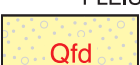


QUATERNARY

PLEISTOCENE AND HOLOCENE



Fan delta deposits.



Braidplain deposits.



Alluvial-fan deposits.



Push moraine.



Lateral moraine.



Raised delta deposits; first (lowest) bench above sea level.



Raised delta deposits; second bench above sea level.



Raised delta deposits; third bench above sea level.



Raised delta deposits; fourth bench above sea level.

LEGEND

QUATERNARY
PLEISTOCENE AND HOLOCENE



Raised delta deposits, undivided.

SVERDRUP BASIN SUCCESSION

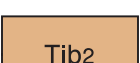
EUREKA SOUND GROUP (K_{e1}–Tib₂)

PALEOGENE

PALEOCENE TO EOCENE

SELANDIAN TO BRIDGERIAN (chrons 26n or 25n to 24r? and younger)

ICEBERG BAY FORMATION (Tib₁–Tib₂)



Coal member: **Sandstone**, quartz arenite, fine- to medium-grained, cross-stratified; minor **shale**, grey; minor **coal**. All lithologies interbedded and arranged in fining-upward cycles; basal lags with mud chips and wood fragments; common paleosols, leaf fossils and mineralized tree stumps; somewhat recessive unit to 1248 m thick. Nonmarine, fluvial and delta plain environments.

PALEOCENE

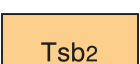
SELANDIAN AND THANETIAN (chrons 26r to 26n or 25n)



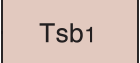
Lower member: **Sandstone**, quartz arenite, fine- to medium-grained, bioturbated, ripple-cross-stratified; minor **siltstone** and **shale**, grey. All lithologies interbedded and arranged in fining-upward cycles; somewhat resistant unit, 430 to 1838 m thick (see spot thickness). Mixed marine and nonmarine, wave-dominated deltaic environments including interdistributary bay, subdelta, shoreface, and foreshore settings.

SELANDIAN (chron 26r)

STRAND BAY FORMATION (Tsb₁, Tsb₂)



Upper member: **Shale**, medium to dark grey, faintly colour-banded, friable, bioturbated only near the top; minor **sandstone**, quartz arenite, sheet-forming, fine-medium grained, trough-cross-stratified sandstone beds near the base; minor **coal**. All lithologies are interbedded. Marine prodeltaic setting with barrier-island sand bars.



Lower member: **Shale**, medium to dark grey, faintly colour-banded, friable, no bioturbation; Marine prodeltaic setting.

PALEOGENE

PALEOCENE

SELANDIAN (chron 26r)

STRAND BAY FORMATION, undivided. Recessive unit, 53 to 783 m thick (see spot thickness).

CRETACEOUS AND PALEOGENE

UPPER CRETACEOUS AND PALEOCENE

MAASTRICHTIAN AND SELANDIAN (chrons 31r? and 26r?)

EXPEDITION FORMATION (K_{e1}, KTe₂)



Upper member: **Sandstone**, quartz arenite, fine- to medium-grained, planar-cross-stratified, rippled and bioturbated, lags of mud chips, fossil wood fragments and rare pebbles; minor **siltstone**, **shale**, and **coal**. Lithologies are arranged in coarsening-upward cycles; somewhat resistant unit, 0 to 746 m thick (see spot thickness). Mixed marine and nonmarine; progradational shoreface and strand-plain settings in a wave-dominated deltaic system.

CRETACEOUS AND PALEOGENE

UPPER CRETACEOUS AND PALEOCENE

CAMPANIAN, MAASTRICHTIAN AND SELANDIAN

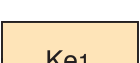


EXPEDITION FORMATION, undivided.

CRETACEOUS

UPPER CRETACEOUS

CAMPANIAN (chrons 33r to 32n)



Lower member: **Sandstone**, quartz arenite, fine- to medium-grained, parallel-bedded, planar- and trough-cross-stratified; common burrows and bioturbation; minor **siltstone** and **shale**, and **ironstone** beds containing inoceramids, rare **coal** and **argillaceous limestone**. Lithologies are arranged in coarsening-upward cycles; somewhat recessive unit, 0 to 947 m thick (see spot thickness). Mixed marine and nonmarine; progradational clastic wedge containing prodelta, shoreface, barrier-island, and distributary-channel settings.

