestone, argillaceous, crpxl.		
			100					1600			
			200						Shale - with limestone scree, as above, blocky, black to dark grey weathering.		
			300					1400			
						F			Shale - with limestone scree, as above, trace of veins and patches of calcite, also thin beds of shell fragments.		
			400								
									Shale - black, carbonaceous appearing, lo[illegible], not as lim[illegible] as below.		
								1200			
			500								

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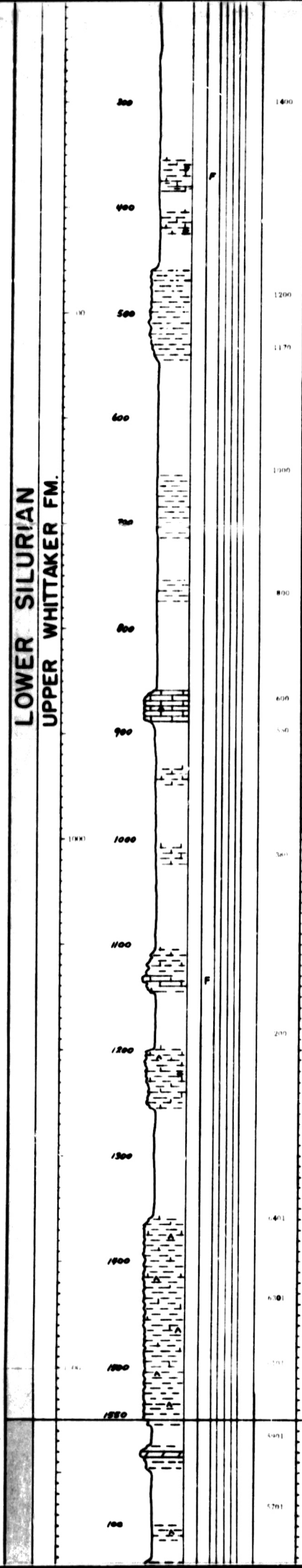

1400

Shale - with limestone scree, as above, trace of veins and patches of calcite, also thin beds of shell fragments.

Shale - black, carbonaceous appearing, lime, not as lime as below.

1200

1170 Base of resistive lime above, recessive saddle below.

Covered saddle.

1000

Covered saddle (brown earth forming shale zone - no outcrop, mostly soil with tan weathered, small, platy, shale debris.

1580' Shale - med dk grey, weathers lt tan to dk grey, lime, platy in lower portion, blocky at top. Trace of calcite filled fractures, also thin beds of calcitic shell fragments. Some variability in composition of shale reflected in weathered characteristics, alternating zones of black, si, siliceous, shale and soft, brown, earth forming shale. Entire zone recessive.

800

Litho change, tan weathering, lime shale above, dark grey weathering debris below.

600 Limestone - resistive, black, finely crystalline,
Shale - black, no brown tinge as above, siliceous?, lime.

550 Litho change - dark grey to black float above, brown weathered float below.

360 Nautiloid - worm tubes (Ordovician - Silurian)

Covered slope - all float that appears very close to being in situ.

200 Shale - lime, platy with occasional blocky slab that also breaks in platy fashion, weathers tan-brown, in part fossiliferous.

Shale - dark grey and medium grey, lime, with calcite on bedding planes, sonorous, (siliceous), semi-platy.

Covered saddle.

6401

6301 Shale - black, platy, sonorous, (siliceous), weathers light tan grey, jet black when wet.

Shale - as above.

5901

Shale - as above, with occasional thicker, lacy dolomite bed. Discontinuous outcrop.

5701

Shale - debris quite platy, black, thin, smooth.

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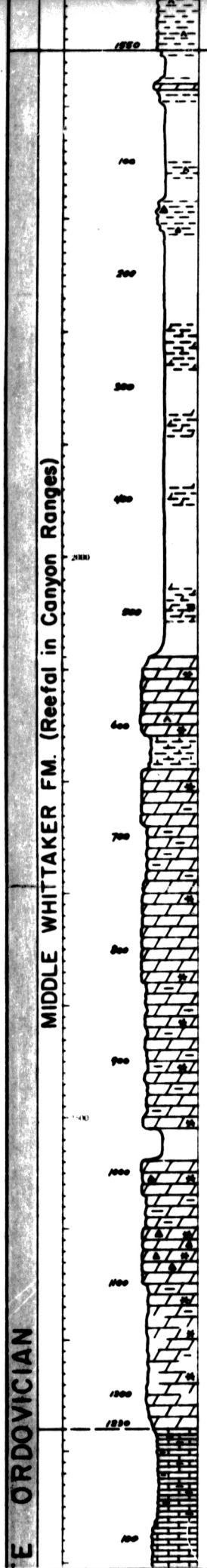

	Shale	– as above.		
5401	Shale	– as above, with occasional thicker, lamin. dolomite bed. Discontinuous outcrop.		
5201	Shale	– debris, quite slaty, black, thin, smooth.		
	Shale	– black, with black, nodular, chert band parallel to bedding.		
5501				
5301		Covered interval – abundant acres of dolomitic, slabby, black shale.	530' Shale – black, slabby to platy dolomitic, with occasional thin, slabby, arg, dolomite bed in upper 60 feet. Also 20 foot nodular chert zone in shale 140 from top of section. Coarse xln dolomite fills obliquely oriented fractures at base of section.	
5101				
5081				Catenipora rubra (Upper Lavonian)
4901		No outcrop but ridges north and south have a unifurm thick section of black weathering, dolomitic shale as outcrops below.		
4701		Scree slope – dolomitic shale, platy, granular, with thin veins of white crystalline dolomite oblique to bedding planes.		
4501				
4360	Dolomite	– black, with prominent rust weathering, quartz veins.		
4301	Dolomite	– medium grey, massive bedded, with quartz veins, weathers light grey.	120' Dolomite – med grey-black, massive bedded, crpxl, with prominent rust, weathering, thick, quartz veins. Some lam. shale beds.	
	Shale	– platy, lam., no quartz veins.		
	Dolomite	– medium grey, crpxl, massive bedded, with quartz veins.		
4144				
	Dolomite	– medium grey, crpxl, argillaceous, buff to grey weathering, lam., recessive.	90' Dolomite – med grey, crpxl, arg, buff weathering, lam., recessive.	
4044				
	Dolomite	– prominant thick veining of coarse crystalline dolomite and quartz, stratifies parallel to bedding, dolomite more massive, dark grey weathering.	170' Dolomite – med greenish grey, very fine xln, argillaceous, slabby, tan to dk grey weathering, massive bedded. Abundant interstrata veining of coarse xln white dolomite.	
	Dolomite	– argillaceous as below.		
3844				
	Dolomite	– medium greenish grey, very finely crystalline, sl. argillaceous, lam., tan-grey weathering, with white dolomite veinlettes.		
3644	Dolomite	– light grey, lam., argillaceous, traces silicefied horn corals, white dolomite fracture filling.		
		Covered depression – light grey, argillaceous, lam, dolomite debris.	170' Dolomite – lam., very fine xln, tan to light grey weathering, arg, silliceous, abundant silicefied colonial and horn corals, chert nodules, chert and thick white quartz veins.	
3444	Dolomite	– black, as below, with abundance of silicefied corals, chert and quartz veins (3 to 6 inches).		
	Dolomite	– black, very finely crystalline, argillaceous, light grey weathering.		
3244	Dolomite	– black, finely crystalline, tan weathering, abundant grey chert nodules and thick white quartz veins, colonial corals, (chert nodules probably silicefied horn corals.)		
3044			140' Dolomite – black, f xln, massive bedded, sparcely foss Abundant coarse xln, white, dolomite veins, weather orange.	
	Dolomite	– black, finely crystallin , sparcely fossiliferous, argillaceous, with abundant coarse crystalline, white, dolomite veins that weathers orange.		
2864	Dolomite	– black, finely crystalline, tan weathering.		
2844				
	Limestone	– black, very shaly and platy.		
2644	Limestone	– black, slabby, fossiliferous, no purple shale laminae as below, becoming more shaly upward.	220' Limestone – black, med xln – crpxl, slabby to rubbly, quite arg, fossiliferous with a variety of species abundant in lower beds.	

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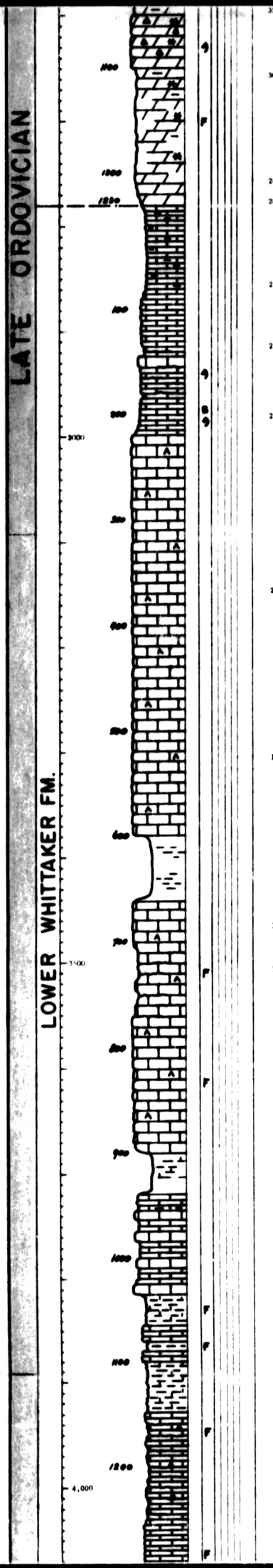

3244	Dolomite	black, finely crystalline, tan weathering, abundant grey chert nodules and thick white quartz veins, colonial corals, (chert nodules probably silicefied horn corals.)		
3044	Dolomite	black, finely crystalline, sparcely fossiliferous, argillaceous, with abundant coarse crystalline, white, dolomite veins that weathers orange.	140' Dolomite - black, f xln, massive bedded, sparcely foss Abundant coarse xln, white, dolomite veins, weather orange.	
2864	Dolomite	black, finely crystalline, tan weathering.		
2844	Limestone	black, very shaly and platy.		
2644	Limestone	black, slaking, fossiliferous, no purple shale laminae as below, becoming more shaly upward.	220' Limestone - black, med xln - crpxl, slaking to rubbly, quite arg, fossiliferous with a variety of species abundant in lower beds.	
2444	Limestone	black, medium crystalline to crpxl, semi-platy to rubbly, argillaceous, fossiliferous, colonial chain corals.		
2244	Limestone	black, interbedded, medium crystalline and crpxl, cup corals, brachiopod, pelecypods, bryozoan all calcitic.		
	Limestone	black, crpxl. very fossiliferous, as below.		
2064	Limestone	dark grey to black, crpxl to micro-granular, siliceous with wavy fracture planes that are colored with a purple lichen that probably grows on surfaces that are argillaceous, the shale laminae are extremely thin and shale is not discernable.	380' Limestone - dark grey to black, crpxl, siliceous, massive bedded, very fossiliferous, wavey purple colored fracture planes characteristic of this section. Limestone beds separated by extremely thin shale laminae.	Pardenie sp, Favistella sp. Hallopora (Late Middle Silurian)
1864	Limestone	black, crpxl to micro-granular, contains coarse crystalline black calcite. With shale laminae, weathers purple on bedding planes of limestone.		
		Covered saddle - probably shale.	60' Covered interval - probable shale zone.	
1664	Limestone	black, granular to crpxl, fossiliferous, very rubbly weathering in part, siliceous in the more resistive beds, fossil collected at 1600.		Receptaculites (Late Ordivician or Silurian)
1600			230' Limestone - black, granular to crpxl, fossiliferous, very rubbly weathering in part, siliceous, massive bedded, resistive.	
1544	Limestone	black, siliceous, massive, resistive, weathers with pseudo-bedding in 3 to 4 inch thicknesses caused by hairline cracks which could be very thin shale laminae, fossiliferous, semi-granular.		
		Covered shale depression.		
1344	Limestone	black, granular, with calcite fossil fragments, thin and thick bedded, recessive bed at 1314 with network of semispherical shale laminae.		
1314				
1266			440' Limestone and shale inter-bedded. Limestone - black, granular, thin and thick bedded. Semi-spherical fracturing along shale laminae characteristic of this section. Calcitic fossil fragments common particularly in base of section where limestone is a fossil fragmental. Black chert nodules restricted to an 80 foot zone near the base of section.	
1211	Shale	black, powdery appearance, with calcite veinlettes, weathers light grey.		
	Limestone	interbedded with shale, limestone is granular, black with calcite fossil fragments.		
1136				
1066	Shale	black, granular, carbonaceous appearance, soft, limy, 60 foot zone.	Shale - black, granular carbonaceous appearance, soft, limy, weathers lt grey, trace calcite veins.	
	Limestone	black, very rubbly as result of abundant fossil material, semispherical shale breaks, and nodules of black chert, brown weathering on shale laminae.		
866	Limestone	black, fossil fragmental, weathers dark grey to black, fossil debris comprised of calcite shell fragments in crescent shape.		

