

This legend is common to Sheets 1-3

PHANEROZOIC

- Unconsolidated Quaternary deposits and talus**
- Qd: Laminophyllous dikes; dark green to brown-weathering, undeformed. Locally fine grained with compositional flow zoning, or with breccia texture defined by numerous, small, aphanitic xenoliths locally with nodular texture (chert nodules). Age unknown.
 - Cd: Diabase/microgabbro dikes; brown-weathering, undeformed with fine to coarse-grained ophiolite texture; E-W trending. K-Ar = 524 ± 78 (Wanless et al., 1970; Taylor, 1979).
- MESOPROTEROZOIC**
- Nd: Diabase/microgabbro dikes; brown-weathering, undeformed, with NW-SE trends. Dated to the south of the map area by the K-Ar method, at ca. 1150 Ma (Wanless et al., 1970; Taylor, 1979).
- PALEOPROTEROZOIC**
- HIGHLY STRAINED ROCKS**
- Pti: Fault breccia and cataclasis, local with pseudotachylite veins.
 - Pumy: Mylonite and ultramylonite; developed under amphibolite to greenschist-facies metamorphic conditions.
 - Pmyl: Amphibolite-facies ductile shear zone and/or mylonite.
- METALPHTONIC ROCKS**
- Mafic dikes**
- Pdg: Amphibolite dikes; olive green weathering, thoroughly recrystallized, hornblende-plagioclase ± garnet (rare) also with clinopyroxene. Intrudes into the Komatiuk shear zone. On southeastern Killiney Island, some 50m wide, grey-green weathering dikes with irregular shapes and internal compositional layering.
 - Pdb: Amphibolite dikes; black to grey weathering, with an equigranular hornblende-clinopyroxene-plagioclase ± garnet matrix and, locally, relict plagioclase phenocrysts. Some are syn-tectonic with the Komatiuk shear zone (crossed by U-Pb ages of 1804-1778 Ma; D. Scott, unpublished); others may be equivalents of Anysvik dikes [Pdb].
 - Pmng: Grenobolite rocks at amphibolite facies. Swirl, mylonite gneiss, derived from veins of Paleoproterozoic gabbro [Pti] sheets of Paleoproterozoic tonalite and diorite [Pti] and intrusions of Archean gneiss [Agn]; generally > 20% of Paleoproterozoic intrusive rocks.
 - Ptgg: Pink and grey granites; sugary-textured, fine- to medium-grained rocks, intruding and retrograding charnockitic rocks [Pti] on Killiney Island.
 - Ptgd: K-feldspar megacrystic granites. Texturally variable from weakly foliated and limited to protomylonitic, sample from McLean Strait dated by U-Pb on zircon as 1854 ± 2 Ma (Scott and Machado, 1993).
- Mesocratic tonalite; colour index = 30-35; composed of hornblende locally after clinopyroxene. Foliated, with relict porphyritic textures defined by augen of plagioclase feldspar. Locally contains fine-grained dioritic xenoliths. Intrusive into Archean Nain gneiss [Agn], and Paleoproterozoic charnockitic rocks [Pti]. Sample from McLean Strait dated by U-Pb on zircon as 1854 ± 2 Ma (Scott and Machado, 1993).**
- DTG suite**
- Ptg: Heavy granite; quartz monzonitic, locally to porphyritic granite and granodiorite. Grey to pink-weathering, medium- to coarse-grained, foliated to schistose rocks at amphibolite facies. Dated by U-Pb on zircon, as 1885 ± 2 Ma (Scott and Machado, 1994).
 - Ptd: Hornblende-biotite diorite. Colour index = 30-35; locally contains 20% by volume of granite veins. Dated at Eclips Channel by U-Pb on zircon, as 1891 ± 2 Ma (Scott and Machado, 1993).
 - Pign: Grey, dioritic, tonalite to granodioritic gneiss; locally retaining relict igneous texture, but generally moderately to strongly mylonitic and strongly deformed under Paleoproterozoic amphibolite-facies conditions; probably in large part equivalent to PtiGTG. Distinguished from similar adjacent Archean gneisses by the absence of Paleoproterozoic dikes; however, it is possible that the unit includes some dyke-free Archean orthogneiss.
