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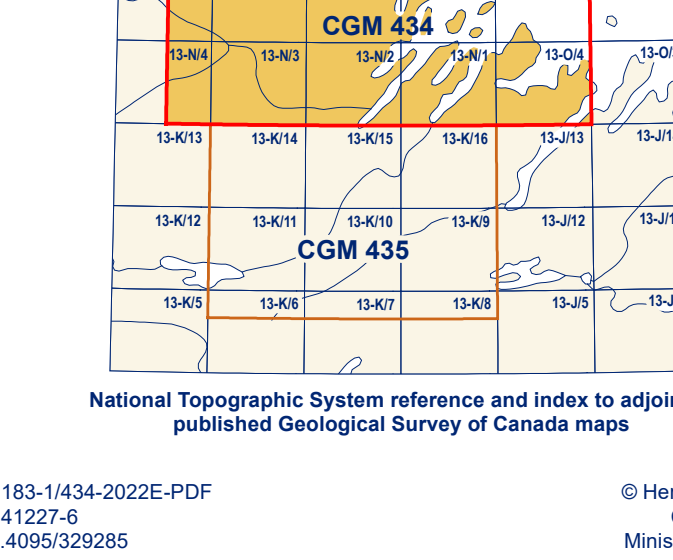
Abstract

This new bedrock geology map product represents the conversion of Map 1668A (Ermanovics, 1992) and its legend to digital format. All geoscience knowledge and information from Map 1668A have been converted to conform with the science language and symbology of the Geological Survey of Canada's Bedrock Data Model (Brouillette et al., 2019). The conversion of paper-only maps published previously is intended to facilitate the efficient compilation, interpretation, management, and dissemination of digital geological-mapping information in a structured and consistent manner.

Résumé

Ce nouveau produit cartographique de la géologie du substratum rocheux correspond à la conversion de la Carte 1668A (Ermanovics, 1992) et de sa légende. Toutes les connaissances et l'information de nature géoscientifique de la Carte 1668A ont été converties en conformité avec le langage scientifique et la symbologie du Modèle de données pour le substratum rocheux de la Commission géologique du Canada (Brouillette et al., 2019). La conversion de cartes publiées antérieurement en format papier uniquement a pour objectif de faciliter la compilation, l'interprétation, la gestion et la diffusion efficaces de l'information géologique cartographique en mode numérique de façon structurée et cohérente.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

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CANADIAN GEOSCIENCE MAP 434
BEDROCK GEOLOGY
CENTRAL HOPEDALE BLOCK
Newfoundland and Labrador
NTS 13-N/1, 2, 3, parts of 13-N/4, 5, 13-N/6, 7, 8, and 13-O/4, 5
1:100 000

61°44'
40'
30'
20'
10'
61°00'
50'
60°00'
59°30'
55°30'
55°00'
Unmapped
Harp Lake
Shapeiau
L A B R A D O R   S E A
A T L A N T I C   O C E A N
H O P E D A L E   R U N
DOUBLE ISLANDS
ANNIOWAKTOOK ISLAND
Hopedale Harbour
DEEP INLET
COMMA ISLAND
KIKKERTAVAK ISLAND
CROSS ISLAND
KINGITOK ISLANDS
HARES ISLANDS
BAY OF ISLANDS
ADLATOK BAY
UJUKTOK BAY
KANAIRIKTOK BAY
KAIPOKOK BAY
Big Cove
Northwest Bight
Saltwater Pond
Island Harbour
Long Point
Drunken Harbour Point
Cape O'War
Cape Roi Head
Kh 2665
Kh 2511 ± 61
R 3226 ± 106
R 2884 ± 86
R 3024 ± 163
R 2854 ± 83
R 3028 ± 199
R 2927 ± 50
Uz 3105 +6/-9
R 3011 ± 110
Kb 2420 ± 50
R 2632 ± 285
R 3124 ± 30
R 2899 ± 116
R 2200 ± 55
R 2831 ± 178
Rb 2469 ± 56
Uz 2838
R 1206 ± 120
R 1847 ± 87
R 2762 ± 118
R 1847 ± 87
R 1843 ± 90
R 3025 ± 102
R 1635 ± 47
R 1805 ± 42
R 1633 ± 59
Uz 1805 ± 5

This legend is common to CGM 433, CGM 434, and CGM 435. Some map units may not appear on all maps.