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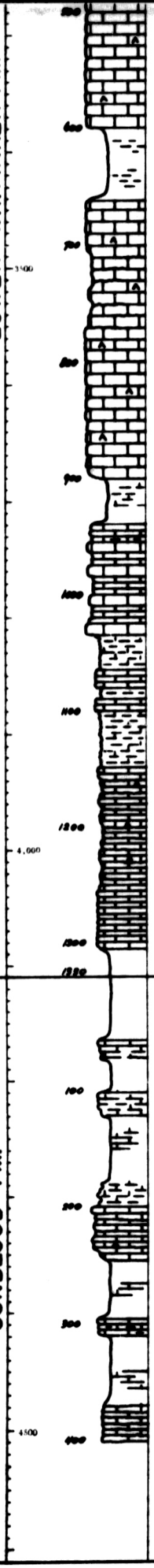

1864	Limestone -	black, crpxl to micro-granular, contains coarse crystalline black calcite. With shale laminae, weathers purple on bedding planes of limestone.		
		Covered saddle - probably shale.	60' Covered interval - probable shale zone.	
1666	Limestone -	black, granular to crpxl, fossiliferous, very rubbly weathering in part, siliceous in the more resistive beds, fossil collected at 1600.		Receptaculites (Late Ordivician or Silurian)
1600			230' Limestone - black, granular to crpxl, fossiliferous, very rubbly weathering in part, siliceous, massive bedded, resistive.	
1566	Limestone -	black, siliceous, massive, resistive, weathers with pseudo-bedding in 3 to 4 inch thicknesses caused by hairline cracks which could be very thin shale laminae, fossiliferous, semi-granular.		
		Covered shale depression.		
1366	Limestone -	black, granular, with calcite fossil fragments, thin and thick bedded, recessive bed at 1314 with network of semispherical shale laminae.		
1314				
1266			440' Limestone and shale interbedded. Limestone - black, granular, thin and thick bedded. Semi-spherical fracturing along shale laminae characteristic of this section. Calcitic fossil fragments common, particularly in base of section where limestone is a fossil fragmental. Black chert nodules restricted to an 80 foot zone near the base of section.	
1211	Shale -	black, powdery appearance, with calcite veinlettes, weathers light grey.		
	Limestone -	interbedded with shale, limestone is granular, black with calcite fossil fragments.		
1136				
1066			Shale - black, granular carbonaceous appearance, soft, limy, weathers lt grey, trace calcite veins.	
	Shale -	black, granular, carbonaceous appearance, soft, limy, 60 foot zone.		
	Limestone -	black, very rubbly as result of abundant fossil material, semispherical shale breaks, and nodules of black chert, brown weathering on shale laminae.		
866				
	Limestone -	black, fossil fragmental, weathers dark grey to black, fossil debris comprised of calcite shell fragments in crescent shape.		
750		Change in slope - possible formation boundary.		
		Covered slope.		
666	Limestone -	white, fossil fragmental, weather mottled, medium grey, with orange patches.		
	Limestone -	dark grey, rust weathering, with shale laminae.	390' Limestone and shale interbedded. Limestone - dr grey to black med xln to crpxl, in part fragmental, with shale laminae, weathers mottled med grey, irregular platy, with orange and rust patches. Outcrop is semi-resistive particularly where beds are siliceous. Shale - black, limy, slatey brown weathering. This zone weathers a light tan color in contrast with the solid mass of section above.	
		Covered slope - talus as above, light tan weathering.		
466	Shale -	black, brown weathering, limy, slaty.		
	Limestone -	black, fragmental, fossiliferous, grading to shale upward.		
400				
	Limestone -	medium grey to medium crystalline, resistive, generous, siliceous with mottled, rust and purple weathering shale laminae, weathers rubbly, fossil poorly preserved.		
		Covered slope, scree as above, limestone, coarse crystalline.		
200	Lisestone -	dark grey, crpxl, argillaceous, platy, dark grey weathering, with some orange coloration.		
		Covered saddle, slopecontains medium grey, coarse crystalline limestone.		
	Limestone -	black, crpxl, argillaceous, irregular platy, with granular shale laminations.		
		Orange weathering Sunblood formation - dolomite with copper mineralization disseminated within the beds.		

C.D.P.-7

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 7
CANYON RANGES

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates :63° 15' N. - 125° 18' W.
Geographic Location: 21 Miles SW of Long Lake (222° AZ.)

Geologists :C.D. Mc Cord, K.W. Campbell.
Date of measurement: June 14, 1963

FOSSIL SYMBOLS

F	Fossiliferous		Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda	⊙	Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm.)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE / FORMATION	SECTION THICKNESS / FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR / FOSSILS / POROSITY (POOR, FAIR, GOOD, V.G.)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
(TRENTON - WILDERNESS) "RED SANDSTONES" (G.S.C.)	100		F	90	This section began in yellow orange weathering, platy, dolomite beds that were in contact with dolomitic limestones and dolomite beds stratigraphically above. The beds above weathered with a grey banded color. This section was measured to compare the Ordivician section with that measured on the Whittaker Anticline. Dolomite - white and dark grey interbedded, siliceous, yellow tan weathering.	60' Dolomite - white and dark grey interbeds, siliceous, yellow-tan weathering.	
				180	Sandstone - light grey to white, weathering yellowish tan color, slightly limy, resistive, calcareous shale laminae within the sandstone have fossil-like rods. Fossiliferous siltstone.	75' Sandstone, Shale and Siltstone: Sandstone is lt grey, sl limy, resistive, weathers yellowish color. Shale occurs as laminae in Sandstone and possibly as thicker beds in covered intervals. Siltstone is fossiliferous.	Worm burrows Arthropod tracks.
	200			200			
			Fp	234	Limestone - black, crpsln, argillaceous, weathers with a semi-lenticular argillaceous laminae; blebs of coarse xln quartz and iron sulphides.		
			Fp		Limestone - black, rubbly, platy, irregularly mottled purple color.	120' Limestone - black, crpsln, arg, platy, weathers rubbly, mottled purple color from uneven laminae of very arg limestone. Coarse xln qts and iron sulphides present.	
	300			330	Covered interval probably thin, platy, argillaceous, limestone, or limy shale as in the float; purple color reflects minute shale laminae.		
			Fp	400	Contact with brilliant orange weathering zone, which is a sandstone, white, fine grained.		
				600	No outcrop, fresh angular, blocky float, contains white, orange weathering, fine grained sandstone with occasional bed of fine siliceous shale. The upper 100 ft. contains more abundant purple weathering, medium to coarse gritty sandstone with thin rounded chert conglomerate beds. The purple color penetrates well into the rock; the rock has, in fact, a high content of purple shale. Limestone may be present in the section in minor amounts as a light grey, gritty-granular limestone was found in the scree.		
	400					275' Conglomerate, sandstone and shale, interbedded in a brilliant orange weathering zone. Sandstone is lt grey to white as above, Shale is purple color and occurs in beds and also as the matrix in the conglomerate which contains mostly rounded white quartzite cobbles.	
				800	No outcrop; float is all purple-ground mass, conglomerate; fragments are mostly rounded ellipsoidal, white quartzite.		
			Fp	880	Conglomerate outcrop, as the float described above.		

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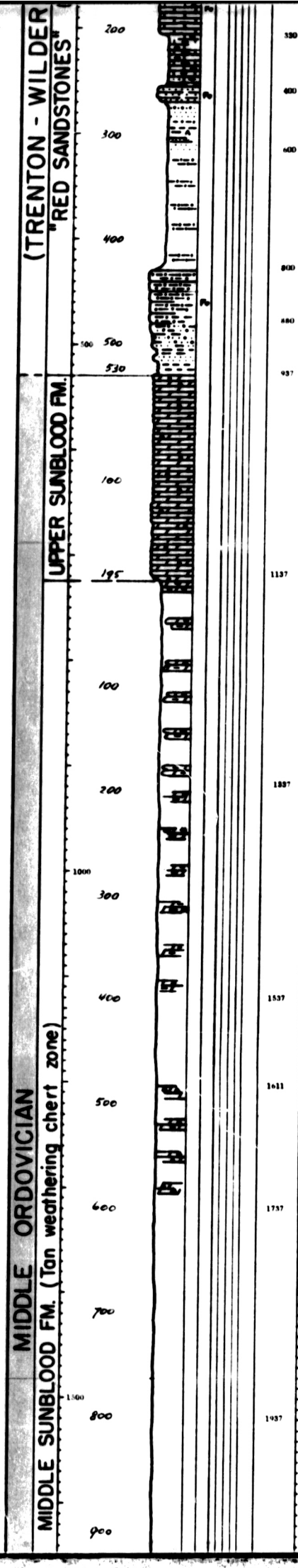


330 Limestone - black, rubbly, platy, irregularly mottled purple color.

Covered interval probably thin, platy, argillaceous, limestone, or limy shale as in the float; purple color reflects minute shale laminae.

600 Contact with brilliant orange weathering zone, which is a sandstone, white, fine grained.

600 No outcrop, fresh angular, blocky float, contains white, orange weathering, fine grained sandstone with occasional bed of fine siliceous shale. The upper 100 ft. contains more abundant purple weathering, medium to coarse gritty sandstone with thin rounded chert conglomerate beds. The purple color penetrates well into the rock; the rock has, in fact, a high content of purple shale. Limestone may be present in the section in minor amounts as a light grey, gritty-granular limestone was found in the scree.

800 No outcrop; float is all purple-ground mass, conglomerate; fragments are mostly rounded ellipsoidal, white quartzite.

880 Conglomerate outcrop, as the float described above.

500 937 Basal zone of conglomerate, contains more and more beds of green shale. Conglomerate grades to a gritty sandstone, mixes with shale and then at the base the zone is complete green and purple shales resting directly on a white dolomite at 937'.

1137 Dolomite - light grey to white, finely xln, siliceous, weathers a yellow tan or light buff, blocky, semi-sharp, dull sounding.

No outcrop, slope is covered with dull tan colored scree; ridge to south has outcrop continuous through this section; the scree weathers in a nature suggesting argillaceous laminations in that there are deep cuts into the dolomite; indeed the dolomite scree has some dark grey dolomite and the white dolomite seems softer, less argillaceous, less arenaceous.

1337

1000 1537 Poor outcrop - impression of a very pure white dolomite - scree in the lower 100 ft. has some material displaying argillaceous mottling that are raised on a weathered surface which, on a fresh surface, are buff colored patches in white dolomite. One-quarter inch sized vugs occur in the pure dolomite beds and have coarser xln dolomite in them. The vuggy dolomite effervesces on contact with acid, the siliceous dolomite in the section above does not.

1611 Scree slope of material as above. At 1611 first occurrence of purple chert beds followed immediately by white xln quartz. In the remaining 120 ft. there is considerable amount of quartz and chert material mixed with argillaceous cream weathering dolomite as above.

1737

1300 1937 Scree slope continues; small outcrop in the gully to the south dips into the hill as outcrop above.

120' Limestone - black, crpxln, arg, platy, weathers rubbly, mottled purple color from uneven laminae of very arg limestone. Coarse xln qtz and iron sulphides present.

275' Conglomerate, sandstone and shale, interbedded in a brilliant orange weathering zone. Sandstone is lt grey to white as above, Shale is purple color and occurs in beds and also as the matrix in the conglomerate which contains mostly rounded white quartzite cobbles.

195' Dolomite - lt grey to white, fine xln, siliceous, blocky, weathers yellow tan.

475' Dolomite - white, med xln, limy, vuggy porosity in part, laminations and patches of dark grey, arg, siliceous dolomite. Scree weathers with narrow deep solution "cuts".

