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The Basement to the Fury & Hecla Group: lithologic, structural and geochemical data, northwest Baffin Island

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Introduction

On the north side of Fury & Hecla Strait (FHS), northwest Baffin Island, the basement is unconformably overlain by the Fury and Hecla Group (FHG) composed of Upper Proterozoic sedimentary and volcanic rocks (Blackadar 1963; Chandler and Stevens 1981). Following an airborne radiometric survey showing uranium anomalies (Geological Survey of Canada, Geophysical Series Map 35647 (Fury & Hecla)), a multi-disciplinary team of the GSC carried out geophysical studies, regional and detailed mapping and sampling on two uraniferous anomalies located at the contacts between sedimentary rocks and their underlying basement orthogneiss and granite (Chandler et al. 1980; Ciesielski and Maley 1980; Charbonneau 1982; Maurice 1982; Chandler 1988). A study of the petrology of the uraniferous Archean granites was carried out by Ciesielski (1983). The purpose of this open file document is to provide data on the petrology, geochemistry and structure of the basement of the FHG.

Geological Context

In the northern part of the FHS the FHG comprises detrital, and chemical sedimentary and volcanic rocks of 1100 Ma age, intruded by gabbroic sills of 716 and 746 Ma (Chandler 1988). To the north, the discordance of the FHG with the basement is marked by east-west and northwest-trending late faults in which most of the uranium anomalies occur (Ciesielski and Maley 1980; Maurice 1982), (Fig. 1). The basement is composed of tonalitic to granitic orthogneiss, metasedimentary rocks, amphibolites, ultrabasites, porphyritic granodiorites and late granites. Late gabbroic bodies are thought to be related to the northwest-trending diabase dykes, intruded parallel to northwest faults. The area can be divided into an eastern block, composed of relatively homogeneous tonalitic orthogneiss, intruded by a large granite pluton containing most of the uranium anomalies, and a western block composed of various types of orthogneiss, metabasite/ultrabasite and metasedimentary rocks affected by a wide north-northeast-trending shear

zone and northwest-trending faults that host a few uranium anomalies (Fig. 1 and 2).

Eastern Block

1- *Petrography*

The eastern half of the area (Fig. 1), is underlain by tonalitic orthogneiss containing oligoclase, quartz, and up to 10% microcline, with minor biotite, hornblende and sphene. It contains inclusions of amphibolite, and minor, local interlayered ultramafic and metasedimentary rocks (biotite paragneiss, quartzite). Minerals include clinopyroxene, hornblende, biotite, prismatic epidote, opaques and sphene; muscovite, chlorite and zoisite indicate local retrogression from upper amphibolite to greenschist grade metamorphism. The central part of the area is occupied by a large rectangular body of pink granite that cuts the orthogneiss and carries the major uranium anomalies; the petrography and petrogenesis of the granite were studied by Ciesielski (1983). The contact between the granite and the tonalitic orthogneiss contains a leucocratic granitic phase showing gradational and sharp contacts with the pink granite, porphyritic textures and inclusions of amphibolite and tonalitic orthogneiss.

2- *Structure*

In the tonalitic orthogneiss, the foliations, defined by biotite and hornblende, trend mainly north and north-northeast; a few asymmetric and symmetric folds with variable plunges are generally parallel to the main fabric. The granite shows a weak north-trending foliation. Northwest and east-west faults locally affect the main foliation trends.

3- *Geochemistry*

Major and trace element contents of 22 samples of orthogneiss are listed in Table I, along with averages, standard deviations and norm calculations. Table II (east) shows the major-element compositions of layered ultramafic units and amphibolites that occur as inclusions in the orthogneiss. Analytical procedures at the GSC chemistry and electron microprobe laboratories (see below), complete analyses of trace elements and REE for part of Table I, along with location of all samples are available upon request.

Western Block

1- *Lithologic types*

1.1 Tonalitic Orthogneiss

Orthogneiss of tonalitic composition, distributed throughout the western block (Fig. 2), is similar to that of the eastern block. It has quartz-plagioclase assemblages with minor orthoclase, biotite, hornblende, sphene, apatite and opaque. Chemical analyses and norms are listed in Table Ia. In zone A (Fig. 2), the tonalitic orthogneiss is mesocratic (rich in hornblende and biotite), contains minor inclusions of metasedimentary and ultramafic rocks and folded amphibolite lenses (probably pre-tectonic dykes), and is in fault contact with metasedimentary rocks and porphyritic granodiorites. In zone B (Fig. 2), tonalitic orthogneiss is leuco and mesocratic and locally contains large amounts of metasedimentary, ultramafic and amphibolitic inclusions; it shows tectonic contacts with metasedimentary and granitic units. In zone C (Fig. 2), most orthogneiss is leucocratic and highly strained or mylonitic. It is in contact with mylonitic metasedimentary, ultramafic and amphibolitic rocks and with porphyritic granite.

1.2 Porphyritic Granite

This unit varies from leucocratic to mesocratic and shows a typical granite or granodiorite mineralogy with variable amounts of mafic minerals and up to 25% orthoclase phenocrysts; chemical analyses are listed in Table Ia (Grnt w). This unit is restricted to the south-central part of Figure 2, and is bounded by a northwest-trending fault and north-northeast-trending mylonite zone. Porphyritic granite is interlayered with leucocratic orthogneiss and metasedimentary rocks east and north of the mylonite zone, west of zone C (Fig. 2).

1.3 Metasedimentary rocks

1.3.1 Metasedimentary rocks correlated with Prince Albert Group

Metasedimentary rocks of variable composition are exposed throughout the western block (Fig. 2). They are mostly sandstone and quartz arenite with minor greywacke and quartz-magnetite rocks. Mineral assemblages include biotite, hornblende, muscovite, opaque and green mica. In zone B and C (Fig. 2), the sedimentary units are relatively homogeneous and show either faulted or low strain contacts with the adjacent orthogneiss. In zone A, quartz-rich, green mica-bearing metasedimentary rocks involved in a wide mylonite zone, are interlayered with meta-ultrabasites (showing possible metamorphosed spinifex textures), amphibolite, iron formation, leucocratic tonalitic orthogneiss and granitic gneiss. Two chemical analyses of quartz arenite from this sequence are listed in Table III. The association micaceous-

quartz arenite/ultrabasite/amphibolite/iron formation is correlated with sequences of the Prince Albert Group (PAG) described from Melville Peninsula (Schau 1982). Although the amphibolite grade metasedimentary rocks in zone B do not contain interlayered basic/ultrabasic/iron formation and are relatively poorer in quartz, they are correlated with the PAG on the basis of their homogeneity, thickness and possible preserved cross-bed structures, as described in metasedimentary rocks of the PAG in Schau (1982) and M. Schau (pers. comm., 1990).

1.3.2 Metasedimentary rocks included in Tonalitic Orthogneiss

Biotite-rich metagreywackes are found as metric inclusions in tonalitic orthogneiss in zone B of Figure 2. The rocks carry minerals such as garnet, cordierite and sillimanite. Chemical analyses of metagreywackes and corresponding biotite/garnet probe results are listed on Table III. Their compositions and geological context do not allow correlation with the PAG. The metagreywackes are older than the tonalitic orthogneiss although the relative chronology of the PAG and tonalitic orthogneiss was not established.

1.4 Granitic Gneiss/Granite

Granitic gneiss is interlayered with leuco- and mesocratic orthogneiss in zone B of Figure 2. Ultramafic and metasedimentary inclusions occur within this unit. Small bodies of late pink granite also occur in this area and extend toward the north. The granites are correlated with the large body mapped in the eastern block of basement.

1.5 Gabbro

Small bodies of cross-cutting gabbro occur in zone A and C of Figure 2, and are probably correlative with the northwest-trending dyke swarm intersecting the Fury & Hecla Group south of the basement/cover unconformity (Chandler 1988).

2- *Structure*

Stereogram A shows that zone A (Fig. 2) is dominated by north-northeast trends, and constitutes the western portion of a 30-km-wide shear zone. North-northeast and northwest faults bound sub-domains showing early northwest and late north-northeast structural trends. Changes in the orientation of foliation are related to late faulting and transposition. Early asymmetric folds trending northwest in the orthogneiss are marked by elongated amphibolite layers and believed to be pre-tectonic dykes.

Stereogram B shows consistent northeast and east-west structural trends in zone B (Fig. 2). Faults are less developed and most lithological units show unstrained contacts. Early dome-like structures are outlined by elongated amphibolite layers also believed to be pre-tectonic dykes.

