ANCILLARY SUPPORT

1. Industry will be invited to participate in joint ventures and to cooperate in the program with work being undertaken under the general direction of joint Government-industry committees which can be formed in cooperation with industry and scientific groups, such as the American Petroleum Institute, university research foundations and others.

2. Provisions will be made for cooperative studies between Government and individual companies or consortiums of companies, including those not now connected with the petroleum industry. In fact, with respect to in situ retorting research, a consortium of some 24-plus companies, with CER-Geonuclear Corporation, Las Vegas, Nevada, as interface, now is negotiating with the United States Government, represented by the Department of the Interior and the Atomic Energy Commission, for joint financing and conduct of a nuclear-explosive, in situ retorting experiment on Federal oil-shale lands.

3. The Federal Government will actively support research directly or through contracts with private organizations, including industry, universities, and foundations.

4. The costs indicated herein are estimated total costs, with the exception of AEC costs of providing and firing nuclear explosives, and conducting the necessary health and safety programs required for nuclear detonations. Any contributions from industry or elsewhere will reduce the costs correspondingly.

5. Multiple-resource planning will involve close cooperation with State and local as well as Federal agencies.

OIL SHALE MINING METHODS RESEARCH

Objective

The mining-research program is intended to develop a mining system technology for the economic extraction of oil shale that is compatible with the requirements for resource conservation and land preservation. The optimum mining system will be correlated to the determinable physical properties and geological conditions of the oil-shale deposits so that the design system will be as universally applicable as possible for oil-shale mining. The system will incorporate the most advanced technology available through research and development.

Program

A ten year program estimated to cost $31,754,000 is proposed that will provide for concurrent research in the major subsystems of rock fragmentation, ground control, materials handling, and environmental control and development of a model mine system design to mine oil shale. At an early stage the investigation will include developing the design and specifications for prototype equipment and testing prototypes. A full-scale demonstration of the design mine system and equipment should follow the 10-year program.

A key element in a conceptual system now under consideration is the use of spent shale as backfill for ground support. A mining system developed around this concept, whereby most of the material mined is returned to the voids from which it was obtained, will vastly reduce surface disposal, and will in addition stabilize the ground during mining, prevent later surface subsidence, permit almost 100-percent extraction of the rock layers being mined, and leave the unmined shale in good condition for later recovery of other minerals if desired. Such a system will require the development of advanced subsystems, particularly for rock breaking and materials handling. It probably will require continuous-mining machines of a type and size that do not now exist, and transportation devices and systems of radically different design. From the standpoint of economics, the system described conceptually offers greater potential than any of the existing conventional mining systems. The physical properties, thickness, and structure of the shale are favorable to the introduction of large, high-capacity machines to eliminate the inefficient drilling and blasting cycle inherent in most existing underground-mining methods and to permit automation in such systems to a high degree. This is a mining method that can yield thousands of tons per man shift rather than the 150 tons per man shift now obtained in the most efficient underground mining methods. At the same time it will accomplish the major conservation objectives.

The program will be conducted as two related phases. Much of the work in phases A and B will be carried on concurrently with constant feedback so individual components can be refined as data are developed.