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DOE'S MIXED WASTE INVENTORY AND WASTE GENERATION RATES

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DOE'S MIXED WASTE INVENTORY AND WASTE GENERATION RATES

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The Mixed Waste Treatment Project (MWTP) has collected and analyzed mixed low-level waste data to assist in developing treatment capability for the U.S. Department of Energy's (DOE) wastes. Initial data on the characteristics of mixed waste was obtained from the Waste Management Information System (WMIS) data base, and has been updated based on visits to DOE sites where most of the wastes are generated and stored. The streams of interest to the MWTP have a current inventory of about 70,000 m^3 and a generation rate of about 7,700 m^3/yr. The current total inventory within the DOE complex is over 300,000 m^3. The difference between these two numbers can be attributed to the Hanford waste tanks and several previously cemented waste streams. The 12 sites with the most significant processing needs are Fernald, Hanford, K-25 (Oak Ridge), Idaho National Engineering Laboratory (INEL), Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), Oak Ridge National Laboratory (ORNL), Paducah Gaseous Diffusion Plant, Portsmouth Gaseous Diffusion Plant, Rocky Flats Plant (RFP), Savannah River Site (SRS), and Y-12 (Oak Ridge). The quantities of wastes of interest to the MWTP are illustrated in figure 1. As can be noted, the 12 sites listed above account for about 98% of the mixed waste volumes. The approximately 20 sites that remain account

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for the balance. It thus appears necessary to construct a limited number of treatment facilities at the major sites and ship the remaining wastes to those sites for treatment.

The wastes have been assigned to specific waste characterization categories and a flowsheet that identifies applicable technologies has been developed. The relative distribution of the wastes among the categories can be noted in figure 2. The largest waste stream category, when considering the current inventory in storage, is inorganic solids, with sludges, filter cakes, and residues the largest specific subcategories. Aqueous liquids are the largest currently generated stream. The other large categories are solid organics, metals wastes, and heterogenous wastes. Organic liquids, which have been a major focus of past R&D efforts, are the smallest of the categories.

Analysis of the waste stream information from each site shows that no two sites have the same distribution of wastes, and in fact certain sites dominate in different waste types. For the current inventory of wastes, aqueous wastes are of the highest inventory at ORNL and SRS; inorganic solids at Fernald, Hanford, K-25, LANL, Paducah, RFP, and Y-12; metal wastes at INEL; and heterogenous solids at Portsmouth. For generation rates, aqueous wastes represent the greatest generation rate at INEL, LLNL, and Y-12; organic liquids at Fernald, ORNL and Paducah; inorganic solids at K-25, LANL, and Rocky Flats; organic solids at Hanford; PCB wastes at Portsmouth; and tritium-containing aqueous wastes at SRS. The variation in waste distribution among the different sites suggests that the treatment technologies selected will need to accommodate major changes in the types and relative volume of different waste streams.

The waste streams have also been evaluated for radionuclide content. It was determined that the two major categories are plutonium contamination and uranium contamination, with smaller quantities in fission product and other radionuclide contamination.

The results of the data review have provided significant information, but have also identified the need for additional information. It should also be recognized that the data will be modified as wastes are characterized and as waste generation practices continue to change.

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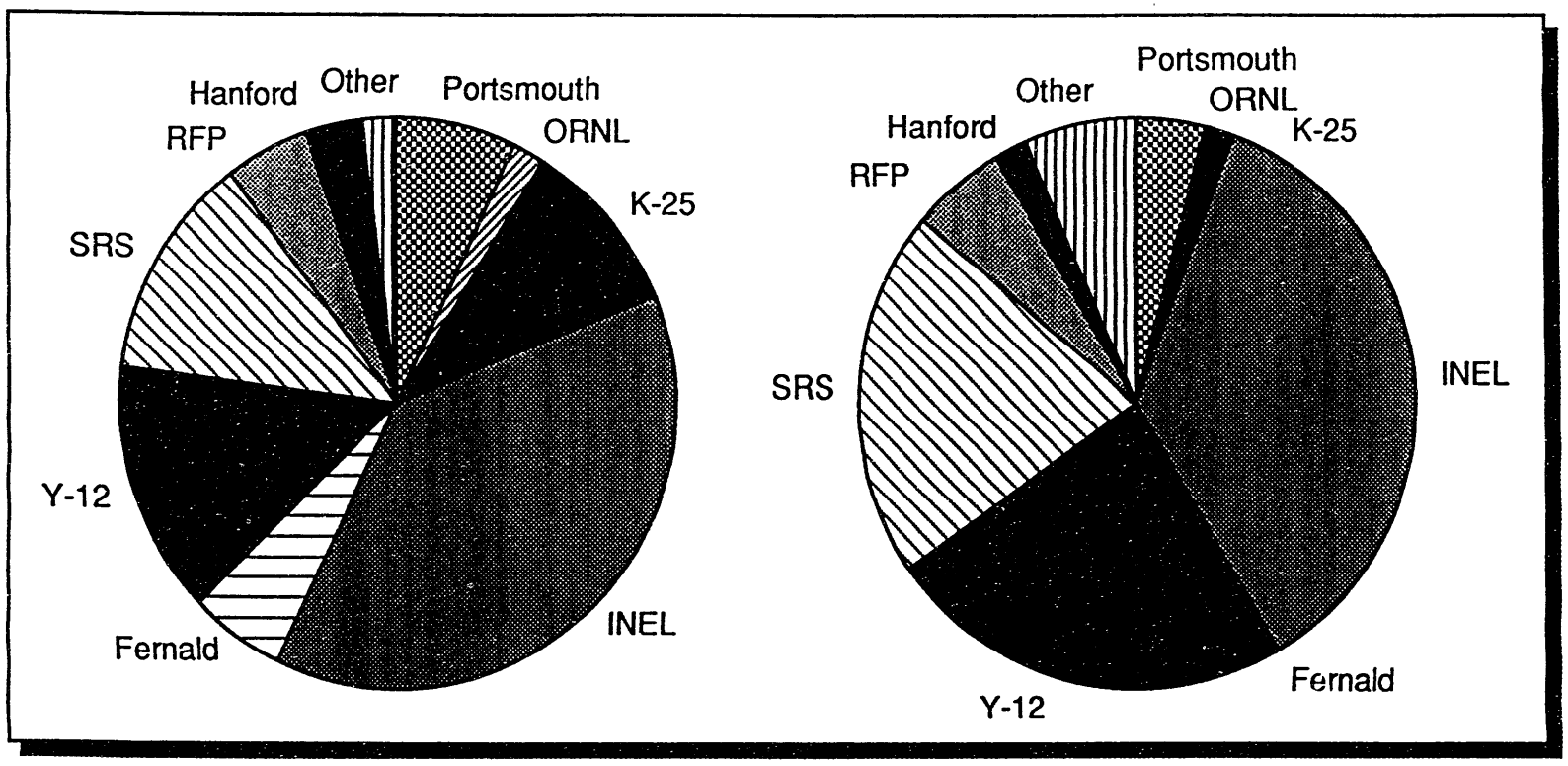
Locations of Mixed Wastes