Zone C (Fig. 2) is dominated by northeast trends (stereogram C), due to a wide shear zone with mylonites in the eastern part. Lithologic contacts are highly strained; the mylonitic and transposed fabric is affected by kilometric and symmetric late folds. Northwest-trending foliations in the tonalitic orthogneiss and shallowly northeast-plunging folded amphibolite layers of kilometric scale, relate to a pre-mylonite deformation and asymmetric folding event. Wide layers of amphibolite and ultramafic rocks are boudined and disrupted "en échelon" by northwest-striking faults.

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Figure / Table Captions

Figure 1

Geological map of the eastern Fury & Hecla basement showing the main tonalitic orthogneiss and granite unit, the east-west faulted basement/cover unconformity and the northwest-trending diabase swarm.

Figure 2

Geological map of the western Fury & Hecla basement showing various ortho and paragneiss units, granite and gabbro and the east-west basement/cover unconformity

Figure 3A

Foliation stereogram from area A of Figure 2

Figure 3B

Foliation stereogram from area B of Figure 2

Figure 3C

Foliation stereogram from area C of Figure 2

Table I

Chemical and modal compositions of tonalitic orthogneiss from eastern Fury & Hecla basement (Figure 1)

Table Ia

Chemical and modal compositions of tonalitic orthogneiss and granite from western Fury & Hecla basement (Figure 2)

Table II

Chemical and modal compositions of amphibolite and ultrabasite from western (west on Tablle II) and eastern (east on Table II) Fury & Hecla basement (Figure 1 & 2)

Table III

Chemical compositions of biotite-garnet paragneiss with corresponding mineral microprobe analyses. (Sill) shows the presence of sillimanite in the rock.

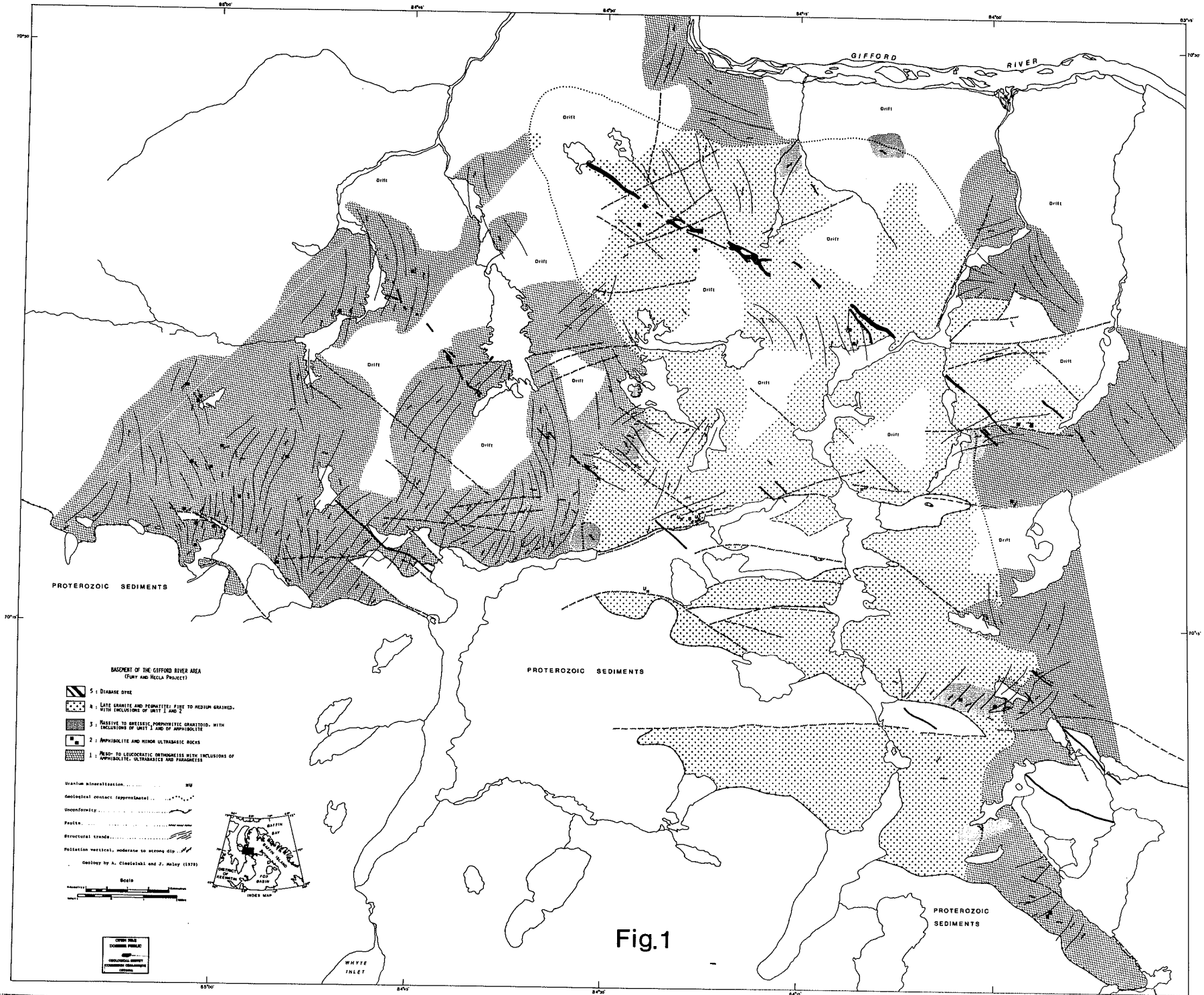
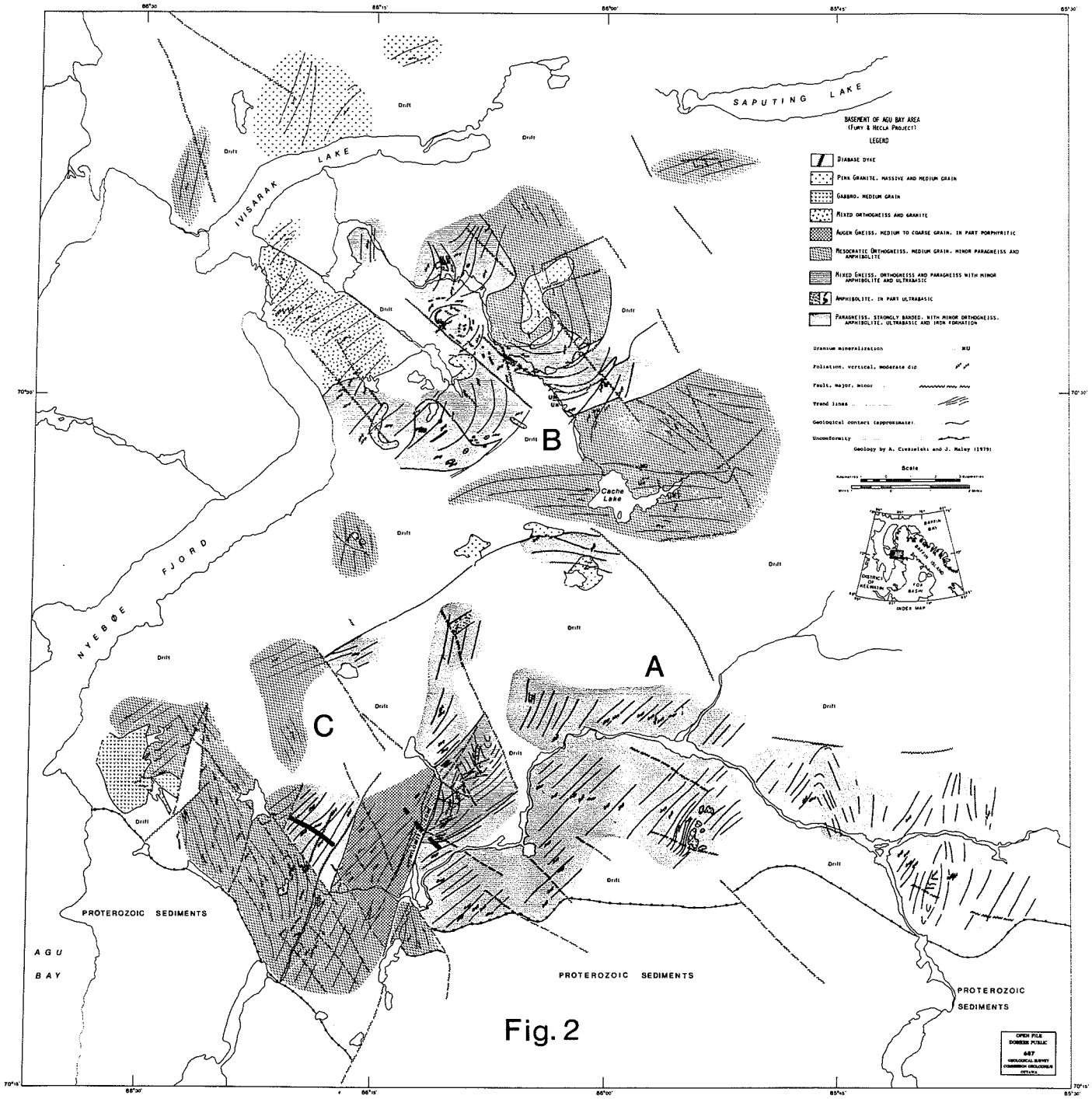

