

## QUATERNARY MAPPING - UPPER HUMBER RIVER AREA

by

D.G. Vanderveer

The area mapped is bounded on the west by the Long Range Mountains, on the south by the Trans Canada Highway, on the east by the Hampden road and on the north by the Sops Arm - Jackson's Arm access road, and covers parts of map areas 12H/3, 7, 10 and 11, and all of map area 12H/6. The mapping was carried out following questions by Westfield Minerals Limited concerning the late Quaternary glacial flow in the area. Westfield has located numerous boulders containing significant amounts of uranium mineralization. This glacial mapping program should be an aid in the search for the source of these boulders.

This program is the first "detailed" survey of the glacial history of the Upper Humber River area, although previous researchers working in surrounding areas may have made references to the glaciation of this area. These workers include MacClintock and Twenhofel (1940), who indicated northward ice flow out of Sandy Lake and Grand Lake; Lundqvist (1965), who showed early eastward and later southeast flow in the Sops Arm area; Grant (1973, 1974), who (a) showed northward trending crag and tail hills north of Sandy Lake (Map 12H/7) but also southward directed meltwater channels in the same area, (b) northwest flow near Bonne Bay Big Pond (Map 12H/5), (c) south to southeast directed meltwater channels along the north shore of Deer Lake (Map 12H/4), and (d) an ice front across Deer Lake with a center presumably to the north; and finally Rogerson (1979), retained by Westfield, who recognized the confused "state of the art" in the area, but concluded that ice flow was first to the north or northeast, then later to the northwest, away from Birchy Ridge.

A detailed interpretive analysis of the surficial and glacial geology was carried out on 1:50,000 scale aerial photography of the field area, followed by regional mapping, "ground truthing" and supplemented extensively by test pitting and sampling in the area of one of the main float occurrences. A backhoe was frequently provided by Westfield and Dave Hoover of Westfield collected numerous samples to aid this mapping program. This assistance was greatly appreciated.

### RESULTS

Two major glacial events are recognized from the glacial striae of the area. The first event consists of eastward directed glacial flow which affected at least the area to the north of Wigwam Brook (Figure 1). This ice was presumably based in the Long Range Mountains. The second event(s) is south to southeastward directed glacial flow down the basin towards Deer Lake. Related to this second event is topographically controlled late ice and the possibility of a readvance from the northeast across Birchy Lake that (a) built four large moraines southwest of Birchy Lake, (b) overran glaciofluvial sediments south of Birchy Lake, and (c) left an extensive network of meltwater channels northeast and east of Birchy Lake.

Glaciofluvial sediments and meltwater channels on the range of hills southwest and south of Adies Pond indicate that glacial meltwater outflow from this pond was interrupted, and the lake dammed until the waters of this proglacial lake flowed over the top of these hills. It has not been possible to determine if this event was related (1)

# LEGEND

- Major transverse moraines .....
- Minor transverse moraines .....
- Drumlin moraines .....
- Drumlinoid-linear moraines .....
- Crag and tail hills .....
- Meltwater channels .....
- Landslide scars .....
- Esker (direction known) .....
- Esker (direction unknown) .....
- Stoss and lee on outcrop .....
- Glacial striae (direction known) .....
- Glacial striae (direction unknown) .....
- Striae - 1 oldest .....
- Till fabric analysis .....

