



## MINFILE NTS 082KSE- LARDEAU

*Original release date: January 1996  
Researched and compiled by: G. J. Arseneau*

**The Lardeau map area lies in the southeastern part of the province and contains 92 documented occurrences.** The Lardeau map area lies immediately west of the Rocky Mountain Trench. Most of the map sheet lies within the Purcell Mountains physiographic domain of the Omineca Belt with the exception of the western portion of the map area, near Duncan and Kootenay lakes, which lies within the Purcell Trench domain. The community of Invermere is in the northeast corner of the map area.

The oldest rocks in the area belong to the Ancestral North American Terrane which comprises metamorphosed Proterozoic assemblages exposed in the eastern and central portion of the map within the Purcell anticlinorium. The western part of the map area is underlain by the Proterozoic to Paleozoic strata of the Kootenay Arc.

The Purcell anticlinorium consists of a series of broad, northwest trending open folds that are generally upright. The dominant regional schistosity is axial planar to the folds; locally developed shear zones are parallel to the foliation. Several near-vertical, north trending normal faults are common in the Purcell anticlinorium. These are important factors in localizing mineralization. Rocks of the Purcell anticlinorium have undergone regional metamorphism to lower greenschist facies. The anticlinorium is underlain by Proterozoic strata of the Purcell and Windermere supergroups and Cretaceous intrusive rocks.

The Lower Proterozoic Purcell Supergroup, represented by the Aldridge, Creston, Kitchener, Dutch Creek and Mount Nelson formations, is a thick sequence of shallowing-upwards, marine-deposited strata which are unconformably overlain by continental deposits of the Horsethief Creek Group and the Toby Formation of the Windermere Supergroup. In the southeast corner of the map, the Lower Aldridge Formation strata are cut by diorite and quartz diorite of the Middle Proterozoic Moyie intrusions. In the central portion of the map, the Dutch Creek and Kitchener formations have been further subdivided and assigned to the Gateway and Van Creek formations. The Van Creek Formation correlates with the Lower Kitchener Formation while the Gateway Formation is equivalent to the lower portion of the Dutch Creek Formation.

The Kootenay Arc is a curving belt of highly deformed metasedimentary and metavolcanic rocks which includes parts of the Upper Proterozoic Horsethief Creek Group, the Proterozoic to Cambrian Hamill Group, the Lower Cambrian Badshot Formation, and the lower Paleozoic Lardeau Group. The volcano-sedimentary sequence is intruded by numerous Paleozoic to Mesozoic granitoid plutons. The Kootenay Arc is dominated by intense and complex deformation. Large-amplitude (10-kilometre scale) west-verging recumbent folds are deformed by at least two phases of upright, tight to isoclinal folds which overturn much of the stratigraphic sequence. The Kootenay Arc rocks have undergone regional metamorphism to middle or upper greenschist facies.

The first recorded exploration work in the area dates back to the late 1800s when prospectors discovered placer gold in Fry (082KSE058) and Toby (082KSE090) creeks. Production from both streams was minimal and exploration was quickly focused towards high grade, polymetallic base metal replacement deposits after the discovery of the Mineral King (082KSE001) and the Paradise (082KSE029) deposits. Of the 91 documented occurrences on the map sheet, 49 are silver-lead-zinc replacement deposits of which 19 are past producers. Most deposits were very small, structurally controlled replacement vein-type deposits which produced less than 200 tonnes of ore. The deposits are located within limestone and dolomite of the Gateway and Mount Nelson formations of the Purcell Supergroup, and within marble of the Badshot Formation. The Delphine (082KSE032), Hot Punch (082KSE034) and Nip and Tuck (082KSE037) are the largest replacement vein-type deposits within the area. Other replacement type deposits include Mississippi valley-type stratabound replacement deposits; these include the Mineral King, Paradise, Ptarmigan (082KSE030) and Duncan mine (082KSE023). Collectively, the production from Mississippi valley-type deposits amounts to over 83,000 kilograms of silver, 44,680 tonnes of lead and 93,990

tonnes of zinc. All deposits are now mined out with the exception of the Duncan mine which has indicated reserves of 9 million tonnes grading 2.7 per cent lead and 2.9 per cent zinc.

