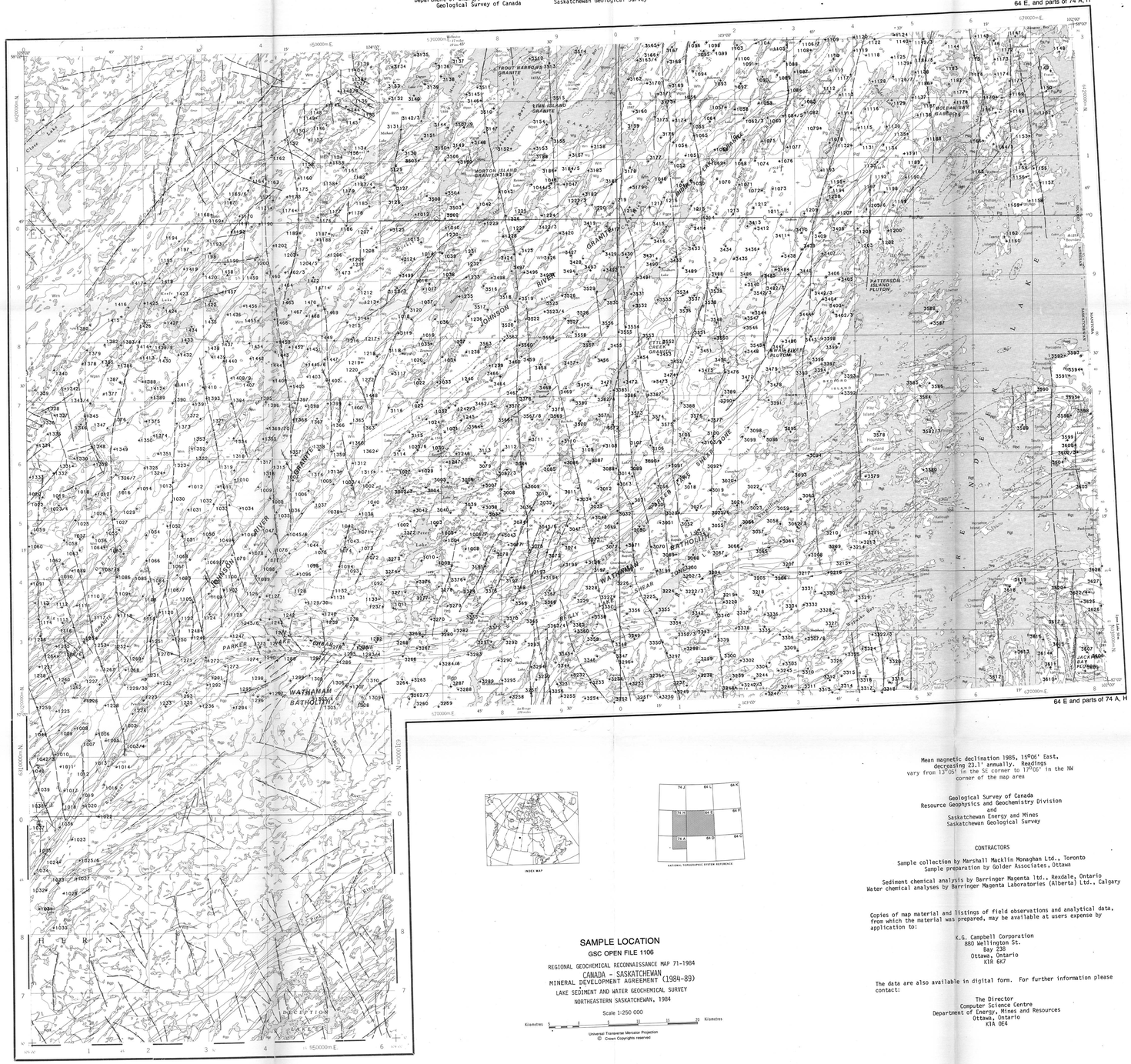
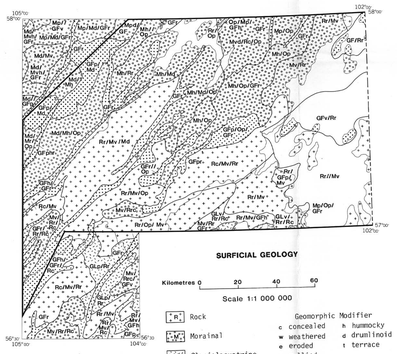
Canada
Department of Energy, Mines and Resources
Geological Survey of Canada

Province of Saskatchewan
Saskatchewan Energy and Mines
Saskatchewan Geological Survey

