

Figure 1. Magnetic anomalies on eastern Melville Peninsula. Contours taken from aeromagnetic maps available from Department of Energy, Mines and Resources. Contours in milligauss, no regional correction. The lines represent the locus from which data was collected to calculate the dip and extent of the magnetic materials.



Table 1 - Depth, width, and magnetic contents of the Prince Albert Group based on least squares solution to dipping plate models of aeromagnetic anomalies according to McGrath and Hood, 1975 (1)

Location (2)	A Northern limb												B Southern limb																		
	EP <sup>1</sup>	AB <sup>2</sup>	WX <sup>3</sup>	CD <sup>4</sup>	QR <sup>5</sup>	ST <sup>6</sup>	OP <sup>7</sup>	I <sup>8</sup>	UV <sup>9</sup>	GH <sup>10</sup>	KL <sup>11</sup>	KL <sup>12</sup>	EP <sup>1</sup>	AB <sup>2</sup>	WX <sup>3</sup>	CD <sup>4</sup>	QR <sup>5</sup>	ST <sup>6</sup>	OP <sup>7</sup>	I <sup>8</sup>	UV <sup>9</sup>	GH <sup>10</sup>	KL <sup>11</sup>	KL <sup>12</sup>							
7587000 7590000	7591000	7592000	7593000	7594000	7595000	7596000	7597000	7598000	7599000	7600000	7601000	7602000	7574830	7578570	7579690	7582300	7583550	420310	426280	426700	430100	434400	437900	449200	455010	464410	464420	452400	453600		
Strike	045°	048°	048°	054°	240°	040°	045°	205°	203°	210°	211°	200°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°			
Dip	83°	83°	83°	76°	86°	90°	87°	83°	90°	90°	89°	89°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°	83°		
Depth of top of model (3) (km)	0	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Depth of bottom of model (km)	5.5	4.0	2.4	2.6	3.1	6.6	5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thickness (km)	.73	.46	.69	.57	.75	1.5	1.2	.85	.62	.71	.93	.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Susceptibility contrast $10^{-4}$ cgs	36824	82847	39451	53756	20138	39383	43467	3961	32632	13699	7249	12461	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equivalent magnetic content (4) (5)	11.44	24.04	12.44	16.34	6.54	12.34	13.44	1.34	10.24	4.44	2.44	4.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RMS of error (6)	205	139	120	235	951	272	114	8	40	234	276	418	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

