



INTRODUCTION

The Dominion Gulf Company's Mount Lightning I Claim Group, located in Frecheville and Holloway townships, Larder Lake Mining Division, Province of Ontario, is composed of 16 claims, 14 of which were staked in August, 1949, the remaining two being staked in December, 1949. The claim group was staked following reconnaissance dip needle and geological traverses, designed to investigate the belt of ultrabasic intrusives east of Johns-Manville's asbestos property in Munro township. The reconnaissance surveys indicated two small peridotite outcrops lying between a gabbro intrusive and a rhyolite horizon. The peridotite was associated with one limb of a horseshoe-shaped dip needle anomaly. It was believed that this anomaly might represent either a folded peridotite sill, or a separate intrusive coming up along the gabbro-rhyolite contact. In either case, the intrusive appeared to be worthy of investigation and accordingly was staked.

In order to define the peridotite belt with sufficient accuracy for diamond drilling, a ground magnetometer survey was proposed. An Askania Schmidt-type magnetic balance, having a sensitivity of about 25 gammas per scale division was used in the survey. Basic coverage consisting of stations at 100 foot intervals on profiles 400 feet apart, was obtained over the north limb and nose of the peridotite body. Over the south limb, which appeared to be more complex, basic coverage consisted of stations 100 feet apart on picket lines 200 feet apart. The survey was not extended into the non-anomalous areas. In all, a total of 938 stations were observed on 12.3 miles of picket line.

The magnetic data were observed and reduced by a Dominion Gulf Company ground magnetometer crew headed by B. Lindroot. On completion of the field work, the field notes and maps were transmitted to the Toronto office of the Dominion

Gulf Company for further processing and interpretation. The basic data, together with isomagnetic contours and interpretation, are presented on a map at a scale of 1 inch equals 400 feet accompanying this report.

SUMMARY

The ground magnetometer survey has accurately defined a peridotite body forming a plunging anticline about a gabbro core.

Several minor faults have been indicated by the survey, but these faults do not appear to have acted as channelways for mineralizing solutions, and their importance is therefore minimized.

Some asbestos fibre has been encountered in a diamond drill hole designed to sample the nose of the anticline. Later drilling indicated that this fibre occurrence was purely local in character.

It has been recommended that no further work be done on this property.

INTERPRETATION

A brief examination of the data indicates that the area may be divided into three magnetically different units, corresponding to known geological conditions. The northern section, having readings ranging from 1000 to 2000 gammas corresponds to the rhyolite lavas. This is bounded on the south side by a very strong anomaly averaging about 600 feet in width, which trends about S60°E until it reaches the easternmost claims, where it is met by a similar anomaly trending easterly. The effect given is that of a continuous horseshoe-shaped anomaly having its apex in the east, with diverging limbs toward the west. The peak intensities found in this horizon range up to 19,000 gammas. The average peak however is closer to 13,000 gammas. Two rock outcrops and several diamond drill holes have confirmed the belief that the anomalies are representative of serpentized peridotite.

In the area between the two limbs of the strong anomaly, the magnetic base level descends to a value between 2000 and 3000 gammas. A large outcrop indicates that the rock in this section is gabbro, which is apparently forming a core for the peridotite.

On the western boundary of the claim group, immediately west of the gabbro core, the magnetic values again drop below the 2000 gamma level. Outcrops a short distance to the west indicate that these low values are again representative of rhyolite.

South of the southern peridotite anomaly, the magnetic values are high, but continually decreasing, indicating that they have not reached base level. Rhyolite capping peridotite was encountered in three drill holes in this area.

In general, therefore, it is possible to distinguish between the three major rock types encountered in the area, on the basis of magnetic intensity alone. Since the major purpose of the survey was to determine the location of the peridotite horizon and its internal structure, it will not be necessary to comment further on the rhyolite and gabbro.

The peridotite anomaly has several marked characteristics which deserve comment. The outside flank of this anomaly everywhere slopes more gradually than that on the inside suggesting that the north limb dips northerly, and the south limb, southerly. The nose apparently plunges easterly. It therefore appears that the peridotite is emplaced as an anticlinal fold, having a gabbro core.

The individual peaks forming the peridotite anomalies do not flow uniformly, but are often offset from one another, indicating late faulting. Based on meagre evidence two directions of faulting may be observed, N30°W and N45°E. In at least two cases, the direction of movement along these faults appears to be vertical, rather than horizontal.

Throughout the peridotite anomaly, sharp local peaks may be seen, particularly along the northern parts of the two limbs. It is believed that these sharp features are representative of topography rather than segregations of magnetite.

Small amounts of asbestos fibre have been found within the peridotite. These occurrences, however, do not appear to be associated with any distinctive magnetic or structural feature. In other areas, sharp, local intense magnetic anomalies in peridotite, may indicate fracture zones subsequently altered to serpentine, chrysotile, and magnetite (in veinlets). No indication of similar conditions may be seen on this property.

Several fault zones have been shown on the accompanying map. In no case, however, are sharp, local anomalies suggestive of magnetite concentrations, associated with these breaks. Drill holes in the vicinity of the shears did not necessarily encounter fibre.

