DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1383-F

SHEET 3 OF 4

Base from U.S. Geological Survey, 1955

Geology generalized from Smith and others (1982)

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

NATIONAL GEODETIC VERTICAL DATUM OF 1929

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

TRANSVERSE MERCATOR PROJECTION

18°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1985

QUADRANGLE LOCATION

Mineral Deposits And Probability Of Exploration For Selected Metals

MINERAL DEPOSITS AND PROBABILITY OF EXPLORATION, MEDFORD 1° BY 2° QUADRANGLE, OREGON AND CALIFORNIA

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EXPLANATION

▭ AREA BOUNDARY - Areas corresponding to previously mapped geologic units; numbers indicate probability of exploration:

- I - Exploration frequent or continuous. Host rock favorable. Known deposits active or inactive, or many prospects.
- II - Exploration intermittent. Host rock favorable. Known deposits depleted or low grade (includes tailings). Exploration stimulated by higher prices or by new concepts, methods, or tools.
- III - Exploration possible. Host rock favorable or concealed by younger formations. Few, if any, known deposits or prospects.
- IV - Exploration unlikely. Host rock unfavorable for specific commodities. Since all rock types of all ages contain valuable deposits somewhere on earth, areas unfavorable for all commodities are rare or absent.

o52 MINES AND PROSPECTS - Numbered deposits have significant production, reserves, or potential; see table

- ▫ - Copper, zinc, lead
- △ - Iron, manganese
- o - Gold, silver
- × - Molybdenum, tungsten
- + - Mercury, antimony

DESCRIPTION OF MAP UNITS

QTv — VOLCANIC ROCKS OF THE HIGH CASCADE RANGE (QUATERNARY AND TERTIARY)

Tv — VOLCANIC ROCKS OF THE WESTERN CASCADE RANGE (TERTIARY)

Ts — MARINE AND NON-MARINE SEDIMENTARY ROCKS (TERTIARY)

KJg — GRANITIC ROCKS (CRETACEOUS AND JURASSIC)

KJs — SEDIMENTARY ROCKS (CRETACEOUS AND JURASSIC)

Jv — VOLCANIC ROCKS (JURASSIC)

Jo — OPHIOLITE (JURASSIC)

TRPzv — VOLCANIC ROCKS (TRIASSIC AND PALEOZOIC)

MzPzm — METAMORPHIC ROCKS (MESOZOIC AND PALEOZOIC)

CONTACT

FAULT

INTRODUCTION

This map is compiled on a generalized geologic map of the Medford 1° by 2° quadrangle (Smith and others, 1982). Its purpose is to aid in land-use planning and in resource analysis by indicating areas where mineral exploration for these selected metals is ongoing, intermittent, probable, or unlikely.

Frequency of exploration is highest in known mining districts, but other localities are re-examined when new concepts or new detectors are devised. Intensity of exploration is related to size and grade of deposits and current values of the metals.

The exploration probability of an area is judged by the number and type of known deposits. Areas are outlined by boundaries at or near the contacts between favorable and less favorable host rock for the specific metals on this map. The extent of each area is determined by the probable extent of favorable host rock without regard for accessibility or present restrictions on land use.

The probability of exploration within each outlined area is likely to remain fairly stable for several years or decades; it could be raised by new discoveries, but it is unlikely to be lowered since it is based on known deposits.

COPPER

Copper is produced from two types of deposits of different ages. Gold-quartz veins are Cretaceous(?); massive (and disseminated) sulfide deposits are of Jurassic age. A third type of copper-bearing deposit, from which there has been no production, is the Chisholm (Shamrock) (no. 64), a magmatic deposit of iron, nickel, and copper sulfides (described under nickel on sheet 2).

Gold-quartz veins have yielded small amounts of copper and lead from concentrates shipped to copper smelters. The amount is not reported.

Massive sulfide deposits have yielded most of the copper produced in the Medford quadrangle. Four mines each produced more than $100,000: Queen of Bronze (no. 26), Cowboy (no. 27), Silver Peak-Umpqua Consolidated (no. 34), and Almeda (no. 21). These deposits appear to be of volcanogenic origin and occur in at least four favorable horizons in metavolcanic rocks. The most conspicuous horizon (called the Big Yank lode), at the contact between the Rogue and Galice Formations, can be traced for more than 20 mi and contains the Almeda mine. Other horizons include the Chieftan lode (California claims, T. 33 S., R. 8 W.), General Grant lode (Benton mine, no. 18), and Queen of Bronze-Cowboy horizon. Other horizons may be indicated by occurrences of manganese and iron.

Grades of massive sulfide ores, all of which contain pyrite and (or) pyrrhotite, range from a trace to 19 percent copper, a trace to 0.44 oz/ton gold, and a trace to 12 oz/ton silver. Some ores contain zinc, lead, cobalt, nickel, and arsenic. Disseminated deposits are too low grade to have been commercial at the time (1904-1930) the massive deposits were mined (Bowen, 1969, p. 125).

