# CHROMITE IN THE MOUNT SIDNEY WILLIAMS AREA, CENTRAL BRITISH COLUMBIA (93K)

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## INTRODUCTION

Fieldwork during the summer of 1982 constitutes the third and final field season involving detailed mapping of ultramafic massifs and associated chromite occurrences, primarily in central British Columbia. The past field season saw additional work done at Murray Ridge (Whittaker and Watkinson, 1981) and new mapping on part of Pinchi Mountain. Both of these bodies are in the Pinchi fault zone (Paterson, 1977) in the Fort St. James area. Most of the fieldwork was done at Mount Sidney Williams, an ultramafic massif 85 kilometres northwest of Fort St. James (Fig. 111). Mount Sidney Williams is also 44 kilometres south of the Mitchell Range ultramafic massif, mapped in 1981 (Whittaker, 1982a, 1982b). Both Mount Sidney Williams and Mitchell Range ultramafic rocks were included in regional mapping by Armstrong (1949) and Little (1947).

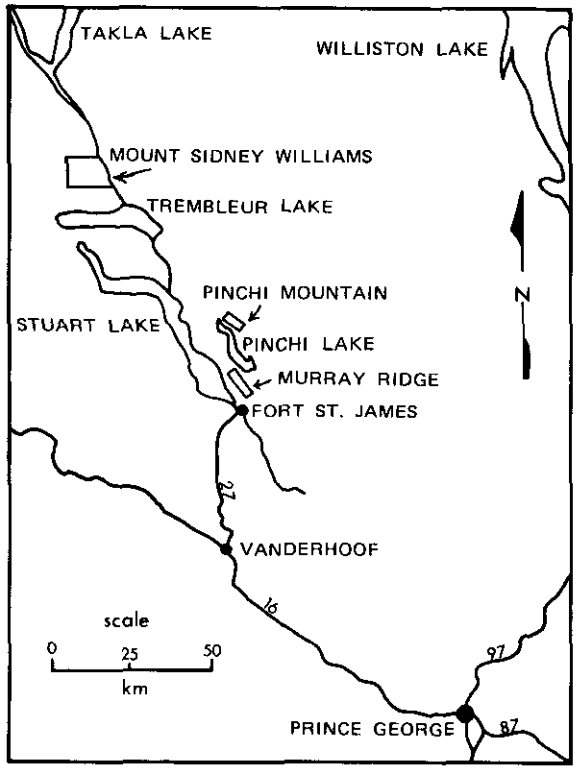


Figure 111. Location map of Pinchi Mountain, Murray Ridge, and Mount Sidney Williams.

