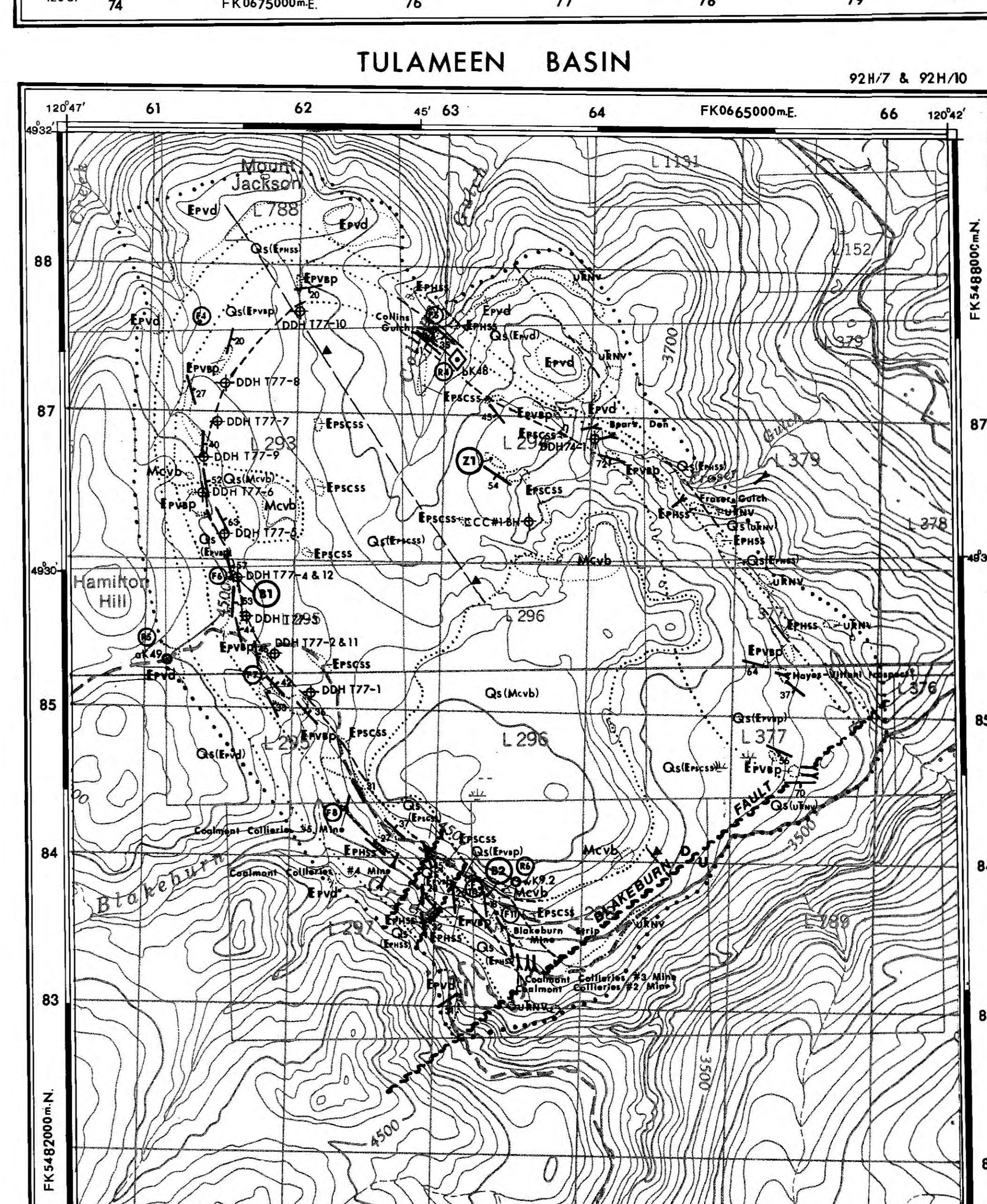