The most logical place to expect structural deformations to develop is in the vicinity of the anticlinal nose. The magnetic data in this region are comparatively uniform, and much less intense than normal. This suggests that the rock is either deficient in magnetite, or more deeply buried. From drilling results, it is evident that the rock in the nose area is slightly more deeply buried than some of the intrusive, but not sufficiently so, to cause the decrease in magnetic intensity. Therefore the rock must be deficient in magnetite also. This suggests that serpentinization of the peridotite is not so widespread in the nose as elsewhere along the limbs. Drilling has shown however, that the best fibre is found in this area. This fibre is extremely local and far below ore grade. The area has been well tested but the results are disappointing.

It is therefore recommended that no further work be done on this property and that it be allowed to lapse when all work credits have been exhausted.

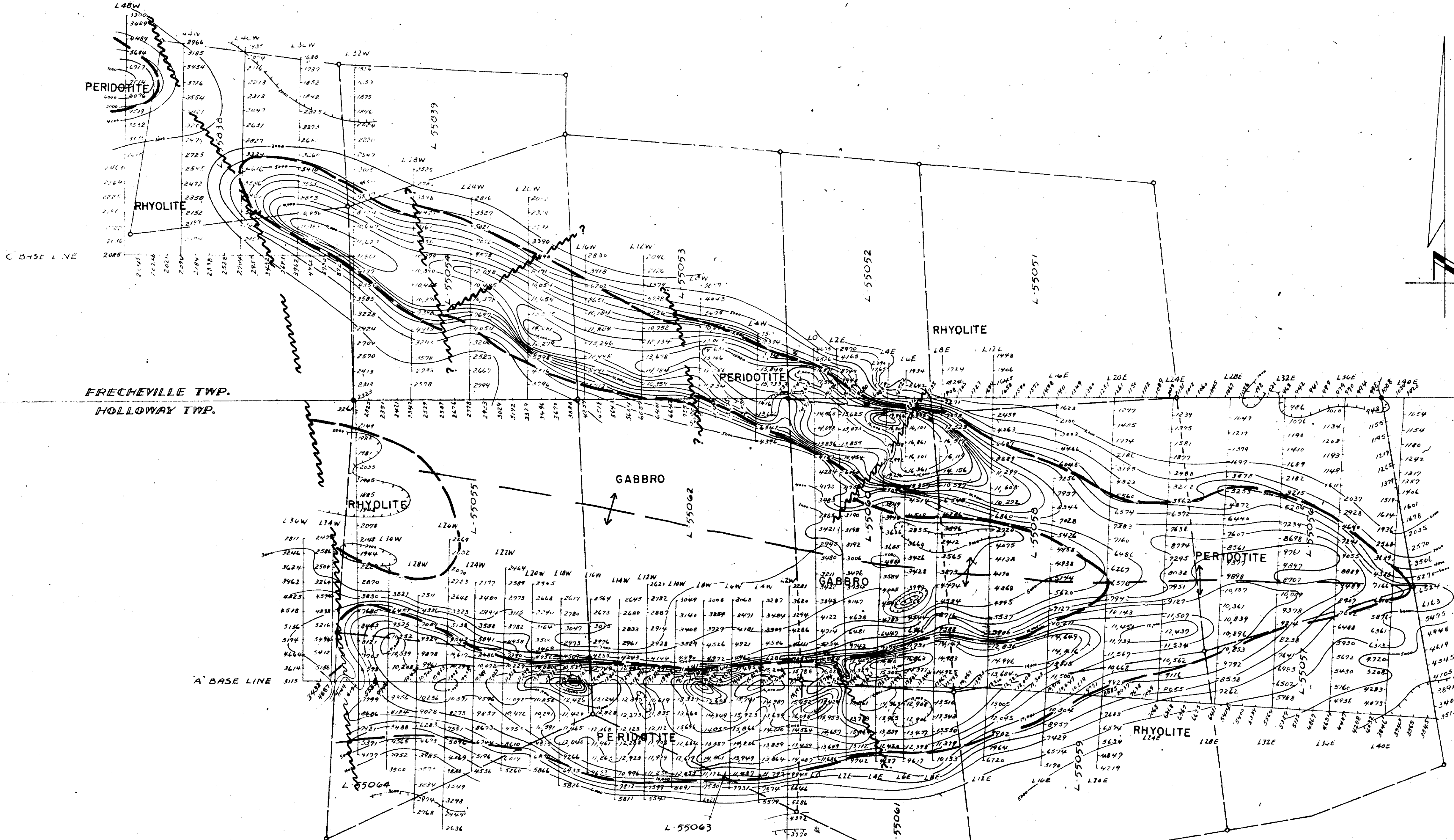
REFERENCES

1. Dominion Gulf Company Report "Case History, Mount Lightning Group" by D. K. Burke, and J. P. Nowlan, with associated maps.

ATTACHMENTS

1. Dominion Gulf Company Map, "Ground Magnetometer Survey", Mount Lightning Claims, Frecheville and Holloway Townships, Ontario, Scale 1" = 400 feet, dated January 30, 1950, contour interval 1000 gammaes.

"J. H. Ratcliffe"



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DOMINION GULF COMPANY
 GROUND MAGNETOMETER SURVEY
 MOUNT LIGHTNING CLS.
 FRECHEVILLE & HOLLOWAY TWP. - ONT.
 SCALE: 1" = 400' DATE: JAN. 30, 1950
 CONTOUR INTERVAL 1000 GAMMAS
 TO ACCOMPANY REPORT BY J.H.R. DATED: AUG. 6, 1954.

