

## OFFICE MEMORANDUM

TO : LASL Waste Management Committee  
THRU : Dr. G. L. *Joelz*, Health Division Leader  
FROM : *John Warren*/L. J. Johnson, H-8  
SUBJECT : *John Warren* SUMMARY REPORT OF LASL SOLID RADIOACTIVE WASTE MANAGEMENT  
OPERATIONS ACTIVITIES IN FY1974, AND PLANNED ACTIVITIES IN FY1975  
SYMBOL : H8-WM-239

DATE: August 19, 1974

Enclosed is the subject report. Comments and suggestions regarding either past or present activities are requested as well as suggestions on other reportable information for future reports of this type.

JLW:LJJ:jc

LASL Waste Management Committee:

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SUMMARY REPORT OF LASL SOLID RADIOACTIVE WASTE MANAGEMENT  
OPERATIONS IN FY1974 AND PLANNED FY1975 ACTIVITIES

A. Solid Waste Disposed/Stored During FY1974

During FY1974 a total of 3 843.1 m<sup>3</sup> (135 660 ft<sup>3</sup>) of solid radioactive waste was disposed of or stored at LASL. The attached Table I gives a general breakdown of this waste volume by type, and Table II tabulates the radionuclide content of this waste. Two points to note regarding these tables are the following:

- (1) The FY1974 waste volume handled was significantly lower than the FY1973 total of 6 950 m<sup>3</sup> (245 390 ft<sup>3</sup>). This decrease resulted because there were no major decontamination/decommissioning projects in the Laboratory during FY1974; almost all of the FY1974 waste volume was routine Laboratory-generated waste.
- (2) The mass of Pu discarded in FY1974 almost equalled the total amount of Pu discarded at the Laboratory in all years prior (FY1974 total 7 600 g (including <sup>241</sup>Am); prior years total 7 661 g). In FY1974 the CMB-11 Group recovery operations generated 306 drums - both 115 ℓ and 210 ℓ - containing 4 760 g of <sup>239</sup>Pu, and average of over 15 g per drum.

In addition, 2 069.5 g of "heat source" <sup>238</sup>Pu were placed into retrievable storage; this waste was contained in 218 115-liter drums for an average of over 9 g per drum.

The only other disposal of some significance during the year involved four lots of enriched  $^{235}\text{U}$  residues, among which was included 95 drums of  $\text{NbCl}_5$  residue containing  $18\pm 5$  kg of  $^{235}\text{U}$ . All of this material was disposed of by burial after all necessary approvals were obtained.

#### B. Program Budget and Staff

For FY1974 the LASL Waste Management Operations program received \$120K from DWMT for the operation of the burial ground/storage area. The salary of one staff member (John Enders) and one technician (C. O. Martinez) came out of the above DWMT funding, leaving approximately \$73K to fund actual operations. In addition, one other staff member has been funded out of Laboratory overhead.

#### C. Major Program Accomplishments During FY1974

The fiscal year 1974 saw significant accomplishments in many areas of the LASL Waste Management Program including the areas of policy and procedure, waste disposal operations, waste handling, retrievable transuranic waste storage, Area "G" facilities, disposal area monitoring, area rehabilitation, and waste records. These are summarized briefly below.

##### LASL Waste Management Policy and Procedures

In response to the issuance in September, 1973, of AECM 0511 and Directors Office Memorandum #48-Radioactive Waste Management Policy, a memorandum (H8-WM-57) was issued in May, 1974, providing Laboratory waste generators with some initial information and guidance on waste management operations necessary to

implement the Laboratory and AEC policies. Work now has been initiated to generate a comprehensive LASL Waste Management Manual.

### Waste Disposal Operations

The establishment of the LASL interim policy on disposal of  $^{238}\text{Pu}$  waste allowed burial of the stack of approximately 1600 "leaky" drums in Pit 8 at Area "G", containing TA-50-generated chemical treatment sludge. The sludge drums in the pit were effectively tying up the use of that pit and consequently a considerable volume of waste was accumulated at Area "G" with no place to be disposed of. The estimated cost of repackaging the sludge to make it "retrievable" had ranged from \$150K-250K. With the burial of the sludge, a general "cleanup" of Area "G" was accomplished, and all stockpiled waste was disposed of.

Two new waste burial pits, pits 7 and 24, were dug during FY1974. The pits, both 200 m long by 17 m wide by 8 m deep are now used for burial of nonretrievable transuranic wastes and uranium wastes. At the beginning of FY1974, six pits at Area "G" were being used for waste disposal or storage. Currently only four pits are being used, and within a few months only three pits will be in active use. (There will then be one pit available as a "standby".)