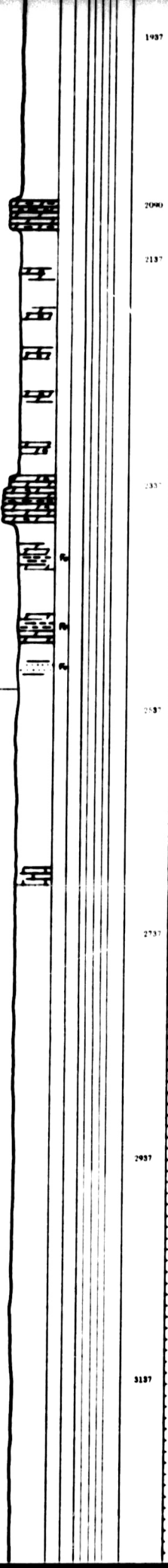
710' Dolomite - white, med xln, tight, with arg laminations and patches as above, weathers cream-tan color. Section is characterized by abundance of purple and milky chert beds, and nodules and coarse xln quartz.

2

MIDDLE ORDOVICIAN - WHITEROCK ?

LOWER SUNBLOOD FM. (Limestone-Grey Beds)

MIDDLE SUNBL



1500
800
900
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1200
2000
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1375
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200
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2500
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700

1937

2090 — Dolomite - white, medium to fine xln., tight, with milky chert bed 3 - 4" thick; also some thin argillaceous laminated dolomite.

2137 — Scree

Scree as above, milky chert irregular patches and oval concretions, otherwise scree is a light blue-grey to white dolomite as above, weathers a creamy tan color.

2337 — Dolomite, white as above, in contact with purple dolomite and shale interbedded. Dolomite is siliceous, more resistive, more rubbly and is sharp. All dolomite has been unfossiliferous with the occasional raised small rounded chert inclusion that could be poorly preserved fossils.

290' Dolomite and Shale - purple, siliceous, more resistive, more rubbly and sharp. Orange and purple weathering.

Dolomite and shale interbedded; mostly float; dolomite is argillaceous, orange and purple weathering with the odd piece of float having a hematitic, red color, it occurs as a network in the dolomite; there is also a trace of orange weathering sandstone.

2537 — Base of the resistive dolomite formation. A piece of yellow weathered soft limestone float may represent the zone below this point.

2737

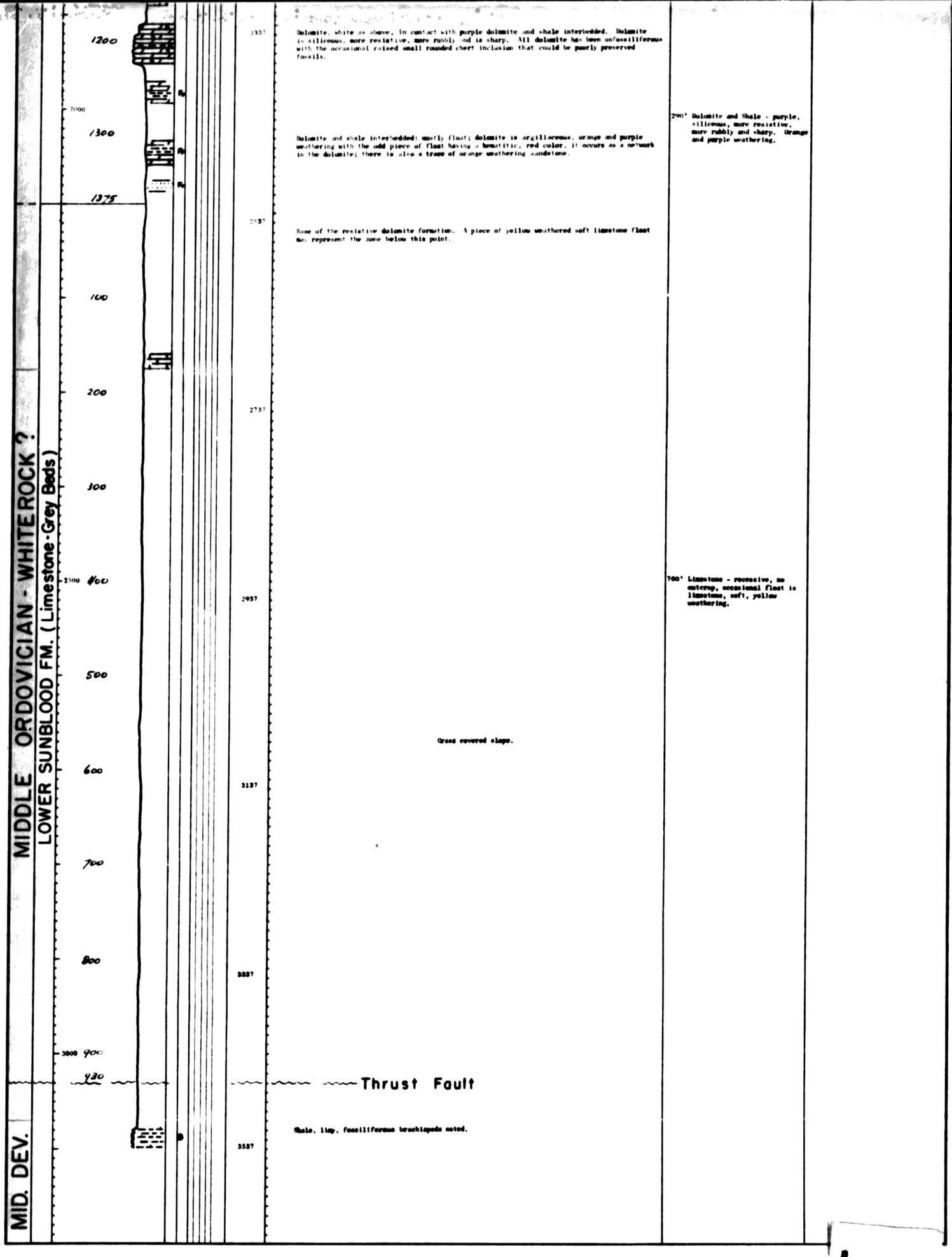
700' Limestone - recessive, no outcrop, occasional float is limestone, soft, yellow weathering.

2937

Grass covered slope.

3137

3 of



Dolomite, white as above, in contact with purple dolomite and shale interbedded. Dolomite is siliceous, more resistive, more rubbly and is sharp. All dolomite has been unfossiliferous with the occasional raised small rounded chert inclusion that could be poorly preserved fossils.

Dolomite and shale interbedded: mostly float; dolomite is argillaceous, orange and purple weathering with the odd piece of float having a hematitic, red color. It occurs as a network in the dolomite; there is also a trace of orange weathering sandstone.

Base of the resistive dolomite formation. A piece of yellow weathered soft limestone float may represent the zone below this point.

Grass covered slope.

Shale, limy, fossiliferous brachiopods noted.

290' Dolomite and Shale - purple, siliceous, more resistive, more rubbly and sharp. Orange and purple weathering.

700' Limestone - recessive, no outcrop, occasional float is limestone, soft, yellow weathering.

4 of 4

C.D.P.-8

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 8
DAHADINNI RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 63° 35' N - 125° 04' W.
Geographic Location : 9 Miles NW of Long Lake (315° AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 15, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	NAHANNI FM.							2970	Limestone - black, cryptic, siliceous, occasional calcite veins. Sharp angular debris and bedding edges. Occasional interbeds of thin platy argillaceous black limestone - 2 - 3 inches thick. Estimated thickness of massive Nahanni Limestone 150'. Two 2' thick beds occur 20' from the top of the massive limestone and contain numerous cup corals. Bedding is massive with irregular bedding planes. Cliff weathers a yellow tan color in the basal 75'.	960' Limestone, black, cryptic, siliceous at top; argillaceous in lower 2/3 of section, massive, irregular bedding, fossiliferous. Base of thin platy are limestone.	
								2700	Outcrop poor due to steep canyon shoulder.		
								2690	Limestone - black, v.f. grained to granular, argillaceous texture, light grey weathering, massive bedded, but quite fractured. Fossiliferous, crinoid stem recognized.		
								2590	Inaccessible outcrop.		
								2490	A view of the section from 2390' reveals that it is made up of alternatively resistive and recessive zones about 30' to 40' thick. The creek at 2100' is located in the first recessive zone. All beds are quite argillaceous and semi-rubbly weathering and are stratigraphically positioned below a massive, light grey weathering, top layer. Station 2390' is located at the base of this resistive top layer.		
								2379	Poor outcrop, tributary creek at 2100' may be in a shale unit with the resistive Limestone bounding it at 2170'. Limestone weathers orange-tan, massive bedded.		
								2300			

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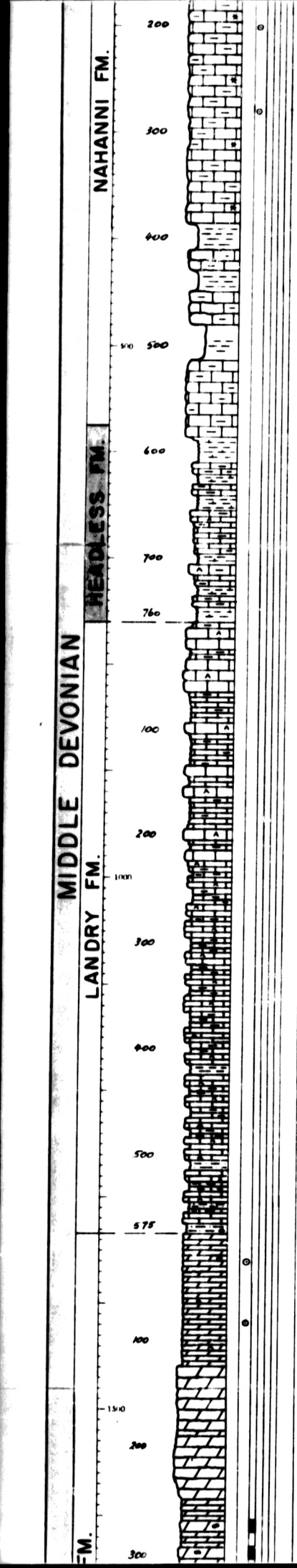

2640

Limestone - black, v f grained to granular, argillaceous to argy, light grey weathering, massive bedded, but quite fractured. Fossiliferous, crinoid stem recognized.

2600

Inaccessible outcrop.

2300

A view of the section from 2300' reveals that it is made up of alternatively resistive and recessive zones about 30' to 40' thick. The creek at 2100' is located in the first recessive zone. All beds are quite argillaceous and semi-rubbly weathering and are stratigraphically positioned below a massive light grey weathering, top layer. Station 2300' is located at the base of this resistive top layer.

2130

Poor outcrops, tributary creek at 2100' may be in a shale bed with resistive limestone rounding it at 2175'. Limestone weathers orange, is massive bedded.

1940

1800

Top of shale section at 1800', very soft pale green grey, top shale at base topped by thick bedded, resistive limestone.

1570

Limestone - section continue to be very argillaceous, platy, brown weathering, and contain beds of lime shale and black thin grained resistive limestone as before, section weathers orange in part. Contains clear coarse xln calcite phenocrysts.

1370

Limestone - interbedded as below. Medium bedded, generally one foot in thickness. Occasional two to three foot beds with a thick SS bed at 1570' which causes a constriction in the canyon. A section downstream from this point is more resistive and more massive bedded. The section upstream is much more platy, argillaceous limestone that has only an occasional thick resistive bed in the section.

1170

Limestone - interbedded siliceous and argillaceous beds. The siliceous beds are hard, dense, crpxln. The argillaceous beds are brownish blue grey, brown weathering and contain shale laminae.

950

Dolomite - crpxln, filled with calcite fossil detritus non distinguishable, many stems, free quartz crystal growth on fracture planes. At 950' a piece of white limy mudstone was described that contained whete calcite phenochrysts.

Dolomite - black, crpxln, siliceous, hard, weathers tangrey, with angular sharp edges.

750

Approximate contact with drag folds below.

Dolomite - black, finely xln, tight, outcrop has a yellowish weathering appearance and is relatively crumbly and massive bedded. There are drag folds in these sediments immediately below the contact of thinner more resistive angular weathered banded dolomites above.

580

Dolomite - coarse xln, vuggy in part.

490

200' Lime tone, black, crpxln, siliceous at top, argillaceous in lower 2/3 of section, massive, irregular bedd ng, fossiliferous. Trace of thin platy are limestone.

