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GEOLOGICAL SURVEY OF CANADA · COMMISSION GÉOLOGIQUE DU CANADA

LEGEND

PALEOPROTEROZOIC

HURWITZ GROUP (PHA-PHG)

PHG — HURWITZ GABBRO: discontinuous gabbro sills; coarse-grained, poikilitic. Local crude layering concordant with bedding in adjacent units. Chloritic shear zones common. 2111 ± 0.6 Ma (Heaman and LeCheminant 1993). Pre-folding of Hurwitz Group

PHT — TAVANI FORMATION: tan and grey-weathering subarkose. Local parallel and cross-stratified heavy mineral bands; rare interbeds of green mudstone and intraclastic mudchip breccia. At base, lenses of microbial laminated dolostone. At top, interbedded with mudstone; abundant ripple marks and soft sediment deformation structures

PHW — WATTERSON FORMATION: rose and orange stromatolitic and microbial laminated dolostone; local intraclastic breccia. Stromatolites close, laterally-linked, bulbous to nodular hemispheroids. Mixed carbonate and siliciclastic intervals of grey arkose with angular carbonate intraclasts grading to orange microbial laminate; arkose to slate fining-upward sequences interbedded with orange microbial laminate

PHA — AMETO FORMATION: at base: red, blue, green slate with mm-cm-scale parallel-stratified arkose. Up-section: cm-dm-scale arkose to slate fining-upward cycles. Hummocky cross stratification at top

KINGA FORMATION (PHP-PHKh)

PHKh — HAWK HILL MEMBER: discontinuous unit of bedded white chert, maroon chert and chert breccia conformably between the Whiterock Member and Ameto Formation. Discordant hematitic breccias at top of Whiterock Member

PHKw — WHITEROCK MEMBER: supermature quartz arenite. Lower part of section commonly massive, upper 200 m with ubiquitous wave ripples. Paleodepth calculations based on symmetric, vortex orbital ripples indicates depths of 2 cm to 2 m for the entire sequence (Aspler et al., 1994b)

PHKm — MAGUSE MEMBER: maroon, pink, grey subarkose to quartz arenite; interbeds of white quartz arenite at top. Local black parallel and cross-stratified heavy mineral bands. At base, pebbly sandstone and grit with clasts of well rounded spherical white quartz, jasper, blue and grey chert

PHP — PADLEI FORMATION: massive mixtite and stratified polymictic conglomerate; arkose; mm-cm-scale sandstone- siltstone-mudstone rhythmites with dropstones; till-pellets; possible ikaite pseudomorphs

NOOMUT FORMATION (PHNc-PHNs)

PHNs — Sandstone facies. Subarkose to quartz arenite

PHNc — Conglomeratic facies. Subarkose to quartz arenite with interbeds of quartz pebble conglomerate, in part pyritic

- - - - - angular unconformity - - - - -

PALEOPROTEROZOIC OR ARCHEAN

ESE-gabbro dykes:

egb — Non-foliated, cut structures in Henik Group at high angle; well-defined chilled margins. Age unkown

MONTGOMERY LAKE GROUP

P/AM — Pyritic lithic wacke; litharenite. Local basal breccia and polymictic conglomerate. Interbedded litharenite and siltstone near middle

- - - - - angular unconformity - - - - -

Agn — Granite. Massive granite; syenite cutting well-foliated Henik Group and overlain by Hurwitz Group

- - - - - intrusive contact - - - - -

ARCHEAN

HENIK GROUP (A2sst-A4)

A4 — Sandstone-mudstone sequence: dm-m scale fining-upward sequences; sharp-based graded sandstone to mudstone. Local ripple-drift cross-stratification

A3 Mafic volcanic, gabbro sill/dyke complex

A3p — Pillowed and massive mafic flows (< 5 m thick). Local shelf and budding structures, variolites

A3g — Gabbro sills and dykes 2-200 m wide in network of semi-concordant sheets and sills that transect flows at low angles and dykes that cut across at high angles to bedding