TURONIAN TO CAMPANIAN



KANGOOK FORMATION: **Shale**, silty, medium to dark grey; minor **bentonite**, greyish yellow; **tuff**, greenish grey; **sandstone**, quartz arenite, micaceous, grey to yellowish brown; **sideritic concretions** containing inoceramids; uncommon **greywacke** locally observed at the base. All lithologies are interbedded; recessive unit, 31 to 847 m thick (see spot thickness). Anoxic sediment-starved marine setting with evidence of distant volcanic activity.

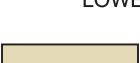
CENOMANIAN AND TURONIAN TO (?)CAMPANIAN (100 to ?81 Ma)



STRAND FIORD FORMATION: **Basalt**, olivine tholeiite, vesicular and amygdaloidal flows, **pillow breccia**; **mafic pyroclastic rocks**, minor **diabase** sills; **pebble conglomerate**, matrix-supported; **sandstone**, volcanoclastic, containing leaf fossils and shale interbeds, uncommon **sandstone**, quartz arenite. Resistant, cliff-forming unit invaded by subvolcanic sills, 270 to 701 m thick (see spot thickness). Subaqueous and subaerial continental-rift volcanic settings with adjacent fluvial and floodplain environments.

LOWER CRETACEOUS

ALBIAN (upper Albian)



BASTION RIDGE FORMATION: **Shale** and **silty shale**, dark grey, minor **siltstone**, brown-weathering, minor **sandstone**, quartz arenite, very fine to coarse-grained, locally with quartz and chert pebbles; minor **ironstone** and **volcanoclastic sandstone**. All lithologies are interbedded and bioturbation is common except in some laminated shales. Recessive unit, 5 to 242 m thick (see spot thickness). Marine environments ranging from offshore anoxic through low-energy nearshore to high-energy shoreface; minor nonmarine-foreshore settings.



HASSEL FORMATION: **Sandstone**, quartz arenite, fine- to medium-grained, brownish-grey- to yellowish-brown-weathering, trough-cross-stratified, often burrowed and bioturbated, **siderite**-cemented and locally containing bivalves; minor **shale** with pedogenic features, some mafic sills may also prove to be basaltic flows. Recessive unit, 105 to 510 m thick (see spot thickness). Mixed marginal marine and nonmarine environments including shoreface and foreshore settings.



(129 to 113 Ma)
QUEEN ELIZABETH and SURPRISE swarms, (undivided): **Diabase** and **gabbro** sills and dykes intruding Strand Fiord Formation and all older strata; includes blocks and dismembered sills, dykes and plugs enclosed within diapiac evaporites (Otto Fiord Formation); minor **basalt** flows and or mafic volcanoclastic **sandstone** in the Isachsen, Christopher, Hassel, and Bastion Ridge formations. Resistant cliff-forming unit. Intrusive continental-rift setting. (Unit not shown on cross-sections.)

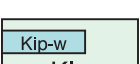
CHRISTOPHER FORMATION: (Kip–Kmp)



ALBIAN (middle and upper Albian)
Macdougall Point Member: **Shale**, dark grey to black, weathering to dark grey and brownish grey; minor **limestone** as subspherical concretions with bivalves and gastropods; uncommon **sandstone**, lithic and mafic volcanoclastic rocks. Lithologies are interbedded; recessive unit, 99 to 564 m (see spot thickness). Offshore low-energy cold-water marine setting with evidence of distant volcanic activity.



ALBIAN (middle Albian)
Invincible (Point Member) (Kip, Kip-w, Kip-j)
Upper part 'Junction beds' (Kip-j): **Sandstone**, feldspathic quartz arenite, grey to greenish grey, micaceous, fine-grained, variably burrowed, bioturbated, and cross-bedded; **siltstone**. Unit locally contains inoceramids. Forms a resistant marker to ~60 m thick in the southeastern part of the report area. Marine inner-shelf and lower shoreface settings.