Shale and Limestone - interbedded, Shale green grey, soft. Lime tone, black, f gr, argillaceous semi-rubbly, massive bedded. Zone is brown and orange weathering.

Limestone - cyclically bedded, thin bedded, v f xln to crpxln, siliceous, tight, hard interbedded with mudstone and limestone, brownish blue grey, dry grading to limey shale. Outcrop is tan grey weathering with serrated character due to variable resistance to weathering.

125' Dolomite - limy, crpxln, with calcite fossil detritus, thin bedded, semi-resistive.

125' Dolomite - black, f xln, tight, massive bedded crumbly, yellowish weathering.

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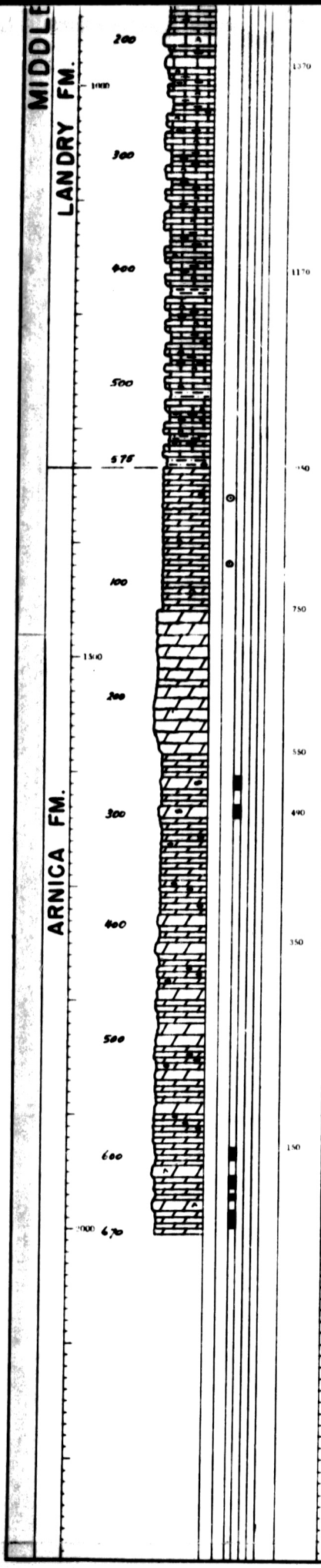

1370

Limestone - interbedded siliceous and argillaceous beds. The siliceous beds are hard, dense, crpxln. The argillaceous beds are brownish blue grey, brown weathering and contain shale laminae.

575' Limestone - cyclically bedded; thin, bedded, v f xln to crpxln, siliceous, tight, hard interbedded with mudstone and limestone, brownish blue grey. are grading to limey shale. Outcrop is tan grey weathering with serrated character due to variable resistance to weathering.

1170

Limestone - thin bedded, weathers with banded colors. Limestone is black, very finely xln to crpxln, siliceous, hard, interbedded with light tan mudstone and argillaceous medium grey limestones. Shale laminae becoming more prominent until lime shale bed encountered at 1150 feet. Outcrop has general tan grey weathered color.

950

Dolomite crpxln, filled with calcite fossil detritous non distinguishable, many stems. Free quartz crystal growth on fracture planes. At 950' a piece of white limy mudstone was described that contained white calcite phenochrysts.

125' Dolomite - limy , crpxln, with calcite fossil detritus, thin bedded, semi-resistive.

Dolomite - black, crpxln, siliceous, hard, weathers tangrey, with angular sharp edges.

750

Approximate contact with drag folds below.

Dolomite - black, finely xln, tight, outcrop has a yellowish weathering appearance and is relatively crumbly and massive bedded. There are drag folds in these sediments immediately below the contact of thinner more resistive angular weathered banded dolomites above.

125' Dolomite - black, f xln, tight, massive bedded crumbly, yellowish weathering.

580

Dolomite - coarse xln, vuggy in part.

490

Dolomite - as below.

350

Dolomite - as below. These rocks are thin bedded 1 to 1½' thick, as below, but they have been much fractured and contain some medium to coarse xln calcite and calcite veins. Beds in places are brecciated.

420' Dolomite, black, sucrose, soft, in part inter-granular porosity to vuggy porosity. Section contains considerable calcite and calcite veins filling fractures and breccia in a folded zone.

150

Dolomite - soft, sucrose, as below, in part porous (inter-granular), interbedded with dolomite black, finely xln, black, hard, tight.

Dolomite - black, sucrose, good bedding becomes somewhat disturbed upward in section.

C.D.P.-9

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 9
DAHADINNI RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 63° 12' N. - 124° 50' W.
Geographic Location : 17 Miles due south of Long Lake

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 15, 1963

FOSSIL SYMBOLS

F	Fossiliferous	ш	Stromatopora
B	Brachiopoda	☤	Foraminifera
G	Gastropoda	⊙	Crinoid
⸸	Coral	⌓	Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	HEADLESS								This section was measured immediately North of Permit 14**, the Permit wherein Mount Lyle is located. The section was measured in an attempt to describe the oldest exposed rocks on the Dahadinni Anticline.	100' Limestone, black, f xln, calcitic fossil fragments and calcite veins. Outcrop weathers dark grey.	
									Limestone - black, finely xln, fossil fragments, white calcite abundant; also calcite veins; rock weathers a dark grey.		
		100						140			
									Covered section with one outcrop in a central position; limestone, black, crystln, unfossiliferous.		
								360			
								41	Limestone - becoming more argillaceous and grading to platy, limy shale in part.		
									Scree slope.		
		100									
						F		61	Limestone - black, siliceous, sonorous, somewhat friable and rubbly, weathers with an uneven bedding plane. Fossils collected at this point.		Murchisonia sp. Middle Devonian
		200							Scree slope as above with minor outcrop of limestone, black, finely xln, siliceous-sharp edged in 1 ft. thick beds, unfossiliferous; occasional purplish to reddish weathering, very argillaceous, limestone laminae. Section weathers a tan colour.		
	LANDRY FM.	300						815		620' Limestone - black, f xln, siliceous, sonorous, somewhat friable and rubbly, fossiliferous, minor brown shale partings cause uneven weathered bedding planes. These beds are cyclically interbedded with recessive, very argillaceous limestone and mudstones. The section weathers with a serrated profile typical of the Landry formation at other localities.	
									Scree slope as above, in part, limy mudstone. This section is not unlike the interbedded resistive section described in Dahadinni Canyon on Section 8.		
N		100									

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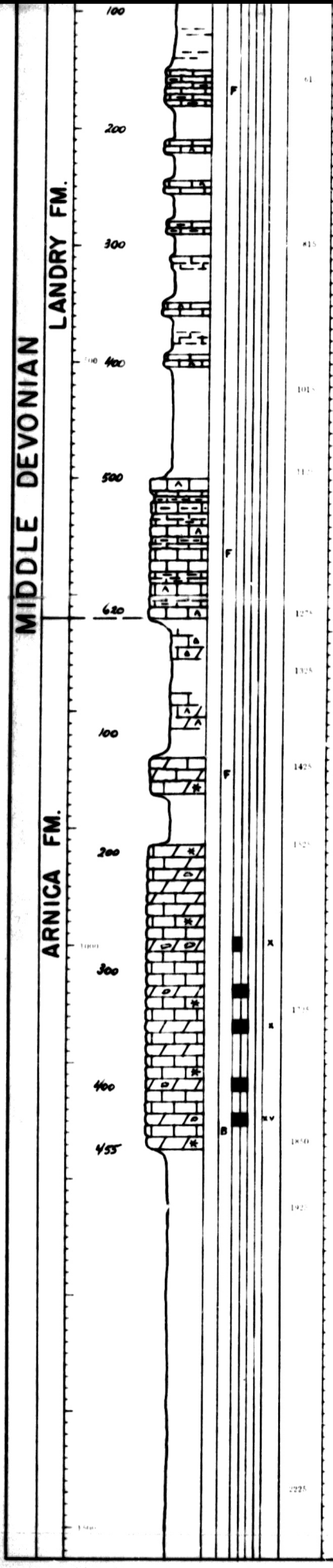

61

Limestone - black, siliceous, sonorous, somewhat friable and rubbly, weathers with an uneven bedding plane. Fossils collected at this point.

Marchisonia sp.
Middle Devonian

Scree slope as above with minor outcrop of limestone, black, finely xln, siliceous, sharp edged, in 1 ft. thick beds, unfossiliferous; occasional purplish to reddish weathering, very argillaceous limestone laminae. Section weathers a tan colour.

620' Limestone - black, f xln, siliceous, sonorous, somewhat friable and rubbly, fossiliferous, minor brown shale partings cause uneven weathered bedding planes. These beds are cyclically interbedded with recessive, very argillaceous limestone and mudstones. The section weathers with a serrated profile typical of the Landry formation at other localities.

815

Scree slope as above, in part, limy mudstone. This section is not unlike the interbedded resistive section described in Wahadinni Canyon on Section 8.

1015

Grass covered slope, top of outcrop cliff at 1125'.

1125

Limestone - black, varied xln, mostly crpln. Minor brownish shale partings, in part uneven bedding planes. Lime tone grades to brownish mudstone in some beds, but the limestone and the mudstone are siliceous and sharp edged; massive bedded with some rare, cherty, poorly preserved fossils.

1275

Section is scree covered and the scree in part includes black chert bands.

1325

Scree slope with outcrop at the 1425 mark. Scree has limestone, black, with white calcite worms streak suggestive of fossils. Probably come from cliff above but was not seen in outcrop. Scree has a very sonorous character; probably siliceous.

1425

Limestone - dark grey, crpln, with calcite fractures and shale laminations.

455' Dolomite - limy or dolomitic limestone - black, blue grey, crpxln, siliceous, sonorous. Section is massive bedded, laced with calcite veins, poorly fossiliferous. Laminated, brown weathering, porous to vuggy beds common, with some brecciation noted. Calcite veins weather orange color in part.

1525

Limestone - blue grey, brownish crpxln laced with white calcite veins. The last 400 ft. from 1725 to 1755 could possibly be limy dolomite. Float at 1725 had cream, vuggy, dolomite debris. Debris from brecciated beds is also present.

1725

Limestone - black, crpxln, with abundant orange weathering thin calcite veins; limestone is slightly fossiliferous including brachiopods shells, sparse. There again is a trace of dolomite, black, fine xln, brown weathering, laminated; that contain intercrystalline porosity and pin point vugs, white calcite crystals in the vugs.

1850

1925

Grass and scree slope. 2225 is the base of the outcrop slope and the end of the section. Imperial formation shale is underlying the grass and tree covered flat area at the bottom of this outcrop; thus a thrust fault is interpreted at this point.

2225

C.D.P.-10

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 10
DAHADINNI RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division.