64 E, and parts of 74 A, H





SURFICIAL GEOLOGY

Kilometres 0 20 40 60

Scale 1:1 000 000

Rk	Rock
Mv	Morainal
GL	Glaciolacustrine
GF	Glaciofluvial
O	Organic

Geomorphic Modifier

c	concealed	h	hummocky
w	weathered	d	drumlinoid
e	eroded	t	terrace
g	gullied		
k	collapsed		
p	plain		
v	veneer		
r	ridged		

Complexes: where two or more classes of terrain are interspersed in a mosaic or repeating pattern the proportion of each component in the combination is given in a three-position designation set off by slashes denoting arbitrary percentage limits. For example, "Mv/D/R" means that at least 60% of the area is underlain by thin till, with up to 40% boggy areas, and less than 15% scattered rock outcrops. "Rc/R" indicates more than 60% bedrock concealed by vegetation and less than 15% outcrop.

INDEX MAP

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE

SAMPLE LOCATION

GSC OPEN FILE 1106

REGIONAL GEOCHEMICAL RECONNAISSANCE MAP 71-1984

CANADA - SASKATCHEWAN
MINERAL DEVELOPMENT AGREEMENT (1984-89)

LAKE SEDIMENT AND WATER GEOCHEMICAL SURVEY

NORTHEASTERN SASKATCHEWAN, 1984

Scale 1:250 000

Kilometres 5 0 5 10 15 20 Kilometres

Universal Transverse Mercator Projection

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Mean magnetic declination 1985, 15°06' East, decreasing 23.1' annually. Readings vary from 13°05' in the SE corner to 17°06' in the NW corner of the map area

Geological Survey of Canada
Resource Geophysics and Geochemistry Division
and
Saskatchewan Energy and Mines
Saskatchewan Geological Survey

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Sample collection by Marshall Macklin Monaghan Ltd., Toronto
Sample preparation by Golder Associates, Ottawa

Sediment chemical analysis by Barringer Magenta Ltd., Rexdale, Ontario
Water chemical analyses by Barringer Magenta Laboratories (Alberta) Ltd., Calgary

Copies of map material and listings of field observations and analytical data, from which the material was prepared, may be available at users expense by application to:

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The data are also available in digital form. For further information please contact:

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LEGEND

Note: This legend is common for Regional Geochemical Reconnaissance Map 71-1984, Open File 1106

NEOHELIKIAN/HADRYNIAN

dd — **Diabase-gabbro**: fine to coarse grained, massive to weakly foliated ± olivine ± biotite ± hypersthene

PALEOHELIKIAN

ATHABASCA GROUP

kmf — **Manitou Falls Formation**: sandstone and conglomerate
Mfc: fluvial sandstone member, locally pebbly
Mfb: conglomerate member

LATE APHEBIAN (HUDSONIAN?)

x — **Cataclasite**: mylonite and sheared rocks at the Needle Falls Shear Zone; derived from rocks of the Wollaston and Peter Lake Domains

WOLLASTON DOMAIN

LATE APHEBIAN (HUDSONIAN?)

Wpeg* — **Granitic pegmatite**: variable grain size, generally massive; ± biotite ± muscovite ± garnet; contacts with migmatitic supracrustal gneisses commonly gradational

Wg — **Granite and aplite**: fine to coarse grained, massive to weakly foliated; ± biotite ± hornblende ± magnetite ± microcline megacrysts; contacts with migmatitic supracrustal gneisses commonly gradational

Wgrdb — **Biotite granodiorite-tonalite**: medium to coarse grained, massive to foliated; grey to buff; local xenoliths and rafts of amphibolite, mica schist and psammitic gneiss

EARLY TO MIDDLE APHEBIAN

Wollaston Group

Wsh — **Quartz-muscovite schist**: pelitic to psammopelitic, fine to medium grained, ± biotite; locally intensely sheared

Wcn — **Calc-silicate gneiss, marble and amphibolite**: medium grained to paleomelic, variable composition and texture, ± diopside ± albite ± hornblende ± biotite ± actinolite/tremolite ± calcite ± scapolite ± grossularite; occurring as conformable bands and lenses in supracrustal sequence

Wms — **Meta-arkosic gneiss**: fine to medium grained, massive to foliated to gneissic, locally plagioclase porphyroblastic; granodiorite to trondhjemite (potassic feldspar ± quartz ± plagioclase ± biotite ± muscovite ± garnet ± hornblende metaarkosite, pelite and calc-silicate rock; commonly anatectic with more than 50 percent leucogranitic neosome

