History of the Springfield Scheelite Mine, Valley County, Idaho

Victoria E. Mitchell

Staff Report 08-4
October 2008

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
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CONTENTS

ILLUSTRATIONS

INTRODUCTORY NOTE

This report was prepared under a cooperative agreement with the U.S. Forest Service, Region IV, as part of an ongoing project to identify and describe inactive and abandoned mines in Idaho. The information in this report is from a number of published and unpublished sources in the Idaho Geological Survey's mineral property files. Where not otherwise noted, most of the mine production data is drawn from the U.S. Geological Survey's (USGS) annual volumes on *Mineral Resources of the United States* (1882-1923) and the equivalent volumes produced by the U.S. Bureau of Mines (USBM), *Mineral Resources of the United States,* 1924-1931, and *Minerals Yearbook*, 1932 to 1984; since 1995, the *Minerals Yearbook* has been published by the U.S. Geological Survey. Information on underground workings and mine equipment is generally from the annual reports of the Idaho Inspector of Mines (IMIR) published from 1899 to 1979. After 1974, the Mine Inspector's office was known as the Mine Safety Bureau, a section of the Idaho Department of Labor and Industrial Services. Detailed accounts of mine operations are, for the most part, drawn from the annual reports prepared by the companies for the State Inspector of Mines; these reports were required by law, and the information contained in them formed the basis of the Mine Inspector's annual reports. Reports of recent developments are taken from the Idaho Geological Survey's (IGS) annual reports on the developments in mining and minerals in Idaho (from 1984 to present) or from similar reports produced by the Survey's predecessor, the Idaho Bureau of Mines and Geology (IBMG) from 1975 to 1984. Other published sources are referenced in the text. A complete list of references is included at the end of the report. Where direct quotations are taken from source materials, the original spelling and grammar are preserved even in cases where they do not conform to currently accepted usage.

History of the Springfield Scheelite Mine, Valley County, Idaho

Victoria E. Mitchell[1]

Introduction

The Springfield Scheelite Mine is in sec. 28, T. 17 N., R. 9 E., on the Big Chief Creek 7.5-minute topographic quadrangle in an access corridor in the Frank Church-River of No Return Wilderness Area (Figures 1, 2, 3, and 4). The mine is at an elevation of about 7,700 feet near the head of the West Fork of Springfield Creek; Springfield Creek is a tributary of Little Pistol Creek and, eventually, the Middle Fork of the Salmon River. Access according to Cater and others (1973) was by an abandoned mine road from Johnson Creek; recent topographic maps show a jeep trail along what was probably this route. The mine was accessible by four-wheel-drive vehicle in 1994.

Recent mapping has identified the rocks in the vicinity of the Springfield Mine as alaskite enclosing Precambrian xenoliths (Figure 5; Fisher and others, 1992). Cater and others (1973, p. 211-212) described the geology as follows:

> The country rock in the area mined is mostly quartz monzonite, and the deposit is in an irregularly shaped remnant of a tactite body derived from sedimentary rocks that were intensely metamorphosed and shattered during emplacement of the Idaho batholith. The tactite is composed of approximately 20 percent carbonate rocks, 25 percent quartz and silicate minerals, 50 percent pyrrhotite, and less than 1 percent chalcopyrite and scheelite. Drilling indicates that the tactite body is a thin lenticular mass less than 400 feet long, about 225 feet wide, and a maximum of 50 feet thick, lying roughly parallel to the slope of the present surface [Figure 6].

Cook (1956) described the orebody as a mass of scheelite-bearing pyrrhotite enclosed in rocks of the Idaho batholith, noting the scheelite occurred in certain zones in the pyrrhotite. With no rock left except the quartz monzonite, Cook was unable to determine if the scheelite occurrence reflected the original sedimentary structure.

[1]Idaho Geological Survey, Main Office at Moscow, University of Idaho, Moscow.

