LEGEND

NEOGENE PLIOCENE

BEAUFORT FORMATION: sand, unconsolidated, fine-grained, quartzose, pale yellowish orange, cross-stratified; wood; peat; minor gravel, mud; fluvial braidplain and overbank; may include older Neogene formations in the subsurface.

CONTINENTAL TERRACE WEDGE

TB projected under cover of younger deposits; pattern indicates offshore areas. SVERDRUP BASIN SUCCESSION

CRETACEOUS UPPER CRETACEOUS

KANGUK FORMATION (Turonian to Campanian) (KK-I - KK-u) Upper shale member: shale, dark grey and brownish black, variably silty, siliceous

Eglinton Member: sandstone, medium- to coarse-grained, quartzose, variably pebbly, manganiferous and oolitic; minor pebble conglomerate; nearshore marine.

and bentonitic; bentonitic clay, yellow and greyish yellow; distal marine.

Lower shale member: shale, dark grey, brownish black and black, variably silty,

LOWER CRETACEOUS

HASSEL FORMATION (Albian): sandstone, fine- and very fine-grained, pale olive-grey and yellowish grey, variably quartzose, pebbly, and carbonaceous, friable; siltstone, ferruginous and manganiferous; minor shale; nearshore marine. KH projected under cover of younger deposits.

siliceous and bentonitic; bentonitic clay, yellow and greyish yellow; distal marine.

CHRISTOPHER FORMATION (Aptian and Albian): shale, dark grey, black and brownish black; siltstone; minor very fine-grained sandstone; minor bentonite in the upper part; common mudstone and calcareous siltstone concretions, variably rich in bivalves; distal marine. KC projected under cover of younger deposits.

ISACHSEN FORMATION (Barremian and Aptian): sandstone, fine- to coarse-grained, quartzose and carbonaceous, light grey; minor lignite coal and clast-supported conglomerate; fluvial, deltaic and nearshore marine. KI projected under cover of younger deposits.

JURASSIC AND CRETACEOUS UPPER JURASSIC AND LOWER CRETACEOUS

DEER BAY FORMATION (Volgian to Valanginian) (JKD-u - JKD-I, east of Intrepid Inlet) Upper part: shale, grey; siltstone; minor sandstone, fine-grained, greenish grey; distal marine. JKD-u projected under cover of younger deposits.

Lower part: very fine-grained sandstone, siltstone and shale; grey to greenish grey; common bivalves; arranged in numerous coarsening-upward rhythms; distal marine. JKD-I projected under cover of younger deposits.

JURASSIC UPPER JURASSIC

AWINGAK FORMATION (Volgian): sandstone, quartzose, fine-grained, variably cemented with calcite, light greenish grey, yellowish grey and pale yellowish orange; siltstone; common bivalves; minor conglomerate; nearshore marine. JA projected under cover of younger deposits.

RINGNES FORMATION (Oxfordian and Kimmeridgian): shale, dark grey to black; siltstone; minor fine-grained sandstone and basal lag gravel; common calcareous mudstone concretions; distal marine. JR projected under cover of younger deposits.

LOWER AND MIDDLE JURASSIC WILKIE POINT GROUP (JJS - JHC) HICCLES COVE FORMATION

(Bathonian and Callovian) (JHC-L. JHC-u: northeast of Mould Bay) Upper part: quartzose sandstone, very light grey and yellowish grey, very fine- to medium-grained, cross-stratified, weakly consolidated, castellate weathering; thin coal beds and coaly sandstone; minor sandstone intraclasts; local shale unit at the base, north and east of Intrepid Inlet only; nearshore marine and deltaic. JHC-u projected under cover of younger deposits.

Lower part: quartzose sandstone, calcite cemented or weakly consolidated, very fineto medium-grained, yellowish grey and pale yellowish orange; fossiliferous ironstone; minor siltstone; common phosphatic nodules and inoceramids; (JMH-I: the base of the mapped lower Hiccles Cove Formation, in all areas southwest of Intrepid Inlet, usually includes 1 to 5 m of beds assignable to the McConnell Island Fm); nearshore

JHC-I projected under cover of younger deposits. McCONNELL ISLAND FORMATION

Upper part: shale, yellowish brown and medium grey; siltstone; common calcareous JMI-u sandstone concretions; distal marine.

