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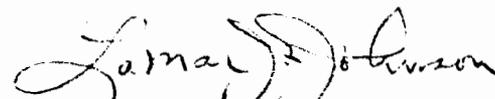
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Mr. Robert W. Ramsey, Jr., Chief
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Gentlemen:

Attached is the December 1976 report on three programs being pursued at LASL dealing primarily with shallow land burial of radioactively-contaminated solid waste materials. A section is included reporting on special program-related activities on which we have invested some effort this reporting period.

Sincerely,



LaMar J. Johnson
Group Leader
H-8 Environmental Studies

LJJ:kr (A414, A415, A420)
Attachment: Report a/s
Distribution List



MONTHLY PROGRESS REPORT

DECEMBER 1976

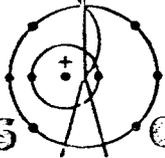
- LS-14-1-7A
- EVALUATION OF TRU-CONTAMINATED WASTE BURIAL SITES

- LS-15-1-7A
- LASL RADIOACTIVE SOLID WASTE DISPOSAL SITE STUDIES

- LS-20-1-7A
- RADIOACTIVE WASTE BURIAL TECHNOLOGY

- RELATED ACTIVITIES

LOS ALAMOS SCIENTIFIC LABORATORY
ENVIRONMENTAL STUDIES GROUP H-8



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scientific laboratory
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DIVISION OF WASTE MANAGEMENT,
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U.S. ENERGY RESEARCH
AND DEVELOPMENT ADMINISTRATION

UNITED STATES
ENERGY RESEARCH AND
DEVELOPMENT ADMINISTRATION
CONTRACT W-7405-ENG. 36

EVALUATION OF TRU-CONTAMINATED WASTE BURIAL SITES, LS-14-1-7A

The draft of the user's manual for the biological transport model portion of the evaluation system was completed and is expected to be available around the end of January. This manual contains complete descriptions of the options available within the transport model, a list of the types and formats for data required to run the program, and detailed instructions for obtaining a successful simulation of a waste-release scenario. This report represents the first step in developing a standardized procedure for site evaluation which may be used for other burial ground locations.

The glossary of all variables used in the model has been completed and forms the foundation for continuing work on a documentation report for the model. The documentation report is a several-month endeavor requiring an intensive review of all equations, explicit and implicit assumptions, and numerical parameters used in the model. The documentation report will catalogue these, and provide justifications and explanations as needed. Work on this report will extend over the remainder of the fiscal year; progress will be reported in monthly installments.

Work on the validation of certain parameters used in the evaluation system continued through December with reduction of the data from allometric studies at the selected field study sites.

LASL RADIOACTIVE SOLID WASTE DISPOSAL SITE STUDIES, LS-15-1-7A

A number of projects are underway at the current LASL waste disposal site Area G, TA-54 and at some of the older, closed burial grounds. The LASL waste disposal area locations are shown in Fig. 1.

Area G Studies

A screening and sampling procedure has been developed for the cores taken during the drilling of the horizontal monitoring holes beneath the Waste Disposal Pit #3. As reported last month, a total of 866 ft of core was collected, approximately one-third of it from directly beneath the waste disposal pit. The core is to be sampled and analyzed to determine if any radionuclides have migrated downward

from the pit. Prior to sampling, the entire core will be screened for radioactivity using an NaI-based screening system. Any core segments with radioactivity detectable with the screening system will be taken for analytical chemistry laboratory analyses. The screening system was assembled during December, and screening will commence in early January. In addition to the detectable radioactivity samples, samples of the core will be taken for radiochemical analyses at 1-ft increments along the core from beneath and within 15 ft (horizontal) of the pit. The remainder of the core will be sampled at 5-ft intervals.

Nine boreholes were augered adjacent to a new tritium disposal shaft (Shaft #150) at Area G. Samples of the cuttings were collected for moisture and tritium analyses. A few of the holes will be added to the moisture monitoring net in the disposal area; the remainder will be preserved for possible future sampling for tritium. Samples taken in boreholes near previously used tritium disposal shafts have indicated very low-levels of tritiated moisture diffusing away from the shaft. Analyses of the samples from around the new disposal shaft, together with data collected in the future, will help determine the effectiveness of modified tritium disposal techniques.

The borehole moisture monitoring project continued during December. A great deal of accumulated data was input to a computer data storage and graphics program to facilitate data recall and use in the future.

Work on the meteorological tower at Area G is proceeding slowly due to inclement weather. Wind and temperature sensors were installed on the tower, and construction of surge protection equipment for protection against lightning continued.

Studies at Other Areas

Measurements for radioactivity in soil samples previously collected at closed burial grounds Area C and Area F were begun in December (see Fig. 1). These consisted of gross-alpha and gross-beta measurements on bulk samples, and tritium-measurements on unbound soil water. After monitoring of the soils for gross radioactivity is completed, specific radionuclide analyses will be performed on selected samples.

Plans were initiated during December for the use of geophysical techniques to aid in establishing exact pit locations at the closed burial ground Area B. Area B is one of the disposal sites used in the early days of the Laboratory and records on the location of the pits within the area are vague.

Water samples were collected from nine springs in the Rio Grande Canyon below Los Alamos. These samples, together with water samples for deep local wells, will be used to determine the relative ages of water at different levels in the aquifer. This will be done using natural tritium dating techniques. This information will contribute to the understanding of possible radionuclide migration pathways at LASL.

RADIOACTIVE WASTE BURIAL TECHNOLOGY, LS-20-1-7A

A proposal was received from the University of Texas to survey non-radioactive hazardous waste disposal practices and material migration experience, and to determine possible burial site engineering containment methods that may be adaptable to radioactive waste disposal operations. After revision, the proposal was accepted, and a LASL subcontract for the work was initiated around the end of the month. Work on the project at the University is expected to commence in late January.

Two offers for staff positions for work on this project were sent out in November, one has been accepted and will be filled by the first of February.

RELATED ACTIVITIES

Efforts continued on developing the information required for our shallow land disposal contribution to the ERDA-sponsored Generic Environmental Impact Statement on LWR waste management. Significant difficulties were encountered regarding the need to quantitatively predict the radionuclide releases from "reference" burial sites. Site conditions can be described which will result in no water or radionuclide migration. However, under conditions where migration would be expected, the information required for a description of the leaching and migration processes is not presently available anywhere to our knowledge. A meeting with Battelle personnel to resolve this

problem has been scheduled for early January.

LASL personnel participated in the "Land Burial Operations Planning Meeting" in Las Vegas, Nevada on December 13 and 14. This meeting was especially informative on non-ERDA programs related to burial of radioactively-contaminated waste and on program activities at other ERDA sites.