Co-Ordinates : 63° 12' N. - 124° 50' W.
Geographic Location: 2 Miles due North of Mount Lylel

Geologists :C.D. Mc Cord, K.W. Campbell.
Date of measurement: June 15, 1963

FOSSIL SYMBOLS

F	Fossiliferous	Stromatopora	
B	Brachiopoda	Foraminifera	
G	Gastropoda	Crinoid	
	Coral	Algue	

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS / FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, V.G.)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
		100			F		6104	End of outcrop - Base of Mountain Range (probably base of Upper Devonian Imperial formation)		
								Limestone - rubbly; tubular calcareous fossils create nodular scree. Limestone weathers light grey.		
		200			F		5904			
								Limestone - extremely rubbly, abundant calcite veins and calcite debris, thin bedded, irregular bedding planes, purplish weathering shale laminae.		
		300			G					
							5704			
		400						Covered.		
		500								

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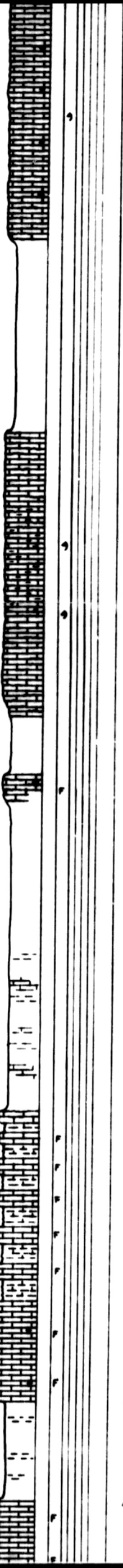
NAHANNI FM. - (Possible repetition of Section by Faulting)



200	5904	Limestone - extremely rubbly, abundant calcite veins and calcite debris, thin bedded, irregular bedding planes, purplish weathering shale laminae.	
300	5704		
400		Covered.	
500	5564	Limestone - rubbly, beds 4 - 8" irregularly laminated. Material is rubbly weathering due to the high content of fossil shells and calcite.	
600	5504	Limestone - finely xln, arg, rubbly bedded, fossiliferous. Large, single, horn corals and smaller, branching corals present.	1500 - Limestone - lt. blue grey crpxln, arg., semi-slaty to irregular slabby - rubbly weathering. Includes calcite filled fractures, abundant fossil debris and shale lamina. One third of section is comprised of covered intervals which may represent shale or very argillaceous limestone zones. Shale outcrop observed is med blue grey, soft, semi slaty, limy fine grained to granular, slightly fossiliferous. This Nahanni limestone section is located on the rear vertical east limb of the Dahadin Anticline. The abnormal thickness of the formation has possibly resulted from repetition by faulting.
700	5400	Coral collected at 5400.	Thamnoporia limitaris (Middle Devonian)
800	5304	Covered	
900	5239	Limestone - brown grey, crpxln, rubbly weathering, slightly fossiliferous, with calcite veins.	
		Covered.	
1000	5104		
1100		Shale - medium grey, soft, semi-slaty, limy, weathers brown, with occasional bed of limestone, fine xln, blue grey, brown weathering, rubbly. Section is covered with debris from limestone above, (stratigraphically positioned below).	
1200	4904	Limestone - arg, slabby, irregular surfaced bedding plane exposed on dip slope, may introduce a thick shale section.	
1300		Shale - slaty, limy, interbedded with limestone, blue grey, fine grained to granular, slightly fossiliferous.	
1400	4704	Limestone - blue grey, crpxln, with white calcite fragments in part.	
	4604		
1500		Shale saddle.	
1600	4504	Limestone - lt grey, crpxln to lithographic, fossiliferous, Nahanni type.	

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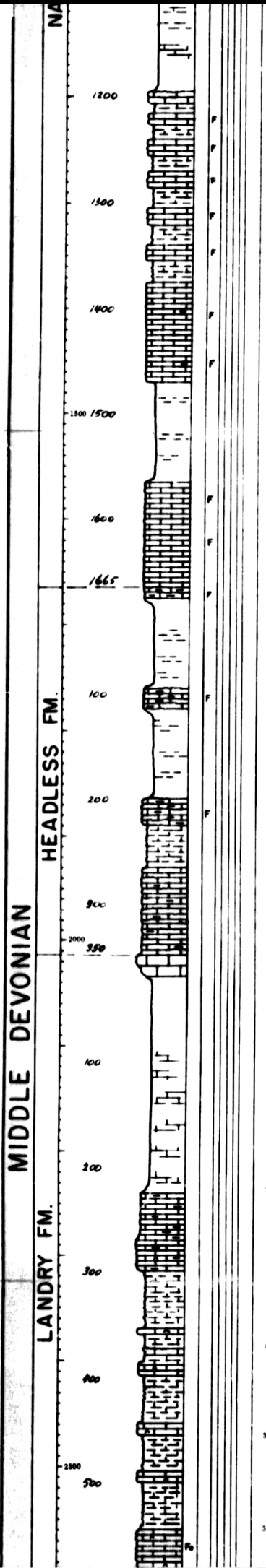


4904 Limestone - arg, slabby, irregular surfaced bedding plane exposed on dip slope; may introduce a thick shale section.

Shale - slaty, limy, interbedded with limestone, blue grey, fine grained to granular, slightly fossiliferous.

4704

Limestone - blue grey, crpxln, with white calcite fragments in part.

4604

Shale saddle.

4504

Limestone - lt grey, crpxln to lithographic, fossiliferous, Nahanni type.

4396 Limestone - rubbly, brown weathering, fossiliferous.

Shale saddle.

4296 Limestone - rubbly, brown weathering, fossiliferous.

Shale saddle.

4176 Limestone - black, with irregular shale laminae, breaks rubbly as a result of high percent of shell fragments.

Shale - smooth planed, slaty, brownish and purplish weathering.

4076

Limestone - platy, irregularly bedding planes.

3976 Limestone - finely xln, massive, 4 ft. thick bed.

Grass covered.

3906

Covered. This section on adjacent ridge is the same as below.

3706

Limestone - very argillaceous, slightly xln, fractures with acicular structure as below, interbedded with limestone, crpxln, more resistive than below.

3506

Limestone - as above and below.

3406

Limestone - very argillaceous; or shale, limy; 6" to 1' thick beds that shatter with acicular structure at right angles to bedding planes. Weathers light grey to white.

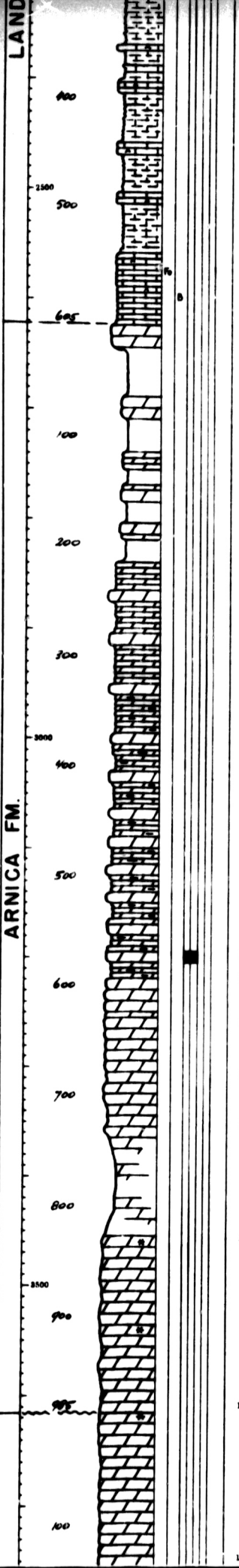
3206

Limestone - black, crpxln, thin bedded, smooth bedding planes, trace of brachipoda, trace of isometric iron sulphite crystals.

350' - Limestone and Shale - interbedded; limestone, black, arg, fossiliferous, rubbly brown weathering, irregularly platy. Shale, slaty, smooth planed, brown and purplish weathering.

620' - Limestone - interbedded, semi-resistive and recessive zones - weathers with a scalloped profile. Limestone, black, crpxln, resistive, siliceous?, interbedded with limestone, and grey, very argillaceous, grading to limy shale, with acicular fractures, weathers lt grey to white.

Schuchertella adoceta
(Middle Devonian - Eifelian)



		grey, very argillaceous, grading to limy shale, with acicular fractures, weathers lt grey to white.
3506		
	Limestone - as above and below.	
3406		
	Limestone - very argillaceous; or shale, limy ; 6" to 1' thick beds that shatter with acicular structure at right angles to bedding planes. Weathers light grey to white.	
3206		
	Limestone - black, crpxln, thin bedded, smooth bedding planes, trace of brachipoda, trace of isometric iron sulphite crystals.	
3106	Dolomite - uppermost bed.	
	Dolomite - as below, repeated small outcrops, section mostly grass covered.	
2970		
	Dolomite - black, outcrop every 40 ft., remainder of section grass covered.	
2770		
	Dolomite - as below, black, medium crystalline, no fossils.	590' - Dolomite - black, med xln, unfossiliferous; thick bedded; interbedded with dolomite, bluish grey, brown on fresh fractured surfaces, med xln, argillaceous,platy.
2570		
	Dolomite - brownish blue, interbedded; platy beds with massive resistive beds.	
2370		
	Dolomite - bluish grey, slight brown tinge on fractures surfaces, medium xln, argillaceous, platy, interbedd d with crpxln dolomite, blue grey to black weathering.	
2170	Dolomite - medium grained, medium xln, with trace of vuggy to intercrystalline porosity, weathers white.	
2140	Dolomite - as before, platy.	
	Dolomite - interbedded as below.	
2070		
	Dolomite - as above and below.	
2000		
	Dolomite - dark and light grey interbedded; medium xln rubbly weathering. Bedding more distinct then below,(1 - 2 ft beds.)	
1920		
	Dolomite - as below.	395' - Dolomite - color banded, dark and light grey, unweathered color - black, med xln, bedding mostly indistinct 1 - 2 ft. thick. Weathers rubbly. Calcite blebs and veins cause rubbly nature of scree.
1800		
	Dolomite - black, medium xln, massive bedded. Bedding distinct only occasionally at 1 - 2 ft thicknesses. Dark grey weathering, rubbly scree. At 1,800 ft there are large white calcite blebs and small calcite veins in dolomite.	
1600	~~~ Pre Arnica erosion ? ~~~	
	Dolomite - coarse xln to granular, white weathering, massive.	
1400		

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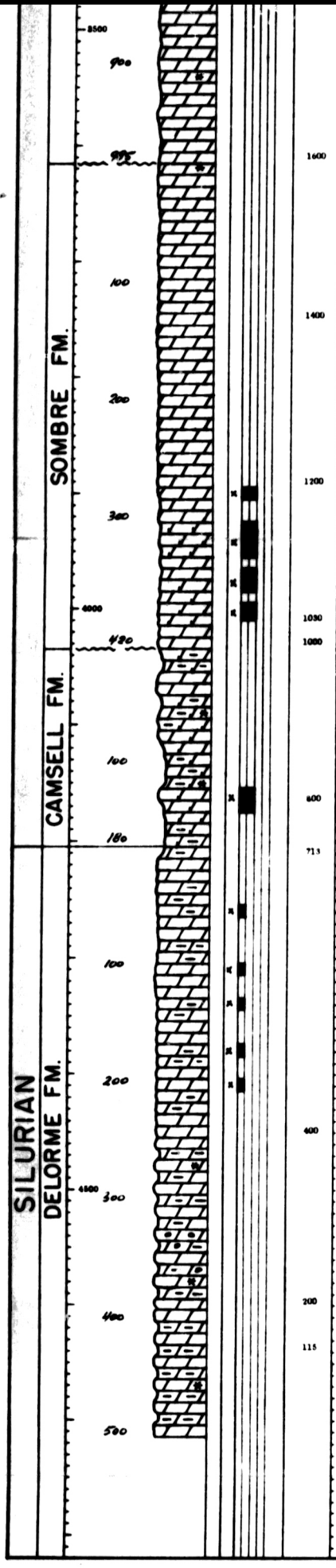

Dolomite - black, medium xln, massive bedded. Bedding distinct only occasionally at 1 - 2 ft thicknesses. Dark grey weathering, rubbly scree. At 1,800 ft there are large white calcite blebs and small calcite veins in dolomite.

1600

Pre Arnica erosion ?

Dolomite - coarse xln to granular, white weathering, massive.

1400

Dolomite - dark grey, medium to coarse xln, in part laminated, black weathering with pitted surface but tight.

420' - Dolomite - dk grey, med to coarse xln to granular, lt grey to white weathering, massive bedded pitted weathered surface, but tight except basal 120 feet which contains interbeds of sucrose, porous, limy, dolomite.

1200

Dolomite - sucrose, porous, limy; interbedded 5m/50 with dolomite as above.

1030

Dolomite - xln, massive, black weathering, tight.

1000

Pre Sombre erosion ?

Dolomite - massive interbeds of: dolomite, argillaceous limy, white weathering; and dolomite, black, coarse xln. Ridges and swales reflect massive intervals of resistive and recessive beds.

140' - Dolomite - black, coarse xln and interbeds of dolomite, arg, limy, white weathering. Ridge and swale effect on weathered surface. Fragmental beds noted is basal 50' of section where the coarse xln white weathering dolomite contains some porosity.

800

Dolomite - massive interbeds, recessive, limy, fragmental dolomite and coarse xln, pogous, white weathering, resiative dolomite.

713

Dolomite - medium to coarse xln, tight, massive 3 - 4 ft beds; alternate black and white weathering beds; trace of granular, porous beds with intergranular porosity, fetid; laminated on weathered surfaces in part.

400

Dolomite - massive bedded as below; includes sucrose, light grey weathering laminated beds and brecciated, limy beds; but mostly section consists of black, medium xln, black weathering, tight dolomite, calcite blebs in part.

500' - Dolomite - black, med xln, tight, massive bedded; calcite blebs in part with interbeds lt grey to white weathering laminate, sucrose, porous dolomite, fetid.

Dolomite weather banded lt grey and black, with deep solution "cuts" in some beds.

