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TECTONIC ASSEMBLAGES AND PLUTONIC SUITES
(from Wheeler and McFeely, 1991)

Tectonic assemblages represent distinctive successions of stratified rocks, mainly bounded by unconformities or faults, deposited in specific tectonic environments during particular intervals of time. Thus they are fundamental components of Cordilleran geology that reflect its evolution and allow comparisons of the tectonic behaviour of various regions during specific intervals of time.

An assemblage may comprise one or more formations from a single region or from several separate regions. Most assemblages are named for an important constituent or group, although a few are named after the region in which the assemblage is best developed. Very few are not yet named. The age assigned to each assemblage reflects the age range of its components. Each assemblage is characterized in terms of its tectonic or depositional setting, the latter illustrated by descriptions of its principal lithologies, facies variations, source areas and other criteria.

The degrees of confidence in the identification of the associated tectonic or depositional regimes vary considerably and, in some cases are controversial. Most assemblages are categorized in terms of environments currently observable on modern continental margins, island arcs and ocean basins. Others are defined with reference to their positions relative to the orogen (foredeep clastic wedge) or to the craton (passive continental margin sediments).

The plutonic suites are defined mainly by age and subdivided on the basis of composition or other attributes. They are grouped, for the most part, into magmatic episodes (Armstrong, 1985).

REFERENCES

Armstrong, R.L.
1985: Mesozoic - early Cenozoic plutonism in the Canadian Cordillera - distribution in time and space; Geological Society of America, Abstracts and programs, 1985, v. 17, p 338

Wheeler, J.O. and McFeely, P.
1991: Tectonic Assemblage Map of the Canadian Cordillera and adjacent parts of the United States of America; Geological Survey of Canada, Map 1712A, scale 1:2 000 000

SOURCES OF INFORMATION

Geological information contained in the GIS map library and the 1:1,000,000 scale folio series is derived directly from John Wheeler's Tectonic Assemblage Map of the Canadian Cordillera (Wheeler and McFeely, 1991; Map 1712A), and is subject to all Copyright laws for distribution in either digital or hard copy form. This map is a revision of the Geological Survey of Canada Map 1505A by Tipper, Woodsworth, and Gabrielse, published in 1981. It is a compilation of published maps, thesis, and unpublished information from officers of the Geological Survey of Canada; from J.G. Abbott, G.W. Lowey, and J.A. Morin of the Geology Section, Department of Indian and Northern Affairs , Whitehorse, Yukon; from D.A. Brew, J.H. Dover, C. Dusel-Bacon, H.L. Foster, J.E. Harrison, W.J. Nokleberg, G. Plafker, and R.W. Tabor of the U.S. Geological Survey; and from R.L. Armstrong, M.T. Brandon, R.L. Brown, D.S. Cowan, P. Erdmer, J. Fillipone, R.M. Friedman, J.T. Fyles, J.M. Hamilton, C.J.R. Hart, R.A. Haugerud, C.J. Hickson, P.M. Holbek, G.A. Jilson, D.L. Jones, A. Jung, W.C. McLelland, E.W. Mountjoy, J.K. Mortensen, D.C. Murphy, J.S. Oldow, R.A. Price, P.B. Read, T.A. Richards, M.E. Rusmore, C.M. Rubin, P.S. Simony, A. Sutherland Brown, R.S. Tolbert, P. van der Heyden, and W.J. Wolfe. Geological cartography for the original version of this map was by M. Sigouin, Geoscience Information Division.