### Waste Handling

A 2300 kg capacity rough terrain forklift and 900 kg capacity truck-mounted boom crane recently were obtained with capital equipment funding. These two items greatly improve the

overall waste handling capabilities at the disposal area and, with the truck-mounted hoist, throughout the Laboratory.

#### Retrievable Transuranic Waste Storage

Approximately one year ago the AEC declared  $^{238}\text{Pu}$  scrap that LASL was holding to be waste. As such, this material required placement into 20-year retrievable storage. The facility for this storage was provided during FY1974, and already contains 2069.5 g of  $^{238}\text{Pu}$  in 218 drums of waste. Funding for this project was not part of the original FY1974 budget submission. When additional DWMT funding was not available at the mid-year review, the Laboratory provided the necessary funds. The total cost of providing the present facility and emplacement of existing waste into storage was about \$45K. The present facility has capacity for at least one additional year's generation of this waste.

Presently at Area "G" there is accumulated about  $1\ 415\ \text{m}^3$  ( $50\ 000\ \text{ft}^3$ ) of other retrievable transuranic contaminated solid waste. This waste, packaged mostly in drums and wooden crates, has accumulated over about three years. To accommodate this waste, a storage facility is in preparation. A pit to be used for this facility was dug in FY1974, and final plans have been made for the completion of the storage facility. Facility readiness will be within 3 to 4 months, depending upon the availability of Zia equipment and personnel. The total estimated cost of the facility is about \$35K, exclusive of waste materials handling costs. The facility will be able to store waste generated over the next 2 to 3 years in addition to all that has already accumulated.

Of major concern this past year was the degradation of some 70 wooden crates containing retrievable transuranic waste. These crates have been stored in the open at Area G. During FY 1974 these crates were repaired, as necessary, to provide a secure waste package. In a majority of cases this consisted of completely rebuilding the crate. The approximate cost of this operation was \$8K.

The repaired crates are now being coated with 1/8" of fire retardant fiber glass. This work, being done by Test Fab Materials and Engineering Corporation of Albuquerque, New Mexico, was begun in the last week of FY 1974. The project will take an estimated 6 to 7 weeks to finish at a cost of about \$17K.

#### Area "G" Facilities

Numerous Area improvement projects were completed during the past year. To aid in controlling dust and mud in area operations, the main roadway in the area was built up and oiled. A new heavy equipment gate to the area was installed to keep heavy equipment off of the improved road.

Two additional small surplus trailers were obtained and installed at the area. One of these will be used for materials storage; the other is being converted into an emergency change trailer. All of the trailers in the area were repaired and painted during the year. The four air-sampling trailers at the area were all put into operational condition, and arrangements now exist for routine maintenance of these units.

A request for GPP funding in FY 1974 to provide electrical power, telephone, and water to Area "G" was not honored,

as was a modified request for about \$35K in FY 1975 to provide only the electricity and telephone, A schedule 44 requesting DWMT GPP funds in the amount of \$200K for FY 1976 has been prepared and submitted.

In the interim, a water supply primarily for the purpose of fire protection was established via emplacement of a 360 m<sup>3</sup> LASL surplus tank at the area. Some emergency lighting facilities at the area were established using a LASL surplus 3.5 kW gasoline powered generator, The cost of providing these emergency water and electrical facilities was about \$5K.

New warning signs meeting OSHA requirements have been obtained and will soon be installed along all waste disposal area perimeter fencing.

#### Disposal Area Monitoring

With the assistance of other Waste Management Program personnel, some monitoring facilities were established in Area "G" during FY 1974. Both of the new disposal pits have facilities installed to permit monitoring of moisture movement below the pit after it is filled with waste, Similar facilities were installed around the stack of "leaky" sludge drums in Pit #8 prior to their burial.

Monitoring facilities already established in the <sup>238</sup>Pu storage facility provide for measurement of soil moisture movement and temperature in and around the concrete cask storage containers.

As mentioned previously, all four air sampling trailers at Area "G" have been made operational,

### Area Rehabilitation

During FY1974 waste disposal operations in a part of Area "G", about 12 acres, were completed. Since that time, planning and preparation have been underway to rehabilitate the area involved through a replanting operation. Assistance to date has been obtained from the U. S. Forest Service and a University consultant.

### Waste Records

LASL Group C-4 began work in FY1974 to adapt a computerized waste records program to the needs of the LASL Waste Management Program.

