U.S. Geological Survey Fact Sheet

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USGS geochemical studies outline mineral potential and environmental hazards in southeastern Oregon

In response to increasing Federal, State, and private interest in the lands of southeastern Oregon, U.S. Geological Survey (USGS) scientists are working in three Bureau of Land Management (BLM) Resource Areas (R.A.)—Malheur, Jordan, and Andrews—to answer important questions regarding:

- Current and future land use
- Development of mineral and energy resources
- Protection of the ecosystems
- Environmental remediation of historic mining sites
- Naturally occurring metals contamination.

Previous USGS investigations in the area have consisted mostly of small, isolated Wilderness Study Area projects and did not provide the broader geochemical overview needed to characterize the mineral potential and environmental hazards of the entire two-county area.

To provide BLM with the geologic information necessary to produce a comprehensive management plan for these resource areas, the USGS initiated a multidisciplinary study involving geologic mapping, geochemistry, geophysics, economic geology, industrial commodities, and environmental geology. The USGS has provided chemical analyses and geochemical interpretations for 2,700 stream-sediment and soil samples from the 12,500 mi^2 area.

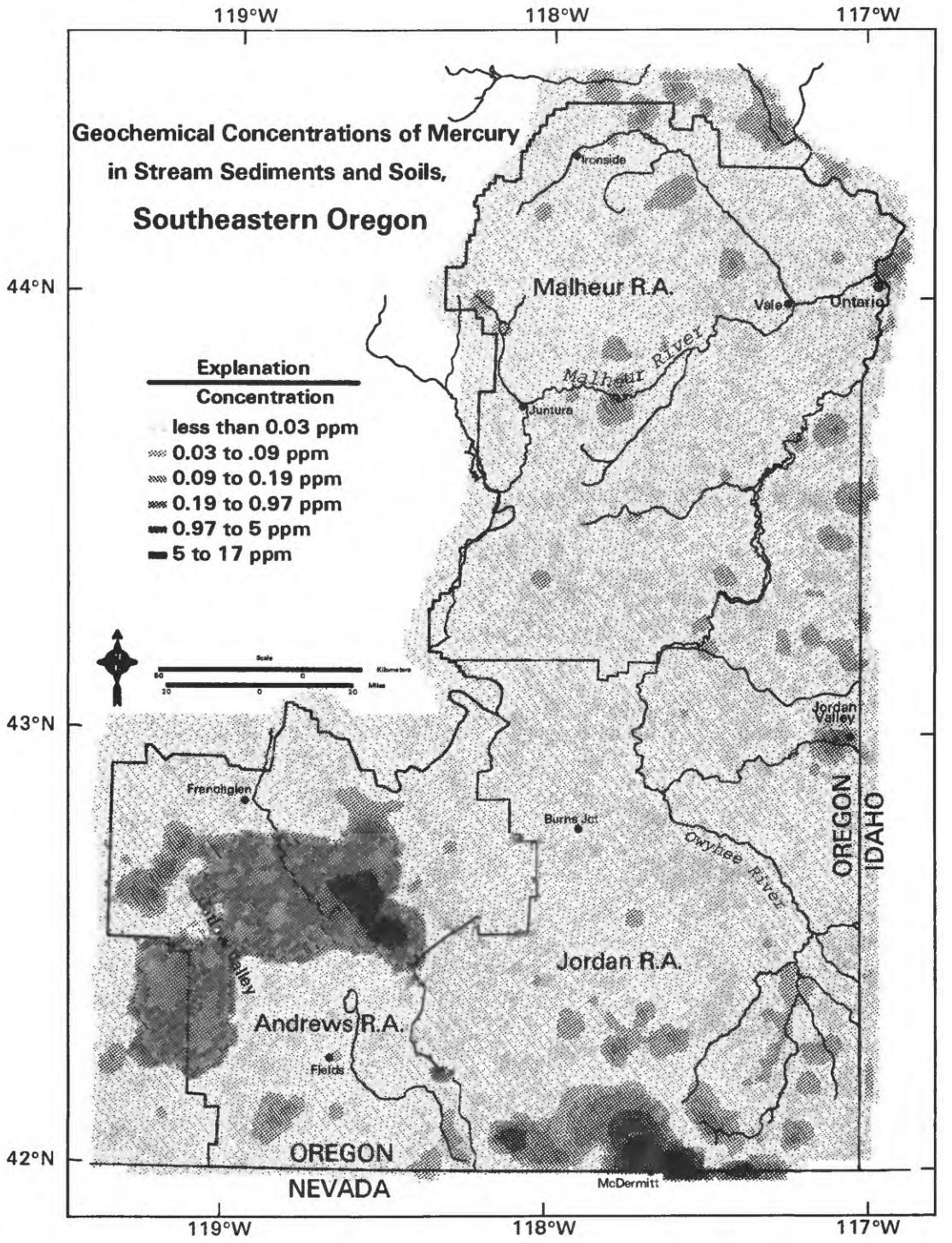
In October 1994, the USGS team provided BLM with a quantitative mineral assessment of the Malheur and Jordan Resource Areas that itemized the potential of undiscovered deposits of gold, silver, mercury, chromium, platinum, nickel, copper, uranium, manganese, asbestos, and diatomite (used as a purification filtering medium for pharmaceuticals and wines). The team is working on a similar study of the Andrews Resource Area and will integrate all three areas in a detailed report for 1997.

For the environmental aspects of the study, the geochemistry team has identified areas where naturally occurring mercury and arsenic contaminants are entering various ecosystems. The team is starting a reconnaissance study for the detection of selenium in geo-biological cycles. In addition, the mercury data are being used in a broader study of geologic contaminants in the upper Columbia River basin.

The figure shows one type of geochemical map produced for this study. Higher levels of mercury in soil and stream-sediment samples are shown by darker shades of gray. The known mercury deposits—those west of McDermitt (currently the largest mercury producer in the U.S.), in the Jordan Resource Area, and northeast of Fields in the Andrews Resource Area—are reflected in the soil and stream-sediment samples and shown as areas of dark and medium gray. Unknown before the geochemical study, high mercury concentrations are seen east of McDermitt and in the large areas on both sides of Catlow Valley in the Andrews Resource Area. The geochemical signature east of McDermitt indicates a possible extension of the known mercury mineralizing system and potential additional deposits. The mercury signature around Catlow Valley is being studied for both its present environmental implications and as an indicator of possible buried mineral deposits and geothermal fields. The scattered, light-gray areas in the Malheur Resource Area represent moderate soil and stream-sediment mercury concentrations that are considered to be indicative, when combined with other geochemical

and geological data, of buried hot-springs-type gold deposits, such as one currently being explored 25 miles south of Vale.

This previously remote corner of Oregon, which has limited access corridors, is experiencing increasing pressures from recreational activities, ranching, farming, mining, geothermal-energy production, and ecosystem conservation. To understand the potential of this high desert land, and, perhaps more importantly, how it will react to the various demands placed upon it, it is vital to know (1) its geological genesis, (2) its present geologic makeup at and below the surface, and (3) its predicted geo-ecosystem responses. The research efforts of this USGS team are targeted at providing this needed information, in both technical and nontechnical formats, for immediate use by other scientists, land-use managers, and the public. ❑



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