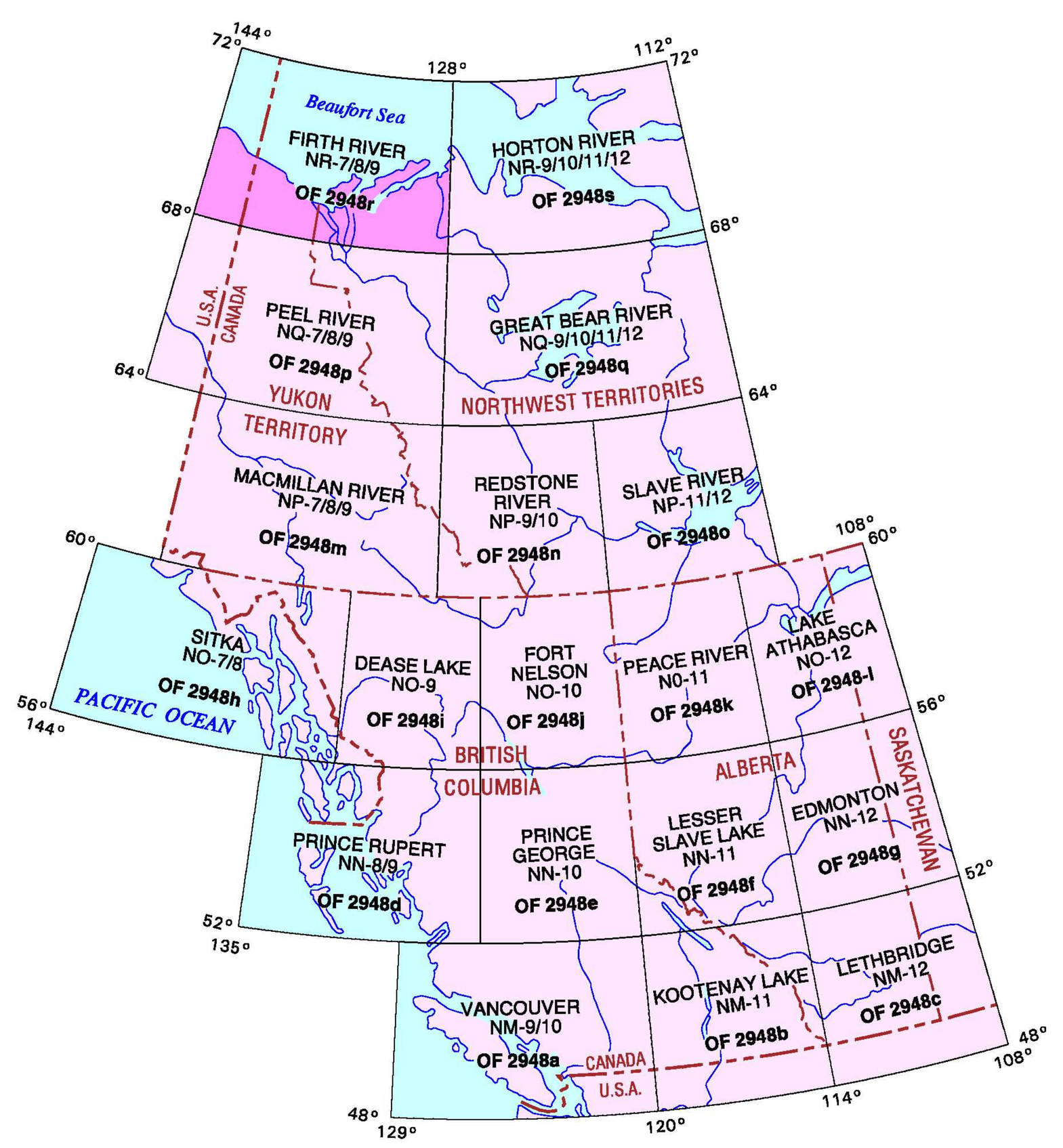
GIS MAP LIBRARY

The Cordilleran GIS Map Library was initiated in March, 1993 as a collaborative research and development project by the Pacific Division and the Geoscience Information Division (GID) of the Earth Sciences Sector (ESS). The goal is to develop an integrated 1:1,000,000 scale digital geoscience database for the Canadian Cordillera that can be used as an archive and research facility by the Geological Survey of Canada (GSC) and its clients. This map is part of a new series of 1:1,000,000 scale tectonic assemblage maps for the Canadian Cordillera based on the Wheeler and McFeely (1991) Tectonic Assemblage Map of the Canadian Cordillera (Map 1712A). It is one of 19 digital data sets derived from the Cordilleran GIS Map Library CDROM (GSC Open File 2948).

