

Ministry of Environment
Province of British Columbia

A Preliminary Assessment of
Acid Mine Drainage
from an Abandoned Copper Mine on
Mount Washington, B.C.

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SUMMARY

A preliminary assessment of water quality in the Tsolum River watershed, Vancouver Island, indicates that acid mine drainage is occurring at an abandoned copper mine located at 1300 m altitude on Mount Washington. Although a portion of the mine site is located within the Oyster River watershed, available data indicate that the majority of acidic drainage enters Pyrrhotite Creek which flows into Murex Creek, a major tributary to the Tsolum River.

High concentrations of several metals occurred in the runoff from the mine site. Copper is of particular concern as concentrations above the criterion for the protection of aquatic life occurred throughout the drainage system, from the mine site to and including the mainstem of the Tsolum River. Significant fisheries resources in the Tsolum River may have been impacted. Water quality criteria for the protection of domestic and irrigation water uses were met in the Tsolum River, where all licenced water use in the watershed occurs.

Further water quality monitoring and water use surveys are recommended to confirm the preliminary interpretations presented here.

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1. INTRODUCTION

In the mid-sixties a copper mine operated briefly on Mount Washington, on Vancouver Island (Figure 1). Nearly two decades later a routine survey of provincial water quality data showed that drainage from the mine was acidic and contained high concentrations of metals (Clark, personal communication). This report is a preliminary assessment of these historical water quality data, collected between January 1965 and August 1984. The purpose of this report is to assess the quality of water emanating from the mine site, to identify areas which require further monitoring, and to form a basis for future action such as reclamation.

The open pit mine, which operated from 1965 to 1967, was located near the summit of Mount Washington. The mine straddled two watersheds, the Oyster River and the Tsolum River; both drain to the Strait of Georgia. Piggott Creek, with headwaters near the mine site, is a tributary to the Oyster River. Pyrrhotite Creek and McKay Creek flow from headwater areas near the mine site to Murex Creek, and thence into the Tsolum River. A mill serving the mine was located approximately four km east of the mine and the tailings pond was located approximately 2.5 km east of the mill. Drainage from the abandoned tailings pond enters Wolf Lake, which drains to the Tsolum River via Headquarters Creek. (Figures 1 and 2).

During operation of the mill attention of environmental agencies was drawn to the mine due to a tailings pipe rupture and uncontrolled discharge from the tailing impoundment. The Federal Department of Fisheries and the Pollution Control Board investigated these problems and advised the company on remedial actions. In August 1966 the Pollution Control Board advised the company to apply for a discharge permit. On April 3, 1967 the Mt. Washington Milling Co. Ltd. was placed in receivership and ceased mining and milling.

Esso Resources Limited held the mineral rights to the abandoned Mt. Washington Mine from October 1978 to July 1983. During 1979 and 1980 Esso carried out leaching experiments on a portion of a waste rock pile, located at the headwaters of Pyrrhotite Creek, to determine potential recovery of copper. The company attempted to enhance the liberation of copper from waste rock through techniques such as addition of sulphuric acid and inoculation with bacteria. After the experiment, the company added lime to neutralize the acidification. It was believed that water quality would return to pre-experiment levels.

The ownership of surface and mineral rights for the area encompassing the abandoned open pit and waste rock dumps is complicated and may require a more thorough legal search than was possible for this report. It is believed that Crown Forest Industries Limited owns the surface rights, Better Resources holds the precious mineral rights (i.e., gold) and Imperial Metals Limited has leased the base mineral rights (i.e., copper) from Fording Coal Limited.