 - PtiGTG: Polyphase intrusive suite, including mafic diorite, tonalite, granodiorite, granite and quartz monzonite; at amphibolite facies. Dominant gabbroic gneiss. Dominant (> 80%) foliated, homogeneous leucocratic to quartz diorite, with inclusions of plagioclase-phyllic diorite and gabbro and layered mafic gneiss [PtiGTG]. Sample from McLean Strait dated by U-Pb on zircon as 1910 ± 2 Ma (Scott and Machado, 1993). Cut by porphyritic gabbro sheets (1891 ± 2 Ma; Scott and Machado, 1993) and numerous phases of leucocratic veins and pegmatite granites. At and south of Killiney Lake, passes into gabbroic tonalite with numerous inclusions and relict of mafic granule gneiss [Pti].
 - PtiMx: Grenobolite rocks at granulite facies. "Tabular" gneiss; alternating black hornblende ± orthopyroxene rich layers and white plagioclase-quartz rich layers, on 5-30 cm scale. Also includes agmatite of amphibolite lenses [Pti] in tonalite [PtiGTG] host.
 - PtiG: Tonalite and tonalite gneiss; grey to buff-weathering, mesocratic to leucocratic (colour index = 5-30), at transitional granulite facies. Contains inclusions and rims of amphibolite to mafic gneiss [PtiG], and small bodies of metapelite [PtiG], some of which might be Archean. Cut by white pegmatite tonalite dikes and veins. Tonalite gneiss can contain orthopyroxene and a monzonite facies; cut by several phases of paleo-diorite/quartzite and grey tonalite; net veiling, symplectic dyking (pre-layering) and multiple cross-cutting intrusive phases are common. Gneissic tonalite at Killiney Lake dated as 1888 ± 2 Ma (Scott and Machado, 1994).
 - PtiGd: Mesocratic quartz diorite; grey to black-weathering, with colour index = 30-35. Weakly stained, foliated rock occurs at Eclips Channel by U-Pb on zircon, as 1891 ± 2 Ma (Scott and Machado, 1993). Cut by U-Pb on zircon as 1895 ± 2 Ma (Scott and Machado, 1993).
 - PtiGm: Tonalite to granodiorite; leucocratic, medium- to coarse-grained, characterized by wavy, indistinct layering, or containing numerous inclusions of ultra-banded gneissic tonalite and mafic gneiss [PtiGm]. Locally contains inclusions of ultramylonite [PtiMx], mafic [PtiG] and anorthositic [PtiMx] rocks, and locally some tonalite orthogneiss of suspected Archean age [Agn]. Two samples of tonalite, dated by U-Pb on zircon as 1895 ± 3 Ma and 1888 ± 2 Ma (Scott and Machado, 1993, 1994). An anorthositic within the Abbotok shear zone is 1893 ± 2 Ma (Scott and Machado, 1994).
 - PtiGd: Mafic diorite, medium grained, granoblastic rocks, as marginal phase to charnockitic rocks [PtiG] and as small sheets within Paleoproterozoic paragneiss [PtiG, PtiG].
- SUPRACRUSTAL GNEISSES**
- Pstgr: White granite with red to lilac-coloured garnets; medium- to coarse-grained, with grey garnetiferous schists of paragneiss relicts. Derived through granulite-facies anatexis of paragneiss [PtiG] and PtiGd.
 - Pstgr: Quartzite; grey, graphic, locally with fine grained garnet.
 - Pstgr: Paragneiss and metasedimentary migmatite. Dominantly grey to buff-weathering, migmatitic paragneiss, characterized by red garnets, biotite, and abundant leucocratic, but in which allanite is rare. At Killiney Lake, grey, finely-layered (cm-dm) quartzite-paragneiss gneiss contains white to pink granitic leucocratic veins and dikes, and are locally interlayered with rusty biotite-sensitized and mafic metasedimentary rocks interpreted as turbidites and/or volcanoclastic metasediments. At Killiney Lake, rusty-weathering gneissic paragneissic-pelitic gneiss is interlayered with green-weathering psammite/quartzite, rare garnetiferous amphibolite, and hornblende-biotite-quartzite layers. Interpreted as mafic granulite facies. White garnet-rich (> biotite) paragneiss and granitic sheets constitute > 50% by volume of outcrops.
 - Pstgr: Rusty brown- and red-weathering paragneiss; graphic, with biotite ± garnet.
 - Pstgr: Calc-silicate and impure marble; consists of 1-5m wide layers of impure dolomite-calcite marble, and light green, massive calc-silicate units (dolomite). 1-10m thick, locally with numerous layer-parallel and layer-disconformable white quartz veins.