GIFFORD RIVER
Drift
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
WHYTE INLET
BASEMENT OF THE GIFFORD RIVER AREA
(FURY AND HECLA PROJECT)
5 : DIABASE DYKE
4 : LATE GRANITE AND PEGMATITE; FINE TO MEDIUM GRAINED, WITH INCLUSIONS OF UNIT 3 AND 2
3 : MASSIVE TO GNEISSIC, PORPHYRITIC GRANITOID, WITH INCLUSIONS OF UNIT 2 AND OF AMPHIBOLITE
2 : AMPHIBOLITE AND MINOR ULTRABASIC ROCKS
1 : MESO- TO LEUCOCRATIC ORTHOGNEISS WITH INCLUSIONS OF AMPHIBOLITE, ULTRABASICS AND PARAGNEISS
Uranium mineralization
Geological contact (approximate)
Unconformity
Faults
Structural trends
Foliation vertical, moderate to strong dip
Geology by A. Ciesielski and J. Maley (1978)
Scale
INDEX MAP
BAFFIN BAY
FOX BASIN
OPEN FILE
DOSSIER PUBLIC
GEOLOGICAL SURVEY
COMMISSION GÉOLOGIQUE
OTTAWA

Fig.1


SAPUTING LAKE
IVISAARAK LAKE
NYEBØE FJORD
AGU BAY
Cache Lake
Drift
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
A
B
C
BASEMENT OF AGU BAY AREA
(FURY & HECLA PROJECT)
LEGEND
Diabase dyke
Pink granite, massive and medium grain
Gabbro, medium grain
Mixed orthogneiss and granite
Augen Gneiss, medium to coarse grain, in part porphyritic
Mesocratic Orthogneiss, medium grain, minor paragneiss and amphibolite
Mixed Gneiss, orthogneiss and paragneiss with minor amphibolite and ultrabasic
Amphibolite, in part ultrabasic
Paragneiss, strongly banded, with minor orthogneiss, amphibolite, ultrabasic and iron formation
Uranium mineralization
Foliation, vertical, moderate dip
Fault, major, minor
Trend lines
Geological contact (approximate)
Unconformity
Geology by A. Ciesielski and J. Raley (1979)
Scale
INDEX MAP
OPEN FILE
DOSSIER PUBLIC
687
GEOLOGICAL SURVEY
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OTTAWA

Fig. 2

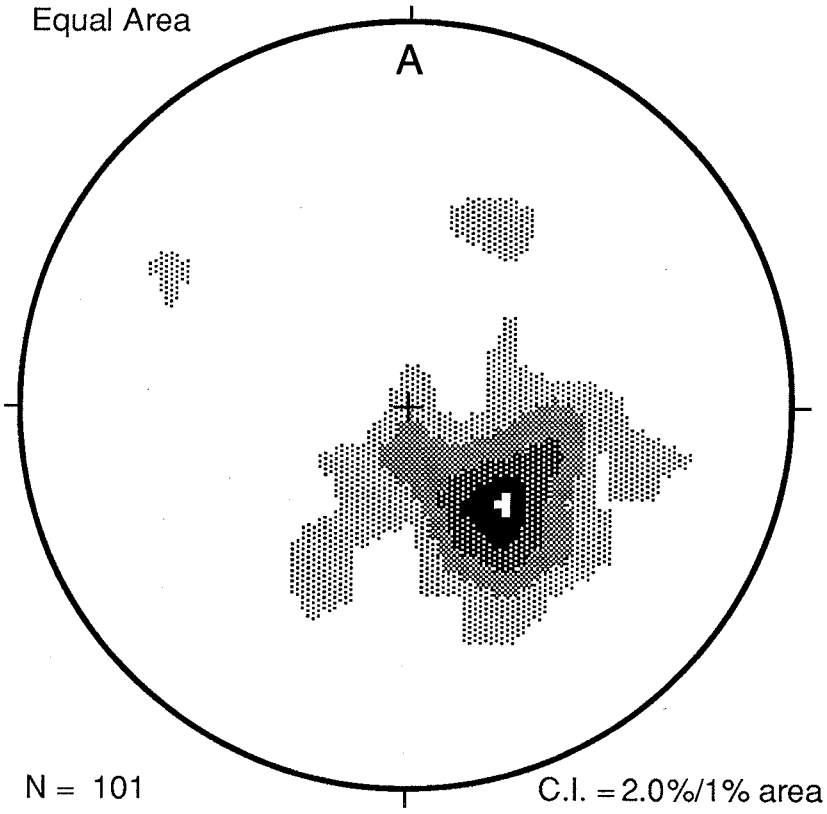

Fig. 34

Fig. No?

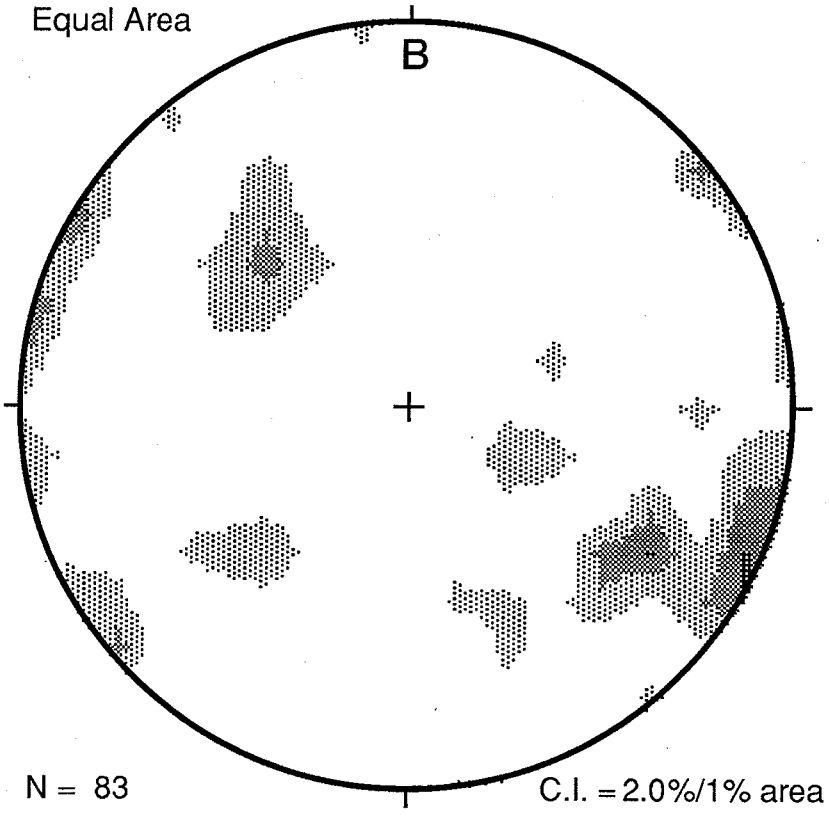

FIG. 3B

Fig. No?

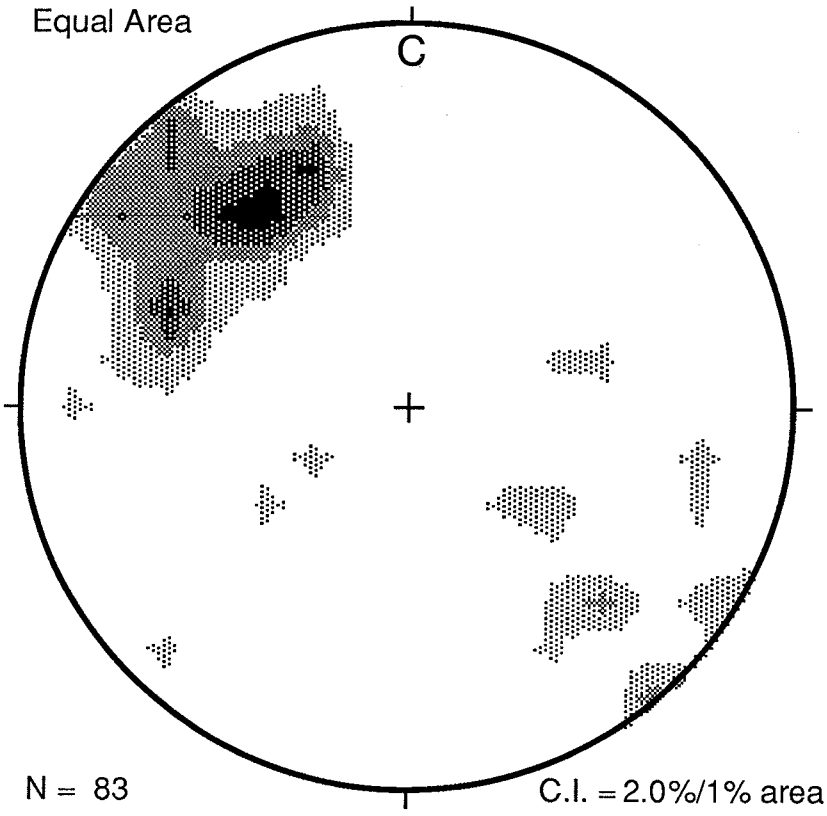

FIG. 3C

Fig. No?