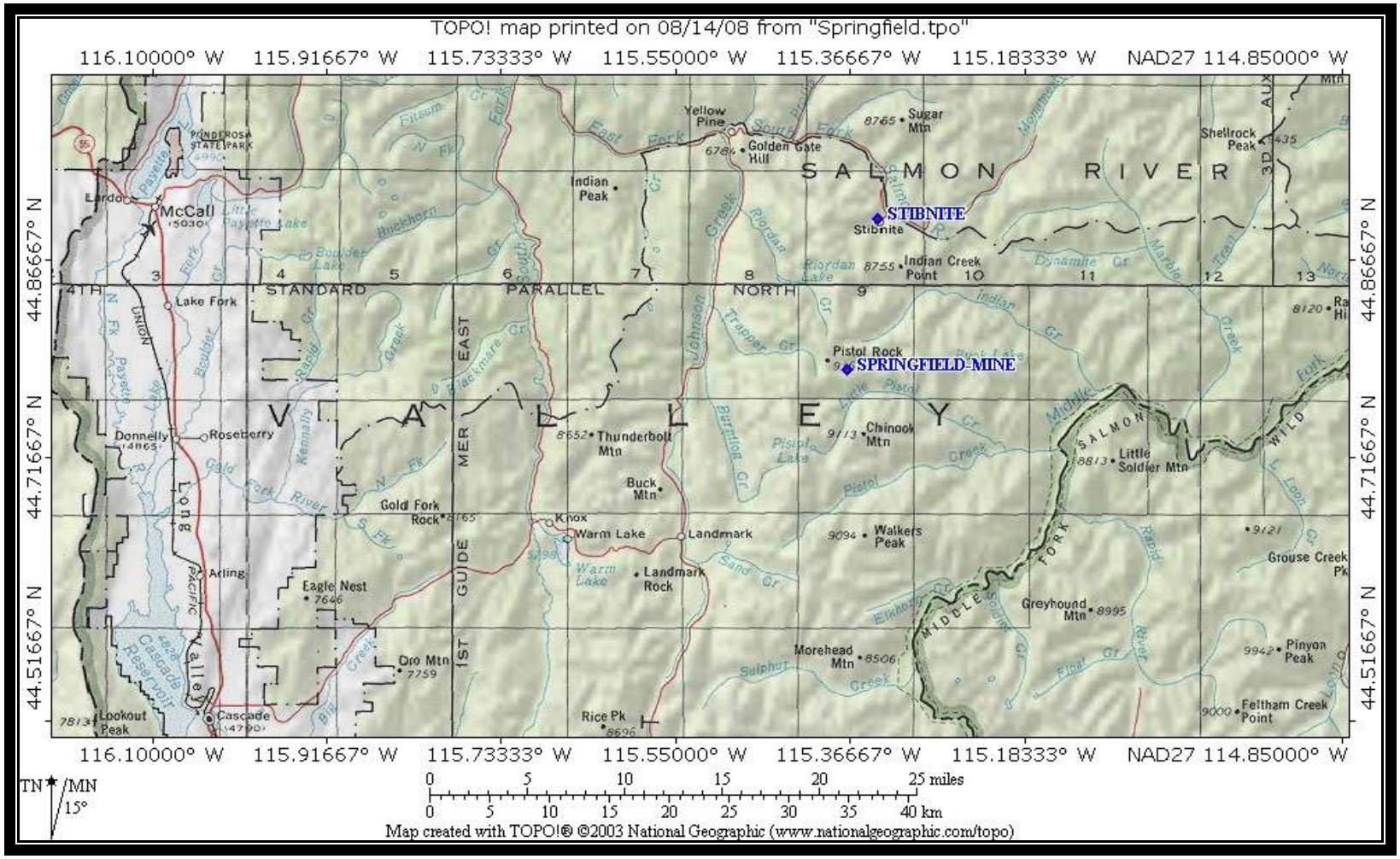

Figure 1. Location of the Springfield Mine, showing its relationship to Stibnite, McCall, and Cascade (National Geographic TOPO! map).

