

**EXPLANATION**  
Area having potential for resources in mineral settings  
Low potential  
MIN-Some lead veins are shown in till where till is thin, or where patches of low potential are more closely covered by till. Mine numbers correspond to numbers in Table 1.

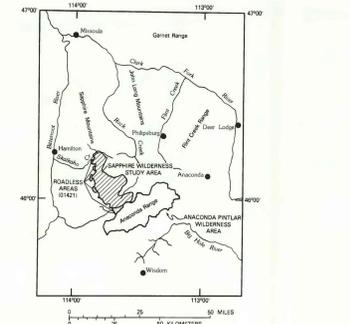
**AREAS HAVING POTENTIAL FOR RESOURCES IN MESOTHERMAL VEINS AND REPLACEMENT ZONES**  
High potential  
Moderate potential  
Low potential  
Areas having potential for resources in placers  
High potential  
Moderate potential  
Low potential  
Areas having potential for resources of rare earth and related elements in plutonic rocks  
Low potential

**DESCRIPTION OF MAP UNITS**  
QUATERNARY AND TERTIARY DEPOSITS  
Qa1 ALLUVIAL DEPOSITS (BOLSONES)—Stream deposits of unconsolidated, poorly sorted, boundary sandy silt.  
Qa2 LANDSLIDE AND ROCKFALL DEPOSITS (BOLSONES AND FLEISCHBACH)—Unconsolidated rock fragments in a matrix of weathered rock and soil in drainage.  
Qa3 TILL (FLEISCHBACH)—Poorly sorted, boundary sandy, clayey, silty gravel.  
Qa4 OUTWASH DEPOSITS (FLEISCHBACH)—Unconsolidated, silty, clayey, silty gravel and well-sorted, boundary sandy and well-sorted.  
Qa5 ALLUVIAL FAN AND FLOODPLAIN GRAVEL DEPOSITS (FLEISCHBACH)—Poorly sorted boulders and gravel in a sandy, clayey, and silty matrix.

**INTRUSIVE ROCKS**  
Tg1 INTRUSIVE ROCKS OF MOUNT CREEK  
Tg2 HOTTETTSBERG GRANODIORITE (TERTIARY TO CRETACEOUS)—Biotite porphyritic, medium-grained, hypidiomorphic-granular rocks with andesine and albite.  
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**MINERAL RESOURCE POTENTIAL MAP OF THE SAPPHIRE WILDERNESS STUDY AREA AND CONTIGUOUS ROADLESS AREAS, GRANITE AND RAVALLI COUNTIES, MONTANA**

By  
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J. H. Hassemer, and W. F. Hanna, U.S. Geological Survey  
and  
D. P. Banister and T. J. Close, U.S. Bureau of Mines



**STUDIES RELATED TO WILDERNESS**  
The Wilderness Act (Public Law 90-201, September 8, 1964) and related acts require the U.S. Geological Survey and the Bureau of Mines to survey certain areas on Federal lands to determine their mineral resources. This report was prepared for the public and is submitted to the President and the Secretary of the Interior. The Sapphire Wilderness Study Area was established by Public Law 95-150, November 1977, and contains roadless areas (RWA) which are to be managed as further planning areas during the second biennial review and evaluation (RARE II) by the U.S. Forest Service, January 1979.

**MINERAL RESOURCE POTENTIAL**  
Some areas in the Sapphire Wilderness Study Area and contiguous roadless areas, Granite and Ravalli Counties, Montana, hereafter referred to as the "study area," contain identified mineral resources and have potential for the occurrence of base and precious-metal resources in small deposits that are associated with igneous and metamorphic rocks. The study area is located in the southern part of the Sapphire batholith in the western part of the study area, and is bounded by the Front Range north and west, and by the Snake Range east and south. The study area is bounded by the Snake Range north and west, and by the Snake Range east and south. The study area is bounded by the Snake Range north and west, and by the Snake Range east and south.

**ASSESSMENT OF POTENTIAL**  
Mineral resource potential, as used in this report, is a geologic evaluation of the potential for occurrence of metallic and energy resources that is based on criteria developed from geologic, geophysical, geochemical, and mine and prospect data. This potential is defined as "a concentration of elements in a particular locality" and is not a measure of the amount of elements that can be extracted from the locality. This potential is defined as "a concentration of elements in a particular locality" and is not a measure of the amount of elements that can be extracted from the locality.

**MINERAL RESOURCE POTENTIAL**  
The study area is characterized by (1) an areally extensive, elongate, unroofed magmatic high that separates local magnetic high from the Snake Range; and (2) low-magnetic Bouguer gravity low that is approximately coincident with the lower level of the unroofed magmatic high. The unroofed magmatic high is a remnant of the Sapphire batholith. The study area is characterized by (1) an areally extensive, elongate, unroofed magmatic high that separates local magnetic high from the Snake Range; and (2) low-magnetic Bouguer gravity low that is approximately coincident with the lower level of the unroofed magmatic high.

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