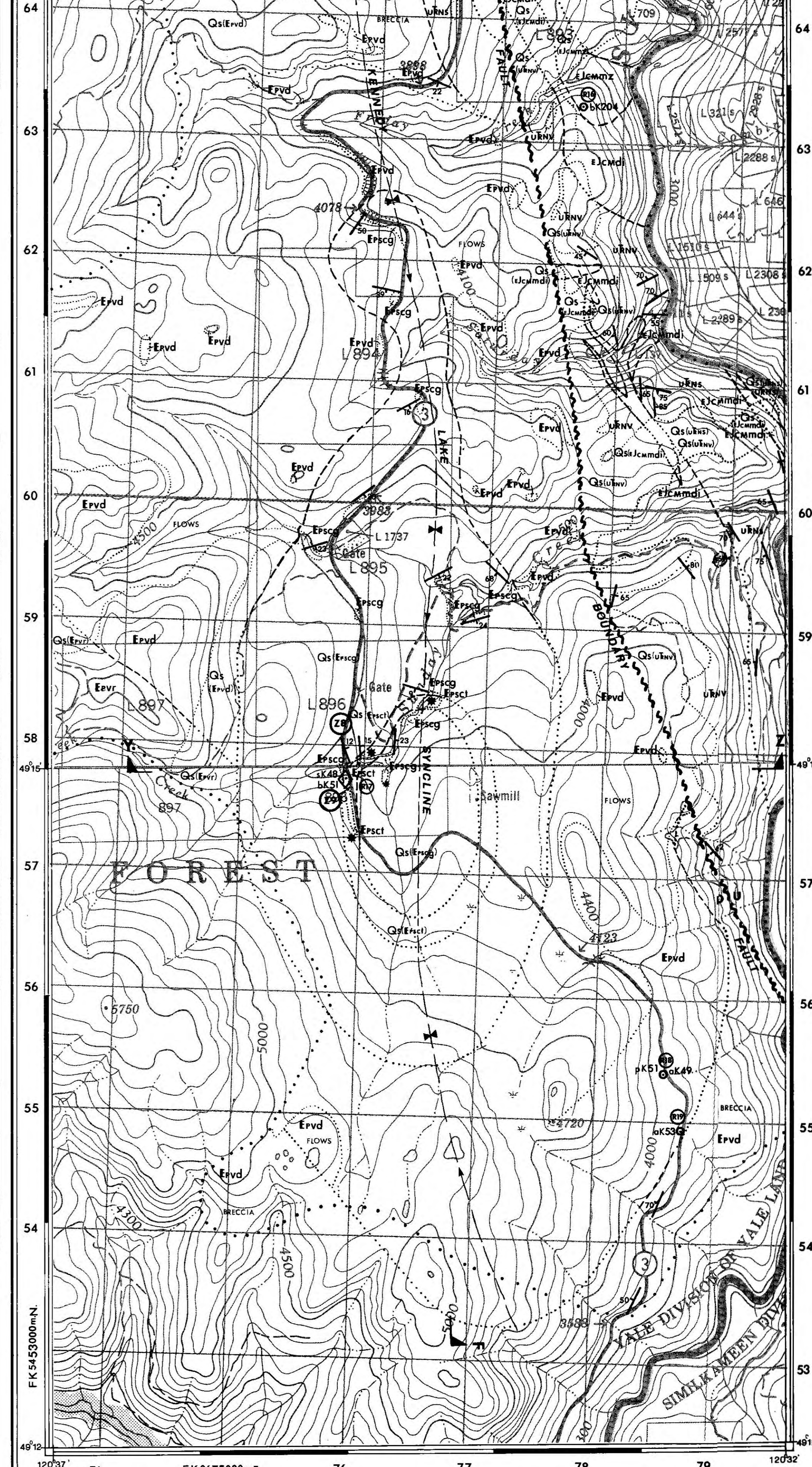
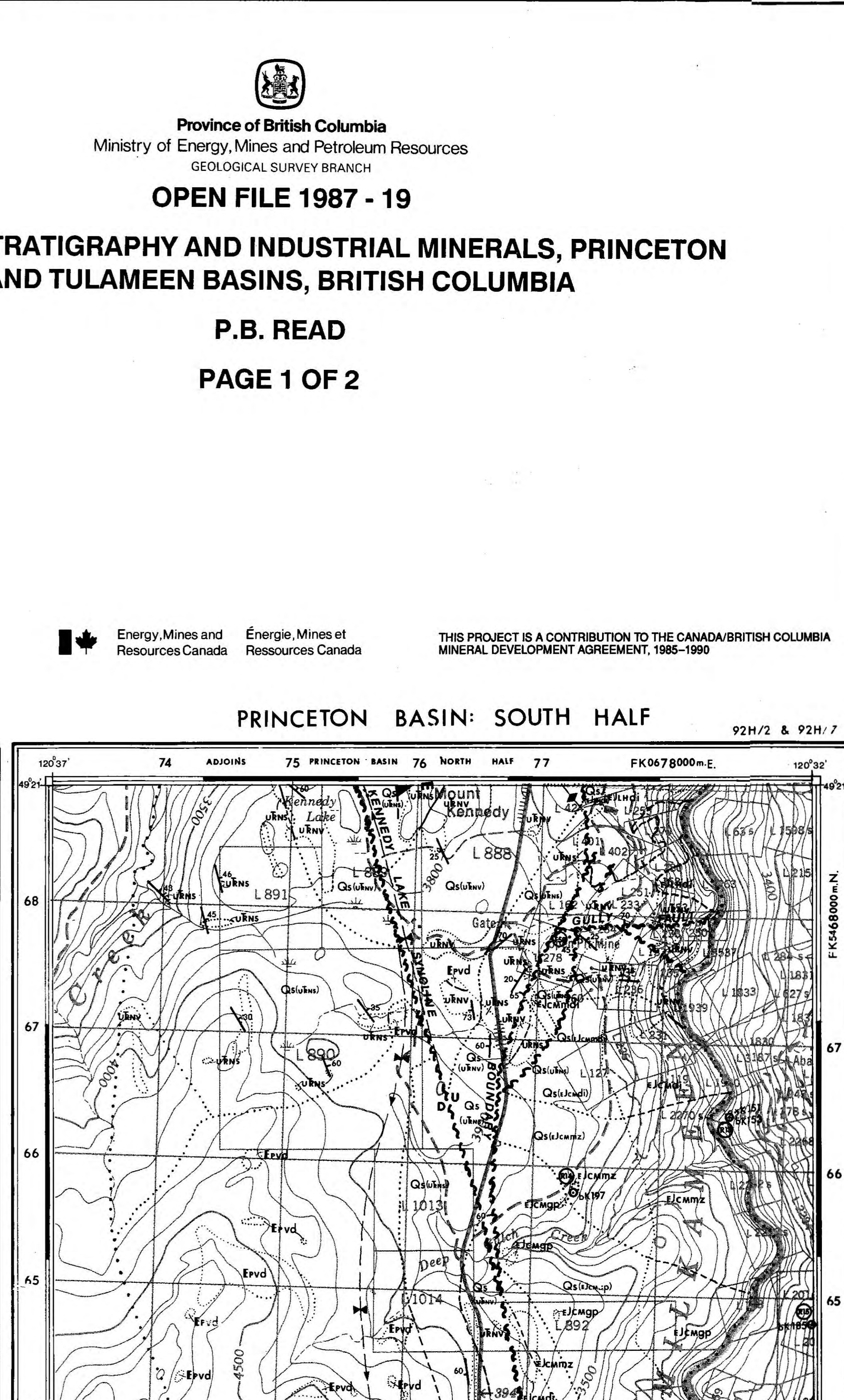