 - Pstgr: Tasiuyak gneiss; rusty brown and white weathering paragneiss and diatexite, characterized by lilac-coloured garnets and allanite. Homogeneous at large scale, but well-layered on a 10cm-dm scale, varying from garnet quartzite to semi-pelitic gneiss-biotite-quartz gneiss, to pelitic allanite-biotite-quartz gneiss. Interpreted as mafic granulite facies. Interlayered with white garnet granite [PtiGd].
 - Pstgr: Mafic gneiss and amphibolite, characterized by units with centimetre-scale compositional layering, but also includes plagioclase-phyllic and more homogeneous amphibolite. Probably derived from mafic metavolcanic rocks.
- ANORTHOTIC TO ULTRAMAFIC ROCKS**
- Panm: Layered anorthosite to leucogabbro.
 - Pab: Amphibolite; homogeneous, equigranular textured rocks at amphibolite to granulite facies. Layering generally not present, locally sheeted and relict with white leucogabbro and pegmatite (south Sheet 3). Derived from gabbro and/or metavolcanic rocks.
 - Panm: Pyroxenite; massive to foliated, with homogeneous to layered textures, composed of clinopyroxene-hornblende ± orthopyroxene.
- LAKE HARBOUR GROUP**
- PtiGp: Biotite paragneiss; varying from psammite quartzite/diatexite gneiss, to semi-pelitic gneiss-biotite-quartzite gneiss. Leucocratic material is rare or absent, in contrast to paragneiss in the Tasiuyak gneiss complex [PtiG, PtiG].
 - PtiGr: Rusty-brown weathering metapelite gneiss.
 - PtiGr: Hornblende-biotite-feldspar-quartz ± rare garnet gneiss (diolite to mesocratic amphibolite); homogeneous to layered mesocratic gneiss, with < 10% leucocratic veins. Interpreted to be derived from volcanoclastic metasedimentary rocks.
 - PtiGr: Quartzite, quartz anorthite and semi-pelitic gneiss; locally with thin units (50cm-5m) of coarse garnet-allanite metapelite.
 - PtiGr: Marble; pure, white-weathering, coarse grained calcite.
- MAFIC DYKES**
- Pdb: Anysvik diorite dikes. Characteristic black feldspar phenocrysts are common throughout the Four Peaks domain, where dikes vary from fresh diabase in the southeastern part of the map area, to dikes with a partly recrystallized matrix of hornblende ± biotite cut by garnet-clinopyroxene-quartz veins, to brown-weathering gneissic (garnet-clinopyroxene-hornblende-plagioclase ± quartz ± orthopyroxene) immediately east of the Komatiuk shear zone. Within and to the west of the Komatiuk shear zone, strongly foliated and deformed dikes contain hornblende-plagioclase ± garnet ± epidote assemblages, in which relict feldspar phenocrysts are white. Many dikes on Sheet 3 were interpreted from photomicrographs and consequently may represent more than one age.
- ARCHEAN OR PALEOPROTEROZOIC**
- PtiGp: Clinite and orthopyroxene gabbro to leucogabbro, with igneous layering and compositional variation to anorthositic, hornblende gabbro, and alkali syenite; undeformed to weakly strained. Cut by Anysvik dikes [PtiG].
 - PtiGr: Mafic gneiss; massive to migmatitic, locally well layered. Associated with PtiG on Killiney Island, at transitional Paleoproterozoic granulite to amphibolite facies.
- HUTTON META-ANORTHOTIC SUITE**
- Panm: Anorthositic, gabbroic anorthosite and leucogabbro; white-weathering, commonly with relict igneous textures and compositional layering, and locally with preserved igneous plagioclase (blue labradorite) and coarse-grained orthopyroxene. Gabbroic anorthosite is dominant, but unit is compositionally heterogeneous.
 - Panm: Granoblastic, recrystallized anorthositic gneiss, derived from Panm. Characterized by disrupted mafic layers, and a cm-dm scale gneissic layering; contains locally abundant amounts of leucocratic-anorthositic veins in hornblende-plagioclase ± garnet ± orthopyroxene rocks.
 - Panm: Layered metagabbro, to rare ultramafic rocks.
- ARCHEAN ROCKS**
- NAIN PROVINCE**
- PtiGr: Pegmatite granitic sheets; white, non-foliated, generally shallowly dipping.
 - PtiGr: Medium grained, granoblastic granite and granite gneiss of the Duck Islands granulite suite. Locally with pink and grey migmatitic layering. "Pti" Pb ages on monazite of 2768, 2870, and 2869 Ma (Scott and Machado, 1994). Cut by mafic dikes [PtiG].