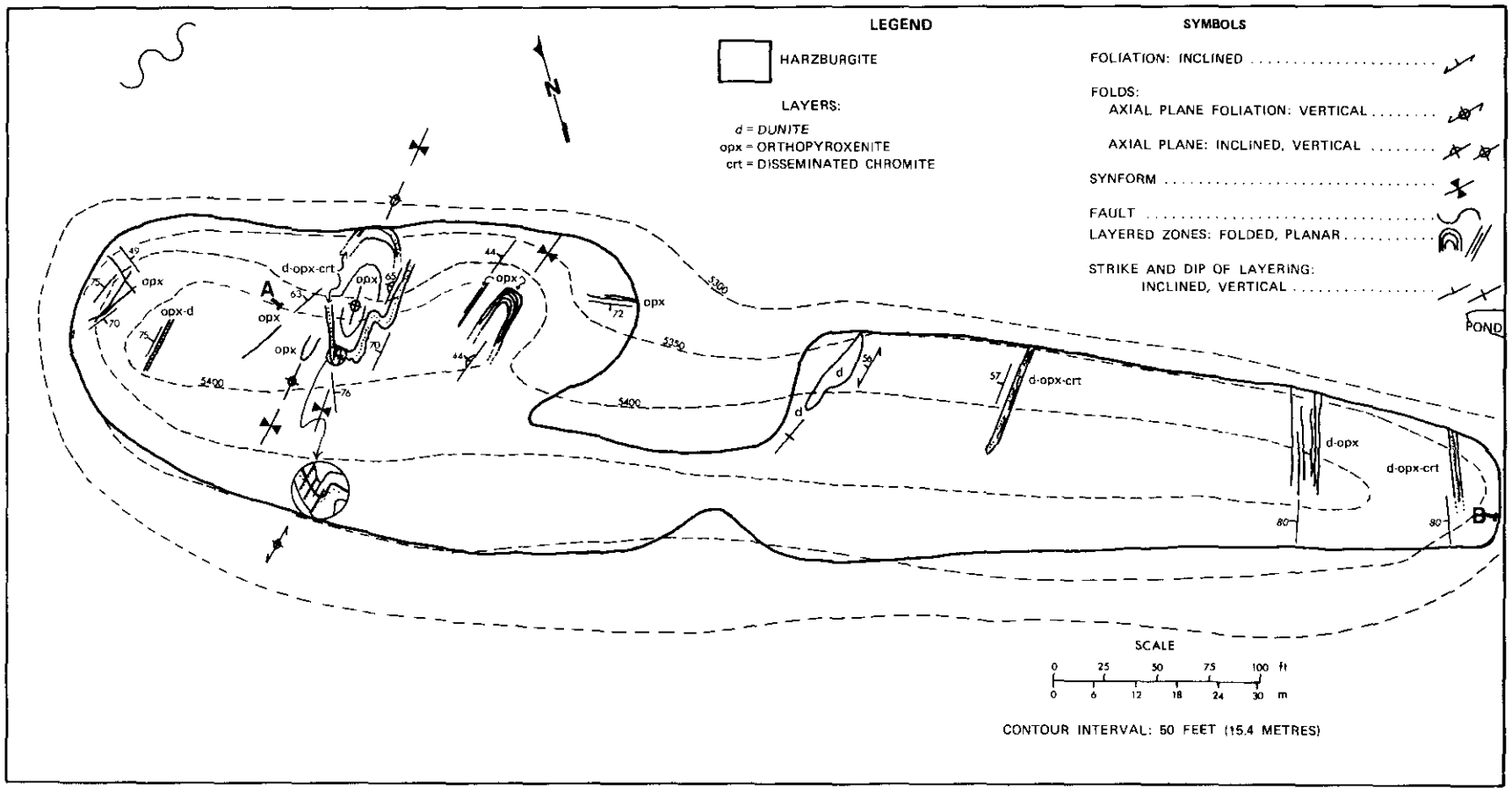


Figure 113. Deformed dunite-orthopyroxenite-chromite layers at Baptiste Spur, southeast flank of Mount Sidney Williams.

## PINCHI MOUNTAIN

Pinchi Mountain is underlain predominantly by harzburgite tectonite and, to a lesser extent, by dunite. Brittle shear from movement in the Pinchi fault zone has developed an intense foliation resulting in friable platy, greyish brown weathered surfaces. Harzburgite tectonite is medium to coarse-grained, equigranular, and carries accessory chromite. Serpentinization is extreme, usually 80 per cent or more complete.

Dunite occurs as deformed layers and pods within harzburgite tectonite and is also completely serpentinized. Ductile passively folded dunite layers and irregularly shaped dunite pods suggests movement in a still-hot environment, which could be the upper mantle (Fig. 112).

Chromite was observed in an irregularly shaped dunite pod, 100 metres wide. The chromite layer has been openly folded and is about 30 centimetres long and exhibits a pinch-and-swell structure up to 3 centimetres thick. Chromite in it is medium grained, subhedral to euhedral, and forms 80 per cent of the layer. Bleached serpentine, greenish white in colour, forms the groundmass. In 50 per cent of the chromite, individual grains are rimmed by 0.5 to 1.0-millimetre-thick bleached serpentine halos.

## MOUNT SIDNEY WILLIAMS

Detailed mapping on Mount Sidney Williams indicates a predominance of harzburgite tectonite with minor dunite, orthopyroxenite, and scattered chromite-chromitite layers in dunite. The West Peak area, northwest of and in fault contact with Mount Sidney Williams, consists of massive and layered norite (Little, 1947) with dunitic dykes or schlieren. This gabbro may be related to the ultramafic massif as a stratigraphically higher component of a dismembered ophiolite or it may have been emplaced along an active fault zone during obduction.

Layered zones within the Mount Sidney Williams massif were mapped and have roughly parallel orientation, north striking with vertical dip. Layering is rhythmic and is defined by alternating layers of harzburgite and dunite. In some cases one or more orthopyroxenite layers occur, usually within dunite layers. Disseminated chromite and chromitite layers, up to 2 centimetres thick, are hosted by some dunite layers. Layered zones up to 5 metres wide were mapped with harzburgite layers up to 1 metre, dunite layers up to 25 centimetres, and orthopyroxenite layers up to 4 centimetres in thickness. In most cases layered zones are planar with sharply defined contacts. One layered zone exhibited a doubly plunging synformal structure with higher order small-scale folding concentrated in the noses of the structure (Fig. 113). This passive folding suggests that ductile deformation took place in zones within the ultramafic massif.