Table I

Tnlt	J 13	J 26	J107.1	J 108	J 112	J 118	J119.11	9A	30B	40B	42.86	43A	44b	46.86	48.86
SiO2 W%	63.90	65.70	74.40	69.90	67.10	70.40	62.90	72.50	67.70	70.00	68.20	64.00	70.80	68.30	66.00
TiO2	0.48	0.39	0.24	0.35	0.76	0.30	0.75	0.13	0.73	0.31	0.37	0.45	0.26	0.31	0.46
Al2O3	15.30	16.20	13.80	15.50	15.10	15.30	13.40	16.10	15.30	15.00	15.70	18.10	16.10	14.60	15.50
Fe2O3t	6.00	3.50	0.00	3.20	4.60	2.40	0.00	0.00	0.00	2.80	3.00	0.00	0.00	3.80	3.70
Fe2O3	2.10	1.20	0.80	0.80	2.20	0.70	0.90	0.30	1.80	1.30	0.90	1.10	0.90	2.20	1.30
FeO	3.50	2.10	1.70	2.10	2.20	1.50	7.70	0.70	2.30	1.40	1.90	1.60	0.90	1.50	2.20
MnO	0.13	0.05	0.04	0.05	0.05	0.03	0.19	0.02	0.03	0.03	0.04	0.06	0.02	0.03	0.03
MgO	2.58	2.03	0.50	1.32	1.64	1.26	2.90	0.41	1.37	1.60	1.99	1.27	0.60	2.57	3.26
CaO	3.81	3.24	2.72	2.60	1.86	2.68	4.12	2.59	1.26	1.85	3.09	3.63	2.30	1.08	1.59
Na2O	4.20	4.50	4.40	4.30	3.50	3.90	0.50	3.90	4.10	3.70	4.70	6.10	4.30	3.70	4.10
K2O	2.55	2.62	0.98	2.14	4.32	2.67	3.02	2.95	3.47	3.88	1.83	1.90	2.93	3.32	2.54
H2Ot	1.20	1.00	0.40	0.90	1.10	0.90	2.40	0.40	1.30	1.00	0.90	0.90	0.50	1.70	2.00
P2O5	0.19	0.14	0.09	0.09	0.15	0.06	0.07	0.07	0.22	0.12	0.15	0.13	0.11	0.13	0.17
S	0.04	0.00	0.01	0.00	0.00	0.01	0.76	0.00	0.02	0.00	0.01	0.01	0.00	0.04	0.00
CO2	0.20	0.10	0.00	0.20	0.30	0.20	0.10	0.10	0.00	0.20	0.10	0.00	0.10	0.00	0.10
Ba	746	597	180	275	920	772	300	1350	1660	1472	379	230	1230	841	741
Rb	65	83	80	73	208	78	112	100	100	111	70	150	130	111	68
Sr	400	616	260	269	229	343	-	510	280	539	539	450	600	324	388
Zr	215	204	280	147	326	128	-	110	420	182	178	72	150	147	181
Total	100.40	99.50	100.20	100.30	100.50	100.10	100.00	99.40	99.90	100.60	100.00	100.10	100.10	99.60	99.40
Ap	0.46	0.33	0.21	0.22	0.36	0.14	0.17	0.17	0.53	0.29	0.36	0.31	0.26	0.31	0.41
Py	0.03	0.00	0.01	0.00	0.00	0.01	0.58	0.00	0.00	0.00	0.01	0.01	0.00	0.03	0.00
Cal	0.46	0.23	0.00	0.46	0.69	0.46	0.23	0.23	0.00	0.46	0.23	0.00	0.23	0.00	0.23
Sph	1.19	0.97	0.59	0.87	1.89	0.74	1.89	0.32	1.81	0.77	0.92	1.11	0.64	0.77	1.15
Alb	35.97	38.46	37.38	36.71	29.94	33.30	4.33	31.62	40.13	52.08	36.57	31.85	35.40	45.11	44.58
Mag	3.08	1.76	1.16	1.17	3.23	1.02	1.34	1.32	1.61	1.31	3.25	1.92	1.17	0.29	1.32
An	15.55	13.95	12.53	10.33	4.44	10.97	17.48	13.23	16.33	9.71	4.09	5.43	18.12	15.72	13.19
Cor	0.00	0.91	0.93	2.38	3.09	2.03	3.13	0.08	2.33	3.51	4.14	0.57	1.74	4.60	1.81
Mg-Act	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe-Act	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg-Bio	8.62	6.77	1.66	4.40	5.47	4.20	9.81	4.23	1.99	8.63	10.98	4.05	5.95	3.81	3.40
Fe-Bio	5.88	3.61	3.07	4.02	2.80	2.73	16.32	1.14	1.15	3.78	3.08	7.66	4.56	4.46	2.30
Or	5.93	8.88	2.93	7.43	20.41	11.46	2.25	4.35	6.95	15.37	13.29	5.53	4.83	5.60	6.19
Qz	23.16	23.78	39.83	32.57	28.63	33.10	42.08	31.09	28.45	14.39	30.56	32.90	30.75	22.08	16.27

Table I

53	62A	77A	79A	94A	105	112A	Average	Stdev
66.60	62.00	66.40	68.10	72.10	69.90	72.30	68.15	3.24
0.33	0.53	0.45	0.40	0.23	0.25	0.25	0.40	0.17
17.60	18.50	18.80	15.60	15.20	15.50	14.10	15.74	1.38
2.70	4.00	0.00	0.00	0.00	0.00	2.30	1.91	1.89
0.80	0.20	0.90	0.80	0.90	0.90	0.40	1.06	0.55
1.70	3.40	2.40	2.30	1.40	1.10	1.70	2.15	1.38
0.03	0.04	0.05	0.06	0.04	0.03	0.03	0.05	0.04
1.22	1.78	1.14	1.02	0.67	1.26	0.51	1.50	0.78
3.91	3.81	3.26	3.58	2.78	2.66	1.07	2.70	0.92
5.30	5.20	4.50	4.00	4.60	4.00	3.30	4.13	1.00
1.58	2.35	1.91	1.63	1.27	1.84	5.17	2.59	0.99
0.60	1.30	1.10	0.80	0.80	1.00	0.60	1.04	0.48
0.12	0.14	0.15	0.11	0.08	0.08	0.08	0.12	0.04
0.01	0.02	0.06	0.02	0.00	0.00	0.01	0.05	0.16
0.00	0.20	0.20	0.20	0.00	0.10	0.10	0.11	0.09
421	578	220	420	160	570	820	676	424
85	103	100	90	80	60	250	105	45
588	632	490	470	270	710	133	430	154
162	106	76	79	100	100	273	173	87
100.00	99.60	99.40	98.70	100.20	98.70	99.80	99.84	0.50
0.29	0.34	0.36	0.26	0.19	0.19	0.19	0.29	0.10
0.01	0.02	0.05	0.02	0.00	0.00	0.01	0.03	0.12
0.00	0.46	0.46	0.46	0.00	0.23	0.23	0.26	0.20
0.81	1.32	1.12	0.99	0.57	0.62	0.62	0.99	0.42
38.50	34.12	39.23	34.19	28.09	34.19	28.09	34.99	8.67
1.17	1.32	1.32	0.58	1.46	1.32	0.58	1.49	0.76
15.01	12.94	11.65	3.67	14.39	11.65	3.67	11.55	4.48
1.57	2.73	1.75	1.62	2.05	2.73	1.75	2.07	1.17
0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03
2.23	4.20	1.69	3.32	4.71	4.20	1.69	4.82	2.60
1.61	3.49	3.12	3.23	1.51	1.61	3.49	3.85	3.11
4.83	4.72	7.15	27.59	4.14	7.15	27.59	9.30	7.13
27.59	32.43	35.22	34.97	31.94	34.97	31.94	29.94	6.57