LEGEND

- Agd**: Granodiorite - tonalite plutons; buff-weathering, foliated, at granulite facies (< 5-10% orthopyroxene + biotite ± garnet). Varied from medium grained, equigranular textures to coarse grained, megacrystic rocks; locally containing inclusions of earlier gneiss [Agn]. Contacts with surrounding gneisses are diffuse and obscured by metamorphism. Cut by plagioclase-phyllic, metamorphosed dioritic dikes [Pdb] and altered to a grey, foliated orthogneiss where deformed and retrogressed to Paleoproterozoic amphibolite facies. Age unknown, but probably Late Archean.
- Agi**: Buff-weathering granulite-facies gneiss that generally retain Archean orthopyroxene + clinopyroxene + hornblende assemblages and which are largely unaffected by subsequent Paleoproterozoic overprints or retrogression. South of Eclips Channel in the Four Peaks domain, gneisses were largely overprinted by a static Paleoproterozoic (1.83-1.79 Ga) garnet-clinopyroxene high-pressure granulite-facies assemblage.
- Agn**: Buff-weathering granulite-facies gneiss, which locally retain relict Archean orthopyroxene-hornblende-clinopyroxene assemblages partially retrogressed to grey amphibolite-facies equivalents during 1.78-1.71 Ga Paleoproterozoic metamorphism. South of Eclips Channel in the Four Peaks domain, gneisses were largely overprinted by a static Paleoproterozoic (1.83-1.79 Ga) garnet-clinopyroxene high-pressure granulite-facies assemblage, that developed prior to the later Paleoproterozoic amphibolite-facies retrogression.
- Argn**: Grey-weathering gneisses, retrogressed to Paleoproterozoic amphibolite-facies assemblages.
- Supracrustal gneisses and associated rocks**
- Ams**: Supracrustal gneisses; white to rusty-weathering, well layered and generally strongly migmatitic. Composed predominantly of rusty, garnetiferous quartzite, rusty allanite-bearing pelitic gneiss, garnet leucogabbro, and minor mafic/calc-silicate and garnet-clinopyroxene-magnetite iron formation; all interlayered with mafic granulite and postolum ultramylonite similar to, and locally having gradational contacts with, Ant.
- ABn**: Anorthositic, layered anorthositic gabbro and metagabbro; purple to white-weathering, with recrystallized granoblastic textures, locally gabbroic (> 40%). Occurs as sheets and disrupted bands of isotropic inclusions within orthogneiss [Agi, Agn, Argn, APtiG]. Igneous layering and "fossil" rock textures are locally preserved.
- Amf**: Mafic gneiss; variably migmatitic, including layered (supracrustal) mafic granulite, layered metagabbro + mafic granulite, and thin ultramylonite (deeply meta-igneous) layers. Dominated by clinopyroxene-garnet-hornblende assemblages but locally with relict orthopyroxene. Unit probably derived from a mixture of metavolcanic and intrusive rocks.
- Amf**: Ultramafic rocks; tan coloured metadiorite or dark brown pyroxenite, often spatially associated with metasedimentary gneisses. Locally altered to actinolite-epidote-bearing rocks with rusty textures.
- ARCHEAN**
- APtiG**: Tonalite-granodiorite orthogneiss and migmatite, with highly variable composition and texture. Generally contains abundant interlayers of massive and banded amphibolite/mafic granulite, ultramylonite and minor amounts of pelitic gneiss and anorthositic rocks in the Tasiuyak gneiss complex, the unit is preserved at Paleoproterozoic granulite facies and varied by Paleoproterozoic charnockitic rocks [PtiG] or grades into PtiG. In the Woodstock complex, this unit is preserved at transitional Paleoproterozoic granulite to amphibolite facies.
- RAE PROVINCE**
- ARin**: White to grey tonalite gneiss and migmatite, contain inclusions and layers of amphibolite, layered mafic gneiss, anorthositic rocks, and rare metasedimentary rocks interlayered with Lake Harbour Group. Distinguished from Archean Nain gneiss [Agn, Agn] by presence of abundant garnet veins and a lesser amount of leucocratic and ultramylonite inclusions. Cut by rare amphibolite dikes, charnockitic rocks of suspected Paleoproterozoic age [PtiG], and by Paleoproterozoic granite sheets.
