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GEOLOGICAL REPORT
on the
GLACIER BLOCK N.W.T. PERMITS
AtlanticRichfieldCompany

*Abstracted for
Geo-Science Data Index*
Data _____

GEOLOGICAL REPORT

on the

GLACIER BLOCK N.W.T. PERMITS

1269, 1270, 1271, 1272, 1273, 1274
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Submitted by:

Atlantic Richfield Company

in partial fulfillment of Department of Northern Affairs
and National Resources Oil & Gas Regulations
(Section 54 (1) (d)

May 30, 1966



REQUIRED REPORT FOR OIL AND GAS REGULATIONS

GLACIER BLOCK - NORTHWEST TERRITORIES

Enclosures:

1. Hume Structure Map
2. Hare Indian Isopach Map
3. Bear Rock Isopach Map
4. Siluro-Ordovician Isopach Map
5. Structure Cross Section

Introduction:

Since the spring of 1957 the AtlanticRichfield-Company in partnership with Columbian Carbon has acquired up to 3½ million acres of land in the Northwest Territories between 65° to 67° N. Lat and 128° to 133° W. Long.

During this time Atlantic has engaged in an active exploration program to evaluate these properties.

Structure:

Most of the Atlantic acreage (Glacier Block) lies on the relatively undisturbed Lower MacKenzie Plain. The east end of the block shows some structure due to its proximity to the Franklin Mountains. The rest of the area exhibits a gentle dip to the southwest.

Stratigraphy:

The Glacier Block is underlain primarily by carbon-

ates which thicken to the southwest. These are in ascending order:

Cambrian

Little is known of the Cambrian in this area. Only two Atlantic wells; the Ontarature H-34 and Ontarature K-4 have penetrated the Cambrian. These wells encountered Red Beds overlying quartzitic sands with some salt beds. The Cambrian Precambrian contact has not been determined.

Siluro-Ordovician

The Silurian and Ordovician have been grouped together as they appear to form a continuous carbonate sequence.

This unit is composed of relatively uniform dolomite with minor intercalated units of dolomitic limestone. The dolomite is usually light to medium grey-brown, medium to massive bedded, fine to coarse crystalline, hard and sugary. Scattered sporadically through the dolomite are cherty zones which become more common near the top of the section.

The Siluro-Ordovician is thinnest to the east and gradually thickens westward to around 4000 feet.

The Bear Rock unconformably overlies this unit.

Bear Rock Formation

Canol geologists used the name Bear Rock to denote strata underlying the Hume Formation and overlying the Silurian. The type locality is at Bear Rock near Fort Norman at the junction of the Great Bear and MacKenzie Rivers.

The Bear Rock is present throughout the Glacier area. It consists primarily of light to dark brown, fine crystalline to microcrystalline limestone and dolomite. Toward the east these carbonates are often brecciated. The Bear Rock generally has an H_2S odour on freshly broken surfaces.

This Formation is thinnest northeast of the MacKenzie River where it is seen in outcrop and tends to thicken to the southwest. It is thought that the contact with the overlying Hume is disconformable.

Hume Formation

The name was first introduced by H.G. Bassett (1960) for a succession of Middle Devonian limestones and shales which overlie the Bear Rock Formation and underlie the Hare Indian Formation. The type section is located on the east branch of the Hume River at 65° 20' 30" N. Lat, 129° 58' 00" W. Long.

The Hume limestone is medium to dark grey-brown, sublitho-

graphic and locally fossiliferous. The Hume varies in thickness from 100' to about 500'.

Structurally the Hume shows a rather undulating surface gently dipping to the southwest (see enclosed map).

The contact with the overlying Hare Indian is often picked at the base of a sequence of shales.

Hare Indian Formation

Kindle and Bosworth (1921) first described the Hare Indian Formation at the Hare Indian River near its junction with the MacKenzie River by Fort Good Hope. The Hare Indian is present throughout the mapped area.

The shale is soft, grey-green, calcareous and fossiliferous. West of the MacKenzie River there is a gradual basinward thickening.

The contact with the overlying Ramparts is gradational and is generally placed at the base of a predominantly limestone section.

Ramparts Formation (Kee Scarp)

The Formation was first designated by Hume in 1954. The type section for Ramparts is located at the "Ramparts" along the MacKenzie River just southwest of Fort Good Hope.

The Ramparts extends in a northwesterly direction from Norman Wells in the south to approximately 67° N. Lat.

The Ramparts Formation is thought to be primarily bioclastic and reefoid. The limestone is generally light grey-brown, thin to massive bedded, moderately to very fossiliferous. A maximum buildup occurs at Norman Wells where the Ramparts attains a thickness in excess of 400 feet.