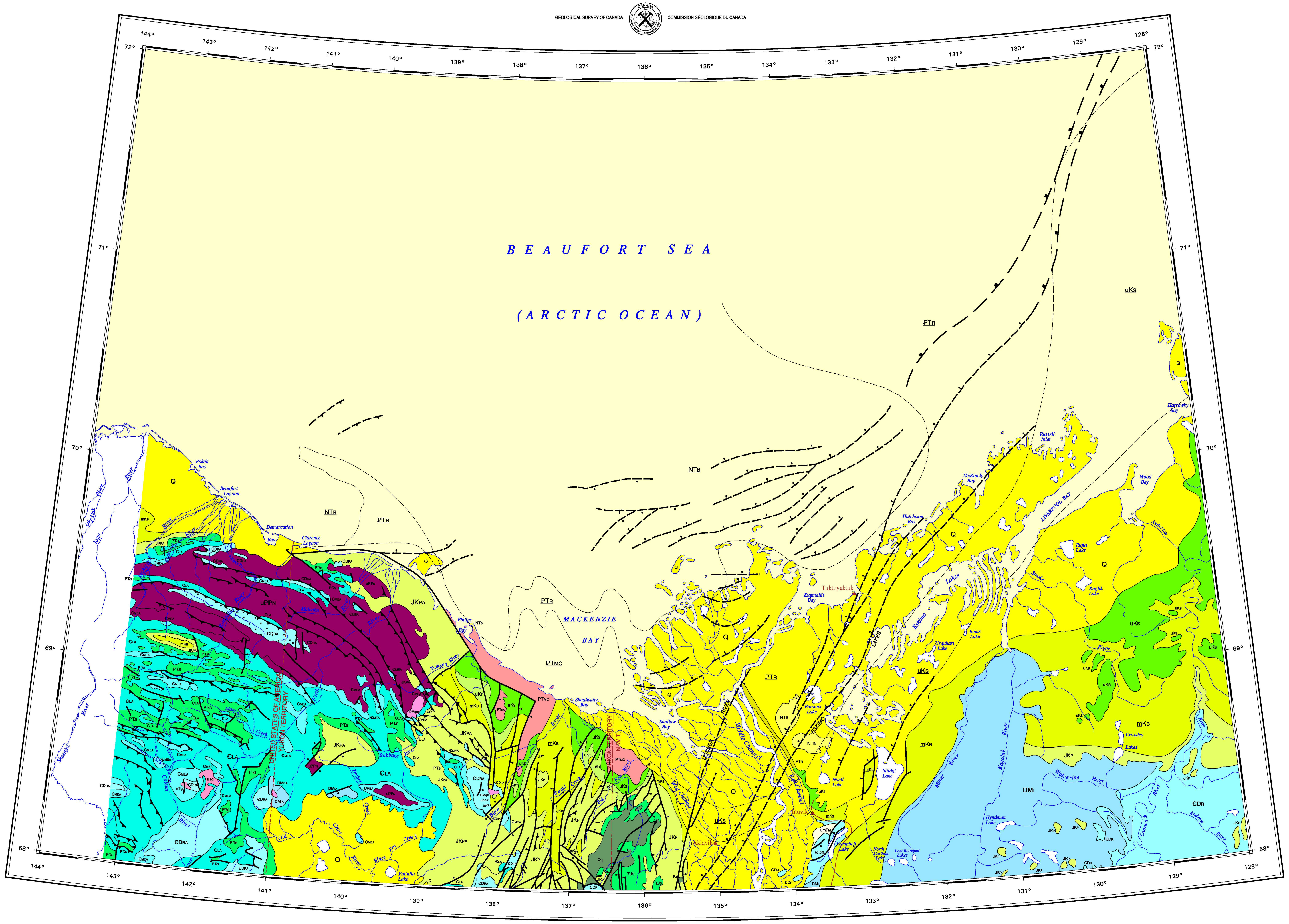
The legend which accompanies Map 1712A was converted to digital format and made available to the GSC by Doug Brownlee, and has been modified and expanded for use as a GIS database. Design and implementation of the digital GIS map library structure, final editing and attributing of all geological and geographic features and cartographic production of the 1:1,000,000 scale folio series were performed by Stephen Williams and Murray Journeay of the GSC Pacific Division, and Richard Allard of the Geoscience Information Division.