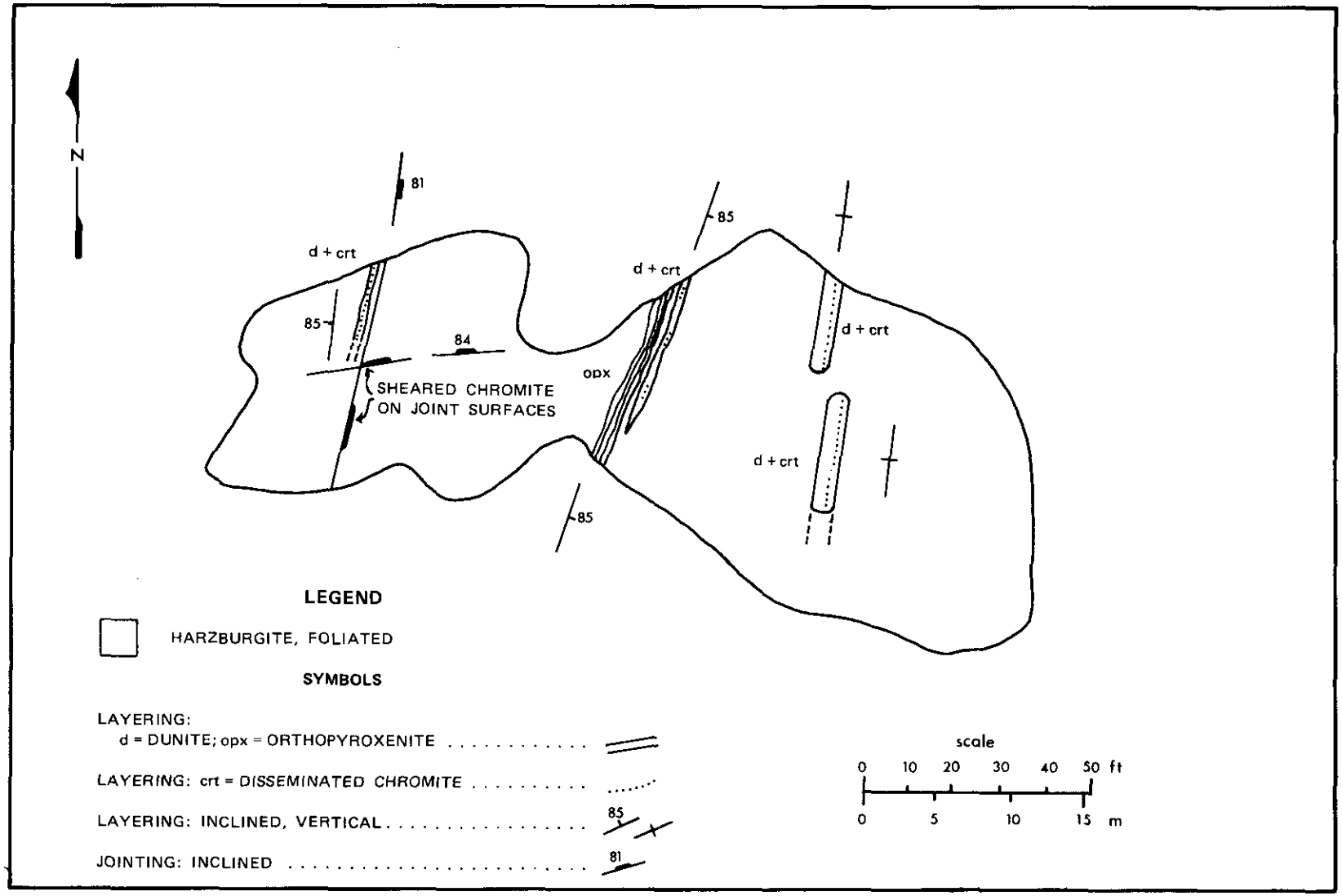


Figure 114. Planar dunite-orthopyroxenite-chromite layers 500 metres north of the summit of Mount Sidney Williams.

Several layered chromitite occurrences were mapped; some have considerable lateral extent (about 500 metres). A vertical zone consisting of several dunite layers, one of which carries a 0.5 to 2-centimetre-wide chromitite band, occurs 50 metres north of the summit of Mount Sidney Williams. This layer strikes north and is subparallel to the summit ridge. A similar zone with a chromitite layer (Fig. 114) crops out on the floor of a cirque 500 metres to the north and directly on strike with the summit chromitite occurrence.

Chromite in layered occurrences on Mount Sidney Williams often exhibit bleached greenish white reaction rims. These serpentine-chlorite rims surround medium-grained subhedral to euhedral chromite and are 0.5 to 1 millimetres thick. Preliminary microprobe analyses show the chromite to be highly altered with high aluminum, magnesium, and sometimes high iron compositions. Texturally the altered chromite exhibits skeletal to dendritic form which is made up of magnetite and low chromium chromite or ferrichromite. In some grains remnant unaltered cores of chromite occur; these are irregular in form and have serrated borders. The chromite cores are amber to reddish brown in transmitted light and have lower chrome values than chromite from podiform chromitite described from the Mitchell Range (Whittaker, 1982a, 1982b).

## ACKNOWLEDGMENTS

Financial support for fieldwork was received from the British Columbia Ministry of Energy, Mines and Petroleum Resources and the Geological Survey of Canada (Grant 203/4/81) via grants to Dr. D. H. Watkinson.

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