- Limit of unconsolidated sedimentary cover and talus
- Lithological contact: known and inferred, extrapolated
- Trace of structural layering from photograph interpretation
- Trace of lineament from photograph interpretation
- Dr-4 fault; known and inferred, extrapolated
- Lithotectonic assemblage boundary; defined, extrapolated
- Dr-3 high strain zone boundary; arrow denotes sense of shear where known
- Dr-3 high strain zone boundary, with reverse sense of shear; teeth on the hanging wall
- Boundaries of Dr-2 high strain zones
- Trace of Fr-2 fold; synform, antiform, overturned antiform
- Trace of Fr-1 fold; synform, antiform, overturned antiform
- Western limit of detailed mapping; west of this line are compiled from Taylor (1977a, 1977b)
- Isograds separating zones in the Four Peaks domain (Sheet 2) are related to the progressive development of the Paleoproterozoic static overprint reaction:
- orthopyroxene + plagioclase + garnet + clinopyroxene + quartz that affects both Archean gneiss [Agi] and Paleoproterozoic Anysvik dikes [Pdb] and which increases in intensity to the west
- gpx - zone: largely retaining Archean orthopyroxene-clinopyroxene-hornblende assemblages in both mafic and mafic gneiss. Anysvik dikes retain igneous texture with minor garnet growth in veins and enclaves, and with greenish-grey foliation overprint on igneous mineralogy.
- gpx-ga - zone: characterized by development of clinopyroxene and garnet at expense of orthopyroxene in both mafic and mafic gneiss, but retaining relict Archean orthopyroxene. Anysvik dikes are variably overprinted by vein network and biotite overgrowth of garnet + clinopyroxene.
- gpx-ga - zone: in which orthopyroxene bearing assemblages have been almost totally replaced by clinopyroxene-garnet assemblages. All Anysvik dikes are overprinted by vein network and biotite overgrowth of garnet + clinopyroxene.
- Pyrite occurrences, generally marked by gossan zone
- Abbreviations: BI = biotite, HB = hornblende, PL = plagioclase, QZ = quartz, SI = sillimanite, XL = intersection lineation
- Strike and dip of inclined Anysvik dikes [Pdb] too small to show on map
- Strike and dip of inclined Anysvik dikes [Pdb] too small to show on map
- STRUCTURAL FABRIC ELEMENTS**
- Paleoproterozoic**
- Dr-4: ultramylonite and faults**
- Strike and dip of inclined ultramylonite zone or fault; no movement sense, reverse, normal
- Strike and dip of vertical ultramylonite zone; no movement sense
- Trend and plunge of lineation; mineral elongation, schistosity
- Dr-3: amphibolite facies**
- Strike and dip of inclined foliation or schistosity; no movement sense, sinistral, dextral
- Strike and dip of vertical foliation or schistosity; no movement sense, sinistral, dextral
- Strike and dip of fold axial plane; inclined, vertical
- Trend and plunge of fold axis; asymmetrical, s-symmetrical, z-symmetrical
- Trend and plunge of lineation; mineral elongation, schistosity
- Dr-2: granulite facies**
- Strike and dip of inclined foliation; no movement sense, sinistral
- Strike and dip of vertical foliation; no movement sense, sinistral
- Strike and dip of fold axial plane; inclined, vertical
- Trend and plunge of fold axis; asymmetrical, s-symmetrical, z-symmetrical
- Trend and plunge of lineation; mineral elongation, schistosity
- Dr-1**
- Strike and dip of foliation; inclined, vertical
- Horizontal transposed bedding (S₁, S₂, S₃) in Tasiuyak gneiss
- Strike and dip of inclined fold axial plane
- Trend and plunge of symmetrical fold axis
- Archean**
- Dn**
- Strike and dip of gneissosity; inclined, vertical
- Trend and plunge of symmetrical fold axis
- Trend and plunge of lineation; mineral elongation, schistosity

SHEET 2

Geology by R.J. Wodde, J. D. Bridgwater, F.C. Mergel, L.M. Campbell, M.J. Van Kesteren, L. Reid, A. Hume, and R. Church, 1991-1993