The geographic base for the GIS library and the 1:1,000,000 scale folio series is derived from the National Atlas Information System (NAIS) 1: 2,000,000 digital map series and is subject to all Copyright laws for distribution in either digital or hard copy form.

CORDILLERAN TECTONIC ASSEMBLAGE MAP LIBRARY



TECTONIC ASSEMBLAGES OF THE FIRTH RIVER MAP AREA
1:1 000 000
GSC OPEN FILE 2948r



OPEN FILE 2948r

TECTONIC ASSEMBLAGE MAP

FIRTH RIVER

NORTHWEST TERRITORIES - YUKON TERRITORY - U.S.A.

Scale 1:1 000 000 - Échelle 1/1 000 000

kilometres 25 0 25 50 75 kilomètres

Lambert Conformal Conic Projection
Standard Parallels 68°40' and 71°20'

Projection conique conforme de Lambert
Parallèles d'échelle conservée 68°40' et 71°20'

LEGEND

TECTONIC ASSEMBLAGES

QUATERNARY

Q — *Undivided Quaternary alluvium and colluvium*

NEOGENE

NTB — *BEAUFORT: rifted continental margin clastics; unconsolidated crossbedded alluvial and deltaic sand, gravel, silt, peat and woody detritus; nonmarine and marine*

PALEOGENE

PTR — *REINDEER: rifted deltaic clastics; alluvial, deltaic, and marine shale, siltstone, conglomerate, coal; nonmarine and marine*

PTMC — *MOOSE CHANNEL: rifted deltaic clastics; marine mudstone, shale and siltstone overlain by deltaic sandstone, conglomerate, mudstone and minor coal*

UPPER CRETACEOUS

uKT — *TREVOR: southwesterly derived clastic wedge; interbedded calcareous and glauconitic sandstone and mudstone, bentonitic shale, and local ironstone lenses; also includes Dunvegan conglomerate, sandstone, siltstone and shale; marine*

uKS — *SMOKY: foredeep marine shales; sideritic and calcareous shale, siltstone and sandstone forming two megacycles; marine*

MID-CRETACEOUS

mKB — *BLAIRMORE: foredeep clastic wedge; mainly eastward prograding deltaic clastics: basal chert-pebble conglomerate, sandstone, locally with metamorphic, granitic and volcanic detritus, shale, coal; alkaline volcanics at top; marine and nonmarine*

UPPER JURASSIC - LOWER CRETACEOUS

JKP — *PARSONS: continental margin clastics;* **JKPA** *in Arctic Alaska Terrane;* **JKPP** *in Porcupine Terrane; shale, siltstone, sandstone derived mainly from south and southeast, deposited on broad northeast-trending continental shelf; fluvial and deltaic sandstone in Mackenzie Delta; marine and nonmarine*

TRIASSIC - JURASSIC

TJS — *SPRAY RIVER: continental margin prism: Jurassic shale, organic-rich paper shale, sandstone, phosphatic and cherty limestone; Triassic shoaling-upward marine siltstone, sandstone, limestone, dolostone, collapse breccia, rare gypsum; marine*

PERMIAN - TRIASSIC

PTS — *SADLEROCHIT: continental margin clastics in Arctic Alaska Terrane; Triassic siltstone, sandstone and shale and Permian ferruginous orthoquartzite, quartzitic sandstone, siltstone, quartzose calcarenite and limestone; marine*

PERMIAN

PJ — *JUNGLE CREEK: clastics mainly derived from uplift of ancestral Aklavik Arch; conglomeratic limestone, limestone, calcareous sandstone, chert-pebble conglomerate, chert, calcareous shale, siliceous mudstone, and siltstone; marine*

CARBONIFEROUS

CL — *LISBURNE: continental shelf carbonate;* **CLA** *in Arctic Alaska Terrane;* **CLP** *in Porcupine Terrane; northward transgressive limestone, dolomite, and black chert; marine*

