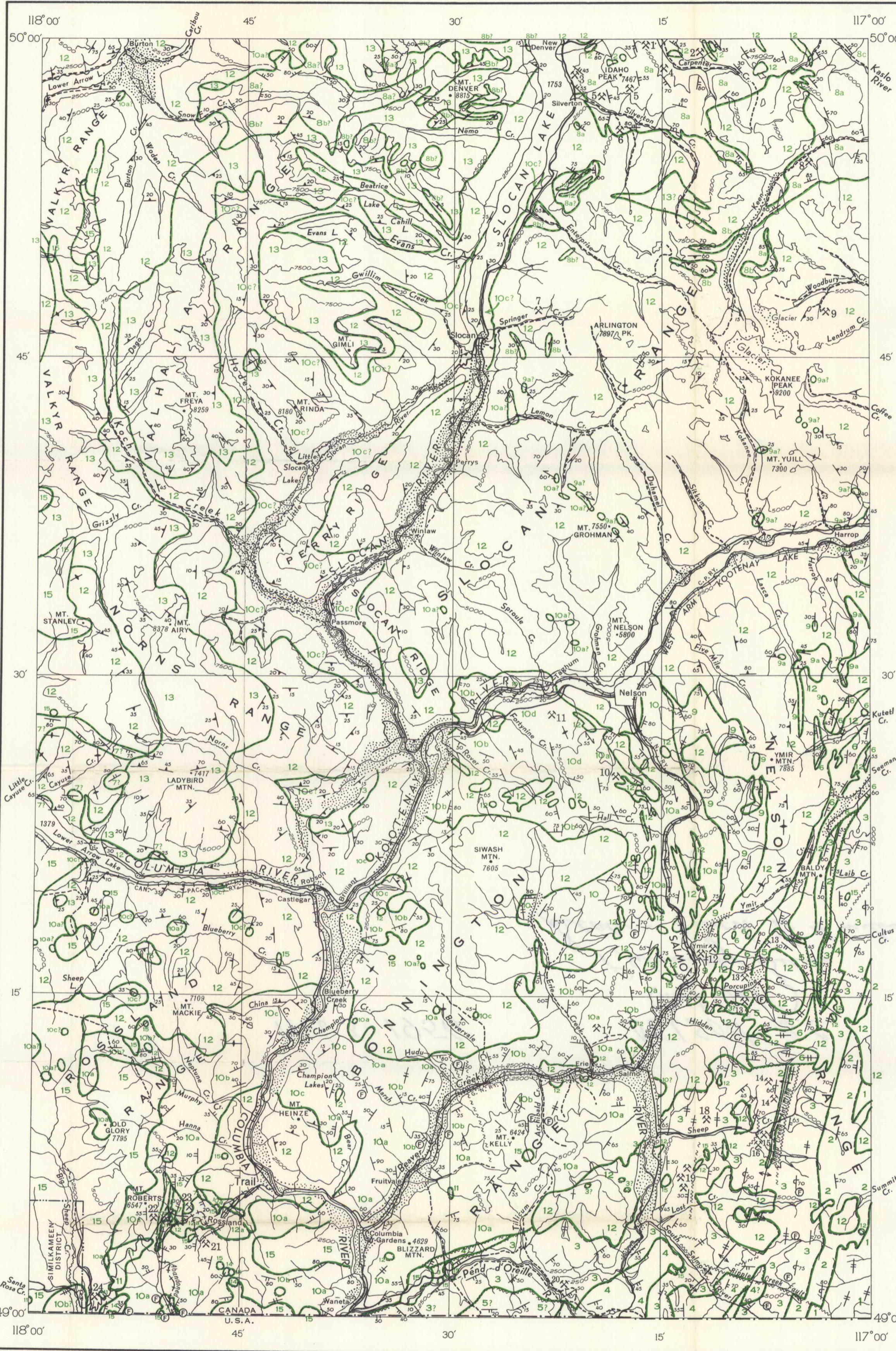


LEGEND

PRELIMINARY SERIES



DESCRIPTIVE NOTES

The Late Proterozoic (Windermere) strata (1, 2) comprise, in ascending stratigraphic order, the Toby, Irene Volcanic, Monk, and, probably, Three Sisters formations. Only the upper few hundred feet of the Toby formation, which is mainly conglomerate, are exposed in the map-area. Except for a possible local unconformity at the base of Monk formation, the Windermere rocks appear to be conformable with one another and with the overlying Cambrian rocks. Approximate thicknesses of the Windermere formations at the International Boundary are: Toby, 5,000 feet; Irene Volcanic, 6,000 feet; Monk, 4,200 feet; Three Sisters 6,000 feet. About 15 miles north along the strike, the Three Sisters formation is about 4,300 feet thick, and farther west where the base is not exposed, it is at least 2,610 feet thick.

The Lower Cambrian rocks (3) comprise, in ascending stratigraphic order, the Quartzite Range, Reno and Laib formations. The Quartzite Range formation is 4,400 feet thick in the southeast part of the map-area and about 2,000 feet thick farther west near Sheep Creek; the Reno is 1,100 feet thick and 50 to 900 feet thick, respectively, in those localities. The Laib formation, which contains spongolites of Lower Cambrian age in the basal limestone member, is estimated to be 3,000 to 5,000 feet thick.

The contact of the Laib formation with the more calcareous Nelway formation (4) is gradational. No diagnostic fossils have been found in the Nelway formation, but south of the International Boundary there are trilobites of Middle Cambrian age in the equivalent Metaline formation (Park and Cannon, 1943). The thickness is estimated at 3,000 feet.

The contact between the Active (5) and Nelway formations has not been observed, but that between the corresponding formations in the Metaline quadrangle to the south is probably unconformable. In the Active formation has yielded only fossils of Normanskill age, the corresponding 'Ledbetter slate' to the south contains graptolites of Deepkill age also, so that the age of the Active formation is probably Lower and Middle Ordovician. It is at least 2,500 feet thick. Unit 6 may be entirely Lower Cambrian rocks, but some rocks of possibly Carboniferous age may be included.