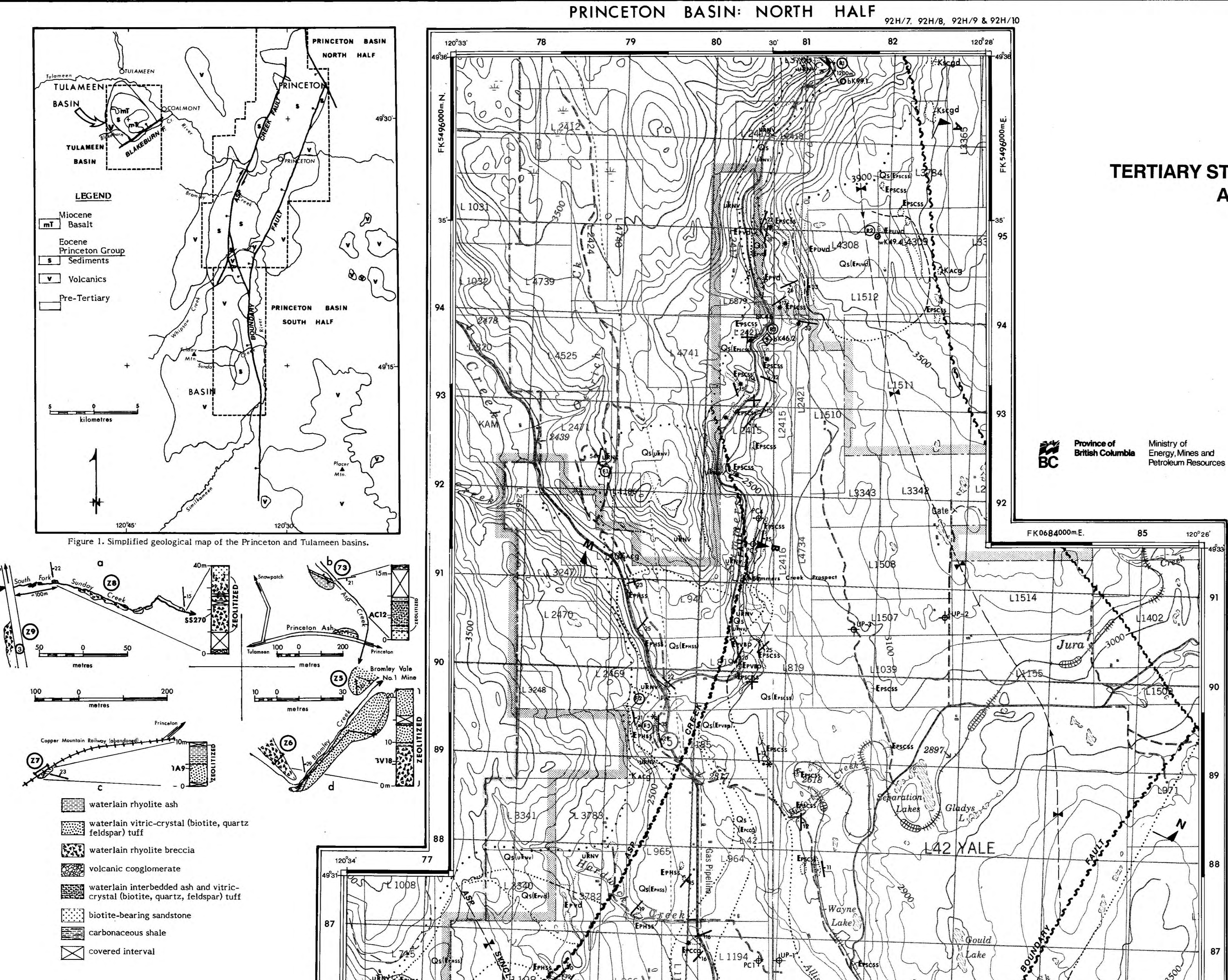