A3md — Interbedded mafic volcanic and dacite. Local agglomerate

A2 Mixed sedimentary-volcanic sequence.
Note: Subunits represent lithofacies; no stratigraphic order is implied

A2i — Interbedded sandstone to mudstone fining-upward sequences; lenses of polymictic conglomerate; stratified sandstone; carbonate-cemented sandstone; felsic tuff; mafic flows

A2tif — Turbidite-hosted iron-formation. Decimetre to m-scale graded sandstone to mudstone and mm-to cm-scale sandstone to magnetite iron-formation rhythmites; abundant soft sediment deformation structures

A2f — Porphyritic felsic to intermediate flows; tuffs; pebbly tuffs; monolithic volcanic breccia; framework-intact conglomerate with felsic pebbles; dolomite-cemented sandstone; local mafic volcanic interbeds

A2g — Gabbroic stocks and sills

A2mv — Mafic flows, locally pillowed; local pyritic chert layers

A2a — Massive to bedded agglomerate with intermediate volcanic clasts in mafic volcanic matrix

A2sst — Thin lenses of dolomite-cemented sandstone, parallel and cross-stratified

Outcrop
Frost heave; probable adjacent outcrop
Geological boundary (defined, approximate)
Bedding (upright, vertical, overturned, top unknown)
Cleavage;
Archean (inclined, vertical)
Paleoproterozoic (inclined, vertical)
Age uncertain
Bedding-cleavage lineation (azimuth and plunge)
Minor fold; tick toward vergence (azimuth and plunge)
Axial trace of plunging:
Anticline (upright)
Syncline (upright, overturned)
Thrust fault
Normal fault
Gossan with sample site number

DESCRIPTIVE NOTES

INTRODUCTION

Archean and Paleoproterozoic supracrustal sequences are important worldwide repositories for a wide range of economic minerals. Such rocks underlie extensive areas of the Hearne Province, District of Keewatin (Fig. 1). Mapping in the North Henik Lake area, central Hearne Province (Aspler and Chiarenzelli, 1997a) completes1:50 000 scale coverage of Archean and Proterozoic rocks in a continuous strip from south of Otter Lake (Aspler et al., 1992;1994a), ca. 125 km northeast to Kinga Lake (Aspler et al., 1993).Three principal supracrustal sequences are exposed: the Henik Group (Archean); the Montgomery Lake Group (age uncertain) and the Hurwitz Group (Paleoproterozoic).

Henik Group

Granite-syenite-diorite pluton (Agn)

Montgomery Lake Group (P/AM)