The Ymir group (9) is believed to be largely equivalent to the Slokan group, of Triassic age. The Kaslo group (8c), in part comprising volcanic rocks, underlies the Slokan group (8a) disconformably in the northeast part of the map-area, but is not recognized in the southeast part. No accurate thicknesses of these groups are obtainable, but rough estimations are: Kaslo group, 3,000 to 6,200 feet; Slokan group, 6,800 feet to perhaps "several times this figure" (Hedley, 1952); Ymir group, 7,000+ feet.

The Ymir group is overlain with apparent conformity by two assemblages of volcanic rocks, the Elise and Beaver Mountain formations (10) separated in many places by the Hall formation (10) that is from possibly zero to 4,000 feet thick. The Hall formation has yielded fossils of Jurassic and, possibly, Cretaceous age. West of Columbia River the Elise formation is underlain unconformably by the Mount Roberts formation (7) which contains fossils of Carboniferous or Permian age.

In the southwest part of the area the rocks from Carboniferous to Jurassic age are intruded by bodies of dunite and peridotite (11) that are largely altered to serpentine, and are in turn cut by Nelson intrusions (12). The Nelson intrusions are mainly granitoid and porphyritic granite, and comprise the most abundant rock unit in the map-area. The monzonite at Rossland (12a) has been shown on the map as part of the same unit, but is actually older. It is remarkably fine grained for such a large body, and the textures suggest a metamorphic origin like that of the "pseudodiorite" near Nelson (Mulligan, 1952). In the core of the Nelson batholith the Valhalla intrusions (13) are gradational into Nelson intrusions, but cut them elsewhere. They may be distinguished from the Nelson rocks mainly by the presence of smoky quartz, rarity of feldspar phenocrysts, allotriomorphic texture, and scarcity of hornblende.

