GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

SHEET 65D

LEGEND

	< 2000 gammas
	2000 — 2300 gammas
	2300 — 2600 gammas
	2600 — 3000 gammas
	3000 — 4000 gammas
	>4000 gammas

Isomagnetic lines (total field)

500 gammas . . . .
100 gammas . . . .
Magnetic depression . . . .

Flight altitude 1000 feet above ground-level

Boundary between magnetic zones A, B, C *and* D. . . . .

Individual or groups of positive or negative magnetic anomalies . . . . (a)–(m)

This is a composite aeromagnetic map compiled from sixteen aeromagnetic maps previously published by the Geological Survey on a scale of 1 inch to 1 mile On this map, flight line traces are eliminated and base-map detail is generalized and reduced to a minimum.

No correction has been made for regional variation which, according to Dominion Observatory Map, "F - isodynamic chart Canada 1955.0" increases at the rate of 1.1 gammas per mile in the direction S. 15° E.

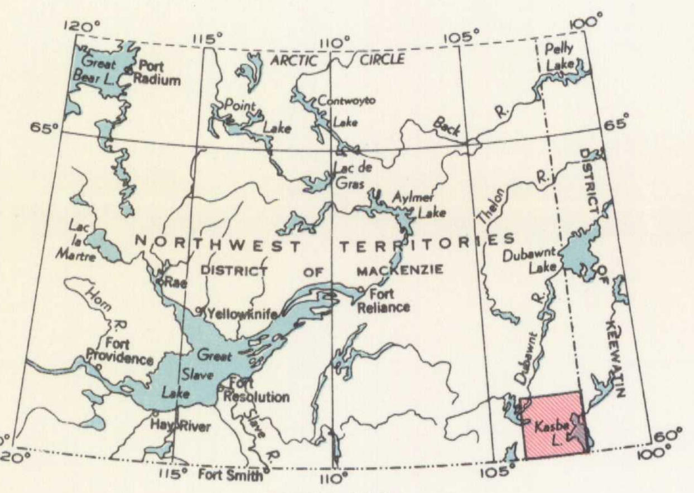
58,700 gammas should be added to each contour value to tie into the absolute value of the earth's field. This is not necessary for interpretation purposes but would assist in the standardization of magnetic data.

Compiled by A. S. MacLaren

Cartography by the Geological Survey of Canada, 1959

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

Approximate magnetic declination, 19° 40' East



DESCRIPTIVE NOTES

PREVIOUS GEOLOGICAL WORK

The most recent geological work in this area was done by Taylor[1]. Helicopter supported geological surveys by Lord[2] and Wright[3] were done in adjacent areas to the east and north.

MAIN MAGNETIC FEATURES

Without reference to geology, the area may be divided into four zones, A, B, C, and D, each with its distinct magnetic character.

Zone A is characterized by areas of positive and negative anomalies of weak magnetic intensity. It is interpreted as being underlain by granitic gneisses.

Zone B is a negative anomaly of low intensity 12 miles long and 2 to 5 miles wide. This is interpreted as being caused by steeply dipping meta-sedimentary rocks in the granitic gneisses of zone A. The large size and magnetic uniformity suggests that this magnetically low area is not due to the contrast with the adjacent areas of relatively high magnetic intensity to the southeast but that it is actually underlain by magnetically inactive rocks.

Zone C is in strong contrast to zones A and B. It comprises a large number of interconnected positive magnetic anomalies trending north to northeast. Negative anomalies of large and small extent are also present north and south of Jenne Lake and east of Sherwood Lake. Local magnetic relief is 2,200 gammas. Intense positive magnetic anomalies are believed to coincide with concentrations of ferromagnetic minerals in several rock types including meta-gabbro, volcanic rocks, and iron formation. The negative anomalies correspond to sedimentary rocks and derived paragneisses containing minor amounts of magnetite.

Zone D has a local magnetic relief of 6,100 gammas. The chief magnetic feature is a belt of strong magnetic anomalies, up to an intensity of 8,000 gammas in the shape of an inverted V, superimposed on a low magnetic background composed of areas of low and medium magnetic intensity oriented at random. The inverted V group of anomalies is believed to be caused by tuffaceous iron formation in country rocks composed of meta-sediments, granite and granodioritic intrusions, and weakly ferromagnetic gneisses.