Table Ia

Id/El	Tnlt W 17 86	33 86	30 86	16 86	117	122C	bc 124a	bc124c	125b2	J48	J85 2	J91	J147 2	Grnt W 124	129
SiO2 W%	59.30	71.70	68.00	71.3	71.80	56.20	69.9	65.2	55.60	71.3	67.6	60.9	56.30	74.6	73.2
TiO2	0.31	0.23	0.25	0.35	0.32	0.50	0.22	0.54	1.60	0.18	0.51	0.91	0.76	0.10	0.10
Al2O3	21.30	14.90	16.10	15.20	14.10	12.80	16.30	16.80	13.00	16.60	15.60	14.50	13.20	14.30	15.00
Fe2O3t	3.30	2.00	2.90	3.10	-	-	1.90	4.50	-	1.10	4.40	8.90	-	-	-
Fe2O3	0.90	0.70	0.80	0.60	1.00	3.40	0.70	1.60	1.50	0.50	2.30	3.90	2.50	0.50	0.50
FeO	2.10	1.20	1.90	2.20	1.80	9.80	1.10	2.60	10.40	0.60	1.90	4.50	5.20	0.30	0.40
MnO	0.04	0.03	0.03	0.04	0.04	0.05	0.03	0.07	0.19	0.01	0.05	0.16	0.14	0.01	0.02
MgO	1.78	0.70	1.48	0.75	1.00	6.08	0.81	1.87	11.70	0.42	1.81	4.03	6.63	0.15	0.20
CaO	6.41	2.44	3.00	2.72	3.28	0.95	2.24	3.64	0.42	3.03	3.27	4.65	5.98	1.45	1.60
Na2O	5.00	4.30	4.80	3.90	3.50	1.40	4.60	4.70	0.80	5.20	4.70	4.00	2.30	3.60	4.40
K2O	1.35	2.65	1.65	2.05	1.38	4.12	2.23	1.85	1.45	1.72	1.40	0.92	4.48	3.89	3.25
H2Ot	1.20	0.50	0.90	0.80	0.70	3.50	1.30	1.20	2.20	0.50	0.90	1.50	0.80	0.30	0.70
P2O5	0.10	0.08	0.06	0.11	0.12	0.13	0.06	0.22	0.20	0.07	0.20	0.15	0.46	0.03	0.04
S	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.08	0.00	0.00	0.00	0.08	0.00	0.03
CO2	0.00	0.10	0.10	0.00	0.10	0.20	0.20	0.10	0.10	0.40	0.10	0.40	0.20	0.10	0.10
Ba	193	1224	256	380	1310	950	588	675	70	490	301	323	1580	940	790
Rb	44	58	73	101	60	225	71	58	140	47	74	48	80	35	100
Sr	554	502	309	215	350	-	285	589	-	692	416	273	-	370	470
Zr	69	120	126	205	61	-	163	204	-	167	192	62	-	29	130
Total	99.80	99.70	99.20	100.20	99.40	99.50	99.90	100.60	99.30	100.60	100.40	100.60	99.30	99.50	99.60
Ap	0.24	0.19	0.14	0.26	0.29	0.32	0.14	0.53	0.48	0.17	0.48	0.36	1.10	0.07	0.10
Py	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.06	0.00	0.00	0.00	0.06	0.00	0.02
Cal	0.00	0.23	0.23	0.00	0.23	0.47	0.46	0.23	0.23	0.91	0.23	0.92	0.46	0.23	0.23
Sph	0.77	0.57	0.62	0.87	0.79	1.27	0.55	1.34	4.02	0.44	1.26	2.27	1.88	0.25	0.25
Alb	42.82	36.57	40.99	33.26	29.82	12.28	39.43	40.25	6.92	44.22	40.13	34.36	19.62	30.55	37.49
Mag	1.32	1.02	1.17	0.88	1.46	5.11	1.03	2.35	2.22	0.73	3.37	5.74	3.65	0.73	0.73
An	30.89	10.57	13.38	12.16	14.39	1.51	9.08	15.30	-4.61	11.80	13.54	17.34	12.56	6.17	6.93
Cor	0.43	1.11	1.57	2.16	1.62	5.71	3.07	1.55	12.03	1.89	1.45	0.68	0.00	1.92	1.74
Mg-Act	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.29	0.00	0.00
Fe-Act	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.44	0.00	0.00
Mg-Bi	5.95	2.32	4.93	2.50	3.32	20.80	2.71	6.25	39.50	1.39	6.03	13.51	22.07	0.50	0.66
Fe-Bi	3.93	2.04	3.56	4.46	3.12	19.62	1.78	4.36	22.70	0.86	2.00	6.39	9.33	0.17	0.37
Or	1.71	12.97	4.40	7.96	4.14	-0.33	10.46	4.25	-31.57	8.76	3.02	-7.50	6.05	22.61	18.67
Q	12.01	32.17	28.30	35.85	40.27	32.82	31.15	24.55	48.42	29.55	29.37	27.14	9.77	36.23	32.43

Table Ia

J119 6	J129 5	J130 3	J133 1	J133 3	J134 2	J135 1
76.8	72.3	72.6	68.7	71.8	72.5	75.2
0.06	0.32	0.28	0.44	0.12	0.23	0.17
13.60	14.00	14.30	14.40	14.50	14.00	13.10
-	-	-	-	-	-	-
0.70	0.60	1.00	1.40	0.30	0.20	0.80
0.10	1.40	0.80	2.40	1.00	1.40	0.60
0.02	0.04	0.03	0.06	0.02	0.02	0.03
0.25	0.97	0.59	1.68	0.98	0.35	0.47
0.78	0.72	1.16	2.23	0.18	0.89	0.80
3.70	3.20	3.60	3.40	3.60	3.10	3.20
4.28	4.94	3.73	2.91	4.35	5.50	4.62
0.40	1.40	1.20	1.70	2.00	0.70	0.60
0.02	0.07	0.09	0.10	0.05	0.06	0.05
0.00	0.00	0.01	0.02	0.00	0.03	0.04
0.00	0.10	0.30	0.20	0.10	0.10	0.10
420	930	750	820	1090	1380	1030
149	110	120	100	120	150	160
30	170	210	360	130	290	120
79	160	180	86	26	180	80
100.80	100.20	99.90	99.80	99.10	99.30	100.00
0.05	0.17	0.22	0.24	0.12	0.14	0.12
0.00	0.00	0.01	0.02	0.00	0.02	0.03
0.00	0.23	0.69	0.46	0.23	0.23	0.23
0.15	0.80	0.70	1.10	0.30	0.57	0.42
31.43	27.46	30.83	29.27	31.09	26.42	27.24
1.02	0.88	1.47	2.07	0.44	0.29	1.17
3.64	1.71	2.74	8.21	-0.26	2.88	2.66
1.56	2.81	3.39	2.75	4.04	1.91	1.88
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.83	3.25	1.97	5.64	3.30	1.16	1.56
-0.49	2.63	0.80	4.11	2.02	2.99	0.51
25.09	25.86	20.48	11.25	22.79	30.23	26.09
37.49	34.54	36.66	34.90	35.03	32.41	37.99