The Sophie Mountain formation (14) (Daly, 1913) rests with marked unconformity on Elise or Beaver Mountain flows, and possibly on peridotite. The formation contains pebbles of Nelson (?) intrusions and yielded fossil plants of probably Upper Cretaceous, or possibly Tertiary age. The strata have been greatly disturbed, and are cut by Coryell and Sheppard intrusions (15). The Coryell intrusions are mainly built to red syenite; the Sheppard are granite and are probably related to the Coryell, as are bodies of porphyritic augite monzonite, and pulaskite. The shonkinite stock east of Ymir resembles parts of the McGregor intrusions (Rice, 1941).

Unlike most parts of the province, the regional strike in this area is not northwest, but forms an arc. Northwest of Slokan Lake the trend is east; east of Slokan Lake it is southeast; along Kootenay Lake it is south, and near the International Boundary it is southwest. Along this arc, the structure is complex. In the northern part of the area (Hedley, 1952) the major structure is a recumbent syncline, open to the southwest and complicated by Z-folds. In the southeast, a monoclinical structure is succeeded to the west by isoclinal folds whose axial planes are vertical. In the southwest the structure is too complex for solution on the present scale of mapping.

Within the Nelson batholith the structure is more simple, as shown by the gentle dips of foliation in paragneiss and gneissosity in the granitic rocks, and by the continuity of the bands of paragneiss. Near the west edge of the map-area, where these rocks are invaded by Coryell intrusions, the structure is complex.

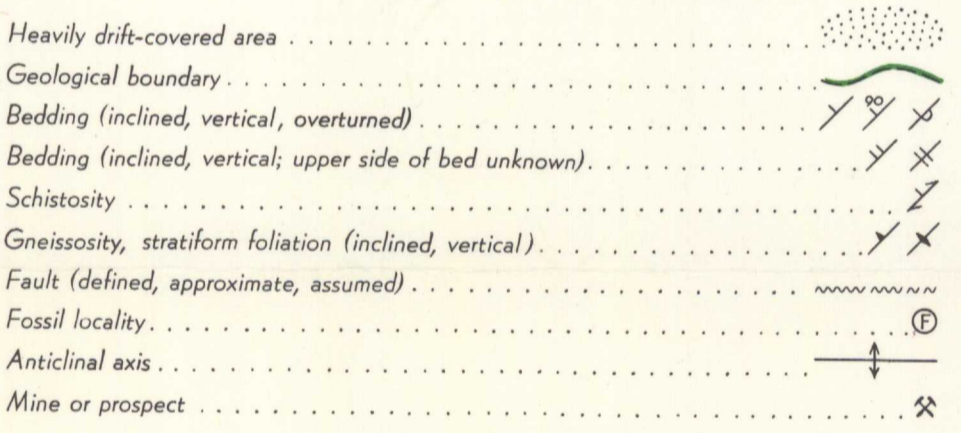
Most of the major faults in the map-area are of pre-Nelson age. The most prominent fault enters the area south of the mouth of Pend-d'Oreille River and, except where interrupted by intrusive bodies, extends northeast to the mouth of Sheep Creek, and probably east across Hidden Creek valley, thence three faults pass northeastward beyond the map-area. The fault and its branches dip steeply, at least in part. The northwest block is relatively depressed.

The Ripple Creek fault which crosses the south end of the Sheep Creek anticline, also dips steeply, and is a tear fault. The largest thrust fault is south of Pend-d'Oreille River and has thrust Ordovician (?) strata over Lower Cambrian. Along Slokan Lake and River, a wide zone of mylonite between paragneiss and Nelson granite dips gently northeast and may represent the final movement resulting from forces that caused the recumbent syncline northeast of it.

