

SCHEDULE 189 ZBB
Justification for Operating Costs & Equipment Obligations

1373
General

LS-1510 A

189 No.

Los Alamos Scientific Laboratory
Laboratory

February 1978
Submission Date:

1. Budget Activity No. JM030362	2. Office ALO	3. Project Title LASL Radioactive Solid Waste Disposal Studies
2. Method of Reporting Monthly and Annual	5. Person in Charge L. J. Johnson	Principal Investigator M. L. Wheeler M. A. Rogers
3. Contractor Los Alamos Scientific Laboratory	7. Working Location Los Alamos	8. State 9. Type NM National Lab
4. Contract No. W-7405-ENG-36	11. Task A415	
4. Division Waste Management	15. Lead Branch Operations Branch	

	FY 1978	FY 1979	FY 1980		
			Minimum	Current	Enhanced
11. MAN YEARS: Scientific	2	3	2	3	3
Other Direct	3	3	3	3	3
Total Direct (No Fractions)	5	6	5	6	6

12. COSTS (In Thousands):					
Total Costs	210	300	255	330	388
Total Obligations					

13. Goods and Services in Order (In Thousands):	
Total	NA

14. EQUIPMENT (In Thousands):					
a) B&R Classifications:					
b) Equipment Obligations	30	20	17	22	110
c) Equipment Costs	30	10	17	22	110

Five Year Plan
(Based on Enhanced Level FY 1980)

	FY 1980		FY 1981		FY 1982		FY 1983		FY 1984	
	BA	BO								
Total Operating	388		356		282		243		183	
Total Equipment	110		15		15		10		10	

25. Milestone Chart-LS-1510-A

COMPLETION DATE
 ● Minimum Budget
 ■ Current Budget
 ▲ Enhanced Budget

TASKS

1. Burial Site Descriptions
 - a. Preliminary surface reconnaissance
 - b. Detailed burial site descriptions for old sites
 - c. Update of source document (LA-6848-MS) on two year cycle
2. Inventory Description
 - a. Determine waste placement
 - b. Determine waste matrix and isotopic distribution
3. Pathways Description
 - a. Detailed geologic mapping of disposal areas
 - b. Published geologic map
 - c. Establish the water balance for the waste sites
 - d. Dev. of geochemical data base
 - e. Geologic report
 - f. Description of the Hydrological transport

	FY 1978	FY 1979	FY 1980	FY 1981	FY 1982
1. Burial Site Descriptions					
a. Preliminary surface reconnaissance	● ■ ▲				
b. Detailed burial site descriptions for old sites		● ■ ▲			
c. Update of source document (LA-6848-MS) on two year cycle		● ■ ▲		● ■ ▲	
2. Inventory Description					
a. Determine waste placement		● ■ ▲			
b. Determine waste matrix and isotopic distribution					
3. Pathways Description					
a. Detailed geologic mapping of disposal areas		● ■ ▲			
b. Published geologic map			● ■ ▲		
c. Establish the water balance for the waste sites			● ■ ▲		
d. Dev. of geochemical data base				▲ ■	●
e. Geologic report			▲	■	●
f. Description of the Hydrological transport				▲ ■	●

COMPLETION DATE

Minimum Budget

Current Budget

Enhanced Budget

25. Milestone Chart-LS-1510-A (Cont.)

TASKS

4. Monitoring Program

a. Description of alternative methods and initiate testing

b. Begin implementing systems

c. Monitor surface changes at the burial sites.

	FY 1978	FY 1979	FY 1980	FY 1981	FY 1982
	● ■ ▲				
	● ■ ▲	Ongoing		} Effort Proportional to Budget	
	● ■ ▲	Ongoing			

26. Publications

1. M. A. Rogers "History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Waste (Areas A, B, C, D, E, F, G, & T): .A Source Document," Los Alamos Scientific Laboratory. LA-6848-MS Vol. I and II, 1977.

2. B. M. Crowe, G. M. Linn, G. Heiken, and M. L. Bevier, "Stratigraphy of the Bandelier Tuff in the Pajarito Plateau: Applications to Waste Management Studies," Los Alamos Scientific Laboratory report. In press.

3. W. D. Purtymun, M. L. Wheeler, and M. A. Rogers, "Geological Description of Cores from Holes P-3 MH-1 Through P-3 MH-5, Area G, Technical Area 54," Los Alamos Scientific Laboratory report, in press.

27. Scope

This program is structured to evaluate the present status of monitoring schemes for LASL radioactive waste disposal sites, describe the possible migration pathways, develop any required new monitoring systems, and implement these systems. The generalized objective is to provide a system of surveillance over any possible environmental releases from LASL burial sites, and to collect sufficient long-term data to evaluate the significance of such releases.