(Bajocian and Bathonian) (JMI-I, JMI-u; east of Intrepid Inlet)

Lower part: sandstone, very fine- to fine-grained, calcite cemented or weakly consolidated, yellowish orange; fossiliferous ironstone; nearshore marine.

JAMESON BAY AND SANDY POINT FORMATIONS, undivided (Pliensbachian to Aalenian): shale, light to medium grey and greenish grey, variably glauconitic; quartzose sandstone, weakly consolidated or calcite cemented, fine-grained; ironstone, variably oolitic, glauconitic and chamositic; local pebble conglomerate at base; common ammonoids, belemnites, silicified wood and phosphatic nodules; (friable quartzose sandstone high in the map unit is assigned to the Sandy Point Fm)

HEIBERG GROUP

JJS projected under cover of younger deposits.

(JG; additional formations in subsurface only)

LOWER JURASSIC GROSVENOR ISLAND FORMATION (Sinemurian): shale, greenish grey; siltstone; minor sandstone, variably calcite-cemented, argillaceous and very fine-grained; oolitic ironstone and red weathering shale unit at base; common ammonoids and phosphatic nodules; distal marine. JG projected under cover of younger deposits.

SCHEI POINT GROUP

(TPB; additional formations in subsurface only)

TRIASSIC UPPER TRIASSIC

PAT BAY FORMATION (Carnian): sandstone, fine- to coarse-grained, pale yellowish orange, calcareous and bioclastic, minor pebbles; bioclastic limestone; red shale interbeds; common Gryphea and other bivalves; nearshore marine. TPB projected under cover of younger deposits.

LOWER TRIASSIC BJORNE FORMATION: sandstone, conglomerate, minor siltstone. Subsurface only;

PERMIAN TROLD FIORD FORMATION: sandstone, quartz-, chert- and glauconite-rich, minor

shale and siltstone, medium to dark grey; minor chert. Subsurface only; known from SABINE BAY FORMATION: shale, siltstone, red; sandstone, variably conglomeratic chert pebble; conglomerate, chert pebble. Subsurface only; known from wells.

RAANES FORMATION: limestone, variably sandy and silty, fossiliferous; light to medium grey; sandstone, variably calcareous; minor siltstone and shale. Subsurface only; known from well.

CARBONIFEROUS AND PERMIAN NANSEN FORMATION: limestone, variably sandy, fossiliferous, locally reefal.

known from wells.

Subsurface only; distribution assumed.

BELCHER CHANNEL FORMATION: arenaceous limestone, shale, marl. Unit not mapped separately from the Canyon Fiord Formation.

CANYON FIORD FORMATION: sandstone, variably pebbly and calcareous; chert-pebble conglomerate; siltstone and shale, red. Subsurface only. Where overlain by Van Hauen and or Trold Fiord formations this unit may include the Sabine Bay Formation and undesignated arenaceous rocks of Artinskian age.

FRANKLINIAN SUCCESSION

DEVONIAN CLASTIC WEDGE - MELVILLE ISLAND GROUP (DB-DPI) DEVONIAN

UPPER DEVONIAN PARRY ISLANDS FORMATION (Frasnian and Famennian): sandstone, quartzose and cherty, kaolinite-cemented, very fine- to coarse-grained, pale yellowish orange, white and yellowish brown, medium- and thick-bedded; green siltstone; minor chert pebble conglomerate, shale and bituminous coal; fluvial and deltaic.

silty, and thin-bedded; basin slope.

BEVERLEY INLET FORMATION (Frasnian): sandstone, quartzose, kaolinite-cemented, fine- and very fine-grained, pale yellowish orange, white, and pale green, thin- and medium-bedded; siltstone, locally red weathering; shale, greyish green; minor chert pebble conglomerate and bituminous coal; fluvial, deltaic and marginal marine.