QUATERNARY

▨	Unconsolidated deposits; gravel, stratified sand and silt; minor clay.

NAIN PROVINCE
EARLY PALEOPROTEROZOIC TO MESOPROTEROZOIC
KIKKERTAVAK DIABASE-GABBRO-DIORITE

EpPmPKH	Diabase, gabbro, and diorite dykes of several generations including Harp dykes; Rb-Sr whole-rock ages of 2200 and 1200 Ma have been established (Ermanovics, 1993).

LATE ARCHEAN (LĀ, FIORD STRUCTURAL TREND)

LĀmg	MIGMATITE; felsic, gneissic, undivided metaplutonic rocks derived from middle Archean rocks; the age of the metamorphism accompanying the formation of this unit is ca. 2760 Ma (Ermanovics, 1993); rocks may contain up to 20% microcline.
LĀmga	Mobilizate derived during amphibolite-facies metamorphism of polymetamorphic metaplutonic rocks.
LĀKmg	Mobilizate derived during intrusion of the Kanairiktok Plutonic Suite (LĀK).

KANAIRIKTOK PLUTONIC SUITE

LĀK	Tonalite, granodiorite, and rare granite containing 10 to 15% biotite or hornblende, or both; medium- to coarse-grained, foliated to gneissic and locally schlieric metaplutonic rocks; prograde mineral assemblages include epidote (±plagioclase) +hornblende+biotite, and garnet+biotite; Rb-Sr whole-rock and U-Pb zircon determinations indicate an emplacement age of ca. 2838 Ma for tonalite and a metamorphic age of ca. 2760 Ma for the suite (Ermanovics, 1993).
LĀKtn	Tonalitic rocks.
LĀKgd	Granodioritic rocks.
LĀKgn	Gneissic and schlieric rocks.

FLORENCE LAKE GROUP

LĀF	Mafic volcanic and felsic clastic and volcaniclastic rocks metamorphosed to upper greenschist facies; this regional metamorphism downgrades garnet, biotite, muscovite, andalusite, cordierite, and staurolite contact-metamorphic assemblages produced during intrusion of the Kanairiktok Plutonic Suite (LĀK).
LĀFum	Ultramafic rocks: mainly serpentinite and rare asbestos; minor metapyroxenite and metagabbro.
LĀFLf	**LISE LAKE FORMATION:** felsic (colour index 15 to 20) and siliceous greywacke with argillaceous, gritty, and conglomeratic units; poorly bedded, rare graded beds, locally banded; generally not reworked; disseminated sulphide minerals and rare cherty horizons.
LĀFLq	Fine graded members containing blue quartz clasts.
LĀFLp	Fine graded members containing plagioclase aggregates.
LĀFAi	**ADLATOK FORMATION:** intermediate (colour index 15 to 20, 35 to 40) greywacke with argillaceous siltstone, sandstone and conglomerate; clast, in part derived from mafic volcanic rocks; poorly sorted but locally finely layered.
LĀFAh	Local sills with hornblende phenocrysts.
LĀFAl	Minor carbonatized ultramafic rocks.
LĀFSv	**SCHIST LAKES FORMATION:** mafic layered flows and sills intercalated with 20% intermediate and felsic rocks; sills reflect composition of host rocks; flows commonly average 12% matrix carbonate; minor ferruginous metachert sulphide facies.
LĀFSp	Local pillowed flows.
LĀFSl	Impure limestone (marble) and calcsilicate.