Table II

Ampb/Ulbs	J48 (West)	J59.1	J66	J71	J82	J92	J119.9	J122.1	J122.2	J123.3	J143.2	J143.4	J147.2	J152.1	J152.2
SiO2 w%	49.10	52.60	49.20	42.70	45.90	38.90	49.70	42.40	49.80	50.30	43.60	43.20	56.30	43.60	47.90
TiO2	2.13	0.77	0.66	0.30	1.60	7.84	1.18	0.24	1.05	1.10	0.37	0.81	0.76	0.38	0.36
Al2O3	12.90	11.90	14.70	6.10	14.70	9.50	14.80	4.20	15.00	14.10	7.90	13.20	13.20	8.70	8.10
Cr2O3	0.00	0.08	0.07	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.28
Fe2O3	2.50	2.50	2.60	4.40	6.70	14.00	2.30	4.40	2.40	2.30	3.40	3.50	2.50	2.50	2.20
FeO	14.80	6.40	8.10	6.30	7.80	12.00	10.50	4.40	8.80	10.60	8.60	11.10	5.20	8.30	7.70
MnO	0.27	0.19	0.22	0.20	0.18	0.42	0.23	0.16	0.19	0.24	0.22	0.22	0.14	0.19	0.17
MgO	4.82	8.73	8.82	25.10	8.14	4.90	6.07	29.50	7.19	6.42	23.40	11.30	6.63	22.10	17.90
CaO	7.62	7.61	11.80	6.64	6.87	7.74	9.63	4.58	8.41	9.40	5.23	11.70	5.98	6.51	8.06
Na2O	2.30	2.30	1.80	0.50	1.70	1.80	2.50	0.40	3.10	3.10	0.20	1.80	2.30	0.70	0.30
K2O	0.95	3.25	0.46	0.61	1.42	0.63	0.77	0.03	1.15	0.74	0.04	0.21	4.48	0.72	2.73
H2O	1.60	1.70	1.10	5.90	3.60	1.10	1.90	9.00	1.70	1.60	6.70	2.20	0.80	5.50	3.00
P2O5	0.09	0.43	0.07	0.03	0.13	0.11	0.13	0.04	0.06	0.12	0.05	0.03	0.46	0.04	0.02
S	0.41	0.25	0.21	0.11	0.11	0.18	0.10	0.06	0.06	0.03	0.02	0.01	0.08	0.08	0.45
CO2	0.30	0.30	0.10	0.20	0.30	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.20	0.20	0.20
Ba	80	1780	70	40	70	80	90	40	200	140	20	70	1580	60	110
Rb	10	60	0	10	30	0	25	0	30	23	0	2	80	60	210
Total	99.90	99.30	100.10	99.50	99.20	99.20	100.10	100.10	99.10	100.30	100.30	99.40	99.30	100.00	99.50
Ap	0.22	1.04	0.17	0.08	0.32	0.26	0.31	0.10	0.14	0.29	0.13	0.07	1.10	0.10	0.05
Py	0.31	0.19	0.16	0.09	0.09	0.14	0.08	0.05	0.05	0.02	0.02	0.01	0.06	0.06	0.35
Cal	0.69	0.69	0.23	0.48	0.71	0.23	0.23	0.25	0.23	0.23	0.00	0.00	0.46	0.48	0.47
Sph	5.31	1.92	1.64	0.78	4.07	19.45	2.95	0.65	2.62	2.74	0.97	2.03	1.88	0.99	0.91
Alb	19.78	19.80	15.40	4.50	14.93	15.40	21.57	3.72	26.69	26.66	1.81	15.57	19.62	6.27	2.62
Mag	3.68	3.69	3.81	6.78	10.08	20.53	3.40	7.02	3.54	3.39	5.28	5.19	3.65	3.84	3.29
An	22.43	12.77	31.01	13.39	27.35	10.37	27.41	10.53	24.03	22.74	22.01	27.94	12.56	19.54	13.09
Cor	0.00	0.00	0.00	0.00	0.73	2.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg-Bi	3.18	21.05	2.75	5.02	9.42	3.29	3.56	0.27	6.20	3.47	0.31	1.24	28.53	5.47	19.82
Fe-Bi	6.18	8.64	1.48	0.59	3.80	2.62	3.83	0.02	4.60	3.59	0.07	0.72	12.06	1.23	5.00
Mg-Act	3.52	21.58	24.95	24.90	0.00	0.00	12.36	17.42	12.43	15.47	5.26	27.60	13.29	14.27	30.24
Fe-Act	6.63	8.58	13.00	2.85	0.00	0.00	12.90	0.95	8.95	15.48	1.07	15.64	5.44	3.10	7.39
Q(+)/D(-)	2.71	0.46	-13.61	-22.52	8.86	12.14	-6.37	-21.36	-6.79	-10.97	-11.22	-27.02	14.36	-17.35	-11.84
Fo	2.47	0.81	22.22	48.15	15.64	17.29	7.97	47.85	9.93	14.00	22.47	42.97	25.07	34.39	23.02
Fa	5.62	0.39	13.99	6.66	7.39	16.12	10.05	3.15	8.64	16.92	5.51	29.41	12.41	9.03	6.80
En	6.05	3.72	-13.14	-7.62	-8.38	-14.81	0.57	11.21	-1.42	-7.33	29.81	-35.21	-41.49	4.13	-3.75
Fs	-19.76	-2.13	-10.61	-7.66	-5.98	-8.34	-13.67	-4.76	-10.06	-13.88	-13.77	-16.21	2.57	-12.67	-7.80

Table II

113B	122C	124B	124C	125B2	128B	128E	128I	128J	131G	43D (East)	72A	82	J128.1	J128.2	J128.3
48.40	56.20	47.40	32.60	55.60	50.80	40.40	49.40	42.80	46.70	38.50	46.90	44.70	35.10	46.10	45.00
0.63	0.50	0.92	1.54	1.60	0.57	0.19	1.09	0.32	0.87	1.73	0.44	0.47	1.22	1.03	1.22
10.90	12.80	15.70	21.30	13.00	14.10	3.90	13.50	5.00	14.60	21.00	24.20	14.50	18.90	16.90	16.80
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.10	3.40	3.50	8.90	1.50	2.50	6.30	3.80	6.50	3.40	7.60	1.70	1.40	4.70	1.20	3.00
9.00	9.80	9.00	7.90	10.40	7.90	4.30	10.40	8.20	8.50	5.00	4.00	7.70	9.60	11.20	10.60
0.27	0.05	0.24	0.11	0.19	0.20	0.16	0.24	0.23	0.23	0.23	0.11	0.26	0.23	0.24	0.25
11.40	6.08	8.04	8.47	11.70	8.92	32.30	6.42	27.80	6.50	3.49	3.89	6.85	16.40	11.60	10.60
12.10	0.95	9.84	12.10	0.42	10.10	2.05	9.58	2.49	12.60	17.30	12.30	18.20	1.47	2.63	8.07
1.30	1.40	1.60	0.00	0.80	2.10	0.00	2.40	0.00	1.90	0.50	1.70	0.60	0.90	2.50	2.40
0.43	4.12	1.58	0.70	1.45	1.24	0.02	1.25	0.05	1.44	0.71	2.22	0.80	6.79	2.99	0.25
1.00	3.50	1.90	6.10	2.20	2.10	9.90	2.40	6.80	3.50	1.70	2.50	2.40	3.90	2.60	1.10
0.13	0.13	0.08	0.16	0.20	0.05	0.04	0.09	0.16	0.09	0.42	0.07	0.04	0.16	0.16	0.17
0.08	0.02	0.02	0.03	0.08	0.06	0.12	0.02	0.03	0.09	0.08	0.00	0.27	0.08	0.09	0.08
0.20	0.20	0.10	0.10	0.10	0.00	0.10	0.00	0.00	0.20	0.10	0.10	1.00	0.20	0.10	0.10
60	950	310	60	70	210	20	110	90	90	100	190	70	80	260	60
0	225	52	20	140	31	0	24	0	50	0	100	30	660	90	0
99.10	99.50	100.00	100.20	99.30	100.80	100.70	100.70	100.50	100.70	98.70	100.20	99.20	99.70	99.50	99.80
0.31	0.32	0.19	0.40	0.48	0.12	0.11	0.22	0.41	136.67	1.01	0.17	0.10	0.39	0.39	0.41
0.06	0.02	0.02	0.02	0.06	0.05	0.10	0.02	0.02	2.89	0.06	0.00	0.21	0.06	0.07	0.06
0.46	0.47	0.23	0.24	0.23	0.00	0.25	0.00	0.00	0.00	0.23	0.23	2.33	0.47	0.23	0.23
1.56	1.27	2.30	4.02	4.02	1.43	0.52	2.74	0.84	165.12	4.32	1.11	1.18	3.12	2.60	3.03
11.11	12.28	13.80	0.00	6.92	18.15	0.00	20.80	0.00	0.00	4.30	14.75	5.20	7.93	21.72	20.53
4.54	5.11	5.17	13.74	2.22	3.70	10.13	5.64	10.11	2340.53	11.21	2.53	2.08	7.09	1.79	4.40
22.87	1.51	31.59	57.20	-4.61	25.92	9.76	22.92	11.72	3259.76	53.89	53.17	35.36	1.53	8.74	34.71
0.00	5.71	0.00	0.91	12.03	0.00	0.73	0.00	1.01	103.02	0.00	0.00	0.00	9.92	6.60	0.00
2.68	20.54	9.00	5.03	8.58	7.54	0.18	6.17	0.41	328.14	4.91	13.16	4.43	47.73	17.19	1.44
1.24	19.37	5.76	1.60	4.93	3.96	0.01	5.79	0.05	53.32	1.51	7.60	3.12	15.05	10.92	0.87
35.39	0.00	13.26	0.00	0.00	23.17	0.00	17.62	0.00	0.00	29.54	6.86	44.51	0.00	0.00	0.48
15.80	0.00	8.23	0.00	0.00	11.79	0.00	16.02	0.00	0.00	8.79	3.84	30.36	0.00	0.00	0.28
-19.73	32.61	-4.77	-6.89	27.98	-9.85	-14.11	-8.40	-8.32	-499.60	-14.58	0.57	-29.08	-1.50	1.76	-7.77
33.67	43.33	7.36	12.84	44.73	16.20	32.25	11.19	17.60	2476.98	27.36	0.90	43.40	2.80	2.72	12.24
18.16	47.84	5.51	4.78	30.10	9.96	1.15	12.29	2.71	551.76	9.84	0.61	35.78	1.03	2.02	8.64
-23.62	-61.63	2.29	0.35	-40.51	-7.58	43.05	-5.36	48.83	4901.73	-35.77	-1.71	-50.61	2.51	12.81	8.11
-11.95	-0.20	-8.70	-6.31	-14.24	-8.67	-2.87	-10.58	-10.32	-1361.50	-1.07	0.26	-8.47	-2.18	-11.27	-16.39