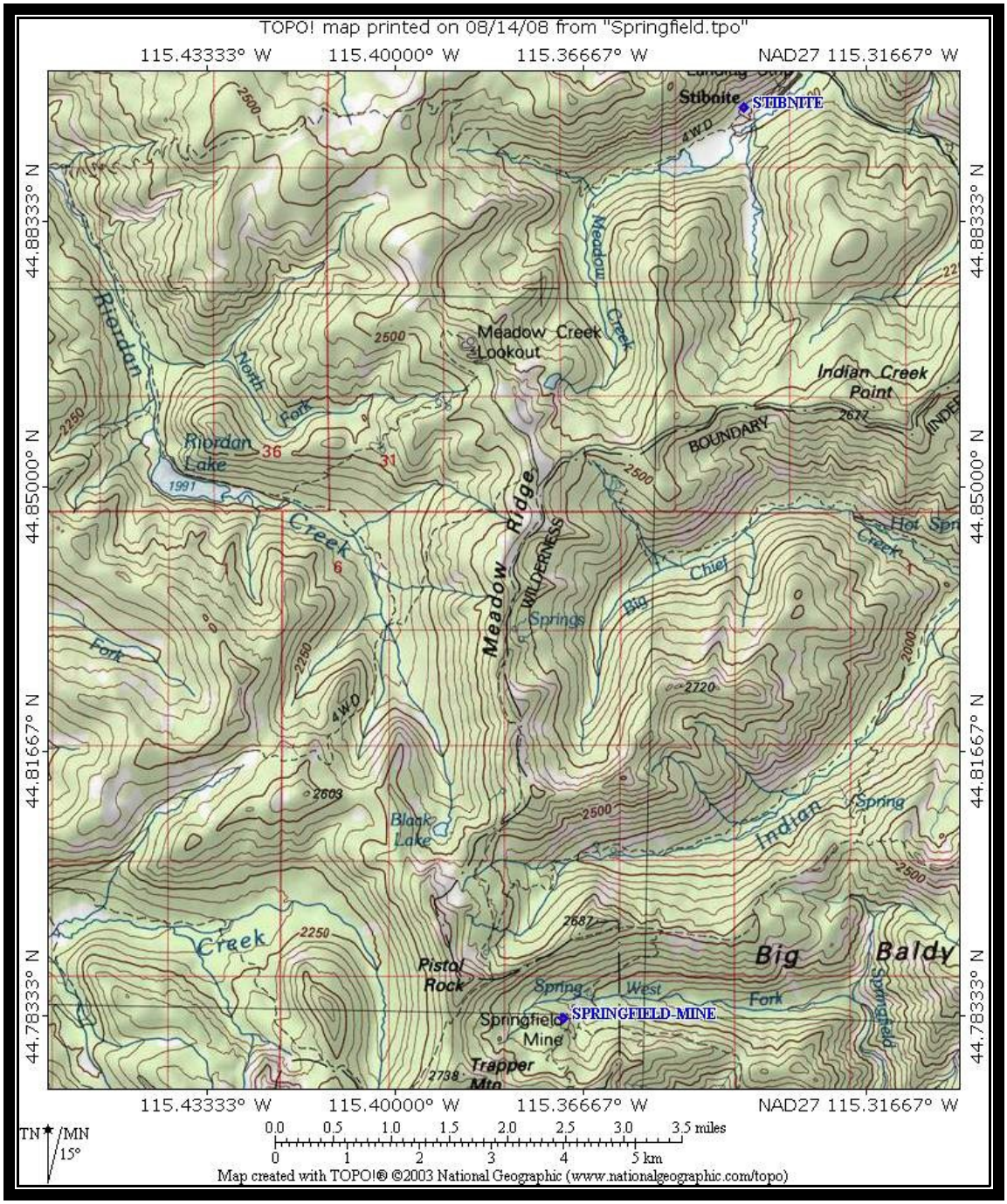

Figure 2. Location of the Springfield Mine, showing its location in relationship to Stibnite (National Geographic Society TOPO! map).