TABLE I

LASL BURIED OR STORED RADIOACTIVE  
SOLID WASTE IN FY1974

A.	<u>Transuranic Contaminated &gt;10 nCi <sup>239</sup>Pu, <sup>241</sup>Am/g, &gt;100 nCi <sup>238</sup>Pu/g</u>		
	(1) Stored awaiting retrievable storage -	585.1	m <sup>3</sup>
	(2) Emplaced into retrievable storage -	90.9	
	(3) Disposed of nonretrievably		
	(a) Area "T", cement paste -	451.0	m <sup>3</sup>
	(b) Area "G" shafts -	9.0	
		<u>460.0</u>	
			<u>1136 m<sup>3</sup></u>
B.	<u>Transuranic Contaminated &lt;10 nCi <sup>239</sup>Pu, <sup>241</sup>Am/g, &lt;100 nCi <sup>238</sup>Pu/g</u>		
	(1) Trash	1083	m <sup>3</sup>
	(2) Chemical Treatment Sludge (TA-50)	125	
	(3) Other	<u>595</u>	
			<u>1803 m<sup>3</sup></u>
C.	<u>Uranium Waste</u>		
	(1) Trash	438	
	(2) Other	<u>460</u>	
			<u>898 m<sup>3</sup></u>
D.	<u>FP/IA Waste</u>		<u>1.4</u>
E.	<u>Tritium Waste</u>		<u>4.7</u>
		TOTAL	<u><u>3843.1</u></u>

TABLE II

## SUMMARY OF RADIONUCLIDES BURIED AND STORED

IN

SOLID WASTE DURING FY1974

<u>Radionuclide Disposed/Stored</u>	<u>Grams</u>	<u>Curies</u>
I. Transuranic Radionuclides		
(a) $^{239}\text{Pu}$ (retrievable)	4 781	340
(b) $^{238}\text{Pu}$ (retrievable)	<u>2 069.5</u>	<u>28 808</u>
Total retrievable	6 850.5	29 148
(c) $^{239}\text{Pu}$ (nonretrievable)	478	29
(d) $^{238}\text{Pu}$ ( " )	1.3	23
(e) $^{241}\text{Am}$ ( " )	170	551
(f) $^{233}\text{U}$ ( " )	26	0.25
(g) $^{237}\text{Np}$ ( " )	4	$2.8 \times 10^{-}$
(h) $^{244}\text{Cm}$ ( " )	$4 \times 10^{-4}$	$3.3 \times 10^{-}$
(i) $^{252}\text{Cf}$ ( " )	<u><math>5.7 \times 10^{-2}</math></u>	<u>30.6</u>
Total nonretrievable	679	634
Total transuranics	7 529.5	29 782
II. Uranium (other than $^{233}\text{U}$ )		
Depleted and normal enriched	5 977,177	5
III. Other		
(a) FP/IA		540
(b) Tritium		3 014
(c) Thorium	14 000	
Total curies		33 341

D. Expected Program Accomplishments During FY1975

LASL Waste Management Program Activities in FY1975, in addition to the routine waste handling, disposal, and storage, will be directed toward the completion of all projects started in FY1974, the extension of disposal area monitoring facilities, and the determination of and planning for future Laboratory waste management programs, in particular, waste treatment programs.

The FY1975 program budget is \$200 K; this will be divided between program staffing of 2 staff members and 2 technicians (an increase of 1 technician), costing approximately \$100 K, and program operations costing approximately \$100 K. The FY1975 capital equipment budget is \$30 K. Part of this will be used to obtain a foam-generating fire-fighting unit for use at the radioactive and chemical disposal areas (approximately \$12 K), and a fiber glass outfit for coating crates here at LASL (approximately \$4 K). While several other equipment items are under consideration, the remaining budget is as yet, not specifically appropriated,

Some of the more specific activities in the LASL Waste Management Operations Program during this next fiscal year are the following:

LASL Waste Management Policy and Procedure

An ALOO audit of LASL Waste Management practice and procedure is expected in late August or early September, 1974. It has been indicated that a major point to be reviewed in this year's audit will be formalized/documentated LASL waste management operational procedures.

It is anticipated that a LASL Radioactive Solid Waste Management Manual can be issued in FY1975 to serve as a comprehensive guide for overall Laboratory Waste Management operations. A draft of this manual now is being prepared for review.

#### LASL Waste Treatment

With the aid of LASL operating groups and Health Physics Group H-1, a review of LASL waste management policy and practice will be undertaken, along with a determination of actual waste generation at the Laboratory.

One of the primary purposes here will be to determine what, if any, waste volume reduction technology can and should be implemented at LASL. Upon completion and documentation of this study, it is anticipated that budget requests will be submitted in FY1975 to DWMT for construction and equipment of LASL waste treatment facilities, this money hopefully will become available in FY1976-77.