Table II

J128.4	Average	Stdevp
37.00	46.42	6.31
1.22	1.09	1.28
19.70	13.31	4.77
0.00	0.04	0.09
4.10	3.81	2.58
11.60	8.59	2.40
0.27	0.21	0.06
15.20	11.81	7.93
3.65	7.81	4.31
1.60	1.42	0.92
1.49	1.48	1.49
3.10	3.23	2.27
0.18	0.13	0.11
0.08	0.13	0.15
0.10	0.15	0.17
70	-	-
60	-	-
99.40	99.80	0.55
0.44	4.45	23.38
0.06	0.16	0.16
0.23	0.27	0.46
3.09	4.00	5.05
13.97	7.67	28.02
6.14	6.11	5.10
13.29	44.16	284.92
11.08	0.54	1.03
9.59	6.31	5.53
4.26	4.91	4.93
0.00	11.64	41.82
0.00	6.30	5.60
-8.93	-1.26	17.75
15.39	6.44	9.69
7.99	15.79	22.35
9.88	-8.57	18.89
-15.01	-8.64	5.70

Table III

Metasediments	SiO2	TiO2	Al2O3	Fe2O3	FeO	MnO	MgO	CaO	Na2O	K2O	H2Ot
J48.1	73.50	0.39	11.20	1.30	5.20	0.12	2.83	1.13	0.90	1.82	1.30
Garnet	37.04	0.07	20.20	-	34.80	2.50	3.38	1.49	0.30	0.03	
Biotite	35.63	2.15	18.31	-	19.96	-	10.36	0.02	0.49	9.10	
J48.2	60.00	0.62	12.10	2.20	8.60	0.16	6.55	0.75	0.20	4.44	3.70
Garnet	37.25	0.01	20.48	-	31.41	4.26	4.48	2.33	0.20	0.01	
Biotite	36.77	1.19	17.76	-	0.18	0.02	12.73	-	0.25	9.47	
J52.1(Sil)	60.20	0.62	16.40	3.70	3.90	0.12	1.83	3.03	2.20	1.90	1.80
Garnet	38.25	0.01	20.80	-	32.64	2.73	4.60	1.58	0.04	-	
Biotite	36.60	3.53	16.61	-	19.28	0.01	9.59	0.12	0.64	8.61	
J52.2(Sil)	61.90	0.68	16.40	2.70	4.60	0.13	2.52	2.63	2.30	2.47	2.00
Garnet	37.67	-	20.75	-	31.95	3.79	4.44	1.46	0.08	0.01	
Biotite	35.62	3.51	17.62	-	19.05	0.01	10.06	-	0.53	9.54	
J53.1	81.10	0.28	10.10	0.50	1.30	0.02	0.80	0.53	1.20	2.58	0.90
J56.2	50.40	0.87	17.30	5.90	10.00	0.18	6.54	0.97	1.20	2.73	3.40
Garnet	36.99	0.05	20.22	-	34.84	0.92	5.15	1.26	0.18	-	
Biotite	37.92	2.24	16.71	-	16.36	-	13.43	0.01	0.66	8.82	
J57.3(Sil)	46.60	1.07	19.60	11.70	0.00	0.07	3.74	1.20	2.60	3.16	3.90
Garnet	36.95	0.09	20.11	-	29.69	8.65	3.22	0.57	0.23	0.02	
Biotite	35.73	3.62	18.04	-	18.30	0.13	9.56	-	0.78	9.47	
J62.A3	58.10	0.66	16.20	8.80	0.00	0.17	2.75	2.59	2.90	1.88	3.80
Garnet	37.06	0.03	20.22	-	25.58	10.50	4.69	1.64	0.17	-	
Biotite	36.68	3.18	16.02	-	16.43	0.20	13.21	0.05	0.48	9.19	
J62.A4(Sil)	61.00	0.75	17.40	3.10	3.80	0.07	1.62	1.58	2.90	1.28	1.60
Garnet	37.19	-	20.69	-	34.25	3.01	4.33	0.66	0.17	-	
Biotite	35.38	3.19	18.41	-	20.47	0.04	8.88	-	0.39	9.13	
J68	69.80	0.62	12.70	1.60	4.60	0.11	2.59	2.48	2.20	2.56	1.30
Biotite	36.12	2.79	14.93	-	21.76	0.37	10.04	0.08	0.54	9.54	
J80.1	46.80	0.87	14.90	2.40	16.40	0.39	6.60	0.99	0.30	4.59	3.90
Garnet	37.53	0.03	20.51	-	33.72	0.42	5.11	2.44	0.17	-	
Biotite	36.07	1.46	16.21	-	21.18	0.05	11.41	0.05	0.12	9.02	
J119.3	57.50	0.86	13.70	3.60	9.20	0.22	3.84	1.40	0.50	4.29	3.70
Garnet	37.07	0.01	19.87	-	31.38	5.13	2.36	3.96	0.41	0.01	
Biotite	35.05	2.35	16.11	-	23.09	0.13	9.15	0.07	0.74	9.26	
J119.8	68.20	0.48	15.90	0.70	3.30	0.07	2.52	2.18	3.30	2.16	1.30
J137.3	60.70	0.58	15.10	2.90	8.00	0.13	3.21	2.38	1.90	2.50	2.70
Garnet	37.20	0.03	20.17	-	34.49	1.23	0.03	3.48	0.38	-	
Biotite	34.91	1.70	16.65	-	23.03	-	10.57	0.10	0.53	7.74	
J143.6	67.40	0.58	14.70	1.60	5.00	0.18	1.06	2.89	2.60	2.20	1.90
Garnet	36.86	0.06	19.86	-	28.51	8.31	1.19	4.67	0.26	0.02	
Biotite	33.96	2.82	15.78	-	28.87	0.25	5.09	0.03	0.44	9.20	
125B1	86.50	0.28	7.20	0.40	0.20	0.01	2.02	0.50	0.80	0.72	0.50

Table III

P2O5	Ba	Rb	Sr	Zr
0.05	540	53	57	62
0.06	860	130	47	75
0.07	540	55	58	170
0.07	470	106	89	190
0.02	790	117	160	110
0.07	330	100	32	200
0.05	480	130	47	83
0.08	270	70	56	98
0.06	380	56	41	180
0.11	300	240	130	100
0.09	310	299	10	78
0.11	1530	180	150	130
0.08	1070	88	380	320
0.16	630	80	220	120
0.16	680	130	200	710
0.17	120	30	-	-