The Ramparts contacts sharply with the overlying Fort Creek shale. The contact is thought to be disconformable.

Fort Creek

Fort Creek was first described by Kindle and Bosworth in 1921 on Thunder River. On the east side of the Glacier area these shales are quite thin but they thicken considerably towards the west side of the block.

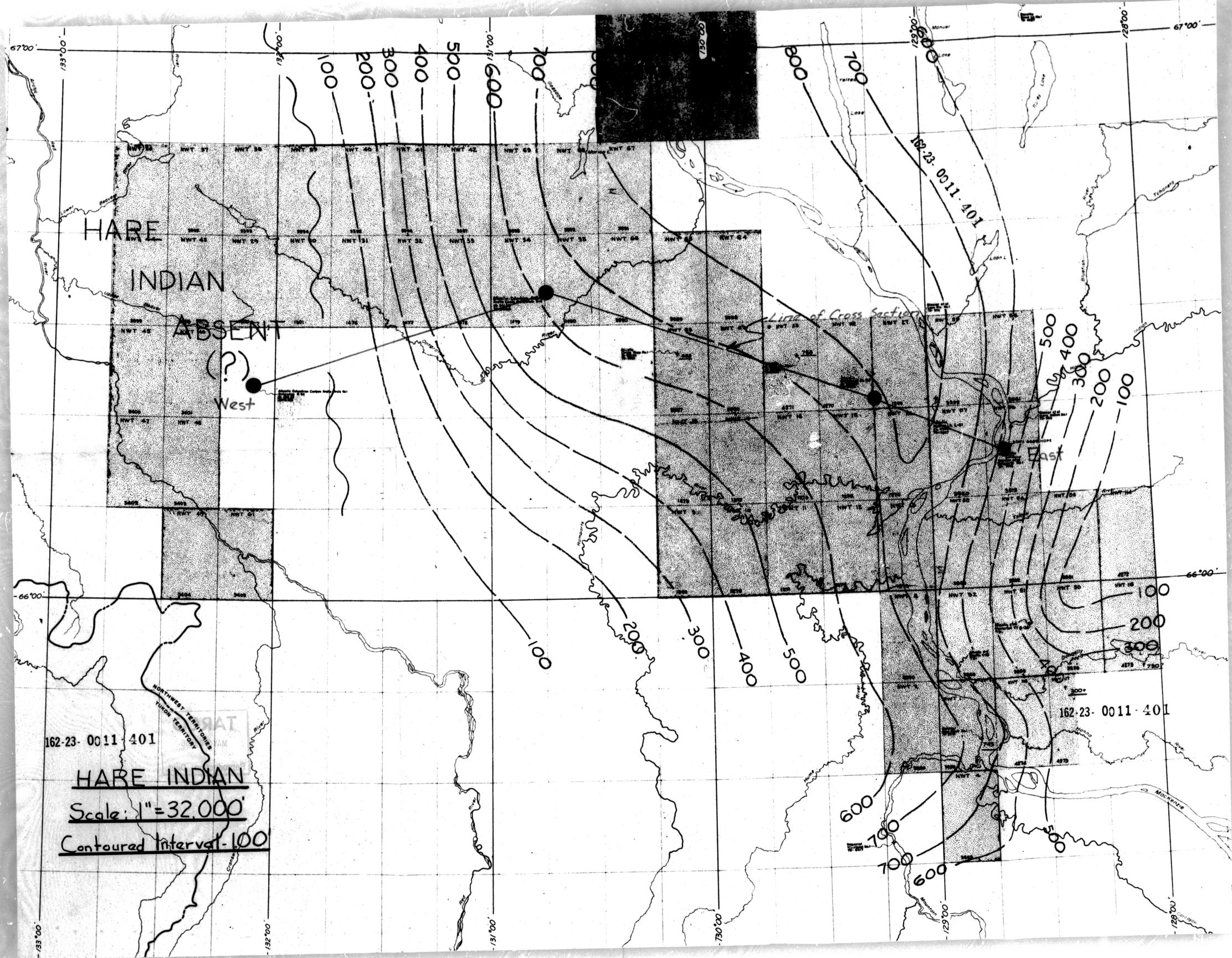
In general, the shales are black, fissile, chippy and hard with occasional finely disseminated pyrite crystals. Interbeds of hard black siltstone and siliceous mudstone are common to the west.

The upper part of the Fort Creek is generally eroded and is in part, truncated by beds of the Lower Cretaceous.

Imperial and Lower Cretaceous

The Imperial and Lower Cretaceous are not discussed in this

report as they are either eroded or very thin over
the Glacier area.



Atlantic et al
Ontarature H-34

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Ontarature K-4

Atlantic
S.W. Airport Cr.

Glacier et al
Ramparts

