

LS-2018A RADIOACTIVE WASTE BURIAL TECHNOLOGY

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TA-21
The objective of this continuing program is to improve the technology related to the shallow land burial of radioactive waste. The need for modifying present burial techniques to provide a more effective means for the disposal of waste generated by the nuclear power industry has been recognized for some time. Several problem areas are pursued in this endeavor, including modifications to burial sites, modified operational procedures, altered site selection procedures, and improved monitoring. This program pays particular attention to an examination of radionuclide mobilization and migration mechanisms, developing and improving monitoring techniques around burial sites, the development of engineering methods to improve waste containment, and the construction of a waste burial demonstration facility.

Progress to Date

Progress has been made in several research areas through August 1978. Drilling operations are in progress at Area T to sample tuff beneath a previously used liquid radioactive waste disposal bed. Concurrently, a hyperpure germanium (HpGe) detector system is being developed to analyze tuff samples such as those collected at Area T, for plutonium, americium, and thorium. Tuff leaching studies have been initiated to determine the effects of various nonradioactive components of waste solutions on the migration of radionuclides through Bandelier Tuff. Feasibility studies have been initiated to characterize erosion, vertical migration, and plant uptake of radionuclides near waste disposal pits, using stable-elements as chemical analogs of radioactive contaminants and neutron activation techniques. We have also initiated evapotranspiration studies, using the heat balance equation, the profile method,



and the combination method, to provide information on one of the driving variables influencing tritium release from disposal pits and near-surface distribution of other radionuclides. The engineering studies of waste containment practices (University of Texas subcontract; annual report) has generally involved a survey of shallow land burial techniques for radioactive and nonradionuclide waste through literature surveys and actual disposal site visits.

Work During September 1978

Several specific accomplishments were made during September 1978, as related to the research areas discussed above. The drilling operations at Area T were temporarily halted due to repairs needed on the drill rig; the fourth hole was then finished to a depth of 33 m. Tuff samples previously collected at Area T were also analyzed for their water content and prepared for radionuclide analysis. The computer system and additional radionuclide counting equipment obtained for the hyperpure germanium-Ge(Li) system is being developed to assay tuff samples for transuranics and high-energy gamma-ray emitters; the coax Ge(Li) detector is currently at ORTEC for repairs. Final designs of an automated sample changer system and a sample container, which will become part of this tuff assay system, were accomplished with personnel in J-7 and the plastics section of CMB-6, respectively. Preparation of a new trailer to house this counting equipment started during September, with construction of an asphalt pad east of the H-12 Modular building and work on the trailer itself. An applicant for the geologic engineering position was interviewed and additional applications are currently being sought for this position.