

1983/53. Magnetic investigation at Dennistoun as an aid to siting a groundwater bore.

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*Abstract*

Results of three total magnetic field traverses over part of the 'Dennistoun' property, Bothwell indicate that the dolerite in this area continues northwards under the Quaternary deposits.

INTRODUCTION

An exploratory groundwater bore is planned for the area near the house [EP056144] on the southern side of the base of the hill about 1.75 km NNE of Billygoat Hill near Bothwell. Quaternary deposits cover the site, with Jurassic dolerite cropping out about 150 m south of the proposed bore site and Triassic quartzose sandstone cropping out uphill within 150 m to the north. Minor outcrops of Permian 'P<sub>3</sub>' formation are evident at the base of the Triassic sandstone and along the outcrop edge of the dolerite (fig. 1).

As the groundwater targets at this site are the oldest sedimentary rocks of the Upper Permian Super-Group, it is desirable that the dolerite not be intersected when the hole is drilled. A magnetometer survey was carried out to determine whether the dolerite continues north under the Quaternary deposits and, if not, where the northern dolerite boundary is located.

OBSERVATIONS AND RESULTS

Observations were made with a McPhar GP-70 proton magnetometer. Three parallel traverses bearing 200° True were run approximately 115 m apart. Readings were taken at ten metre intervals, starting ten metres south of the 'north fence' (fig. 1). Base stations were established but temporal magnetic variations were not sufficiently large to necessitate the application of corrections. Traverse 1 was not completed at the first attempt and was repeated the following day. All results are shown in profile form in Figure 2.

INTERPRETATION AND CONCLUSIONS

No part of any profile is sufficiently unperturbed for a sufficient distance to indicate that dolerite is no longer present at shallow depth. The dolerite outcrop is therefore expected to continue northwards uninterrupted beneath the Quaternary deposits (and probably also Permian sediments) at least as far as the start of the traverses, as shown in Figure 3. The magnetic survey results suggest that dolerite would be intersected at shallow depth (say 10 to 30 m) by drilling at the proposed site.

ACKNOWLEDGEMENTS

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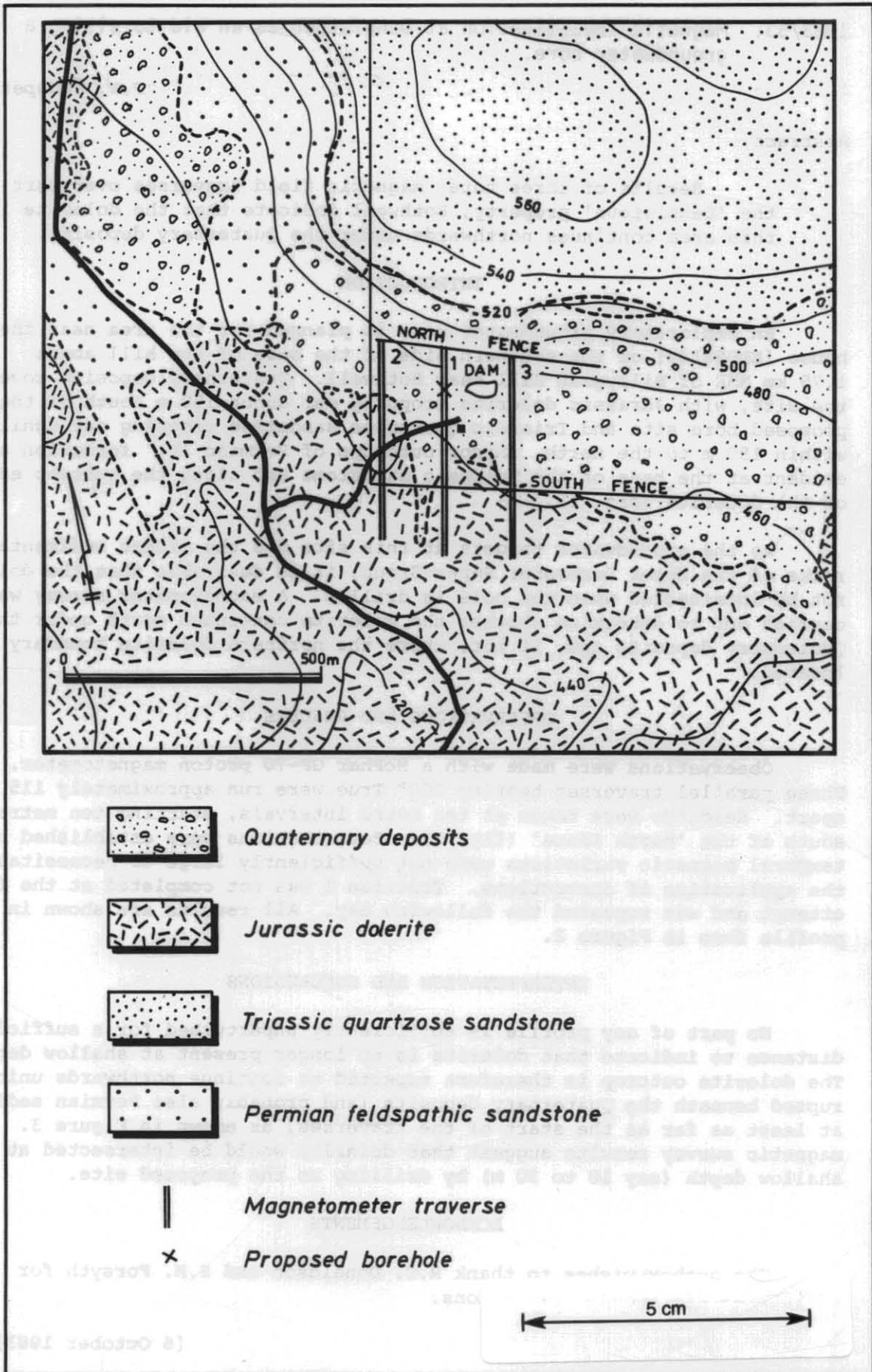