#### Waste Disposal Operations

##### (a) Routine waste disposal operations

We anticipate the handling and disposal by burial of approximately 14 000 - 17 000 m<sup>3</sup> (130 000 - 150 000 ft<sup>3</sup>) of Laboratory waste this year. Most of this will be routine Laboratory-generated trash and equipment. No major Laboratory decontamination/decommissioning projects are projected until possibly at the very end of FY1975, with the decommissioning of the TA-2 Omega West Water Boiler Reactor. This, however, may not occur until FY1976.

While no new pits likely will need to be dug this year, we

will require at Area G several new disposal shafts of varying sizes.

(b) Retrievable transuranic waste storage

These operations, for the most part, in FY1975 will become routine. The retrievable storage pit facility, Pit #9, will be completed and all stockpiled retrievable transuranic waste will be emplaced and covered. The coating of the wooden crates with fiber glass will be completed by mid-August.

Investigations will be made to determine if some or all of 20 CMR Building filter plenum sections can be buried rather than being placed into retrievable storage. These pieces are very difficult to handle, and the present containment of contamination in these pieces must be questioned, especially over a 20-year storage period. It appears that the 100 nCi<sup>238</sup>Pu/g retrievable limit may allow burial of at least half of the pieces.

The existing <sup>238</sup>Pu storage facility is sufficient to contain all planned FY1975 generation. Planning for an addition to this facility may be required late in the year, for needed FY1976 storage space. A review of all aspects of the present facility will be made.

The mass of Pu handled in all waste materials should remain at least at the FY 1974 level, or could even increase. More of this transuranic activity will, however, go into retrievable storage with the storage of the cement paste generated at DP-257 by Group H-7. The activity of waste handled in FY1975 should decrease significantly from the 1974 value as a result of the handling and storage of much less of the <sup>238</sup>Pu waste.

## Area G Facilities

Efforts presently are underway to obtain a trailer unit to be established at Area G for temporary use as an office and change room facility. Additionally, a schedule 44 request has been submitted for \$200 K of DWMT GPP money in FY 1976. This money is being requested for the following:

- (1) Establishment of power and telephone services to Area G. (Approximately \$35 K)
- (2) Additional fencing of waste disposal areas. (Approximately \$30 K)
- (3) Permanent markers for disposal shafts and pits. (Approximately \$20 K)
- (4) An operations building to be used for storage of equipment at the disposal/storage area, and possibly for housing a compactor/baler unit for use to reduce the volume of up to 1/2 of LASL-generated waste by a factor of at least 10:1. Retrievable transuranic wastes would not be treated in this facility; only the large volume of routine Laboratory-generated trash would be treated. Associated waste assay equipment could be installed to assure proper and safe waste handling. (Approximately \$100 k)

Should it become apparent that this funding will be available, planning work will continue on these projects in order to have them ready to proceed as soon as the funding is received.

Work to install new signs around all waste disposal areas

already has begun.

### Disposal Area Monitoring

In FY1975, primarily through the efforts of other WM program personnel, studies will be carried out to define the quantity of water and pathways by which water is moving through soil and tuff in disposal areas, and obtain field information on the mobility of radionuclides known to be present in the disposal area, either in pits or shafts. These studies will involve the following:

- (1) Establishment of a climate (weather) station at Area G; measuring precipitation, atmospheric temperature and humidity, and wind velocity and direction on a continuous basis. (Equipment to measure the first three variables now is operational at the site.)
- (2) In conjunction with the climate station, establishment of a soil lysimeter, to measure fluctuations in soil moisture by direct weighing of an in-place soil mass.
- (3) Installation of a "string" of thermocouple psychrometers to measure soil moisture potential gradients in the tuff underlying Area G. These data will permit description of the flow paths of any water moving through the tuff.
- (4) Sampling of the tuff for radionuclides, via auger holes. This will include, but not be limited to, tritium and plutonium analyses.

### Area Rehabilitation

It is planned that the 12-acre area in Area G will be replanted in this fiscal year. This program of area rehabilitation will be an ongoing program in attempting to determine improved means of re-establishing a controlled ground cover in disturbed waste disposal areas.

A long used waste disposal site at TA-33 will be cleaned up this year, with the removal to Area G, TA-54, of all of the improperly discarded waste. In accomplishing this cleanup, a safety problem and an eyesore will be removed. A work order for this project has been written.

Other LASL waste disposal areas will continue to be investigated this year to determine, what, if any, rehabilitation, fencing, removal, or other improvements in conditions are required.

### Waste Records

A computerized waste records system, now being worked on, will become operational this year. All available past data will be placed into the system, as will all future waste disposal information.