28. Relationship to Other Projects

Other programs funded by DOE at the LASL include:

1. TRU Waste Burial Evaluation, LS-1410 A
2. Radioactive Waste Burial Technology, LS-2010 A
3. ERDA TRU Waste Research, Development, and Demonstration Program, LS-1210 A

4. Contaminated Solid Waste Disposal and Storage, LS-1110 A

LASL Radioactive Solid Waste Disposal Studies, LS-1510 A, interacts with all of the above. Evaluation of past and present monitoring practices depends upon background data from the TRU Waste Disposal and Storage work and upon data from studies which examine potential changes in the waste matrix due to chemical and physical reactions of stored radionuclides and changes in waste matrix due to treatment and volume reduction processes. Interaction with the TRU burial evaluation studies provides that program with information on the condition and use history of selected disposal areas, and provides this program with information on possible migration pathways. Similarly, the waste burial technology programs draws upon information related to past burial practices, and provides information on possible migration mechanisms operative at LASL disposal sites.

29. Technical Accomplishments in FY 1978

Preliminary reconnaissance of radionuclide distributions in plants, soils and animals at major LASL disposal areas were continued, and more detailed investigations begun in selected areas. Detailed geologic mapping of these major disposal areas will be finished, together with measurements of the significant hydrologic transport parameters at these sites. Studies will be underway to quantify the radionuclide movement along potential pathways.

Data collection from the moisture monitoring net continued. Experiments are being conducted, using the meteorological tower at Area G, to define the net flux of moisture into the burial site. Further work was conducted on defining the regional groundwater migration pathway, using groundwater dating techniques. Several possible systems for monitoring the radionuclide migration were selected, and testing initiated.

The stratigraphy of the Pajarito Plateau and the waste burial sites will be described in the form of geological maps. Preliminary geochemical data has been developed for the Bandelier Tuff.

30. Expected Results in FY 1979

An environmental report will be prepared, describing the major geologic and hydrologic features at Area G. This will include the stratigraphy and structure, petrographic and geochemical data, and description of the principal potential migration pathways. The results of investigations, or radionuclide distributions in plants, animals and surface soils will be used to design a subsurface sampling program at the major LASL disposal areas. Together, the surface and subsurface investigations present a complete picture of the distribution of radionuclides in the vicinity of the waste disposal pits or shafts. When this information is coupled with the migration pathways analysis, the likely rates and direction of any further movement can be established. The measurement of moisture distributions in earth material over and adjacent to waste disposals will be evaluated, and modifications made, as necessary, in the location and frequency of those measurements. The overall goal of the program is to predict, with reasonable accuracy, the quantities of precipitated moisture moving through the waste material.

Measurements at Area G will continue to be taken and recorded of windspeed, temperature, humidity, precipitation, surface temperature, and heat transfer in the soil. Routine surveillance of wind-direction and velocity will assist in tracking any accidental atmospheric release during burial site operations. Intensive research studies will be performed to model atmospheric dispersion processes, soil moisture flux, and evaporation of precipitation. These studies add to the understanding of possible processes of radionuclide migration.

The field testing of migration detection systems, begun in FY 1978, will continue. A program goal is to select an initial system for installation or implementation, beginning in FY 1979. The fruition of this is dependent on research conducted during the latter part of FY 1977 and during FY 1978.

31. Expected Result in FY 1980

The major effort for FY 1980 will be a continuation of efforts during FY 1979. The data from the expanded LASL Burial Facilities Monitoring System will be collected and reviewed, permitting sufficiently more reliable predictions of the possible movement of radionuclides away from the burial locations. Review of the monitoring data is expected to result in upgrading and modification of the system. As the monitoring system for radionuclides and water movement in the burial sites become final designs, the techniques are expected to be available for use at other DOE contractor or commercial land burial sites.

Minimum Effort

A minimum effort funding of this contract will result in delay of the planned development of geological and hydrological data base. The data base will be required for implementing radionuclide migration studies planned under LS-2010A and implementing monitoring systems.

Current Effort

The delays would be less than those for the minimum effort, but would affect the same areas of effort as indicated in the ZBB milestones.

Enhanced Effort

The description of the radionuclide migration environment is expected to be completed by the end of FY 1980, although some special

problems can be anticipated requiring further definition. It is expected the migration environment will be influenced by the moisture characteristics and conductivity functions of the significant hydrologic units in the Bandelier Tuff. The overall water balance, including precipitation input, surface runoff, and deep seepage for the waste areas will be an important part of establishing the migration environment.

32. Expected Results Beyond FY 1980

During FY 81, FY 82, and FY 83 will consist of expansion and eventual completion of the monitoring systems for the Solid Waste Disposal Sites at LASL. Program personnel will be responsible for the collection and interpretation of data from the monitoring net. In order to detect changes in radionuclide distribution at and below surface of the burial sites, this amount of time as a minimum, will be required.

33. Description and Justification of Major Procurement Items.

Funds will be required for conducting test drilling, geophysical, geochemical, and petrographic measurements. Part of this work is expected to be fulfilled by subcontracting. A total cost of dollars 100K is anticipated for these projects.

Increased materials and services costs are anticipated for FY 1980. The monitoring program will be using several expendable pieces of equipment that do not fall under capital items.

34. Description and Justification of Major Equipment Items

Installation and testing of radionuclide monitoring systems is expected to require additional automation of data collection. Additional monitoring systems will be added to other burial sites at LASL. The anticipated equipment includes: 1) microprocessor for data reduction

\$20K. 2) electronics for data automation \$10K. 3) drilling rig
for drilling monitoring holes \$80K.

35-40. NA