Figure 1. *Geology of the Dennistoun area*

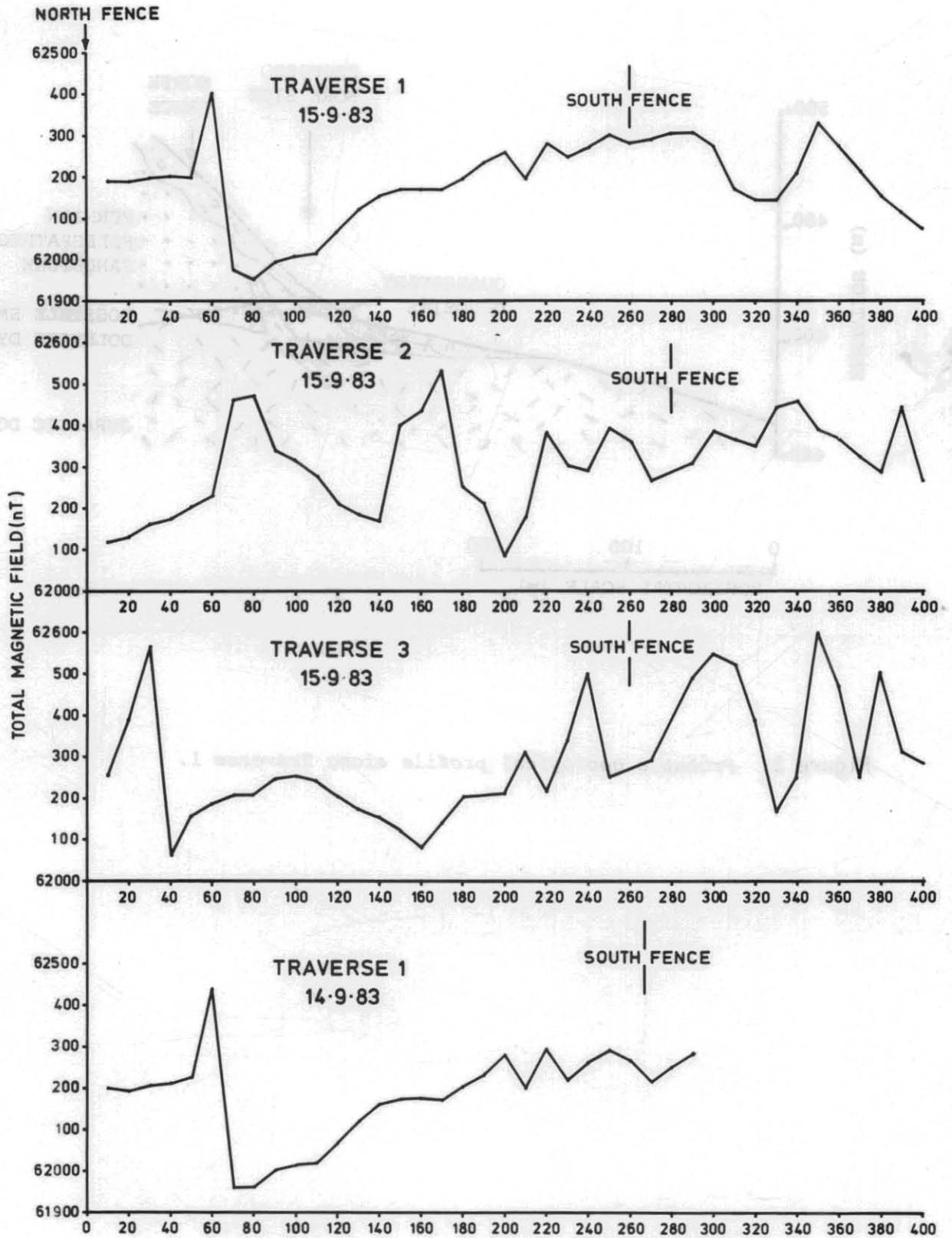


Figure 2. Magnetic profiles

5 cm