MINOR MAGNETIC FEATURES

Magnetic anomalies lettered a and b coincide with gneisses derived from sedimentary and volcanic rocks (Taylor's unit 5)[1]. The magnetic intensity over these areas is 500 to 1,500 gammas higher than over the adjacent gneisses. For this reason they are considered to be derived from volcanic rocks now altered to basic gneisses.

Area c is chiefly an area of low magnetic intensity corresponding to granitic gneisses and some non-ferromagnetic sedimentary rocks. Meta-gabbro, granite, and granodiorite are also present. The mapped meta-gabbro (Taylor's unit A)[1], according to airborne data is not significantly magnetic.

Area d corresponds to an area mapped by Taylor, 1956, as granite, granodiorite, granitic gneisses, sediments, gabbro, and amphibolite (Taylor's map units 1, 5, 6, A and G)[1]. The magnetic data suggest that a basic phase of the gneisses, possibly containing iron formation lies just east of unit 6.

Area e corresponds to areas of granitic gneisses and sedimentary rocks. It has an east-west trend and forms a magnetically weak area. The position of the contact between acid gneisses and sedimentary rocks is not suggested by the magnetic data.

Area f is separated from area d by a long, linear magnetic negative anomaly extending from Barr Lake to the north end of the map-area. The magnetic intensity over area f is 200 to 500 gammas higher than over the adjacent rocks. This area corresponds to mapped sedimentary and volcanic rocks, granitic gneisses, and minor gabbro. The long linear magnetic depression between areas c and f is interpreted as being due to a fault zone parallel with the one mapped by Taylor along the southeast edge of Snowbird Lake.

Area g corresponds chiefly to sedimentary and volcanic rocks with minor gneisses and gabbro. Localized areas of high magnetic intensity are attributed to local concentrations of ferromagnetic material within these rocks.

Area h, of relatively low magnetic intensity, corresponds to sedimentary rocks and paragneisses containing small amounts of ferromagnetic minerals. From trends in the bedrock and from the magnetic picture it is interpreted that the sedimentary areas west of Meyrick Lake should be joined as one unit. Area h is interpreted to extend northeast through Dehoux Bay up the east side of Snowbird Lake.

Area i is composed of many magnetic anomalies in the form of an inverted V. These anomalies have intensities from 100 to 6,000 gammas above the magnetic background over adjacent granite, granodiorite, and sedimentary and volcanic rocks. Because of their intensity, linearity, and occurrence in Taylor's unit 2[1], they are attributed to tuffaceous iron formation. For details of the intense anomaly east of Atzinging Lake, refer to Geophysics Paper No. 218[4].

Area j is probably due to a basic ferromagnetic phase of the volcanic rocks mapped by Lord[2] to the east.

Area k is a double anomaly which is interpreted as being due to an intrusive phase of the volcanic rocks mapped by Taylor in this area.

Area m, lying west of and parallel with area i, may, like area i, coincide with iron formation in volcanic rocks.

The presence of the fault mapped by Taylor along the east side of Snowbird Lake is suggested by the inverted V in the magnetic data near 65° 45' north latitude. From the magnetic data, this fault would appear to join with the fault to the east suggested by the negative magnetic anomaly between areas d and f.

[1]Taylor, F. C. Snowbird Lake, District of Mackenzie, Northwest Territories: Geol. Surv., Canada, P.S. Map 7-1956.

[2]Lord, C. S. Geological Notes on the Southern District of Keewatin, Northwest Territories: Geol. Surv., Canada, Paper 53-22, 1953.

[3]Wright, G. M. Geological Notes on The Eastern District of Mackenzie, Northwest Territories: Geol. Surv., Canada, Paper 56-10, 1956.

[4]Geological Survey of Canada Aeromagnetic Map, Magnetic Anomaly East of Atzinging Lake, District of Mackenzie, N.W.T.: Geophysics Paper 218, 1954

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MAP 1080A

AEROMAGNETIC MAP

WHOLDAIA LAKE EAST

DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

Scale: One Inch to Four Miles = 1/253,440

Miles
4 2 0 4 8 12