MIDDLE AND UPPER DEVONIAN WEATHERALL FORMATION (Givetian and Frasnian): siltstone, greyish green; sandstone, very fine-grained, pale green and greyish green, variably calcareous and fossiliferous, thin-bedded; shale, greyish green; numerous coarsening-upward

rhythms; delta front and marine shelf. DW projected under cover of younger deposits. MIDDLE DEVONIAN CAPE DE BRAY FORMATION (Eifelian and Givetian): shale, silty, calcareous, and micaceous, greyish green; siltstone; minor sandstone, very fine-grained, argillaceous,

DCB projected under cover of younger deposits. BLACKLEY FORMATION (Eifelian): sandstone, argillaceous, medium grey and greenish grey, very fine-grained; shale; arranged in fining-upward rhythms; DB-u DB-I: upper and lower sequence; sediment gravity flows deposited in submarine fan setting. Subsurface only; known from wells.

LOWER DEVONIAN KITSON FORMATION: shale, argillaceous limestone; condensed deep-marine. Subsurface only; known from wells.

PRINCE PATRICK CARBONATE PLATFORM FACIES

ORDOVICIAN(?) AND SILURIAN(?) Limestone, dolostone, minor calcareous shale; unrestricted marine shelf; includes equivalent seismic succession below limits of drilling. Subsurface only; upper part known from wells.

CAMBRIAN(?) AND ORDOVICIAN(?)

Platformal seismic sequence below limits of drilling on Prince Patrick Island. ps€O Subsurface only.

CAMBRIAN(?)

DBI

PALEOZOIC

VENDIAN(?) ps2

ps4

ps3

Seismic sequences below limits of drilling on Prince Patrick Island.

KANGUK FORMATION, undivided. KK projected under cover of younger deposits. ISACHSEN AND CHRISTOPHER FORMATIONS, undivided. KIC projected under cover of younger deposits.

RINGNES AND AWINGAK FORMATIONS, undivided at surface near Landing Lake and around Walker Inlet.

JRA projected under cover of younger deposits.

JKD projected under cover of younger deposits.

and west of Intrepid Inlet.

DEER BAY FORMATION, undivided at surface north of Green Bay

HICCLES COVE FORMATION, undivided. JHC projected under cover of younger deposits.

of Mould Bay, and west of Intrepid Inlet. JMI projected under cover of younger deposits. JAMESON BAY FORMATION (Toarcian): younger and older beds

McCONNELL ISLAND FORMATION, undivided east and north

JJB projected under cover of younger deposits.

missing at surface in the Mould Bay area.

TRIASSIC AND JURASSIC

UPPER TRIASSIC AND LOWER JURASSIC HEIBERG GROUP, undivided: sandstone, shale. Subsurface only; ТJН known from wells.

TRIASSIC UPPER TRIASSIC

> BARROW FORMATION, shale, minor siltstone. Subsurface only; known from wells.

MIDDLE AND UPPER TRIASSIC

SCHEI POINT GROUP, undivided: sandstone, calcareous sandstone, shale, minor limestone. Subsurface only; known from wells.

CANYON FIORD and BELCHER CHANNEL FORMATIONS:

undivided. Subsurface only.

BLACKLEY FORMATION, undivided.

Platformal seismic sequences ps1 through ps5,

undivided. Subsurface only.

Subsurface only.

PERMIAN

VAN HAUEN FORMATION: shale, siltstone, dark grey to black, organic-matter-rich; minor limestone, medium to dark grey, fossiliferous. Subsurface only; known from

TRAPPERS COVE FORMATION: sandstone, quartz- and chert-rich, minor siltstone and shale, noncalcareous, red; siltstone and shale, dark grey, brown and black, organic-matter-rich. Subsurface only; known from wells.

McCONNELL ISLAND AND HICCLES COVE FORMATIONS,

undivided at surface in the Mould Bay area.

JMH projected under cover of younger deposits.

CARBONIFEROUS AND PERMIAN HARE FIORD FORMATION: 'mudrock' (siltstone, shale, chert), dark grey to black; minor limestone; medium grey, fossiliferous, breccia. Subsurface only; uppermost part known from well.

CARBONIFEROUS

BORUP FIORD FORMATION: conglomerate, pebble to boulder, red; sandstone, siltstone, variably pebbly, red. Subsurface only; assumed unit below limits of drilling.

MELVILLE ISLAND GROUP, undivided. D projected under cover of younger deposits.