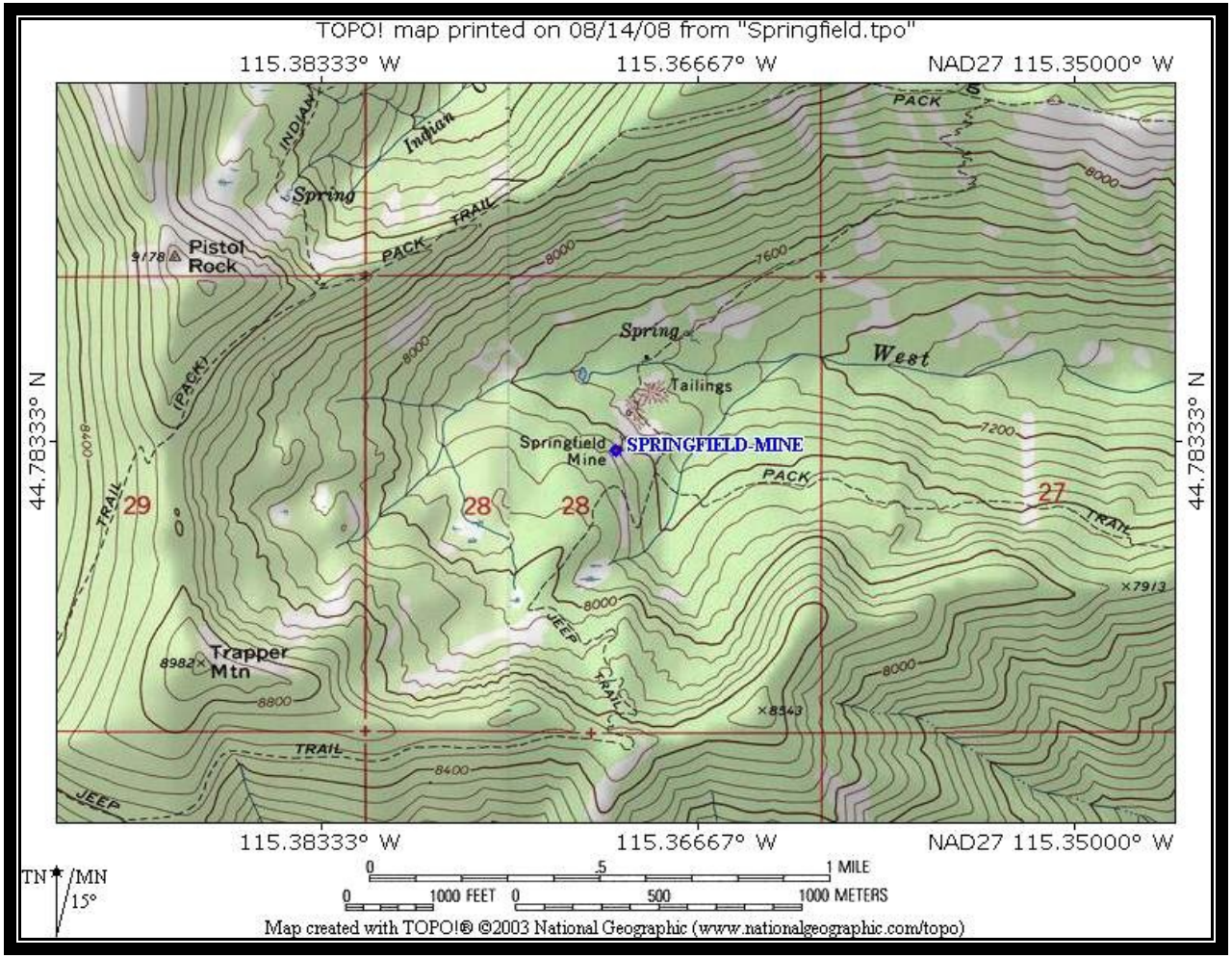

Figure 3. Topographic map of the Springfield Mine, Valley County, Idaho (National Geographic Society TOPO! map).

Figure 4. Springfield Mine from altitude of 10,100 feet (Google Earth satellite view). Tailings area of the mine is at the north end of the treeless zone, and most of the mine area is not vegetated.