Hurwitz Group

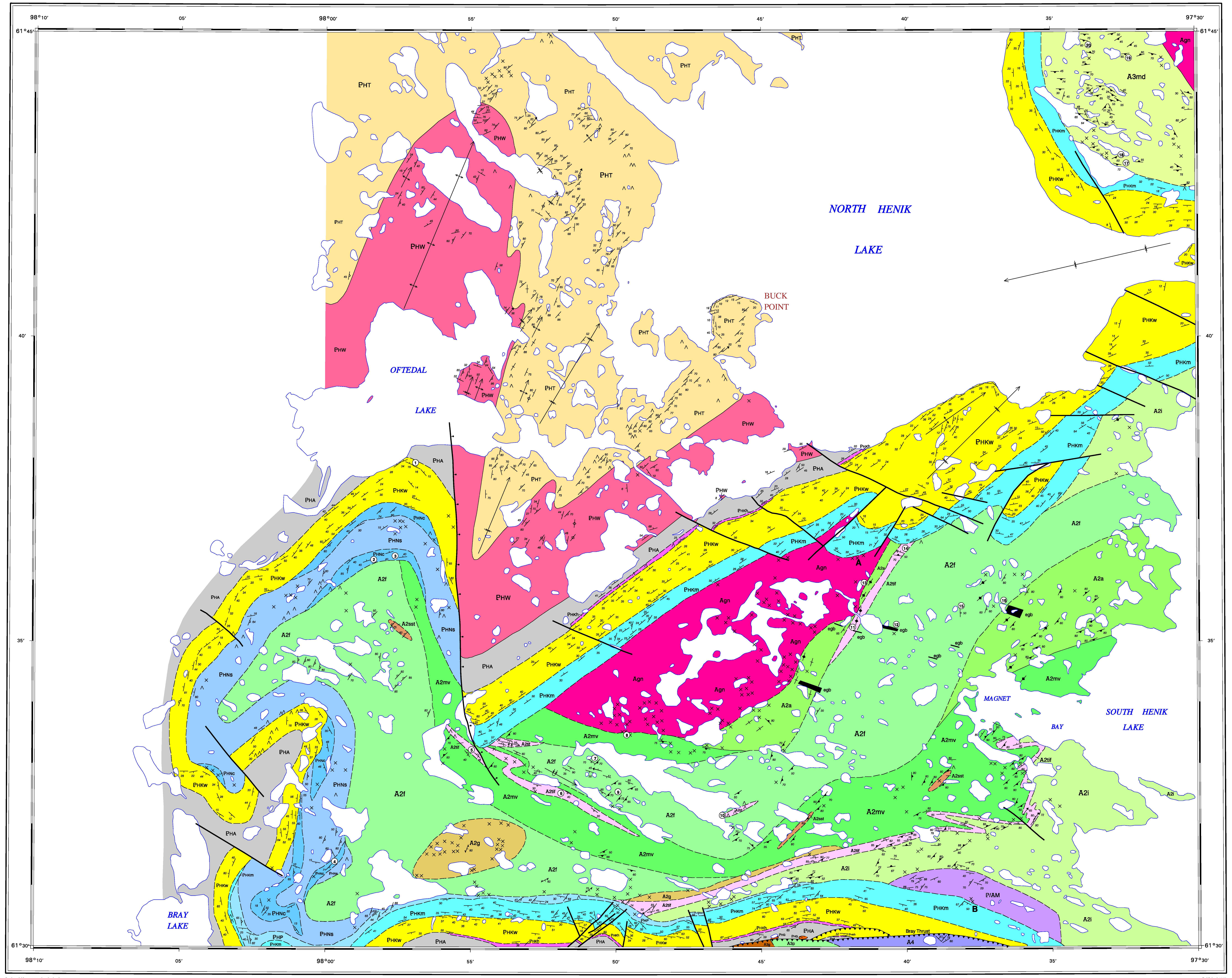
ESE-trending gabbro (egb)

Structural Geology

Sm/Nd Isotopic Geochemistry

Gossans

REFERENCES



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GEOLOGY

OFTEDAL LAKE AREA

DISTRICT OF KEEWATIN

NORTHWEST TERRITORIES

Scale 1:50 000 - Échelle 1/50 000

Kilometres 1 0 1 2 3 4 Kilomètres

Universal Transverse Mercator Projection · Projection transverse universelle de Mercator

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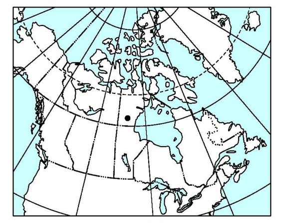

LOCATION MAP

Geology by L.B. Aspler, J.R. Chiarenzelli, 1991, 1993, 1996

Co-ordinated by L.B. Aspler through the auspices of the Western Churchill NATMAP Project

Electrostatic plot produced by Geoscience Information Division

Any revisions or additional geological information known to the user would be welcomed by Geological Survey of Canada

Digital base map from data compiled by Geomatics Canada. Modified by Geoscience Information Division

Copies of topographic maps for this area may be obtained from Canada Map Office, Natural Resources Canada, Ottawa, Ontario, K1A 0E9