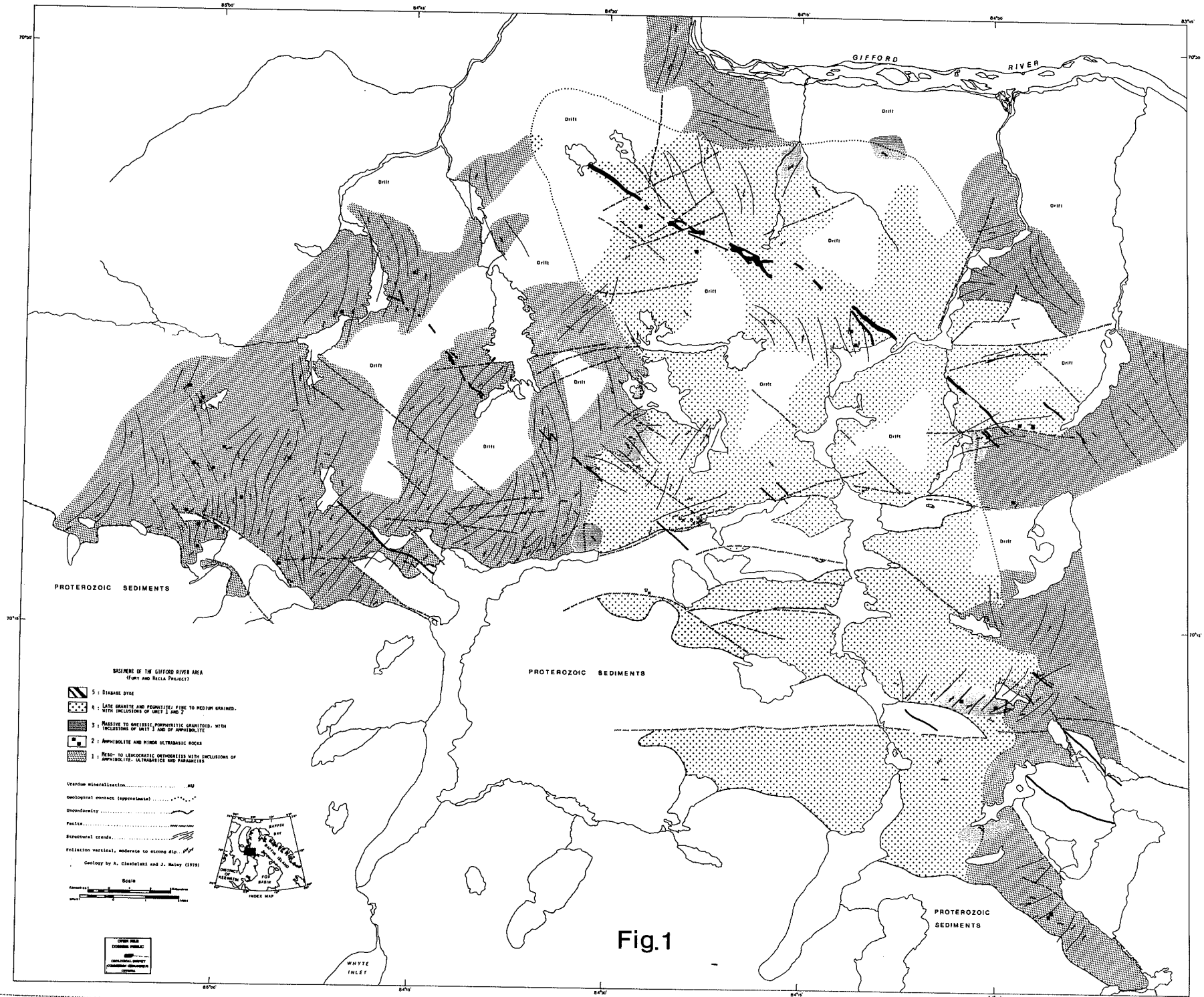
GIFFORD RIVER
Drift
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
WHYTE INLET
BASEMENT OF THE GIFFORD RIVER AREA
(FURY AND HECLA PROJECT)
5 : DIABASE DYKE
4 : LATE GRANITE AND PEGMATITE, FINE TO MEDIUM GRAINED, WITH INCLUSIONS OF UNIT 3 AND 2
3 : MASSIVE TO GNEISSIC PORPHYRITIC GRANITOID, WITH INCLUSIONS OF UNIT 2 AND OF AMPHIBOLITE
2 : AMPHIBOLITE AND MINOR ULTRABASIC ROCKS
1 : MESO- TO LEUCOCRATIC ORTHOGNEISS WITH INCLUSIONS OF AMPHIBOLITE, ULTRABASICS AND PARAGNEISS
Uranium mineralisation
Geological contact (approximate)
Unconformity
Faults
Structural trends
Foliation vertical, moderate to strong dip
Geology by A. Ciesielski and J. Maley (1979)
Scale
INDEX MAP
OPEN FILE
DOSSIER PUBLIC
GEOLOGICAL SURVEY
COMMISSION GÉOLOGIQUE
OTTAWA

Fig.1

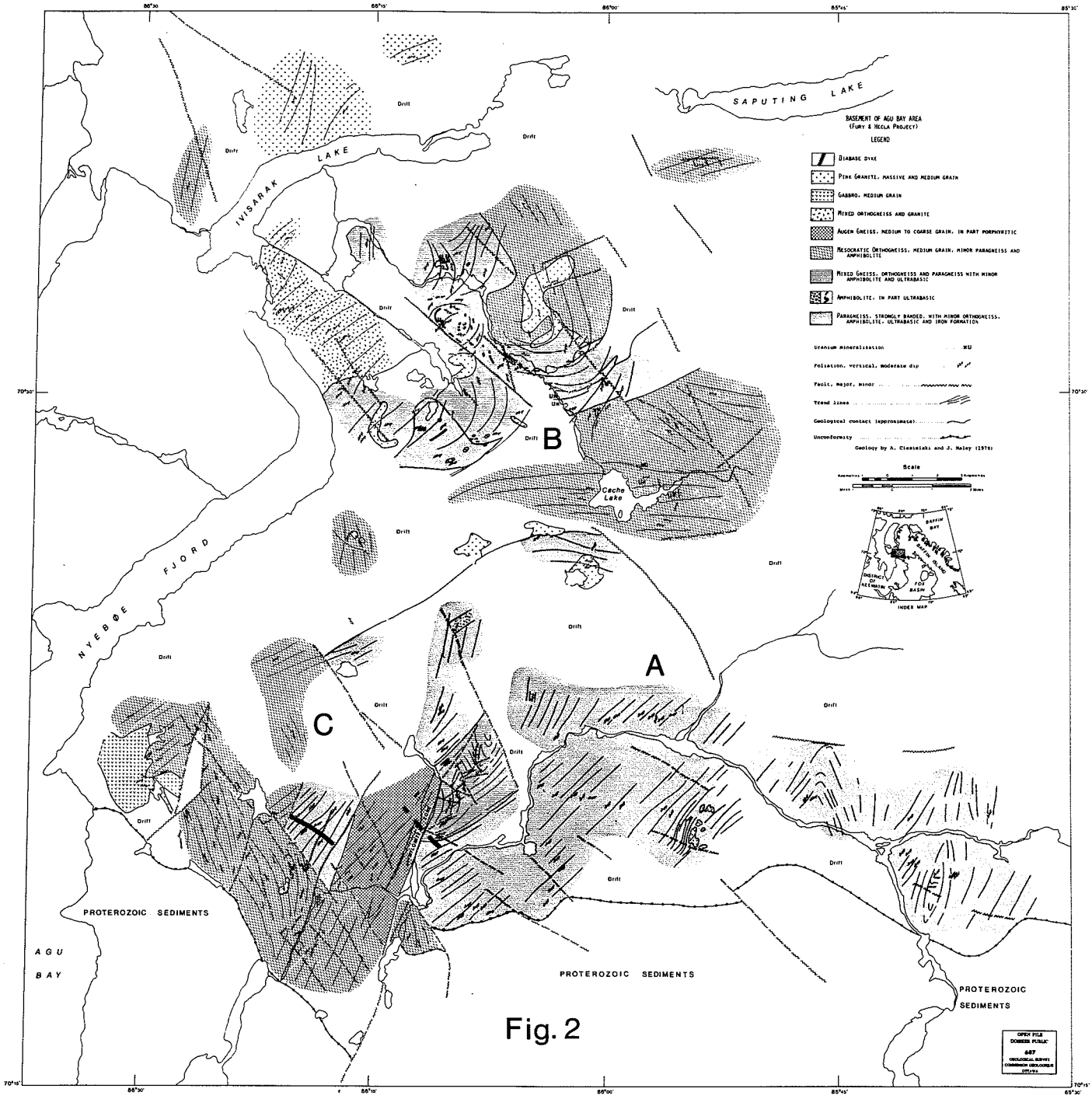
SAPUTING LAKE
IVISARAK LAKE
NYEBØE FJORD
AGU BAY
Cache Lake
A
B
C
Drift
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
PROTEROZOIC SEDIMENTS
BASEMENT OF AGU BAY AREA
(FURY & HECLA PROJECT)
LEGEND
Diabase dyke
Pink Granite, massive and medium grain
Gabbro, medium grain
Mixed orthogneiss and granite
Augen Gneiss, medium to coarse grain, in part porphyritic
Mesocratic Orthogneiss, medium grain, minor paragneiss and amphibolite
Mixed Gneiss, orthogneiss and paragneiss with minor amphibolite and ultrabasic
Amphibolite, in part ultrabasic
Paragneiss, strongly banded, with minor orthogneiss, amphibolite, ultrabasic and iron formation
Uranium mineralization
Foliation, vertical, moderate dip
Fault, major, minor
Trend lines
Geological contact (approximate)
Unconformity
Geology by A. Ciesielski and J. Haley (1978)
Scale
INDEX MAP
BAFFIN BAY
SOUTHAMPTON ISLAND
FOX BASIN
OPEN FILE
DOSSIER PUBLIC
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Fig. 2