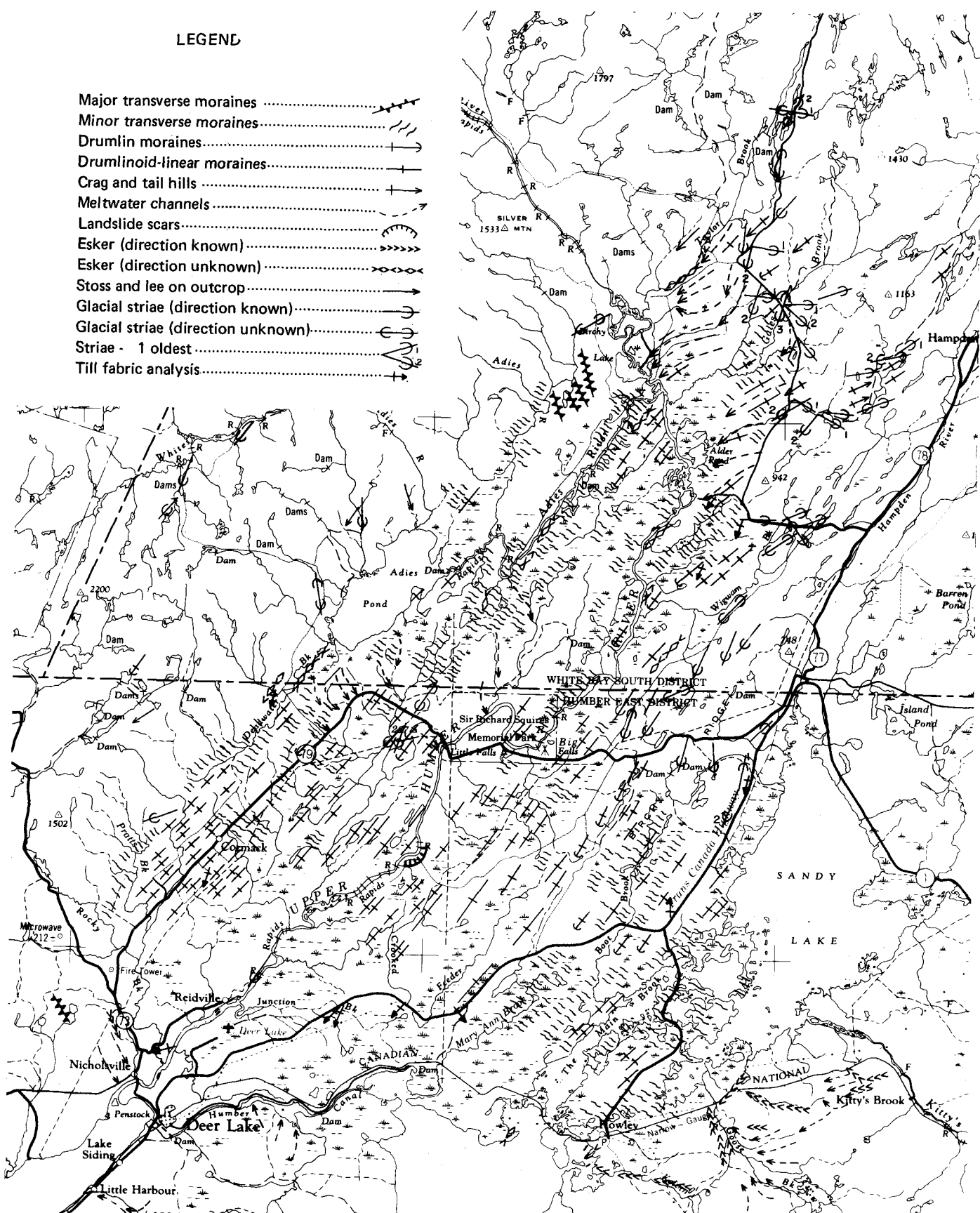


FIGURE 1

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to the readvance that built the moraines near Birchy Lake, (2) to the retreat of the major glacial advance southeast through the basin, or (3) to the advance of valley glaciers off the Long Range Mountains.

Glacial stratigraphy in the area is normally as follows:

- (a) A light pinkish gray sandy till related to the easterly movement of ice off the Long Range Mountains. In the area east of the Sops Arm access road, this till contains some erratics of red sandstone that were derived from the lowland area to the west. A similar type of till also occurs in the southern part of the study area in the vicinity of the Trans Canada Highway east of Deer Lake.
- (b) Throughout the main part of the basin, the normal basal till unit (as confirmed by drill core recovery) is a red clay-rich till that contains numerous gabbroic erratics, most likely derived from a gabbro complex located to the north of the study area.
- (c) A local immature till, related to the lithologies of bedrock present in the immediate vicinity of deposition, usually overlies the red clay till although in some areas a glaciofluvial deposit of sand, gravel and/or silt may separate the two tills. In areas of dominantly red sandstones, this local till is very angular, sandy and red. In the vicinity of mudstones and shales, the till is usually brown, gray or red depending on the color of the bedrock and in some cases may include blebs or blocks of any other till unit that it may overlie.

Till fabric analyses of the basal red clay-rich till indicate transport generally to the south and southeast. Fabric analyses in the overlying local till units are generally inconclusive because of the lack of development in the till and the lack of comminution within the till unit.

An analysis of terrain, landforms, meltwater channels, etc. has led the author to tentatively conclude that the source of ice that deposited the upper local till unit was located to the north and northeast. Further work shall include textural analyses of the various till samples collected and release of the 1:50,000 scale surficial maps.

#### REFERENCES

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