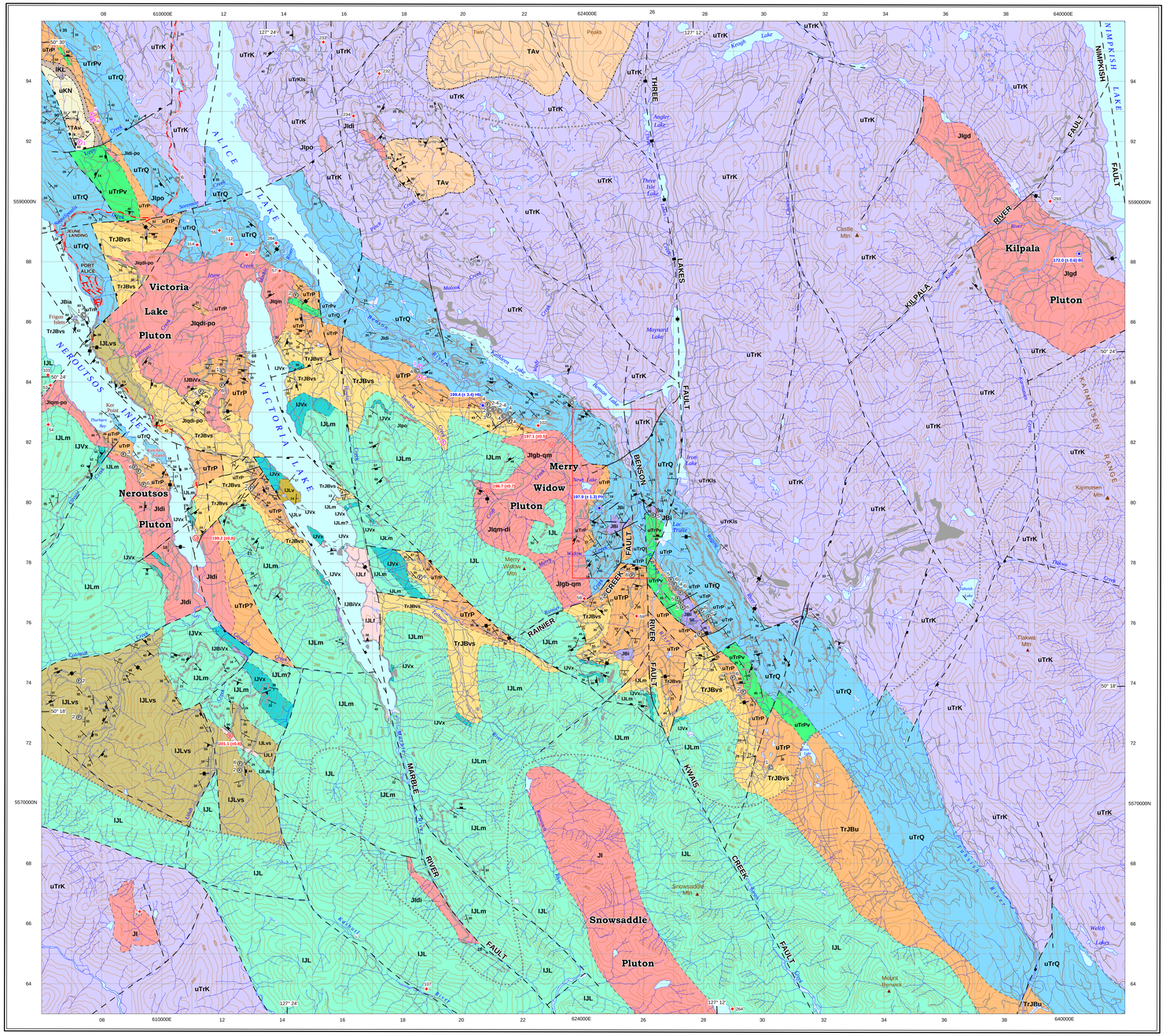


BC Geological Survey
GEOSCIENCE MAP 2006-1

Geology of the Alice Lake Area, Northern Vancouver Island

NTS 92L/6

G.T. Nixon, L.D. Snyder, G.J. Payie, S. Long, A. Finnie, R.M. Friedman, D.A. Archibald, M.J. Orchard, T. Tozer, T.P. Poulton and J.W. Haggart

PALEONTOLOGY
by
M.J. ORCHARD, T. TOZER, T.P. POULTON and J.W. HAGGART (Geological Survey of Canada)

GEOLOGY
by
G.T. NIXON, L.D. SNYDER and G.J. PAYIE (BC Geological Survey)
S. LONG and A. FINNIE (University of Plymouth)

GEOCHRONOLOGY
by
R.M. FRIEDMAN (The University of British Columbia)
D.A. ARCHIBALD (Queen's University)

0 2 4
kilometres
Scale 1:50 000

LAYERED ROCKS

TERTIARY
Neogene
ALERT BAY VOLCANICS

TAv — 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

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

LOWER CRETACEOUS
Late Valanginian to Barremian
LONGARM FORMATION EQUIVALENTS

IKL — 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 Pliensbachian (Alice Lake Area)
LEMARE LAKE VOLCANICS (subdivided by lithotype)
Age designation: IJ, Lower Jurassic

L — 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.

