84-21

SURFICIAL GEOLOGY
AND
OVERBURDEN CHARACTERISTICS
LANDON LAKE AREA

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INTRODUCTION

This map and the report were prepared at the request of Mr. G. Grant, Amoco Canada Petroleum Ltd. They describe the surficial geology and overburden characteristics of the area described as Township 55, Range 6, West of 4th Meridian.

The surficial geology is based on air photo interpretation using 1:30,000 and 1:60,000 scale photos and field observations and analysis of samples collected during the summer of 1982.

The subsurface information was obtained from Alberta Environment lithologs and from Alberta Research Council borehole data and from the bedrock topography map by V.A. Carston and D.V. Currie (1973).

Information from adjacent townships was also used. All sites of observations are indicated on the map.

SURFIFICAL GEOLOGY

UNIT DESCRIPTION

MF - (FLUTED MORAINE)

This unit covers the northeastern corner of the township. It is a glacially streamlined terrain, with smooth ridges and furrows with a northwest southeast direction: parallel to ice flow direction. They are composed of till (sand 45%; silt 30%; clay 25%; moisture content 9-10% - average of 14 samples) which may contain thin and discontinuous sand bodies. The furrows are poorly drained and may be marshy. The crests are made of slightly sandier material.

The topography is very gently undulating with a general relief of 2 m. This unit is thicker than 3 metres.

MU1 - (MORAINE, UNDIVIDED)

This unit forms a large ridge (2 km wide, 40 m high) that runs in a northwest-southeast direction. It is mostly composed of till, which has a composition of 45% sand, 23% silt, 33% clay with a moisture content of 9-11% (average of 3 samples). At the edges of the ridge, sandy and gravelly discontinuous bodies up to 5 m thick were observed. Field observations and drilling logs indicated the thickness of the till to be more than 20 metres.

FG (FLUVIAL GLACIAL DEPOSITS ON UNDIVIDED MORAINE)
MU

This unit consists of a discontinuous, thin to thick coverage of fluvial glacial sand and gravel, overlying the till. Fluvial sediment is usually poorly sorted. No till samples were processed.

The topography is hummocky with of 1 to 3 m of relief.
The fluvial glacial material can be up to 4 m thick.

MU2 (MORAINE UNDIVIDED)

This unit comprises a mixture of till and very small, irregular silty to sandy bodies. No samples were collected of this unit.
The topography is low and hummocky, with occasional small knobs. The thickness of this unit varies from 4 to 6 metres.

MT (GLACIALLY DISTURBED MORAINE)

The material within the unit is highly variable. Small and large bedrock blocks incorporated into the till. It is possible that some of the hummocks are composed entirely of glacially thrusted bedrock, and neighbouring hummocks of till or a mixture of bedrock block, stratified drift blocks and till. No samples were collected from this unit.

The unit has a relief of 2 to 5 metres, is hummocky and poorly drained and is thicker than 3 metres.

PS (POND SEDIMENT)

This unit is applied to a mixture of clay, silt, sand and organic sediment, of variable thickness. It can be covered with water during a part of the year.

The topography is usually flat to very gently undulating. Thickness is usually more than 1 metre.

