Needs

It is necessary to (1) effect an increase in domestic production of gold at least to the level of industrial consumption, thereby reducing the drain of U. S. gold stocks, and (2) demonstrate a capability to produce significant additional amounts of gold from domestic sources in the near future, thereby providing a psychological advantage to the U. S. in international economic diplomacy. New deposits of gold that can be developed profitably by industry with current techniques, as well as economically marginal or submarginal deposits, must be identified and delineated. New mining and metallurgical techniques must be developed to make many of the marginal and submarginal deposits profitable to operate.

Alternatives

The supply of gold could be increased by raising the price above the $35/ounce figure set in 1934 or by paying subsidies to gold producers. Both of these alternatives are vigorously opposed by the Treasury Department.

Criteria (for Government involvement)

The combination of fixed price and increasing production costs has caused mining of gold to decline. As a result, little research in support of gold production has been done either by Government or by private industry in the United States. The Heavy Metals program of the Department of the Interior—being conducted jointly by the Department's Geological Survey and Bureau of Mines—is designed to rekindle interest in gold.

Preferred course of action

Under the Heavy Metals program, basic geologic, geochemical, geophysical, and technological information is being gathered and disseminated to stimulate increased efforts by private industry in searching for new deposits and in developing new ore bodies. In recent years, for example, most of the effort devoted to gold has remained in the context of traditional sources (namely gold veins, conventional placers, and byproduct recovery) and of traditional treatment methods. But if gold output is to be increased significantly, new sources in new kinds of geologic environments must be found and new sampling, mining, and metallurgical techniques must be developed. Primary emphasis at present is directed toward finding and stimulating the production of gold, but concomitant discoveries are expected in the other heavy metals.

Technical objectives

In scope, the Heavy Metals program is designed to include any subject that has a bearing on the occurrence and geological-geochemical behavior of gold and the other heavy metals, or on improvements in methods of mining and recovery. The objectives of the program are:

(1) Delineation of exploration targets that private industry can develop.

(2) Identification of large-scale, low-grade resources that might be made into productive deposits through improvements in technology.

(3) Development of mining systems and processing methods to make low-grade resources minable at acceptable costs.

(4) Development or improvement of sampling and analytical techniques and detection devices that will enhance the capability of both Government and industry to locate and delineate deposits.

(5) Expansion of knowledge of the processes that control the occurrence and behavior of gold and other heavy metals in nature.

(6) Improvement in the methods to appraise and classify the potential of new deposits.

Application of science and technology

To attain the objectives of the Heavy Metals program, a wide variety of scientific and technologic methods are being utilized or are under development. Some examples are:

(1) Basic geologic mapping.

(3) Improved extremely sensitive and rapid analytical techniques.

(3) Mobile chemical laboratories and spectrographs.

(4) Highly sophisticated analytical instruments based on neutron activation principles.

(5) New equipment for sampling such as the experimental resonant vibratory drill which will be tested both in the continental shelf waters and on