Current Inventory
70,000 (M3)

Generation Rate
7,700 (M3/Y)

Mixed Waste Treatment Project

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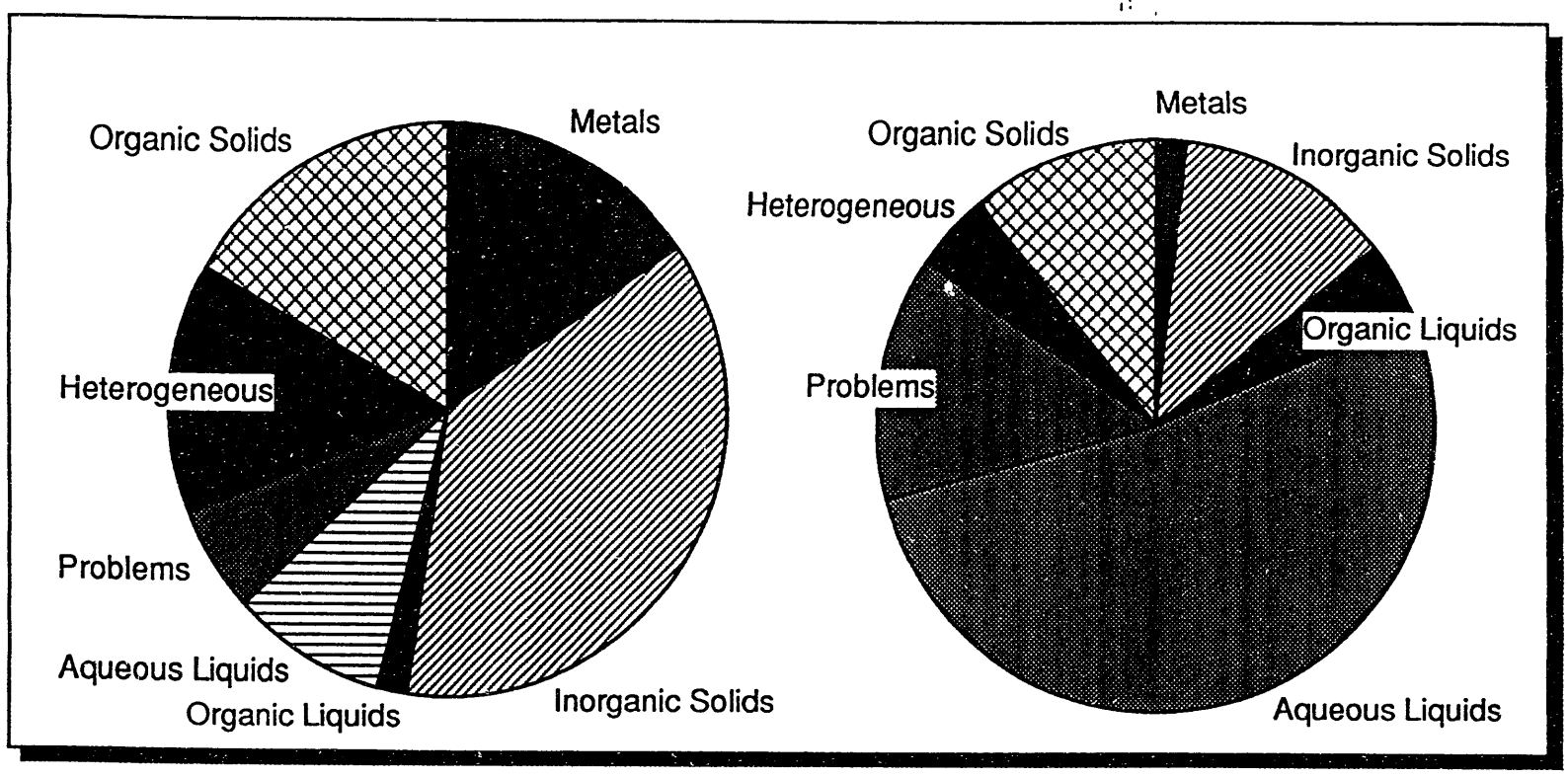
Major Categories of Wastes



Current Inventory
70,000 (M3)

Generation Rate
7,700 (M3/Y)

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