

Geology of the Quatsino-Port McNeill Area, Northern Vancouver Island

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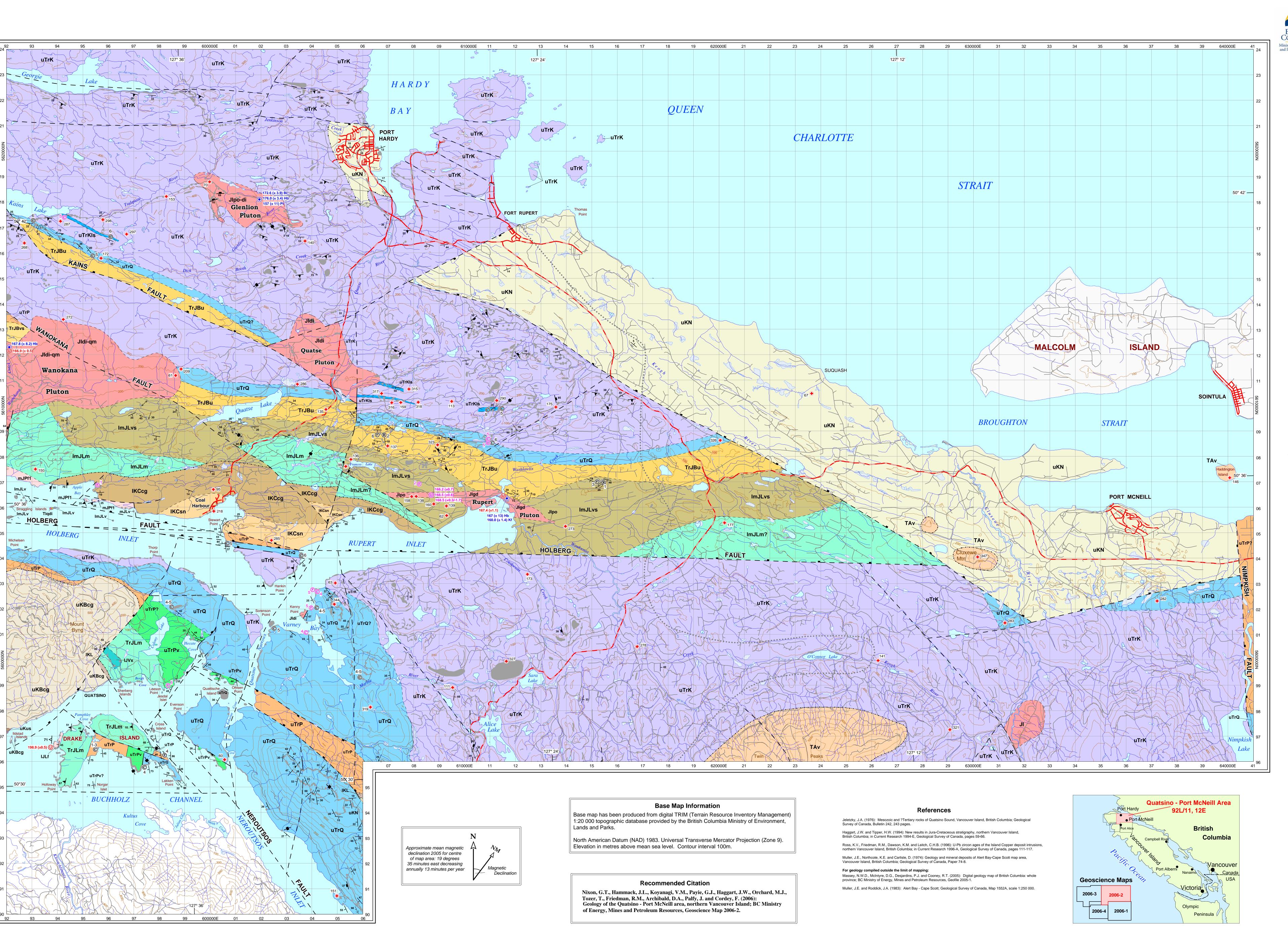
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BC Geological Survey GEOSCIENCE MAP 2006-2



Geology of the Quatsino-Port McNeill Area, Northern Vancouver Island

NTS 92L/11, 12E

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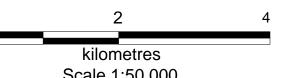
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PALEONTOLOGY

GEOCHRONOLOGY

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LAYERED ROCKS

Basaltic to rhyolitic, aphanitic to porphyritic flows, flow domes and volcanic breccia; minor volcanic conglomerate, sandstone and debris-flow deposits

UPPER CRETACEOUS

NANAIMO GROUP EQUIVALENTS (IN PART)

Campanian to ?Maastrichtian Medium to coarse-grained arkosic to lithic wacke, pebble to cobble conglomerate, siltstone and minor coal; locally fossiliferous.