Lead-zinc mineralization is also present within tensional faults cutting clastic rocks of the Dutch Creek, Creston and Aldridge formations. At the Yornoc (082KSE009) and Shelly (082KSE059), sulphide mineralization is associated with quartz-barite veins cutting the Dutch Creek Formation. At the Silver Key (082KSE053) and Doc (082KSE060), lead-zinc mineralization is associated with quartz veins cutting quartzite and argillite of the Lower Aldridge and Creston formations, respectively.

Limestone, marble and quartzite have been quarried for dimension and building stone from the Badshot Formation (Lardeau, 082KSE077, Marblehead, 082KSE076) and from the Hamill Group (Alimona Quartzite, 082KSE083). Barite has been mined from veins within the Mount Nelson Formation and development work is being carried out to bring into production an industrial-grade talc quarry, Duncan Lake (082KSE074), from a talc schist horizon of the Index Formation of the Lardeau Group.

Current exploration continues to be directed at high grade replacement silver-lead-zinc deposits. Some recent exploration work has also been focused towards the possibility of finding diamonds within ultra-potassic dikes and sills identified in the Toby Creek area. Although the presence of ultra-potassic intrusions has been confirmed, no diamonds have been recovered or identified yet.

The area has good potential for hosting new replacement type deposits and the possibility of identifying Sedex-type mineralization within the Lower Aldridge Formation in the southeastern part of the map area near the Doc and Rocky Top (082KSE081) does not appear to have been greatly explored.

### **SELECTED REGIONAL REFERENCES (082KSE - LARDEAU)**

- Fyles, J.T. (1964): Geology of the Duncan Lake Area, Lardeau District, British Columbia; B.C. Ministry of Energy, Mines and Petroleum Resources, Bulletin 49, 87 pages.
- Hoy, T., Price, R.A., Legun, A., Grant, B. and Brown, D.A. (1995): Purcell Supergroup, Southeastern British Columbia Geological Compilation Map (NTS 82G; 82F/E; 82J/SW; 82K/SE); B.C. Ministry of Energy, Mines and Petroleum Resources, Geoscience Map 1995-1.
- McLaren, G., Stewart, G. and Lane, R. (1990): Geology and Mineral Occurrences of the Purcell Wilderness Conservancy, East Half; B.C. Ministry of Energy, Mines and Petroleum Resources, Open File 1990-20.
- McLaren, G., Stewart, G. and Lane, R. (1990): Geology and Mineral Potential of the Purcell Wilderness Conservancy; B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1990-1, pp. 29-37.
- Okulitch, A.V. and Woodsworth, G.J. (1977): Geology, Kootenay River, British Columbia, Alberta, United States; Geological Survey of Canada, Open File 481, Scale 1:1,000,000.
- Pope, A. (1990): The Geology and Mineral Deposits of the Toby-Horsethief Creek Map Area, Northern Purcell Mountains, Southeast British Columbia (82K); B.C. Ministry of Energy, Mines and Petroleum Resources, Open File 1990-26.
- Reesor, J.E. (1973): Geology of the Lardeau Map Area; Geological Survey of Canada, Memoir 369, 129 pages.
- Warren, M.J. and Price, R.A. (1992): Tectonic Significance of Stratigraphic and Structural Contrasts between the Purcell Anticlinorium and the Kootenay Arc, East of Duncan Lake (82K): Preliminary Results; B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1990-1, pp. 27-35.
- Wheeler, J.O. and McFeely, P. (1991): Tectonic Assemblage Map of the Canadian Cordillera and Adjacent parts of the United States of America; Geological Survey of Canada, Map 1712A, Scale 1:2,000,000.