SILURIAN AND DEVONIAN IBBETT BAY FORMATION, upper part: seismically defined basin-floor and -rise deposits below limits of drilling on Eglinton and southwesternmost Prince Patrick Island. Subsurface only.

CANROBERT TROUGH FACIES

ORDOVICIAN AND SILURIAN IBBETT BAY FORMATION, lower part: seismically defined basin-floor and -rise deposits below limits of drilling on Eglinton and southwesternmost Prince Patrick Island. Subsurface only.

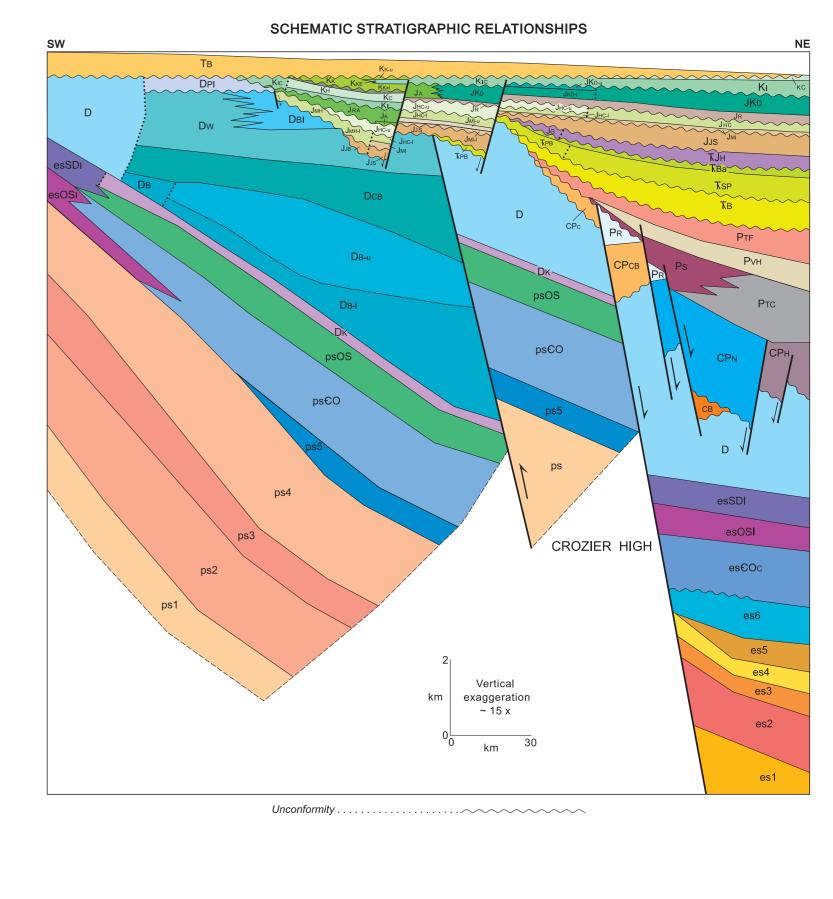
CAMBRIAN(?) AND ORDOVICIAN CANROBERT FORMATION: seismically defined tabular carbonate(?)unit below limits of drilling on Eglinton Island. Subsurface only.

CAMBRIAN(?) OR OLDER

es2

es5 es4 Subsurface only es3

Platformal seismic sequences below limits of drilling on Eglinton Island.



Geological boundary (defined, approximate, assumed) projected under cover (approximate, assumed) Limit of geological interpretation or change in mapping precision Bedding, tops known (inclined, horizontal) Bedding, (from aerial photographs or estimated from aircraft) Lineament (from aerial photographs) Fault undetermined (solid circle indicates downthrown side where known: projected under cover (defined, approximate) Fault, subsurface only (arrow indicates relative movement) Thrust fault (teeth indicate upthrust side; defined, approximate) projected under cover (defined, approximate) Anticline (trace of axial plane; upright or inclined; arrow indicates plunge direction; projected under cover (defined, approximate) Syncline (trace of axial plane; upright or inclined; arrow indicates plunge direction; projected under cover (defined, approximate) Borehole (abandoned) Mineral occurrence (coal, manganese)

NOTE: All symbology marked in red on the map has been projected under younger cover; either cover of Beaufort Formation across western Prince Patrick Island, or under marine cover in all offshore areas.