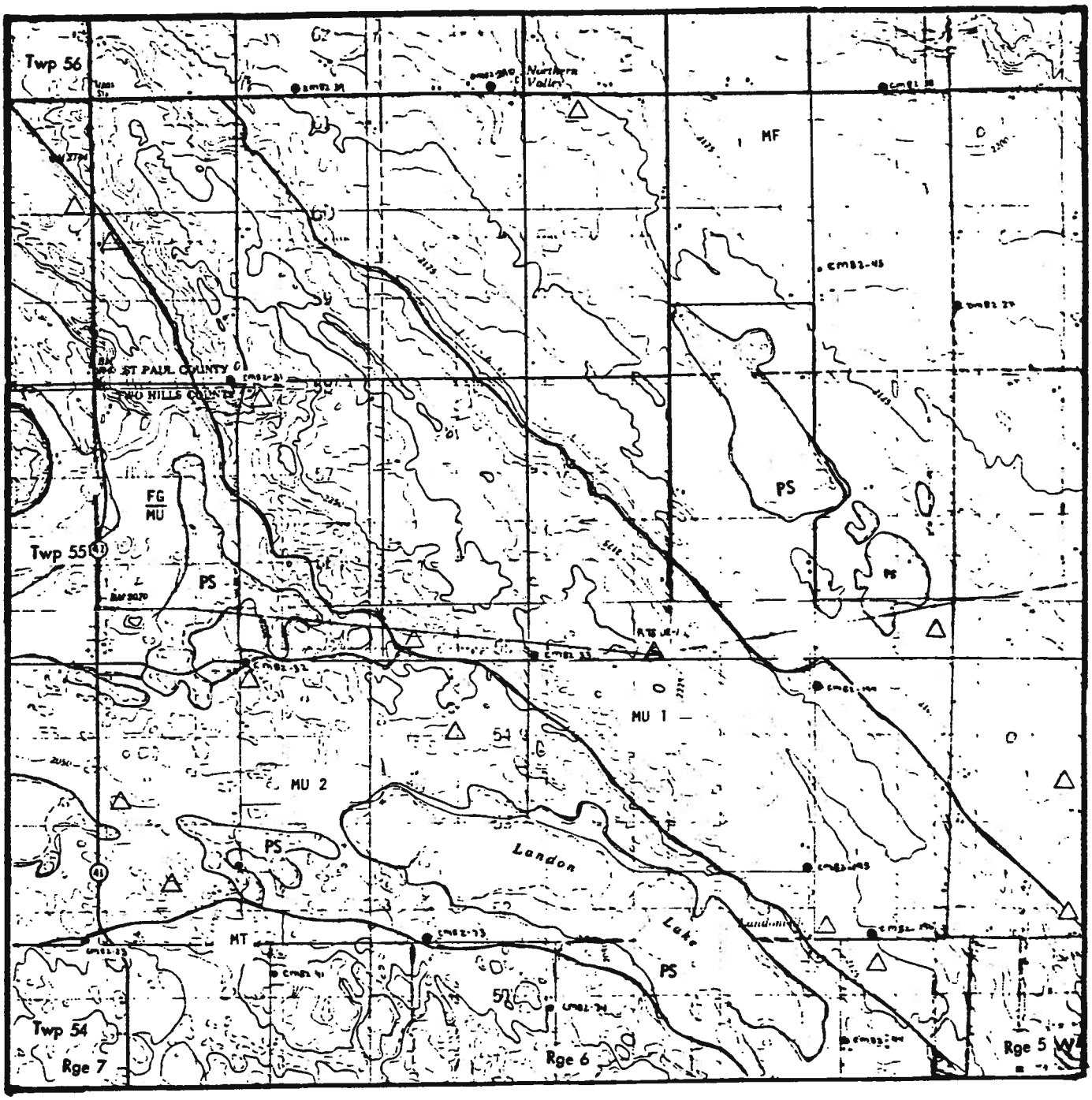
OVERBURDEN CHARACTERISTICS

In the northeastern corner, the overburden is composed mainly of till, generally m thick, which can be up to 20 metres, small, discontinuous sand bodies may be locally present within the ridge the till thickens, at least locally to 25 m.

On the west side of the ridge, the overburden varies from 10 to 20 metres thick and locally contain alternating layers of till and gravelly sand. These gravelly sand bodies are 2 to 5 metres thick and more numerous and continuous in the southwestern corner of the township. No data are available for the very southern portion of the area.

REFERENCE

Carlson, V.A., Currie, D.V., 1973, Bedrock topography of the Vermilion Map Area NTS73E, Alberta, Alberta Research Council.



SURFICIAL GEOLOGY , LANDON LAKE AREA, ALBERTA

LEGEND

PS	POND SEDIMENT
MF	FLUTED MORAINE
MU 1	UNDIVIDED MORAINE, type 1
MU 2	UNDIVIDED MORAINE, type 2
FG / MU	FLUVIAL GLACIAL DEPOSITS ON UNDIVIDED MORAINE
MT	GLACIALLY DISTURBED MIXED MATERIAL MATERIAL
—	APPROXIMATE GEOLOGICAL BOUNDARY

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ALBERTA GEOLOGICAL SURVEY, ALBERTA RESEARCH COUNCIL

The Alberta Geological Survey would welcome any addition information on this area.

surficial geology field observation site
Alberta Environment drill hole
Alberta Research Council drill hole