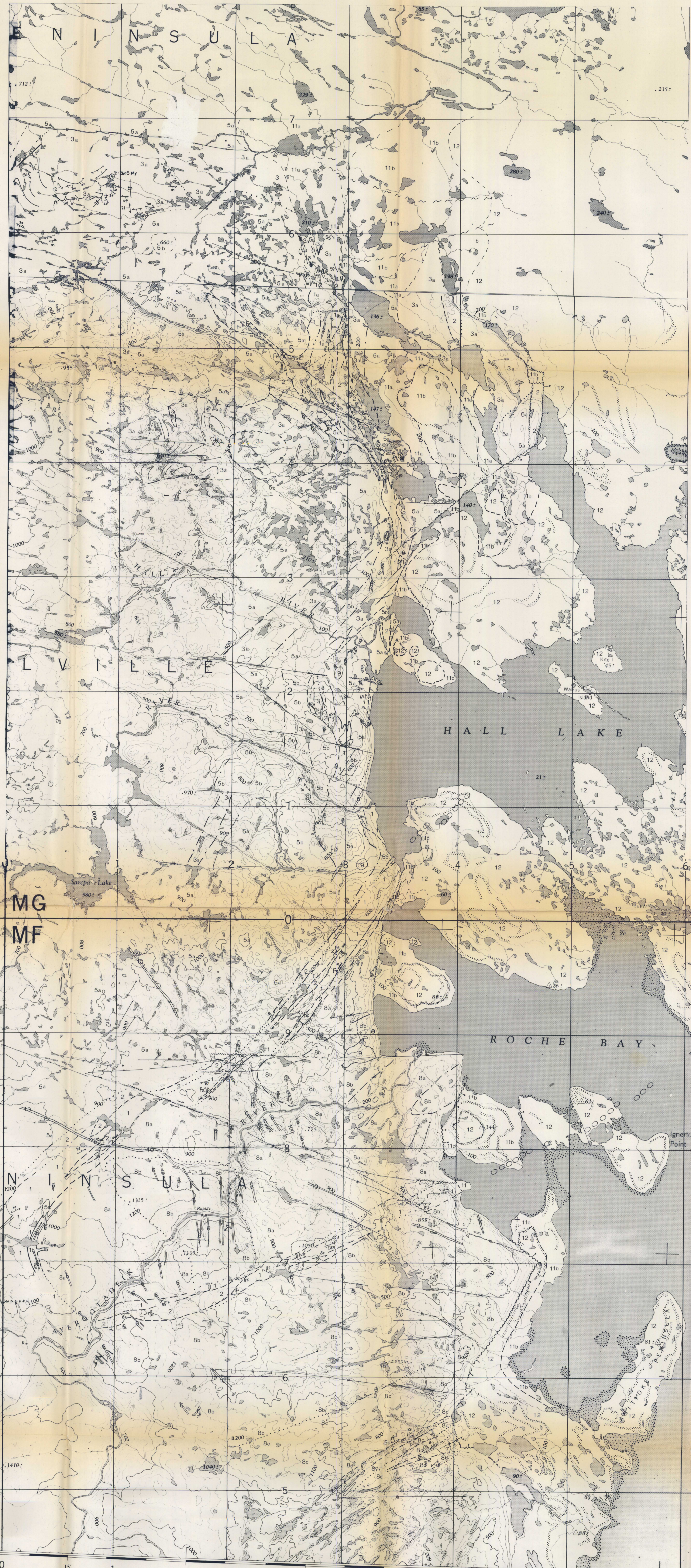
(1) Calculated by P. McGrath, GSC.  
 (2) Location taken at peak of anomaly (all UTM values in Zone 17N); maps 82780, 82770.  
 (3) Depth for EP, AB, WX, CD, QR, ST, OP, UV, GH, KL and KL are covered by uncertain thickness of Ordovician limestone not exceeding 1 km.  
 (4) According to Hood (1964).  
 (5) Magnetic contents of analyzed samples of information (Table 2) are generally twice the amount indicated by the susceptibility. The model assigns a larger volume with a lower magnetic content. Probably the complex inter-fingering relationships between the iron formations and the Tasijuaq Gabbro accounts for the dilution suggested by the model.  
 (6) A measure of the accuracy of the method; the smaller the number the better the fit.

Table 2 - Chemical Analyses of Prince Albert Group

	1	2	3	4	5	6	7
SiO <sub>2</sub>	35.80	30.30	38.50	72.50	46.00	45.30	55.80
TiO <sub>2</sub>	.03	.06	.01	.00	.01	.00	.01
Al <sub>2</sub> O <sub>3</sub>	1.80	2.00	1.22	.00	.00	.09	.90
Fe <sub>2</sub> O <sub>3</sub>	25.60	24.70	31.20	14.30	32.30	33.20	17.20
P <sub>2</sub> O <sub>5</sub>	28.20	31.60	21.70	7.00	21.30	17.60	17.30
MnO	.06	2.00	.11	.04	.02	.01	.12
MgO	1.91	4.30	2.02	.44	.95	1.44	1.30
CaO	2.32	1.66	3.38	2.96	2.64	1.07	2.92
Na <sub>2</sub> O	.20	.20	.10	.00	.00	.00	.10
K <sub>2</sub> O	.10	.16	.01	.11	.00	.11	.04
P <sub>2</sub> O <sub>5</sub>	.60	.05	.07	.10	.22	.12	.16
CO <sub>2</sub>	.00	.00	.00	2.40	1.60	.00	1.60
H <sub>2</sub> O	1.80	2.10	1.00	.50	.70	.10	1.20
S	.48	.22	.00	.30	.10	.08	.04
Li	.0005	.0006	.0005	.0006	.0008	.0005	
Cs	.00002	.00002	.00004	-	-	-	
Rb	-	.0004	.0002	-	-	-	
Er	.002	.001	.001	.0026	.001	.002	
Ba	.003	.001	-	.0017	.007	.001	
Zr	nd	nd	nd	.0037	-	-	
Cu	nd	nd	nd	.0033	nd	nd	
Sn	.008	.007	.003	-	.002	.003	
V	nd	nd	nd	-	nd	nd	
Cr	-	-	-	.0052	-	-	
Ni	.001	.003	-	.0061	.002	.002	
Co	nd	nd	nd	.0028	nd	nd	