NOTES

1. All map symbols marked in red, including unit abbreviations, faults and fold axes, have been cartographically projected to surface through younger cover; either cover of Beaufort Formation across western Prince Patrick Island, or through marine cover in all offshore areas.

2. Small areas of lbbett Bay Formation (Ordovician to Devonian) may be exposed on the seafloor of Fitzwilliam Strait west of the Canrobert Hills region of northwestern Melville Island.

3. Northerly striking faults, mapped on the westernmost land areas of Melville Island, support the probability of additional similar faults within Devonian strata in the immediate offshore beneath eastern Kellett Strait. Additional details concerning the geology of western Melville Island are provided on Geological Survey of Canada Map 1844A.

4. The Beaufort Formation is believed to subcrop on the seafloor in western Ballantyne Strait and in many areas of Satellite Bay. Jurassic units mapped in these areas have been cartographically projected to surface through both marine cover and Beaufort Formation. This relationship is complicated by the fact that the Ringnes Formation is exposed on several islands and in some shore areas of Satellite Bay. A linear inlier belt of the same Jurassic strata is inferred to be exposed on the seafloor, surrounded on all sides by unconformable Beaufort Formation.

5. There are insufficient geophysical data to determine the bedrock geology exposed on the sub-Beaufort Formation unconformity: 1) on peninsulas of westernmost Prince Patrick Island north and south of Bloxsome Bay; 2) in a coastal strip of small deltas and points of land along the Arctic coast of northwesternmost Prince Patrick Island, and; 3) in all offshore areas of the Arctic Ocean and western

SCHEDULE OF WELLS

1. Elf Jameson Bay C-31 T.D. 2538 m (abandoned 5/71) **2.** BP et al. Satellite F-68 T.D. 3723.9 m (abandoned 5/72) **3.** Elf Intrepid Inlet H-49 T.D. 1716.6 m (abandoned 3/73) **4.** Elfex Andreasen L-32 T.D. 2174.2 m (abandoned 5/73) 5. Panarctic Gulf Eglinton P-24 T.D. 1859.6 m (abandoned 7/74) 6. Panarctic et al. Pedder Point D-49 T.D. 1897.3 m (abandoned 11/74)

8. Elf et al. Dyer Bay L-49 T.D. 3208.9 m (abandoned 2/76)

Note: Wells are listed chronologically by completion date

7. Elfex et al. Wilkie Point J-51 T.D. 2374.7 m (abandoned 5/75)

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Geology by J.C. Harrison, 1987, 1991, and 1992, with contributions by A.F. Embry, T.P. Poulton, Q. Goodbody, J.G. Fyles, D.A. Hodgson and J.H. Wall in 1987, R. Brady in 1991, T. de Freitas in 1992, and B. Beauchamp in 2000. Additional observations from E.T. Tozer and R. Thorsteinsson, Geological Survey of Canada, Memoir 332 (1964) and from A.F. Embry and J. E. Klovan, Bulletin of Canadian Petroleum Geology, v. 24, no.4 (1976). U. Mayr and B.C. MacLean provided critical comments and advice during the preparation of this map for publication. Logistical support in the field was provided by the Polar Continental Shelf Project.

Digital Cartography by Geological Survey of Canada (Calgary)

Geological compilation by J.C. Harrison and T.A. Brent

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

Digital base map from data compiled by Geomatics Canada, modified by

Bathymetry contours, provided by Panarctic Oils Limited, are from standardized water depths based on 4750 ft./s water velocity using industry marine reflection seismic, industry

the Geological Survey of Canada (Calgary)

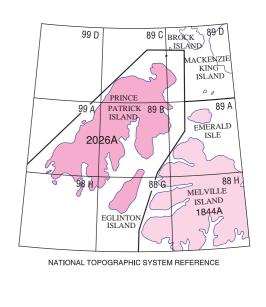
Proximity to the North Magnetic Pole causes the magnetic compass to be unstable in this area

sea-ice reflection seismic, and soundings at reconnaissance government gravity stations.

Elevations in feet above mean sea level.

Bathymetric contours in feet below mean sea level.





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