More detailed descriptions of the rocks and structures of parts of the map-area may be found in the following publications:

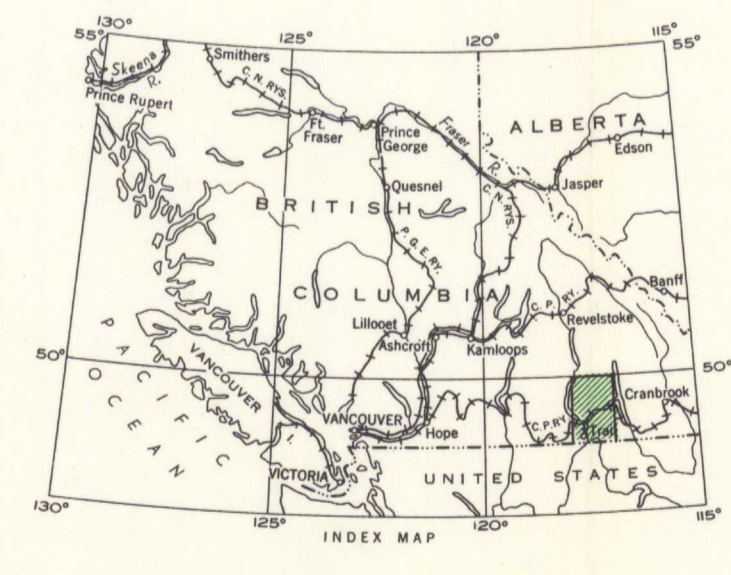
- McConnell, R. G. and Brock, R. W.: West Kootenay Sheet; Geol. Surv., Canada, Map 792 (1904).
- Daly, R. A.: Geology of the North American Cordillera at the Forty-ninth Parallel; Geol. Surv., Canada, Mem. 38 (1913).
- Orysdale, C. W.: Geology and Ore Deposits of Rossland; Geol. Surv., Canada, Mem. 77 (1915).
- Caimes, C. E.: Slokan Mining Camp, B.C.; Geol. Surv., Canada, Mem. 173 (1934).
- Rice, H. M. A.: Nelson Map-area, East Half, B.C.; Geol. Surv., Canada, Mem. 228 (1941).
- Park, C. F., Jr. and Cannon R. S., Jr.: Geology and Ore Deposits of the Metaline Quadrangle, Washington; U.S. Geol. Surv., Prof. Paper 202 (1943).
- Little, H. W.: Salmo Map-area, B.C.; Geol. Surv., Canada, Paper 50-19 (1950).
- McAllister, A. L.: Ymir Map-area, B.C.; Geol. Surv., Canada, Paper 51-4 (1951).
- Mulligan, R.: Bonington Map-area, B.C.; Geol. Surv., Canada, Paper 52-13 (1952).
- Hedley, M. S.: Geology and Ore Deposits of the Sandon Area, Slokan Mining Camp, B.C.; British Columbia Dept. of Mines, Bull. No. 29 (1952).
- Mathews, W. H.: Geology of the Sheep Creek Camp, B.C.; British Columbia Dept. of Mines, Bull. No. 31 (1953).