Wmg: impure metaquartzite

Wpsm — **Pelitic to psammopelitic gneiss**: fine to medium grained, foliated to gneissic, locally intensely sheared; quartz ± graphite ± biotite ± muscovite ± cordierite ± garnet ± sillimanite; interlayered metaquartzite, meta-arkosic, calc-silicate rock and marble with psammitic types locally abundant; commonly anatectic with more than 50 percent leucogranitic neosome

Wgr: graphite-bearing pelitic gneiss

Ws — **Mixed metasediment**: variable and both along and across strike, generally fine grained and foliated, interlayered laminated slate, meta-argillite, metaquartzite, metachert, meta-arkose, calc-silicate rock, marble and rare banded iron formation

Wq — **Metaquartzite**: fine grained, massive to foliated, locally layered; ± muscovite ± biotite ± garnet ± feldspar ± hornblende ± sulphide; local conglomerate and interbedded graphitic meta-argillite ± andalusite ± garnet ± sulphide

PROBABLY EARLY APHEBIAN (LATE ARCHEAN?)

Wr — **Meta-arkose**: fine to medium grained, massive to foliated, locally layered and cross stratified; ± muscovite ± chlorite ± biotite; lithic fragments; local conglomerate with granite, granite gneiss, metavolcanic and metasedimentary clasts; local interbedded pelitic schist ± andalusite ± staurolite ± garnet

Wv — **Amphibolite**: fine grained, massive to poorly foliated, locally pillowed; local intercalated pelitic gneiss

COURTENAY-CAVINS LAKE BELT

UNCONFORMITY

ARCHEAN, DEFORMED AND METAMORPHOSED WITH APHEBIAN SUPRACRUSTAL ROCKS DURING THE HUDSONIAN OROGENY

Wfrs — **Felsic granitoid gneiss**: fine to coarse grained, foliated to gneissic, generally homogeneous rocks of syntectonic to anatectic origin; quartz ± biotite ± muscovite ± amphibole ± cordierite, with rare hypersthene (of granulite facies metamorphic origin); local inclusions of amphibolite and/or pelitic schist; locally partially anatectic with leucogranite neosome

Wfb: biotite-hornblende bearing

ROTTENSTONE DOMAIN

APHEBIAN (HUDSONIAN) WITH POSSIBLE ARCHEAN ELEMENTS

Rgp — **Megacrystic granitoid**: medium to coarse grained, massive to foliated, with local spectacular flow banding; microcline megacrysts (up to 10 cm) in granodiorite, quartz monzonite, monzogranite and granodiorite; local pelite, amphibolite and/or metabasite xenoliths; locally abundant pegmatite, aplite and non-megacrystic granitoid toward margins

Rgps: sheared variants, with strongly foliated groundmass and flattened microcline megacrysts, locally ocellomylonitic

Rgm — **Monzogranite-granodiorite**: containing abundant xenoliths and rafts of amphibolite and amphibole gneiss derived from unit Pb

Rbd — **Quartz monzodiorite, diorite and gabbro**: fine to coarse grained, massive to foliated; ± hornblende ± plagioclase ± potassium feldspar ± quartz ± biotite; local porphyritic inclusions; contact zones commonly injected with granitic material

WATHAMAN BATHOLITH (c.1890 Ma)

Rpeg — **Granitic pegmatite**: massive to foliated, ± biotite ± muscovite ± hornblende ± garnet

Rgt — **Tonalite, granodiorite and trondhjemite**: compositionally variable, generally potassium feldspar-poor; fine to coarse grained, massive to weakly foliated; quartz ± biotite ± muscovite ± garnet ± hornblende; local amphibolite and/or pelite inclusions

Rgtz: metamorphosed leucotonalite, pink, massive, porphyroblastic with abundant garnetiferous feldspar and quartz ± aureole of Wathaman Batholith

Rmg — **Amphibolite and derived migmatite**: paleosome fine to medium grained, foliated, locally layered; ± hornblende ± feldspar ± biotite ± muscovite ± garnet ± quartz; local pelitic to psammitic gneiss and calc-silicate gneiss; neosome tonalitic, granodioritic or trondhjemitic (50 to 90 percent of unit), medium to coarse grained, massive to weakly foliated; quartz ± biotite ± muscovite ± garnet ± hornblende

Rmg — **Pelitic to psammitic gneiss and derived migmatite**: paleosome fine to medium grained, well foliated to gneissic, locally layered; ± biotite ± quartz ± feldspar ± muscovite ± garnet ± sillimanite ± graphite; neosome tonalitic, granodioritic or trondhjemitic (50 to 90 percent of unit), medium to coarse grained to pegmatitic, massive to weakly foliated; ± biotite ± muscovite ± garnet ± hornblende

