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(CONTRACT W-7405-ENG-36)  
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IN REPLY

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Mr. Gerald H. Daly, Chief  
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Production and Reprocessing  
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Washington, D.C. 20545

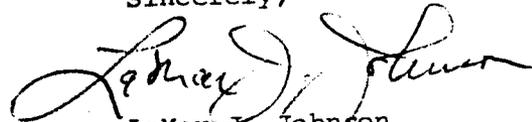
Mr. Robert W. Ramsey, Jr., Chief  
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Gentlemen:

With the beginning of fiscal year 1977, we have initiated a monthly progress report covering three ERDA/NFCP sponsored programs being conducted at the Los Alamos Scientific Laboratory entitled: (1) Evaluation of TRU Contaminated Waste Burial Sites (LS-14-1-7A), (2) LASL Radioactive Solid Waste Disposal Site Studies (LS-15-1-7A), and (3) Radioactive Waste Burial Technology (LS-20-1-7A). The third program is new and staffing efforts are under way. Also, possible contract work on selected tasks by universities and other outside organizations is being pursued to bring existing expertise to bear on problems where adaptation of knowledge developed for other reasons can contribute to nuclear waste disposal needs.

Progress on these programs for November 1976 is indicated in the attached pages. Related work, authorized by NFCP and performed by LASL staff, is also discussed as a separate category in this report. This related work is exemplified by recent assignments in writing a section on shallow waste burial for ERDAs Technical Alternatives Document; assisting the Nuclear Regulatory Commission with development of background information and criteria on shallow land disposal of radioactivity contaminated solid waste materials; and currently, development of shallow land disposal information and scenarios for ERDAs Generic Environmental Statement on Commercial Waste Management.

Sincerely,



LaMar J. Johnson  
H-8 Group Leader  
Environmental Studies

LJJ:kr (A414, A415, A420)  
Attachment: Report a/s  
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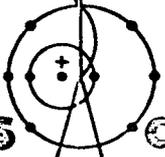
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MONTHLY PROGRESS REPORT

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

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

The November effort was primarily concerned with developing the draft of a user's manual for the biological transport model portions of the evaluation. This draft is expected to be reviewed during December and developed in final form in January 1977. Work began on a program documentation report with the compilation of a glossary of variables. This glossary defines, describes, and gives the units for each of the model's variables.

The user's manual and the program documentation report are two of the three forms of model documentation to be provided for the biological transport models. The third is code documentation which will be generated within the model code as it is analyzed and updated during the writing of the program documentation report.

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

The contractor's report on construction of horizontal monitoring holes at Area G, TA-54 was received this month. Five holes were drilled horizontally from a work area about 150' away from the edge of Waste Disposal Pit #3, from an elevation below the bottom of the pit. The holes have a total combined length of 1376 ft. A total of 866 ft of core was collected, approximately one-third of it from beneath the waste disposal pit. The drilling depth beneath the pit varied from less than 1 ft to more than 20 ft. The locations of the holes, in plan and cross-section, are presented as Figures 1 and 2 of this report.

The purpose of this project is to determine the extent, if any, of radionuclide and moisture migration beneath Pit #3. The first step is to analyze samples of the core for a suite of radionuclides, including cesium, strontium, and plutonium. The sampling design will be developed during December, and sample analyses will be performed in subsequent months. The holes will also be used for direct measurement of moisture distributions beneath the waste pit, using a neutron moisture probe.

The final report is in on a detailed gravity survey of the

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Pajarito Plateau in the Los Alamos area. The survey indicates the presence of a small NNE trending basin or sub-basin within the Rio Grande rift zone beneath the Pajarito Plateau. This feature is only partially expressed in the surface geology of the area; the western boundary of the basin coincides with the Pajarito Fault zone, but no mapped surface features coincide with its eastern boundary. The surface geologic mapping project now in progress will be oriented, in part, towards identification of any such surface features.

Work continued on the meteorological tower at Area G with the completion of the instrument/maintenance shelter, and construction of surge protection gear for the power source to the instruments. The surge protection gear, in conjunction with lightning arrestors, is designed to protect the data acquisition system against lightning strikes on or adjacent to the tower. Such strikes are a common occurrence in Los Alamos, and have been responsible for total disablement of meteorological systems in the past.

Existing capabilities at the Laboratory were canvassed with regard to the development of instrumentation for monitoring radionuclides in earth materials. Indications are that delayed neutron techniques can be used for determining the plutonium content of soils with low or known fissile uranium content. However, the lower range of sensitivity of this technique (about 2 nCi/g) is similar to the lower sensitivity of field FIDLER and phoswich systems presently in use thus removing some significance from this approach. Information was also obtained on an activation analysis technique which employs a track-etch detector for identifying induced fission events. The technique can measure plutonium in prepared biological materials to levels of  $6 \times 10^{-5}$  pCi/gm. Further work is required to adapt the method to soil materials.

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

A proposal was received from the University of Texas to

perform work related to developing site engineering methods for improving site containment, and to compiling information regarding non-nuclear waste management. The proposal has been reviewed and accepted, with some modifications, and will be the basis for work scheduled to start in January 1977.

Recruiting status for this program is that offers have been made to two staff members, and three new technicians have been hired.

#### RELATED ACTIVITIES

The description of a reference burial facility for the ERDA sponsored Generic Environmental Impact Statement was prepared, in final form, for submission to BPNL staff. The description includes all operational aspects, and is set in two distinct midwestern environments. The "wet" environmental setting provides for sufficient subsurface drainage to prevent saturated conditions in the waste under normally expected climatic conditions. The "very wet" environmental setting presumes that subsurface drainage is not sufficient to prevent saturation of the waste. The rates, direction, and radionuclide content of leachate movement within both environmental settings will provide information on possible long term impacts from waste burials. A third reference environment will also be described, characterized as "dry", in which moisture movement is not sufficient to produce leaching of the waste. This will permit comparison of burial impacts over a wide range of environments.

A meeting was attended in Madrid, Spain, sponsored by the International Atomic Energy Agency (IAEA), to assist in the development of a guidebook on the location, operation, and ultimate disposition of shallow land burial sites for radioactive wastes. A set of recommendations, endorsed by representatives of 13 member nations, was submitted to the IAEA to aid in the preparation of the guidebook. A detailed trip report will be completed by mid-December.

November 1976

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