In the other area is strip mine reclamation. We have projects with the States on these subjects which are currently confined to public lands where the State proposes the demonstration work to be done and it is funded jointly on a 75 Federal, 25 State basis. We work together working out the engineering and other details of the project and in reporting.

I would like to turn quickly, if I may, now to the current status of pollution abatement technology, in my opinion.

The scientific information on pollution information is for the most part more advanced than the engineering technology. There are theoretical chemical equations for handling many of the pollutants from the standpoint of their formation and from the standpoint of their alleviation. However, the problem is that the corresponding engineering technology either hasn't been developed or, if you include in the definition of technology the question of economics, the economics are unfavorable.

This does not mean that we recommend no further basic research because, as a strong supporter of basic research, I believe that it is reasonable to expect that a better understanding of the fundamental processes involved in pollution formation and prevention would lead to more feasible avenues for developing technologies.

However, one would hope to use, wherever possible, existing technology because of the timespan involved and, therefore, it is the technological area where we are in short supply.

One of the major reasons for this is because most pollutants are in a very low concentration in the environment and therefore the removing of relatively small amounts of materials from very large volumes of harmful substances is generally an economic problem.

Incineration of combustible refuse is a good example of moderately adequate scientific information but very inadequate engineering technology. I state that the scientific background is fairly well known because incineration is basically a combustion problem. Since incineration is a combustion process, it should be possible to design incinerators on the basis of the theory and practices of burning solid fuels such as coal. However, whether it is a small household or a large municipal incinerator, the design and operation is complicated by enormous variations in the quantity and composition of the refuse fed to the furnace. These variations in the feed cause significant fluctuations in the temperature of the combustion chamber which creates serious problems in controlling the evolution of smoke, fly ash, and malodorous or noxious gases. In addition, combustion control is complicated because the moisture content of the combustible refuse may vary from almost zero to at least 80 percent. All too often, municipal incinerators are designed and built without adequate attention to the nature and volume of the materials they must handle at the outset, let alone within the next decade. Residential incinerators generally are inadequate for the job and are operated by unskilled personnel. Unfortunately, basic and applied research on the incineration process has been notably scanty. The Bureau of Mines and the Taft Engineering Center conducted limited investigations on incineration in the 1950's, but the work was terminated long before completion. Limited research has been conducted in recent years by a num-