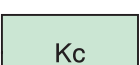


APTIAN AND ALBIAN (early Aptian to middle Albian)
Lower part (Kip): Offshore low-energy cold-water marine setting with evidence of distant volcanic activity. **Shale**, dark grey to black, weathering to dark grey and brownish grey, minor **limestone** as subspherical concretions, spar calcite ('hedgehog') concretions, cone-in-cone structures, rare inoceramids; uncommon **sandstone**, lithic arenite and mafic volcanoclastic arenite; rare bedded **anhydrite**. Lithologies are interbedded; unit is recessive, 0 to 1587 m thick (see spot thickness) (lower and upper parts). 'Wolf Tongue' (Kip-w): **Sandstone**, quartz arenite and **siltstone**. Resistant marker to ~40 m thick in the Wolf Diapir-Glacier Fiord Anticline area. Marine inner shelf and lower shoreface.

CRETACEOUS

LOWER CRETACEOUS

APTIAN AND ALBIAN



CHRISTOPHER FORMATION, undivided. (see spot thickness).

BARREMIAN TO (?)APTIAN



ISACHSEN FORMATION (Ki, Ki–Kdi)
Local facies in upper part
Sandstone, quartz arenite, fine- to medium-grained but ranging to coarse-grained, weathers light yellowish-brown and grey, often cross-stratified and containing plant fragments and plant fossils in the upper part and **shale**, dark grey interbedded with minor **diabase** sills, **basalt** flows and breccia, **tuff**, **mafic agglomerate**, minor **siltstone**, **clay ironstone**, and rare **coal**. All lithologies are interbedded and the unit is resistant. Nonmarine delta-plain setting with periodic continental-rift volcanism. Fan delta deposits.

VALANGINIAN TO APTIAN



Sandstone, quartz arenite, fine- to medium-grained but ranging to coarse-grained, weathers light yellowish-brown and grey, often cross-stratified and containing plant fragments and plant fossils in the upper part, **siltstone**, and **shale**, dark grey, locally carbonaceous; minor **conglomerate**, clay ironstone and rare **coal**, bivalves locally found in the lower part of the formation. Lithologies are interbedded although basal conglomerate and **sedimentary breccia** are noted locally near and above diapiac evaporites. Unit is resistant and 92 to 1549 m thick (see spot thickness). Marginal marine deltaic settings in the lower part grading to nonmarine delta plain in the upper part.

JURASSIC AND CRETACEOUS

UPPER JURASSIC AND LOWER CRETACEOUS

KIMMERIDGIAN TO VALANGINIAN



DEER BAY FORMATION: **Shale**, dark grey to greyish-black, and **silty shale**, common **ironstone**, **sideritic** and clayey, occurring as concretionary layers and containing bivalves, crinoids, belemnites and gastropods. Lithologies are interbedded, the unit is recessive, 0 to 952 m thick (see spot thickness). Marine prodelta and clastic offshore shelf.

JURASSIC

UPPER JURASSIC

OXFORDIAN AND KIMMERIDGIAN



AWINGAK FORMATION: **Sandstone**, quartz arenite, fine- to medium-grained, grey, weathers grey to yellowish-brown, in part cross-stratified and in part cemented by dolomite, minor **shale**, dark grey to black, and **siltstone**, occurring as partings in sandstone. Otherwise lithologies are interbedded. Rare ammonites and bivalves are found in the lowest and highest beds. Unit is resistant, 0 to 488 m thick (see spot thickness). Mixed nonmarine strand-plain and nearshore marine settings.

LOWER JURASSIC TO UPPER JURASSIC

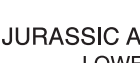


TOARCIAN TO OXFORDIAN
'SAVIK beds': JAMESON BAY, SANDY POINT, McCONNELL ISLAND and RINGNES FORMATIONS, undivided: **Shale**, dark grey to greyish-black, minor **sideritic ironstone** occurring as concretionary layers, minor **siltstone** and **argillaceous limestone**, rare marker beds of **sandstone** and **silty shale** (Sandy Point Formation) are found in some sections; locally common Buchia bivalves, inoceramids, and ammonites. Lithologies are interbedded, unit is recessive, 0 to 819 m thick (see spot thickness). Marine offshore shelf, periodically sediment starved.

JURASSIC AND CRETACEOUS

LOWER JURASSIC TO LOWER CRETACEOUS

TOARCIAN TO VALANGINIAN



'SAVIK beds', AWINGAK AND DEER BAY FORMATIONS, undivided.