1 7609223 428288 iron formation block in agmatite  
 2 7585200 418600 iron formation  
 3 7565041 414700 iron formation  
 4 7604635 434495 iron formation  
 5 7596827 430142 iron formation  
 6 7580605 409945 iron formation  
 7 7585400 419100 iron formation

Each analysis is of a several hundred gram hand specimen. Analyses are by the analytical laboratories of the Geological Survey.



GEOLOGICAL SURVEY OF CANADA  
 DEPARTMENT OF ENERGY, MINES AND RESOURCES  
 COMMISSION GÉOLOGIQUE DU CANADA  
 DÉPARTEMENT DES ÉNERGIES, MINES ET RESSOURCES

LEGEND

PHANEROZOIC

ORDOVICIAN

12 BAD CACHE RAPIDS FORMATION: massive micritic limestone

11 SHIP POINT FORMATION: sandstones and dolomites

11a: sandstones and dolomites

11b: dolomitic limestones

PROTEROZOIC

UPPER:

10 Diabase: possibly of Franklin dyke swarm

MIDDLE:

9 Granite: microlitic, chloritized, medium to coarse grained granite

LOWER:

8 AMITIKOKE GNEISS COMPLEX: granitoid gneisses

8a: agmatic and layered gneisses of granitic composition

8b: augen gneisses and foliated porphyritic granite to granodiorite grades into 5 and 5a

8c: well layered gneisses, biotite-rich mafic layers and rare diopside inclusions interlayered with granitic layers; possibly grades into 3

8d: undifferentiated and not well layered granitic gneisses, which include inclusions of 7 and locally include granite which intrudes 7

7 PENNYN GROUP: metasediments include quartzites, marbles, biotite schists, calc-silicate rocks and felsic gneisses

6 Metadiabase: may include some 4

POSSIBLY ARCHAIC

5 HALL LAKE PLUTONIC COMPLEX: granite to granodiorite

5a: porphyroblastic to porphyritic granite

5b: agmatite with fragments of 1, 2 or 3 set in 5a

4 Metadiabase

ARCHAIC

3 MELVILLE PENINSULA GNEISS COMPLEX:

3a: layered granitic gneisses with rare layers of amphibolite, marble, iron formation

3b: gneissic granodiorite grades into 3a

2 TASIJUAQ GABBRO COMPLEX: medium grained porphyritic and anorthositic metabasite, commonly with rafts of iron formation more foliated, locally gneissic in southern regions

1 PRINCE ALBERT GROUP: metasedimentary and metavolcanic rocks, including quartzites, iron formations, mica schists, meta-conglomerates, felsic breccias, metamorphosed pillow basalts (1a) and chlorite tremolite schists (1b)

Geological boundary (defined, approximate, assumed, gradational)

Bedding tops known (horizontal, inclined, vertical, dip overturned)

Bedding tops unknown (inclined, vertical)

Schistosity (inclined, vertical)

Gneissosity (inclined, vertical)

Lineament (from air photograph)

Fault (defined, approximate, assumed)

Mineral occurrence: Mo = molybdenite, Fe = iron formation, Cu = chalcopyrite

Aeromagnetic anomaly beneath Paleozoic cover (interpreted to be extension of Prince Albert Group)

Geological Notes

The Hall Lake region has been affected by three tectonic cycles.