Cenomanian or Early Turonian to ?Santonian

BLUMBERG FORMATION Massive to thinly bedded lithic to arkosic wacke with minor pebble to

cobble conglomerate. Massive conglomerate with minor lenses of coarse-grained lithic wacke.

Cenomanian to ?Turonian

Dark grey, calcareous to non-calcareous siltstone and impure limestone interbedded with subordinate wacke and minor pebble conglomerate.

LOWER CRETACEOUS COAL HARBOUR GROUP

> Upper sandstone facies: through cross-laminated lithic wacke intercalated with siltstone, minor pebble conglomerate and rare coal.

Lower conglomerate facies: massive conglomerate with minor lenses of coarse-grained

Late Valanginian to Barremian LONGARM FORMATION EQUIVALENTS

Thinly bedded to massive sandstone, siltstone, mudstone, pebble conglomerate

and minor coal; locally fossiliferous.

UPPER TRIASSIC (CARNIAN) TO MIDDLE JURASSIC (MID-BAJOCIAN) **BONANZA GROUP**

Rhaetian or Hettangian to mid-Bajocian (Quatsino - Port McNeill Area) LEMARE LAKE VOLCANICS (subdivided by lithotype) Age designation: mJ, Middle Jurassic; lmJ, Lower and/or Middle Jurassic;

lJ, Lower Jurassic; TrJ, uppermost Triassic - lowermost Jurassic Undifferentiated basaltic to rhyolitic, predominantly subaerial lavas and pyroclastic rocks including ash-flow and rare airfall tuffs and reworked equivalents, minor pillow lavas, breccia, hyaloclastite and pyroclastic surge deposits, locally intercalated with marine to non-marine, volcanic

conglomerate, sandstone, siltstone, mudstone, impure limestone and localized debris-flow deposits. Mainly rhyolitic or dacitic to rhyolitic lavas and/or pyroclastic rocks, including flow and pyroclastic breccias, welded to non-welded crystal-lithic lapilli tuffs and rare airfall tuffs;

may include thin interbedded sedimentary deposits. Mainly basaltic to andesitic lava flows with minor intercalated volcaniclastic and sedimentary lithologies similar to Lvs; locally includes minor pillow lava and breccia.

Mainly basaltic to andesitic volcanic breccia of epiclastic and pyroclastic origin, and

variably reworked lithic-crystal tuff; locally fine-grained sedimentary interbeds. Interbedded volcaniclastic and sedimentary strata, includes lithic and crystal-lithic lapilli tuffs and reworked equivalents, pyroclastic and epiclastic volcanic breccias,

phreatomagmatic deposits; may include rare lava flows.

Middle Jurassic (mid-Bajocian) Pemberton Hills Rhyolite

Rhyolitic lavas and ash-flow tuffs with minor intercalated epiclastic deposits (subunit 1).

sandstone, siltstone, mudstone, impure limestone, and minor debris-flow and

Hettangian (or possibly Rheatian to Sinemurian) (Quatsino - Port McNeill Area) Victoria Lake Megacrystic Basalt

Plagioclase-megacrystic basaltic to andesitic lavas locally intercalated with, and laterally

equivalent to, aphanitic and plagioclase-phyric flows near the base of the LeMare Lake

Rhaetian to Hettangian or ?Sinemurian (Quatsino - Port McNeill Area)

VOLCANICLASTIC-SEDIMENTARY UNIT Interbedded volcaniclastic and lesser sedimentary strata (predominantly submarine): buff to grey-green, thin to very thickly bedded, calcareous to non-calcareous, volcanic breccia, lithic and feldspathic wacke, siltstone and impure limestone; lithic-crystal tuff,

volcaniclastic debris-flow breccia.

Early Norian to Hettangian or Sinemurian (Quatsino - Port McNeill Area) Undivided strata of the Parson Bay Formation and overlying volcaniclastic-sedimentary lithologies in the basal part of the Bonanza Group in areas of sparse outcrop north of

lapilli tuff and reworked equivalents; and minor vitric tuff, pebbly sandstone, shale and

(late) Early Norian to Rhaetian or ?Hettangian (Quatsino - Port McNeill Area) PARSON BAY FORMATION

Holberg Inlet and outside the limit of mapping.