CM — *MATTSON: distal, northerly derived clastic wedge; includes* **CMEA** *- Endicott Group in Arctic Alaska Terrane; northward and northeasterly derived, mainly south- and southwestward prograding deltaic quartz sandstone, shale, minor quartz- and chert-pebble conglomerate, limestone and coal; includes Endicott clastics basal to Lisburne Assemblage; marine and nonmarine*

DEVONIAN - MISSISSIPPIAN

DMI — *IMPERIAL: distal northerly derived clastic wedge;* **DMIA** *Arctic Alaska Terrane; northerly derived turbiditic shale and siltstone; basal dark, partly bituminous shale; includes chert-pebble conglomerate and quartz sandstone of Mattson Assemblage in E. Richardson Mts; marine*

CAMBRIAN - DEVONIAN

ЄDR — *ROCKY MOUNTAINS: passive continental margin sediments;* **ЄDRA** *in Arctic Alaska Terrane;* **ЄDRP** *in Porcupine Terrane; resistant dolomite, limestone, and local sandstone interbedded with recessive red, green, and grey shale and detrital carbonate that together form several carbonate-shale grand cycles. These pass westward into offshelf shale, siltstone and thin-bedded carbonate with minor alkalic tuff, breccia and amygdaloidal basalt of Cambrian, Cambro-Ordovician, Silurian, and Devonian ages but mainly of Ordovician age; marine*

UPPER PROTEROZOIC - PALEOZOIC

uPPN — *NERUOKPUK: mainly clastic continental margin sediments; includes equivalents of Hyland, Rocky Mountains and Earn assemblages in Arctic Alaska Terrane; mainly Proterozoic-Lower Cambrian green, buff, red and maroon argillite and siltstone with trace fossils, limestone and argillite; grey, green and red quartzite and argillite; overlain by Ordovician and Silurian argillite and chert; succeeded by Devonian (?) argillite, sandstone and chert-pebble conglomerate; marine*

MIDDLE AND UPPER PROTEROZOIC

umPM — *MACKENZIE MOUNTAINS: platformal continental margin sediments (equivalent to Rae Group - on the craton); shallow-water platformal assemblage of red and green mudcracked shale, siltstone and sandstone, gypsum and anhydrite, basinal limestone, rhythmite, nodular limestone, stromatolite reefs, platform carbonate grainstone, fluvial-deltaic orthoquartzite and mudstone, stromatolitic and argillaceous dolomite; marine and nonmarine*

PLUTONIC AND ULTRAMAFIC ROCKS

Pluton....(Sedgwick)

EARLY TERTIARY (40 - 64 Ma)

ET — **ETg** - *undivided granodiorite and quartz diorite; commonly has concordant U-Pb and K-Ar ages in Coast Plutonic Complex*

DEVONIAN - MISSISSIPPIAN

DM — **DMqF, DMqA** - *(Fitton, Ammerman): biotite quartz monzonite*
DMqse - *(Sedgwick): porphyritic biotite-hornblende*

VOLCANIC ROCKS

Tholeiitic volcanic rocks

SUBSURFACE FORMATION

Widespread subsurface formations beneath Pliocene and younger cover in Mackenzie Delta and adjacent Beaufort Sea are designated by an underlined notation: NTB, PTR, PTMC, uKS

SYMBOLS

- *Geological contact (defined)*
- *Thrust fault (teeth on upper plate)*
- *Extension fault (solid circle indicates downthrow side)*
- *Fault of unknown displacement*
- *Submerged geological contact*
- *Submerged faults and those buried by younger strata*
- *Submerged flexure*
- *Submerged normal fault (solid circle indicates downthrow side)*
- *Submerged pseudofault*
- *Submerged thrust fault (teeth on upper plate)*

British Columbia
Mineral Development Agreement
Canada

Contribution to Canada – British Columbia Agreement on Mineral Development (1991 – 1995), a subsidiary agreement under the Canada – British Columbia Economic and Regional Development Agreement.
Contribution à l'Entente Canada – Colombie Britannique sur l'exploitation minérale (1991 – 1995), entente auxiliaire négociée en vertu de l'Entente Canada – Colombie Britannique de développement économique et régional.

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