MIDDLE ARCHEAN (MĀ, HOPEDALE STRUCTURAL TREND)

MĀmg	MAGGO MIGMATITE; veined and anatectically reconstituted, irregularly layered, felsic granodioritic gneisses and amphibolites produced during shear deformation of Maggo gneisses and Weekes amphibolite; alkali-rich neosomes containing biotite, hornblende, and garnet grade to zoned quartzofeldspathic and mafic paleosomes containing amphiboles, garnet, pyroxene, and andesine.

HUNT RIVER GROUP

MĀH	Polymetamorphic, polydeformed metasediments and meta-igneous rocks.
MĀHpe	Pegmatite; foliated leucocratic rocks containing garnet, muscovite, and tourmaline.
MĀHgq	Gabbro, diorite, and quartz monzodiorite; medium- to coarse-grained rocks in which colour indices average 40; local gneissic layering.
MĀHga	Anorthositic and gabbroic rocks (colour index 1 to 20); layered gneisses comprising lenses of amphibole in a granoblastic matrix of zoned labradorite-andesine; locally, in areas of lesser strain, polycrystalline plagioclase concentrations of football size and larger occur in 10 to 20% interstitial granoblastic amphibole and pyroxene.
MĀHum	Ultramafic rocks: talcose serpentinite, tremolite schist, and hornblendite; serpentinites weather rusty brown and contain either primary or secondary olivine and orthopyroxene suggestive of peridotitic source rocks.
MĀHpl	Metapelites; coarse-grained, porphyroblastic schist; stable mineral associations include plagioclase+cordierite+biotite, plagioclase+staurolite+garnet, and quartz+biotite+sillimanite; unit at Canoe Lake contains biotite, andesine, staurolite, cordierite, garnet, and kyanite.
MĀHpg	Paragneiss; variegated, granoblastic, layered (flaggy weathering), quartzofedspathic gneiss (colour index 10 to 25); layered hornblend gneiss (colour index 20 to 40); minor termolite/actinolite schist; rocks were probably derived from greywacke; stable mineral associations include biotite+garnet+staurolite and plagioclase+epidote+amphibole±diopside.
MĀHv	Amphibolites; derived from tholeiitic basalts and hornblende sheets; subtly laminated; colour index 40 to 90; nematoblastic-hypidioblastic amphiboles in a fine-grained matrix of mainly plagioclase and minor quartz; members include diopsidic amphibolite and garnetiferous amphibolite restricted to laminae a few centimetres wide containing as much as 30% garnet; two occurences of pillow structures were observed; late amphiboles, chlorite, epidote, and carbonate are ubiquitous; rocks of possible andesitic composition occur in northern half of Hunt River belt.

MAGGO GNEISS

MĀM	Undivided grey, leucocratic, granoblastic (±porphyroblastic) quartzofeldspathic gneisses of tonalitic-granodioritic composition, and mesocratic hornblend gneiss cut by granoblastic, mafic, hornblende-plagioclase, tholeiitic dykes (Hopedale dykes); a number of Rb-Sr whole-rock and U-Pb zircon determinations yield ages in the range 3000 to 3300 Ma; in part or in whole younger than Hunt River Group (Ermanovics, 1993).
MĀMgd	Granodiorite-tonalite porphyroblastic gneiss; locally layered and migmatized; microcline, biotite, hornblende quartz, plagioclase, and sporadic garnet give way westward to upper amphibolite and, locally, granulite-facies assemblages.
MĀMtn	Tonalite gneiss; homogeneous, medium-grained; migmatite and hornblende gneisses occur locally; biotite, hornblende, quartz plagioclase, epidote, and sporadic garnet give way westward to upper amphibolite- and, locally, granulite-facies assemblages.
MĀMgl	Relict granulite-facies, lineated, granodioritic rocks and layered quartzofeldspathic genisses; probable equivalents of MĀMgd and MĀMtn confined to mainly west of longitude 61°20' of the map area where the rocks are progressively overprinted by Proterozoic greenschist facies; east of this longitude orthopyroxene is only locally metastable in amphibolite-facies rocks.