200

115

Dolomite - interbedded: dark grey, with light grey to white, weathering beds, (variably argillaceous), medium to fine xln, massive bedded occasional calcite veining

Starting point near axis of Dahadinni Anticline; section measures beds exposed in east limb.

C.D.P.-11 & 12

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 11 & 12
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 36' N. - 124° 49' W.
Geographic Location : 8 Miles NW of Trench Lake (340° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement : June 16, 1963

FOSSIL SYMBOLS

F	Fossiliferous	Stromatopora	
B	Brachiopoda	Foraminifera	
G	Gastropoda	Crinoid	
Coral		Algae	

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UP. DEVONIAN	FT. SIMPSON FM.								Shale - black with siltstone, outcrop weathers dk grey, one massive basal bed weathers orange, also laminae throughout shale. Shale and siltstone not limy. Section dips NE but is badly contorted.	200' Simpson shale - mostly covered, very recessive along front of vertical resistive beds of Sahanni formation in Whittaker range. Black shale with siltstone.	
									Covered interval presumably Simpson formation shales as above.		
								1458			
									Limestone - blue grey to black, f xln to crpln, fine calcite material throughout, bedding as evidenced by hairline fractures in a massive resistive cliff is all less than one foot thick with average approximately seven inches. Bedding in upper 70 feet averages 2 - 3 inches in thickness but is still very resistive; weathers med grey with some orange staining of calcite.	250' Limestone - blue-grey, f to crpln, bedding less than 1 foot thick, but section is very resistive, fine orange weathering calcite material, (crinoids).	
								1208			
	NI FM.								Limestone - med grey, crp ln to fine xln, fewer shale laminae than below, not as rubbly, variable resistance to erosion - probably results from a variable arg content.		

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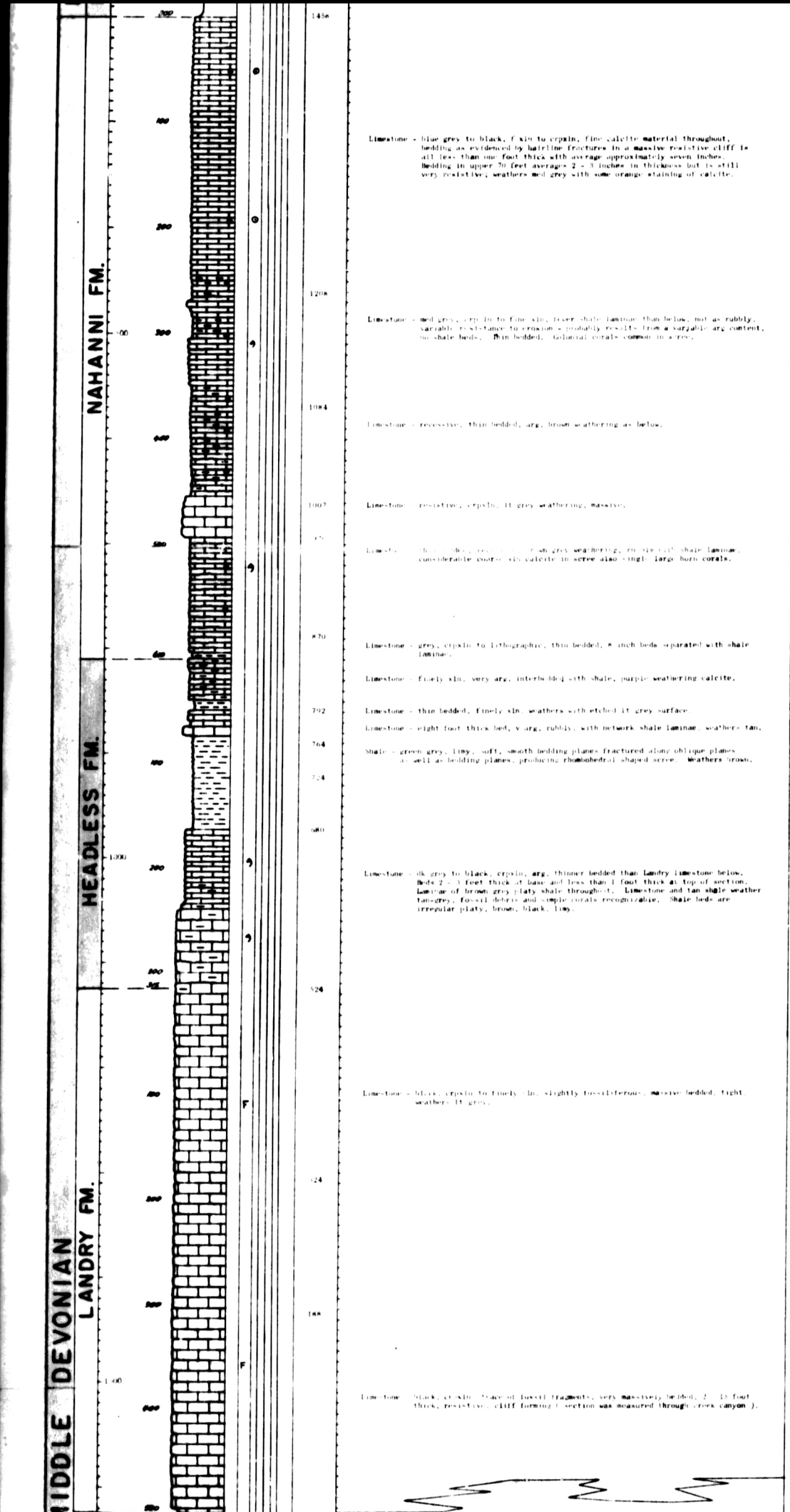

1456

Limestone - blue grey to black, f xln to crpxln, fine calcite material throughout, bedding as evidenced by hairline fractures in a massive resistive cliff is all less than one foot thick with average approximately seven inches. Bedding in upper 70 feet averages 2 - 3 inches in thickness but is still very resistive; weathers med grey with some orange staining of calcite.

280' Limestone - blue-grey, f to crpxln, bedding less than 1 foot thick, but section is very resistive, fine orange weathering calcite material, (crinoids).

1208

Limestone - med grey, crp lo to fine xln, fewer shale laminae than below, not as rubbly, variable resistance to erosion - probably results from a variable arg content, few shale beds. Thin bedded. Colonial corals common in scree.

120' Limestone - med grey as above, trace of shale laminae, trace of rubbly weathering moderately resistive, colonial corals common.

1084

Limestone - recessive, thin bedded, arg, brown weathering as below.

90' Limestone - recessive, thin bedded, arg, brown weathering.

1007

Limestone - resistive, crpxln, lt grey weathering, massive.

40' Limestone - resistive, crpxln lt grey weathering, massive.

975

Limestone - thin bedded, recessive, brown grey weathering, rubbly with shale laminae. Calcite and horn corals abundant.

125' Limestone - thin bedded, recessive, brown grey weathering, rubbly with shale laminae. Calcite and horn corals abundant.

870

Limestone - grey, crpxln to lithographic, thin bedded, 8 inch beds separated with shale laminae.

Limestone - finely xln, very arg, interbedded with shale, purple weathering calcite.

792

Limestone - thin bedded, finely xln, weathers with etched lt grey surface.

Limestone - eight foot thick bed, v arg, rubbly, with network shale laminae, weathers tan.

764

Shale - green grey, limy, soft, smooth bedding planes fractured along oblique planes as well as bedding planes, producing rhombohedral shaped scree. Weathers brown.

724

315' Limestone and Shale - thin bedded.
Limestone - fine xln, very arg, purple weathering calcite; thin bedded, rubbly. Shale - brown grey to green grey, platy, limy, soft with smooth bedding planes. Limestone and Shale weather tan-brown.

680

Limestone - dk grey to black, crpxln, arg, thinner bedded than Landry Limestone below. Beds 2 - 3 feet thick at base and less than 1 foot thick at top of section. Laminae of brown grey platy shale throughout. Limestone and tan shale weather tan-grey, fossil debris and simple corals recognizable. Shale beds are irregular platy, brown, black, limy.

524

Limestone - black, crpxln to finely xln, slightly fossiliferous, massive bedded, light weathers lt grey.

524

800' Limestone - dark grey to black, crpxln - finely xln, slightly fossiliferous, weathers lt grey, massive bedded, resistive, cliff forming.

188

Limestone - black, crpxln, trace of fossil fragments, very massively bedded, 2 - 15 foot thick, resistive, cliff forming (section was measured through creek canyon).

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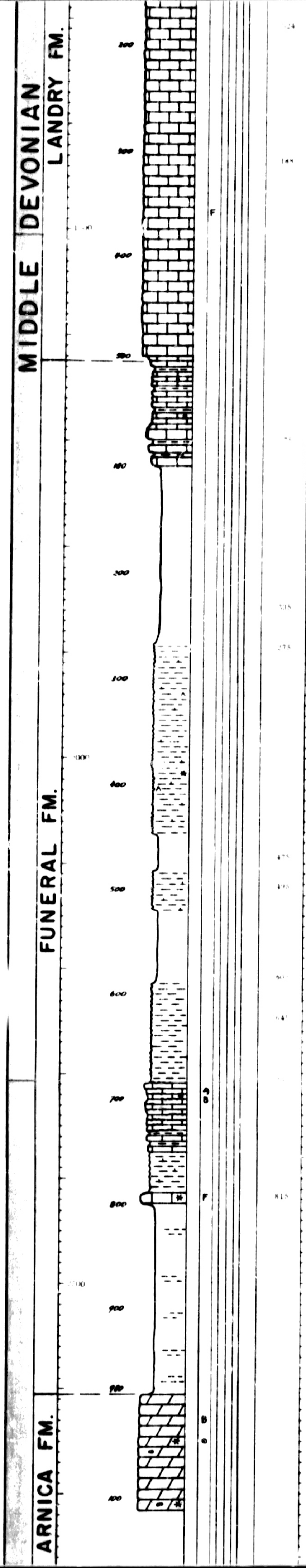


400' Limestone - dark grey to black, crpxln to finely xln, slightly fossiliferous, weathers lt grey, massive bedded, resistive, cliff forming.

Limestone - black, crpxln, trace of fossil fragments, very massively bedded 2 - 15 foot thick, resistive, cliff forming (section was measured through creek canyon).

Limestone - black, crpxln, very regular 7" thick bedding, which contrasts with massive lt grey beds above. Much purple coloration on bedding planes, with shale laminae - Shale is black, granular, limy, weathers platy, friable, sonorous scree, 2 - 3 inches thick, weathers purple. Limestone has calcite veins in part.

230' Limestone and Shale - weather purplish grey. Upper 1/3 of section is limestone with shale laminae Lower 2/3 of section is shale,mainly covered and recessive, with trace of calcite veins.

Covered interval - scree is purple, argillaceous material as above.

Covered interval - scree is yellow brown, weathering platy as outcrop below.

Shale - black,powdery, limy, hard, weathers yellow brown, slabby.

Shale - as above brownish black, limy,with calcite veinlettes, weathers brown.

450' Shale - black, powdery, limy, hard, weathers yellow-brown, slabby, in part trace of calcite veinlettes, acicular and possibly siliceous in part, becomes thicker bedded at base. Section is recessive and is approximately 1/3 covered.

Shale outcrop - as above

Covered scree is brown weathering, slaty, limy. Shale is somewhat more acicular than above, sonorous.

Shale outcrop - as above.

Shale - as above,more massively bedded.

Limestone - purplish dk grey, finely xln, fossiliferous, weathers lt grey, rubbly, trace of obliquely oriented calcite veins.

Limestone - as above with slaty black shale interbeds.

120'
Limestone and Shale - Limestone is purplish dark grey, f xln, foss. Shale is black, platy, limy. Calcite veins are present.

Shale - black, slaty, limy.

Limestone Bed - massive, Much coarse xln calcite, abundant fossil material.

Covered recessive slope.