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Digital map compilation by R.J. Wodde and L.V.J. Crosby-Whitely, Newfoundland Geological Survey, 1994

Digital cartography by E. Everett, Geological Survey of Canada

Electrostatic plot produced by the Geological Survey of Canada

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

Digital base map assembled and modified by the Geological Survey of Canada from digital bases compiled by the Survey, Mapping and Remote Sensing Branch

Copies of the topographical edition of this map may be obtained from the Canada Map Office, Natural Resources Canada, Ottawa, Ontario, K1A 0G9

Mean magnetic declination 1985, 33° 02' W, decreasing 12.8' annually. Readings vary from 30° 30' W in the SW corner to 33° 25' W in the NE corner of the map

Elevations in feet above mean sea level

COOPERATION
AGREEMENT
MINERAL DEVELOPMENT

ENTENTE DE COOPERATION
L'EXPLOITATION MINÉRIALE

Contribution to Canada-Newfoundland Cooperation Agreement on Mineral Development (1990-1994), a subsidiary agreement under the Economic and Regional Development Act (1990-1994), entered into force on 1990-1994.

Contribution à l'Entente de coopération Canada-Terre-Neuve sur l'exploitation minière (1990-1994), entrée en vigueur le 1990-1994.

Canada

Newfoundland
Terre-Neuve

OPEN FILE 2927
SHEET 2
GEOLOGY

LABRADOR PENINSULA AND OFFSHORE ISLANDS NORTH OF 59°15'N NEWFOUNDLAND (LABRADOR) - QUÉBEC - NORTHWEST TERRITORIES

Scale 1:100 000 - Échelle 1/100 000

Kilometres 2 4 6 8 Kilomètres

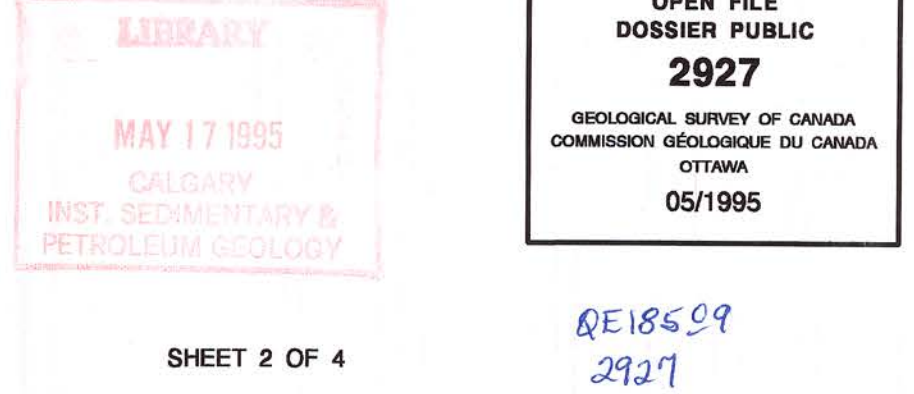
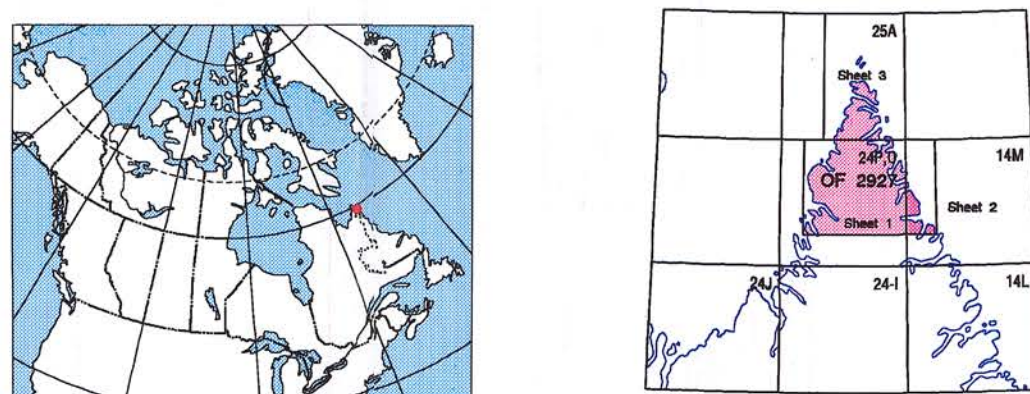
Transverse Mercator Projection
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SHEET 2 OF 4

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