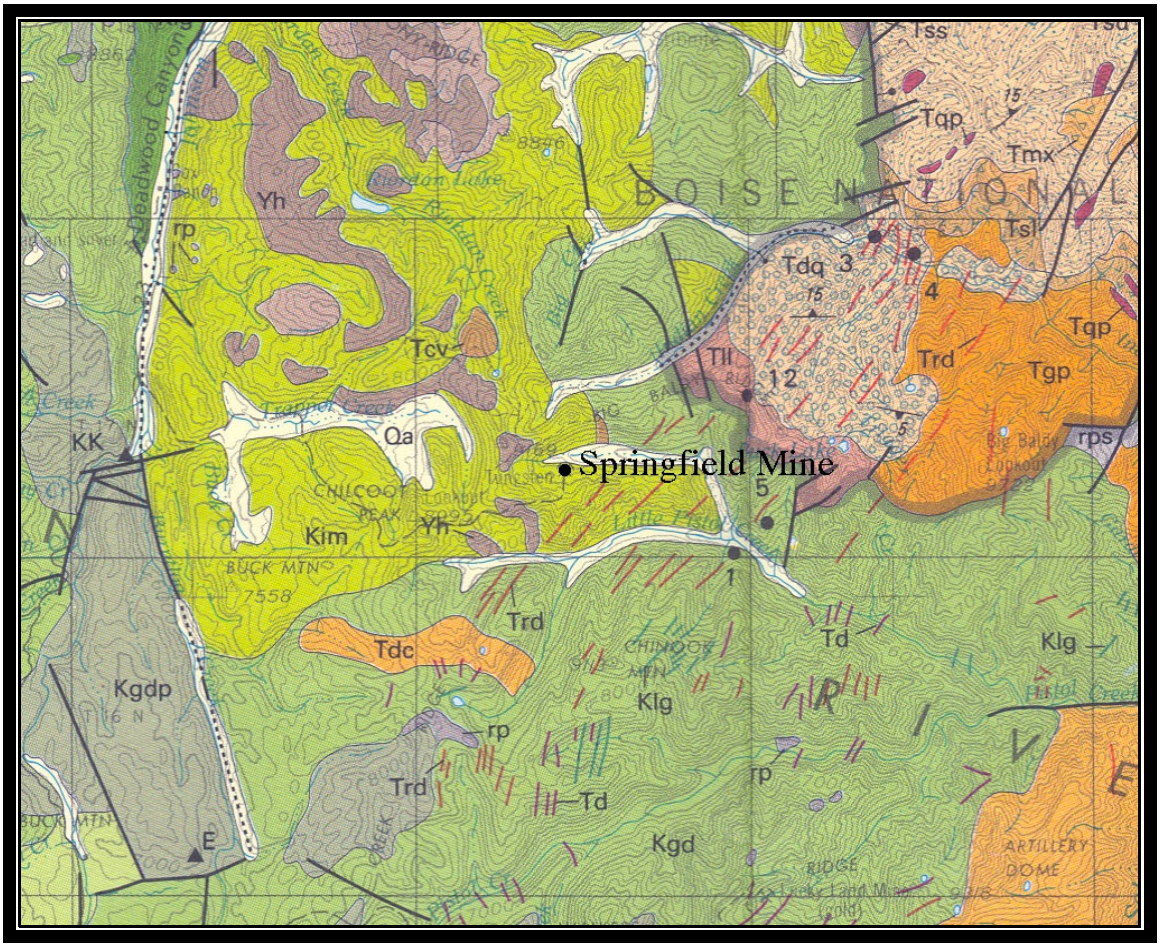

Figure 5. Geology of the area surrounding the Springfield Mine (Fisher and others, 1992). Qa - Holocene alluvium, undivided; Tss - Eocene Sunny side tuff; Tmx - Eocene megabreccia; Tsl - Eocene lower tuff of the Sunny side tuff; Tll - Eocene lower latite lava; Tgp - Eocene gray porphyry; Tcv - Eocene Challis Volcanic Group, undivided; Td - Eocene dikes; Trd - Eocene rhyolite dikes; Tqp - Eocene quartz porphyry intrusions; Tdc - Eocene diorite complex; Klg (dikes and dark green along Deadwood Canyon) - Cretaceous leucocratic granite; Kg (light green in lower left corner) Cretaceous muscovite-biotite granodiorite and granite; Kgd - Cretaceous biotite granodiorite; Kgdp - Cretaceous porphyritic biotite granodiorite and granite; Kim - mixed rock units; Yh - Proterozoic Hoodoo Quartzite; Yy (lighter brown) - Proterozoic Yellowjacket Formation; rp - Paleozoic(?) or Proterozoic(?) roof pendants and xenoliths of metamorphic rocks in the Idaho batholith, undivided; rps - schist roof pendant.