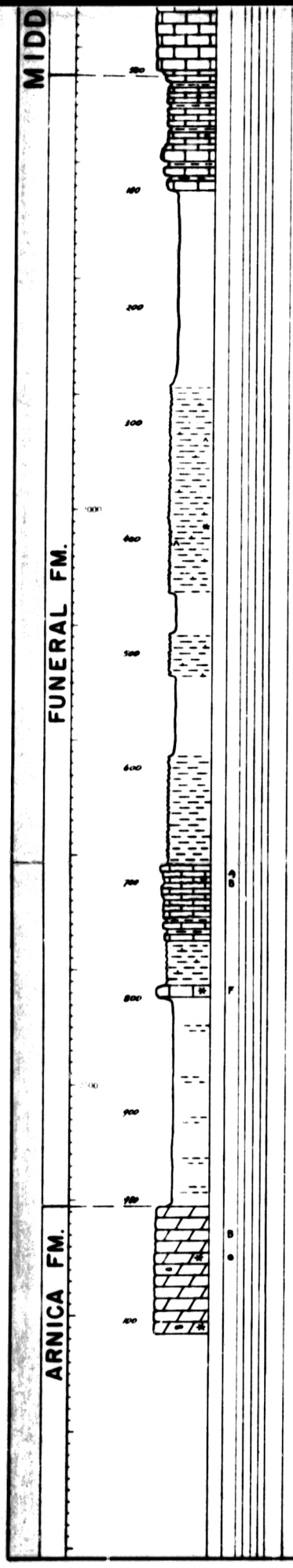
190' Covered recessive slope on the two ridges that were examined, probably shale zone, as above.

Base of Funeral formation as per Section 4.

Warrenella Kirki

L. Givetian or U. Eifelian

3



Lime tone - black, crystln, very regular 2" thick bedding w - - contrasts with massive lt grey beds above. Shale - - fairly purple coloration on bedding planes, with shale laminae - Shale - is black, granular, limy, weathers platy, friable sonorous scree, 2 - 4 inches thick, weathers purple. Limestone has calcite veins in part.

75

230' Limestone and Shale - weather purplish grey. Upper 1/3 of section is limestone with shale laminae. Lower 2/3 of section is shale, mainly covered and recessive, with trace of calcite veins.

Covered interval - scree is purple, argillaceous material as above.

335

Covered interval - scree is yellow brown, weathering platy as outcrop below.

275

Shale - black, powdery, limy, hard, weathers yellow brown, slabby.

Shale - as above brownish black, limy, with calcite veinlettes, weathers brown.

480' Shale - black, powdery, limy, hard, weathers yellow-brown, slabby, in part trace of calcite veinlettes, acicular and possibly siliceous in part, becomes thicker bedded at base. Section is recessive and is approximately 1/3 covered.

475

Shale outcrop - as above.

495

Covered scree is brown weathering, platy, limy. Shale is somewhat more acicular than above, sonorous.

605

Shale outcrop - as above.

645

Shale - as above, more massively bedded.

Lime stone - purple, dk grey, finely ln, fossiliferous, weathers lt grey, rubbly, trace of obliquely oriented calcite veins.

720

120' Limestone and Shale - Limestone is purplish dark grey, f xln, foss. Shale is black, platy, limy. Calcite veins are present.

Lime-tone - as above with slaty black shale interbeds.

Shale - black, slaty, limy.

Limestone Bed - massive, much coarse xln calcite, abundant fossil material.

815

Covered recessive slope.

190' Covered recessive slope on the two ridges that were examined, probably shale zone, as above.

Base of Funeral formation as per Section 4.

Warrenella Kirki

L. Givetian or V. Eifelian

C.D.P.-13

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 13
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 34' N. - 124° 47' 36" W.
Geographic Location : 5 Miles NW of Trench Lake (345° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement : June 17, 1963

FOSSIL SYMBOLS

F	Fossiliferous	ш	Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda	⊙	Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, V.G.)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
								2237	Contact - limestone breccia of Camsell formation and blue grey very fine crystalline dolomite of overlying Sombre formation.		
								1997	Limestone Breccia - light green with minor yellow and orange mottling. Very brecciated and very rust colored on fresh surface, angular, very fine grain, crpxl tan grey fragments in calcite matrix. Weathers in semi-resistant, rounded, relatively smooth shoulder on ridge.	550' Limestone - breccia, calcite matrix, coarse crystalline, orange-yellow weathering. Argillaceous, very fine crystalline, tan-grey fragments. Outcrop weathers semi-resistive, rounded; scree rubbly, light grey.	
								1797			

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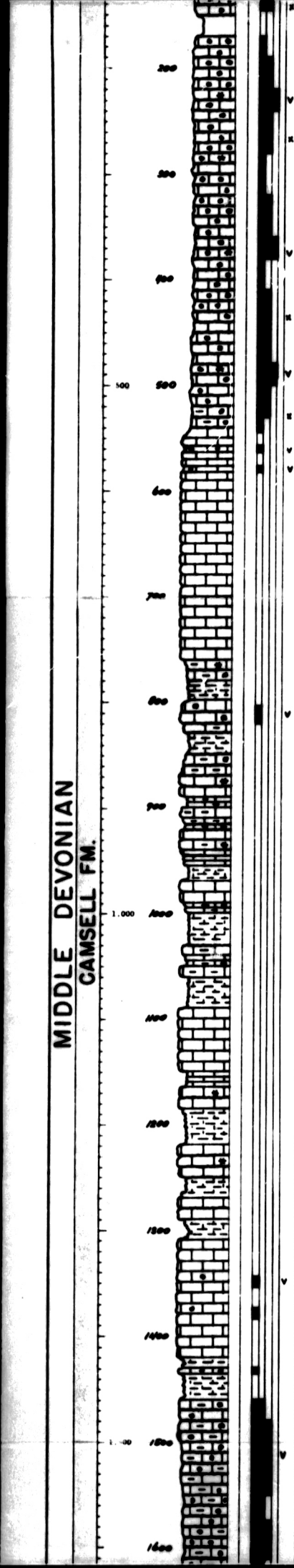


1997

Limestone Breccia - light green with minor yellow and orange mottling. Very brecciated and very rust colored on fresh surface, angular, very fine grain, crpxl tan grey fragments in calcite matrix. Weathers in semi-resistant, rounded, relatively smooth shoulder on ridge.

1797

1517

Limestone - tan, very fine crystalline - massive bedded with a few 1 foot yellow-rust weathered zones near the top of the section. These breccia zones have boxwork cavities from weathering out of laminated limestone fragments (Salt casts ?).

1437

Limestone - tan very fine crystalline, crpxl, very massive bedded 4--10' thick.

1237

1200 Limestone - blue grey crystalline, interbedded 50-50 with argillaceous breccia zones as below.

1049

Limestone - interbedded with yellow weathering shale, 80% of section is softer yellow weathering, rubbly, irregular slabby material comprised of white, medium to coarse crystalline calcite and limestone, containing yellow-rust network of argillaceous laminae.

849

823 Limestone - massive, blue grey, very fine crystalline.

779

Limestone - interbedded massive limestone as below, and yellow weathering shale, also limestone white, medium crystalline, irregular slabby, with coarsly crystalline calcite veins.

Limestone - beds range in color from tan to brown to medium grey and crpxl to fine crystalline. Resistive beds approximately 35% of section.

579 Limestone - light tan, fine crystalline, with dark blue grey crpxl limestone interbedded; brecciation in part, in yellow weathering patches that are oblique to bedding. Zone is resistive and forms the "back bone" of the Camsell formation ridge outcrop.

459 Shale - irregular platy, interbed with occasional limestone bed, crpxl,dark grey, brecciated.

377

300

Limestone Breccia - brecciation not as extremely developed as below. Bedding quite distinct, occasional bed weathers light grey appears unbrecciated, but contains network of

550' Limestone - breccia, calcite matrix, coarse crystalline; orange-yellow weathering. Argillaceous, very fine crystalline, tan-grey fragments-. Outcrop weathers semi-resistive, rounded; scree rubbly, light grey.

210' Limestone - tan, very fine crystalline, massive bedded, very resistive, 4--10' foot thick beds.

540' Limestone - and shale interbedded, limestone blue grey very fine crystalline and white, medium crystalline, is resistive and massive bedded in sections not containing shale laminae, is recessive and rubbly in argillaceous zones.

Shale - soft yellow weathering calcite vein common, but brecciation not as developed as the top of formation.

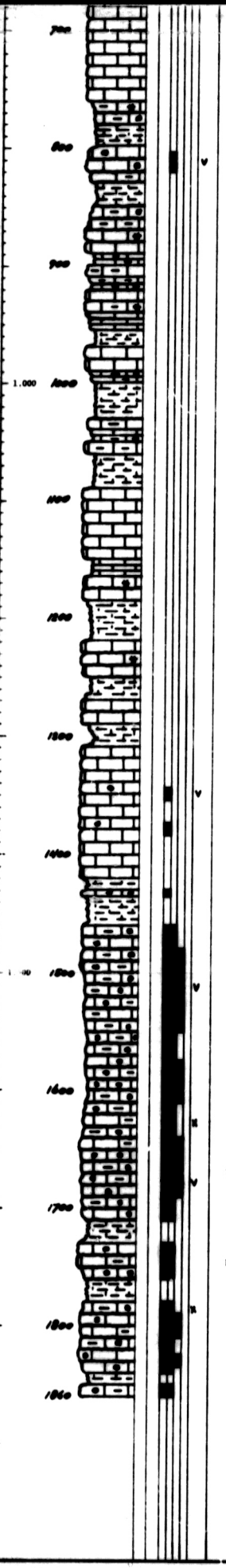
120' Limestone - light tan, grey, fine crystalline, resistive, yellow brecciated patches in part.

450' Limestone - breccia in

2 of

MIDDLE DEVONIAN

CAMSELL FM.



1237

1200 Limestone - blue grey crystalline, interbedded 50-50 with argillaceous breccia zones as below.

1049

Limestone - interbedded with yellow weathering shale, 80% of section is softer yellow weathering rubbly, irregular slabby material comprised of white, medium to coarse crystalline calcite and limestone, containing yellow-rust network of argillaceous laminae.

540' Limestone - and shale interbedded, limestone blue grey very fine crystalline and white, medium crystalline, is resistive and massive bedded in sections not containing shale laminae; is recessive and rubbly in argillaceous zones.

Shale - soft yellow weathering calcite veins common, but brecciation not as developed as the top of formation.

849

823

Limestone - massive, blue grey, very fine crystalline.

779

Limestone - interbedded massive limestone as below, and yellow weathering shale, also limestone white, medium crystalline, irregular slabby, with coarsly crystalline calcite veins.

Limestone - beds range in color from tan to brown to medium grey and crpxl to fine crystalline. Resistive beds approximately 35% of section.

579

Limestone - light tan, fine crystalline, with dark blue grey crpxl limestone interbedded; brecciation in part, in yellow weathering patches that are oblique to bedding. Zone is resistive and forms the "back bone" of the Camsell formation ridge outcrop.

120' Limestone - light tan, grey, fine crystalline, resistive, yellow brecciated patches in part.

459

Shale - irregular platy, interbed with occasional limestone bed, crpxl, dark grey, brecciated.

377

300

Limestone Breccia - brecciation not as extremely developed as below. Bedding quite distinct, occasional bed weathers light grey appears unbrecciated, but contains network of calcite veins - limestone light tan grey, finely crystalline.

450' Limestone - breccia in massive bedded grey-buff argillaceous, granular, crpxl limestone.

Shale beds in part, particularly at base of section, irregular platy lime , orange weathering.

200

120

Limestone Breccia - [illegible] thick bed, with ten 12' [illegible] probably contain argillaceous [illegible]

54

Lime-stone Breccia - orange weathering calcite matrix with angular grey-buff, granular to crpxl inclusions up to 1 inch in size, argillaceous laminae in fragments. Zone is semi-recessive.

Shale - 5' bed, orange weathering, platy, with white crystalline lime-stone laminae.

Lime-stone Breccia - as above.

Contact - light grey, fine crystalline, siliceous, slabby dolomite.