WEEKES AMPHIBOLITE

MĀW	Rocks assumed to be derived in part from Hunt River Group and in part from unknown, possible older rocks; hornblende+clinopyroxene+garnet, garnet+biotite, and hornblende+biotite+orthopyroxene+hornblende give way to orthopyroxene+clinopyroxene+garnet (±hornblende, biotite) assemblages westward in the map area; includes amphibolites with Fiordian S-L fabrics.
MĀWan	Anorthositic rocks associated with ultramafic rocks and amphibolites.
MĀWum	Ultramafic rocks; mainly serpentinites, tremolite-actinolite schists, and garnetiferous amphibolites; metastable orthopyroxene and rare olivine.
MĀWab	Amphibolite; commonly associated with ultramafic rocks; unit 2 km west of Napatalik Island contains biotite, gedrite, andesine, pinitzed cordierite, sillimanite, garnet, zircon, rutile, ±kyanite.
MĀWpl	Rare laminae and layers of ferruginous or aluminous metasediments.

LATE ARCHEAN (FIORD STRUCTURAL TREND)
MODIFIED MIDDLE ARCHEAN GNEISS

LĀM	Tonalitic gneiss; compositionally well preserved Maggo gneiss (MĀM), Weekes amphibolite (MĀW), and transposed remnants of Hopedale dykes; may contain mixed Hopedalian and Fiordian S-L fabrics.
LĀMgd	Mainly texturally layered, porphyritic, felsic gneiss.
LĀMtn	Mainly homogeneous, granoblastic felsic gneiss.
LĀMga	Zones of boudined, coarse-grained anorthositic rocks and amphibolite.

MAKKOVIK SUBPROVINCE
EARLY MESOPROTEROZOIC
KOKKORIVIK DYKES

EmPSdd	Dioritic dykes and sheets (lamprophyric); subhorizontal to shallow-dipping, grey-red-weathering, amphibole-phyric; locally zoned; two Rb-Sr whole-rock determinations indicate an age of 1640 Ma (Ermanovics, 1993).
EmPSdb	Diabase and mafic dykes (rare occurrences).

LATE PALEOPROTEROZOIC
BALLET POND SCHISTS

LpPB	Tectonically distinctive rocks probably derived from Windsor Harbour gneisses rather than Archean gneiss directly; may have developed during Kanairiktok shear.
LpPBM	Quartzofeldspathic and mafic layered schists derived from layered gneisses (MpPHM or LĀM).
LpPBK	Felsic schists derived from granitic rocks (MpPHK or LĀK).

ISLAND HARBOUR PLUTONIC SUITE

LpPPgr	Trondhjemite (granodiorite) and granite: undivided, coarse-grained, feldspar-phyric, massive granite and weakly foliated granodiorite containing with epidote/allanite, muscovite, biotite (±hornblende), and trace amounts of fluorite; early border phases of medium-grained, foliated, plagioclase-phyric granodiorite; late leucocratic trondhjemite dykes; Rb-Sr whole-rock and U-Pb zircon age determinations yield 1790 to 1840 Ma for various phases of the suite (Ermanovics, 1993).
LpPPp	Porphyritic microcline granite.
LpPPgd	Trondhjemite (granodiorite); variably foliate and plagioclase porphyritic.
LpPPad	Appinite, (hornblende gabbro) diorite, and hornblendite.
LpPPgn	MIGMATITE AND GNEISSIC GRANODIORITE; Archean gneisses deformed during early Proterozoic and intruded by rocks of the Island Harbour Plutonic Suite; includes gneissic granodiorite that may have formed during synkinematic intrusion of early granodiorite (LpPPgd).

MIDDLE PALEOPROTEROZOIC
MORAN LAKE GROUP (MpPM)

MpPM	Undifferentiated Moran Lake Group.
MpPMws	**WARREN CREEK FORMATION:** grey to black mudstone, slate, siltstone, sandstone, minor limestone, dolostone, and chert.
MpPMJb	**JOE POND FORMATION:** massive and pillowed basalt, pillow breccia and bedded tuff, minor dolostone and chert; resting unconformably on Archean rocks.