Figure 6. Photograph of the Springfield Mine, looking to the west (Figure 64 from Cater and others, 1973). T = tactite, Ki = Cretaceous Idaho batholith.

History

The White Mare claims, which cover the Springfield Scheelite Mine, were located by Lafe Cox in 1945. Bradley Mining Company leased the claims in 1947 and completed 1,900 linear feet of exploratory diamond drilling. A government subsidy for tungsten stimulated Bradley to begin mining in 1953 (Cater and others, 1973). Scheelite ore from a talus deposit was first treated in a simple gravity mill at the mine. The concentrates from the gravity mill were trucked to Stibnite for electric separation (USBM). During the summer and fall, the talus was processed at a rate of 60-75 tons per day (tpd). The rough concentrate contained 15-20 percent WO_3. In August 1953, exploratory drilling under a Defense Minerals Exploration Administration contract delimited an irregularly shaped tactite body (Figure 7; Cater and others, 1973).

In 1954, Bradley built a 75-tpd gravity mill to process the rest of the talus and the ore from the tactite body. The average grade of the mill feed was 0.35 percent WO_3 (Cater and others, 1973). Bradley Mining Co. processed 12,000 tons of crude ore during the summer. About 8 tons of low grade material (9 percent WO_3) was shipped to the Salt Lake Tungsten Company for treatment, and a total of 1,522 units of high grade scheelite concentrate (over 70 percent WO_3) was purchased by the government.

In 1955, Bradley Mining Co. produced 10,683 tons of tungsten ore averaging 0.4 percent WO_3 from the Springfield Mine. About 2,159 units[1] WO_3 in high grade concentrate and a small tonnage of lower quality material were recovered (USBM). The mill was dismantled and removed at the end of the mining season (Cater and others, 1973).

Total production from the mine was over 39,000 tons of ore which yielded over 5,940 short ton units of WO_3. An estimated 151,000 tons of scheelite-bearing rock still remains. This material, which includes the remaining talus and a small remnant of the unmined tactite body, contains an average of 0.30 percent WO_3 (or 45,300 units of WO_3). In addition, the mill tailings total about 27,000 tons of crushed material averaging an estimated 0.10 percent WO_3 (2,700 units of WO_3). This gives an estimated total of 178,000 tons of all types of tungsten-bearing materials remaining on the property. This material averages 0.27 percent WO_3 (4,800 units of WO_3; Cater and others, 1973).

In the late 1980s, the claims were still owned by Lafe and Emma Cox (McHugh and others, 1991). An Idaho Geological Survey geologist visited the site in 1994. At that time, the sulfur-bearing minerals in the ore were breaking down to sulfuric acid in the tailings area (Figures 8 and 9), and the fumes were strongly noticeable. Other features noted at that time included two adits, at least one of which was open (Figure 10) and the remains of the mill buildings (Figure 11).

References

Cater, F.W., D.M. Pinckney, W.B. Hamilton, R.L. Parker, R.D. Weldin, T.J. Close, N.T. Zilka, 1973, Mineral resources of the Idaho Primitive Area and vicinity, Idaho: U.S. Geological Survey Bulletin 1304, 431 p.

[1]A short ton unit equals 20 pounds of WO_3 and contains 15.862 pounds of tungsten.