C.D.P.-15

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 15
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 01' N. - 124° 52' W.
Geographic Location : 5 Miles NW of Trench Lake (205° AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 17, 1963

FOSSIL SYMBOLS

F	Fossiliferous	Stromatopora	
B	Brachiopoda	Foraminifera	
G	Gastropoda	Crinoid	
	Coral	Algae	

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
						F		6 - 666	Limestone - white, fossil fragmental, weather mottled, medium grey, with orange patches.		
		100							Limestone - dark grey, rust weathering, with shale laminae.		
									Covered slope - talus as above, light tan weathering.		
								6 - 466	Shale - black, brown weathering, limy, slaty.		
		200							Limestone - black, fragmental, fossiliferous, grading to shale upward.	435' Limestone - dark grey to black, crpxln to med xln, fossiliferous in part, fragmental in part, platy, argillaceous with shale laminae. Lm slaty shale beds exposed may represent several other shale zones in covered intervals that comprise 50% of section. Shale lamina weather purple or rust colors from oxidation of sulphide minerals present.	Macluritus sp. U. Ordovician.
								6 - 400	Limestone - medium grey, medium crystalline, resistive, sonorous, siliceous with mottled, rust and purple weathering shale laminae, weathers rubbly, fossil poorly preserved.		
									Covered slope, scree as above, limestone, coarse crystalline.		
		300						6 - 200	Limestone - dark grey, crpxl, argillaceous, platy, dark grey weathering, with some orange coloration.		
									Covered saddle, slope contains medium grey, coarse crystalline limestone.		
									Limestone - black, crpxl, argillaceous, irregular platy, with granular shale laminations.		
		400							Limestone - light greenish blue grey, soapy lustre.		
								15 - 100	Limestone - or limy dolomite, very finely xln, tight, irregularly platy, weathers orange.		
								15 - 200			

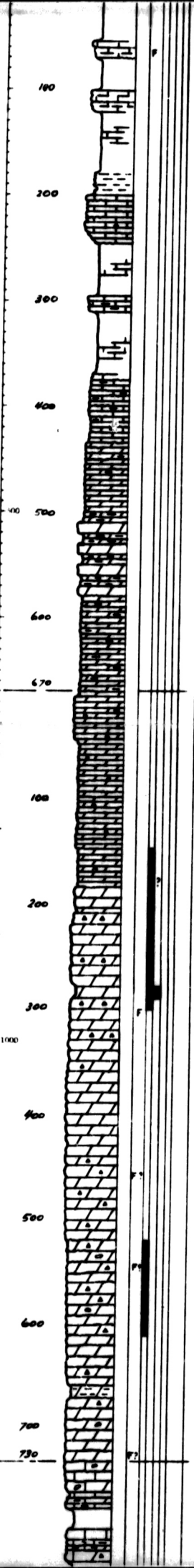
EQUIVALENT TO "RED SANDSTONES" CDP-7

1 of

EQUIVALENT TO "RED SANDSTONES" CDP-7

MIDDLE ORDOVICIAN

SUNBLOOD FM.



6 - 686	Limestone - white, fossil fragmental, weather mottled, medium grey, with orange patches.		
	Limestone - dark grey, rust weathering, with shale laminae.		
	Covered slope - talus as above, light tan weathering.		
6 - 466	Shale - black, brown weathering, lim, slaty.		
6 - 400	Limestone - black, fragmental, fossiliferous, grading to shale upward.	435' Limestone - dark grey to black, crpxln to med xln, fossiliferous in part, fragmental in part, platy, argillaceous with shale laminal. Lim slaty shale beds exposed may represent several other shale zones in covered intervals that comprise 50% of section. Shale lamina weather purple or rust colors from oxidation of sulphide minerals present.	Macluritus sp. U. Ordovician.
	Limestone - medium grey, medium crystalline, resistive, sonorous, siliceous with mottled, rust and purple weathering shale laminae, weathers rubbly, fossil poorly preserved.		
	Cover d slope, scree as above, limestone, coarse crystalline.		
0 - 200	Limestone - dark grey, crpxl, argillaceous, platy, dark grey weathering, with some orange coloration.		
	Covered saddle, slope contains medium grey, coarse crystalline limestone.		
	Limestone - black, crpxl, argillaceous, irregular platy, with granular shale laminations.		
	Limestone - light greenish blue grey, soapy lustre.		
15 - 100			
15 - 200	Limestone - or lim dolomite, very finely xln, tight, irregularly platy, weathers orange.		
1 - 300	Dolomite - shaly and blocky, interbedded, very orange weathering. Blocky beds definitely dolomite. Shaley beds are lime, with purple stained laminae, irregularly slabby.	145' Dolomite - green grey, very fine xln, blocky - massive; interbedded with dolo. platy, lim, argillaceous, orange weathering.	
15 - 400	Dolomite - as above, light green grey.		
15 - 522			
	Dolomite - mostly argillaceous, irregularly platy, orange weathering.	95' Dolomite - green grey, argillaceous, irregularly platy, orange weathering.	
15 - 650	Dolomite - gritty to arenaceous much quartz in beds, very resistive.		
15 - 722			
		140' Dolomite - irregular slabby as above, siliceous to gritty much quartz in beds, very resistive.	
15 - 850	Dolomite - irregularly slabby, siliceous.		
899-1000	Contact with brown weathering material		
	Dolomite - very light tan, medium to coarse xln to sucrose, may be inter-xln porosity, followed by dolomite, tan, sucrose, massive, weathering yellow with solution cuts.		
1200		140' Dolomite - tan to black, sucrose, porous, with trace chert nodules, weathers yellow brown.	
	Dolomite - as above, with trace chert nodules parallel to bedding. Much white quartz debris.		
1400			
	Dolomite - black, sucrose-sandy, with porous beds.		
	Dolomite - black, coarse xln, fossiliferous with many small spherical knobs of chert similar to silicified corals, one inch in diameter		Macluritus sp. U. Ordovician
1600			
	Dolomite - black and tan, interbedded, massive.	265' Dolomite - black and tan interbedded; coarse xln, tight, chert inclusions as before, weathers brown - tan.	
1800			
	Dolomite - as above, black weathering beds no longer interbedded below 1950'.		
1950			
2000			
2073	Contact brown weathering dolomite above, grey weathering dolomite below.		
	Dolomite - black, coarse xln, tan weathering, massive, abundant coral type chert inclusions.	135' Dolomite, black, coarse xln, massive, brecciated in part. Abundant coral type chert inclusions, generally grey weathering with trace argillaceous tan weathering beds.	
2200			
2270			
2300	Dolomite - black, sucrose, grey weathering, quite rubbly weathering with oblique orange weathering laminae and patches. Semi-brecciated in part. Chert nodules continue. Tan weathering beds still present in minor amounts. One thick bed at 2270' very laminated, brown, soft.		
	True contact with grey weathering beds at 2300'.		
2400			
	Limestone - milky grey, almost crpxln, but seem fragmental in origin with dark, sub-rounded, medium to fine xln dolomite or limestone inclusions. Possible fossil fragments.		
	Limestone - grey, as above, with dolomite, black, xln and dolomite green, argillaceous, and Shale, dolomitic, blue grey fine grained, hard, slaty, with purple weathering.		

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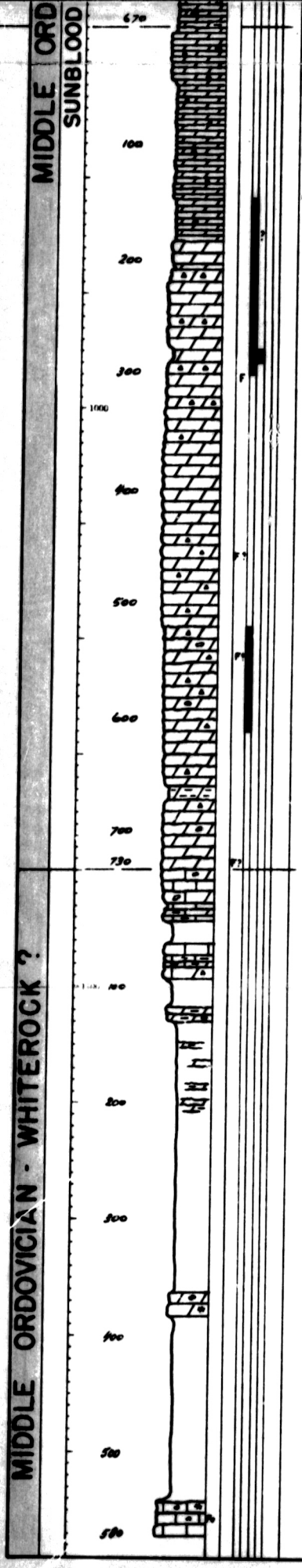

15 - 650 Dolomite - gritty to arenaceous much quartz in beds, very resistive.

15 - 722

140' Dolomite - irregular slabby as above, siliceous to gritty, much quartz in beds, very resistive.

15 - 850 Dolomite - irregularly slabby, siliceous.

899-1000 Contact with brown weathering material

Dolomite - very light tan, medium to coarse xln to sucrose, may be inter-xln porosity, followed by dolomite, tan, sucrose, massive, weathering yellow with solution cuts.

1200

140' Dolomite - tan to black, sucrose, porous, with trace chert nodules, weathers yellow brown.

Dolomite - as above, with trace chert nodules parallel to bedding. Much white quartz debris.

1400

Dolomite - black, sucrose-sandy, with porous beds.

Dolomite - black, coarse xln, fossiliferous with many small spherical knobs of chert similar to silicified corals, one inch in diameter

Macluritus sp.
U. Ordovician

1600

Dolomite - black and tan, interbedded, massive.

265' Dolomite - black and tan interbedded; coarse xln, tight, chert inclusions as before, weathers brown - tan.

1800

Dolomite - as above, black weathering beds no longer interbedded below 1950'.

1950

2000

2073 Contact brown weathering dolomite above, grey weathering dolomite below.

Dolomite - black, coarse xln, tan weathering, massive, abundant coral type chert inclusions.

135' Dolomite, black, coarse xln, massive, brecciated in part. Abundant coral type chert inclusions, generally grey weathering with trace argillaceous tan weathering beds.

2200

2270 Dolomite - black, sucrose, grey weathering, quite rubbly weathering with oblique orange weathering laminae and patches. Semi-brecciated in part. Chert nodules continue. Tan weathering beds still present in minor amounts. One thick bed at 2270' very laminated, brown, soft.

2300

True contact with grey weathering beds at 2300'.

2400

Limestone - milky grey, almost crpxln, but seem fragmental in origin with dark, sub-rounded, medium to fine xln dolomite or limestone inclusions. Possible fossil fragments.

Limestone - grey, as above, with dolomite, black, xln and dolomite green, argillaceous, and Shale, dolomitic, blue grey fine grained, hard, slaty, with purple weathering.

2600

Dolomite - debris on covered section, slaty as above. Dolomite is tan to blue grey, medium xln to sucrose. Tan material is quite slabby argillaceous. Quartz veins and chert nodules present, but not abundant.

615' Limestone - milky grey, crpxln to fragmental, massive bedded. Interbedded with argillaceous dolomite and dolomitic, slaty shale. Lower part of section fractured, calcite veined. Iron and copper sulphides. Section weathers with a light grey color.

2785 Creek bed - base chained section on mountain slope.

Creek Bed

Dolomite - tan, sucrose, slaty, argillaceous in part; with dolomite, blue grey, medium xln.

Lowest outcrop down-stream in creek.

Limestone - milky grey, fragmental, massive bedded. Creek, in part, follows a calcite vein in a fracture zone where copper sulphides have been deposited. Elevation readings indicate a total thickness of 740 feet for the grey beds, 150 feet additional thickness below the lowest station, 2785 feet, on the measured section.

C.D.P.-16

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 16
ENGLISH CHIEF RIVER

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 34' N. - 124° 35' W.
Geographic Location : 6 Miles NW of Iverson Lake (340°AZ)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 18, 1963

FOSSIL SYMBOLS

F	Fossiliferous	≡	Stromatopora
B	Brachiopoda	♈	Foraminifera
G	Gastropoda	⊙	Crinoid
⸗	Coral	⌒	Algae

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm.)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / V.G.)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN	- (Unit 22 - G.S.C. Paper 61-31)	100							Sandstone - brown with shale laminae containing vera burrows ½" in diameter, flattened. Shale - green, soft, with limestone, greey-grey, medium to fine sin. Sandstone - green, soft, fine grained, in part silty, argillaceous to shaly in part, also contains limy, white laminations. Shale - as above with limestone and sandstone laminae.		

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Argillaceous Dolomite | Coarse Crystallization | Pyritic | Micaceous | Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN	ZONE 2 - (Unit 22 - G.S.C. Paper 61-31)	100 200 300 400 500 600 700 750							Sandstone - brown with shale laminae containing worm burrows ¼" in diameter, flattened. Shale - green, soft, with limestone, greey-grey, medium to fine sln. Sandstone - green, soft, fine grained, in part silty, argillaceous to shaly in part, also contains limy, white laminations. Shale - as above with limestone and sandstone laminae. Siltstone - green, med granular, argillaceous, soft. Creek level.		

2 OF 2