Magnetic declination 1997, 4°35′E, decreasing 9.5′ annually

Site	Sample	Element	Au	Ag	Cu	Pb	Zn	Ni	Cr	V	Mo	Fe	Mn	Co	As	Hg	W	Mg	Sb	U
		Method	AA	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		Detection Limit	2	0.3	1	3	1	1	1	1	1	0.01	2	1	2	1	2	0.01	2	5
		('96'-samples)	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
		Method	NA	ICP	ICP	ICP	ICP	ICP						ICP	NA		NA		NA	
		Detection Limit	5	0.5	0.5	2	0.5	1						1	2		2		0.5	
		('91'- & '93' - samples)	ppb	ppm	ppm	ppm	ppm	ppm						ppm	ppm		ppm		ppm	
Site	Sample	Lithology																		
1	96-16-21A	hematitic qtz vein; Whiterock Member	267	<.3	5	9	4	6	23	1	2	.47	28	< 1	< 2	< 1	7	<.01	< 2	< 5
2	96-24-27		272	<.3	13	<3	54	82	97	51	2	7.29	123	25	17	<1	3	1.32	< 2	< 5
3	96-24-28	pyritic quartz pebble	4212	<.3	231	5	25	48	87	25	7	4.36	117	27	84	<1	5	.61	< 2	< 5
4	91-26-14 A	conglomerate,	480	<.5	69.7	10	30.8	72	na	na	na	na	na	59	54	na	< 2	na	4.3	na
4	91-26-14 B	Noomut Formation	120	0.8	135	12	12.8	50	na	na	na	na	na	56	760	na	< 2	na	3.4	na
4	91-26-14 C		1600	0.8	151	28	14.7	140	na	na	na	na	na	120	120	na	< 2	na	7.0	na
5	96-26-7	pyritic chert; BIF	37	5.1	83	63	55	54	18	13	1	21.14	632	49	172	1	3	.36	15	< 5
6	93-52-21	pyrite in magnetite BIF	< 5	1.8	28.6	43	11.7	34	na	na	na	na	na	46	24	na	2	na	<.5	na
7	93-52-14	sulphides in felsic agglomerate	9	1.3	102	< 2	6	< 1	na	na	na	na	na	<1	170	na	6	na		< 5
8	96-20-22	sulphides in mafic volcanic adjacent granite	3	.4	66	< 3	16	8	16	6	2	13.82	1480	7	< 2	<1	4	.19	< 2	na
9	93-52-8	disseminated sulphides in mafic volcanic	16	1	972	2	37.3	33	na	na	na	na	na	26	< 2	na	6	na	<.5	na
10	96-20-36	py in qtz veins; felsic tuff	361	24.1	61	34	6	64	23	4	27	12.94	84	63	111	<1	9	<.01	2	< 5
11	96-19-12	sulphides in mafic volcanic interbed in BIF	10	0.4	333	< 3	32	33	13	3	1	17.34	1387	30	< 2	<1	< 2	0.11	< 2	< 5
12	96-19-17 A	py lenses in felsic volcanic	5	< .3	39	< 3	27	48	46	33	2	2.88	320	22	< 2	<1	5	1.53	< 2	< 5
13	96-19-6	sulphides in mafic volcanic adjacent granite	77	2.9	2117	3	72	134	31	35	3	15.17	792	166	< 2	<1	2	0.57	3	< 5
14	96-12-23C		1	< .3	4	6	7	6	8	4	<1	27.57	500	5	< 2	<1	2	<.01	< 2	< 5
14	96-12-23D	sulphides in BIF	7	.3	18	< 3	20	5	12	3	1	21.00	251	5	< 2	<1	3	0.01	< 2	< 5
14	96-12-23E		2	< .3	8	< 3	14	5	13	2	<1	21.40	291	4	< 2	<1	3	0.02	< 2	< 5
14	96-12-23F		2	< .3	6	< 3	5	4	13	3	<1	25.95	411	5	< 2	<1	2	<.01	< 2	< 5
15	96-19-21A	py-chert layer in mafic volcanic	114	4.1	655	23	1067	122	9	9	18	25.59	364	21	80	<1	2	<.01	< 2	< 5
15	96-19-21B	sulphides in mafic volcanic	37	1.2	1334	6	497	71	14	18	<1	27.29	2046	24	29	<1	< 2	0.17	< 2	< 5
15	96-19-21C	qtz vein cutting py-chert and mafic volcanic	15	0.6	276	< 3	53	17	25	4	4	3.97	168	3	8	<1	12	0.01	< 2	< 5
16	96-21-27	sulphides in dacite	464	< .3	9	< 3	126	62	79	59	<1	16.23	232	19	70	<1	2	1.89	< 2	< 5
17	96-9-8	py in mafic volcanic	29	.3	15	< 3	241	46	38	304	<1	12.87	805	74	38	2	< 2	3.02	< 2	< 5
18	96-9-11	py–qtz vein in mafic and dacitic volcanic	72	.3	9	3	11	9	14	6	2	2.95	22	2	75	<1	8	0.01	14	< 5
19	96-10-35	py in dacitic agglomerate	4	<. 3	42	< 3	225	100	67	74	<1	8.45	928	28	< 2	<1	< 2	2.18	< 2	<5
20	96-10-25A	py in mafic volcanic	11	< .3	117	< 3	61	27	24	128	25	5.57	446	53	< 2	<1	4	0.84	< 2	8
20	96-10-25B	py-qtz vein; mafic volcanic	2	< .3	52	< 3	12	14	30	10	4	1.03	128	10	5	<1	11	0.03	2	< 5