KIKKERTAVAK METADIABASE - METAGABBRO (MpPKM)

MpPKm	Discordant amphibolites derived from early members of the Kikkertavak diabase and gabbro dyke swarm, (EpPmPKH); dykes become green and foliated 2 to 3 km in Proterozoic forelands (mapped as Archean) east of Ingrid Group, northwest of Moran Lake Group, and in Kanairiktok Bay.
MpPKmg	Discordant amphibolite derived from gabbroic dykes.
MpPKmd	Discordant amphibolite 3 m wide; derived from diabase and unspecified mafic dykes.

WINDSOR HARBOUR GNEISSES

MpPHgn	Undivided metaplutonic rocks derived from Archean rocks of adjacent Nain Province and characterized by thinned amphibolite-facies planar fabrics and by subvertical mineral lineations of Aphebian age; concordant and discordant masses of massive to foliated trondhjemite and granite may compose 30% of these map units.
MpPHM	Layered gneisses, derived from layered Archean assemblages including LĀM and possibly MĀM.
MpPHK	Tonalite and granodiorite gneisses, derived from rocks of the Kanairiktok Plutonic Suite (LĀK).
MpPHW	Anorthositic rocks and amphibolite, derived from middle Archean rocks (MĀHga or MĀWan); ultramafic MpPHWu.
MpPHWu	Ultramafic rocks.

ARCHEAN OR PALEOPROTEROZOIC

ApPHgd	Granodioritic orthogneiss; homogeneous, seriate, muscovite-biotite-bearing rocks of unknown derivation; may contain numerous schlieric masses of felsic metaplutonic rocks.

NAIN-CHURCHILL PROVINCES
LATE MESOPROTEROZOIC
FLOWERS RIVER IGNEOUS SUITE

LmPF	Peralkaline granite; massive, fine- to medium-grained, leucocratic; rare, layered gabbro (LmPFg).
LmPFg	Gabbro.

EARLY MESOPROTEROZOIC
NAIN IGNEOUS COMPLEX (EmPN)

EmPN	Granitic rocks: fine- to medium-grained, quartz-poor, rusty-weathering; amphibole, clinopyroxene, and olivine.
EmPNsy	Syenite and quartz syenite.
EmPNqm	Monzonite and quartz monzonite; mantles of K-feldspar enclose plagioclase.
	Gabbroic and anorthositic rocks: clinopyroxene, orthopyroxene, and olivine.
EmPNan	Anorthosite and leucogabbro; coarse- to very coarse-grained, foliate plagioclase and plagioclase-olivine cumulates.
EmPNag	Leucogabbro; medium- to coarse-grained, massive to layered.
EmPNgb	Gabbro; fine-grained, plagioclase-phyric; occurs as thin, marginal phases between anorthosite (EmPNan) or leucogabbro (EmPNag), and host rocks of the complex.

HARP LAKE COMPLEX (EmPH)

EmPH	Granitic rocks: medium- to coarse-grained, quartz-poor, rusty-weathering; amphibole, clinopyroxene, and olivine.
EmPHgr	Granite; leucocratic, pink to red, rare olivine.
EmPHqm	Adamellite; local rapakivi texture.
	Gabbroic and anorthositic rocks: clinopyroxene, orthopyroxene, and olivine.
EmPHfd	Ferrodiorite, locally monzodiorite or diorite.
EmPHan	Anorthosite, leuconorite, less common leucogabbro.
EmPHag	Anorthosite, leucotroctolite, leuconorite, and minor leucogabbro.
EmPHgb	Gabbro; massive to weakly layered; occurs as thin marginal phases between anorthositic rocks and host rocks of the complex.