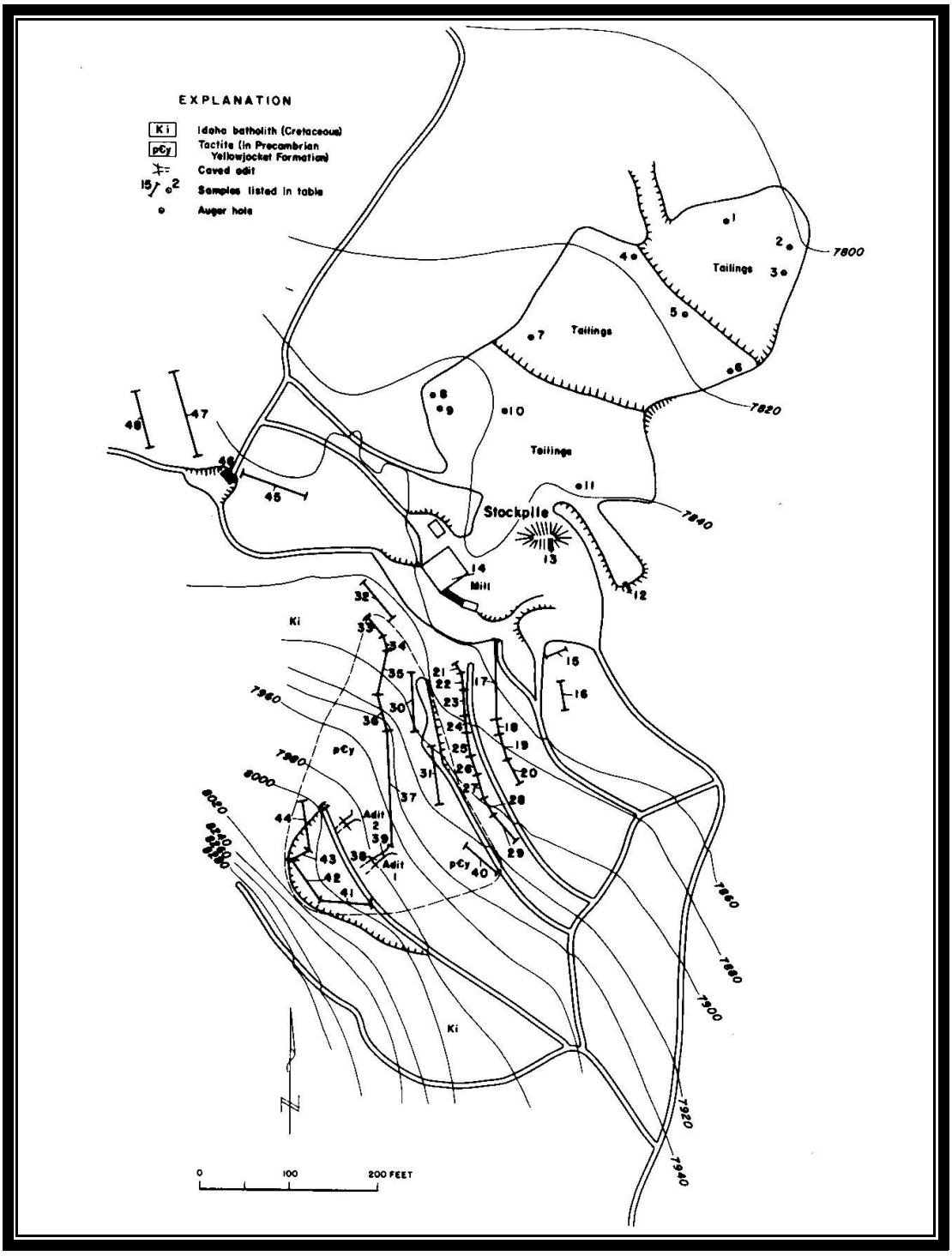

Figure 7. Map of the Springfield Scheelite Mine (Figure 63 from Cater and others, 1973).

Figure 8. View of the tailings impoundment at the Springfield Scheelite Mine. The millsite is to the left of the picture (Idaho Geological Survey photograph by Falma J. Moye).

Figure 9. Tailings impoundment at the Springfield Scheelite Mine, showing lodgepole pine growing on the tailings (Idaho Geological Survey photograph by Falma J. Moye).

Figure 10. Open adit at the Springfield Scheelite Mine (Idaho Geological Survey photograph by Falma J. Moye).

Figure 11. View of millsite and pit area at the Springfield Scheelite Mine (Idaho Geological Survey photograph by Falma J. Moye).

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