- LEGEND
QUATERNARY
PLISTOCENE AND RECENT
Unconsolidated sedimentary glacial deposits, colluvium and alluvium; few if any outcrops probable above up within parentheses.
TERTIARY
MIOCENE AND PLIOCENE
CHILCOTIN GROUP
Basaltic and andesitic flows and andesitic tuff.
MIDDLE EOCENE
PRINCETON GROUP
UPPER VOLCANIC FORMATION
Andesitic and porphyritic (felspathic) rhyolite flows and breccia.
Light to dark grey porphyritic (felspathic) andesite flows.
ALLENBY FORMATION
Ahnaha Shale; Grey shale, carbonaceous shale, minor thin sandstone beds.
Bromley Vale Tephra; Bedded, vitric-crystal (biotite, quartz, plagioclase, sanidine) zeolitized rhyolite tuff and volcanic breccia.
Tullings Ash; Bedded, cream-coloured, vitric-crystal (biotite, quartz, plagioclase, sanidine) zeolitized rhyolite tuff and volcanic breccia.
Power Plant Shale; Grey shale, carbonaceous shale, and coal; minor thin sandstone beds.
Summers Creek Sandstone; White to ochre-weathering sandstone; Summers Creek tuffaceous (crystal-vitric) zeolitized sandstone grading northward to crystal (biotite, quartz, plagioclase, sanidine) tuff; minor siltstone and shale; rare carbonaceous shale and coal.
PRINCETON ASH; Vitric-crystal (biotite, quartz, plagioclase, sanidine) rhyolite tuff.
ASP CREEK ASH; Bedded, cream-coloured, vitric-crystal (biotite, quartz, plagioclase, sanidine) zeolitized rhyolite tuff and volcanic breccia.
VERMILION BLUFFS SHALE; Grey shale, carbonaceous shale, and coal; local maroon shale; minor thin sandstone beds.
SILKMEEN RIVER; Buff to brown weathering pebble conglomerate, volcanic sedimentary breccia, feldspar, and sandstone.
SPOWATCH ASH; Ochre-yellow weathering, vitric-crystal (biotite, quartz, plagioclase, sanidine) zeolitized tuffaceous sandstone; minor rhyolite tuff.
HARDWICK SANDSTONE; White-weathering sandstone, minor siltstone, rare shale (E+H); local basal conglomerate and lithic grit.
SANDY CREEK TEPHRA; Light buff-green vitric-crystal (biotite, hornblende, quartz, plagioclase, sanidine) zeolitized rhyolite tephra.
UNDIVIDED; sandstone, shale.
CEDAR FORMATION
Cream-weathering porphyritic (felspathic) rhyolite flows and breccia.
Red brown to grey vesicular, porphyritic (felspathic) dacite, andesite and basalt flows and breccia; cross pattern indicates probable intrusions.
TRIASSIC
NICOLA GROUP
Porphyritic (augite) and aphyric andesite and basalt flows and crystal-lithic tuff; minor volcanic breccia.
Grey tuffaceous limestone.
Bedded tuffaceous wacke and argillite.
CRETACEOUS
ALLISON CREEK STOCKS; Pink to grey porphyritic leucogranite.
SUMMERS CREEK STOCK; Grey biotite-hornblende granodiorite, pinkish grey biotite quartz monzonite; minor pink granite.
EARLY JURASSIC
LOST HORSE INTRUSIONS; Porphyritic (augite) and biotite-augite microdiorite, microzononite and microyenite.
COPPER MOUNTAIN STOCK; Microdiorite and quartz latite porphyry dykes.
Pegmatite, syenite, perthosite.
Monzonite.
Diorite; minor gabbro.
SMELTER LAKE STOCK; Diorite.
Geological boundary
Fault
Bedding
Flow layering
Foliation
Trace of axial surface
Zeolite-bearing
Bentonite-bearing
Radiometric date
Location and rock type
Limit of mapping