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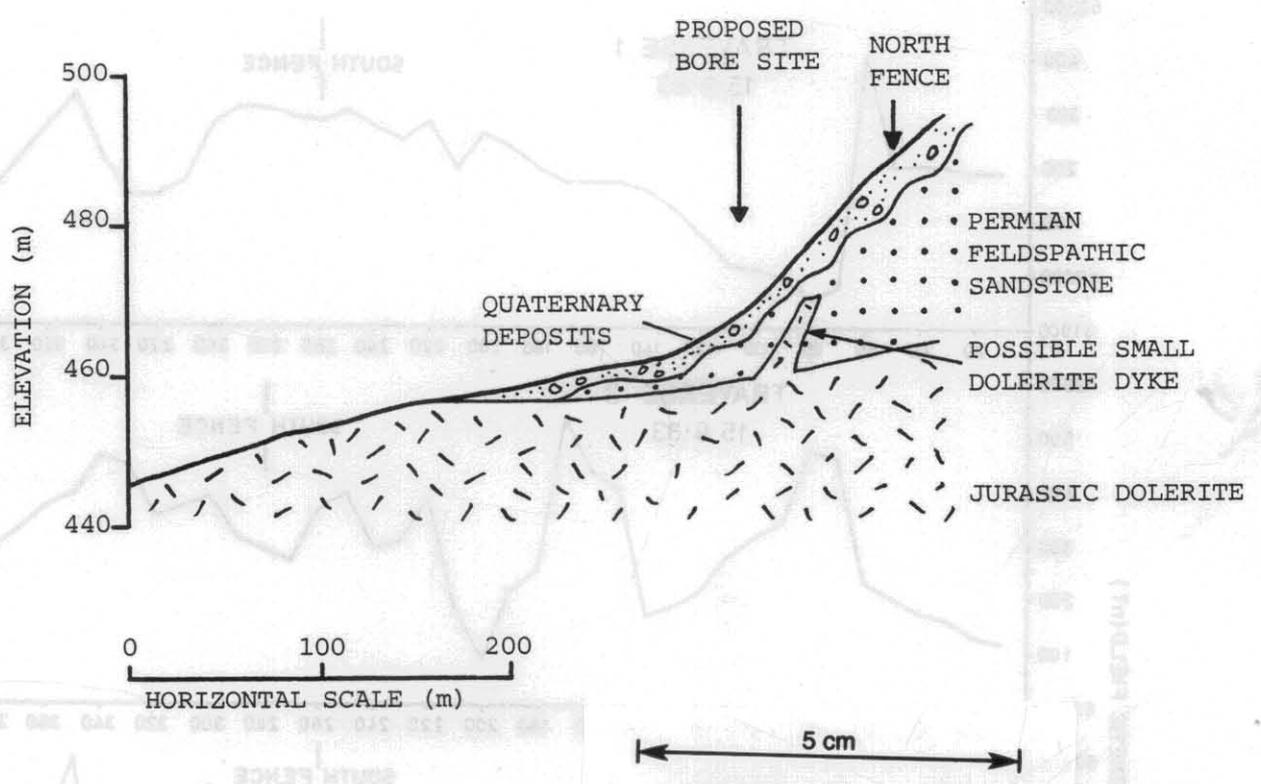


Figure 3. Probable geological profile along Traverse 1.