CHURCHILL PROVINCE
PALEOPROTEROZOIC
INGRID GROUP

pPl	A succession of mafic lavas, and polymictic conglomerate and coarse-grained sandstone altered to lower greenschist facies; in fault contact with Archean rocks.
pPlcf	Conglomerate, felsic and polymictic; minor mafic volcanic conglomerate, sandstone and purple siltstone.
pPlcm	Conglomerate, mafic volcanic conglomerate; minor felsic polymictic conglomerate, grit, sandstone, purple siltstone, and mafic lavas.
	Unconformity
pPls	Coarse-grained sandstone and minor purple siltstone and silty mudstone; minor polymictic conglomerate; rare dacitic rocks.
pPlpv	Basalt, porphyritic; minor mafic to intermediate lavas and mafic volcanic conglomerate.
pPlmv	Lavas, mafic to intermediate; minor porphyritic basalt and mafic volcanic conglomerate; rare pillowed lavas.

CHURCHILL PROVINCE GNEISSES

pP	Polymetamorphic gneissic to finely layered metaplutonic rocks of unknown derivation; biotite, amphibole, and rare garnet; dipside in numerous amphibolite inclusions and discontinuous layers; muscovite-bearing mylonite is in gradational tectonic contact with western part of Ingrid Group; in part older and younger than Ingrid Group.
pPgd	Granodioritic orthogneiss and gneissic migmatite.
pPmg	Layered quartzofeldspathic gneisses, migmatite, and minor amounts of amphibolite.

GRENVILLE PROVINCE
LATE MESOPROTEROZOIC
SEAL LAKE GROUP

LmPSL	Plateau basalts and comagmatic sills; red sandstone and shale; unconformable on Archean rocks and the Harp Lake Complex (EmPH).

EARLY MESOPROTEROZOIC
BRUCE RIVER GROUP

EmPBHS	**HEGGART LAKE FORMATION:** massive to well bedded, buff to maroon, arkosic sandstone, minor polymictic conglomerate and mudstone; lies unconformably on Moran Lake Group (MpPM).

○ LĀKmg	Rock outcrop, with map-unit designator
⌒	Contact, undefined or depositional-unconformable
· · ·	Limit of mapping
15 ↗	Bedding, top indicated, overturned
25 ↗	Bedding, inclined
	Igneous layering:
15 ↗	*Inclined*
✕	*Vertical*
10 ↗	Foliation
15 ↗	Gneissosity or gneissic layering
↗ 25	Small fold, generally multiple
↗ 15	Mineral lineation, generally in S-L fabric
	Fault:
———	*Defined*
— — —	*Approximate*
～ ～ ～	Zone of highly deformed rocks, generally by shear
10 ↗	Minor shear plane
● Uz 1805	Location of age determination; age in million of years: potassium-argon, hornblende (Kh) rubidium-strontium, whole-rock (R) uranium-lead zircon (Uz)
— ‖‖ —	Lineament
	Isograd:
Opx — —	*Orthopyroxene in*
Hbl — —	*Hornblende in*
Act — —	*Actinolite in*
• MĀM	Local occurence with map-unit designator

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Geological Survey of Canada
Canadian Geoscience Maps

Author: Geological Survey of Canada

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Map projection Universal Transverse Mercator, zone 20
North American Datum 1983

BEDROCK GEOLOGY
CENTRAL HOPEDALE BLOCK
Newfoundland and Labrador
NTS 13-N/1, 2, 3, parts of 13-N/4, 5, 13-N/6, 7, 8, and 13-O/4, 5
1:100 000
2 0 2 4 6 8 km

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications
Elevations above mean sea level are expressed in metres (NTS 13-N/2, 3, 4, 5, 6, 7, 13-O/4, 5) and feet (NTS 13-O/4, 5).

Mean magnetic declination 2022, 20°52'W, decreasing 15.5' annually
Readings vary from 21°00'W in the NE corner to 20°42'W in the SW corner of the map.

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CANADIAN GEOSCIENCE MAP 434
BEDROCK GEOLOGY
CENTRAL HOPEDALE BLOCK
Newfoundland and Labrador
NTS 13-N/1, 2, 3, parts of 13-N/4, 5, 13-N/6, 7, 8, and 13-O/4, 5