

Mr. KELLY. It shows the chimney created by the nuclear explosion, the injection of compressed air necessary to support combustion, the advance of the combustion zone through the rock fragments which decomposes the kerogen and the recovery of the petroleum products at the bottom of the chimney.

The geological medium or rock type in which the explosion occurs is, of course, an important factor in determining what will result. There has never been a nuclear explosion to date in oil shale; however, we have conducted many nuclear explosions in several other types of rock and have successfully extrapolated the results from one type of rock to another. We have experience to date in six types of rock including alluvium (deposits of unconsolidated sand and gravel), tuff (cemented volcanic ash), salt, basalt (solidified lava flow), grandiorite (granite), and dolomite (carbonate rock). The latter is chemically similar to oil shale.

A seventh rock type in which we expect to gain experience soon is the gas bearing sandstone occurring in the pictured cliffs formation underlying the San Juan Basin of northwestern New Mexico where we plan to conduct Project Gasbuggy, which has been referred to earlier, in cooperation with the El Paso Natural Gas Co. and the Department of the Interior. The Gasbuggy experiment is a test of whether nuclear explosions can liberate large amounts of natural gas held in geologically tight underground formations which have a low permeability. Information obtained from Gasbuggy will be of considerable value to us in planning for a specific oil shale experiment utilizing nuclear explosives.

The staff of the AEC and the U.S. Bureau of Mines only very recently began a detailed feasibility study regarding the use of nuclear explosives in oil shale in connection with some 25 companies in the oil and gas and related industries represented by the CER Geonuclear Corp. of Las Vegas, Nev. A list of these companies is submitted for the record.

(The document referred to follows:)

COMPANIES CURRENTLY PARTICIPATING IN OIL SHALE COMBINE ORGANIZED BY CER GEONUCLEAR CORP.

Ashland Oil & Refining Co.
Atlantic Richfield Co.
Cameron & Jones, Inc.
Cities Service Oil Co.
Continental Oil Co.
El Paso Natural Gas Co.
Equity Oil Co.
Getty Oil Co.
Humble Oil & Refining Co.
Marathon Oil Co.
Mobil Oil Co.
Murphy Oil Corp.
Pan American Petroleum Corp.

Shell Oil Co.
Sinclair Oil & Gas Co.
Sohio Petroleum Corp.
Sun Oil Co.
Superior Oil Co.
Tenneco Oil Co.
Texaco, Inc.
The Cleveland-Cliffs Iron Co.
The Oil Shale Corp.
Union Pacific Railroad Corp.
Western Oil Shale Corp.
Wolf Ridge Minerals Corp.

Mr. KELLY. It is expected that the feasibility study report can be completed and a report published later this year. Such a report, when completed, may form the basis for any formal proposal the CER combine would wish to make to the Government. In the event such a proposal were made, a very precise evaluation of the technical, safety