Medium grey to black, laminated to medium bedded impure limestone, calcareous to non-calcareous mudstone, siltstone, and shale, locally intercalated with minor grey-green lithic wacke, feldspathic wacke, lithic, crystal and vitric tuff and reworked equivalents and volcaniclastic breccia, and rare pebbly sandstone, conglomerate and debris-flow deposits; calcareous facies locally contain colonial coral horizons; organicrich facies comprise carbonaceous to graphitic shales, mudstone and limestone; locally abundant fossils.

Volcaniclastic and volcanic lithologies: predominantly basaltic to andesitic epiclastic waterlain breccias and tuffs, includes lithic lapilli tuff and tuff-breccia of phreatomagmatic origin; minor pillow lava and hyaloclastite; locally interbedded fine-grained volcaniclastic and sedimentary rocks.

LAYERED ROCKS (Cont'd)

UPPER TRIASSIC

VANCOUVER GROUP

Carnian to (late) Early Norian (Quatsino - Port McNeill Area) QUATSINO FORMATION

Medium to pale grey, thinly bedded to massive micritic limestone and locally bioclastic limestone; minor silica replacements and chert nodules; rare laminated interbeds, oolitic layers and algal mats; locally fossiliferous.

KARMUTSEN FORMATION

Aphanitic to plagioclase-phyric and locally plagioclase-megacrystic basaltic lava flows, commonly amygdaloidal; predominantly subaerial flows in the upper part of the succession; may include minor pillow lava, breccia and hyaloclastite. Trend of thin grey limestone beds and lenses intercalated with basalt

INTRUSIVE ROCKS

TERTIARY (?Neogene)

Medium grained quartz diorite possibly equivalent to Alert Bay Volcanics (known only on Straggling Islands in Holberg Inlet).

EARLY TO MIDDLE JURASSIC **ISLAND PLUTONIC SUITE**

Medium to coarse-grained, equigranular granitoid rocks and porphyry; includes hornblende +/- biotite-bearing diorite (di),

near the top of the succession.

plagioclase +/- hornblende porphyry (po), quartz monzonite/monzodiorite (qm) and granodiorite (gd).

MAP SYMBOLS

———— Geological contact, defined

Geological contact, approximate – – – – Geological contact, inferred

High-angle fault, defined (block on downthrow side if known) — — – High-angle fault, approximate ─ ─ ─ ─ ─ High-angle fault, inferred

----- Unconformity, approximate ----- Unconformity, inferred ····· Limit of mapping

Bedding, inclined

Primary flow lamination in volcanic rocks, inclined Welding, inclined

Cleavage, fault-related, inclined Lineation (slickenfibres on fault plane)

Lineation (slickenfibres on fault plane), horizontal Plunge of minor fold axis

Minor fold with dip of axial plane Dike, inclined, vertical Macrofossil locality (with indicated age)

1 Early Cretaceous 2 Middle Jurassic (Aalenian) 3 Early Jurassic (Sinemurian) 4 Late Triassic (Late Norian)

5 Late Triassic (Early Norian) 6 Late Triassic GSC macrofossil locality (ages as above)

Conodont locality (with indicated age) 1 Late Triassic (Rhaetian) 2 Late Triassic (Late Norian)

3 Late Triassic (Middle Norian) 4 Late Triassic (Early Norian) 5 Late Triassic (Carnian - Late Carnian)

6 Late Triassic GSC conodont locality (ages as above) Radiolaria locality (with indicated age)

1 Early Jurassic (Sinemurian - Pliensbachian) 2 Late Triassic (Late Carnian - Middle Norian) Ar40/Ar39 mineral date (Ma, 2 sigma error); Hb: hornblende; Kf: K-feldspar; Bi: biotite U-Pb zircon date (Ma, 2 sigma error);

167 (± 1.0) Ross et al. (1996) U-Pb zircon date (Ma, 2 sigma error) MINFILE locality (92L 10)

Outcrop examined Outcrop too small to show at map scale

Roads, paved ———— Roads, dirt

> **Data Compilation** G.T. Nixon, K.A. Johnston and M.C. Kelman

Digital Cartography: X.A. Johnston