

In the past there has been a tendency to look askance at recycling; the idea of reusing "junk" was considered degrading. Nevertheless, the Bureau of Mines has persevered—sometimes at only token levels of funding, and often alone—in this field of research.

The growing realization of the importance of waste reclamation has generated social pressures for additional actions by the Federal Government. With the passage of the 1965 Solid Waste Disposal Act, the Bureau's responsibility was clearly indicated. Under the provisions of the Act, the Secretary of the Interior was given responsibility for dealing with "... problems of solid waste resulting from the extraction, processing, or utilization of minerals or fossil fuels..." This is interpreted to include the return to the industrial base of metal scrap and mineral residues from all sources.

The scope of the Department's activity is spelled out in the Act as follows:

"The Secretary shall conduct, and encourage, cooperate with, and render financial and other assistance to appropriate public authorities, agencies, and institutions, private agencies and institutions, and individuals in the conduct of, and promote the coordination of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the operation and financing of solid waste disposal programs, the development and application of new and improved methods of solid waste disposal and the reduction of the amount of such waste and unsalvageable waste materials."

In carrying out these provisions the Secretary is authorized to:

1. collect and make available, through publications and other appropriate means, the results of such research and other activities including appropriate recommendations in connection therewith;
2. cooperate with public and private agencies, institutions and organizations, and with any industries involved, in the preparation and the conduct of such research and other activities; and
3. enter into contracts or make grants-in-aid to public or private agencies and institutions and to individuals for research, training, projects, surveys, and demonstrations."

The Department of the Interior, through the Bureau of Mines, immediately initiated an expanded program to:

1. Delineate the factors causing and contributing to waste disposal problems in mineral and mineral-related industries; establish the magnitude and nature of the waste products; identify the problems that demand priority of attention; appraise the effectiveness of waste disposal practices; provide estimates of waste that may accumulate from future operations; and make recommendations for the improvement of waste disposal practices;
2. In areas where the scope of the problem was already clearly identified (automobile scrap, incinerator waste, alumina plant red mud), develop new or improved techniques of solid waste recovery and utilization and demonstrate their applications; alternatively, develop nonpolluting methods for disposing of solid waste where no valuable constituents can be identified and for which no use can be found;
3. Devise methods for separation of components of nonferrous scrap by continuation of research previously underway;
4. Interest and train college students in the field of solid waste utilization and disposal.

Work on auto scrap was divided into two phases: (1) upgrading to an acceptable feed for steelmaking and (2) finding alternative uses.

The presence of copper in automobile scrap is a major barrier to its use in steelmaking; a maximum of 0.15% copper is permitted for steel that is to be shaped by deep drawing. Tin, aluminum, and lead are other unwanted, but less troublesome, impurities. Methods investigated for the effective removal of impurities have included physical sorting, leaching, and pyrometallurgical treatments.

Good progress has been made on a project designed to determine the exact location and composition of nonferrous components of typical scrap automobiles and to find the most economical method of stripping these components from the hulk. Representative models of junk cars were disassembled and analyzed and the results transmitted to the Institute of Scrap Iron and Steel, the American Federation of Independent Scrap Yard Dealers, and the American Foundryman's Society. These organizations, in turn, disseminated the information to their in-