Prince Albert Group (1), Tasijuaq Gabbro Complex (2) were in part transformed to become Melville Peninsula Gneiss Complex (3) during the first cycle. Later mafic dykes (4) cut the rocks.

The region was intruded by the Hall Lake Complex (5) during the second tectonic cycle. Mafic dykes (6) cut the rocks.

Following uplift and erosion the Pennyyn Group (7) was deposited and the third cycle which most affected the southern part of the area commenced. Previous map units were transformed and intruded by the Amitoke Gneiss Complex (8). Later faulting and small microlitic granites (9) were followed by mafic dykes (10).

Following uplift and erosion the Paleozoic sediments (11,12) were deposited, and after Paleozoic(?) horst and graben faulting, was removed from the uplands.

Glaciation modified the previous landscape and spread material from east to west across the peninsula. Subsequent to glaciation the area has risen.

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Airphotographs covering the map area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa.

The base map was reproduced from 1:250 000 topographical map sheets published by the Department of Energy, Mines and Resources, 47A in 1967, 47D in 1967. The scale is 1:125 000.

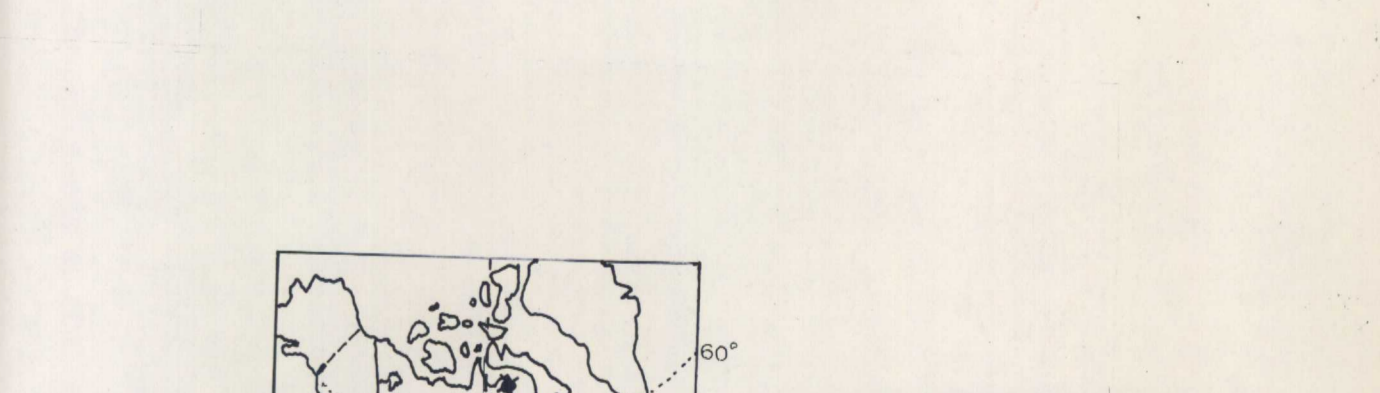
A PRELIMINARY GEOLOGICAL MAP OF THE PRINCE ALBERT GROUP,  
 EASTERN MELVILLE PENINSULA

Scale 1:125,000

Geology contributed by M.W. Heywood, 1967, 1973, pers. comm. 1977, Mikkel Schau, J. Maley, and E. Sehe, 1974, H.P. Trettin, 1975, S.V. Sanford, 1977. Compiled by Mikkel Schau, 1979.

The magnetic compass is erratic in this area. Although efforts have been made to eliminate spurious orientation data, some may persist. Corrections are welcomed.

Errors and omissions will be corrected by the author when brought to his attention.



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