Lf — 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.

Lm — Mainly basaltic to andesitic lava flows with minor intercalated volcaniclastic and sedimentary lithologies similar to Lvs; locally includes minor pillow lava and breccia.

Lv — Mainly basaltic to andesitic volcanic breccia of epiclastic and pyroclastic origin, and variably reworked lithic-crystal tuff; locally fine-grained sedimentary interbeds.

Lvs — Interbedded volcaniclastic and sedimentary strata, includes lithic and crystal-lithic lapilli tuffs and reworked equivalents, pyroclastic and epiclastic volcanic breccias, sandstone, siltstone, mudstone, impure limestone, and minor debris-flow and phreatomagmatic deposits; may include rare lava flows.

Hettangian (or possibly Rhaetian to Sinemurian) (Alice Lake Area)
Victoria Lake Megacrystic Basalt

IJVx — 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 Volcanics.

Rhaetian to Hettangian or ?Sinemurian (Alice Lake Area)
VOLCANICLASTIC-SEDIMENTARY UNIT

TrJBvs — 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, lapilli tuff and reworked equivalents; and minor vitric tuff, pebbly sandstone, shale and volcaniclastic debris-flow breccia.

(late) Early Norian to Hettangian or Sinemurian (Alice Lake Area)

TrJBu — Undivided strata of the Parson Bay Formation and overlying volcaniclastic-sedimentary lithologies in the basal part of the Bonanza Group outside the limit of mapping.

(late) Early Norian to Rhaetian or ?Hettangian (Alice Lake Area)
PARSON BAY FORMATION

uTrP — 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; organic-rich facies comprise carbonaceous to graphitic shales, mudstone and limestone; locally abundant fossils.

uTrPv — 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.

UPPER TRIASSIC
VANCOUVER GROUP
Carnian to (late) Early Norian (Alice Lake Area)
QUATSINO FORMATION

uTrQ — 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.

Carnian
KARMUTSEN FORMATION

uTrK — 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.

uTrKls — Trend of thin grey limestone beds and lenses intercalated with basalt near the top of the succession.

INTRUSIVE ROCKS

EARLY TO MIDDLE JURASSIC
ISLAND PLUTONIC SUITE

JI — Medium to coarse-grained, equigranular granitoid rocks and porphyry; includes hornblende+/-biotite-bearing gabbro (gb), diorite (di), quartz diorite (qdi), plagioclase+/-hornblende porphyry (po), quartz monzonite/monzodiorite (qm) and granodiorite (gd).

Minor Intrusions

JBi — Subvolcanic basaltic to andesitic, aphanitic to porphyritic intrusions; may include diabase; JBa: augite-phyric basaltic intrusion.

IJBiVx — Subvolcanic plagioclase-megacrystic dikes and sills; probably equivalent to Victoria Lake megacrystic basalt.

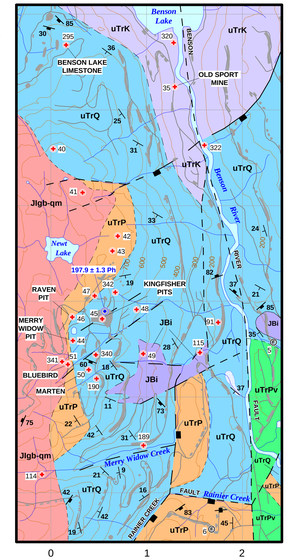
MAP SYMBOLS

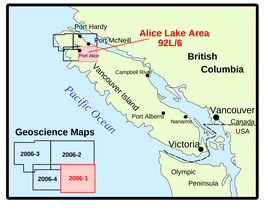
- Geological contact, defined
- Geological contact, approximate
- Geological contact, inferred
- Unconformity, approximate
- Unconformity, inferred
- High-angle fault, defined (block on downthrown side if known)
- High-angle fault, approximate
- High-angle fault, inferred
- Limit of mapping
- Bedding, inclined
- Primary flow lamination in volcanic rocks, inclined
- Cleavage, fault-related, inclined, vertical
- Lineation (slickenfibres on fault plane), inclined, horizontal
- Minor fold with dip of axial plane
- Dike, inclined, vertical
- Macrofossil locality (with indicated age)
  1 Late Jurassic - Cretaceous
  2 Early Jurassic (Sinemurian - Pliensbachian)
  3 Late Triassic
  4 Late Triassic (Late Norian)
  5 Late Triassic (Early - Middle Norian)
  6 indeterminate
- 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)
- Ar40/Ar39 mineral date (Ma, 2 sigma error); Hb: hornblende; Ph: phlogopite; Bi: biotite
- 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

Approximate mean magnetic declination (2005) for centre of map area: 19 degrees 28 minutes east decreasing annually 12 minutes per year

N — Magnetic Declination

MERRY WIDOW Cu-Fe-Au SKARN CAMP





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Base Map Information

Base map has been produced from digital TRIM (Terrain Resource Inventory Management) 1:20 000 topographic database provided by the British Columbia Ministry of Environment, Lands and Parks.

North American Datum (NAD) 1983. Universal Transverse Mercator Projection (Zone 9). Elevation in metres above mean sea level. Contour interval 100m.

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

Digital Cartography: K.A. Johnston