ROTTENSTONE MIGMATITE COMPLEX

PETER LAKE DOMAIN

APHEBIAN AND ARCHEAN ROCKS, STRONGLY REWORKED PROBABLY LATE IN THE HUDSONIAN

Px — **Mylonite**: fine grained to aphanitic, cataclasite to finely laminated, interlayered mafic and felsic gneiss

Pgn — **Felsic gneiss**: medium grained, strongly foliated to gneissic; locally subsynkinematic granitoid rock ± biotite ± hornblende ± flattened micropertite megacrysts

Pn — **Hornblende-biotite gneiss**: hornblende to gabbroic composition, medium to coarse grained, with minor metagabbro and amphibolite

Pbn — **Mafic gneiss**: fine to medium grained, foliated to gneissic, locally subsynkinematic; ± hornblende ± plagioclase ± biotite ± quartz ± potassium feldspar; local pods of weakly foliated to massive mafic rock

Pbng: area cut by numerous granitic dykes and sills likely derived from the Wathaman Batholith

PARKER LAKE GNEISSES

HUDSONIAN WITH POSSIBLE ARCHEAN ELEMENTS

Pg — **Felsic granitoid**: generally medium to coarse grained, locally megacrystic, multiply intrusive, granodiorite to syenite to alaskite and aplite; local relict igneous textures, generally very weakly foliated except in discrete shear zones; ± biotite ± amphibole; local amphibolite and/or pelite inclusions

Pgl: late granodioritic to alaskitic and aplitic intrusive sheets

Pgp — **Megacrystic granitoid** (ancistrophyloitic in places from unit Rgp)

Pgpx: sheared variants

PETER LAKE COMPLEX

PROBABLY MAINLY ARCHEAN

Pbg — **Mafic plutonic rocks**: fine to coarse grained, massive to weakly foliated; metagabbro to metadiorite to metadiorite; local relict ophitic to subophitic texture; ± hornblende ± plagioclase ± biotite ± quartz ± diopside ± actinolite/tremolite, with local metasedimentary xenoliths;

includes amphibolite rocks of possible metavolcanic origin

Pba: layered metagabbro, minor anorthosite, ultramafic rock and granodiorite

Pbp: megaphyric diorite, massive with potassium feldspar megacrysts

Pnf — **Quartzofeldspathic gneiss**: fine to medium grained, equigranular granoblastic, locally porphyroblastic, locally compositionally banded; granitic to granodioritic ± biotite ± hornblende; local biotite-hornblende gneiss lenses

'Campbell River Group'

Pel — **Slate, phyllite and biotite schist**: very fine to fine grained, well foliated, locally layered; ± biotite ± muscovite ± pyrite/pyrrhotite ± carbonaceous material; local hornblende-biotite schist, psammite, amphibolite and metagabbro

LA RONGE DOMAIN

PROBABLY HUDSONIAN a.k.a.? (c.1740 Ma)

Lgd — **Granodiorite and quartz monzonite**: medium grained, well foliated to gneissic, biotite ± hornblende; abundant xenoliths of paragneiss and Left Lgm

Lgm — **Quartz monzodiorite**: fine to coarse grained, foliated to gneissic; ± hornblende ± biotite; abundant xenoliths of paragneiss and amphibolite; exsolvens of granodiorite to quartz monzodiorite material in migmatitic contact zone

SYMBOLS

Single bedrock exposure; approximate area of abundant bedrock exposure

Geological contact: defined to approximate; inferred

Structural basement; possible to probable fault, as interpreted from postnatal, geophysical and/or airphoto evidence

Major fold axial trace: anticlinorium; synforme

Trend and approximate dip of dominant foliation surface: dip shallow (0-20°), moderate (30-50°), steep (60-84°), subvertical (85-90°)

Mineral prospect:
1. George Lake: Zn,Pb (Karup-Möller and Brummer, 1970; Coombe, 1977)

Sample location (geochronology):
1. 1523±35 Ma: K-Ar muscovite (Wanless et al., 1970)
2. 1700±30 Ma: Rb-Sr whole rock isochron (Bell and Macdonald, 1980); map location is approximate centre of collecting area

* No analytical result

* A mnemonic name recorded as rock types as part of field observations

This legend was modified and the geology derived for these geochemical maps from Compilation Bedrock Geology Series 228A, 229A and 232A, Saskatchewan Energy and Mines, Saskatchewan Geological Survey

This map forms one of a series of maps released by the Geological Survey of Canada, Open File 1106. The Open File consists of maps of various geochemical variables: 16 for lake sediment, 3 for lake water and 1 sample site location

SAMPLE LOCATION
GSC OPEN FILE 1106
NORTHEASTERN SASKATCHEWAN, 1984

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