Table 1. Analyses of grab samples from gossans. Samples from 1991 and 1993 ('91'- and '93'-) were analyzed by X-Ray Assay Laboratories, Don Mills Ontario. Samples from 1996 ('96-') were analyzed by Acme Analytical Laboratories, Vancouver.

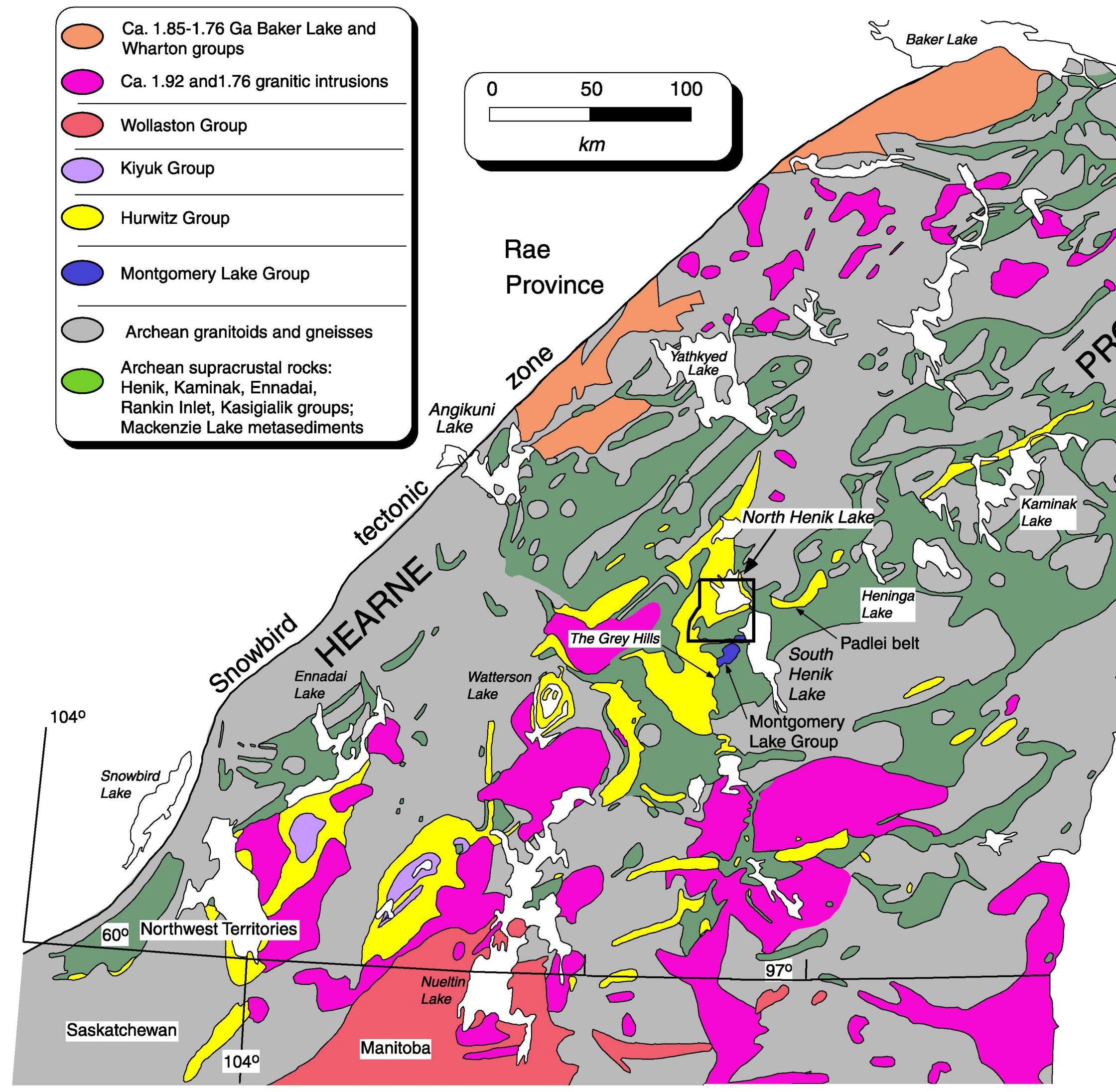

Figure 1: Simplified geology of the Hearne Province and location of map area

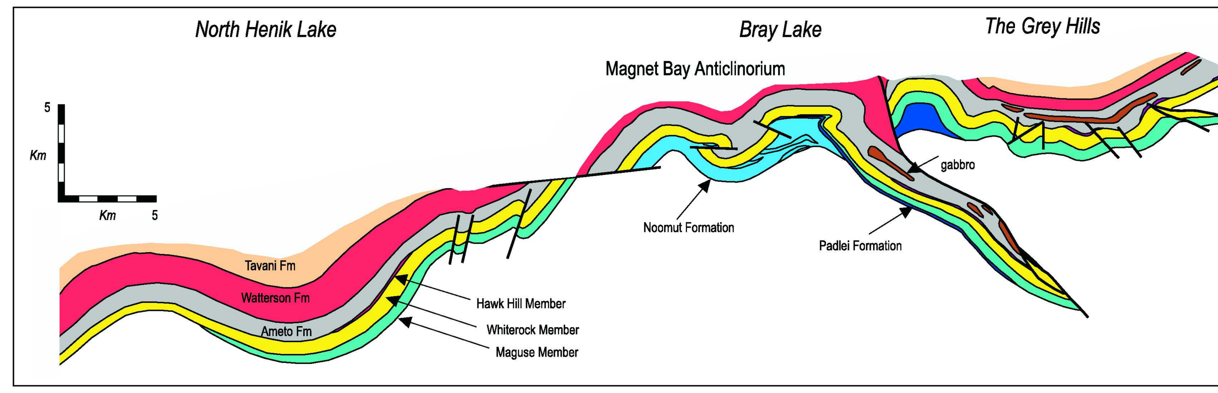

Figure 2: Axial projection: view to northeast. Constructed by projecting data both up and down plunge onto a NW-SE surface across the central part of the map area. Data from The Grey Hills have been added from Aspler et al. (1992).

NATMAP CARTNAT — Western Churchill Project

Canada's National Geoscience Mapping Program

Le Programme Nationale de Cartographie Géoscientifique du Canada

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