TERTIARY STRATIGRAPHY AND INDUSTRIAL MINERALS, PRINCETON AND TULAMEEN BASINS, SOUTHERN BRITISH COLUMBIA (92H/7, 92H/8, 92H/9, 92H/10)
P.B. READ
INTRODUCTION
Princeton Basin is a northerly trending trough partly filled by Eocene volcanic rocks of intermediate composition...
INDUSTRIAL MINERALS OF THE PRINCETON AND TULAMEEN BASINS
Zeolites
Prior to this investigation, Princeton Basin contained the only bedded zeolite deposit (ZA) known in southern British Columbia south of latitude 51°N (Stora and Kwong, 1984)...
In the northern portion of the basin, Asp Creek ash is the stratigraphically lowest...
SUMMERS CREEK SANDSTONE contains a vitric-crystal (biotite, quartz, plagioclase, sanidine) tuff...
Bentonite
Bentonite is widespread throughout the north half of Princeton Basin, usually occurring in the shale and coal-rich sections of the stratigraphy in layers up to 2 metres thick...
TULAMEEN BASIN
In Tulameen Basin, bentonite layers (up to a metre thick) are part of the middle shale and coal section. Calcium exchange analyses of two bentonite samples from a metre-thick seam near the top of the coal section, as exposed in bore hole 177-12 to the east of Hamilton Hill (H1) and in Nakaburn strip mine (N2), indicate that calcium and magnesium are the major exchangeable cations (Freyer et al., 1985).