- TERTIARY**
- 15 CORYELL, SHEPPARD, AND McGREGOR INTRUSIONS: syenite; granite; minor shonkinite, monzonite, and pulaskite
- CRETACEOUS (?)**
UPPER CRETACEOUS OR LATER
- 14 SOPHIE MOUNTAIN FORMATION: conglomerate; minor argillite
- LOWER CRETACEOUS (?)**
- 13 VALHALLA INTRUSIONS: granite; minor granodiorite
- 12 NELSON INTRUSIONS (12): Porphyritic granite; granodiorite, diorite; minor syenite and monzonite; 12a, Rossland monzonite
- 11 Serpentine, dunite, peridotite; minor quartz-carbonate rock
- MESOZOIC**
- TRIASSIC (?) JURASSIC, AND CRETACEOUS (?)**
- 10 ELISE, HALL, AND BEAVER MOUNTAIN FORMATIONS: agglomerate, augite andesite, latite, argillite, greywacke; 10a, mainly volcanic rocks; 10b, mainly sedimentary rocks; 10c, paragneiss; 10d, pseudodiorite
- TRIASSIC**
- 8 KASLO AND SLOCAN GROUPS
8a, SLOCAN GROUP: slate, argillite, limestone, quartzite; 8b, paragneiss; 8c, KASLO GROUP: lava and pyroclastic rocks
- 9 YMIR GROUP: Slate, argillite, quartzite; minor limestone; 9a, paragneiss
- CARBONIFEROUS AND/OR PERMIAN**
- 7 MOUNT ROBERTS FORMATION: argillaceous quartzite, greenstone, limestone; paragneiss
- 6 White quartzite, schist, limestone; minor argillite and greenstone; paragneiss; possibly largely Lower Cambrian (3)
- ORDOVICIAN LOWER (?) AND MIDDLE ORDOVICIAN**
- 5 ACTIVE FORMATION: slate, argillite, argillaceous quartzite; minor limestone
- CAMBRIAN**
MIDDLE CAMBRIAN
- 4 NELWAY FORMATION: dolomite, limestone, argillite; minor slate
- LOWER CAMBRIAN**
- 3 QUARTZITE RANGE, RENO AND LAIB FORMATIONS: quartzite; schist, argillite, limestone; minor dolomite
- PROTEROZOIC**
- WINDERMERE (?)**
- 2 THREE SISTERS FORMATION: green grit and quartzite; minor schist and conglomerate
- WINDERMERE**
- 1 TOBY, IRENE VOLCANIC, AND MONK FORMATIONS: greenstone; green argillite and phyllite; conglomerate; minor limestone



Geology compiled by H. W. Little from published reports of the Geological Survey of Canada and the British Columbia Department of Mines, and from field work by H. W. Little, 1948 to 1950, and 1952

- INDEX TO SOME MINES AND PROSPECTS**
- Slocan Region**
1. Victor (Violamac Mines (B.C.) Limited)
 2. Noble Five, American Boy, Deadman (Cody Reco Mines Limited)
 3. Bosun (New Santiago Mines Limited)
 4. Wonderful (Silver Ridge Mining Company Limited)
 5. Mammoth, Standard, Monarch (Western Exploration Company Limited)
 6. Van Roi (Van Roi Consolidated Mines Limited)
 7. Ottawa (Hardex Mines Limited)
 8. Cork Province (Base Metals Mining Corporation Limited)
 9. Scranton, Pontiac (Scranton Mines Limited)
- Nelson Region**
10. Silver King
 11. Granite-Poorman (Kenville Gold Mines Limited)
- Ymir Region**
12. Yankee Girl, Dundee (Yankee Dundee Mines Limited)
 13. Last Chance, Oxide, Jack Pot (New Jersey Zinc Explorations Limited)
- Sheep Creek Region**
14. Reno, Motherlode, Nugget
 15. Kootenay Belle
 16. Sheep Creek
- Salmo Region**
17. Arlington (New Arlington Mines Limited)
 18. H.B. (Consolidated Mining and Smelting Company of Canada Limited)
 19. Jersey, Emerald, Feeney, Dodger (Canadian Exploration Limited)
 20. Reeves-MacDonald (Reeves-MacDonald Mines Limited)
- Rossland Region**
21. Mayflower
 22. O.K., I.X.L.
 23. Le Roi, Centre Star, War Eagle, Josie
 24. Velvet



MAP 3-1956
NELSON
(WEST HALF)
KOOTENAY AND SIMILKAMEEN DISTRICTS
BRITISH COLUMBIA

Scale: One Inch to Four Miles = 1/253,440 Miles

4 2 0 8 12

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

Printed by the Surveys and Mapping Branch

LEGEND

Main highway

Other roads

Trail

International boundary

District boundary

Stream, (position approximate)

Marsh

Contours (interval 2500 feet)

Height in feet above mean sea-level

Approximate magnetic declination, 22° 24' East

Cartography by the Geological Cartography Unit, 1956

MAP 3-1956
NELSON
BRITISH COLUMBIA
SHEET 82F
(West Half)