The exploration potential of known disseminated deposits is discouraged by recent low copper prices. The potential for the occurrence of undiscovered deposits of massive and disseminated sulfides containing copper with subordinate zinc, lead, silver, and gold is highest along the stratigraphic horizons in which known deposits occur.

LODE GOLD AND SILVER

Lode deposits containing gold and silver are of three different types of three different ages. Massive sulfide deposits are of Jurassic age; gold-quartz veins are Cretaceous(?); sulfide veins are Tertiary.

Massive sulfide deposits are valuable mostly for copper, but leached outcrops at the Oak (T. 35 S, R. 5 W.), Turner-Albright (no. 17), Gold Note (no. 47), and Silver Peak (no. 34) were mined for their residual gold content. The gossans contained 0.1 to 0.6 oz/ton gold and some silver.

Gold-quartz veins are the most abundant and the most productive. Twenty mines yielded the bulk of the gold. Largest was the Greenback ($3,500,000, no. 40) where the grade averaged 0.44 oz/ton gold (Brooks and Ramp, 1968). Perhaps the highest grade deposit was the Gold Hill Pocket (no. 56), which occupied a quartz vein 3 to 4 ft thick to a depth of only 15 ft. The outcrop was so full of gold it could scarcely be broken with a sledge hammer (Brooks and Ramp, 1968, p. 238).

Sulfide veins are reported from two mines, each with a record of small production: Al Sarena ($24,000, no. 71) and Barron ($9,000, no. 72). The veins are fracture zones as much as 12 ft thick containing brecciated rhyolite, gouge seams, very little quartz, and veinlets of base-metal sulfides with gold and silver. Grade of ore at the Barron mine averaged 0.79 oz/ton gold and 17.4 oz/ton silver.

Potentially large tonnages of low-grade ore are known at the Benton (no. 18), Almeda (no. 21), and Forget-Me-Not copper deposits, which also contain gold and silver. Many known lode deposits have not been exhausted, but the greatest potential appears to be contingent upon the discovery of gold- and silver-bearing base-metal deposits amenable to large-scale methods of mining (Brooks and Ramp, 1969, p. 143).

MERCURY

Mercury is produced from both placer and lode deposits. The first discoveries were probably in placer gold deposits. There is no record of early production, but it was probably small. Of the 18 productive lode deposits in the quadrangle, the War Eagle (no. 63) yielded a substantial part (622 flasks) of the total production (950+ flasks). The most productive mercury mine in Oregon, the Bonanza mine, is 30 mi north of the Medford quadrangle. It produced 39,488 flasks.

The potential for new discoveries is often best near the more productive mines. Mercury detectors and geochemical sampling should aid in the search, especially in area of heavy soil cover such as the Cascade Range (Brooks and Bailey, 1969, p. 158).

OTHER SELECTED METALS

Antimony.--Small production. Systematic investigations in secs. 14, 23, 24, 25, and 27, T. 40 S., R. 4 W. would seemingly be justified (Wagner and Ramp, 1969, p. 98).

Arsenic.--No production. Arsenopyrite is a common gangue mineral in some copper, gold-silver, and mercury deposits.

Cobalt.--No production. Possible byproduct from copper, gold-copper, nickel-copper, and nickel-laterite deposits (Vhay, 1969, p. 117). Reserve estimate for Cobalt group (sec. 33, T. 36 S., R. 11 W.) may not be reliable.

Iron.--A few tons tested. Tolman deposit north of Gold Hill may contain 760,000 tons or more of 51.6 percent iron and 0.06 percent phosphorus. Victory Group near Gold Hill contains disseminated magnetite in amphibolite (Mason, 1969, p. 147).

Lead.--Small production. Potential byproduct of copper or lode gold and silver deposits.

Lithium.--No production. Water from Ashland Lithia spring (SE1/4 sec. 7, T. 39 S., R. 2 E., not shown on map) contains 9.7 ppm lithium, which amounts to 0.12 percent of the dissolved solids (Winchell, 1914, p. 88-107).

Manganese.--Small production. Small deposits of rhodonite and pyrolusite are unlikely to be competitive (Appling, 1969, p. 152).

Molybdenum.--No production. Veins and disseminated deposits in Klamath Mountains may have potential value (King, 1969, p. 163).

Titanium.--No production. Victory Group (T. 32 S., R. 7 W.) near Gold Hill contains disseminated magnetite. The concentrate contains 5 percent titanium (Mason, 1969, p. 147).

Tungsten.--Small production. Ten or more deposits near Medford and Ashland are all of marginal size and grade (Hobbs 1969, p. 180).

Uranium.--No production. Two occurrences in rhyolite tuff, one of autunite in T. 34 S., R. 2 W., the other in sec. 31, T. 33 S., R. 1 W. (neither shown on map) contained about 0.2 percent U_3O_8 (Schafer, 1956, p. 101). Considering the association of uranium and lithium, the Tertiary nonmarine strata in the Ashland area may warrant investigation.

Zinc.--Small production. Potential byproduct of lode gold and silver or copper deposits.

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