TRIASSIC AND JURASSIC

UPPER TRIASSIC AND LOWER JURASSIC

NORIAN TO PLEIENSCHACHIAN



HEIBERG FORMATION, undivided: **Sandstone**, quartz arenite, fine-grained grading upwards to fine- and medium-grained, locally calcite-cemented, weathers yellowish-brown and hematitic red, minor **siltstone** and **shale** in the lower part; bivalves common in the lower part, plant fossils in the upper part. Lithologies are interbedded, unit is resistant and 213 to 1250 m thick (see spot thickness). Mixed nearshore marine grading upwards to nonmarine progradational delta complex.

TRIASSIC

MIDDLE TRIASSIC AND UPPER TRIASSIC

LADINIAN TO CARNIAN

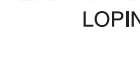


BLAA MOUNTAIN GROUP, undivided: **Shale** and **siltstone** dark grey to black; weathers grey, yellowish-brown and reddish-brown; minor **clay ironstone**, in layers and concretions, rare **limestone** containing belemnites, Halobia bivalves and rare ammonites. Lithologies are interbedded, unit is recessive, upper exposed part exceeds 700 m in thickness; possibly to 2500 m thick in the subsurface. Marine offshore shelf and basin slope.

PERMIAN AND TRIASSIC

LOPINGIAN AND LOWER TRIASSIC

CHANGHSINGIAN TO SPATHIAN



BLIND FIORD FORMATION, undivided: **Shale**, dark grey and **siltstone**, minor **sandstone**, quartz arenite, fine-grained. Lithologies are interbedded, unit is recessive, upper exposed part exceeds 600 m in thickness; possibly to 1500 m thick in the subsurface. Marine basin slope and other deep-water settings.

PERMIAN

CISURALIAN TO LOPINGIAN

KUNGURIAN TO CHANGHSINGIAN



VAN HAUEN FORMATION: **Shale**, siliceous, dark grey to black, and minor **chert**, argillaceous and spiculitic, uncommon **limestone**. All lithologies are interbedded. This is a subsurface unit only. Thickness at Buchanan Lake on eastern Axel Heiberg Island is 160 m. Marine basin slope and sediment-starved deep-water settings. (Unit shown in Figure 3.)

CARBONIFEROUS AND PERMIAN

PENNSYLVANIAN TO CISURALIAN

BASHKIRIAN TO KUNGURIAN



HARE FIORD and TRAPPERS COVER FORMATIONS, undivided: **Shale**, dark brown and greenish-grey, **chert**, **siltstone**, and **marl**, often containing shelly fossil debris. All lithologies are cyclically interbedded. This is a subsurface unit only. Thickness at Buchanan Lake on eastern Axel Heiberg Island is 300 m. Sediment gravity flows in marine basin slope and deep-water settings. (Unit shown in Figure 3.)

PERMIAN AND CARBONIFEROUS

HARE FIORD, TRAPPERS COVER and VAN HAUEN FORMATIONS, undivided. (Subsurface only, shown on structural cross-sections).

CARBONIFEROUS

PENNSYLVANIAN

SERPUKHOVIAN TO MOSCOVIAN

OTTO FIORD FORMATION (Cof–Cof-bx)



Breccia, variously clast-supported and matrix-supported, angular clasts of limestone, dolostone and sandstone in a sparse matrix of quartz arenite sand and mud; common pyrite replacement, iron oxide gossan, disseminated and massive iron sulphides. Diapirism-related evaporite-dissolution collapse breccias; slope debris flows; superimposed evidence of hydrothermal activity.



Limestone, grey to yellowish-brown weathering and fetid, minor **dolostone**, fossiliferous; evidence of in situ brecciation, common pyrite replacement, iron oxide gossan, disseminated and massive iron sulphides; occurs as tectonically dismembered beds, rafts and blocks within evaporite diapirs or as mappable layers on the outer margins of diapirs and salt walls. Restricted and unrestricted shallow marine settings; residual carbonate produced by dissolution of soluble evaporite interbeds.



Anhydrite and **gypsum**, and probable subsurface rock **salt** (bedded halite) containing blocks and tectonic rafts of minor **limestone**, **dolostone** and **diabase**. Rift-related evaporites exposed in diapirs, subhorizontal sheets and salt walls.