DRILL HOLES
COMPANY # of holes REFERENCE
Bethlehem Copper Corporation Ltd. 15 Anderson 1972, 1976
Blackmore boreholes 2 Rice 1947
Cominco 7 Nicholson 1981
Fording Coal Limited 5 Carpenter 1980
Graby borehole 1 Shaw 1952a
Sharp's borehole 1 Rice 1947
Vermilion Forks Mining and Development Company 6 Rice 1947
ADITS
Ashington Mine
Black Mine & Granby Strip Mine
Blue Flame Mines (2)
Bromley Vale Mines (2)
Harris Prospect
China Creek Prospect
Deer Valley Prospect
Gem Mine
Fairley Prospect
Golden Glow Prospect
Jackson #1 Mine
Pleasant Valley Mines (3)
Princeton Mines (3)
Princeton Tulameen Mine
Red Triangle Mine
Summers Creek Prospect
Taylor #1 Mine
Tulameen Mines (3)
United Empire Mine

Geology by Geotec Consultants Limited, P.B. Read, 1977, 1978 and 1986.
Scale: 1:25,000

TERTIARY STRATIGRAPHY AND INDUSTRIAL MINERALS, PRINCETON AND TULAMEEN BASINS, BRITISH COLUMBIA

P.B. READ
PAGE 2 OF 2

TABLE 1
EXCHANGEABLE Ca, Na, K, AND Mg ANALYSES
AND CATION EXCHANGE CAPACITY (CEC)

Table with columns: Unit, Loc #, Exchangeable Cation Analysis (Mg, Ca, K, Na, Total), CEC (meq/100g). Rows include Tulameen Basin, Vermilion Bluffs shale, Princeton Basin, and Summers Creek sandstone.

TABLE 2
INDUSTRIAL MINERALS IN PRINCETON AND TULAMEEN BASINS

Table with columns: Loc #, Property, Commodity, Status, Location (Easting, Northing), Cert, Mintile Number. Lists various mineral locations and their details.

TABLE 3
VITRINITE REFLECTANCE, PRINCETON BASIN

Table with columns: Loc #, UTM Coordinates (Easting, Northing), Elev., Rock Unit, Stratigraphic Level. Lists vitrinite reflectance data for various locations.

TABLE 4A
PALEONTOLOGY & PALYNOLOGY, PRINCETON AND TULAMEEN BASINS

Table with columns: Map No., UTM Coordinates (Easting, Northing), Elev., Rock Unit, Age & (Reference). Lists paleontological and palynological findings.

TABLE 4B
RADIOMETRIC DATING, PRINCETON AND TULAMEEN BASINS

Table with columns: Map No., UTM Coordinates (Easting, Northing), Elev., Rock Unit, Age & (Reference). Lists radiometric dating results.

TABLE 5
STRATIGRAPHIC CORRELATION OF COAL SEAMS

Table with columns: Mine or Prospect, Rock Unit, Coal Zone or Seam, Stratigraphic Level. Correlates coal seams across different mines.

References section listing various geological and scientific publications related to the study, including works by Anderson, Miller, Nicholson, etc.

