

- EXPLANATION**
- Au** GOLD PLACER DEPOSITS ALONG THE NORTH FORK JOHN DAY RIVER
  - I** AREAS OF HIGH GOLD POTENTIAL.—Stream-sediment samples contain more than 50 parts per million (ppm) total gold
  - II** AREAS OF MODERATE GOLD POTENTIAL.—Stream-sediment samples contain between 10 and 50 ppm total gold
  - III** AREAS OF LOW GOLD POTENTIAL.—Stream-sediment samples contain between 0.5 and 10 ppm total gold

- CORRELATION OF MAP UNITS**
- |      |                        |
|------|------------------------|
| Qag  | QUATERNARY             |
| Tv   | TERTIARY               |
| KJqm | CRETACEOUS OR JURASSIC |
| Jd   | JURASSIC               |
| RPzs | TRIASSIC AND PALEOZOIC |

- DESCRIPTION OF MAP UNITS**
- Qag ALLUVIUM, GLACIAL DEPOSITS, AND TEPHRA (QUATERNARY)
  - Tv VOLCANIC DEPOSITS (TERTIARY)
  - KJqm QUARTZ MONZONITE (CRETACEOUS OR JURASSIC)
  - Jd DIORITE (JURASSIC)
  - RPzs SEDIMENTARY AND IGNEOUS ROCKS (TRIASSIC AND PALEOZOIC)
- CONTACT  
— APPROXIMATE BOUNDARY OF NORTH FORK JOHN DAY RIVER ROADLESS AREA

**STUDIES RELATED TO WILDERNESS**

The Wilderness Act (Public Law 93-577, September 3, 1984) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral resource potential survey of the North Fork John Day River Roadless Area in the Unatilla and Willowa-Whitman National Forests, Grant County, Oregon. North Fork John Day River Roadless Area (89253) was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

**SUMMARY**

A mineral survey of the North Fork John Day River Roadless Area, Oregon, was conducted in 1981-1983. The survey revealed that 2.8 million yd<sup>3</sup> of placer gravel resources occur along the river. The average value of gold (at \$500 per troy ounce) in the gravels is \$1.00/yd<sup>3</sup>. About 840,000 yd<sup>3</sup>, or 30 percent of the total resources, are indicated and inferred marginal reserves averaging \$1.78/yd<sup>3</sup>. Several drainages tributary to the North Fork in the roadless area also contain potential gold resources within Paleozoic and Triassic rocks underlying the drainages, and in Tertiary and Quaternary placer deposits.

**GEOLOGY**

Most of the roadless area is underlain by rocks of late Paleozoic or Triassic age (Evans, 1984a). These include Elkhorn Ridge argillite (late Paleozoic and Triassic), which is the most widespread unit and is mostly black argillite and chert; a pyroclastic and volcanic rock assemblage (Permian or Triassic hornblende diorite (Paleozoic and Triassic); and a Triassic melange that consists largely of argillite, similar to the Elkhorn Ridge argillite, and subordinate amounts of serpentinite (Middle Triassic). These rocks are juxtaposed by faulting. The Paleozoic and Triassic rocks are intruded by Jurassic diorite, and by Jurassic or Cretaceous quartz monzonite. The Paleozoic and Mesozoic rocks are overlain by a Tertiary (Eocene and Oligocene) assemblage that consists of basalt, andesite, ignimbrite, sandstone, and lake bed deposits. Quaternary alluvium, glacial till, and a thick regolith with reworked tephra cover a large part of the eastern half of the roadless area.

**GEOCHEMISTRY**

Geochemical studies included sampling of stream-sediment (60 silt and 57 pan-concentrates samples from 60 sites), placer deposits (444 samples from 285 sites) and mineralized rocks (60). The results of these analyses have been reported by Conyac (1983) and Evans (1984b). Gold, the principal commodity of the area, occurs in numerous placer deposits along the North Fork John Day River. Tributaries of the North Fork also contain gold in stream sediments, indicating sources underlying these drainages.

**MINERAL RESOURCE EVALUATION**

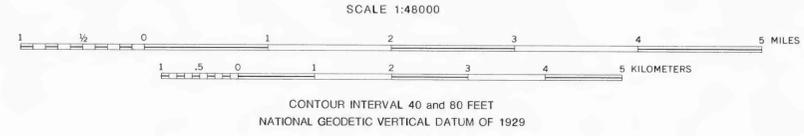
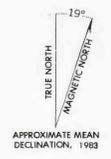
Placer gold resources along the North Fork John Day River in the roadless area consist of indicated and inferred resources totaling 2.8 million yd<sup>3</sup> and have a weighted average value of \$1.00/yd<sup>3</sup>, using a gold price of \$500 per troy ounce. About 840,000 yd<sup>3</sup> or 30 percent of the total resources, are indicated and inferred marginal reserves having a weighted average value of \$1.78/yd<sup>3</sup> (Conyac, 1983).

Twenty-one drainages tributary to the North Fork John Day River have potential for gold resources. Resources consist of stream sediments, Tertiary and Quaternary placer deposits, gold-bearing glacial till, and mineraliferous Paleozoic and Mesozoic rock. On the basis of concentrations of gold found in the sediment samples, mostly in pan concentrates, the areas with gold potential (placer and lode resources) are ranked: high (I), gold greater than 50 parts per million (ppm); moderate (II), gold between 10 and 50 ppm; low (III), gold between 0.5 and 10 ppm. The highest ranked areas are along the southeast margin of the roadless area and include Crane and Granite Creeks, which are largely outside the area.

Silver may be recoverable with the gold. Fractured basalt and chert suitable for road metal, and sand and gravel deposits occur in the roadless areas. No high-quality ornamental or building stone occur in the area. The roadless area has no potential for nuclear or fossil fuels or geothermal resources.

- REFERENCES CITED**
- Conyac, M. D., 1983, Mineral investigation of the North Fork John Day River RARE II Assessment (No. 89253), Grant County, Oregon: U.S. Bureau of Mines Mineral Land Assessment MLA 34-83, 16 p.
  - Evans, J. G., 1984a, Geologic map of the North Fork John Day River Roadless Area, Grant County, Oregon: U.S. Geological Survey Miscellaneous Field Studies Map MF-1581-C, scale 1:48,000, in press.
  - , 1984b, Geochemical map of the North Fork John Day River Roadless Area, Grant County, Oregon: U.S. Geological Survey Miscellaneous Field Studies Map MF-1581-B, scale 1:48,000 in press.

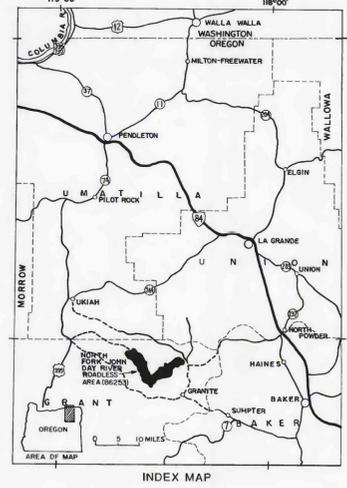
Base from U.S. Geological Survey  
1:24,000 Granite, Trout Meadows, 1972;  
1:62,500 Desolation Butte, 1951



Geology mapped by James G. Evans in 1982

## MINERAL RESOURCE POTENTIAL MAP OF THE NORTH FORK JOHN DAY RIVER ROADLESS AREA, GRANT COUNTY, OREGON

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Explanatory pamphlet accompanies map  
Interior—Geological Survey, Reston, Va.—1983  
For sale by Branch of Distribution, U.S. Geological Survey,  
Box 25286, Federal Center, Denver, CO 80225